

**REPORT ON THE 1999 EXPLORATION PROGRAM**

**ON THE TODD CREEK PROPERTY**

**SKEENA MINING DIVISION,**

**STEWART GOLD CAMP,**

**NORTHWESTERN BRITISH COLUMBIA**

**LATITUDE 56° 17' NORTH**

**LONGITUDE 129° 48' WEST**

**NTS 104 A/5, 104 A/4**

**BY**

**GEOFINE EXPLORATION CONSULTANTS LTD.**

**FOR**

**OKAK BAY RESOURCES LTD.**

**DECEMBER 1999**

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**GEOLOGICAL SURVEY BRANCH  
MINERAL REPORT**

**26,285**

**DECEMBER 1999**



**PHOTO 1. MIDDLE EXTENSION OF SOUTH ZONE (MEXT SZ)  
1999 GOLD/COPPER DISCOVERY AT MEXT CREEK  
(FOR SCALE, NOTE GEOLOGIST AT BOTTOM LEFT)**

## **SUMMARY, 1999 TODD CREEK PROJECT REPORT:**

The approximately \$80,000, 1999 Todd Creek Project was carried out by Geofine Exploration Consultants Ltd. on behalf of Okak Bay Resources Ltd. of Vancouver. The Todd Creek Property is located in the heart of the historic Stewart Gold Camp, and straddles the Todd Creek Valley, approximately 35 km northeast of Stewart, Northwestern British Columbia. The property comprises 428 claim units in 24 mineral claims, which are registered in the name of Geofine; and, in which Okak Bay Resources Ltd. has a right to earn a 100% ownership interest, subject to an underlying option agreement and a Geofund royalty.

Favourable Hazelton Group rocks, which host most of the significant gold and polymetallic mineralization in the Stewart Camp, including the world class Eskay Creek Mine (current reserves of about 1.4 Mt, grading 57.7 g gold/t and 2493 g silver/t; and, total deposit size of 7.1 M oz gold equivalent), underlie much of the property. Numerous gold/copper and silver/lead/zinc showings are located in altered Hazelton pyroclastic rocks, proximal to the postulated Todd Creek and Fall Creek Valley fault systems. For example, the South Zone deposit (207,000 tonnes grading 5.48 g gold/t, along with significant copper credits) is located near the head of the Todd Creek Valley on an interpreted splay off the Todd Creek Valley Fault. On surface, the South Zone is up to over 15 m in width, and the South Zone Structure, which hosts multiphase, breccia vein and stringer gold/copper mineralization, has been traced by historic work for about 950 m.

Noranda work indicates that the first 425 m (the South Zone deposit) and the last 100 m of the structure (herein, the NEXT SZ) are mineralized. The potential of the structure appears to remain open for evaluation, since it disappears to the south and north under the glacial-fluvial deposits of the Todd Creek Valley, where no historic work has apparently been done; since air photos suggest the structure continues for at least another 300 m to the south; since the structural fabric is conducive to the development of plunging ore shoot morphologies; since ore shoot models appear to have never been applied in the historic drill strategies; and, most importantly, since new, significant South Zone gold/copper mineralization (i.e., the MEXT SZ) has been discovered in 1999. It is thus concluded that the structure, which has an apparent strike length of over 4 km, has not been adequately explored in the past, and that further exploration could yield an important gold/copper deposit.

Moreover, the favourable Todd Creek geological environment (e.g., the South, Amarillo, Yellow Bowl, and North Zones) continues to be interpreted as having potential for hosting much more significant mineralization (including Eskay Creek VMS type deposits) than is currently apparent in the historical showings. For example, the strong polymetallic geochemical signature and alteration of the Amarillo Zone are interpreted to be indicative of a prospective epithermal system which is considered to be a major exploration target, and which has yet to be tested by diamond drilling.



The foremost objective of the 1999 project was to further appraise and prioritize the most important exploration targets in order to facilitate the discovery of ore via the planned Y2K drill program. As initially contemplated by Okak, the drill program would focus mainly on the expansion of the South Zone deposit; and, as facilitated by budget, on the initial drill evaluation of the Amarillo and Yellow Bowl Zones.

During the 1999 program, 14 tentative diamond drill holes were spotted in the field, with six in the South Zone target area (five on the South Zone deposit and one on the NEXT SZ); four on the North Zone; and, four on the Amarillo Zone. The new Middle Extension of the South Zone (MEXT SZ) gold/copper target was discovered in 1999; and, with some additional fieldwork, it may prove to be the most prospective of South Zone drill targets. Based on the results of the 1999 Todd Creek Project, Geofine recommends the following prioritization of Y2K drill targets.

#### **RECOMMENDED Y2K, PHASE 1 DRILL STRATEGY:**

<b>OVERALL PRIORITY:</b>	<b>APPROX HOLE LENGTH:</b>	<b>TARGET/RATIONALE/ORCHESTRATION:</b>
------------------------------	------------------------------------	--

- |    |       |   |
|----|-------|---|
| 1. | 300 m | <p><b>AMARILLO ZONE, EAST TARGET AREA, CAMP POND, DDHAZ00-04, L50N:</b> the Amarillo Zone is interpreted as epitomizing the top of a very prospective epithermal system. The large target has been outlined by a 1994 airborne potassium channel radiometric survey, and partially by ground geochemical and geological surveys. Sub crop located in 1999 at Camp Pond has a very prospective polymetallic geochemical signature (gold, copper, silver, lead, zinc, arsenic, mercury, antimony, molybdenum) and correlates with the strongest polymetallic soil geochemistry that Geofine has encountered in the Stewart Camp. The anomalies and favourable geology are deemed indicative of a particularly high priority drill target in a system that could host significant gold/copper mineralization at depth.</p> |
|----|-------|---|

As recommended by Geofine in 1997, the ownership of the TODD Claim to the west should be ascertained, and if available, optioned, prior to the commencement of drilling.

<b>OVERALL PRIORITY:</b>	<b>APPROX HOLE LENGTH:</b>	<b>TARGET/RATIONALE/ORCHESTRATION:</b>
<b>1.A.</b>	<b>250 m</b>	<b>CONTINGENT ON POSITIVE RESULTS FROM DDHAZ00-04: either a deeper cut under DDHAZ00-04 in search of gold/silver or gold/copper mineralization lower in the epithermal system; or DDHAZ00-01, a continuation of the drill section across the Amarillo Zone, but on L49N, 175 m west and 100 m south of DDHAZ00-04.</b>
<b>2.</b>	<b>135 m</b>	<p><b>SOUTH ZONE DEPOSIT, SOUTH ZONE, DDHSZ00-01A: recommended by Geofine as a confirmation of, and a 15 m northerly step out on the high grade lens (Noranda 1988 drill core values up to 8.83 g gold/t and 0.45% copper over 11.7 m); and, utilizing HQ size core (2.5") to evaluate the apparent nugget effect of disseminated chalcopyrite, and to confirm ore shoot morphology and grade parameters.</b></p> <p><b>Two additional claims (the former Pat 9 and Pat 10 Claims) should be staked to cover the apparent along strike extension of the South Zone structure south of the South Zone deposit.</b></p>
<b>3.</b>	<b>200 m</b>	<b>SOUTH ZONE DEPOSIT, SOUTH ZONE, DDHSZ00-01: Okak recommended hole, as deeper step out (75 m vertically below DDHSZ00-01A) on the high grade lens, to determine continuity and confirm interpreted ore shoot morphology.</b>
<b>4.</b>	<b>100 m</b>	<b>MIDDLE EXTENSION OF SOUTH ZONE (MEXT SZ): May be the highest priority of South Zone drill targets; is a test of newly discovered, significant gold/copper mineralization (1999 panel sample values up to 7.80 g gold/t; talus sample values up to 7.25 g gold/t and 2.06% copper); but dependent on locating hole set up, possibly after some further evaluation on ropes. Recommended to be spotted on cliffs above MEXT, and drilled at steep inclination (approx. -75°), azimuth 100°, as dip and topography dictate.</b>
<b>5.</b>	<b>175 m</b>	<b>SOUTH ZONE DEPOSIT, SOUTH ZONE, DDHSZ00-03: Okak recommended hole, as deeper test about 180 m from DDHSZ00-01A, down postulated east plunge axis of high grade lens.</b>

6. 100 m **NORTHERN EXTENSION OF THE SOUTH ZONE (NEXT SZ), DDHNEXTSZ00-01: quartz breccia gold/copper zone somewhat similar to South Zone deposit, but on surface, zone intensely silicified and less fractured and sulfidized; appears to be significant target with widths up to over 6 m, an apparent strike length over 100 m, and 1999 panel samples returning up to 1.30 g gold/t and 1.31% copper; only minimal apparent historic work; testing and hole position subject to confirmation of apparent dip and displacement on NEXT Fault: a shallow, initial hole drilled west from valley floor could be most economical, but chasing west dipping zone; and, displacement may indicate that the South Zone Structure has been displaced under Todd Creek Valley sediments i.e., NEXT Zone may be second, parallel mineralized zone to main target.**
- Prior to the commencement of Y2K work, it is recommended that the former Pat 8 Claim should be restaked to cover the possible displacement of the South Zone Structure to the east, into Todd Creek Valley.
7. 80 m **B ZONE, NORTH GRID, DDHBZ00-01: hole would be drilled under and parallel to the approximately one meter wide, cross cutting semi massive sulfide copper/gold zone (seven 1999 samples average 0.81 g gold/t and 1.50% copper); however, sulfides are thought to be fracture filling off larger target coincident with northwest trend of B Zone - trend towards Amarillo Zone. Evidence for such target is found about 120 m to the south where 1994 chip samples returned up to 2.21 g gold/t and 2.28% copper over a 6.5 m width; 100 m to south where three, 1994 semi massive sulfide sub crop samples averaged 4.70 g gold/t and 2.8% copper; and about 70 m to north where a 1999 float sample contained 140 ppb gold, 0.13% copper, 0.08% lead and 0.17% zinc; mineralization on North Grid (e.g., B, A, NE Zones) is thought to be associated with emanations from lower area of Amarillo epithermal system, and could thus offer important gold/copper targets.**
8. 100 m **A ZONE, NORTH GRID, DDHAN00-01: hole would be drilled under outcrop which was re-sampled in 1999 and which returned 44.18 g gold/t and 3.3% copper over 2 m; the A Zone was previously drilled by Noranda (values up to 3.47 g gold/t and 0.75% copper over 31.85 m, incl. 14.47 g gold/t and 2.06% copper over 5.95 m); proposed hole would be 25 m step out to south, towards Fall Creek Valley Fault.**

**It is concluded that the Todd Creek Property has excellent potential for hosting a major polymetallic orebody, with substantial gold and copper components. Of the eight proposed Holes referenced above, seven have been spotted in the field and cross-sections and relevant vertical longitudinal sections prepared. As recommended above, and ideally as soon as possible, the former Pat 8, 9, and 10 claims should be staked south and east of the South Zone deposit to cover the postulated along strike extension of the South Zone structure and any possible displacement of it to the east at the NEXT Zone. Restaking of the former Pat 6 and 7 Claims is also proposed to cover the East Zone VMS target, along with the staking of two new claims to the north of the Pat 1 and Pat 2 Claims, to cover the Hamila Target Area. The ownership of the TODD Claim west of the Amarillo Zone should be ascertained and, if available, optioned.**

**It is recommended that the Phase 1 drill program be orchestrated to optimize budget, and according to on-going results. For example, with an initial, significant discovery on the Amarillo Zone, the zone could immediately become the principal focus of Y2K drilling activities. However, the Amarillo Zone is at a higher elevation relative to the rest of the targets, and depending on yearly snow conditions, its testing may have to be postponed until late July or August. Notwithstanding the above, the South Zone is considered to offer a unique discovery opportunity. If access to Amarillo were delayed, Geofine would then recommend the pursuit of the South Zone drill targets and the follow-up work at the MEXT SZ early in July, as the first Y2K priority.**

**Based on Geofine's considerable experience in the Stewart Camp, a cost effective drill program and follow-up recommended geological surveys would include an on-site camp and helicopter. The minimum cost effective, helicopter supported HQ drill program entails about 1000 m of diamond drilling. The approximately 1450 m program contemplated in the table above, along with proposed follow-up work, would have an estimated all in cost, net of refundable reclamation bond and GST, of about \$340/m. The estimate is based on 1999 contractor bids.**

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**REPORT ON THE 1999 EXPLORATION PROGRAM**  
**CARRIED OUT ON THE TODD CREEK PROPERTY,**  
**STEWART GOLD CAMP, SKEENA MINING DIVISION,**  
**NORTHWESTERN BRITISH COLUMBIA**

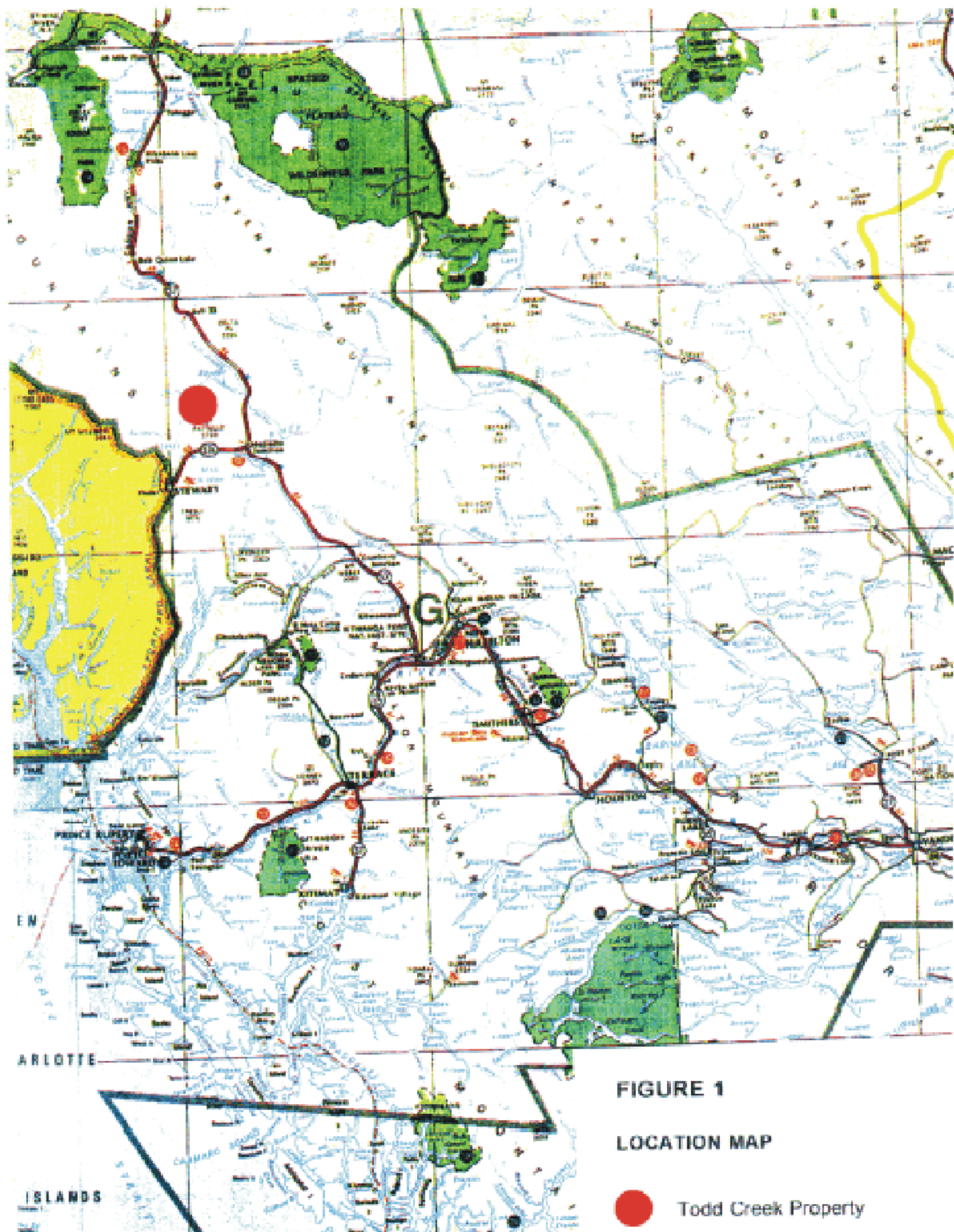
**1. INTRODUCTION:**

The following report reviews the results of the 1999, helicopter supported exploration program carried out on the Todd Creek Property (Map 1) by Geofine Exploration Consultants Ltd. on behalf Okak Bay Resources Ltd. The property is located in the Stewart Gold Camp of Northwestern British Columbia (Figures 1, 2, 3) and straddles the Todd Creek Valley, about 35 km northeast of Stewart, British Columbia.

The work was carried out in July, August and September as weather conditions, characterized by residents as the worst ever experienced in the Stewart area, allowed. The main objective of the program was the identification, evaluation and prioritization of the most prospective drill targets in order to facilitate the discovery of a significant orebody via a Y2K drill program.

There is no lack of drill targets on the property, which is mainly underlain by the Jurassic Age, Unuk River Formation that hosts most of the significant mineralization in the Stewart Camp (Figures 2, 7). The exploration target is a substantial gold/copper, and/or a copper/lead/zinc/silver orebody, most likely to be discovered at, or in proximity to the large, epithermal system that is apparent on the Amarillo Zone (Figures 3, 8A). The principal structures which host many of the quartz breccia gold/copper showings (e.g., the South Zone Structure) could also yield an important deposit, particularly at structural junctions where substantial ore shoots may be developed (e. g., at the Middle Extension of the South Zone {MEXT SZ}; Maps 1, 2).

Relevant Stewart Camp models that apply to the Stewart Property include the Eskay Creek VMS deposit (Figure 2) with 1999 reserves of about 1.4 million tonnes grading 57.7 g gold/t, and 2493 g silver/t: e.g., the East Zone's rhyolite and mudstone environment east of the Amarillo Zone, and the Yellow Bowl Zone's pyroclastic and felsic volcanic stratigraphy; the historic Silbak-Premier deposit (Figure 2): i.e., to the lower levels of the Amarillo Zone epithermal system; and, the Marc Zone, Red Mountain (Figure 2) type mineralization (auriferous pyrite and chalcopyrite in fracture controlled, often brecciated zones associated with Jurassic intrusions): e.g., possibly the South Zone deposit.



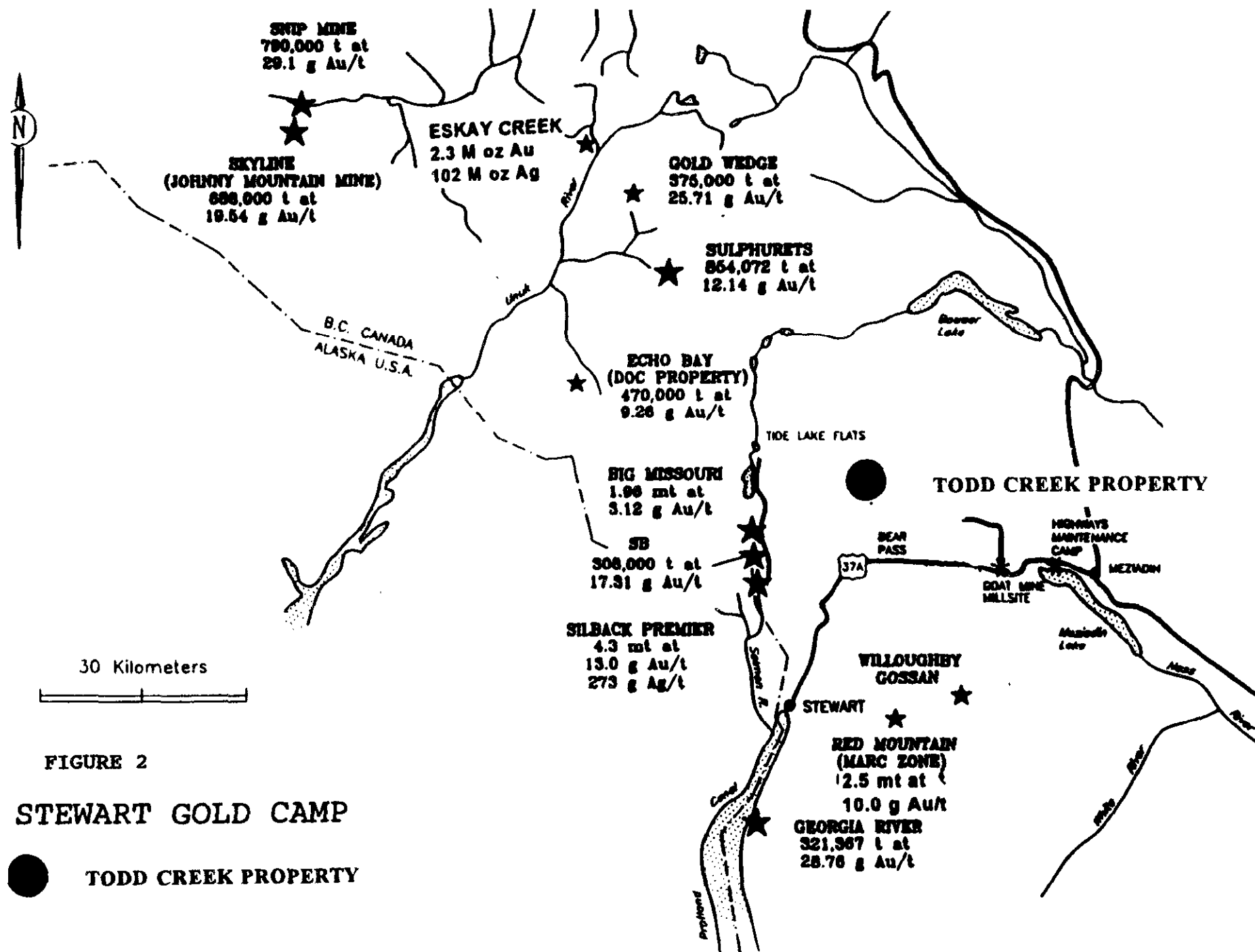


FIGURE 2

## STEWART GOLD CAMP



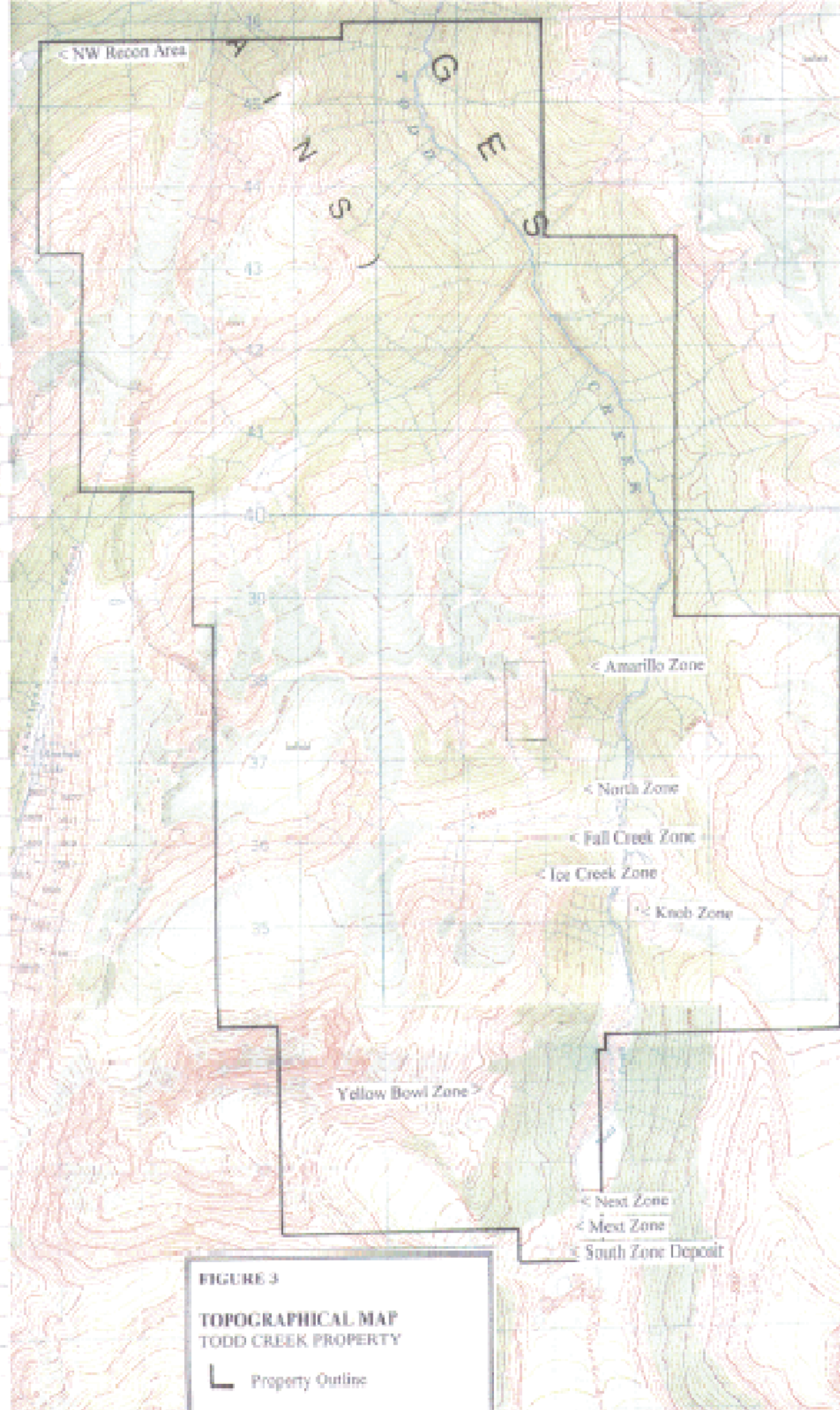


FIGURE 3

TOPOGRAPHICAL MAP  
TODD CREEK PROPERTY

└ Property Outline



## **2. PROPERTY, OWNERSHIP, OPTION AGREEMENTS:**

The Todd Creek Property consists of the Todd 1-13 and Todd 18 Claims, the Pat 1-5 Claims, and the Pat 20-24 claims (Table 1; Map 1). The property comprises 424 claim units that cover 106 square km. The 24 claims are located on British Columbia Mineral Titles Maps 104A04E, 104A04W, 104A05E and 104A05W (Map 1).

The Claims are registered in the name of Geofine Exploration Consultants Ltd, as agent of Geofund. Geofund is the owner of the property and is a private investment group that funds the research, acquisition and marketing of mineral targets. Okak Bay Resources Ltd. holds the property under option from Geofine, and can earn a 100% interest by fulfilling escalating option payments and work conditions. The interest is subject to an underlying option agreement with Island Arc Resources Ltd.; and, to a Geofund 2% NSR, which is subject to a buyout.

## **3. LOCATION AND ACCESS:**

The Todd Creek Project is located in the Skeena Mining Division, about 35 km northeast of the town of Stewart, Northwestern British Columbia (Figures 1, 2). The property is located on NTS Map Sheets 104/A4 and 104/A5 and centred at about Latitude 56°, 17'; Longitude 129°, 48' (Figure 3). The claims straddle the Todd Creek Valley, approximately 10 km north of the Stewart Highway 37A (Figure 2).

In view of the mountainous terrain, helicopter access is currently required, either from the Vancouver Island Helicopter base in Stewart or from staging areas near American Creek; or, from the Bowser Lake access road off the Stewart-Cassiar Highway. The most logical land route to facilitate the development of an ore body is probably north along Todd Creek to the Bowser River, east to Bowser Lake and east by barge across the lake where lumber roads lead to the Stewart-Cassiar Highway 37. A 9 km tunnel driven north from the Rufus Creek area on Highway 37A would provide the most direct and all season route to the port of Stewart, and to the historic Westmin mill. However, a major discovery would be required to justify the expense of such a tunnel.

## **4. TOPOGRAPHY, DRAINAGE, CLIMATE, WILDLIFE & VEGETATION:**

The Todd Creek property is located within the Boundary Ranges of the northern British Columbia Coastal Mountains (Figure 4). The regional topography is characterized by the Todd Creek Valley, which has an elevation of between about 600 to 900 m on the property (Figure 4). East and west of Todd Creek, the valley rises steeply to elevations over 2000 m. The mountainous topography is characterized by young, deep valleys hosting tributaries, that drain into Todd Creek and that facilitate geological and geochemical surveys (Figure 3). The

DECEMBER 15/99

TABLE 1

TODD CREEK PROPERTY  
LIST OF CLAIMS AND EXPIRY DATES

CLAIM NAME	TAG NO.	RECORD NO.	UNITS	STAKED	EXPIRY	COMMON ANNIVERSARY EXPIRY	CLAIM MAP
TODD 1	230148	325164	20	APRIL 17/94	APRIL17/2001	MAY 13/2001	104A05W
TODD 2	230149	325165	20	APRIL 17/94	APRIL17/2001	MAY 13/2001	104A05W
TODD 3	230150	325166	20	APRIL 17/94	APRIL17/2001	MAY 13/2001	104A05W
TODD 4	230151	325167	20	APRIL 17/94	APRIL17/2001	MAY 13/2001	104A05W
TODD 5	230152	325168	20	APRIL 17/94	APRIL17/2000	MAY 13/2000	104A05W
TODD 6	230153	325169	20	APRIL 17/94	APRIL17/2000	MAY 13/2000	104A05W
TODD 7	230154	325170	20	APRIL 17/94	APRIL17/2000	MAY 13/2000	104A05W
TODD 8	230155	325171	20	APRIL 17/94	APRIL17/2001	MAY 13/2001	104A05W
TODD 9	230156	325172	20	APRIL 17/94	APRIL17/2000	MAY 13/2000	104A05W
TODD 10	230157	325173	20	APRIL 17/94	APRIL17/2000	MAY 13/2000	104A05W
TODD 11	230158	325174	20	APRIL 17/94	APRIL17/2000	MAY 13/2000	104A04W
TODD 12	230159	325175	10	APRIL 17/94	APRIL17/2001	MAY 13/2001	104A04W
TODD 13	231613	354785	18	APRIL 10/97	APRIL 10/2002	MAY 13/2002	104A04W
TODD 18	220191	370599	2	AUG 1/99	AUG 1/2000	MAY 13/2001	104A04W
PAT 1	219257	329966	20	AUG 17/94	AUG 17/2000	MAY 13/2000	104A05W
PAT 2	219258	329967	20	AUG 17/94	AUG 17/2000	MAY 13/2000	104A05W
PAT 3	219259	329968	18	AUG 17/94	AUG 17/2000	MAY 13/2000	104A05W
PAT 4	219260	329969	20	AUG 17/94	AUG 17/2000	MAY 13/2000	104A05E
PAT 5	229769	329970	20	AUG 17/94	AUG 17/2000	MAY 13/2000	104A05E
PAT 20	231609	354781	20	APRIL 10/97	APRIL 10/2000	MAY 13/2000	104A05W
PAT 21	231610	354782	20	APRIL 10/97	APRIL 10/2000	MAY 13/2000	104A05W
PAT 22	218219	355287	15	APRIL 20/97	APRIL 20/2000	MAY 13/2000	104A05W
PAT 23	231612	354784	20	APRIL 10/97	APRIL 10/2000	MAY 13/2000	104A05W
PAT 24	218220	355288	5	APRIL 20/97	APRIL 20/2000	MAY 13/2000	104A05W
TOTAL			428				



heads of the valleys are often occupied by glaciers, which are currently receding at a rate of tens of meters per year. Approximately 20% of the property is covered by glaciers and ice fields (Figure 3).

The exploration field season generally extends from late June to October. In 1999, the Stewart area experienced adverse weather that long time residents have characterized as the worst in memory. Below normal temperatures with rather constant rain and fog entailed generally negative exploration conditions for much of the of the field season. Winters have been getting milder. However, snow can cover higher elevations in late September and accumulations can total several meters in a 24-hour period. Recorded mean annual snowfalls in the area range from 520 cm at Stewart (sea level) to 1,500 cm at Tide Lake Flats (915 m elevation). Summers are usually characterized by long hours of daylight and pleasant temperatures. The proximity to the ocean and relatively high mountains can make for highly changeable weather, including dense morning fog along the coast. Stewart is located on the Portland Canal (Figure 2) and has the distinction of being Canada's most northerly, ice-free seaport.

Wildlife in the area consists of mountain goats, foxes, grizzly bears, wolves, marmots, martins and ptarmigan. Vegetation in the Todd Valley ranges from dense tag alders to small areas of spruce forest, to sub-alpine spruce thickets, with heather and alpine meadows. Above treeline at approximately 1,200 m, bare rock, talus slopes and glaciers with occasional islands of alpine meadow prevail.

## **5. EXPLORATION HISTORY:**

The central area of the Stewart Camp was prospected at the close of the 19th century, mainly for visible gold in quartz veins. The showings were generally located on patented claims, but very little of this work was documented.

The most prominent early discovery was the historic Silbak-Premier gold-silver mine, which produced 56,000 kg of gold and 1,281,400 kg of silver in its original lifetime from 1918 to 1976. The mine was re-opened by Westmin in 1988 with reserves quoted at 5.9 million tonnes grading 2.16 g gold/t and 80.23 g silver/t (Randall, 1988). The mine closed in 1998 and the 2500 t/d mill facility is currently shut down and under care and maintenance.

The Camp, after more recent discoveries (Figure 2) that include the recently closed Snip Mine (total deposit size of 1,055,105 ounces of gold contained in 1.3 M tonnes); the Eskay Creek Mine (total deposit size of about 7.1 M ounces gold equivalent); and, Red Mountain (with reserves of about 1 M ounces of gold), continues to be regarded as a very prospective environment where discoveries of rich, gold/silver/base metal deposits can be made.

In 1999, only minor exploration activity took place in the camp, other than some diamond drilling at the Eskay Creek Mine and the current program described herein. The decline in metal prices and in the junior equity markets, along with the uncertainty with regard to

natural resource policy in BC, and to the resolution of native land claims settlements, have generally curtailed exploration in the province. Expenditures in the Northwest Region, which extends up to the Yukon in BC, declined to their lowest levels in years, down to about \$5.3 M from the approximately \$8.5 M in 1998 (pers. com., Paul Wojak, BC geologist). However, industry analysts indicate there could be a dramatic increase in activity in the province, with a more favourable political atmosphere.

Historical exploration activities on the Todd Creek property evolved around the 12 mineral showings that are located on and in the vicinity of the property and that are referenced in the BC government's mineral records ("Minfile"). The showings are briefly described below, and are located on Map 1 according to Minfile Number.

**a. Minfile 001: South Zone on Todd 13:**

The South Zone was located on the Noranda Toc 10 claim at the south end of the Todd Creek property. The South Zone was discovered by Newmont Mining Corporation in 1959, and was held by Noranda Exploration Company, Limited and Goldnev Resources Inc. until the spring of 1997. The South Zone was staked by Geofine, via the Todd 13 claim.

According to Government Assessment Report 18800, the South Zone is the most significant target area located on the Toc 10 and 11 claims. Drilling in 1987 tested the southern 175 m strike length of the zone and significant results include:

- 11.93 g gold/t over 1.73 m
- 4.10 g gold/t over 2.00 m
- 4.01 g gold/t over 1.50 m
- 3.25 g gold/t over 3.69 m
- 3.36 g gold/t over 2.61 m

Drilling in 1988 tested the down dip extension and strike continuity of the zone for an additional 200 m to the north. Intersections ranged from 1-30 m and significant values include:

- 6.91 g gold/t over 8.15 m
- 6.86 g gold/t over 2.00 m
- 6.53 g gold/t over 2.05 m
- 4.65 g gold/t over 6.15 m
- 8.83 g gold/t over 11.70 m
- 6.12 g gold/t over 6.10 m

The zone has been tested by 34 holes comprising 3186 m. The zone was reported by Noranda to be hosted by altered feldspar porphyry exposed over an area of 950 by 500 m. Quartz-pyrite is the principal alteration, but near the mineralization, quartz-sericite is the dominant type.

The mineralization consists of chalcopyrite, pyrite, specular hematite and malachite. The mineralization is hosted by a 5 to 15 m wide, northeast trending, fracture zone that dips west. The area is underlain by Hazelton Group rocks, of Upper Triassic to Lower Jurassic, Unuk River Formation.

The South Zone is reported to contain drill indicated reserves of 207,000 tonnes grading 5.48 g gold/t (Hemlo Gold Mines Inc., 1988 Annual Report).

**b. Minfile 111: Mid Zone on Todd 12:**

The Mid Zone was discovered by Noranda in 1986. It comprises an area about 500 by 250 m encompassing several west-southwest to northwest trending quartz-pyrite-chalcopyrite veins. The veins are 0.01 to 6.0 metres wide and 1 to 108 metres long. Grab samples assayed up to 1.68% copper with negligible molybdenum, lead, zinc, silver, arsenic, cadmium, antimony, and gold values. The mineralization is apparently hosted by altered felsic rocks composed of quartz-sericite-pyrite.

**c. Minfile 110: Ridge Showing on Todd 12:**

The Ridge showing was discovered by Noranda in 1987. The showing consists of several mineralized outcrops that cover an area about 300 by 200 m. Mineralization comprises pyrite, chalcopyrite and malachite. North-northwest trending andesite flows and agglomerates are reported to be interbedded with feldspar porphyry (intrusive?) and rhyolite flows and tuffs. Grab samples assayed up to 0.34 g gold/t, 5.2 g silver/t, and 14.14% copper. The mineralization appears to be hosted by mafic volcanics that lie immediately west of a large gossan apparently associated with feldspar porphyry. Approximately 200 m north of the showing, a sample from outcrop assayed 12.7g silver/t, 1.17% lead and 1.71% zinc.

**d. Minfile 109: Knob 1 Showing on Todd 3:**

The Knob 1 showing was discovered by Noranda in 1987. The showing comprises several 1-10 cm wide chalcopyrite veins that occur in a large, prominent gossan. The gossan includes extensive areas of quartz-sericite-pyrite alteration. A grab sample from one of the veins assayed 0.37% copper. The mineralization occurs in pervasively altered, northwest trending andesite flows and breccias, which are intruded by fine grained mafic dykes.

**e. Minfile 108: Toc 9 Showing on Todd 4:**

The Toc 9 showing was discovered by Noranda in 1986. Mineralization consists of narrow chalcopyrite veins that occur in 1-2 m wide discontinuous, north-northwest trending shear zones. The zones are reported to be hosted by altered feldspar porphyry composed of quartz, sericite and pyrite. Grab samples assayed up to 32.9 g gold/t and 3.08% copper.

**f. Minfile 107: F1 Zone or Fall Creek East Zone on Todd 3:**

The F1 Zone was discovered by Noranda in 1987 as a follow-up of anomalous values returned in a soil survey on the south side of Fall Creek. During 1986 to 1989 Noranda completed geological mapping, silt and soil geochemical surveys and four holes totalling 368 m on the zone. Significant intersections include:

- 6.72 g gold/t over 1.45 m
- 12.10 g gold/t over 1.25 m
- 2.73 g gold/t and 0.59% copper over 13.00 m
- incl. 5.41 g gold/t and 0.50% copper over 5.25 m
- 4.34 g gold/t over 2.00 m
- 3.94 g gold/t over 7.90 m
- incl. 4.71 g gold/t over 4.75 m

The mineralization is associated with pervasively altered andesites that contain quartz-sericite-pyrite zones and that are cut by mineralized structures with a variety of orientations. The main zone of interest is associated with quartz-pyrite-chalcopyrite-barite veins that have been traced for 400 m along strike and 300 m vertically. The drilling tested the zone over a strike length of 100 m and to a depth of 50 m.

IP and soil geochemistry delineated an anomalous area 900 by 450 m, which encompasses the F1 zone and several other mineralized outcrop and float occurrences. In 1990, Golden Nevada Resources Inc. drill tested a number of the IP targets with 10 holes that did return some significant results including 1.35 g gold/t over 15.35 m (Baerg, 1991). The encouraging results were never followed up.

**g. Minfile 106: North A Zone on Todd 2:**

The North A Zone on the Todd 2 claim was a Newmont discovery and yielded significant results. The zone is described as northwest trending and vertically to steeply west dipping, comprising 0.1-2 m wide quartz, chalcopyrite, pyrite, hematite and breccia veins. The veins are commonly banded and brecciated and have been traced for 320 m. Trenching results ranged up to 3.8 g gold/t across 14.3 m.

The zone was tested with 9 holes and a Mise-a-la-masse survey. The drilling and geophysics suggest that the zone is discontinuous and poddy along strike and down dip. Widths on the zone range from 1-32 m. The zone was tested over a strike length of 150 m. Significant drill values include the following:



3.47 g gold/t, 0.75% copper over 31.85 m  
inc. 14.47 g gold/t, 2.06% copper over 5.95 m  
2.83 g gold/t, 0.58% copper over 1.95 m  
3.95 g gold/t, 0.22% copper over 2.00 m  
3.43 g gold/t, 0.73% copper over 1.70 m  
6.21 g gold/t, 0.60% copper over 1.75 m

Another zone 200 to 550 m east of the above zone contains identical mineralization except for the absence of stringer mineralization. Chip sampling on this zone produced assay values up to 9.53 g gold/t and 0.35% copper across 1 m.

**h. Minfile 105: North East Zone on Todd 2:**

The showing was discovered by Noranda in the course the follow-up of a geochemical survey. The host rocks are propylitically altered green volcanics, green to buff agglomerates/flow breccias and tuff. Alteration consists of chlorite, carbonate, sericite and pyrite (2-5%). A feldspar porphyry dyke is exposed near the showing. Mineralization consists of a west-northwest trending barite-quartz-galena vein, which cuts the feldspar porphyry body. Samples assayed up to 39.30 g silver/t, 12% lead, and 6.2% zinc, with negligible copper and gold values.

**i. Minfile 104: Orange Mt. Showing on Woodcock's Todd Claim (2 units) within Todd 1 and Todd 2:**

The showing is hosted by altered volcanics within an alteration zone some 1500 m by 1200 m. A barite jasper zone lies within the alteration zone and is the locus of the showing. Mineralization comprises pyrite, barite, and galena. Abundant jarosite is noted in the intensely altered area. Chip samples ranging up to 232.5 g silver/t and 12.8% lead across 0.7 m were reported. Approximately 190 m east northeast of the showing, grab samples assayed up to 199.5 g silver/t and 27.7% lead. Approximately 250 m northeast of the showing grab samples assayed up to greater than 100 g silver/t, 0.22% copper, and 0.28% lead.

**j. Minfile 103: Bow 31 Showing on Todd 2:**

Brucejack Gold Ltd. outlined an area of anomalous gold and silver values in 1987-1988. Marlin Developments analyzed the previously collected samples for base metals. The showing consists of massive to weakly foliated, fine grained tuff that contains 7 to 10% finely disseminated pyrite. A grab sample assayed 175.9 g silver/t, 0.41% lead, and 0.52% zinc.

**k. Minfile 102: Bow 32 Showing on Todd 2:**

Brucejack Gold in conjunction with Marlin Developments found the zone in the follow-up of a geochemical survey. Mineralized outcrops occur on both sides of Todd Creek over a distance of about 200 m. Silver values from the outcrops typically range from 34 to 343 g/t. The



assium feldspar megacrysts. The Eocene Hyder quartz-monzonite, comprising a main batholith, several smaller plugs and a widespread dyke phase, represents the Coast Plutonic Complex.

Middle Cretaceous regional metamorphism (Alldrick et al., 1987) is predominantly of the lower greenschist facies. This metamorphic event seems to be related to compression and concomitant crustal thickening at the Intermontaine - Insular superterrane boundary (Rubin et al. 1990). Biotite hornfels zones are associated with a majority of the quartz monzonite and granodiorite stocks.

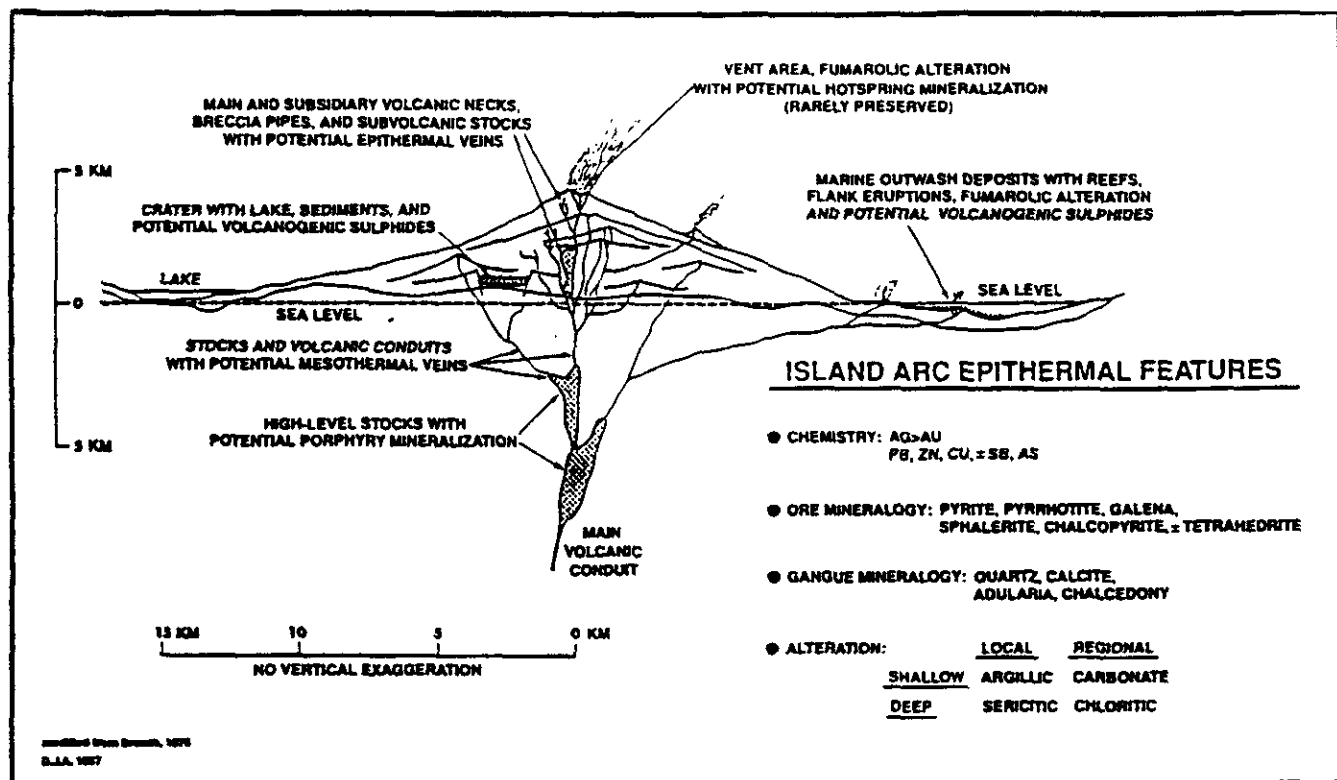
## **7. REGIONAL MINERALIZATION:**

The Stewart Complex is the setting for the Stewart (Silbak-Premier, Silver Butte, Big Missouri, Red Mountain, Iskut (Snip, Johnny Mountain, Eskay Creek) Sulphurets, and Kitsalt (Alice Arm) gold/silver mining camps (Figure 2). Mesothermal to epithermal, depth persistent gold-silver veins form one of the most significant types of economic deposit. There appears to be a spatial as well as a temporal association of gold deposits to Lower Jurassic Calc-alkaline intrusions and volcanic centres (Figures 8, 8A). These intrusions are often characterized by 1-2 cm sized, potassium feldspar megacrysts and correspond to the top of the Unuk River Formation.

The most prominent example of this type of mineralization is the historic Silbak-Premier gold-silver mine, which has produced 56,000 kg of gold and 1,281,400 kg of silver in its original lifetime from 1918 to 1976. The mine was re-opened by Westmin in 1988 with reserves quoted at 5.9 million tonnes grading 2.16 g gold/t and 80.23 g silver/t (Randall, 1988). The mine was closed in the summer of 1997 and the mill is currently up for sale.

The ore is hosted by Unuk River Formation andesites and comagmatic Texas Creek porphyritic dacite sills and dykes. The ore bodies comprise a series of en echelon lenses, which are developed over a strike length of 180 m and through a vertical range of 600 m (Grove, 1986; McDonald, 1988). The mineralization is controlled by northwesterly and northeasterly trending structures and their intersections but also occurs locally concordant with andesitic flows and breccias.

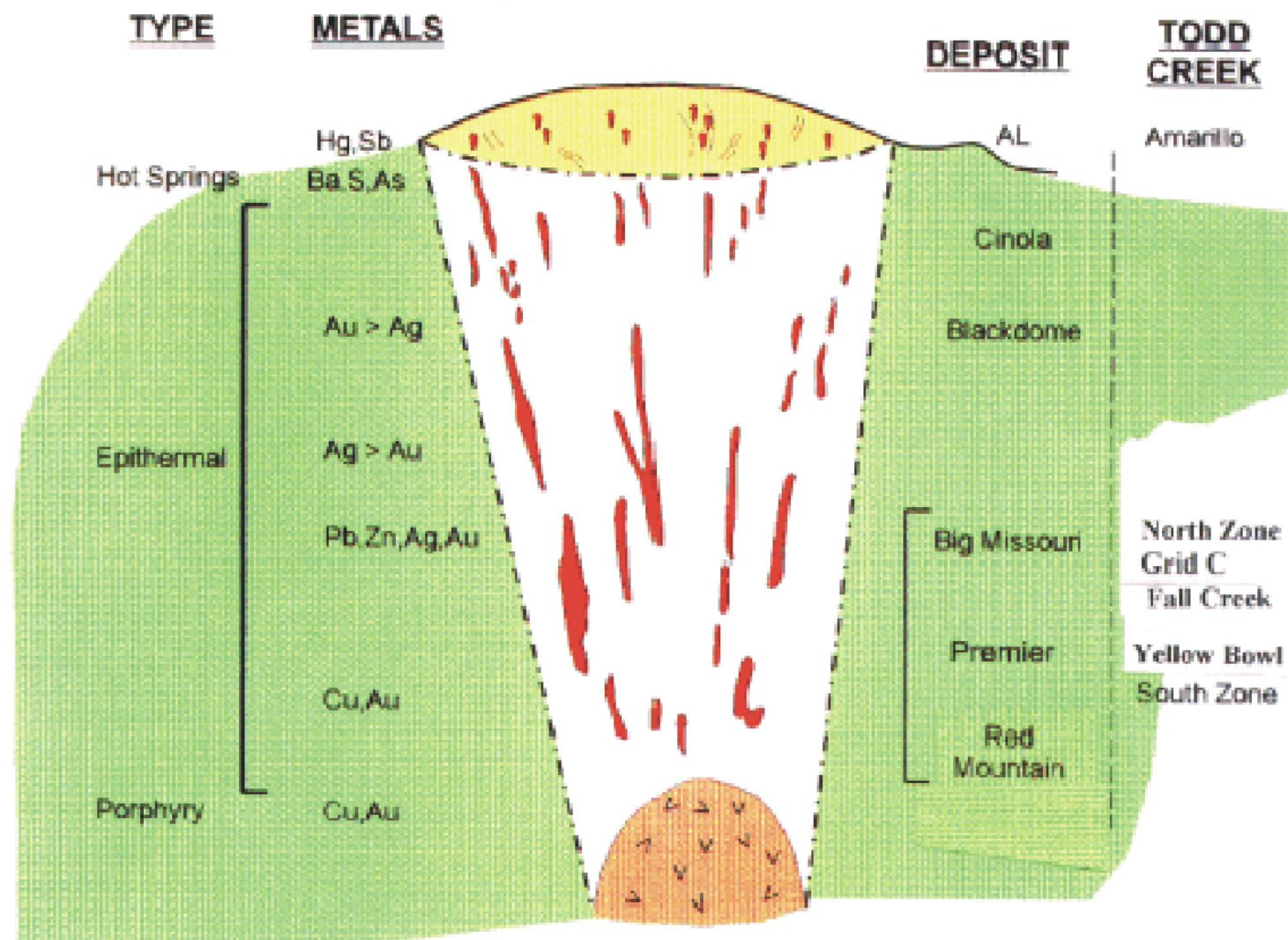
Two main vein types occur: silica-rich, low-sulfide precious metal veins and sulfide-rich base metal veins. The precious metal veins are more prominent in the upper levels of the deposit and contain polybasite, pyrrhite, argentiferous tetrahedrite, native silver, electrum and argentite. Combined sulfides of pyrite, sphalerite, chalcopyrite and galena are generally less than 5%. The base metal veins crosscut the precious metal veins and increase in abundance with depth. They contain 25 to 45% combined pyrite, sphalerite, chalcopyrite and galena, with minor amounts of pyrrhite, argentiferous tetrahedrite, native silver, electrum and arsenopyrite.



Distribution of ore deposits within a stratovolcano (modified from Branch, 1976).

## FIGURE 8

### MINERALIZATION TYPES STEWART CAMP



(after Panteleyev, 1986 and others)



FIGURE 8A

EPITHERMAL MINERALIZATION TYPES,  
TODD CREEK PROPERTY

Quartz is the main gangue mineral, with lesser amounts of calcite, barite, and some adularia being present. The mineralization is associated with strong silicification, feldspathization, and pyritization. A temperature range of 250 to 260 degrees C has been determined for the deposition of the base and precious metals (McDonald, 1990).

Middle Eocene silver-lead-zinc veins are characterized by high silver to gold ratios and by spatial association with molybdenum and/or tungsten occurrences. They are structurally controlled and lie within north, northwest, and east trending faults. This mineralization has been less significant in economic terms.

Porphyry molybdenum deposits are associated with Tertiary Alice Arm Intrusions, a belt of quartz-monzonite intrusions parallel to the eastern margin of the Coast Plutonic Complex. An example of this type of deposit is the BC Molybdenum Mine at Lime Creek.

The Eskay Creek Mine (current reserves of 1.4 million tonnes grading 57.7 gold/t and 2493 g silver/t) is planning to increase current production from 150 t/d to 250 t/d in October 2000. The deposit is hosted within Contact Unit carbonaceous mudstone and breccia, as well as the underlying rhyolite breccia. Two styles of mineralization are present. The first is a visually striking assemblage of disseminated to near massive stibnite and realgar within the Contact Unit. The second style occurs in the adjacent footwall rhyolite, and features a stock work style quartz-muscovite-chlorite breccia mineralized with sphalerite, tetrahedrite and pyrite. Highest gold and silver values are obtained where the Contact Unit is thickest and the immediately underlying rhyolite breccia is highly fractured and altered. Drilling continues to expand the original, approximately 280 m by 100 m zone that has an average thickness of 10 m.

The Eskay Creek 21B deposit is approximately 900 m long, from 60 to 200 m wide and locally in excess of 40 m thick. Contact Unit mineralization comprises a continuous stratiform sheet of banded high grade gold and silver bearing base metal sulfide layers, from 2 to 12 m thick. Mineralization appears to be bedding parallel. Sulfide minerals present include sphalerite, tetrahedrite, boulangerite, bornite plus minor galena and pyrite. Gold and silver are associated with electrum, which occurs as abundant grains associated with sphalerite. Peripheral and footwall to the banded sulfide mineralization, are areas of microfracture, veinlet hosted, disseminated tetrahedrite, pyrite and minor boulangerite mineralization.

No exploration was carried out on Royal Oak's Red Mountain project in 1999, and the property is now in the hands of a receiver. Royal Oak had apparently curtailed work in 1997 as a result of a dispute with the BC government. The Marc Zone and its northerly extension, the AV Zone, occur as sulfide lenses or cylinders associated with a structural junction and the brecciated contact of the Goldslide Intrusion. The mineralization consists of densely disseminated to massive pyrite and/or pyrite stringers and veinlets and variable amounts of arsenopyrite, tetrahedrite and various tellurides. Several phases of mineralization and deformation are indicated by the presence of different generations of pyrite and breccia

fragments consisting of pyrite. High grade gold values are usually associated with the semi massive, coarse-grained pyrite aggregates, but also with stock works of pyrite stringers and veinlets. Gold occurs as native gold, electrum and as tellurides. Approximately 1 M ounces have been outlined to date, with an average grade of about 10 g gold/t.

## **8. TODD CREEK PROPERTY GEOLOGY:**

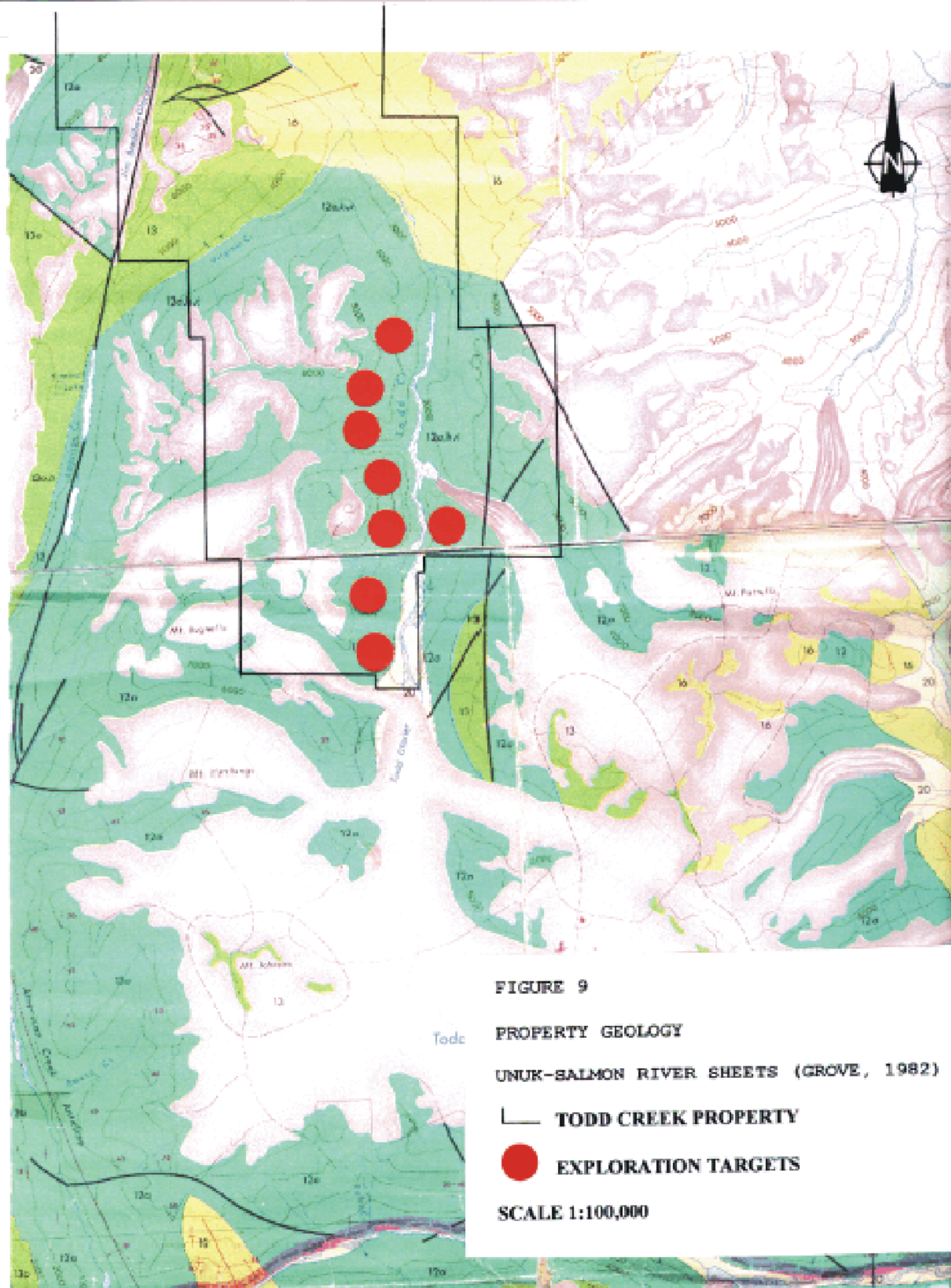
The property geology (Grove, 1992; Figure 9; Maps 2-4) is dominated by the Lower Jurassic Unuk River Formation that hosts most of the significant base and polymetallic mineralization in the Stewart Camp. The rocks are mainly comprised of green and grey-black andesite flows, green, red, purple volcanic breccias and agglomerates, and interbeds of crystal and lithic tuffs and a variety of sediments.

As indicated in Min File Report 104A 001, the rocks are reported to have been intruded by a number of feldspar porphyry bodies, the extent of which remain to be determined. As indicated by the regional total field magnetics (Figure 10), a number of circular magnetic lows in the southern area of the property may reflect such intrusions or zones of alteration. Varying degrees of pervasive alteration have been observed ranging from calcite-epidote-pyrite, chlorite-quartz-pyrite, quartz-carbonate-pyrite to quartz-pyrite-sericite-jarosite/alunite. A spectacular gossan zone, Orange Mountain (Photo 43), composed of iron oxide and clay alteration is associated with altered (quartz-barite-hematite) pyroclastic rocks and andestitic flows. The Amarillo Zone on the east side of Orange Mountain (Maps 1, 2) is thought to epitomize the top of a large epithermal system.

The Unuk River Formation is overlain on the northern part of the property by Middle Jurassic mafic lavas and breccias and a variety of sediments of the Betty Creek Formation. Overlying rhyolite and rhyolite breccia of the Mt. Dilworth Formation is found mainly on the northeast part of the property in the East Target Area (Map 2A).

As mapped by Grove (Figure 9), the property is bordered on the west by a major northeast trending fault that follows American Creek, and partially on the east by a north trending structure. Prominent structural junctions are apparent on the property and the structural fabric trends north, north-northwest, north-northeast, east-northeast, and east. The often orthogonal to sub-orthogonal fabric generally has near vertical to steep westerly and to steeply southerly dips, and appears to control much of the drainage of the area.

A major north trending fault system is postulated to be associated with the Todd Creek Valley; and, an east trending fault is associated with the Fall Creek Valley. Many of the mineralized showings on the property comprise structurally controlled quartz-pyrite-chalcopryite +/- hematite, galena and sphalerite breccia veins located in proximity to these faults. The mineralization is hosted mainly by quartz-pyrite and quartz-pyrite-sericite altered volcanic breccias, agglomerates and crystal tuff.







# GEOLOGY OF THE UNUK RIVER-SALMON RIVER-ANYOX MAP AREA



## SEDIMENTARY AND VOLCANIC ROCKS

[illegible]

- 20 UNIDENTIFIED OBJECTS, DARK FLAMMABLE, EXPLOSIVE,  
WATER SUSPENSIBLE AND TOXICALLY ACTIVE, FINE DELTA AND  
BEACHES, OUTRIGER, GLASS, LAST BEHINDERS, FILL, PEAT,  
LAVENDER, VULCANITE AND, NOTHING DETECTED

- Keywords:** *depression, mood, personality, self-esteem*

**Abstract**

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

**Figure 1**

1. **Introduction**

- 17** **MINIONS, SPHERULES, NAUFRAGS, BONE CALCARENITE, WRECK, LIND, CONGLOMERATE, MINOR LITHOLOGICAL, MINOR IDEAL, PRODUCE, MINOR, MINOR, AND BONE, MINOR, AND BONE**



**Keywords:** child sexual abuse; disclosure; social support

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- RESEARCH, RESEARCH DESIGN, RESEARCH, DESIGN, AND OTHER TOPICS

**Keywords:** child sexual abuse; disclosure; social support

- FULLER, LARRY, UNIVERSITY FULLER THEOLOGICAL SEMINARY AND**

- Journal: *Journal of Management Education* 35(10) 1153-1167

- CEMENT, LANTHAN, AND SILICATE IN CRYSTAL AND LITHIUM  
TYPE AND SILICATE IN SILICATE AND LANTHAN IN  
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1. [Introduction](#)

- GREEN, RED, AND PURPLE MOUNTAIN BEDDING. CONGLOMERATE SANDSTONE, AND SLTSTONE IN: CRYSTAL AND LITHIC FUFF IN SANDSTONE IN CONGLOMERATE IN Limestone IN: CRISTAL BEDDING IN

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- 10 MYTHOS, LANGUAGES, COMMUNITARIANISM AND VOLUNTARY  
11 STATE SANCTIONS COMMUNITARIANISM AND STATE SANCTIONS  
12 IN CHINA: A COMMENTARY BY LI LINGLING

**PUBLISHED BY**

**THE UNIVERSITY OF CHICAGO**

5. **WEEK 440: BLUE HERRING, WHITE LILY, CHERRY (WHITE & RED)**  
 MONDAY: 400-410, 410-420, 420-430, 430-440, 440-450, 450-460, 460-470, 470-480, 480-490, 490-500, 500-510, 510-520, 520-530, 530-540, 540-550, 550-560, 560-570, 570-580, 580-590, 590-600, 600-610, 610-620, 620-630, 630-640, 640-650, 650-660, 660-670, 670-680, 680-690, 690-700, 700-710, 710-720, 720-730, 730-740, 740-750, 750-760, 760-770, 770-780, 780-790, 790-800, 800-810, 810-820, 820-830, 830-840, 840-850, 850-860, 860-870, 870-880, 880-890, 890-900, 900-910, 910-920, 920-930, 930-940, 940-950, 950-960, 960-970, 970-980, 980-990, 990-1000, 1000-1010, 1010-1020, 1020-1030, 1030-1040, 1040-1050, 1050-1060, 1060-1070, 1070-1080, 1080-1090, 1090-1100, 1100-1110, 1110-1120, 1120-1130, 1130-1140, 1140-1150, 1150-1160, 1160-1170, 1170-1180, 1180-1190, 1190-1200, 1200-1210, 1210-1220, 1220-1230, 1230-1240, 1240-1250, 1250-1260, 1260-1270, 1270-1280, 1280-1290, 1290-1300, 1300-1310, 1310-1320, 1320-1330, 1330-1340, 1340-1350, 1350-1360, 1360-1370, 1370-1380, 1380-1390, 1390-1400, 1400-1410, 1410-1420, 1420-1430, 1430-1440, 1440-1450, 1450-1460, 1460-1470, 1470-1480, 1480-1490, 1490-1500, 1500-1510, 1510-1520, 1520-1530, 1530-1540, 1540-1550, 1550-1560, 1560-1570, 1570-1580, 1580-1590, 1590-1600, 1600-1610, 1610-1620, 1620-1630, 1630-1640, 1640-1650, 1650-1660, 1660-1670, 1670-1680, 1680-1690, 1690-1700, 1700-1710, 1710-1720, 1720-1730, 1730-1740, 1740-1750, 1750-1760, 1760-1770, 1770-1780, 1780-1790, 1790-1800, 1800-1810, 1810-1820, 1820-1830, 1830-1840, 1840-1850, 1850-1860, 1860-1870, 1870-1880, 1880-1890, 1890-1900, 1900-1910, 1910-1920, 1920-1930, 1930-1940, 1940-1950, 1950-1960, 1960-1970, 1970-1980, 1980-1990, 1990-2000, 2000-2010, 2010-2020, 2020-2030, 2030-2040, 2040-2050, 2050-2060, 2060-2070, 2070-2080, 2080-2090, 2090-2100, 2100-2110, 2110-2120, 2120-2130, 2130-2140, 2140-2150, 2150-2160, 2160-2170, 2170-2180, 2180-2190, 2190-2200, 2200-2210, 2210-2220, 2220-2230, 2230-2240, 2240-2250, 2250-2260, 2260-2270, 2270-2280, 2280-2290, 2290-2300, 2300-2310, 2310-2320, 2320-2330, 2330-2340, 2340-2350, 2350-2360, 2360-2370, 2370-2380, 2380-2390, 2390-2400, 2400-2410, 2410-2420, 2420-2430, 2430-2440, 2440-2450, 2450-2460, 2460-2470, 2470-2480, 2480-2490, 2490-2500, 2500-2510, 2510-2520, 2520-2530, 2530-2540, 2540-2550, 2550-2560, 2560-2570, 2570-2580, 2580-2590, 2590-2600, 2600-2610, 2610-2620, 2620-2630, 2630-2640, 2640-2650, 2650-2660, 2660-2670, 2670-2680, 2680-2690, 2690-2700, 2700-2710, 2710-2720, 2720-2730, 2730-2740, 2740-2750, 2750-2760, 2760-2770, 2770-2780, 2780-2790, 2790-2800, 2800-2810, 2810-2820, 2820-2830, 2830-2840, 2840-2850, 2850-2860, 2860-2870, 2870-2880, 2880-2890, 2890-2900, 2900-2910, 2910-2920, 2920-2930, 2930-2940, 2940-2950, 2950-2960, 2960-2970, 2970-2980, 2980-2990, 2990-3000, 3000-3010, 3010-3020, 3020-3030, 3030-3040, 3040-3050, 3050-3060, 3060-3070, 3070-3080, 3080-3090, 3090-3100, 3100-3110, 3110-3120, 3120-3130, 3130-3140, 3140-3150, 3150-3160, 3160-3170, 3170-3180, 3180-3190, 3190-3200, 3200-3210, 3210-3220, 3220-3230, 3230-3240, 3240-3250, 3250-3260, 3260-3270, 3270-3280, 3280-3290, 3290-3300, 3300-3310, 3310-3320, 3320-3330, 3330-3340, 3340-3350, 3350-3360, 3360-3370, 3370-3380, 3380-3390, 3390-3400, 3400-3410, 3410-3420, 3420-3430, 3430-3440, 3440-3450, 3450-3460, 3460-3470, 3470-3480, 3480-3490, 3490-3500, 3500-3510, 3510-3520, 3520-3530, 3530-3540, 3540-3550, 3550-3560, 3560-3570, 3570-3580, 3580-3590, 3590-3600, 3600-3610, 3610-3620, 3620-3630, 3630-3640, 3640-3650, 3650-3660, 3660-3670, 3670-3680, 3680-3690, 3690-3700, 3700-3710, 3710-3720, 3720-3730, 3730-3740, 3740-3750, 3750-3760, 3760-3770, 3770-3780, 3780-3790, 3790-3800, 3800-3810, 3810-3820, 3820-3830, 3830-3840, 3840-3850, 3850-3860, 3860-3870, 3870-3880, 3880-3890, 3890-3900, 3900-3910, 3910-3920, 3920-3930, 3930-3940, 3940-3950, 3950-3960, 3960-3970, 3970-3980, 3980-3990, 3990-4000, 4000-4010, 4010-4020, 4020-4030, 4030-4040, 4040-4050, 4050-4060, 4060-4070, 4070-4080, 4080-4090, 4090-4100, 4100-4110, 4110-4120, 4120-4130, 4130-4140, 4140-4150, 4150-4160, 4160-4170, 4170-4180, 4180-4190, 419

RECEIVED: 10 FEBRUARY 1993; REVISED: 10 JUNE 1993; ACCEPTED: 10 JUNE 1993

- GRANITE COUNTY INC., GRANITE STATE INC., GRANITEFLEX INC., GRANITE**  
**CONCRETE INC., GRANITE CONCRETE INC., GRANITE CONCRETE CO.**

- OSAE PLUTONIC GROUPS: GRANODIORITE to GRANITE GNEISS  
to COLLATE GRANODIORITE, GRANITE GNEISS to MONZONITE - 1000  
EAST 100

1997-1998

- [illegible]

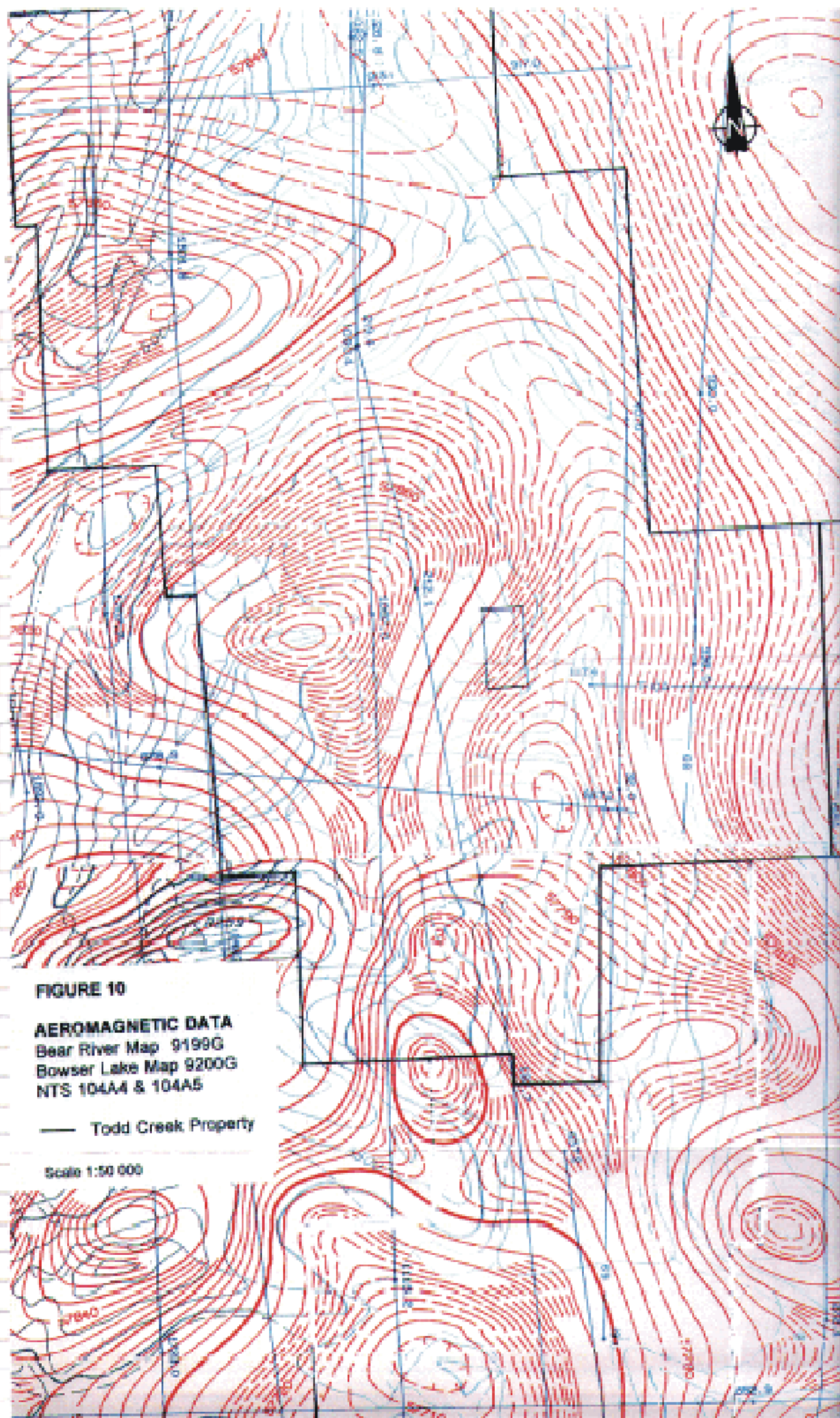
**Abstract**

- STAFF** **LA STAMPA** - 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2

## THE LANCET

**THE LATEST IN**

- 100% **GUARANTEE** YOUR MONEY BACK



**FIGURE 10**

**AEROMAGNETIC DATA**  
Bear River Map 9199G  
Bowser Lake Map 9200G  
NTS 104A4 & 104A5

— Todd Creek Property

Scale 1:50 000



highest grade mineralization occurs on the east bank of the creek and is hosted in a hematite-chlorite altered felsic tuff. It consists of a 20 to 30 cm wide stock work of quartz, barite and carbonate containing 15% pyrite as disseminations and stringers. A sample of this mineralization assayed 2262.9 g silver/t. Immediately west of the showing on the west bank of the creek, a grab sample assayed 0.14 g gold/t, 233.1 g silver/t and 0.54% lead.

In 1994, Geofund staked the Todd Creek Property and, under an option agreement with Oracle Minerals Inc., carried out a \$200,000, Phase 1 exploration program (Molloy, 1994). The work included compilations of historical data; an Aerodat helicopterborne conventional EM and gradiometer survey (Map 2); and, reconnaissance geological and geochemical surveys on a number of the most prospective targets, including the Fall Creek, North and Amarillo Zones. Based on the work, a \$600,000, 1997 follow-up program was recommended that included a number of components of the current program, and an 1800 m drill program. The historical Noranda gold and copper intersections on the East and West Fall Creek Zones and on the North A Zone were the main focus of the proposed drill program.

In 1997, Geofund optioned the property to Island Arc Resources Ltd. Geofund carried out a \$215,000 detailed follow-up program on the Amarillo, North, Yellow Bowl and South Zones; and reconnaissance surveys on the East Target area and the Mylonite Zones. As a result, an \$850,000 exploration program was proposed that included further target prioritization and about 2600 m of diamond drilling on the South, Amarillo and Fall Creek, and North Grids.

## **6. REGIONAL GEOLOGY:**

The Todd Creek property is situated in a broad, north-northwest trending volcanogenic-plutonic belt consisting of the Upper Triassic Stuhini Group and the Upper Triassic to Lower Middle Jurassic Hazelton Group. This belt has been termed the "Stewart Complex" (Figures 5, 6) by Grove (1986) and forms part of the Stikinia Terrane. The Stikinia Terrane, together with the Cache Creek and Quesnel Terranes, constitute the Intermontaine Superterrane, which was accreted to North America in Middle Jurassic time (Monger et al, 1982). To the west, the Stewart Complex is bordered by the Coast Plutonic Complex. Sedimentary rocks of the Middle to Upper Jurassic Bowser Lake Group overlay the Stewart Complex in the east.

The Jurassic stratigraphy was established by Grove (1986, Figure 5) during regional mapping conducted from 1964 to 1968. Formational subdivisions have been made and are currently being modified and refined as regional work continues, most notably by the Geological Survey Branch of the British Columbia Ministry of Energy, Mines and Petroleum Resources (Alldrick, 1984, 1985, 1989); and, by the Geological Survey of Canada (Anderson, 1989; Anderson and Thorkelson, 1990; Lewis, et al, 1993; Creig, et al, 1995). The sedimentological, structural, and stratigraphic framework of the area is being established with some degree of precision.

# REGIONAL GEOLOGY STEWART COMPLEX

(AFTER E.W.GROVE)

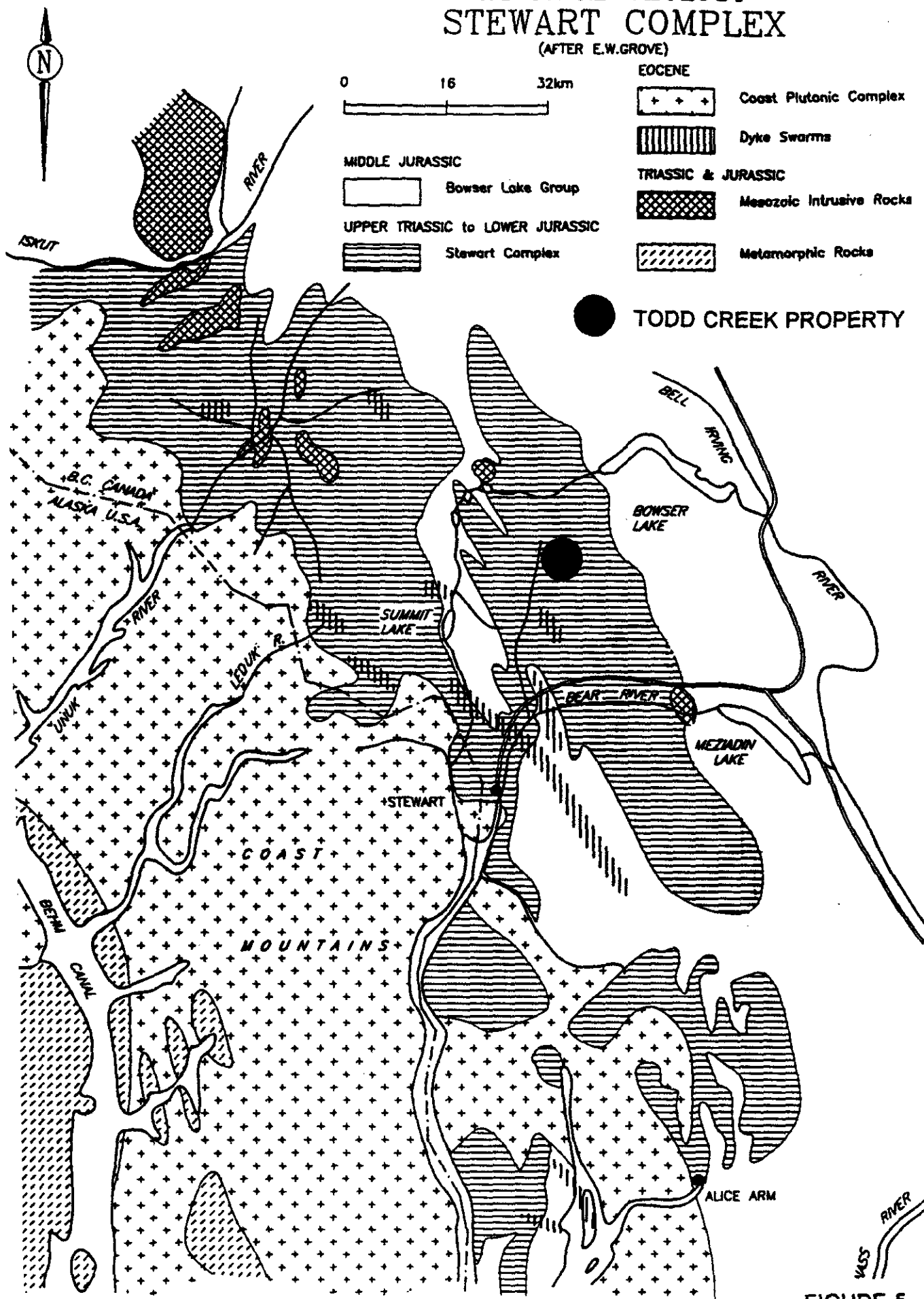


FIGURE 5

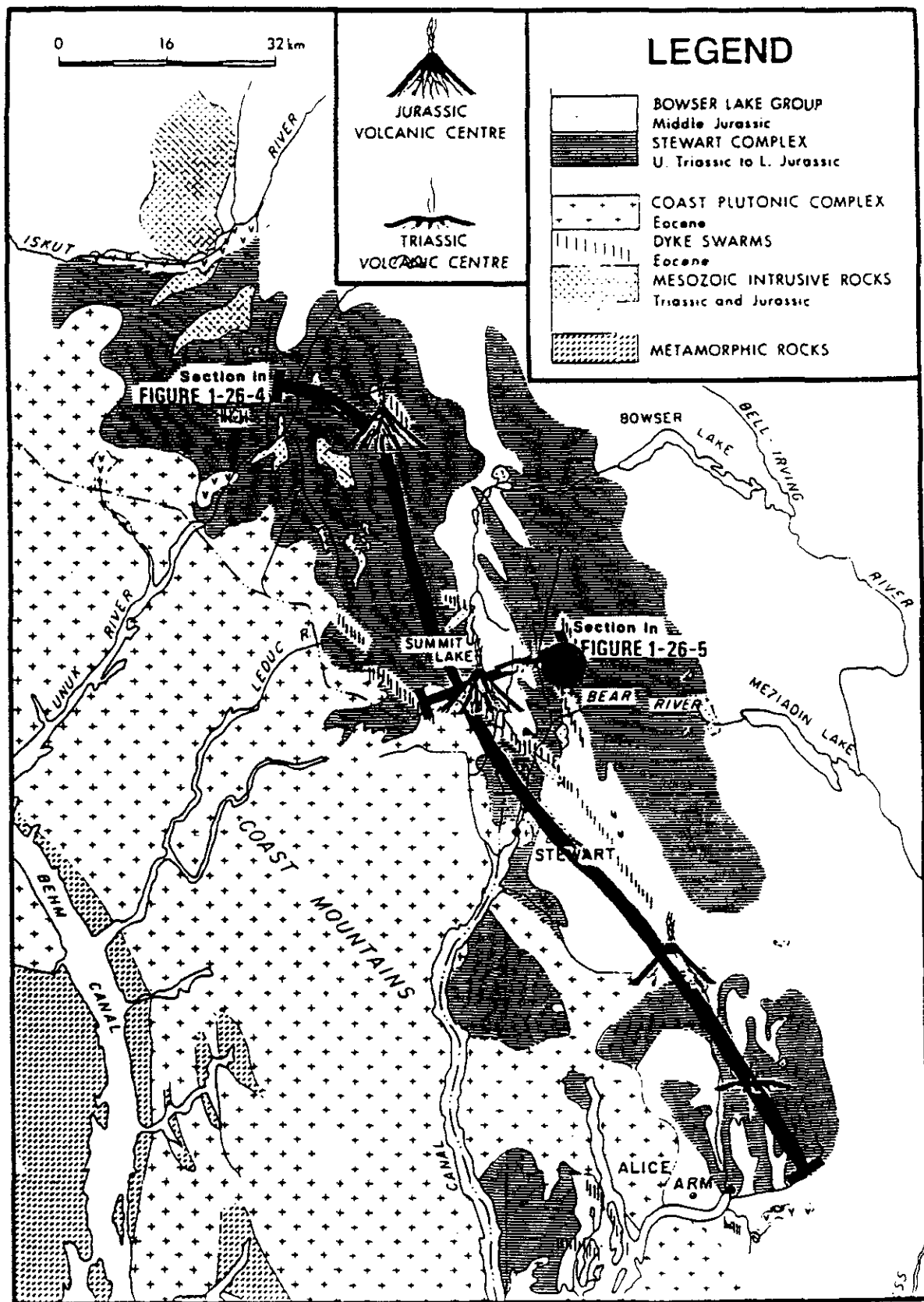


Figure 1-27-3. Distribution of the Stewart complex showing the locations of section lines for Figures 1-27-4 and 1-27-5

## FIGURE 6

### STEWART VOLCANIC BELT



STEWART PROPERTY

**The Hazelton Group represents an evolving (alkalic/calc-alkalic) island arc complex, capped by a thick turbidite succession (Bowser Lake Group). Grove (1986) divided the Hazelton into four litho-stratigraphic units (time intervals defined by Alldrick, 1987):**

- 1. The Upper Triassic to Lower Jurassic Unuk River Formation (Norian to Pliensbachian).**
- 2. The Middle Jurassic Betty Creek Formation (Pliensbachian to Toarcian).**
- 3. The Middle Jurassic Salmon River Formation (Toarcian to Bajocian).**
- 4. The Middle to Upper Jurassic Nass Formation (Toarcian to Oxfordian - Kimmeridgian).**

**Alldrick assigned formational status (Mt. Dilworth Formation, Figure 7) to a Toarcian rhyolite unit (Monitor Rhyolite) overlying the Betty Creek Formation. Rocks of the Salmon River Formation are transitional between the mostly volcanic Hazelton Group and the wholly sedimentary Bowser Lake Group and are presently regarded as the uppermost formation of the Hazelton or the basal formation of the Bowser Lake Group.**

**The Unuk River Formation (Figure 7), a thick sequence of andesite flows and pyroclastic rocks with minor interbedded sedimentary rocks, hosts a number of major gold deposits in the Stewart Camp (Figure 2). The unit is unconformably overlain by heterogeneous, maroon to green, epiclastic volcanic conglomerates, breccias, greywackes and finer grained clastic rocks of the Betty Creek Formation. Felsic flows, tuffs and tuff breccias characterize the Mt. Dilworth Formation (Figure 7). This formation represents the climatic and penultimate volcanic event of the Hazelton Group volcanism and forms an important regional marker horizon. The overlying Salmon River Formation has been subdivided in the Iskut area into an Upper Lower Jurassic and a Lower Middle Jurassic member (Anderson and Thorkelson, 1990). The upper member has been further subdivided into three north trending facies belts: the eastern Troy Ridge facies (starved basin), the medial Eskay Creek facies (back-arc basin) and the western Snippaker Mountain facies (volcanic arc).**

**Sediments of the Bowser Lake Group rest unconformably on the Hazelton Group rocks and they include shales, argillites, silt and mudstones, greywackes and conglomerates. The contact between the Bowser Lake Group and Hazelton Group passes between Strohn Creek in the north and White River in the south. The contact appears to be a thrust zone with the Bowser Lake Group sediment "slices" occurring within and overlying the Hazelton Group pyroclastics to the west.**

**Two main intrusive episodes occurred in the Stewart area: a Lower Jurassic suite of diorite to granodiorite porphyries (Texas Creek Suite) that are comagmatic with extrusive rocks of the Hazelton Group; and, an Upper Cretaceous to Early Tertiary intrusive complex (Coast Plutonic Complex and satellite intrusions). The early Jurassic suite is characterized by the occurrence of coarse hornblende, orthoclase and plagioclase and phenocrysts and locally pot-**

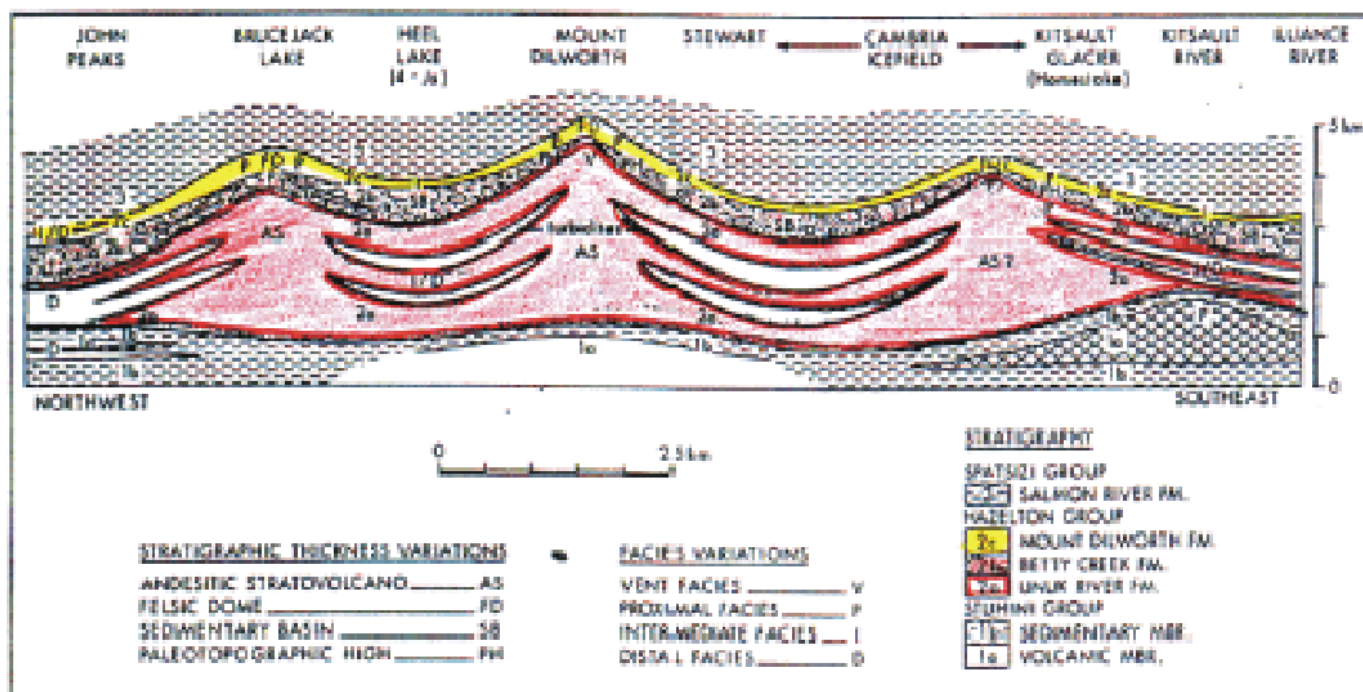


Figure 1-27-4. North-south schematic reconstruction through the Stewart complex.

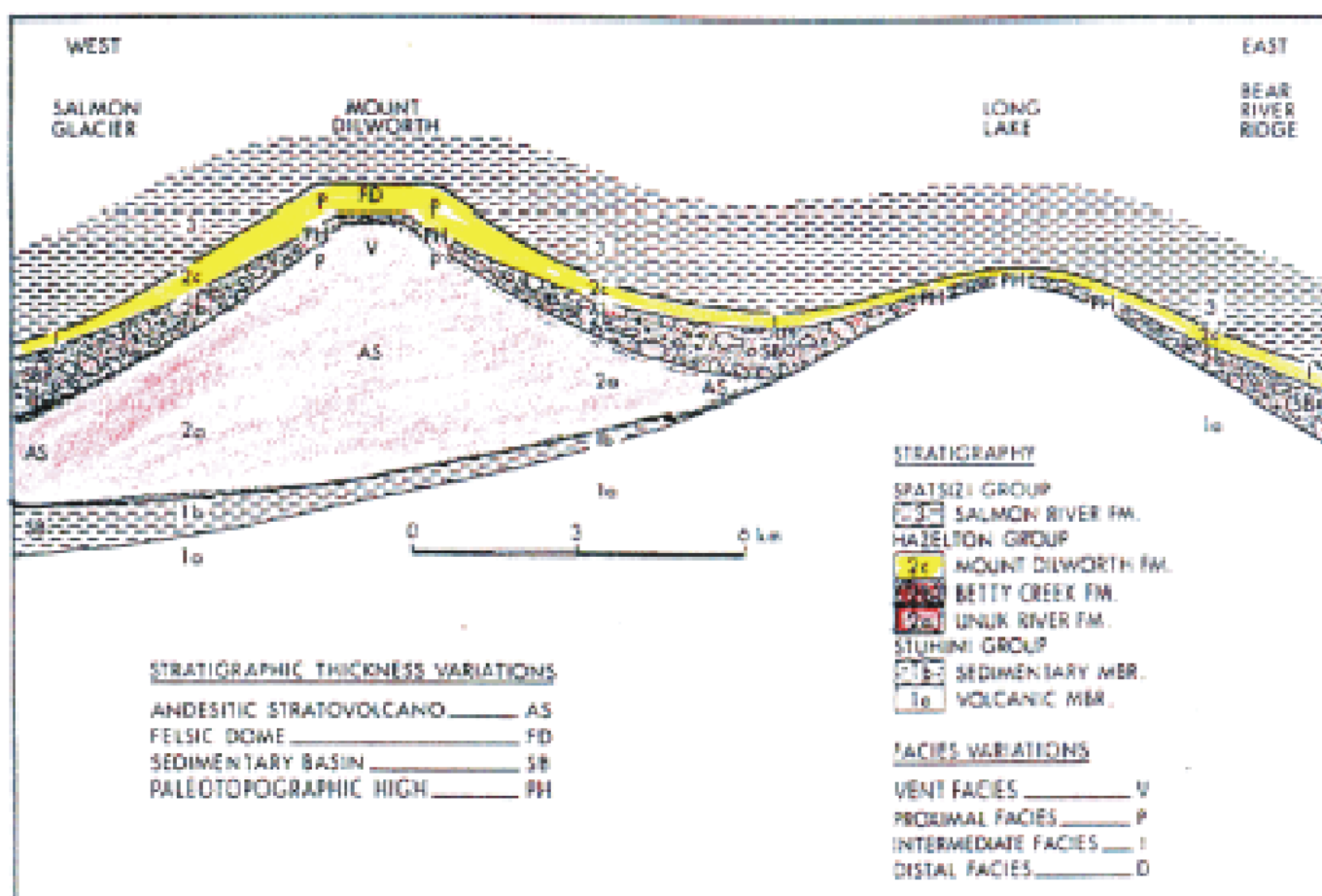


Figure 1-27-5. West-east schematic reconstruction through the Stewart complex.

## FIGURE 7 DILWORTH FORMATION IN STEWART COMPLEX STRATIGRAPHY

## **9. 1999 EXPLORATION PROGRAM, TODD CREEK PROPERTY:**

The 1999 exploration program was carried out by Geofine in July, August and September, as allowed by weather and field conditions. Exploration expenditures, including permitting, claim staking, field work, mob-demob, compilations, analytical quality assurance, reporting, filing fees, and overhead, total about \$80,000 and are summarized in Table 2. A total of 216 samples were submitted to Chemex Labs in Vancouver, and are summarized in Table 3 by sample type. Sample descriptions, analytical results and Chemex Certificates of Analyses for each specific target are included at the end of that section of the report.

### **9.1 QUALITY ASSURANCE OF ANALYTICAL DATA (TABLES 4, 5, 6):**

The quality of the Chemex analytical data was monitored by three types of check samples (Tables 4, 5):

- a) An in-house stream sediment sample with anomalous gold, silver, copper lead, zinc, arsenic, cadmium, molybdenum and nickel values. The sample is a composite stream sediment from Bitter Creek, which drains the area of the Red Mountain gold deposit. The sample's analytical results characterize the polymetallic signature often associated with significant Stewart Camp deposits.
- b) Canmet standard, CH3, that is used as a "high" gold check and that has a Canmet certified content of 1400 ppb gold (Table 4); not all the values for CH3 are "certified"; provisional and informational values are those provided by other laboratories and are so named by Canmet to indicate a lower confidence level relative to certified values.
- c) Canmet standard, WGM-1, that is used as a "low" gold check and that has a Canmet certified content of 110 ppb gold (Table 4); gold is the only element analyzed by Canmet that is relevant to this program.

In addition to the check samples, a number of pulps from samples analyzed by Chemex (Table 6) were run at second lab, XRAL Analytical Services in Toronto.

The check samples are shown in Table 5 by type, invoice number and date, and by analytical results for 10 elements. This data, in Geofine's opinion, has given rise to the following issues:

TABLE 3: 1999 EXPLORATION EXPENDITURES,  
TODD CREEK PROPERTY:

EXPENDITURE TYPE:	AMOUNT* (\$CDN):	GST (\$CDN):
SALARIES:	25725.29	1090.26
WC INS.:	1190.32	
SUPPLIES:	1881.04	123.61
COMMUNICATION:	997.20	66.82
ACCOMODATION, SUBSISTANCE:	2489.82	46.43
MOB-DEMOB:	2889.00	189.00
AIRCRAFT CHARTER:	14952.09	978.18
ANALYSES:	6182.71	404.46
VEHICLE, KMS, INS, SAMPLE SHIP:	3839.23	184.16
COURIER:	382.10	25.01
COPIER:	896.44	57.72
REPORT, PERMITTING, FILING, ASSESSMENT FEES:	15867.28	676.68
GRAND TOTAL:	77292.52	
OVERHEAD:	<u>2318.78</u>	
GRAND TOTAL	79611.30	3842.33

\* estimated where all figures are not currently available

TABLE 3: 1999 GEOCHEMICAL SAMPLES,  
TODD CREEK PROPERTY

SAMPLE TYPE:					
ROCK: STR.SED.:		SOIL:	CHK SAMP.	STANDARDS: SEDIMENT:	
EXPLORATION					
TARGET:					
PROJECT:				16	10
Geophysical Line, South Zone:	18	4	4		
MEXT South Zone:	23	1			
NEXT South Zone:	21				
A Zone, North Grid:	12				
B Zone, North Grid:	24	1			
NE Zone, North Grid:	3	2			
Amarillo Zone:	44				
Yellow Bowl Zone:	15	4			
NW Recon:	6	4			
Knob Recon:	1	3			
TOTALS:	167	19	4	16	10

GRAND TOTAL: 216



**TABLE 4:**

**CANMET ANALYTICAL DATA**

**FOR CANMET STANDARDS WMG-I, CH-3**

# WMG-1

## Mineralized Gabbro PGE Material

WMG-1 was obtained from the Wellgreen Complex, Yukon Territory, Canada. This mineralized gabbro consists largely of pyroxene with prehnite, amphibole, chlorite and accessory magnetite, ilmenite and titanite. Mineralization consists chiefly of chalcopyrite, pyrrhotite, pentlandite, violarite and altaite.

WMG-1 was prepared and certified in cooperation with the Analytical Method Development Section of the Mineral Deposits Division of the Geological Survey of Canada (GSC).

### Recommended Values and 95% Confidence Intervals

Certified						Provisional
Au ng/g	Pt ng/g	Pd ng/g	Rh ng/g	Ru ng/g	Ir ng/g	Os ng/g
110. ± 11.	731. ± 35.	382. ± 13.	26. ± 2.	35. ± 5.	46. ± 4.	24.

### Approximate Composition, wt %

SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	MnO	P <sub>2</sub> O <sub>5</sub>	LOI	Stot
41.	8.6	17.0	0.7	15.0	11.5	0.1	0.2	0.2	0.1	4.5	3.5

Thirty-three university, commercial, and government laboratories from Canada, United States, Europe, Australia, Africa, and Japan participated in an interlaboratory certification program. Up to 80 elements were analyzed by methods of each laboratory's choice. A statistical analysis of the PGE data yielded recommended values for gold, platinum, palladium, rhodium, ruthenium, and iridium. A provisional value for osmium is also given.

A certificate of analysis will be issued with each order of WMG-1. A copy of CANMET report CCRMP 94-4E, "WMG-1: A certified PGE geochemical reference material", will be forwarded, free of charge, on request to the Coordinator, CCRMP.

**CCRMP - CANMET (NRCan) - 555 Booth Street, Ottawa, Ontario, Canada K1A 0G1**

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**Internet: [ccrmp@nrcan.gc.ca](mailto:ccrmp@nrcan.gc.ca)**

# CH-3

## Gold-Bearing Sulphide Ore

The source for CH-3 is a gold-bearing material obtained from Westminer Canada Limited from its mine in Chibougamau, Quebec, the same source as CH-2, which has been exhausted. CH-3 was made by blending raw mill feed and waste-rock material.

The ore-grade sample was found to contain pyrite, pyrrhotite, magnetite, siderite, chloritoid, and chalcopyrite with traces of sphalerite, arsenopyrite, chlorite, quartz, and gold. The main gold-bearing mineral was found to be electrum, which occurred as inclusions in the pyrite and chalcopyrite. The waste-rock sample contained mainly silicate minerals.

Both grades of source material were dried, comminuted, sieved, and blended to obtain sub-74 micron (-200 mesh) product. These were assayed at CANMET, blended in the desired proportions and bottled in 200-gram units. Each bottle was sealed under nitrogen in a laminated aluminum foil-mylar pouch to prevent oxidation.

### Recommended Values and 95% Confidence Limits

Constituent	Ag µg/g	As µg/g	Au µg/g	CaO wt%	Cu wt%	Fe wt%	S wt%	SiO <sub>2</sub> wt%	Zn µg/g
Mean	2.63	143.	1.40	6.35	0.83	12.65	2.82	40.3	164.
95% confidence limits	±0.20	±14.	±0.03	±0.13	±0.02	±0.25	±0.03	±1.1	±15.

### Provisional Values

Constituent	Al <sub>2</sub> O <sub>3</sub> wt %	Ba µg/g	C wt %	Co µg/g	Cr µg/g	K <sub>2</sub> O wt %	LOI wt %	MgO wt %	Mn wt %
Mean	16.1	31.	1.74	245.	35.	0.64	6.7	4.47	0.203
95% confidence limits	± 0.5	± 14.	± 0.03	± 21.	± 16.	± 0.04	± 0.6	± 0.12	± 0.01

Constituent	Mo µg/g	Na <sub>2</sub> O wt %	Ni µg/g	Sb µg/g	Sr µg/g	Ti wt %
Mean	2.5	1.47	86.	0.7	49.	0.29
95% confidence limits	± 2.5	± 0.10	± 28.	± 1.0	± 11.	± 0.07

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## Informational Values

Constituent	Bi µg/g	Cd µg/g	Hg µg/g	La µg/g	P2O5 wt %	Pb µg/g	Se µg/g	Te µg/g	Zr µg/g
Mean	1.6	0.8	0.01	19.	0.06	2.	1.3	2.7	18.
95% confidence limits	± 2.6	± 1.0	± 0.07	± 6.	± 0.12	± 3.	± 0.9	± 0.9	± 9.

---

Twenty-five industrial, commercial, and government laboratories participated in an interlaboratory certification program. Up to 56 elements were analyzed by methods of each laboratory's choice. A statistical analysis of the data yielded recommended values for nine constituents and a further fifteen elements had provisional values assigned. The means for nine more elements are given for information.

A certificate of analysis will be issued with each order of CH-3. A copy of CANMET Report 93-2E, "CH-3: A Certified reference gold ore", will be forwarded, free of charge, on request to the Coordinator, CCRMP.

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**Internet: [ccrmp@nrcan.gc.ca](mailto:ccrmp@nrcan.gc.ca)**

TABLE 5: ANALYTICAL RESULTS FOR CHECK SAMPLES:

SAMPLE NUMBER	MATERIAL	DATE	CHEMEX INV NUMBER	ANALYSES (AU FA/AA; REMAINING ELEMENTS ICP)											
				AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm	NI PPM
106500	CH3	AUG 19	9925241	1700	2.6	8800	<2	140	144	<10	0.5	<1	<2	1	65
460327	CH3	AUG 27	9926484	1540	3	7780	<2	128	124	<10	<0.5	<1	4	4	74
160525A	CH3	AUG 27	9926486	1430	2.6	7740	<2	128	112	<10	<0.5	<1	6	3	73
598780	CH3	AUG 27	9926489	1220	2.2	7160	<2	122	118	70	<0.5	<1	6	4	75
160500A	CH3	AUG 27	9926488	1495	2.6	8400	<2	136	130	<10	<0.5	<1	2	4	76
598790A	CH3	AUG 31	9926640	1400	3	7490	8	140	124	30	1	<1	<2	3	68
160244R	CH3	AUG 31	9926637	1320	3.2	7930	6	138	122	<4	1	<1	6	<1	65
160340A	CH3	SEPT 24	9928535	1445	3	7800	6	128	130	<10	0.5	<1	2	<1	69
CANMET STANDARD VALUES FOR CH3:				1400*	2.6*	8300*	2***	164*	143*	31**	0.8***	0.01***	0.7**	2.5**	86**
CHEMEX AVERAGE VALUES				1444		7888		132	126						71
160548A	WMG1	SEPT 10	9927484	145	4.4	6270	12	68	<2	10	<0.5	<1	<2	2	2330
598800A	WMG1	SEPT 10	9927486	115	4	6670	10	72	<2	50	<0.5	<1	<2	1	2350
160373A	WMG1	SEPT 13	9927893	135	2.4	5300	12	62	8	<10	0.5	<1	6	<1	1995
160542A	WMG1	SEPT 13	9927893	140	2.8	5260	16	70	6	<10	0.5	<1	2	<1	1990
160392A	WMG1	SEPT 13	9927891	160	2.4	5340	14	64	4	<10	0.5	<1	2	<1	1940
160422A	WMG1	SEPT 13	9927891	190	2.6	5560	10	68	8	10	0.5	<1	2	<1	2140
160425A	WMG1	SEPT 13	9927891	115	2.6	5550	12	66	6	<10	0.5	<1	<2	<1	2100
160401A	WMG1	SEPT 13	9927482	145	4.2	6060	6	74	<2	10	<0.5	<1	<2	3	2270
CAMET STANDARD VALUES FOR WMG1:				110*											
CHEMEX AVERAGE VALUES				143											
* CERTIFIED VALUE    ** PROVISIONAL VALUE    *** INFORMATIONAL VALUE															
160201	SSC	AUG 17	9925239	126	1.2	126	48	178	82	70	2.5	<1	4	5	43
160275	SSC	AUG 31	9926638	80	1	139	30	196	90	80	2	1	6	6	50
160300	SSC	AUG 31	9926788	50	1.2	31	52	194	96	80	2.5	<1	<2	8	47
160395A	SSC	SEPT 9	9927887	135	1.2	134	56	224	98	90	2.5	<1	6	11	48
160462	SSC	SEPT 10	9927481	55	1.8	47	28	160	72	70	2.5	<1	<2	7	44
86988	SSC	SEPT 13	9927889	40	1.4	121	76	164	88	60	2	<1	4	3	45
160531A	SSC	SEPT 13	9927886	65	1	270	44	184	88	80	3.5	<1	4	6	39
160475	SSC	SEPT 15	9927993	20	0.8	88	32	170	80	50	2	1	2	7	62
86987	SSC	SEPT 17	9927995	NA	1.8	135	44	178	92	70	3	<1	<2	7	47
160437A	SSC	SEPT 24	9928536	80	0.8	100	32	190	70	80	2.5	<1	4	4	38

TABLE 6, PART 1:  
CHEMEX ANALYSES VS XRAL ANALYSES:

SAMPLE NO. & LAB*:	ANALYSES:										
	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	As ppm	Ba ppm	Cd ppm	Sb ppm	Hg ppm	Mo ppm
598780 C	1220										
598780 X	1240	na	na	na	na	na	na	na	na	na	na
598500A C	1495										
598500A X	1440	na	na	na	na	na	na	na	na	na	na
160395A C	135										
160395A X	100	na	na	na	na	na	na	na	na	na	na
160517 C	210	5.0	6460	18	204	92	30	<0.5	2	<1	6
160517 X	266	5.2	6260	25	195	98	434	2	10	<1	4
460331 C	25	0.6	156	12	44	50	90	<0.5	4	<1	12
460331 X	27	0.7	148	12	45	37	424	<1	<5	<1	14
160393 C	7800	2.4	63	80	154	12	140	1.5	<2	<1	4
160393 X	7610	2.8	44	95	151	<3	186	3	<5	<1	4
460317 C	<5	1.2	191	22	32800	34	60	252	12	25	32
460317 X	8	1.2	185	32	>10K	27	127	211	<5	26	27
598796 C	30	40.4	2360	1735	5760	220	60	152	218	24	14
598796 X	49	30.5	2500	2030	5440	235	1410	135	218	28	13
160401 C	495	0.5	11400	17	32	288	30	0.5	2	1	22
160401 X	464	2.5	10290	32	50	297	432	1	<5	<1	19
160402 C	110	3.8	1015	40	18	310	20	<0.5	<2	1	121
160402 X	106	3.0	919	51	20	322	315	<1	<5	<1	121
160518 C	140	7.4	1315	792	1315	254	20	24	6	<1	43
160518 X	142	6.9	1190	791	1570	249	441	21	6	1	38

## **TABLE 6, PART 2**

**CANMET Standard WMG-1 - ALS Chemex Results High**

ALS Chemex results reported for CANMET standard WMG-1 were all higher than the CANMET mean of 110 ppb Au. To investigate this problem, a group of Geofine samples and a selection of low grade reference materials were reanalyzed for Au.

The following table lists re-run results for samples originally appearing on certificate A9927893. The re-analysis included certified reference materials WMG-1, WPR-1 and WMS-1.

SAMPLE DESCRIPTION	ORIGINAL ON A9927893	Au ppb RE-RUN	CERTIFIED MEANS
160373	60	60	
160373A (WMG-1)	135	190	110
160374	30	35	
160527	<5.0	<5.0	
160532	15	15	
160533	<5.0	<5.0	
160534	15	30	
160537	50	40	
160538	<5.0	<5.0	
160539	15	15	
160540	<5.0	<5.0	
160542	15	<5.0	
160542A (WMG-1)	140	NSS	110
160560	10	<5.0	
160562	45	40	
160563	5	<5.0	
160575	35	25	
QWC-99 *	195		**190
WMG-1		140	110
WMG-1		110	110
WPR-1		40	42
WPR-1		30	42
WMS-1		235	279
WMS-1		265	279
QWC-99 *		190	**190
QWC-99 *		175	**190
Silica		<5.0	<5
Silica		<5.0	<5

\* ALS Chemex in-house reference material.

\*\* Mean based on a set of 192 samples with results obtained from 5 laboratories.

Results for WGM-1 remain high while results for other references are closer to the expected values. The check results for the unknown samples are in reasonable agreement with the original values.



**CANMET Standard CH-3 – Zn, Ni, As, and Sb**

Results for certified reference material CH-3 run in Geofine sample batches have been extracted from our database and are tabulated below.

SAMPLE NUMBER	SAMPLE DESCRIPTION	FA/AA AU ppm	ICP 32 AS ppm	ICP 33 NI PPM	ICP 34 CU ppm	ICP 35 ZN ppm	ICP 36 SB ppm
A9925241-11	P106500	1.700	144	65	8800	140	<2.0
A9926484-19	460327	1.540	124	74	7780	128	4
A9926486-11	P160525A	1.430	112	73	7740	126	6
A9926488-1	P160500A	1.495	130	76	8400	136	2
A9926489-9	598780	1.220	118	75	7160	122	6
A9926637-6	P160244R	1.320	122	65	7930	138	6
A9926640-14	598790A	1.400	124	68	7490	140	<2.0
A9928535-7	P160340A	1.445	130	69	7800	128	2
	Average	1.444	126	71	7888	132	4
	Median	1.438	124	71	7790	132	5
	<b>CANMET</b>	<b>1.4</b>	<b>143</b>	<b>86</b>	<b>8300</b>	<b>164</b>	<b>0.7</b>
	STDDEV	0.1439	9.5	4.4	510.7	7.0	2.0
	MAX	1.700	144	76	8800	140	6
	MIN	1.220	112	65	7160	122	2

\*\*Certified values in bold, provisional values in italics

## **TABLE 6, PART 3**

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### **Barium Recovery from Aqua Regia Digestion**

Barium will not be quantitatively recovered from an aqua regia digestion. This issue is addressed in the Explore paper by Hall

The aqua regia digestion "is an efficient solvent for numerous metal sulphides (e.g. galena, sphalerite, molybdenite, pyrite, marcasite); **many sulphates (except barite)**; arsenides, selenides, tellurides, native Au, Pt and Pd; minerals belonging to the group of simple oxides (e.g. U) and their hydrates (e.g. Fe-Mn); phosphates (e.g. apatite); carbonates; and organically-bound elements"

Recoveries for Ba in the LKSD (Lake Sediment), STST (Stream Sediment) and TILL (Till) references materials by aqua regia digestion ranged for 9 to 64% of the total barium content.

A stronger digestion such as HF-HClO<sub>4</sub>-HNO<sub>3</sub>-HCL can be used. However, even this digestion is limited in its application to high barium samples.

"Mineral phases which are resistant to attack (as they would be also by aqua regia), to varying degrees, include cassiterite, rutile, monazite, ilmenite, garnet, wolframite, spinels, sphene, beryl, zircon, tourmaline and **high concentrations of barite**.

It is our recommendation that when a 'total' barium value is required the pressed pellet XRF method or a lithium metaborate fusion followed by ICP be used. The XRF method has the advantage of a higher sample weight which eliminates concerns about small sample sizes.

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### **Barium – Differences between ALS Chemex and Check Laboratory**

A small group of samples were sent to another laboratory for check analysis. While results for most elements had good agreement there were substantial differences for barium with ALS Chemex values being much lower.

As part of the investigation of some other concerns, CANMET standards were analyzed by the ALS Chemex by the aqua regia digestion and the tri-acid digestion. Ba values for two standards STSD-2 and STSD-1 are presented below. ALS Chemex tri-acid digestion values agree with the CANMET values for the "Total" digestion method. Gwendy Hall published an article in a recent issue of EXPLORE (G.E.M. Hall, 1999. "Near-total" acid digestions. Explore, 104:15-19.) discussing recoveries from aqua regia digestions for a number of elements. In the Explore paper, a values of  $110 \pm 5$  is listed for STSD-2 for Ba by aqua regia. The value 250 is estimated from the graph (40% recovery of 630). ALS Chemex values from the aqua regia method (G32) are in reasonable agreement with the values from Hall indicating the procedure is in control.

Canmet Standard	Ba ppm			
	ALS Chemex AQ Digestion	Hall (Explore) AQ Digestion	ALS Chemex Tri-Acid Dig.	CANMET Provisional – Total
STSD-2a	110	110	490	540
STSD-2b	110	110	500	540
STSD-1a	290	250	580	630
STSD-1b	270	250	560	630

ALS Chemex has been using the same reference material for the G32 procedure since 1997. The Barium values for the database plus the values for Geofine samples are listed below. Results are consist from both years.

Ba (ppm)	ALS Chemex In-House Reference – Geo96			
	1998		1999	
	Overall ALS Chemex	Geofine	Overall ALS Chemex	Geofine
Mean	596.5304	564.6154	596.1704	566.1905
Std Deviation	81.70863	66.78515	105.5301	85.40938

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Element. Method. Det.Lim. Units.	Au FA301 1 ppb	Be ICP70 0.5 ppm	Na ICP70 0.01 %	Mg ICP70 0.01 %	Al ICP70 0.01 %	P ICP70 0.01 %	K ICP70 0.01 %	Ca ICP70 0.01 %	Sc ICP70 0.5 ppm	Ti ICP70 0.01 %	V ICP70 2 ppm	Cr ICP70 1 ppm	Mn ICP70 2 ppm	
598780	1240	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	
598500a	1440	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	
160395a	100	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	
160517	266	0.5	0.02	0.50	1.68	0.02	0.05	0.18	1.9	<0.01	51	40	1390	
460331	27	0.6	0.02	0.43	1.34	0.05	0.39	0.19	1.0	<0.01	20	27	807	
160393	7610	0.7	0.02	0.59	0.48	0.01	0.28	0.56	1.0	<0.01	18	59	912	
460317	8	<0.5	0.02	0.01	0.31	0.05	0.33	0.06	<0.5	<0.01	5	33	23	
598796	49	<0.5	0.02	<0.01	0.02	0.02	0.04	<0.01	1.2	<0.01	<2	4	31	
160401	464	<0.5	0.02	0.60	1.08	0.02	0.28	1.45	0.5	<0.01	28	44	1470	
160402	106	<0.5	0.02	0.14	0.49	0.02	0.26	0.36	<0.5	<0.01	10	45	216	
160518	142	0.6	0.02	0.53	1.33	0.01	0.02	2.73	1.8	<0.01	40	52	1300	
*Dup 598780	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	

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Element. Method. Det.Lim. Units.	Co ICP70 1 ppm	Ni ICP70 1 ppm	Cu ICP70 0.5 ppm	Zn ICP70 0.5 ppm	As ICP70 3 ppm	Sr ICP70 0.5 ppm	Y ICP70 0.5 ppm	Zr ICP70 0.5 ppm	Mo ICP70 1 ppm	Ag ICP70 0.2 ppm	Cd ICP70 1 ppm	Su ICP70 10 ppm	S ICP70 1 ppm
598780	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
598500a	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
160395a	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
160517	11	3	6260	195	98	8.1	3.9	3.3	4	5.2	2	<10	1
460331	10	2	148	44.9	37	15.9	4.8	6.8	14	0.7	<1	<10	<
160393	5	1	44.2	151	<3	19.7	4.1	4.2	4	2.8	3	<10	<
460317	3	<1	185	>10000	27	8.9	2.8	10.7	27	1.2	211	<10	<
598796	<1	<1	2500	5440	235	175	<0.5	1.3	13	30.5	135	<10	21
160401	7	6	10290	50.0	297	48.8	5.2	4.8	19	2.5	1	<10	<
160402	20	17	919	19.9	322	24.7	2.6	4.2	121	3.0	<1	<10	<
160518	13	3	1190	1570	249	82.1	7.5	3.7	38	6.9	21	<10	1.3
*Dup 598780	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.

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Element. Method. Det.Lim. Units.	La ICP70 0.5 ppm	W ICP70 10 ppm	Pb ICP70 2 ppm	Bi ICP70 5 ppm	Hg ICP70 1 ppm
598780	I.S.	I.S.	I.S.	I.S.	I.S.
598500a	I.S.	I.S.	I.S.	I.S.	I.S.
160395a	I.S.	I.S.	I.S.	I.S.	I.S.
160517	10.0	<10	25	*INF	<1
460331	9.9	<10	12	<5	<1
160393	15.8	86	95	<5	<1
460317	8.4	<10	32	<5	26
598796	2.2	<10	2030	*INF	28
160401	7.9	<10	32	*INF	<1
160402	8.4	<10	51	<5	<1
160518	17.4	<10	791	*INF	1
*Dup 598780	I.S.	I.S.	I.S.	I.S.	I.S.

FAX NO. 1

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1. With regard to the low gold check (WMG-1; Table 5), the Chemex gold values appear to be biased upward on average by 30% (all Chemex values are greater than the Canmet certified value).
2. With regard to CH3 material (Table 5), the Chemex zinc values are biased downward on average by 20% (all Chemex values are less than the Canmet certified value).
3. With regard to the CH3 material, the Chemex nickel values are biased downward on average by 17% (all Chemex values are less than the Canmet provisional value).
4. With regard to CH3 material, arsenic values are biased downward by 12% (all Chemex values except one are less than the Canmet certified value).
5. With regard to the SSC material (Table 5), there seems to be too great a variation in the gold, and in the copper values.

Although all the results are within the realm of acceptable statistical variance (e. g. see Table 6, Part 2: Canmet Standard CH-3), in Geofine's experience with the use of such standards, many of these issues can often be explained and resolved satisfactorily via reference to the work of an "umpire" laboratory. As shown in Table 6 Part 1, there is generally excellent correlation between the Chemex analytical results and those produced by XRAL analysis (XRAL lab sheets are included in this Section) of the same pulp material from a broad range of sample types. An even broader comparison was contemplated; however, there was insufficient pulp material for all the samples that were requested for this study.

The postulated biases, i.e., variances 1-4 noted in the table above with regard to the Canmet standards, are no longer apparent in Table 6. The greatest concern was that the low-end Chemex gold values were biased upwards; but as shown in Table 6, most of the XRAL low end gold analyses are higher than the Chemex values. Moreover, Chemex has thoroughly researched the apparent bias in-house by re-running a number of the pulps against a variety of check materials (Table 6, Part 2: Canmet Standard WMG-1 - Chemex Results High). The pulp re-runs are in reasonable agreement with the original values; however, most of the WMG-1 analyses remain higher than the certified value. It is concluded that the biases referenced above are not related to Chemex and have not affected the program sample results. They may be related to some inhomogeneity in the standards themselves.

The variance in the SSC material is explained by the inhomogeneity in the sample material: the gold is associated with small grains of



chalcopyrite, and even though the material is fine has been thoroughly mixed, the grains are believed to constitute a nugget effect. However, each analysis of the sample has produced an anomalous polymetallic signature that would warrant detailed follow-up. The Red Mountain gold/copper deposit is located several km upstream from where the check sample material was collected on Bitter Creek. The geochemical signature, including the anomalous nickel values, is reflective of that of the deposit.

The issues referenced above are, in Geofine's opinion, fully resolved. However, the XRAL data has to some extent substantiated a final concern. As noted in this report, barite is commonly associated, directly or indirectly, with much of the mineralization on the Todd Creek Property, particularly with that on the northern target areas (e.g., the Amarillo Zone). However, the Chemex data does not, in a number of cases, appear to reflect the strong presence of the indicator element. This concern becomes somewhat apparent in Table 6: the Chemex barium analyses therein average 56 ppm; XRAL analyses of the same material average 471 ppm.

This discrepancy is addressed by Chemex in Part 3 of Table 6: "the aqua regia method is not fully quantitative for barium due to digestion and solubility problems". Chemex goes on to demonstrate (Table 6, Part 3) that its partial results via aqua regia are satisfactory with regard to standards and to the work of others (e.g., Hall) with the same standards. Chemex indicates (pers.com.) that the variance between the XRAL results and the Chemex results probably relates to the specific method followed in the aqua regia digestion. Chemex indicates that in its method, barium, especially when present in larger amounts, tends to precipitate quickly out of solution. In fact, according to Chemex, with its method, there may thus be an inverse relation between the barium reported and the amount present i.e., the lower the result, the higher the barium content. This phenomenon would explain the concern noted in the paragraph above e.g., with substantial amounts of barite in the samples from the BA1 Zone on the Amarillo Zone, the results for barium are extremely low. The barium inversion issue is not a critical one for the geochemical database herein or the exploration program (quantitative barium values, if required, can be obtained for about \$10 per sample; Chemex is running a number of samples at its cost in order to comment fully on the XRAL results). However, it is essential to be aware of the barium phenomenon and to understand that all references to barium or barium zones in this report usually indicate the presence of significant quantities of barite, even if the analytical results for barium are low.

## **9.2 CLAIM STAKING:**

The Todd Project included the staking of the Todd 18 Claim (Map 1, Table 1) to cover an important gap north of Todd 13 and along strike of the Yellow Bowl Zone (Map 1). As summarized in Table 1, all the Todd Creek Property claims are currently in good standing until at least May 13, 2000

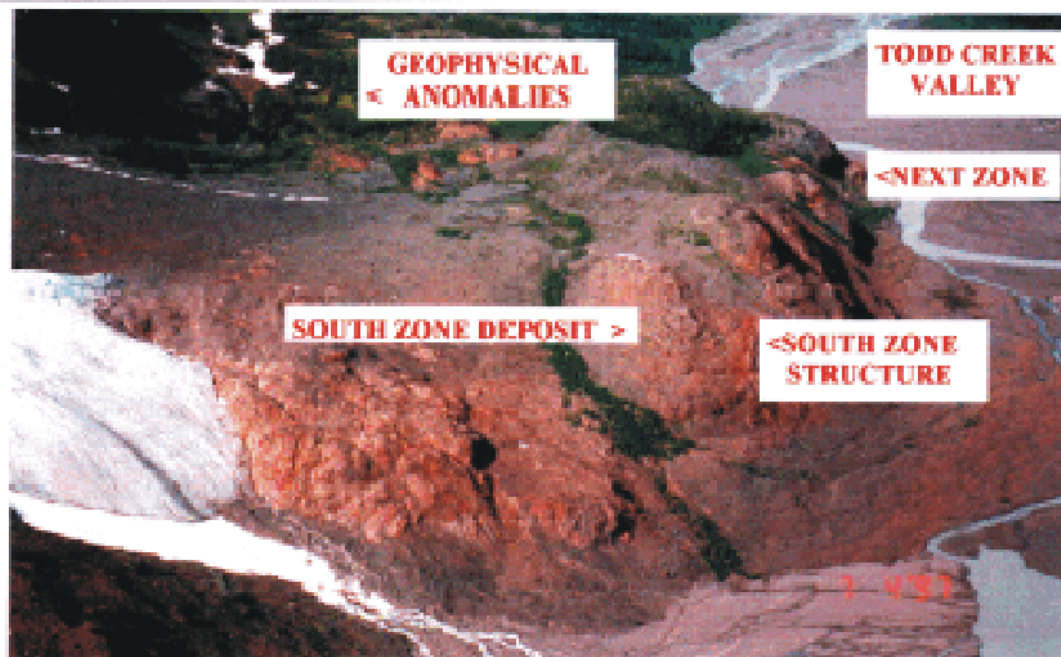
## **9.3. DIAMOND DRILL HOLE TARGET LOCATION, EVALUATION AND PRIORITIZATION:**

The primary objective of the 1999 exploration program on the Todd Creek Property entailed the location, evaluation and prioritization of exploration targets in order to facilitate the discovery of ore via a Y2K diamond drill program. A total of 14 diamond drill holes were located in the field subsequent to various grid line/base line installations/restorations; clinometer/compass/chain surveys of historical hole collars and topography; cutting of alders and stripping to expose showings; detailed and reconnaissance geological, geochemical surveys; and, prospecting. The work on the various targets is described below:

### **9.3.A. SOUTH ZONE DEPOSIT (MAPS 1, 2, 3A, 3B, 4, PHOTOS 2-12; SECTIONS 9840N, 9960N, 10115N, 10150N, VERTICAL LONG SECTIONS 1, 2):**

The South Zone deposit (Photo 2; 207,000t grading 5.48 g gold/t, along with copper credits) is located in the South Zone Target Area, near the head of the Todd Creek Valley (Maps 1, 2, 2A, 3A, 3B). On surface, the South Zone deposit is up to over 15 m in width (Photo 3) and remains open for expansion to the south, north and down dip (Vertical Section 1). The deposit is hosted by altered (quartz-pyrite +/- sericite) tuffs and breccias, and associated with a north-northeast striking (10°), 60 to 70° west-dipping splay off the Todd Creek Valley Fault (Photo 4).

As indicated on Photo 4, the South Zone Structure has been traced for over 900 m and remains open to the north and to the south, where it disappears under the glacial-fluvial deposits of the Todd Creek Valley. In Photo 4, the lineament associated with the structure can apparently be followed for several hundred meters beyond the most southerly mineralized outcropping of the South Zone deposit. The north end of the structure and associated altered host rocks have been dextrally offset to the east by the NEXT Fault (Photo 5). However, depending on the amount of displacement, the mineralized zone located there i.e., the Northern Extension of the South Zone (NEXT SZ), may be a fracture zone parallel to the South Zone, and the main South Zone Structure may be located further east, under the Todd Creek Valley. This situation may be analogous to the South Zone deposit where, as shown on Vertical Long Section 2, a second mineralized zone, the South Zone, Zone B is located to the west of, and in



**PHOTO 2: SOUTH ZONE DEPOSIT,  
SOUTH ZONE STRUCTURE**



**PHOTO 3: SOUTH ZONE DEPOSIT: PYRITE,  
CHALCOPYRITE, MALACHITE,  
HEMATITE**



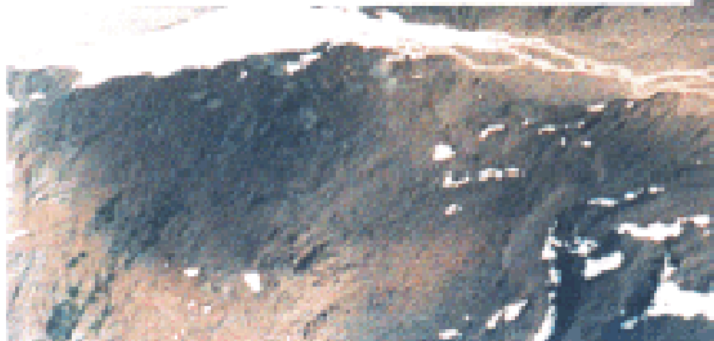
**NEXT ZONE >**

**NEXT ZONE >**

**SOUTH ZONE STRUCTURE >**

**SOUTH ZONE DEPOSIT >**

**SOUTH ZONE STRUCTURE >**



**PHOTO 4**  
**SOUTH ZONE DEPOSIT,**  
**MINERALIZED ZONES,**  
**SOUTH ZONE STRUCTURE**  
**APPROX SCALE 1:4500**  
**LOOKING NORTH**



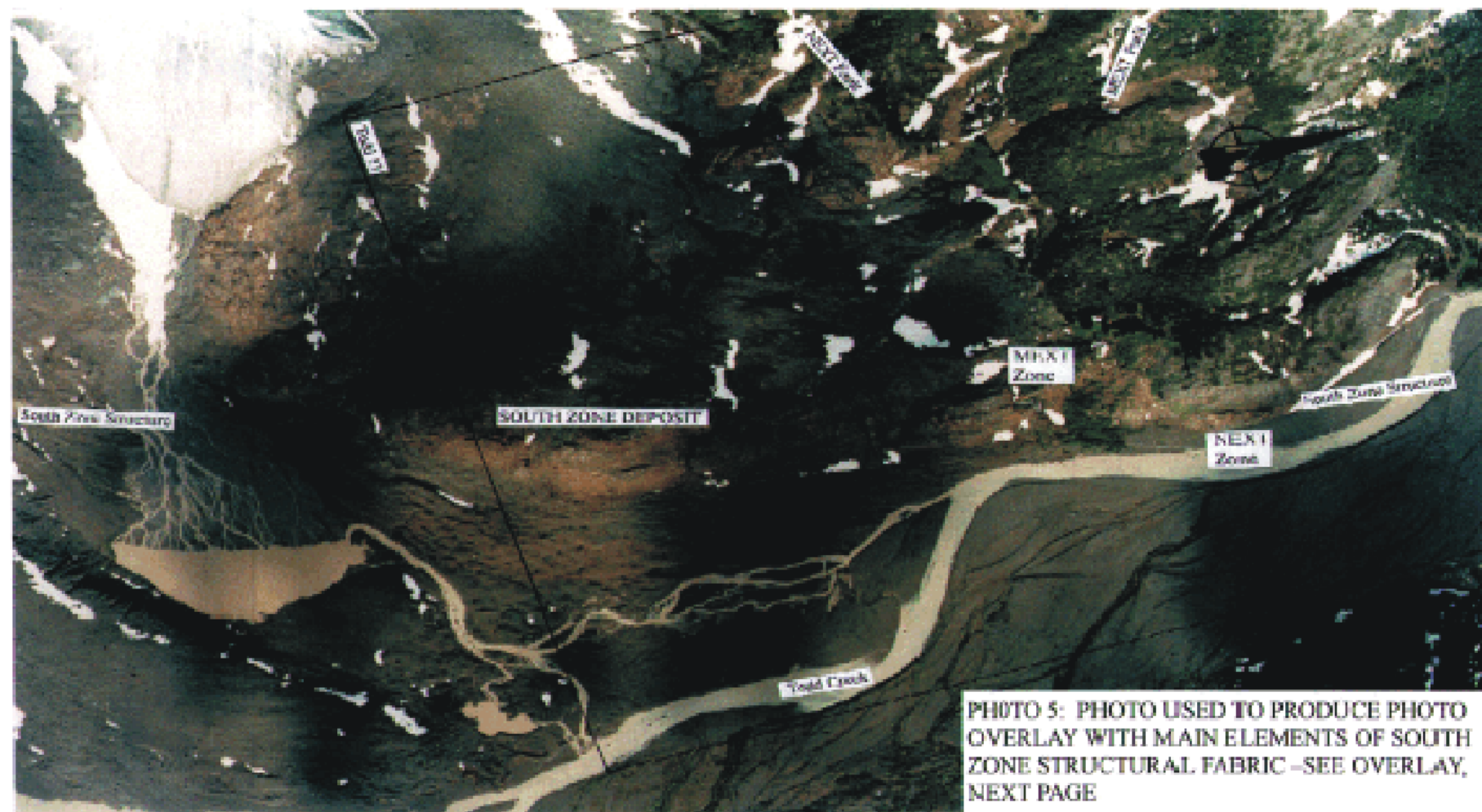


PHOTO 5: PHOTO USED TO PRODUCE PHOTO  
OVERLAY WITH MAIN ELEMENTS OF SOUTH  
ZONE STRUCTURAL FABRIC -SEE OVERLAY,  
NEXT PAGE

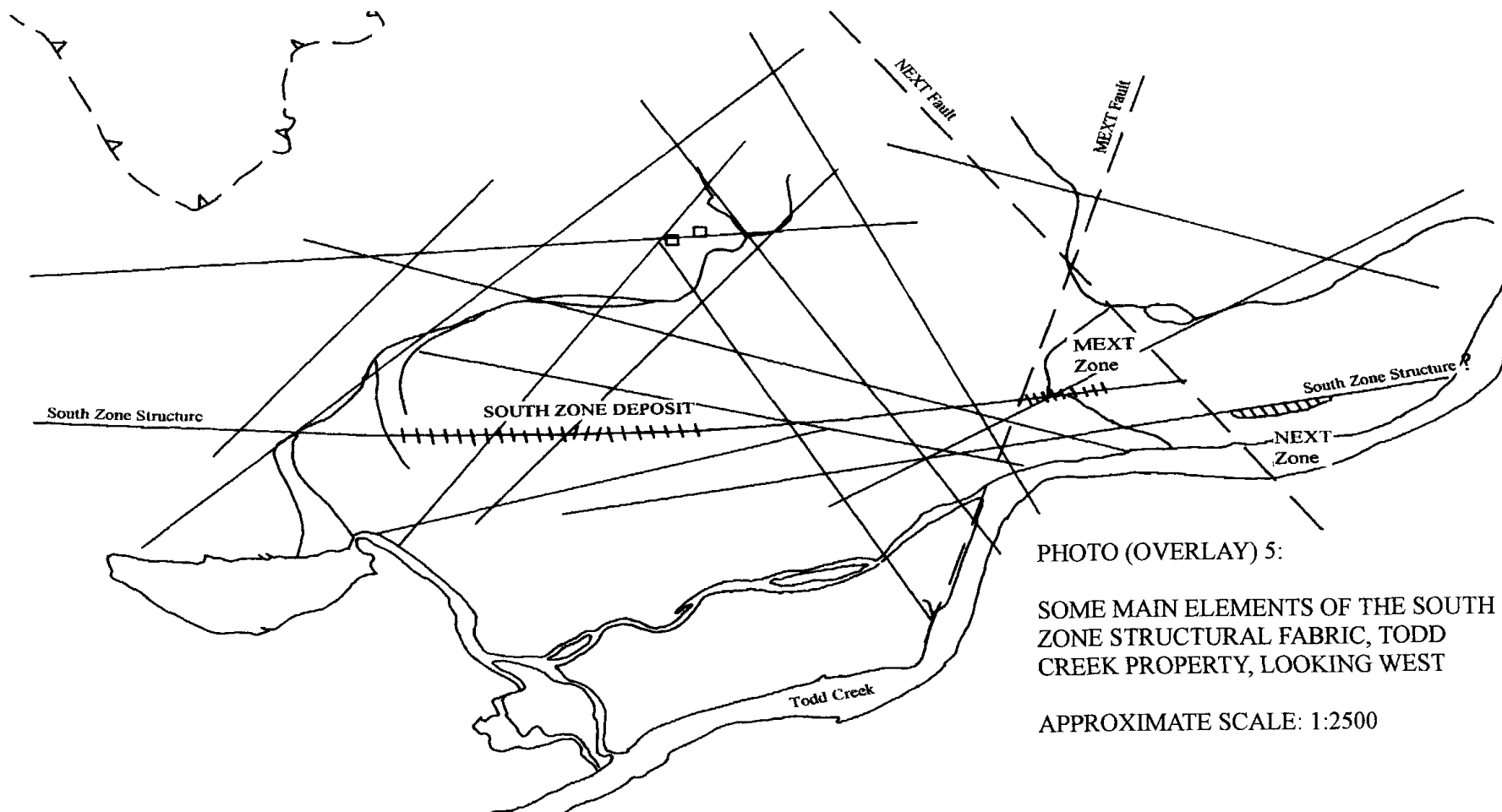


PHOTO (OVERLAY) 5:

SOME MAIN ELEMENTS OF THE SOUTH  
ZONE STRUCTURAL FABRIC, TODD  
CREEK PROPERTY, LOOKING WEST

APPROXIMATE SCALE: 1:2500

close proximity to Zone A (Vertical Long Section 1, Appendix C).

The multiphase mineralization (Photo 3) is hosted by a prominent fracture zone containing quartz breccia veins (Photos 6, 7), mineralized with massive pyrite veins, lenses and disseminations of pyrite and specular hematite, patches of malachite and hematite, and coarse blebs and disseminations of chalcopyrite in intensely hematized and silicified zones. A sub orthogonal structural fabric, some of the main components of which (e.g., South Zone Structure, MEXT Fault, NEXT Fault) are shown on the overlay of Photo 5, is deemed conducive to the development of a plunging ore shoot morphology, similar to that at the Golden Patricia Mine in Northwestern Ontario. There, the focus on such morphologies in the drill strategy led to the discovery and delineation of the ore body in 1985, after historical drilling had originally been carried out unsuccessfully, in 1964.

As described by Noranda,

mineralization occurs along the southern 425 m and the northern 100 m of the exposed portions of the South Zone. There are two types of mineralization within the fracture system:

1. massive pyrite-chalcopyrite stringers and veins from less than 1 cm to 10 cm wide; and,
2. a zone of quartz-hematite-chalcopyrite stringers and breccia veins to 3 m wide.

Typically, the zone consists of one or two larger quartz breccia veins separated by a stock work of narrow quartz-hematite veins. The larger quartz breccia veins occur along the footwall and hanging wall of the zone. Above the main zone, moving into the hanging wall is a zone of silica-sericite-chlorite alteration with minor quartz-hematite and/or pyrite +/- hematite stringers (Photos 8, 9). The amount of pyrite veining was observed to increase from the south to the north.

Geochemically, the two types of mineralization are distinct: the pyrite-chalcopyrite veins generally have distinctly higher molybdenum, copper and arsenic values, and lower gold values than the quartz breccia veins.

Noranda chip sampling on the South Zone in 1986 averaged 4.1 g gold/t over an area 3 m by 270 m (Map 4). A number of narrow stringers to wider veins (up to 50 cm) of quartz and quartz breccia trend parallel to the South Zone Deposit, and are located in the hanging wall rocks within 100 m of the deposit.

As described in Section 5 of this report, the South Zone deposit was drilled by Noranda in 1987 to test the southern 175 m strike length of the zone. Significant results included:



PHOTO 6: QUARTZ BRECCIA VEIN, SOUTH ZONE DEPOSIT



PHOTO 7:

QUARTZ BRECCIA VEIN,  
SOUTH ZONE DEPOSIT





**PHOTO 8: ALTERED (QUARTZ-SERICITE-PYRITE)  
PYROCLASTIC HANGINGWALL ROCKS, SOUTH ZONE**



**PHOTO 9:  
QUARTZ BRECCIA  
STRINGER ZONE,  
HANGINGWALL  
ROCKS, SOUTH  
ZONE DEPOSIT**

11.93 g gold/t over 1.73 m  
4.10 g gold/t over 2.00 m  
4.01 g gp/d/t over 1.50 m  
3.25 g gold/t over 3.69 m  
3.36 g gold/t over 2.61 m

Drilling in 1988 tested the down dip extension and strike continuity of the zone for an additional 200 m to the north. Intersections ranged from 1-30 m and significant values include:

6.91 g gold/t over 8.15 m  
6.86 g gold/t over 2.00 m  
6.53 g gold/t over 2.05 m  
4.65 g gold/t over 6.15 m  
8.83 g gold/t over 11.70 m  
6.12 g gold/t over 6.10 m

The zone has been tested over a 375 m strike length by 34 holes comprising 3186 m that have outlined drill indicated reserves of 207,000 tonnes grading 5.48 g gold/t (Hemlo Gold Mines Inc., 1988 Annual Report). As shown on Vertical Longitudinal Section 1, Zone A as traced by diamond drilling to date, has apparent good continuity down dip, down to about 160 m along a 60 to 70 degree dip to the west. A second zone, Zone B, located in the hanging wall from about 10 to a few meters west of Zone A, is much narrower and weaker than Zone A.

**9.3.A.i. 1999 SURVEY OF HISTORIC SOUTH ZONE DEPOSIT HOLES (TABLE 7; MAPS 3A, 3B; VERTICAL LONG SECTIONS 1, 2):**

A location/elevation/topographic survey of the historic Noranda drill holes was carried out to ensure the accuracy of the South Zone deposit cross sections and vertical long sections (VLS). Such information is required for the utilization of a plunging ore shoot model and gram meter product contouring, and to optimize ore targeting and drill program orchestration.

The field location of many of the historic Noranda drill collars as shown on plan Maps 3A and 3B was facilitated by the debris left from historical drill programs on the property. It is now understood that Noranda, as required by the BC Ministry of Energy and Mines, has carried out the necessary reclamation this fall. In order to accurately establish the holes' relative positions and elevations in the hilly terrain, and facilitate the spotting of Y2K holes, a new 535 m long base line, BL 9950E, was installed across the old Noranda grid in an area that required only a minor off set i.e., from 9900N to 9840N, the base line was offset 3 m to the east (Maps 3A, 3B). Segments of the Noranda historic grid were also re-established to locate some of the holes.

The location/elevation of Noranda holes NTC88-29, 30 (Table 7; Map 3B) were used as datums for the survey. A total of 24 collars were found, and the 25th collar location was estimated from set-up debris. The relative locations/elevations of the historic holes were then surveyed from points on the new baseline. Four new grid lines on which five Y2K proposed drill holes were spotted, were installed and marked with pickets at 25 meter intervals (Maps 3A, 3B).

The azimuth and inclination of each leg of the survey was established by using a Suunto Compass and Inclinator. The compass is accurate to  $\pm 0.3^\circ$  on level terrain. The inclinometer is accurate on level shots to  $\pm 0.6^\circ$ . Based on survey loop closure data of previous surveys, the accuracy of the 1999 South Zone survey should be at least 97%. Distances were established with a fibreglass chain, which was "broken" to obtain horizontal distances on slopes. The results of the survey as shown in Table 7 indicate that the majority of the holes show only minor discrepancies in position relative to those reported by Noranda. The greatest discrepancy, up to about 5 m occurs with respect to the two holes on the southernmost area of the grid, where there are steep slopes and rugged topography.

With regard to elevations, as shown in Table 7, Noranda 1987 reported elevations are problematic, but appear to have been corrected in 1988 (some 1988 holes were drilled from 1987 set-ups). There is good correlation of Noranda reported elevations for 1988 holes (and corrected 1987 holes) to the elevations determined in this survey. For NTC88-38 (10072N) and all other drill holes measured to the north, the discrepancies are all less than 1.5 m. With the exception of NTC87-1, for all holes to the south of NTC88-38, 1999 survey measurements are consistently about 4 m less than those reported by Noranda. No collar was found for NTC87-1, and its position was estimated from set-up debris. The survey data suggests that Noranda did make rather precise elevation measurements, but may have made a minor error at one location on the grid.

#### **9.3.A.i.a INTERPRETATION OF SURVEY OF HISTORIC SOUTH ZONE HOLES:**

It is concluded from the 1999 survey that most discrepancies in the 1988 Noranda drill co-ordinates and elevations with regard to the 1999 data are within the accuracy limits of the 1999 survey method, i.e., a survey conducted with compass, inclinometer and fibreglass chain. The Noranda historical data base as revised in 1988 is thus generally regarded as sufficiently accurate for utilization in the Y2K drill program. All co-ordinates referenced in this report are thus relative to the historic Noranda grid shown on Maps 3A and 3B.

TABLE 7: SURVEY CO-ORDINATES OF HISTORIC NORANDA DRILL HOLES,  
SOUTH ZONE DEPOSIT, TODD CREEK PROPERTY:

DRILL HOLE:	NORTHING:		EASTING:		ELEVATION (m):	
	OLD:	NEW:	OLD:	NEW:	OLD:	NEW:
NTC 88-29, 30*	10153.0	10153.0	9947.0	9947.0	1143.0	1143.0
NTC 88-26, 27, 28	10116.0	10114.0	9975.0	9978.0	1139.0	1138.5
NTC 88-36, 37	10100.0	10098.0	9952.0	9954.0	1131.0	1129.8
NTC 88-38	10072.0	10070.0	9949.0	9949.5	1132.5	1132.4
NTC 88-39	10044.0	10045.0	9950.0	9950.0	1136.0	1131.1
NTC 88-13	N/A	9997.0	N/A	9963.0	N/A	1120.0
NTC 87-8, 9	N/A	9997.0	N/A	9963.0	N/A	1120.0
NTC 87-6, 7	9959.0	9959.0	9967.0	9970.0	1060.0	1101.0
NTC 88-14	9959.0	9959.0	9967.0	9970.0	1105.0	1101.0
NTC 88-31, 32	10200.0	10200.5	9967.0	9962.7	1148.0	1148.9
NTC 88-33, 34, 35	10099.5	10101.2	9983.5	9986.0	1137.0	1135.4
NTC 88-10A	10021.0	10023.6	9985.2	9985.7	1120.0	1116.4
NTC 88-15	9927.0	9929.4	9964.0	9967.5	1090.0	1084.1
NTC 87-4	9927.5	9929.4	9964.6	9967.5	1060.0	1084.1
NTC 87-5	9927.5	9929.4	9964.0	9967.5	1060.0	1084.1
NTC 88-16	9867.4	9871.3	9976.3	9981.7	1060.0	1055.7
NTC 87-2, 3	9867.4	9871.3	9976.3	9981.7	1060.0	1055.7
NTC 87-1**	9831.6	9832.0	9982.5	9987.8	1050.0	1052.2

\*hole locations used as datum for survey

\*\*no collar found, position estimated

### **9.3.A.ii. PROPOSED Y2K SOUTH ZONE DEPOSIT DIAMOND DRILL HOLES:**

The parameters of the five Y2K drill holes spotted in the field in 1999 on the South Zone deposit are shown in Table 8. The holes are plotted on Maps 3A, 3B, on Sections 9840N, 9960N, 10115N, 10150N, and on Vertical Long Sections (VLS) 1, 2. For drill targeting and orchestration purposes, an initial, simple plunging ore shoot model has been applied to the long sections; and, gram meter products have been contoured at 8 and 16 gmp (VLS 1, 2). Geofine staff have been rather successful in the interpretation and utilization of plunging ore shoot morphologies and their axes in the exploration of the Golden Patricia gold ore body, and the KPM gold deposit in Northwestern Ontario.

In such structurally controlled deposits, there is often a regular periodicity of distribution of ore shoots; a dominant plunge direction; and, a weaker back plunge direction. Plunge axes are generated by the intersection of the planes of orthogonal or sub orthogonal structures, and the higher grades of mineralization are often found along, or near the axes of such shoots. The successful delineation of ore via early stage drilling can thus depend on the recognition of such shoots and their distribution. However, the interpretation of the precise morphology is often complicated by a number of factors. For example,

- a) at the Golden Patricia Mine, the mainly free gold entailed a nugget effect, such that only one drill hole in three, in an ore shoot, actually returned ore grade values;
- b) in mineralization with reasonable continuity and little nugget effect, it is possible to drill through an ore shoot without the zone returning ore grade values.

As a result, the core has to be of sufficient size and the drilling of sufficient density to ensure the correct interpretation of ore shoot morphologies and adequate evaluation of the target. The gram meter product data for a hole in an ore shoot can reflect the adverse factors referenced above; and, thus the continuity of alteration and geology can be often extremely important i.e., indicative of the existence of an ore shoot in lieu of ore grade values.

Based on the discussion referenced above, Hole DDHSZ00-01A (Photo 10; Table 8; Section 10115; VLS 1) is recommended by Geofine as a confirmation of, and a 15 m northerly step out on the higher grade lens (Noranda drill holes NTC88-19, 27, 35, 37, with core values up to 8.83 g gold/t and 0.45% copper over 11.7 m; VLS 1). It is proposed that the hole employ HQ size core (2.5") to evaluate apparent nugget effect of disseminated chalcopyrite, and to further delineate the ore shoot morphology and grade parameters.

Hole DDHSZ00-01 (Photo 11; Table 8; Section 10115N; VLS 1), as recommended by Okak, would entail a deeper step out (75 m vertically below DDHSZ00-01A), down, and in proximity to the postulated back plunge axis of the higher grade lens, and thus attempt to determine continuity and confirm the interpreted ore shoot morphology.



**PHOTO 10:  
BACKSIGHT, DRILL SITE,  
FORESIGHT, DDHSZ00-1A**



**PHOTO 11:  
FORESIGHT, DRILL SITE,  
BACKSIGHT, DDHSZ00-1**

TABLE 8: PROPOSED 2000, PHASE 1 DRILL PROGRAM, TODD CREEK PROPERTY\*  
(SUBJECT TO AVAILABLE METERAGE AND ON-GOING RESULTS)

TARGET A> AMARILLO ZONE

CURRENT PRIORITY*:	HOLE NO.:	REF X SECT	LOC. ON GRID	ELEV (m)	AZIMUTH (DEG)	INCL.PLAN (DEG) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
1X	DDHAZ00-04	NA	L50+00N, 51+75E	NA	292.00	-45.00	300.00	NA	NA	NA
2?X	DDHAZ00-04A	NA	L50+00N, 51+75E	NA	292.00	-65.00	250.00	NA	NA	NA
2?	DDHAZ00-02	NA	50+00E, L49+00N	NA	292.00	-45.00	175.00	NA	NA	NA
?	DDHAZ00-01	NA	50+00E, L48+00N	NA	292.00	-45.00	300.00	NA	NA	NA

TARGET B> SOUTH ZONE: ZONE 1, ZONE 2

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2ZONE 1	EST PROJ PT CORDS ON VLS 10000E	EST HOR PROJ		
						(m)	(m) (m)	ZONE 1 (N)	ELEV (m)	DIST (m)	
3?X	DDHSZ00-01	10116N	10115N 9880E	1138.00	100.00	-65.00	200.00	NA	10115.00	975.00	-88.00
2?X	DDHSZ00-01A	10116N	10115N 9834E	1145.00	100.00	-60.00	135.00	NA	10115.00	1050.00	-12.50
?	DDHSZ00-02	9832N	9840N 9943E	1050.00	100.00	-60.00	100.00	NA	9640.00	973.50	-12.50
4?X	DDHSZ00-03	9959N	L9960N 9890E	1105.00	100.00	-70.00	175.00	95.50	9960.00	947.50	-55.75
?	DDHSZ00-04	10154N	L10150N 9913E	1143.00	100.00	-75.00	225.00	NA	10150.00	950.00	-30.00

TARGET C> MEXT SOUTH ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
3?X	DDHMEXTSZ00-01	NA	WEST CLIFF?	985?	100?	-70?	100?	NA	NA	NA

TARGET D> NEXT SOUTH ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
5?X	DDHNEXTSZ00-01	NA	TODD CRK VALLEY?	885.00	280.00	-30.00	100?	NA	NA	NA

TARGET E> NORTH GRID, B ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
6?X	DDHBZ00-01	NA	208+50N, 209+12E	1060.00	40.00	-45.00	80.00	NA	NA	NA
	DDHBZ00-02	NA	209+02N 209+00E	1070.00	139.00	-45.00	100.00	NA	NA	NA

TARGET F> NORTH GRID, NORTHEAST ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
7?	DDHNEZ00-01	NA	209+77N 209+90E	1060.00	70.00	-45.00	100.00	NA	NA	NA

TARGET G> NORTH GRID, A ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1	EST PROJ PT CORDS ON VLS 10050N	EST HOR PROJ DIST			
						(m)	(m) (m)	ZONE 1 (E) ELEV (m)	(m)			
8?X	DDHAN00-01	10050N	10015N, 10097E	990.00	45.00	-45.00	100.00	NA	45.00	10097.00	945.00	15.00

\*X = PROPOSED, NINE HOLE, PHASE 1 DRILL PROGRAM SCENARIO: APPROX. 1440 m  
(HOLE ORDER AND PROPOSED SCENARIO SUBJECT TO ON-GOING RESULTS)

**Hole DDHSZ00-04 (Photo 12; Table 8; Section 10150N; VLS 1), as proposed by Geofine, would be contingent on the success of DDHSZ00-01. It would constitute an apparent 50 m step out, down the interpreted back plunge axis, and if successful, could significantly increase the potential of the South Zone deposit.**

**Hole DDHSZ00-03 (Table 8; Section 9960N; VLS 1), as recommended by Okak would entail about a 175 m step out from the centre of the higher grade lens down the interpreted dominant, south plunge axis. This plunge direction is indicated by Noranda DDHNTC88-13 (gmp of 17.72).**

**Hole DDHSZ00-02 (Table 8; Section 9840N; VLS 1), as recommended by Okak would constitute the deepest test on the southern area of the deposit to date. The hole is proposed to evaluate the South Zone mineralized structure where it plunges under the glacio-fluvial deposits of the Todd Creek Valley. The hole is currently spotted, but if the aforementioned holes confirm the postulated ore shoot morphology, the hole would be then recommended to intersect the target closer to the most southerly, south axis plunge shown on VLS 1.**

### **9.3A.iii. INTERPRETATION SOUTH ZONE DEPOSIT:**

**The South Zone deposit is open down dip and along strike to the north (see Sections 9.3.C., D.); and, as is obvious in the field, to the south, under the glacial-fluvial sediments of the Todd Creek Valley. The southern extension of the mineralized zone extends off the current land holding, and it is strongly recommended that the historic Pat 9 and 10 claims (Map 1) be restaked.**

**In view of some historic ore grade intersections, and the possibility of ore shoot morphologies that are common in such structurally hosted mineralization, the deposit is deemed to offer high priority drill targets that should be carefully orchestrated according to on-going results. The gold mineralization in the breccia veins and silicified zones is associated with disseminated, blebby chalcopyrite, and thus could constitute a nugget effect. HQ size core (2.5") is thus recommended for a more accurate appraisal of the grade of the target.**

**Notwithstanding the above, even with positive initial drilling results, the South Zone drill targets may be subordinate in priority to other targets such as those on the Amarillo Grid (see Section 9.3.H.) and the apparent extension of the South Zone deposit mineralization - the newly discovered Middle Extension or MEXT SZ target (see Section 9.3.C.). It is thus recommended that the Y2K Phase 1 program be of sufficient size and scope (about 1200 m) to initially test a variety of the targets prioritized in this report.**



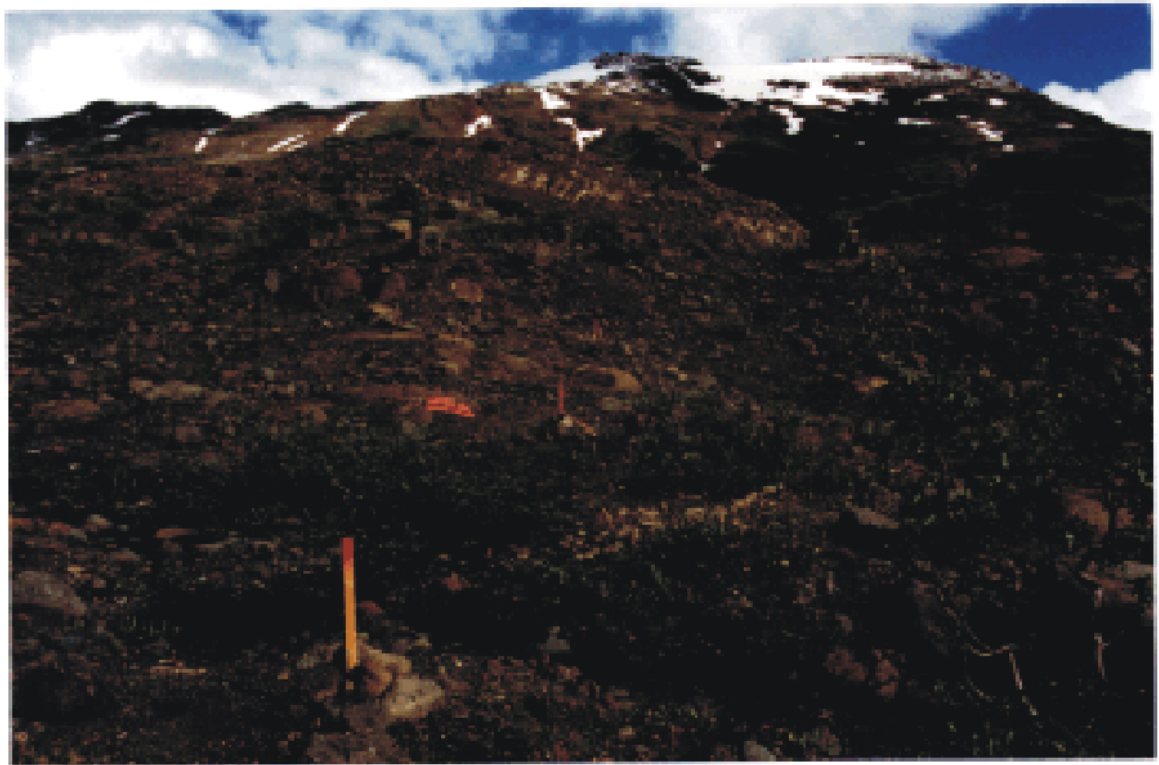


PHOTO 12: BACKSIGHT, DRILL SITE, FORESIGHT, DDHSZ00-04

### **9.3.B. GEOPHYSICAL TARGET, SOUTH ZONE TARGET AREA (PHOTOS 2, 13; MAPS 2, 4, 5):**

#### **9.3.B.i. 1999 FOLLOW-UP SURVEYS:**

The 1999 field program investigated a weak, 2 line Aerodat airborne, conventional electromagnetic anomaly that was delineated in a 1994 helicopterborne survey (Map 2). The anomaly is located about 500 m northwest of station L10200N, BL9950E, South Zone grid (Maps 4, 5); or, about 225 m west of the MEXT Zone (see Section 9.3.C.). The response was of interest because of its proximity to the South Zone deposit; and, the favourable geology, which includes an extensive gossan zone consisting of altered (limonite +/- jarosite/alunite, and pyrite-quartz +/-carbonate, sericite), coarse pyroclastic rocks with some tuffaceous interbeds.

Follow-up work consisted of the installation of a 400 m Geophysical Grid Line (GL; Maps 4, 5); and, initial geochemical and geological surveys (Map 5). As plotted from the airborne data, the EM anomaly axis crosses the GL at about 140E and correlates with an alpine meadow. Soil sampling indicates the meadow is underlain by thick, grey clay, which, in Geofine's experience and interpretation, is the probable source of the EM anomaly.

The altered breccias and agglomerates are generally rather monotonous in their composition - mainly quartz, pyrite and limonite, with pyrite contents averaging 3 to 5%. The rocks apparently lack the hematitic alteration and quartz-carbonate-sulfide stringers and stock works that often signal important targets elsewhere on the property. However, at approximately 410E, 40S on the GL (Map 5), the breccias become intensely fractured and more oxidized. The fractures contain oxidized and siliceous gouge with disseminations of granular, black to honey coloured sphalerite (Photo 13).

This is the first time Geofine has encountered zinc mineralization on the South Zone, and the showing is considered important - zinc in the Stewart Camp often haloes gold mineralization (e.g., the Red Mountain deposit). The GL Zinc Showing was particularly significant in the 1999 program: because of its presence and the gold association referenced above, the South Zone Structure was examined about 225 m to the east, and immediately yielded the new Middle Extension (MEXT SZ) gold/copper target as described in Section 9.3.C.

Sample descriptions, along with some analytical results, are shown in Table A1 for the GL rock, stream sediment and soil samples. The group of elements referenced represents the principal geochemical signature utilized by Geofine in its exploration of the Stewart Camp. All the analytical data is presented on Chemex Certificates of Analyses, which accompany Table A1.

As shown in Table A1, the GL Zinc Showing is characterized by rock samples (460316RCH-460320RCH) which contain some weakly anomalous silver; anomalous copper, lead, zinc (up to 6.2%) arsenic, and cadmium; some anomalous mercury and antimony; and weakly anomalous



PHOTO 13: GL ZINC SHOWING, GEOPHYSICAL LINE: SILICIOUS, OXIDIZED  
FRACTURE FILLING C/W DISSEMINATED SPHALERITE NEAR WALL  
ROCK SAMPLE 460319RCH

TABLE A1

## ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE GEOPHYSICAL LINE, SOUTH ZONE

## I. ROCK SAMPLES

ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, TYPE	LOCATION: NAME, COLOUR:	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm	
460301RS COMP SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 1+81E, 10 M N	ALT ROCK: W: BLK ORG, BRN GRY F: BRN GRN GRY	FI, SUG TEXT, WELL SIL MAFIC VOL BREC; WELL FR LIM, MN ON FRACS, SOM JAR/AL, 2-4% DISSEM PY, LOC 10% IN PATCHES & FRAC FILLINGS	<5	<0.2	17	<2	96	2	50	<0.5	<1	4	1
460308RS, RC COMP SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 1+72E, 0 M S	ALT ROCK: W: BLK ORG, BRN GRY F: BRN GRN GRY	FI, SUG TEXT, WELL SIL MAFIC VOL BREC; WELL FR C/W SOM CARB V, JAR/AL, 3-5% DISSEM PY	<5	<0.2	46	2	8	8	120	<0.5	<1	<2	1
460309RS, RC COMP SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 1+86E, 16 M S	ALT ROCK: W: BLK ORG, BRN GRY F: BRN GRN GRY	FI, SUG TEXT, WELL SIL MAFIC VOL BREC; WELL FR LIM, MN ON FRACS, JAR/AL, 3-5% DISSEM PY, LOC 10% IN PATCHES	<5	<0.2	17	8	48	6	80	<0.5	<1	2	3
460310RF COMP SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 1+86E, 16 M S	ALT ROCK: W: BLK ORG, BRN GRY F: BRN GRN GRY	FI, SUG TEXT, WELL SIL MAFIC VOL BREC; WELL FR LIM, MN ON FRACS, JAR/AL, 3-5% DISSEM PY, LOC 10% IN PATCHES	<5	<0.2	29	<2	90	<2	30	<0.5	<1	2	2
460313RC 10X10 M COMP SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 2+75E, 2 M N	ALT ROCK: W: BLK ORG, BRN GRY F: BRN GRN GRY	FI TO APHAN, SUG TEXT, WELL SIL, 90% QTZ, 5% OXID MAT, 5% DISSEM PY JA , LIM ON SURF & 2-4% DISSEM FRACS, MIN HEM, SER TRENDS 5 DEG	<5	<0.2	28	6	14	14	120	<0.5	<1	<2	4
460314RC 15X10 COMP SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 3+27E, 7 M N	ALT ROCK AS 460313RC		<5	<0.2	5	10	6	8	90	<0.5	<1	<2	3
460315RC 12 X 20 M COMP SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 3+73E, 2 M N	ALT ROCK AS 460313RC LESS PY		5	<0.2	6	20	2	12	170	<0.5	<1	2	3
460316RC 6X2 M COMP SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 4+12E, 40 M S	ALT ROCK AS 460313RC ALT MAFIC VOL BREC C/W INTENSE SULF, WELL FRACS, SULFS IN FAULTS UP TO 15 CM WIDE, SOM WITH SPHAL, GAL		<5	0.2	82	12	1720	30	90	17.5	<1	2	10

460317RCH FRACT SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 4+12E, 39 M S OVER 1 M	FR FILL SULFS, QTZ	A FR ZONE: UNDULAT CTS, 2-10 CM WIDE, C/W INTENSE SULF, LOC FILLED WITH FI-CO PY & PY GOUGE, TR SPHAL FAULT 176/62W	<5	1.2	191	22	32800	34	60	252	25	12	32
460318RP FRACT SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 4+11E, 35 M S OVER 0.5 X 0.3 M	FR FILL SULFS, QTZ	A FR ZONE: UNDULAT CTS, 2-7 CM WIDE, C/W INTENSE SULF, LOC FILLED WITH FI-CO HONEY COL SPHAL IN QTZ BECOMES ANOMOST TO PROX 460317R	<5	1	101	44	63200	54	50	463	19	18	6
460319RCH HW TO 460318RP	S ZONE GL 4+11E, 34 M S	HW 0-15 CM AS 460316RC		<5	<0.2	101	12	4500	52	90	38.5	3	2	6
460320RCH FW TO 460318RP	S ZONE GL 4+12E, 34 M S OVER 15 CM	FW 0-15 CM AS 460316RC 3-8% PY, TR SPHAL		<5	<0.2	56	12	934	52	100	13	<1	2	6
460321RCH FRACT SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 4+11E, 47 M S OVER 1 M	FR FILL SULFS, QTZ W: ORG BRN F: BRN, GRY	A FR ZONE: UNDULAT CTS, 6-20 CM WIDE, C/W INTENSE SULF, TR SPHAL, 5% PY	<5	<0.2	9	18	48	18	120	<0.5	<1	<2	5
460322RCH FRACT SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 4+10E, 57 M S OVER 1 M	FR FILL SULFS, QTZ W: ORG BRN F: BRN, GRY	FR ZONE PAR TO 317: CTS, TO 6 CM WIDE, C/W INTENSE SULF, TR SPHAL	<5	<0.2	8	18	92	18	120	0.5	<1	2	13
460323RCH FRACT SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 4+12E, 35 M S OVER 1 M	QTZ/ PY GOUGE IN FR VOL BX W: ORG BRN F: BRN, GRY WH	SEP FR 70 CM BELOW 318 FR 5-7% PY LOC, AVER 2-3%, UP TO 20 CM WIDE 190/36W	<5	<0.2	26	14	270	14	90	4	<1	<2	5
460324RTC JAR/AL ZONE SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 3+88E, 66 M N COMP	ALT MAFIC VOL BREC W: ORG BRN YEL F: GRN, GRY YEL	FI-APHAN, SUG TEXT, V WELL SIL, SOM PORPH TEXT - GRY QTZ PHENOS IN SIL PY MATRIX - 5-7% DISSEM PY JAR/AL ON SURF/FRS	<5	<0.2	7	6	10	2	70	<0.5	<1	<2	4

460325RTC JAR/AL ZONE SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 3+89E, 51 M N COMP	ALT MAFIC VOL BREC W: ORG BRN YEL F: GRN, GRY YEL	FI-APHAN, SUG TEXT, V WELL SIL, SOM PORPH TEXT - GRY QTZ PHENOS IN SIL PY MATRIX - 3-5% DISSEM PY JAR/AL ON SURF, FRS	<5	<0.2	8	10	10	16	110	<0.5	<1	<2	10
460326RC 5 x 10 M SMAL JAR/AL ZONE SEE GEOPHYSICAL LINE, DETAILED MAP	S ZONE GL 4+58E, 4 M N	ALT MAFIC VOL BREC W: ORG BRN YEL F: GRN, GRY WH	FI-APHAN, SUG TEXT, V WELL SIL, SOM QV TO 5 CM, 3-5% DISSEM PY	<5	0.4	15	12	4	8	90	<0.5	<1	<2	43

TABLE A1

## ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON GEOPHYSICAL LINE

## ii. SOIL SAMPLES

## ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

NUMBER, LOCATION:	SOIL HORIZON	TYPE, COLOUR	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
460302SO GL @ WEST 1+00E, MEADOW 2 M N SEE DETAIL MAP	SOIL A-C 10 CM, POOR DEV	CL, ORG GRY-BRN	CL-SILT 40% SILT, 20 ORG, 40 CL	<5	<0.2	9	<2	22	2	540	1.5	<1	2	6
460304SO GL @ WEST 1+26E, MEADOW 1 M S SEE DETAIL MAP	SOIL A-C 25 CM, POOR DEV	CL, ORG GRY-BRN	CL-SILT 40% SILT, 20 ORG, 40 CL	<10	<0.2	5	<2	4	<2	110	<0.5	2	<2	<1
460305SO GL @ WEST 1+50E, MEADOW 1 M S SEE DETAIL MAP	SOIL A-C 25 CM, POOR DEV	CL, ORG GRY-BRN	CL-SILT 40% SILT, 20 ORG, 40 CL	<10	<0.2	4	<2	2	<2	140	0.5	3	<2	1
460306SO GL @ WEST 1+75E, MEADOW ON GL SEE DETAIL MAP	SOIL A-C 30 CM, POOR DEV	CL, ORG GRY-BRN	CL-SILT 20% SILT, 30 ORG, 50 CL	<5	<0.2	17	8	26	8	610	0.5	1	2	3

TABLE A1

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON GEOPHYSICAL LINE  
 iii. STREAM SEDIMENT SAMPLES ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

NUMBER, LOCATION:	FLOW DIR	MATERIAL, COLOUR	GRAIN SIZE, COMP	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
460303SS GL @ MAIN STR 2+02E, SEE DETAIL 43 M N MAP	CAMP CRK FL SE	CL, SILT, GR	CL, SILT 50% CL, 50% MIN ORGS SILT	<5	<0.2	11	10	44	10	310	<0.5	<1	<2	6
460307SS GL @ SM TRIB 1+81E, INTO C CRK 10 M N SEE DETAIL MAP	FL N	CL, SD BRN	CL-CO 10% CL, 80% SD, 10% HETRO FRAGS - GR, PK VOL, OXID MAT SD: 50% LIM, 10% ORG, 20% ANG GR VOL, 20% OXID MAT, QTZ, MIN EPID	10	<0.2	18	4	66	6	250	<0.5	<1	2	3
460311SS GL @ SM TRIB 2+16E, INTO C CRK ON GL SEE DETAIL MAP	FL SE	SILT, SD BRN	SILT - CO, 40% SILT, 60% SD, MIN ORGS SD: 50% OXID, 30% GR VOL, 20% QTZ, MIN OXID	<5	<0.2	22	8	68	10	210	<0.5	<1	2	6
460312SS GL @ INTMIT 2+49E, CRK 3 M S SEE DETAIL MAP	FL SE	D MUCK, BLK	CL-SILT 40% SILT, 20 ORG, 40 CL	<5	<0.2	61	8	82	12	230	1.5	<1	2	3





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## CERTIFICATE OF ANALYSIS

A9926484

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
460301	205 226	< 5	< 0.2	2.45	2	< 10	50	< 0.5	< 2	2.19	< 0.5	16	7	17	5.55	< 10	< 1	0.18	< 10	2.53
460308	205 226	< 5	< 0.2	0.39	8	< 10	120	< 0.5	< 2	2.82	< 0.5	4	77	46	2.41	< 10	< 1	0.26	< 10	0.19
460309	205 226	< 5	< 0.2	0.37	6	< 10	80	< 0.5	< 2	0.59	< 0.5	6	30	17	3.08	< 10	< 1	0.31	< 10	0.16
460310	205 226	< 5	< 0.2	2.19	< 2	< 10	30	< 0.5	< 2	1.83	< 0.5	21	13	29	6.01	10	< 1	0.06	< 10	2.15
460313	205 226	< 5	< 0.2	0.41	14	< 10	120	< 0.5	< 2	0.74	< 0.5	6	35	28	2.94	< 10	< 1	0.26	< 10	0.20
460314	205 226	< 5	< 0.2	0.44	8	< 10	90	< 0.5	< 2	0.53	< 0.5	5	30	5	2.67	< 10	< 1	0.28	< 10	0.10
460315	205 226	5	< 0.2	0.50	12	< 10	170	< 0.5	< 2	0.70	< 0.5	4	43	6	2.68	< 10	< 1	0.33	< 10	0.09
460316	205 226	< 5	0.2	0.55	30	< 10	90	< 0.5	< 2	2.05	17.5	8	34	82	2.71	< 10	< 1	0.35	< 10	0.02
460317	205 226	< 5	1.2	0.64	34	< 10	60	< 0.5	< 2	0.08	252	5	53	191	3.15	< 10	25	0.41	10	0.02
460318	205 226	< 5	1.0	0.42	54	< 10	50	< 0.5	< 2	2.28	463	6	45	101	2.43	< 10	19	0.26	< 10	0.02
460319	205 226	< 5	0.2	0.55	52	< 10	90	< 0.5	< 2	1.89	38.5	8	64	101	2.70	< 10	3	0.34	10	0.02
460320	205 226	< 5	< 0.2	0.63	52	< 10	100	< 0.5	< 2	2.56	13.0	8	42	56	2.90	< 10	< 1	0.40	10	0.03
460321	205 226	< 5	< 0.2	0.49	18	< 10	120	< 0.5	< 2	1.79	< 0.5	7	50	9	2.36	< 10	< 1	0.32	10	0.03
460322	205 226	< 5	< 0.2	0.52	18	< 10	120	< 0.5	< 2	1.80	0.5	7	30	8	2.02	< 10	< 1	0.31	10	0.02
460323	205 226	< 5	< 0.2	0.63	14	< 10	90	< 0.5	< 2	1.27	4.0	8	40	26	2.72	< 10	< 1	0.39	< 10	0.03
460324	205 226	< 5	< 0.2	0.49	2	< 10	70	< 0.5	< 2	0.63	< 0.5	6	36	7	2.40	< 10	< 1	0.33	< 10	0.04
460325	205 226	< 5	< 0.2	0.35	16	< 10	110	< 0.5	< 2	0.93	< 0.5	6	49	8	2.00	< 10	< 1	0.29	< 10	0.24
460326	205 226	< 5	0.4	0.47	8	< 10	90	< 0.5	< 2	0.06	< 0.5	5	45	15	2.16	< 10	< 1	0.29	< 10	0.02
460327	214 229	1540	3.0	3.71	124	< 10	< 10	< 0.5	< 2	3.16	< 0.5	193	25	7780	9.68	< 10	< 1	0.03	< 10	1.99

CERTIFICATION:

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49 NORMANDALE RD.  
UNIONVILLE, ON  
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Project: TSZ  
Comments: ATTN: D. MOLLOY CC: D. MOLLOY

Page Number : 1-B  
Total Pages : 1  
Certificate Date: 27-AUG-1999  
Invoice No. : 19926484  
P.O. Number : TSZ  
Account : KIV

## CERTIFICATE OF ANALYSIS

A9926484

SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
460301	205 226	965	1	0.03	1	1710	< 2	3.28	4	10	49	0.28	< 10	< 10	148	< 10	96
460308	205 226	1720	1	0.01	< 1	390	2	0.60	< 2	1	488	< 0.01	< 10	< 10	7	< 10	8
460309	205 226	335	3	0.01	< 1	610	8	2.21	2	2	35	< 0.01	< 10	< 10	17	< 10	48
460310	205 226	735	2	0.04	4	1320	< 2	4.15	2	11	27	0.28	< 10	< 10	159	< 10	90
460313	205 226	415	4	< 0.01	< 1	540	6	1.41	< 2	2	53	< 0.01	< 10	< 10	20	< 10	14
460314	205 226	290	3	0.01	< 1	570	10	1.59	< 2	2	44	< 0.01	< 10	< 10	9	< 10	6
460315	205 226	355	3	0.01	< 1	600	20	1.18	2	2	60	< 0.01	< 10	< 10	11	< 10	2
460316	205 226	410	10	< 0.01	< 1	590	12	2.59	2	2	177	< 0.01	< 10	< 10	8	< 10	1720
460317	205 226	30	32	< 0.01	< 1	600	22	4.15	12	1	12	< 0.01	< 10	< 10	6	80	>10000
460318	205 226	600	6	< 0.01	< 1	630	44	4.85	18	3	211	< 0.01	< 10	< 10	8	270	>10000
460319	205 226	560	6	0.01	1	570	12	2.70	2	2	176	< 0.01	< 10	< 10	8	< 10	4500
460320	205 226	690	6	0.01	1	590	12	2.97	2	3	240	< 0.01	< 10	< 10	8	< 10	934
460321	205 226	520	5	0.03	1	600	18	1.93	< 2	3	202	< 0.01	< 10	< 10	7	< 10	48
460322	205 226	390	13	0.01	< 1	600	18	1.70	2	3	173	< 0.01	< 10	< 10	7	< 10	92
460323	205 226	280	5	< 0.01	< 1	680	14	2.50	< 2	1	92	< 0.01	< 10	< 10	8	< 10	270
460324	205 226	190	4	< 0.01	< 1	600	6	2.14	< 2	1	76	< 0.01	< 10	< 10	5	< 10	10
460325	205 226	615	10	< 0.01	< 1	480	10	1.32	< 2	1	55	< 0.01	< 10	< 10	6	< 10	10
460326	205 226	35	43	< 0.01	1	360	12	1.71	< 2	< 1	11	< 0.01	< 10	10	3	< 10	4
460327	214 229	1570	4	0.03	74	170	< 2	2.41	4	7	9	0.03	< 10	< 10	56	< 10	128

Anto



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**A9927115**

### CERTIFICATION

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## CERTIFICATE OF ANALYSIS

A9926446

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
460302	201 202	< 5	< 0.2	0.97	2	< 10	540	0.5	< 2	0.24	1.5	67	2	9	>15.00	< 10	< 1	0.03	20	0.16
460303	201 202	< 5	< 0.2	1.70	10	< 10	310	< 0.5	< 2	0.59	< 0.5	5	4	11	1.79	< 10	< 1	0.08	10	0.44
460304	201 202	< 10	< 0.2	0.10	< 2	< 10	110	< 0.5	< 2	0.49	< 0.5	< 1	1	5	0.18	< 10	2	0.05	< 10	0.02
460305	201 202	< 10	< 0.2	0.17	< 2	< 10	140	< 0.5	< 2	0.62	< 0.5	1	< 1	4	0.26	< 10	3	0.01	< 10	0.01
460306	201 202	< 5	< 0.2	1.51	8	< 10	610	0.5	< 2	0.94	0.5	4	4	17	1.40	< 10	1	0.06	10	0.29
460307	201 202	10	< 0.2	1.65	6	< 10	250	0.5	< 2	0.63	< 0.5	15	4	18	4.71	< 10	< 1	0.08	10	0.80
460311	201 202	< 5	< 0.2	1.86	10	< 10	210	0.5	< 2	0.73	< 0.5	12	5	22	5.38	< 10	< 1	0.10	10	0.88
460312	201 202	< 5	< 0.2	2.10	12	< 10	230	1.0	< 2	0.57	1.5	28	4	61	4.54	< 10	< 1	0.07	10	0.56

*D. 07.0*



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Page Number : 1-A

Total Pages : 1

Certificate Date: 27-AUG-1997

Invoice No. : I9926446

P.O. Number : TSZ

Account : KIV

## CERTIFICATE OF ANALYSIS

A9926446

SAMPLE	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
460302	201	202	< 5	< 0.2	0.97	2	< 10	540	0.5	< 2	0.24	1.5	67	2	9	>15.00	< 10	< 1	0.03	20	0.16
460303	201	202	< 5	< 0.2	1.70	10	< 10	310	< 0.5	< 2	0.59	< 0.5	5	4	11	1.79	< 10	< 1	0.08	10	0.44
460304	201	202	< 10	< 0.2	0.10	< 2	< 10	110	< 0.5	< 2	0.49	< 0.5	< 1	1	5	0.18	< 10	2	0.05	< 10	0.02
460305	201	202	< 10	< 0.2	0.17	< 2	< 10	140	< 0.5	< 2	0.62	< 0.5	1	< 1	4	0.26	< 10	3	0.01	< 10	0.01
460306	201	202	< 5	< 0.2	1.51	8	< 10	610	0.5	< 2	0.94	0.5	4	4	17	1.40	< 10	1	0.06	10	0.29
460307	201	202	10	< 0.2	1.65	6	< 10	250	0.5	< 2	0.63	< 0.5	15	4	18	4.71	< 10	< 1	0.08	10	0.80
460311	201	202	< 5	< 0.2	1.86	10	< 10	210	0.5	< 2	0.73	< 0.5	12	5	22	5.38	< 10	< 1	0.10	10	0.88
460312	201	202	< 5	< 0.2	2.10	12	< 10	230	1.0	< 2	0.57	1.5	28	4	61	4.54	< 10	< 1	0.07	10	0.56

*[Handwritten signature]*

molybdenum. Metal contents of the remaining rock samples are generally uninteresting, except perhaps for the molybdenum contents of samples 460325RTC and 460326RC. The metal contents of the soil samples, as well as those for the stream sediment samples are generally uninteresting except for the weakly anomalous copper, arsenic and cadmium content of sample 460312SS.

#### **9.3.B.ii. INTERPRETATION OF FOLLOW-UP OF GEOPHYSICAL ANOMALIES:**

The source of the electromagnetic airborne electromagnetic anomaly is postulated to be a clay horizon underlying the alpine meadow, with which the response is apparently associated. The newly discovered GL Zinc Showing is of interest since it is the first time, in Geofine's experience, that zinc has been found on the South Zone; and, since zinc is one of the most important geochemical signatures of gold in the Stewart Camp. As a result of the showing, significant gold/copper/hematite mineralization (MEXTZ SZ) was discovered on the South Zone Structure, about 225 m to the east. The exact relationship of the showing to the MEXT Zone has yet to be ascertained, but the zone currently appears to be one of the most important targets on the South Zone. Follow-up work to ascertain the full extent and significance of the showing is recommended in conjunction with the Y2K drill program.

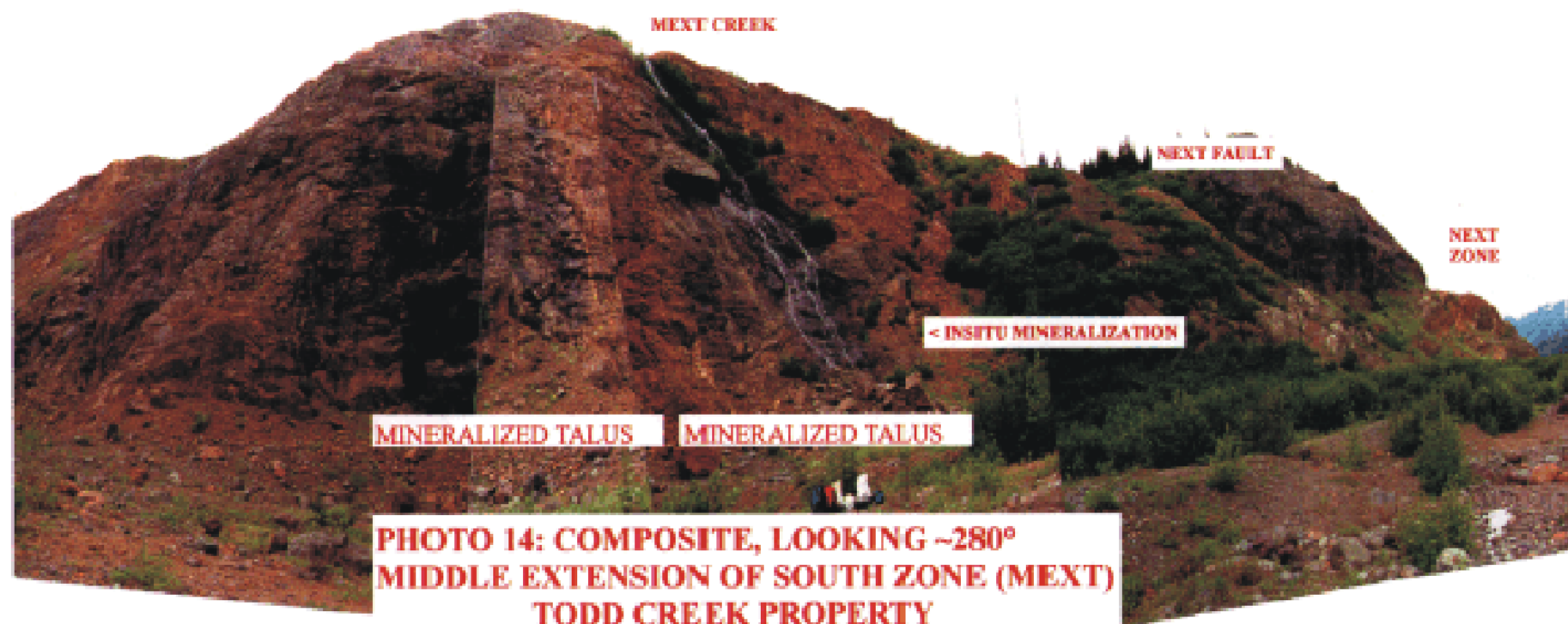
#### **9.3.C. MIDDLE EXTENSION OF THE SOUTH ZONE DEPOSIT (MEXT SZ; PHOTOS 1, 14, 15, 16; MAPS 4, 5, 6; TABLE A2):**

##### **9.3.C.i. 1999 MEXT SZ DISCOVERY SURVEYS:**

Based on Geofine's experience with the zinc-gold metal association in the Stewart Camp, which includes the Red Mountain deposit, and with the 1999 discovery of the GL Zinc Showing, the most logical location to further evaluate the South Zone Structure in 1999 was east of the Zinc Showing i.e., the Middle Extension of the South Zone (MEXT SZ; Photos 1; 14, 15, 16); Maps 4, 5, 6; Table A2).

Noranda's historical work (1988 Assessment Work Report 18800, incl. Map 4) suggests the company did little work in the area of the Middle (MEXT) or Northern (NEXT) Extensions of the South Zone (Photo 14, Map 6). For example, only two rock samples (15020-21) were apparently taken by Noranda at the MEXT Zone. The samples have weakly anomalous copper values of 108 and 54 ppm, and a weakly anomalous gold value of 10 ppb.

As noted in Section 9.3.A., Noranda work indicated that the southern 425 m and the northern 100 m (herein the NEXT SZ; Map 4; see Section 9.3.D.) of the 950 m exposure of the South Zone Structure are mineralized. As shown on Map 4, if the new BL 9950E was extended to the north, the grid co-ordinates of the MEXT Zone are approximately 10050E, L10550N, which is about 300 m north of the most northerly drill holes on the South Zone. MEXT Creek (Photo 14), the apparent center of the MEXT Zone, is located about 170 m south of the NEXT Zone.



**PHOTO 14: COMPOSITE, LOOKING ~280°  
MIDDLE EXTENSION OF SOUTH ZONE (MEXT)  
TODD CREEK PROPERTY  
SCALE: VARIABLE (~1:150 >1:250)**

Mineralization in talus at the MEXT has been found over an apparent strike length of about 125 m, suggesting that much more of the South Zone Structure may be mineralized than indicated by historic work. The discovery of the MEXT was facilitated by the MEXT Creek waterfall cutting and eroding mineralization hosted by the structure. This process is obviously promoted via the chloritic alteration and fractures found in some of the mineralized talus. The main target at MEXT Zone appears to be located in cliffs above Todd Creek (Photos 14, 15), and thus its extent, the orientation of the shearing, and any resulting displacement are not readily discernable from the Todd Creek Valley.

The MEXT Zone does appear to be in the same stratigraphic position as the South Zone i.e., in the lower part of a zone of altered (quartz-pyrite+/-sericite) breccia, tuff and agglomerate host rocks, which are rather similar to those of the South Zone deposit. Based on work to date (Map 6; an overlay Photo 14), the zone is mainly evidenced via angular, mineralized talus, including some large angular blocks, below, and north and south of the waterfall (Photo 15). The excellent potential of the MEXT Zone is immediately suggested by the gold content of the 1999 stream sediment sample 480347SS: 495 ppb (Map 6; Table A2ii). The result is the highest stream sediment gold value that Geofine is aware of on the property. The sample was taken about 30 m below the waterfall, also contains anomalous silver, copper, lead, zinc, arsenic, barium and very elevated manganese.

Most of the 19 mineralized composite talus and outcrop panel samples taken from the MEXT in 1999 have strong copper and gold contents (Photo 14; Map 6; Table A2i). Gold values range from 0.35 to 7.8 g/t, and average 3.36 g/t. Twelve samples have gold contents over 2 g/t, and eight samples have gold contents over 4.7 g/t. The mineralization is further characterized generally by weakly anomalous silver values; variable copper values that range from 22 ppm to 2.57%; weakly anomalous to some strongly anomalous lead values; a few anomalous zinc values; anomalous to high arsenic values; low to highly anomalous barium values; low cadmium and mercury values; some weakly anomalous antimony values; and, weakly anomalous molybdenum values.

Black, auriferous hematite (Photo 16) is a major component of the mineralization in the form of veins, disseminations and breccia vein matrix and fragments. Since hematite is the best indicator of gold elsewhere on the property, the MEXT, as indicated by the assays, appears to have both good gold potential and copper potential. The analyses and gold-hematite association suggest three main types of auriferous mineralization:

- a. > the classic South Zone quartz breccia vein type material, but often with varying intensities of chloritization and shearing, and sulfidized with pyrite and blebby chalcopyrite and some bornite: six composite talus samples have elevated gold contents, averaging 4.90 g/t; elevated copper contents, averaging 1.80%; anomalous arsenic contents, averaging 275 ppm; and elevated manganese contents, averaging 1660 ppm.





**PHOTO 15: MEXT ZONE PANEL SAMPLING**



**PHOTO 16: HEMATIZED ROCK, SAMPLE 160399RP (2.2 g gold/t),  
MEXT ZONE**

TABLE A2

## ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE MIDDLE EXTENSION OF THE SOUTH ZONE (MEXT SZ)

## I. ROCK SAMPLES

ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, TYPE	LOCATION:	NAME, COLOR	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
460327RP SEE DETAIL MAP ABOVE WAT FAL ON LEDGE	PANEL OVER 1.5 X 3 M 0.6 M S OF 160328RC ON LEDGE BELOW ALD	ALT VOL BREC W:OB GRY F: GRY GR	>10% PY & QV> 30% FI PY, 1-2% CPY BLEBS >40% ALT VOL BREC, MAINLY QTZ/CHL/SER/PY ALT, LOC WITH ANK; 2-4% FI DISEM PY >50% BX VN INCL FRAGS OF QTZ, ALT VOL, JASPER., BD QTZ IN MATRIX OF QTZ & PY; 2% CPY AS BLEBS AND STRING, VN @ 200/72W	565	2.8	2560	64	56	374	10	<0.5	<1	2	6
460328RC SEE DETAIL MAP ABOVE WAT FAL ON LEDGE	COMP OVER 0.3 X 3M 0.6 M N OF 160327RP	QTZ, PY VN W:OB GRY F: GRY GR	QTZ PY AND SOM WR, MAINLY PY & QTZ, 20-80% PY, OVERALL 35%, SOM BD QTZ, VN CUT BY PY QTZ VNS, & BD VNS, LOC TR CPY WR WEL SIL, PY	665	5.8	738	184	152	1110	<10	2	<1	20	4
460329RP SEE DETAIL MAP ABOVE WAT FAL ON LEDGE	PANEL OVER .5 M CONTIG WITH & NE OF 160328RC	ALT VOL BREC WALL ROCK W:OB F: GRY GR	FI, GRAN - MASS, MOD PY, SIL, SER, LOC SMAL QTZ STR, WITH HEM, 5% FI DISSEM PY	125	0.6	914	22	62	142	40	<0.5	<1	4	11
460330RP SEE DETAIL MAP	PANEL OVER .5 x 1.5 M CONTIG WITH & N OF 160339RP	ALT VOL BREC WALL ROCK & PY QTZ VN W:OB, RDB BLK F: GRY GR PK	FI, GRAN - APHAN, VUG, EARTHY SUG TEXT, WELL FRAC, FI PY IN STR, STWKS, VNS TO 0.5 M LOC WELL DEVEL, TO 10% PY; ALSO SOM CO BLEBS, STR CPY TO 1-2%; SOM CO BLEBS PATCHES, VN TO 0.5M OF BLK GRAN HEM TO 1-2%	360	2.2	317	38	96	70	80	<0.5	<1	8	18
460331RP SEE DETAIL MAP	PANEL OVER 1X1 M	AS 460330RP	BUT ALSO C/W STR CHL SECTS, FI SILKY TO SIL SUG MASS; VERY WELL OXID MIN - MAINLY FI PY, SOM FI CPY & HEM TO 1%	25	0.6	156	12	44	50	90	<0.5	<1	4	12
460334RT SEE DETAIL MAP 50 TO 75 M S OF WAT FALLS	RT COMP BELOW CLIFFS	HEM VN & STWK W:OB, BLK, LIM, VUG F: GR, GRY, BLK, OB	FI - MASS, EARTH, VUG TO SUG, WELL FRAC, QTZ HEM & HEM BLEBS, PATHCES, LENS, VN STWK TO 0.75 CM; 3-5% SPEC, SOM SECTS WELL CHL, C/W TR CPY; LOC WELL HEM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
460335RT SEE DETAIL MAP AT 460339RT	RT COMP	CHL SCH W: OB-WH F: GRY, GR, WH	FI TO APHAN, SILKY, EARTHY WELL OXID, HEM, LIM, WELL CHL TO CHL SCH, C/W QTZ CARB VN C/W CO BLEBS BORN, CPY AZUR; MAL STAIN, EARTHY, VUG, SOM SIL FRAGS TO 3 CM CUT BY QTZ VN; SOM QTZ CARB BREC FRAGS, OVERALL 5-7% CU MIN	6290	1.6	25700	24	18	242	30	<0.5	<1	<2	13

460336RT SEE DETAIL MAP AT 460339RT	RT COMP AS 460339RT	BUT MORE CPY (4-5%), C/W CHL SLICKEN ON SURF		5720	1.2	21900	22	44	260	10	<0.5	<1	<2	8
460337RT SEE DETAIL MAP AT 460339RT	RT COMP AS 460339RT	BUT 3-5% BLEBS, MASS, DISSEM OF PY		4830	1.4	18000	18	60	312	10	<0.5	<1	<2	7
460338RT SEE DETAIL MAP AT 460339RT	RT COMP AS 460339RT	BUT MORE CPY (4-5%), C/W SLICKEN ON SURF		4740	1.2	19300	22	22	222	30	<0.5	<1	2	9
460339RT SEE DETAIL MAP AT WAT FAL & TAL PIL	RT COMP FROM BLK .75X 1 M	CPY QTZ BREC W:OB, BLK GR, GRY F: GRY GR	MATRIX: FI - APHAN, GRAN - MASS, GRY GRN QTZ, SOM SUG & VUG TEXT, WELL FRAC, LIM, MN MAL ON SURF AND FRACS BREC FRAGS: 10 -40% OF SAMP, GEN ANG FRAGS, SOM RD, TO 3 CM, GEN WH CAL, QTZ AS RD PHENOS OR VES FILS?; ANG FRAGS INCL HEM QTZ, GR QTZ, MAF VOL QW, SOM VUG, OXID FRAGS, TO 4 CM, WELL FRAC, GEN 2.5% CPY, BORN, AZUR, AS FI DISSEM, BLEBS PATCH, FRAC FILS; HEM PATCH; SOM FRAGS C/W CRUSTIFORM TEXT - QTZ RIMS C/W CPY BLEBS; 1-2% FI PY; TR SPEC	7250	2	20600	22	44	242	20	0.5	<1	2	7
460342RT SEE DETAIL MAP AT 5 M E, 35 M N OF 460339RT	RT COMP AS 460346RT	HEM BREC		2290	0.2	261	8	56	44	120	<0.5	<1	4	2
460343RT SEE DETAIL MAP AT 5 M E, 35 M N OF 460339RT	RT COMP AS 460346RT	BUT HEM MATRIX HAS DISSEM 1-2% CPY, ALSO CPY IN QTZ VN		640	<.02	593	10	66	50	60	<0.5	<1	2	3
460344RT SEE DETAIL MAP AT 5 M E, 35 M N OF 460339RT	RT COMP AS 460346RT			1405	0.2	364	10	62	40	70	<0.5	<1	2	<1
460345RT SEE DETAIL MAP AT 460339RT	RT COMP AS 460346RT	BUT MORE CPY (5-7%) AS VN, STR, & DISSEM IN HEM CPY MATRIZ; ALSO SOM RD HEM FRAGS TO 1 CM; VUG ROCK, WELL OXIDIZED:LIM, MN, HEM		5690	1.6	19700	22	44	204	70	<0.5	<1	2	6

460346RT SEE DETAIL MAP 10 M N, 5 M E OF 160339RT	VAR 2 RE 160418RT	RT COMP	HEM BREC W:OB, BLK, GRY, PK F: GRY GR BLK	HEM MATRIX: FI-CO, GRAN MASS, BLK -GRY HEM; MIN DISSEM PY, SOM HEM CRUSTIFORM TEXTS ON FRAGS; HEM 30%; 1-2% CO CPY BLEBS, BRECC FRAGS: GEN ANG, GRY SIL QTZ, WH QTZ CARB, MAF VOL, OXID FRAGS TO >5CM; 55% SIL FRAGS; 10% QTZ CARB FRAGS, QTZ CARB FRAGS & VN TO 2CM, C/W HEM CRUSTIFORM TEXT:	5320	1	19900	20	40	250	10	<0.5	<1	<2	8
460348RT SEE DETAIL MAP 25 M N, 12 M E OF 160339RT	VAR 1 RE 160418RT	RT COMP	HEM VN IN WR W:OB, BLK F: GRY GR BLK	FI-APHAN, GRAN MASS SIL WR C/W 2-3% DISSEM HEM; 2CM MASS HEM VN C/W QTZ, CAL INCL, 50% HEM 50% QTZ CARB; LOC UP TO 80% HEM	1860	0.2	415	16	68	44	80	<0.5	<1	6	1
160392RT SEE DETAIL MAP 50-100 M S OF FALLS		RT COMP AS 160394RFL	BUT JUST QTZ HEM VN AND BREC - ABOUT 40% HEM		3080	0.6	400	2	22	24	250	<0.5	<1	2	5
160393RP SEE DETAIL MAP NW OF FALLS		PANEL 1.5 X .3 M AS 160394RT	QTZ HEM VN AND BREC - ABOUT 60% HEM, 40% QTZ MIN PY IN QTZ		7800	2.4	63	80	154	12	140	1.5	<1	<2	4
160394RT SEE DETAIL MAP 25 M TO 50 M S OF FALLS ALONG CLIFFS		RT COMP SAMP	HEM BREC W:OB, BLK, GRY, PK F: GRY GR RLK	HEM MATRIX: FI-CO, GRAN MASS, BLK -GRY HEM; ALSO HEM STWK VN, HEM CRUSTS ON GR CHL BREC FRAGS & QTZ BREC FRAGS; SOM QTZ HEM VN TO 0.5 CM, BD; GEN 35% HEM	2510	0.6	230	4	52	14	240	<0.5	<1	<2	4
160399RP ON SLOPE NW OF FALLS SEE DETAIL MAP		PANEL OVER 1X 0.5 M	HEM BREC W:OB, BLK, RD BRN F: GR GRY BLK, OB	SOM FI SIL WR TO 70%; ALSO CHL WR TO 40%; VUG, EARTHY, WELL FRAC, WELL LIM, MN; QTZ & HEM VN & STWK TO 1.5CM; HEM CRUST ON QTZ VN & HEM INCL IN VN	2200	0.6	295	8	48	40	100	<0.5	<1	2	3
160418RT SEE DETAIL MAP 25 M S, 20 M E OF 460339RT		RT COMP SAMP	HEM BREC W:OB, BLK, GRY, PK F: GRY GR BLK	HEMC MATRIX: FI-CO, GRAN MASS, BLK -GRY HEM; MIN DISSEM PY, SOM HEM CRUSTIFORM TEXTS ON FRAGS; SURFS WITH CHL SLICKENS; 10 - 85% HEM; GEN 45% BRECC FRAGS: GEN ANG, GRY SIL QTZ, WH QTZ/BA, MAF VOL, GR FUSCHITE, JASPEROID FRAGS; 1 QTZ VN TO 2.5 CM; SOM VUG, OXID FRAGS	605	<0.2	22	<2	34	<2	1070	<0.5	<1	<2	5

160422RT  
SEE  
DETAIL MAP  
25 M S, 20  
M E OF  
460339RT

AS  
160418RT LOC 80-90% HEM  
MORE QTZ/BA VN

345	<0.2	31	6	36	<2	1620	<0.5	<1	<2	4
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TABLE A2

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE MIDDLE EXTENSION OF THE SOUTH ZONE (MEXT SZ)  
 ii. STREAM SEDIMENT SAMPLES ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

NUMBER, LOCATION:	FLOW DIR	MATERIAL, GRAIN SIZE. COLOUR COMP	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
460347SS SEE DETAIL MAP	BELOW FALLS ON NEXTSZ CRK	FL NE ORG MUCK SILT-CO, -GRAV OXID PEBS SILT - PEBS 60%, BLK-BRN SILT 30% ORG 10%	495	1.6	94	44	112	36	430	1.5	<1	4	4



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To: GEOFINE EXPLORATION CONSULTANTS LTD.

49 NORMANDALE RD.  
UNIONVILLE, ON  
L3R 4J8

Project: TSZ  
Comments: ATTN: D. MOLLOY CC: D. MOLLOY

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## CERTIFICATE OF ANALYSIS

A9926484

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
460301	205 226	< 5	< 0.2	2.45	2	< 10	50	< 0.5	< 2	2.19	< 0.5	16	7	17	5.55	< 10	< 1	0.18	10	2.53
460308	205 226	< 5	< 0.2	0.39	8	< 10	120	< 0.5	< 2	2.82	< 0.5	4	77	46	2.41	< 10	< 1	0.26	< 10	0.19
460309	205 226	< 5	< 0.2	0.37	6	< 10	80	< 0.5	< 2	0.59	< 0.5	6	30	17	3.08	< 10	< 1	0.31	< 10	0.16
460310	205 226	< 5	< 0.2	2.19	< 2	< 10	30	< 0.5	< 2	1.83	< 0.5	21	13	29	6.01	10	< 1	0.06	< 10	2.15
460313	205 226	< 5	< 0.2	0.41	14	< 10	120	< 0.5	< 2	0.74	< 0.5	6	35	28	2.94	< 10	< 1	0.26	< 10	0.20
460314	205 226	< 5	< 0.2	0.44	8	< 10	90	< 0.5	< 2	0.53	< 0.5	5	30	5	2.67	< 10	< 1	0.28	< 10	0.10
460315	205 226	5	< 0.2	0.50	12	< 10	170	< 0.5	< 2	0.70	< 0.5	4	43	6	2.68	< 10	< 1	0.33	< 10	0.09
460316	205 226	< 5	0.2	0.55	30	< 10	90	< 0.5	< 2	2.05	17.5	8	34	82	2.71	< 10	< 1	0.35	< 10	0.02
460317	205 226	< 5	1.2	0.64	34	< 10	60	< 0.5	< 2	0.08	252	5	53	191	3.15	< 10	25	0.41	10	0.02
460318	205 226	< 5	1.0	0.42	54	< 10	50	< 0.5	< 2	2.28	463	6	45	101	2.43	< 10	19	0.26	< 10	0.02
460319	205 226	< 5	0.2	0.55	52	< 10	90	< 0.5	< 2	1.89	38.5	8	64	101	2.70	< 10	3	0.34	10	0.02
460320	205 226	< 5	< 0.2	0.63	52	< 10	100	< 0.5	< 2	2.56	13.0	8	42	56	2.90	< 10	< 1	0.40	10	0.03
460321	205 226	< 5	< 0.2	0.49	18	< 10	120	< 0.5	< 2	1.79	< 0.5	7	50	9	2.36	< 10	< 1	0.32	10	0.03
460322	205 226	< 5	< 0.2	0.52	18	< 10	120	< 0.5	< 2	1.80	0.5	7	30	8	2.02	< 10	< 1	0.31	10	0.02
460323	205 226	< 5	< 0.2	0.63	14	< 10	90	< 0.5	< 2	1.27	4.0	8	40	26	2.72	< 10	< 1	0.39	< 10	0.03
460324	205 226	< 5	< 0.2	0.49	2	< 10	70	< 0.5	< 2	0.63	< 0.5	6	36	7	2.40	< 10	< 1	0.33	< 10	0.04
460325	205 226	< 5	< 0.2	0.35	16	< 10	110	< 0.5	< 2	0.93	< 0.5	6	49	8	2.00	< 10	< 1	0.29	< 10	0.24
460326	205 226	< 5	0.4	0.47	8	< 10	90	< 0.5	< 2	0.06	< 0.5	5	45	15	2.16	< 10	< 1	0.29	< 10	0.02
460327	214 229	1540	3.0	3.71	124	< 10	< 10	< 0.5	< 2	3.16	< 0.5	193	25	7780	9.68	< 10	< 1	0.03	< 10	1.99

*Ant*



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Invoice No. : 19928  
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CERTIFICATE OF ANALYSIS A9926484

SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
460301	205 226	965	1	0.03	1	1710	< 2	3.28	4	10	49	0.28	< 10	< 10	148	< 10	96
460308	205 226	1720	1	0.01	< 1	390	2	0.60	< 2	1	488	< 0.01	< 10	< 10	7	< 10	8
460309	205 226	335	3	0.01	< 1	610	8	2.21	2	2	35	< 0.01	< 10	< 10	17	< 10	48
460310	205 226	735	2	0.04	4	1320	< 2	4.15	2	11	27	0.28	< 10	< 10	159	< 10	90
460313	205 226	415	4	< 0.01	< 1	540	6	1.41	< 2	2	53	< 0.01	< 10	< 10	20	< 10	14
460314	205 226	290	3	0.01	< 1	570	10	1.59	< 2	2	44	< 0.01	< 10	< 10	9	< 10	6
460315	205 226	355	3	0.01	< 1	600	20	1.18	2	2	60	< 0.01	< 10	< 10	11	< 10	2
460316	205 226	410	10	< 0.01	< 1	590	12	2.59	2	2	177	< 0.01	< 10	< 10	8	< 10	1720
460317	205 226	30	32	< 0.01	< 1	600	22	4.15	12	1	12	< 0.01	< 10	< 10	6	80	>10000
460318	205 226	600	6	< 0.01	< 1	630	44	4.85	18	3	211	< 0.01	< 10	< 10	8	270	>10000
460319	205 226	560	6	0.01	1	570	12	2.70	2	2	176	< 0.01	< 10	< 10	8	< 10	4500
460320	205 226	690	6	0.01	1	590	12	2.97	2	3	240	< 0.01	< 10	< 10	8	< 10	934
460321	205 226	520	5	0.03	1	600	18	1.93	< 2	3	202	< 0.01	< 10	< 10	7	< 10	48
460322	205 226	390	13	0.01	< 1	600	18	1.70	2	3	173	< 0.01	< 10	< 10	7	< 10	92
460323	205 226	280	5	< 0.01	< 1	680	14	2.50	< 2	1	92	< 0.01	< 10	< 10	8	< 10	270
460324	205 226	190	4	< 0.01	< 1	600	6	2.14	< 2	1	76	< 0.01	< 10	< 10	5	< 10	10
460325	205 226	615	10	< 0.01	< 1	480	10	1.32	< 2	1	55	< 0.01	< 10	< 10	6	< 10	10
460326	205 226	35	43	< 0.01	1	360	12	1.71	< 2	< 1	11	< 0.01	< 10	10	3	< 10	4
460327	214 229	1570	4	0.03	74	170	< 2	2.41	4	7	9	0.03	< 10	< 10	56	< 10	128

CERTIFICATION:

*[Signature]*





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49 NORMANDE RD.  
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Project: TMEXTSZ  
Comments: ATTN: D. MOLLOY

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## CERTIFICATE OF ANALYSIS A9927891

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
160392	205 294	3080	0.6	0.38	24	< 10	250	< 0.5	< 2	0.06	< 0.5	3	165	400	6.61	< 10	< 1	0.21	20	0.06
160392A	214 229	160	2.4	2.64	4	30	< 10	< 0.5	8	1.52	0.5	153	218	5340	7.10	< 10	< 1	0.01	< 10	2.33
160393	205 294	7800	2.4	0.52	12	< 10	140	< 0.5	< 2	0.60	1.5	6	89	63	8.93	< 10	< 1	0.23	< 10	0.61
160394	205 294	2510	0.6	0.92	14	< 10	240	< 0.5	< 2	0.35	< 0.5	4	69	230	6.67	< 10	< 1	0.31	10	0.40
160399	205 294	2200	0.6	2.51	40	< 10	100	< 0.5	< 2	0.27	< 0.5	10	61	295	9.20	10	< 1	0.20	< 10	0.73
160418	205 294	605	< 0.2	1.25	< 2	< 10	1070	< 0.5	< 2	1.15	< 0.5	4	113	22	7.16	< 10	< 1	0.14	10	0.53
160422	205 294	345	< 0.2	1.28	< 2	< 10	1620	< 0.5	< 2	1.38	< 0.5	4	88	31	7.57	< 10	< 1	0.13	10	0.60
160422A	214 229	190	2.6	2.81	8	30	10	< 0.5	< 2	1.49	0.5	162	235	5560	7.35	< 10	< 1	0.01	< 10	2.41
160425A	214 229	115	2.6	2.95	6	30	< 10	< 0.5	< 2	1.65	0.5	158	242	5550	7.39	< 10	< 1	0.01	< 10	2.46
460327	205 294	565	2.8	0.67	374	< 10	10	< 0.5	24	1.27	< 0.5	10	68	2560	6.25	< 10	< 1	0.28	< 10	0.62
460328	205 294	665	5.8	0.19	1110	< 10	< 10	< 0.5	12	0.35	2.0	10	92	738	10.20	< 10	< 1	0.17	< 10	0.11
460329	205 294	125	0.6	1.89	142	< 10	40	< 0.5	< 2	0.52	< 0.5	10	40	914	6.82	< 10	< 1	0.28	< 10	0.72
460330	205 294	360	2.2	0.43	70	< 10	80	< 0.5	< 2	0.36	< 0.5	9	42	317	9.14	< 10	< 1	0.35	< 10	0.60
460331	205 294	25	0.6	1.63	50	< 10	90	< 0.5	< 2	0.22	< 0.5	10	28	156	5.10	< 10	< 1	0.34	< 10	0.47
460335	205 294	6290	1.6	0.53	242	< 10	30	< 0.5	Intf*	2.13	< 0.5	20	44	>10000	7.84	< 10	< 1	0.26	< 10	0.71
460336	205 294	5720	1.2	1.17	260	< 10	10	< 0.5	Intf*	3.02	< 0.5	20	40	>10000	8.70	< 10	< 1	0.19	< 10	1.21
460337	205 294	4830	1.4	1.49	312	< 10	10	< 0.5	Intf*	1.43	< 0.5	19	36	>10000	9.19	< 10	< 1	0.18	< 10	0.91
460338	205 294	4740	1.2	0.67	222	< 10	30	< 0.5	Intf*	1.86	< 0.5	21	48	>10000	6.91	< 10	< 1	0.25	< 10	0.71
460339	205 294	7250	2.0	1.21	242	< 10	20	< 0.5	Intf*	2.44	0.5	16	49	>10000	8.76	< 10	< 1	0.19	< 10	1.23
460342	205 294	2290	0.2	1.67	44	< 10	120	< 0.5	< 2	0.58	< 0.5	9	66	261	8.49	< 10	< 1	0.23	< 10	0.62
460343	205 294	640	< 0.2	2.56	50	< 10	60	< 0.5	< 2	0.94	< 0.5	8	41	593	9.13	10	< 1	0.19	< 10	1.16
460344	205 294	1405	0.2	2.51	40	< 10	70	< 0.5	< 2	0.74	< 0.5	9	52	364	9.17	10	< 1	0.18	< 10	1.09
460345	205 294	5690	1.6	1.20	204	< 10	10	< 0.5	Intf*	2.22	< 0.5	17	34	>10000	8.37	< 10	< 1	0.17	< 10	1.10
460346	205 294	5320	1.0	1.12	250	< 10	10	< 0.5	Intf*	2.56	< 0.5	22	37	>10000	8.59	< 10	< 1	0.17	< 10	1.06
460348	205 294	1860	0.2	2.41	44	< 10	80	< 0.5	< 2	0.67	< 0.5	8	31	415	8.20	< 10	< 1	0.21	< 10	0.93



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49 NORMANDE RD.  
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Project: TMEXTSZ  
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## CERTIFICATE OF ANALYSIS

A9927891

SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
160392	205 294	340	5 < 0.01		4	100	2	0.12	2	1	10 < 0.01	< 10	< 10	17	180	22	
160392A	214 229	200	< 1 < 0.01		1940	400	14	2.74	< 2	1	13	0.07	< 10	< 10	33	< 10	64
160393	205 294	910	4 < 0.01		3	120	80	0.41	< 2	1	23 < 0.01	< 10	< 10	10	110	154	
160394	205 294	1290	4 < 0.01		3	320	4	0.30	< 2	3	47 < 0.01	< 10	< 10	18	70	52	
160399	205 294	875	3 < 0.01		3	220	8	0.92	2	1	10 < 0.01	< 10	< 10	23	60	48	
160418	205 294	1195	5 < 0.01		3	60	< 2	0.04	< 2	2	77 < 0.01	< 10	< 10	20	90	34	
160422	205 294	1240	4 < 0.01		2	50	6	0.05	< 2	3	120 < 0.01	< 10	< 10	24	110	36	
160422A	214 229	220	< 1 < 0.01		2140	460	10	3.13	2	1	14	0.07	< 10	< 10	35	< 10	68
160425A	214 229	225	< 1 < 0.01		2100	450	12	3.01	< 2	1	15	0.08	< 10	< 10	37	< 10	66
460327	205 294	1200	6 < 0.01		5	290	64	4.14	2	2	47 < 0.01	< 10	< 10	7	< 10	56	
460328	205 294	325	4 < 0.01		6	60	184	> 5.00	20	< 1	13 < 0.01	< 10	< 10	2	< 10	152	
460329	205 294	735	11 < 0.01		3	390	22	2.54	4	2	24 < 0.01	< 10	< 10	16	< 10	62	
460330	205 294	765	18 < 0.01		3	290	38	1.54	8	2	28 < 0.01	< 10	< 10	7	60	96	
460331	205 294	835	12 < 0.01		3	430	12	1.35	4	1	15 < 0.01	< 10	< 10	16	< 10	44	
460335	205 294	1600	13 < 0.01		4	Intf*	24	4.77	< 2	1	121 < 0.01	< 10	< 10	6	40	18	
460336	205 294	2260	8 < 0.01		4	Intf*	22	4.41	< 2	1	83 < 0.01	< 10	< 10	10	30	44	
460337	205 294	1410	7 < 0.01		4	Intf*	18	4.71	< 2	1	42 < 0.01	< 10	< 10	16	30	60	
460338	205 294	1250	9 < 0.01		5	Intf*	22	4.65	2	1	102 < 0.01	< 10	< 10	6	30	22	
460339	205 294	1920	7 < 0.01		4	Intf*	22	4.56	2	1	88 < 0.01	< 10	< 10	13	30	44	
460342	205 294	1600	2 < 0.01		3	190	8	0.69	4	3	21 < 0.01	< 10	< 10	19	90	56	
460343	205 294	1175	3 < 0.01		3	280	10	1.50	2	3	49 < 0.01	< 10	< 10	22	30	66	
460344	205 294	1010	< 1 < 0.01		3	250	10	1.32	2	3	31 < 0.01	< 10	< 10	22	40	62	
460345	205 294	2010	6 < 0.01		4	Intf*	22	4.44	2	1	77 < 0.01	< 10	< 10	12	30	44	
460346	205 294	2100	8 < 0.01		4	Intf*	20	4.47	< 2	1	70 < 0.01	< 10	< 10	9	30	40	
460348	205 294	1285	1 < 0.01		3	300	16	1.43	6	2	22 < 0.01	< 10	< 10	20	20	68	



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Account : KIV

## CERTIFICATE OF ANALYSIS

A9927889

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
86988	201 202	40	1.4	1.44	88	< 10	60	< 0.5	< 2	2.23	2.0	24	25	121	4.78	< 10	< 1	0.08	< 10	1.19
480347	201 202	495	1.6	1.23	36	< 10	430	< 0.5	< 2	1.20	1.5	14	3	94	4.03	< 10	< 1	0.11	20	0.34

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# CERTIFICATE OF ANALYSIS

A9927889

SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
86988	201	645	3	< 0.01	45	960	76	1.95	2	3	105	0.02	< 10	< 10	43	< 10	164
480347	201	5180	4	< 0.01	6	1110	44	0.21	4	5	93	0.01	< 10	< 10	35	< 10	112

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**A9928566**

SAMPLE	PREP CODE	Cu %
460335	212 --	2.57
460336	212 --	2.19
460337	212 --	1.80
460338	212 --	1.93
460339	212 --	2.06
460345	212 --	1.97
460346	212 --	1.99

- b > hematite quartz breccia veins, hematite veins, stock works, generally without much chalcopryite: 10 composite talus and panel outcrop samples have highly anomalous to elevated gold contents, averaging 2.27 g/t; much lower copper contents than type a., with the 10 samples averaging 267 ppm; much lower arsenic contents, averaging 27 ppm; and, lower manganese contents, with the 10 samples averaging 1092 ppm.**
- c. > a combination of a. and b., usually with a hematite matrix containing quartz and hematite breccia fragments and significant blebby chalcopryite, often exhibiting various degrees of chloritization: two composite talus samples have elevated gold contents, averaging 5.5 g/t; elevated copper contents averaging 1.98%; anomalous arsenic values averaging 227 ppm; and, elevated manganese contents averaging 2055 ppm.**

**Initial activities on the lower area of the cliff (Photos 15, 16) located some type a. and c. materials in situ: panel sample 160399RP (1 x 0.75 m) of b. type material contained 2.2 g gold/t and 295 ppm copper; panel sample 160393RP (1.5 x 0.3 m) of b. type material contained 7.8 g gold/t and 63 ppm copper; panel sample 460327RP (1.5 x 0.3 m) of c. type material contained 565 ppb gold and 0.26% copper (Table A2). Three wall rock samples (460329RP - 460331RP) have average gold and copper contents of 170 ppb and 516 ppm, respectively.**

### **9.3.C.ii. INTERPRETATION OF THE MEXT ZONE:**

**Based on the analytical results, the quantity of the mineralized talus, the discovery of in situ gold and copper mineralization, and the apparent breccia veining in the cliffs, the MEXT is regarded as an important target. The MEXT Zone has a chloritic shear component which may represent a cross cutting structure reflected by the MEXT Creek drainage, thus providing a structural junction which could entail ore shoot morphologies discussed in Section 9.3.C.**

**Additional work (perhaps on ropes) and/or diamond drilling is required to further ascertain the morphology and potential of the zone. In view of a possible westerly dip (similar to that of the South Zone), an initial steep hole from the top of the cliff may be recommended.**

**9.3.D. NORTHERN EXTENSION OF THE SOUTH ZONE (NEXT SZ: MAPS 4, 5, 7; PHOTOS 14, 17, 18, 19, 20, 21, 22; TABLE A3; VERTICAL LONG SECTION DDHNEXTSZ00-01):**

**9.3.D.i. 1999 GEOLOGICAL, GEOCHEMICAL SURVEYS:**

Little historic work was apparently carried out in the area of the NEXT Zone. The metal contents of 5 rock samples (15022-25, 15051; Map 4) taken by Noranda between the MEXT waterfall and the southern area of the NEXT Zone are uninteresting, except for one anomalous copper value (244 ppm). However, three Noranda rock samples (Map 4; 15052-54) taken at the north end of the NEXT Zone have interesting copper contents (0.07 to 1.17%); and, anomalous gold contents ranging up to 754 ppb. Based on the lack of consistent results, it is assumed Noranda decided to concentrate its efforts on the more advanced targets i.e., on the South Zone deposit, and other parts of the Todd Property, including the Fall Creek target area.

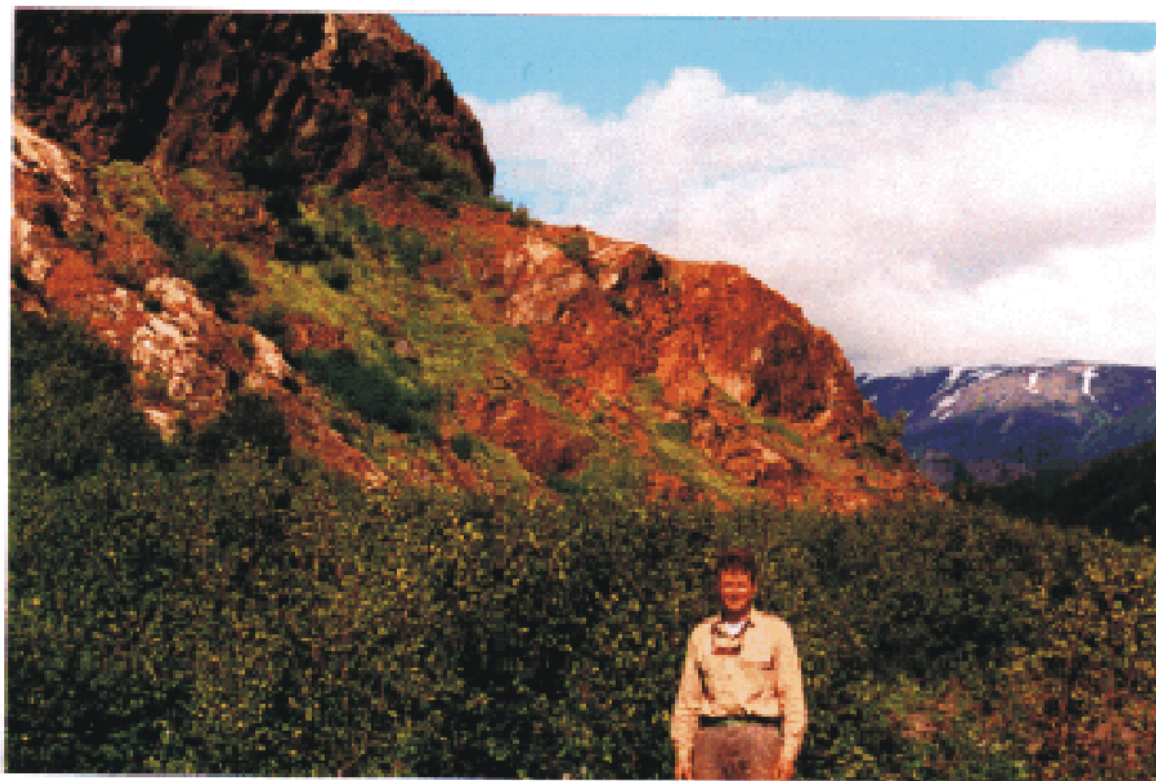
The NEXT Zone (Photos 14, 17, 18) is postulated to be the dextrally offset, most northerly, 150 m long segment of the South Zone structure; or, a parallel structure (equivalent to Zone B, South Zone deposit?) before it disappears under the glacial-fluvial deposits of the Todd Creek Valley (Photo 19, Maps 4, 7). The NEXT zone is located about 170 m north of the MEXT Creek (Photos 14, 18; Map 4).

The NEXT quartz breccia zone (NEXT Zone; Photos 20), is located near the contact with hanging wall mafic pyroclastic rocks (Photo 21, Map 7) - thus apparently not in the same stratigraphic position as the South Zone deposit and its Middle Extension i.e., near similar footwall rocks. The hanging wall mafic breccias and agglomerates are moderately to weakly altered (pyrite-quartz-carbonate +/- chlorite, carbonate, epidote stringers, lenses and stock works); and, as evidenced by malachite staining on the cliffs, have at least local concentrations of chalcopyrite. The hanging wall rocks are distinctly different than the intensely altered (quartz-pyrite-sericite-carbonate +/- hematite) hanging wall rocks of the South Zone deposit. As shown on Photos 14 and 17, south of the NEXT Zone the intensely altered host rocks are dextrally offset by the northeast trending NEXT Fault. If the position of the South Zone Structure remains in the same relative position to the west boundary of the altered pyroclastic rocks, the main structure may be located under the Todd Creek Valley.

The NEXT Zone is often mineralized with disseminations of fine pyrite and blebby chalcopyrite, and has been traced on surface over about a 100 m strike length, with an apparent width between 3 to 6+ m, a strike of about 10°, and a dip between 50 and 70° to the west. The zone often comprises angular, green-white siliceous fragments up to over 0.5 m (Photo 22); and, varying sizes of quartz-carbonate and red jasper fragments, along with coarse chalcopyrite blebs and fine disseminations of pyrite and chalcopyrite set in an aphanitic, siliceous matrix. Occasional bifurcating quartz-carbonate, and massive sulfide veins and stringers also occur in the zone, some with banded textures indicative of multiphase activity.



**PHOTO 17: NEXT ZONE (RIGHT CENTER) AT SHARP CONTACT  
WITH MAFIC VOLCANIC BRECCIAS; NEXT FAULT  
AT SOUTH SIDE OF WEAKLY ALTERED BRECCIAS;  
LOOKING NORTH FROM NEXT ZONE**



**PHOTO 18: NEXT ZONE, MAFIC VOLCANIC BRECCIA CONTACT;  
LOOKING NORTH**





**PHOTO 19: NORTH END OF EXPOSED NEXT ZONE;  
LOOKING SOUTH**



**PHOTO 20: NEXT QUARTZ BRECCIA ZONE**



**PHOTO 21: CONTACT OF MAFIC VOLCANIC BRECCIAS AND NEXT ZONE**



**PHOTO 22: COARSE, SILICEOUS BRECCIA FRAGMENTS  
IN NEXT QUARTZ BRECCIA ZONE**

No detailed historical work appears to have ever been carried out. The NEXT Zone is intensely silicified, and has flat surfaces that render detailed sampling very difficult (Noranda used a diamond saw on such surfaces on the South Zone deposit). Although considerable effort was made to obtain representative panel samples (Map 7; Table A3), samples could only be taken where irregular surfaces allowed, and may thus not reflect the true potential of the zone.

The mineralization is generally characterized by anomalous to high gold values ranging up to 1.3 g/t; weakly anomalous silver values; anomalous to high copper values ranging up to 1.31%; anomalous lead values; highly anomalous arsenic values; low barium, cadmium, mercury and antimony values; and, weakly anomalous molybdenum values (Table A3). Panel sample 160417RP (Photo 23; Map 7), taken about 50 m south of Todd Creek at the hanging wall contact of the zone, returned interesting gold (600 ppb) and copper (0.79%) values over a 3 m width. A panel sample (160419RP) contiguous, and to the south of 160412RP, returned 1.3 g gold/t and 1.31% copper over 1 x 5 m. Panel sample 160420RP, taken about 27 m south of 160419RP, contained 755 ppb gold and 0.94% copper over a 2 m width. Panel sample 160424RP (Photo 20), starting at about 25 m south of 160419RP, and taken over 1.5 x 20 m, in an area where there are few surfaces amenable to sampling, returned 715 ppb gold and 1.39% copper.

The NEXT Zone is cut by a recessed mafic dyke just north of sample 160424RP, where 16 contiguous panel samples, each over a meter width, were collected on the east side of the hanging wall (Photo 24; Map 7). As noted above, the hard rock and flat surfaces are prohibitive to sampling, and any anomalous values should not be overlooked. The first sample, 160401RP taken at the hanging wall, returned 495 ppb gold and 1.14% copper over 1 m. The next six samples, taken over a total of 6 m all have anomalous gold contents (up to 125 ppb); elevated copper contents (up to 1290 ppm), and strongly anomalous arsenic contents (up to 556 ppm). The 11th sample, 160411RP, returned 0.29% copper.

As shown on Section DDHNEXTSZ00-01 (Appendix C), the drill hole was spotted about 10 m out into the Todd Creek valley (Photo 25), with a planned dip of about thirty degrees to intersect the apparent west dipping (60°-70°) NEXT Zone, south of the NEXT Dyke. The hole would be chasing the zone down dip, and could be moved closer to the target. However, before any drill testing takes place, the amount of displacement on the NEXT Fault should be ascertained to ensure that the NEXT Zone is really the main target, and not the equivalent to Zone B at the South Zone deposit. The work should be carried out in conjunction with follow-up work on the MEXT Zone.

#### **9.3.D.ii. INTERPRETATION OF THE NEXT ZONE RELATIVE TO THE SOUTH ZONE, MEXT ZONE:**

The host rocks of the South Zone deposit, MEXT and NEXT Zones are, in Geofine's opinion, not feldspar porphyry as shown by Noranda on Map 4, but mafic breccias, agglomerates and

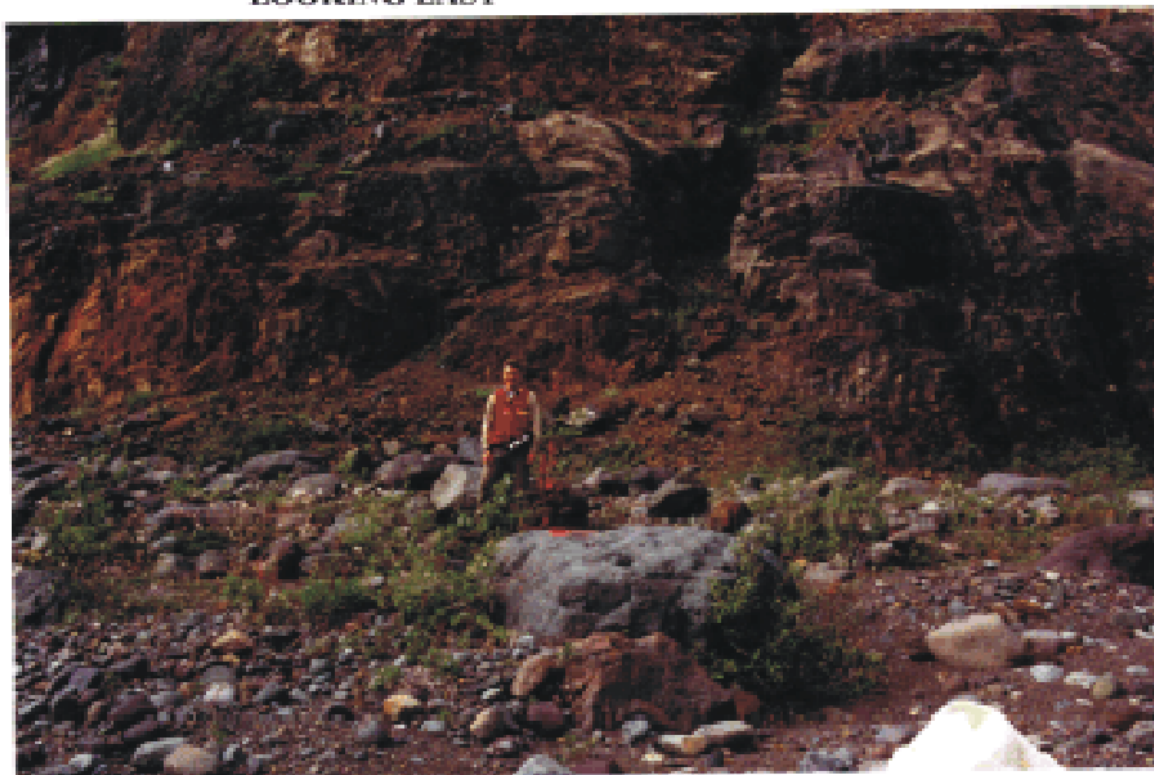


**PHOTO 23: SAMPLE 160417RP (0,6 g gold/t, 0.79% copper), NEXT Zone**





**PHOTO 24: NEXT DYKE SAMPLE LINE, AT NEXT ZONE,  
LOOKING EAST**



**PHOTO 25: COLLAR, DDHNEXTSZ00-01, AT NEXT DYKE,  
LOOKING WEST**

TABLE A3

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE NORTHERN EXTENSION OF THE SOUTH ZONE (NEXT SZ)  
ROCK SAMPLES

ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, TYPE	LOCATION:	NAME, COLOR	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160400RCH NE EXT SZ AT CARB/MAFIC DYKE SEE DETAILED MAP	WR AT W END OF DYKE BEFORE CLIFF & BEFOR E CT OF CPY BREC ZONE OVER 1 M	ALT MAFIC VOL BREC STR ZONE W: BLK, WH, BRN F: GR, WH, PK	FI, GREAS - EARTH - CO BREC TEXT, GEN UP TO 2 CM PATCH, LENSES, STR, VN, STW WHITE QTZ-CAL, OFTEN WITH HEM, VN HAVE VAR ORIENTATIONS, MATRIX GEN WEL CHL, LOC WEL SIL; LOC UP TO 10% PY, TR CPY IN VN TO 1.5 CM NEAR QTZ-CAL VN NOTE: APPROX 30 M ABOVE ON CLIFF, MAL STAINING	<5	1.4	274	21	216	158	50	<0.5	<1	<2	1
160401RP NE EXT SZ AT CARB/MAFIC DIABASE DYKE CONTIG WITH & E OF 160400CH SEE DETAILED MAP	QTZ CPY BREC ZONE: W CT WITH WR CLIFF PANEL OVER 1 M - AVAIL SURFS	W: BLK, ORG BRN F: GR, GRY, OB, BRASS	APHAN-FI-CO; GLASS TO SUG TO BREC TEXT; WELL LIM ON SURF, WELL SIL, GRY QTZ MATRIZ, QTZ CARB FRAGS AS BREC FRAGS IN MATRIX, LOC HEM STAIN, HEM FRAGS, WELL SULF - LOC 5-7% PY, AS DISSEM, LENSES, STR, VNS; FI TO CO BLEBS CPY IN BREC SECTIONS, AT LEAST ONE 5 CM MASS CPY VEIN SUB PERPEND (35 DEG) TO STR (10 DEG?) SOME CPY STR; MAL STAIN IN BREC AREAS - OFTEN VUG, EARTH IN SULF AREAS; CPY MAINLY ASSOC WITH BREC; OVERALL 2-3% CPY, TR SPHAL; 4% PY  NOTE: NO APPAR DETAILED HIST SAMP - SURFACES ARE FLAT & HARD AREAS ONLY AMEN TO SPECIFIC SAMPLING - NEEDS SAW OR DRILL	495	3	11400	17	32	288	30	0.5	1	2	22
160402RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 160401RP SEE DETAILED MAP	QTZ CPY BREC ZONE: PANEL OVER 1 M - AVAIL SURFS	W: BLK, ORG BRN F: GR, GRY, OB	AS 160401RP, GEN LARGE (UP TO 35 CM SIL BREC FRAGS IN GRY SIL MATRIX; GEN 3-5% PY WITH 5-7% PY IN BREC FRAGS AND TR - 2% CPY IN FRAGS; 1-2% CARB AS PATCH, DISSEM, SOM QTZ VN & STWKS LOC WELL CHL AREA C/W PY STR	110	3.8	872	18	40	310	20	<0.5	1	<2	121
160403RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 160402RP SEE DETAILED MAP	QTZ CPY BREC ZONE: PANEL OVER 1 M - AVAIL SURFS	W: BLK, ORG BRN F: GR, GRY, OB	AS 160402RP, SAMPLE FROM N & S OF DYKE VERY HARD TO SAMPLE; APPAR 3-5% PY, 1-2% CPY; WELL DEVEL CO BREC TEXT ALONG STR TO N BEYOND MN COATING	90	2.2	1290	17	18	292	10	<0.5	1	<2	23

180404RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 180403RP SEE DETAILED MAP	QTZ CPY BREC ZONE: PANEL OVER 1 M - AVAIL SURFS		AS 180402RP, SAMPLE FROM N & S OF DYKE VERY HARD TO SAMPLE	125	1.8	1015	16	24	390	10	<0.5	<1	2	26
180405RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 18040RP SEE DETAILED MAP	QTZ CPY BREC ZONE: PANEL OVER 1 M - AVAIL SURFS		AS 180402RP, SAMPLE FROM N & S OF DYKE VERY HARD TO SAMPLE 25% OF SAMP MATRIZ, 75% QTZ BREC, BREC INCL QTZ BANDING TO .5 CM, & DEFOR OF BANDING - MULTIPHASE ACT; OVERALL 5-8% PY; 0.5% CPY SULFS AS FI TO CO DISSEM	80	2	573	20	26	324	20	<0.5	<1	<2	7
180406RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 180405RP SEE DETAILED MAP	QTZ CPY BREC ZONE: PANEL OVER 1 M - AVAIL SURFS	ALT VOL BREC W: GR, RD BRN, LIM, MIN MN F: GRY, GR	FI, GRAN TO MASS, SOM BREC TEXT, 20% OF SAMP IS BREC C/W ALT FRAGS IN GR GRY SIL MATRIX, 20% OF SAMP HAS QTZ STR, & MIN STWK ALT IN WR IS QTZ, CHL, SER, PY, SOM CARB, ALT NEAR BREC VN & IN FRAGS IS SIM BUT NO CHL, CARB, MOR PY, MOR SIL, 5 TO 10% PY LOC, TR TO 1 % CPY GEN IN OR NEAR BREC	100	3	645	32	34	556	10	<0.5	<1	<2	18
180407RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 180406RP SEE DETAILED MAP	FW OF QTZ, CPY BREC ZONE: PANEL OVER 1 M ON AVAIL SURGS	ALT VOL BREC W: GR, RD BRN, LIM, MIN MN F: GRY, GR	FI, GRAN TO MASS, STR CHL CARB SER PY ALT, 35% OF SAMP CONTAINS QT BREC VN, OR QTZ CARB STR & VN, IN SIL WR GEN 5% PY, DISSEM & STR, BUT LOC 10% NEAR OR IN QTZ VNS, TR 3% CPY AS BLEBS & DISSEM, IN BREC VN OR NEAR QTZ VN, OVERALL 0.5% CPY	55	2.8	1050	40	70	370	10	<0.5	<1	2	14
180408RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 180407RP SEE DETAILED MAP	FW OF QTZ CPY BREC ZONE: OVER 1 M	ALT VOL BREC W: GR, RD BRN, LIM, MN F: GRY, GR	AS 180410RP, C/W 1-5%PY, CHL 1-15%, F F W SMALL QTZ CARB VN	25	1.4	348	18	28	212	20	<0.5	<1	<2	9
180409RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 180408RP SEE DETAILED MAP	FW OF QTZ CPY BREC ZONE: PANEL OVER 1 M & PT 2.5 M STR LEN	ALT VOL BREC W: GR, RD BRN, LIM, MN F: GRY, GR	AS 180410RP, C/W 3-5%PY, CHL AS SMALL ANG FRAGS, MIN QTZ, PY VN	15	1.2	81	28	46	150	30	<0.5	<1	<2	9

160410RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 160409RP SEE DETAILED MAP	FW OF QTZ CPY BREC ZONE: PANEL OVER 1 M & 2.5 M STR LEN	ALT VOL BREC W: GR, RD BRN, LIM, MN F: GRY, GR	AS 160412RP, C/W STR QTZ- CHL (TO 10%)-CAL (TO 4%)- SER (<3%) ALT, 1-3% DISSEM PY & 1-2% CPY BLEBS IN PY; GEN 3-5% DISSEM PY, MIN STR, LOC 10-15% PY WITHIN 15 CM QTZ VN AS MASSES & FRAC FILS, TR 1% BLEBS CPY	10	0.8	18	14	54	62	120	0.5	<1	<2	21
1604011RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 1604010RP SEE DETAILED MAP	FW OF QTZ CPY BREC ZONE: PANEL OVER 1 M	ALT VOL BREC W: GR, WELL LIM F: GRY, GR	AS 160412RP, C/W 13 CM QTZ CHL PY VN IN OC @ 185/75W, C/W DISSEM, STR, SEMI-MASS PY, & 1-2% CPY BLEBS IN PY; GEN 3-5% DISSEM PY, MIN STR, LOC 10-15% PY WITHIN 15 CM QTZ VN, AS MASSES & FRAC FILS, TR 1% BLEBS CPY	55	5.4	2940	17	46	258	40	0.5	<1	2	5
160412RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 160411RP SEE DETAILED MAP	FW OF CPY BREC ZONE: PANEL OVER 1 M OF AVAIL SURFS	ALT VOL BREC W: GR, SOM MN F: GRY, GR	AS 160414RP, NAR QTZ-CAL +/- CHL VN, <3MM THICK @ 0/28E, FEW FRACS, GEN 3% FI DISSEM PY, LOC 10% IN QTZ STRING AND WR	10	0.8	96	10	60	92	120	0.5	<1	<2	6
160413RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 160412RP SEE DETAILED MAP	FW OF QTZ CPY BREC ZONE: PANEL OVER 1 M OF AVAIL SURFS	ALT VOL BREC W: GR, SOM MN F: GRY, GR	AS 160414 RP, TR MAL ON FRACS, SOM QTZ-CHL-CAL STRS, A 1-4 CM QTZ VN, 2-8% FI DISSEM PY, TR CPY, BLEBS IN QTZ VN	25	1	235	11	60	112	90	<0.5	<1	<2	13
160414RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 160413RP SEE DETAILED MAP	FW OF QTZ CPY BREC ZONE: PANEL OVER 1 M	ALT VOL BREC W: GR, SOM MN F: GRY, GR	FI-MED, GRAN - MASS, STRONG QTZ-CHL-SER-PY ALT (<2% SER, 2-8% CHL, MAINLY QTZ), WELL FRAC, 0/28E, 357/29E, SOM MM QTZ-CAL-CHL VN; GEN 2-6% DISSEM PYR, SOM MIN BA VN	45	0.6	131	12	44	194	60	<0.5	<1	<2	3
160415RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 160414RP SEE DETAILED MAP	FW OF QTZ CPY BREC ZONE: PANEL OVER 1 M	ALT VOL BREC W: GR BRN, MOD LIM, MN F: GRY	FI-MED, GRAN - MASS, STRONG QTZ-CHL-SER-PY ALT (2-3% SER, 3-5% CHL, MAINLY QTZ), TR CARB, 3-5% DISSEM PY, TR CPY ? C/W FEW QT-CARB-CHL VN @ 10/30E FROM ,1MM TO 2.5CM & GEN BARREN	10	0.4	58	3	38	66	70	<0.5	<1	<2	3



160416RP NE EXT SZ AT CARB/MAFIC DYKE CONTIG WITH & E OF 160415RP SEE DETAILED MAP	FW OF QTZ CPY BREC ZONE: PANEL OVER 1 M	ALT VOL BREC W: GR - RD BRN, MOD LIM F: GRY	FI-MED, GRAN - MASS, STRONG QTZ-CHL-SER-PY ALT (2-3% SER, 3-5% CHL, MAINLY QTZ), 3-5% DISSEM PY, TR CPY	<5	1	106	10	22	60	70	<0.5	1	2	3
160417RP NE EXT SZ ABOUT 50 M N OF 160401RP SEE DETAILED MAP	SAMP TAKEN AS AVAIL PANEL OVER 3X1 M	CPY QTZ BREC ZONE W: GR, BRN F: GR, GRY	50% FI GR SIL MATRIX, 3-10% BLEB - FI CPY, 3 % FI DISSEM PY FROZEN BRECCIA: 50% ANG TO RD FRAGS OF WH, GRY QTZ BAR, PATCHES HEM, JASPER, LARGE (TO 10 CM) SIL FRAGS, CRUSTI TO COLOFORM TEXTS, WITH BANDED QTZ-CARB, HEM, 1-2% CPY IN BREC, MIN TO 4% PY AS FI DISSEM	600	1.6	7880	6	34	102	40	<0.5	<1	<2	6
160419RP NE EXT SZ ABOUT 50 M N OF 160401RP SEE DETAILED MAP	SAMP TAKEN AS AVAIL PANEL OVER 1X5 M	CPY QTZ BREC ZONE W: GR, BRN F: GR, GRY	AS 160417, BUT MOR VARIABLE, INCL FROZEN BREC (40%), & QTZ PY CARB CHL BREC (40%) GEN 3-5% CPY, 3-7% PY, PY GEN IN MATRIX MAT	1300	2.8	13100	14	26	194	30	<0.5	1	<2	7
160420RP NE EXT SZ ABOUT 25 M N OF 160401RP SEE DETAILED MAP	SAMP TAKEN AS AVAIL PANEL 2X2 M	FROZEN QTZ BREC W: BRN- RD BRN, MOD LIM F: GRY	50% FI, GRAN QTZ, PY MATRIX, C/W DISSEM, BLEBS CPY & FI PY 40% ANG FRAGS OF WH, GRY QTZ, PATCHES HEM, JASPER, LARGE (TO 18 CM) FRAGS SIL FRAGS WITH DISSEM, BLEBS CPY 10 % VEINS INTERGROWTHS MIN BARITE, QTZ, CALCITE OVERALL 2-4% CPY, 3% PY - GEN IN MATRIZ	755	3.8	9410	38	32	400	10	<0.5	1	2	19
160424RP W CT BREC ZONE S OF 160401RP 160402RP	SAMP TAKEN AS AVAIL PANEL 2X20 M	FROZEN BREC W: GRY, BRN F: GRY, WH, PK	FI - APHAN, SUG TEXT, V WELL SIL, WITH GRY/BLK QTZ, OF HEM, & COMPRISING 50-80% OF ROCK; BREC FRAGS FR MM TO 20 CM AS ANG HEM TO WH CAL/ QTZ TO ROUND (VESICLE FILS?) TO CO BLEBS TO BLD BAR TO DISSEM OF CPY - LOC MAL STAIN, 2-4% CPY OVERALL, 1-2% PYR; TO EAST BREC BECOMES QTZ SER CHL +/- CARB MATRIX WITH FRAGS & STWK OF SAME MAT C/W PY TO 5% AND BLEB CPY	715	3.2	13900	22	24	154	10	0.5	1	<2	1



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Invoice No. : 19927482  
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Account : KIV

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## CERTIFICATE OF ANALYSIS A9927482

SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
P160400	205 226	1180	1 < 0.01		9	1220	21	1.94	< 2	8	23 < 0.01	< 10	< 10	140	< 10	216	
P160401	205 226	1385	22 < 0.01		4	Intf*	17	2.40	2	< 1	49 < 0.01	< 10	< 10	25	< 10	32	
P160401A	225 229	250	< 1 < 0.01		2270	530	6	3.43	< 2	< 1	17	0.13	< 10	< 10	51	< 10	74
P160402	205 226	200	121 < 0.01		21	250	40	3.17	< 2	< 1	23 < 0.01	< 10	< 10	11	< 10	18	
P160403	205 226	260	23 < 0.01		5	330	17	3.77	< 2	< 1	25 < 0.01	< 10	< 10	13	< 10	18	
P160404	205 226	255	26 < 0.01	< 1	330	16	4.05	2	< 1	13 < 0.01	< 10	< 10	13	< 10	24		
P160411	205 226	480	5 < 0.01		9	320	17	2.63	2	1	22 < 0.01	< 10	< 10	17	< 10	46	
P160412	205 226	335	6 < 0.01		4	400	10	1.27	< 2	< 1	14 < 0.01	< 10	< 10	12	< 10	60	
P160413	205 226	390	13 < 0.01		3	400	11	1.20	< 2	1	13 < 0.01	< 10	< 10	13	< 10	60	
P160414	205 226	390	3 < 0.01		4	390	12	1.60	< 2	< 1	43 < 0.01	< 10	< 10	11	< 10	44	
P160415	205 226	490	3 < 0.01		3	390	3	1.33	< 2	< 1	66 < 0.01	< 10	< 10	8	< 10	38	
P160416	205 226	145	3 < 0.01		2	430	10	1.25	2	< 1	10 < 0.01	< 10	< 10	8	< 10	22	

CERTIFICATION:



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SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
P160400	205 226	< 5	1.4	4.00	158	< 10	50	< 0.5	< 2	0.56	< 0.5	28	26	274	9.71	10	< 1	0.22	10	1.91
P160401	205 226	495	3.0	1.42	288	< 10	30	< 0.5	Intf*	1.53	0.5	8	61	>10000	5.26	< 10	1	0.29	< 10	0.64
P160401A	225 229	145	4.2	3.35	< 2	80	10	< 0.5	2	2.29	< 0.5	158	271	6060	7.53	< 10	2	0.01	< 10	2.51
P160402	205 226	110	3.8	0.71	310	< 10	20	< 0.5	2	0.36	< 0.5	22	72	872	3.68	< 10	1	0.26	< 10	0.16
P160403	205 226	90	2.2	0.93	292	< 10	10	< 0.5	2	0.36	< 0.5	11	84	1290	4.39	< 10	1	0.40	< 10	0.15
P160404	205 226	125	1.8	1.02	390	< 10	10	< 0.5	2	0.24	< 0.5	9	55	1015	5.29	< 10	1	0.31	< 10	0.21
P160411	205 226	55	5.4	1.05	258	< 10	40	< 0.5	< 2	0.37	0.5	12	86	2940	4.07	< 10	< 1	0.34	< 10	0.27
P160412	205 226	10	0.8	0.82	92	< 10	120	< 0.5	< 2	0.09	0.5	7	40	96	3.18	< 10	< 1	0.31	10	0.16
P160413	205 226	25	1.0	0.91	112	< 10	90	< 0.5	< 2	0.23	< 0.5	7	41	235	3.18	< 10	< 1	0.31	< 10	0.23
P160414	205 226	45	0.6	0.94	194	< 10	60	< 0.5	< 2	0.40	< 0.5	7	28	131	3.17	< 10	< 1	0.30	< 10	0.28
P160415	205 226	10	0.4	0.65	66	< 10	70	< 0.5	< 2	0.44	< 0.5	6	27	58	2.38	< 10	< 1	0.25	< 10	0.19
P160416	205 226	< 5	1.0	0.59	60	< 10	70	< 0.5	< 2	0.15	< 0.5	7	25	106	2.26	< 10	1	0.23	< 10	0.15

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**A9928592**

SAMPLE	PREP CODE	Cu %
P160401	212 --	1.14

27



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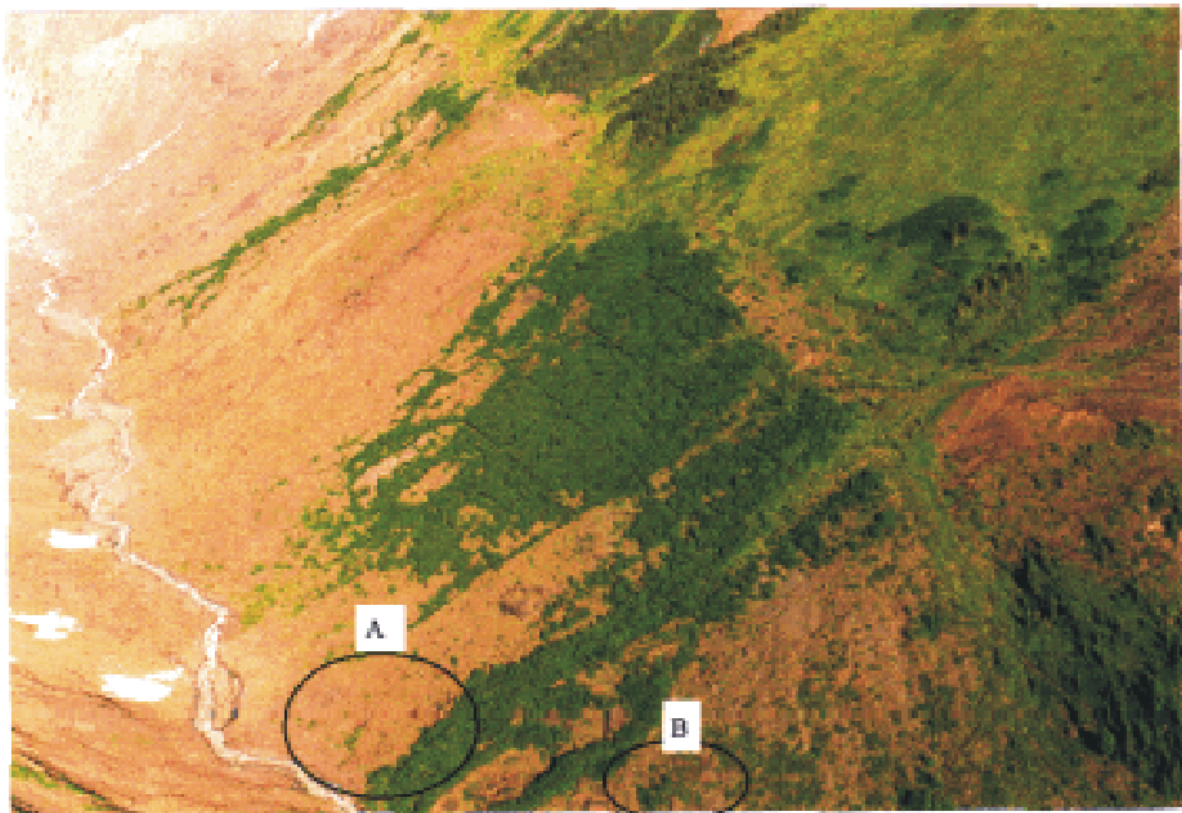
21 27

crystal tuff, often with the same general intense alteration package (limonite +/- jarosite/alunite, manganese, hematite; quartz-pyrite +/-sericite, +/-carbonate, +/-barite); or, moderate to weak alteration package (quartz-carbonate-pyrite-epidote-chlorite) that is found proximal to many showings on the South, Yellow Bowl and Fall Creek Target Areas.

The South Zone deposit and NEXT Zone mineralization are intensely silicified and brecciated. The South Zone deposit mineralization is highly fractured, and in addition to the multiphase quartz breccia veins, fracture fillings of pyrite, and to a lesser extent hematite and carbonate, are common in and proximal to the South Zone deposit. These components are far less apparent in the NEXT Zone, but the intense fracturing, mainly hematite and some chlorite fracture fillings as veins, lenses, stock works, in addition to the multiphase quartz breccia vein component, are present at the MEXT.

An interpretation of the main structural fabric of the South Zone area is presented on the overlay of Photo 5 (p. 36). The northeast trending NEXT Fault appears to be an important structural component, and may be conducive to the development of ore shoot morphologies. The fault may have displaced the main South Structure out into the Todd Creek Valley. Such a possibility should be ascertained via the measurement of the amount of displacement of the altered hanging wall rocks on the NEXT Fault. Such information is critical to the further exploration of the NEXT Zone and the South Zone Structure to the north of the NEXT Zone.





**PHOTO 25A: NORTH ZONE, GRID C: A ZONE LOCATED JUST WEST OF TAG ALDERS, NORTH OF FALL CREEK; B ZONE LOCATED TO EAST**

### **9.3.E. 1999 NORTH ZONE DRILL TARGET PRIORITIZATION:**

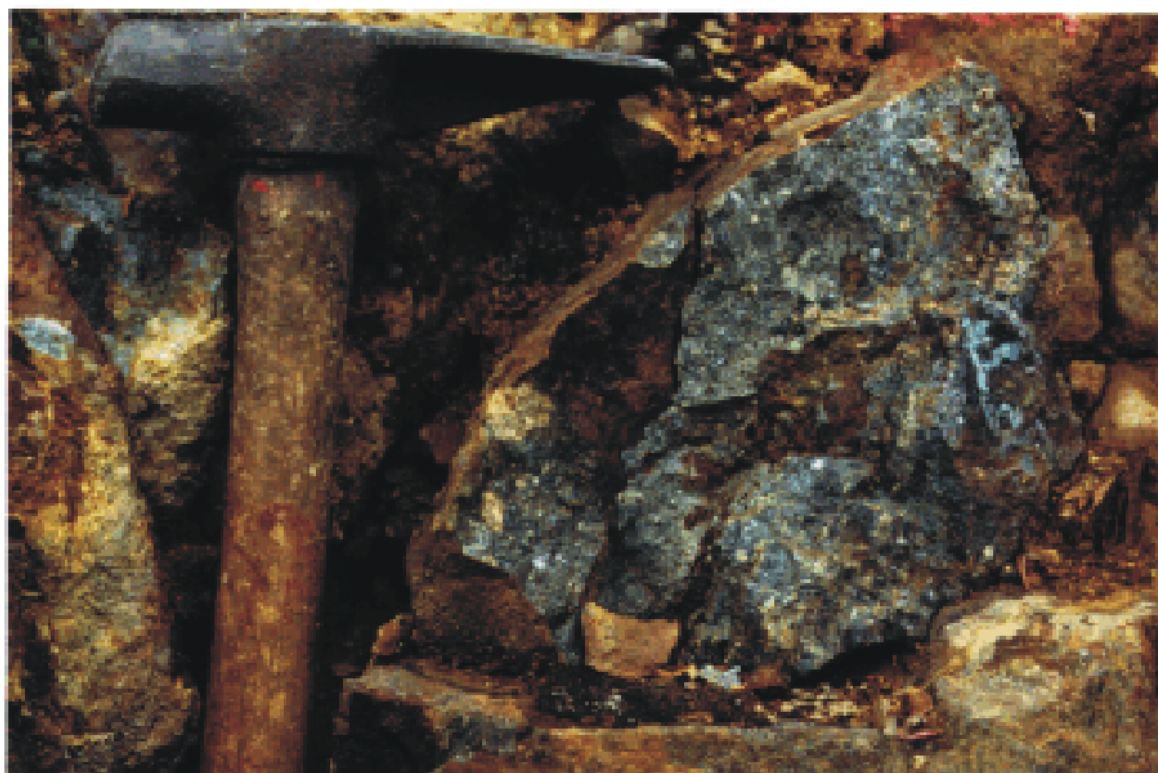
#### **9.3.E.i. B ZONE (MAPS 8, 10; PHOTOS 25A-29; TABLE A4; SECTIONS DDHBZ00-01, 02):**

Activities in 1999 on the B Zone entailed the follow-up of the Semi Massive Sulfide Zone (SMSZ; Photo 26), which was discovered in the last hour of the 1997 program (Molloy, 1997). The B Zone is hosted by coarse volcanic breccias, agglomerates and interbedded tuffs, which are generally weakly altered (limonite-jarosite/alunite-quartz-carbonate-epidote +/- hematite). The vein system generally comprises a number of steeply westerly dipping, northwest to north trending quartz breccia stringers, veins and stock works, and can attain widths up to over 10 m. The zone contains minor carbonate and is often well sulfidized, with local concentrations ranging up to 30% chalcopyrite and 60% pyrite, as disseminations, veins and stock works. The breccia veins fragments are often banded – an indication of multiphase, hydrothermal activity.

In 1994, Geofine examined a 60 m strike length of the B Zone north of Fall Creek (Molloy 1994; Map 8A). Composite samples returned up to 2.21 g gold/t, 1130 ppm arsenic, and 2.28% copper over a 6.5 m width. A sample (86720) of a large, angular, massive sulfide boulder returned 4.49 g gold/t and 6.03% copper. Two samples of altered (silicified, chloritized, sericitized) semi massive sulfide float boulders had gold contents of 4.70 and 4.80 g/t, and copper contents of 1.63% and 0.74%, respectively. One stream sample (86709), taken at the north limit of the Geofine sampling, returned 94 ppb gold and 775 ppm copper, indicating further potential to the north.

In 1997, attempts to follow the B Zone to the northwest with the C Grid were generally frustrated by dense tag alders and boulder terrain. However, walking the zone out along strike to the northwest gave some further indications of potential. For example, on L208+50N at about 210+00E, a variety of float boulders mineralized with chalcopyrite veins, stringers and disseminations returned the following values:

SAMPLE NO. :	GOLD (g/t)	SILVER (g/t)	COPPER (%)	LEAD (ppm)	ZINC (ppm)	ARSENIC (ppm)
598844	2.20	35	8.65	65	60	1020
598845	0.48	16	3.26	60	190	180
598846	0.39	9	1.48	85	85	180
598847	0.95	13	2.61	75	80	1210



**PHOTO 26: SEMI MASSIVE SULFIDE ZONE (SMSZ; PYRITE, CHALCOPYRITE) AT FAULT CONTACT, B ZONE**



**PHOTO 27:  
SMSZ FAULT (AT PICK HEAD)  
AND SMSZ BELOW HANGING  
WALL BRECCIAS**

Sixty meters farther to the northwest on the along strike extension of the B Zone, a large gossan zone emerges out of the boulder terrain, between L208+50N and L209+00N. A surface chip sample (598842) of the oxidized and silicified pyroclastic rocks had no metal contents of interest. However, on the vertical south face of the gossan, a semi-massive lens or zone (Semi Massive Sulfide Zone) of pyrite and chalcopyrite was discovered, and the initial 2.5 m chip sample returned 1.4 g gold/t, 16 ppm silver, 3.02% copper, 60 ppm lead, 495 ppm zinc and 60 ppm arsenic.

The in situ mineralization is located on a rock face enveloped by dense tag alders. Follow-up of the target (Photo 26) in 1999 involved the cutting out and the stripping of the showing (Photo 27); ascertaining its morphology (Photo 28); detailed chip sampling (Photo 27; Map 10); and the installation of two drill lines (Photo 29); and, the spotting of two diamond drill holes (DDHBZ00-01, 02, Appendix B; Sections DDHBZ00-01, 02, Appendix C).

The SMSZ trends about 45° across (perpendicular to) the B Zone, and dips steeply to the northwest under hanging wall rocks. Based on the limited exposure, the zone generally has a sharp fault contact with altered (limonite-quartz-pyrite) hanging wall and footwall breccias (Map 10; Photos 27, 28). However, as shown on Map 10, there is some apparent irregularity in the contact, with weaker mineralization appearing to transgress both the hanging wall and footwall (samples 160523RP and 160480RP, respectively). The zone ranges up to about over 2.5 m in width and has been traced to date for about 14 m. To the west and to some extent the south, the zone disappears under overburden. To the east and to the north, the zone apparently plunges and dips, respectively, under coarse volcanic breccias. The zone comprises massive to semi massive, coarse to fine pyrite, chalcopyrite, and malachite, usually as matrix material to white and blue, angular to rounded quartz breccia fragments (Photo 26).

The SMSZ was evaluated with 23 rock samples (Map 10; Table A4). Individual panel samples have gold contents ranging up to 1.39 g/t, and copper contents to 3.5%. Seven panel samples from the SMSZ have average gold contents of 0.81 g/t, and average copper contents of 1.5%. A sample of an angular subcrop boulder located southeast of the last eastern exposure of the SMSZ returned 0.83 g gold/t and 1.81% copper (Map 10). The host rocks are characterized by generally weakly anomalous gold and lead values; and, some weakly anomalous silver values. Samples from the SMSZ, in addition to gold and copper contents, have elevated silver values (up to 18.6 ppm); anomalous zinc and cadmium contents; highly anomalous arsenic values; and, some anomalous molybdenum contents.

A sediment sample (160519SS) from a small spring located about 15 m southwest of the SMSZ (Map 10) returned anomalous copper (74 ppm) and weakly anomalous lead, zinc and cadmium. A composite sample (160518RF; Map 8A) from a sulfidized boulder located about 70 m to the northwest of the SMSZ, on a wide gossan zone indicative of the extension of the B Zone, returned 140 ppm gold, 0.13% copper, 792 ppm lead and 0.17% zinc.



**PHOTO 28: SMSZ AT SMSZ FAULT;  
LOOKING NORTHEAST**



**PHOTO 29: BACKSIGHT, DRILL  
SIGHT, FORESIGHT,  
DDHBZ00-01,  
LOOKING 45°**

TABLE A4

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE B ZONE, SMS SHOWING  
i. ROCK SAMPLES ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, LOCATION		NAME, COLOUR:	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160477RP, B ZONE N GRID, SMS SHOWING: W END OF ZONE - SEE DETAILED MAP	PANEL FROM HW OF 160491 RP OVER 2X1 M	ALT M VOL BREC; W:ORG BRN GRY F: GRY PK	FI GR, V WEL SIL, SER, 10 GEN LIM ON SUR, SUG TEXT, PINK PAT K ALT, FI DISSEM PY, SOME DISSEM, SCAT CPY 3-4% SULF OVERALL, MAINLY QTZ		0.2	11	18	34	10	90	<0.5	<1	<2	3
160478RP, B ZONE N GRID, SMS SHOWING: W END OF ZONE - SEE DETAILED MAP	PANEL FROM FW OF 160491RP OVER 1X1 M	ALT M VOL BREC; W:ORG BRN GRY F: GRY BLK BRN	FI GR, V WEL SIL, SER, 25 GEN LIM ON SUR, SUG TEXT, PINK PAT K ALT, FRAC C/W QTZ CARB VEINS AND STRING, DISSEM PY 2-3%, LOC SOOTY PY IN CHL PATCHES, LOC MN STAINED, UP TO 90% QTZ		0.6	148	40	214	24	80	2.5	<1	<2	5
160479RP, B ZONE N GRID, SMS SHOWING: W END OF ZONE - SEE DETAILED MAP	PANEL FROM HW OVER 1 M	ALT M VOL BREC; W:ORG BRN BLK F: GR BRN	FI GR, V WEL SIL, SER, 10 GEN LIM ON SUR, SUG TEXT, PINK PAT K ALT, FRAC C/W QTZ CARB VEINS AND STRING, SOME UP TO 3 CM WIDE, WITH QTZ CARB VEINS ON MARGINS, ANKERITIC BREC VEIN MATIC WITH SIL GR QTZ FRAGS UP TO 2 CM; GR SIL PHENOS AND ROCK WITH UP TO 5% DISSEM PY, TR CPY.		<0.2	9	8	20	10	100	<0.5	<1	<2	3
160480RP, B ZONE N GRID, SMS SHOWING: W END OF ZONE - SEE DETAILED MAP	PANEL FROM FW OF 160492RP OVER 2X1 M	ALT M VOL BREC; W:ORG BRN BLK F: GR GRY	FI-CO, SOM QTZ PHEN 260 WELL CHL LOC; CHL IN FRACS C/W BLEBS, DISSEM CPY; SOOTY CHL WITH CPY, PY V WEL SIL, SER, GEN LIM ON SUR, SUG TEXT, PINK PAT K ALT, LOC WELL CARB, SOM LARG BLEBS PY, CPY 4-5% SULF OVERALL		4.4	6330	38	222	152	60	2	<1	<2	7
160481RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	PANEL FROM FW OF 160493RP OVER 2X3 M	AS 160480RP		25	0.4	239	20	132	26	90	0.5	<1	<2	7

160482RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	PANEL FROM SMS ZONE UP TO 1 M WIDE SAMP OVER up to 1.2X2 M	SMS ZONE  W: ORG BRN F: GR GRY	FI CHL SULF MATRIX WH QTZ PHENOS AND GR GRY PHENOS SOME BRECC WITH RI D K ALT; SULF MAINLY CPY, DISSEM AND LARG BLEBS; VUGS WITH MAL STAIN; UP TO 40% SULFS; MIN PY AND ASPY	1080	11.8	12400	80	398	626	10	5.5	<1	<2	12
160483RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	PANEL FROM SMS ZONE UP TO .8M WIDE SAMP OVER up to .8 X2 M	SMS ZONE & ALT VOL BREC W: ORG BRN F: GR GRY	AS 160482RP, BUT FADES TO 160484 MAT FADE OUT MAY BE FAULTED OFF AT E END OF SAMPLE, OR MAY BE ZONE PLUNG E UNDER HANGING WALL ROCKS	580	7.2	5010	24	308	114	50	4.5	<1	6	7
160484RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	PANEL FROM IMED E OF SMSZ APPAR FADE OUT UP TO 1X2 M	ALT VOL BREC W: ORG BRN BLK F: GR GRY	FI - APHAN - CO - PORPH; WEL SIL, MOD CARB, WEL FRAC, WK - MOD SER, MAIN QTZ PHENOS IN SIL MATRIX, 1-4% DISSEM PY, TR CPY	10	0.2	26	14	24	8	100	<0.5	<1	2	6
160485RS, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	SAMPLE FROM RUB SUBCROP ALONG STR PROJ OF SMS	ALT VOL BREC W: ORG BRN BLK F: GR GRY ORG BRN	FI - APHAN SUG - VUG - EARTH TEXT; WEL SIL, SER, MAINLY GRY GR FUSCH QTZ CAV 2-3% DISSEM PY, TR CPY	10	0.2	32	10	58	8	110	<0.5	<1	2	3
160486RS, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	COMP OVER 2 M FROM RUB SUBCROP ON E EXT OF B ZONE ABOUT 7 M N OF 160485RP	ALT VOL BREC W: ORG BRN BLK F: GR GRY	AS 160485RS, WELL FRAC, CHL IN FRACS AND PATCHES, APPROX 85% QTZ, 10% CHL, 5% DISSEM PY FRACS AT 292/82W	5	<0.2	7	6	86	8	120	<0.5	<1	2	3
160487RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	SAMPLE OVER 2 M CONTIG & E OF 160486RS	AS 160486RS BUT WITH 2-3% DISSEM PY		<5	<0.2	9	8	102	10	180	<0.5	<1	2	2
160488RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	PANEL OVER 2 M CONTIG & E OF 160487RP	AS 160486RS BUT VAR: SOM PORPH TEXT, CAV QTZ CARB PHENOS IN CHL, SIL MATRIX; GEN VUG 3-5% DISSEM SULFS, MAINLY PY, SOME SECTS WELL CHL, SOME WELL SIL WITH GRY QTZ & SER		5	<0.2	13	20	156	16	80	1	<1	2	4

160489RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP E END OF SHOWING	PANEL OVER 2X1 M CONTIG & E OF 160488RP	ALT VOL BREC W:ORG BRN BLK	FI, GRAN TO PORPH 15 TEXT; SIL MATRIX, SOM QTZ, AMPH, CARB PHENOS TO 0.5 CM, SOM WEL CHL SECTS; SOME WELL SIL SECTS: UP TO 5% DISSEM PY & SOOTY PY COATS; LIM & HEM ON FRACS; SOM QTZ ANK BREC VEINS TO 3 CM CW AMPHIB, QTZ FRAGS & DISSEM PY, TR CPY, SPHAL	<0.2	24	12	118	10	90	0.5	<1	2	4	
160490RP, B ZONE N GRID, SMS SHOWING: W END OF ZONE - SEE DETAILED MAP	PANEL FROM HW OVER 2 M NORTH OF 160477RP	ALT M VOL BREC; W:ORG BRN BLK F: GRY BLK	FI - PORPH,WELL SER, 10 WELL SIL, LOC WELL CARB, AS COATINGS, VEINLTS, SOM AREAS WELL CHL; RED K ALT PATCHES; SOME LARG 1.5 CM QTZ PHENOS, MIN DISSEM PY, TR CPY	<0.2	20	8	202	10	110	1.5	<1	<2	2	
160491RP, B ZONE N GRID, SMS SHOWING: W END OF ZONE - SMS ZONE SEE DETAILED MAP	PANEL FROM W EXT OF SMS Z 1X0.7 M	SMSZ  W:ORG BRN BLK F: GRY BLK	FI - PORPH,WELL SER, 1010 WELL SIL, GEN QTZ PHENOS IN SULF NET TEXT - SULFS FI CPOY TO BLEBS & PATCHES, SOM SOOTY UP TO 60% SEMI MASS SULFS, GEN 20-30% SOM WEL FRAC, C/W QV C/W DISSM CPY; MAL AZUR STAIN ON FRACS	6.4	17300	64	352	654	<10	6	<1	2	18	
160492RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP W OF & CONTIG WITH 160493RP	PANEL FROM SMS ZONE OVER 1X2 M	SMSZ  W: ORG BRN F: GR GRY	FI SULF CHL MATRIX 1390 WITH QTZ AND BREC QTZ FRAGS, SOME GOOD NET TEXT, FI CPY, BLEBS CPY SOOTY PY AROUND FRAGS; SOME LARG ANG QTZ FRAGS + 10 CM, SOM LARG CPY BLEBS, WELL FRAC WITH MAL STAIN ON FRACS; UP TO 60% SULFS, MAINLY CPY	14.8	23900	72	164	1000	<10	3	<1	<2	4	
160493RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP CONTIGOUS WITH & E OF 160492RP	PANEL FROM SMS ZONE OVER 1X1 M	AS 160492RP		1155	18.6	35000	40	646	738	10	12.5	<1	2	11



160518RF, B ZONE N GRID, @ 209+45N, 209+00E, ABOUT 70 M N OF SMS ZONE, B ZONE	COMP OF MIN FLT	ALT VOL BREC W: ORG BLK F: GRY WH PK	FI - APHAN MATRIX, C/W QTZ CARB PHENS & BREC FRAGS & QTZ ANK STWKS; MATRIX (60%) IS SIL, CHL, C/W RD PATCHES K ALT, LOC ANK, & FRACS C/W DISSEM CPY; MATRIX & FRAGS C/W DISSEM CPY, PY, SPHAL, GAL	140	7.4	1315	792	1740	254	20	23.5	<1	6	43
160520RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	PANEL FROM HW ABOVE 160492RP OVER 2 M X 2 M	ALT VOL BREC W: ORG BRN F: GR GRY	FI, SUG TO GRAN TEXT; WELL SIL, WELL SER, 2-3% DISSEM PY, WELL FRAC, MN AND LIM ON FRACS	10	0.2	10	12	16	12	70	<0.5	<1	<2	3
160521RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	PANEL FROM HW ABOVE 160493RP OVER 2 M X 2 M & CONTIG & TO E OF 160520RP	AS 160520RP, C/W SOM VUG TEXT, SOME QTZ FRAGS TO 2 CM, 1-2% DISSEM PY NB THIS SECTION INCL LENS OF SMS - SEE SAMPLE 160523RP		10	0.2	11	20	32	12	90	<0.5	<1	<2	2
160522RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	PANEL FROM HW ABOVE 160482RP OVER 2 M X 2 M & CONTIG & TO E OF 160521RP	AS 160520RP, C/W SOM PORPH SECTIONS- QTZ PHENOS IN SIL, & SOM SER MATRIX; SOM PY VNS TO 0.5 CM, SOM CARB AND QTZ CARB FRAC FILLINGS IN MM RANG; SOM FUSCH QTZ LENSES; GEN 2-3% DISSEM PY		10	0.2	13	20	128	22	80	1	<1	<2	2
160523RP, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	PANEL FROM SMS LENS IN HW IN LOW SECT OF SAMP 160521RP 0X1X0 OVER 2 M	SMSZ W:ORG BRN F: GRY GR	FI-CO, GR TO PORPH TEXT; CHL & SIL MATRIX C/W PHI NOS & BREC FRAGS OF BLU, GRY QTZ; FI SOOTY SULFS TO DISSEM & BLEBS OF CPY, PY; SOM VNS, VNLETS TO 0.5M CPY, GEN 40% QTZ, 40% CHL, 20% SULFS, MAINLY CPY	220	4.4	5810	44	552	166	40	8	<1	8	6

160524RS, B ZONE N GRID, SMS SHOWING: SEE DETAILED MAP	SAMPLE OVER 2X2 CONTIG & E & S OF 160489RP	ALT VOL BREC W:ORG BRN BLK F: GR GRY	FI, SUG TO GRAN TEXT; WELL SIL, WELL FRAC LOC, HEM, LIM ON FRACS; 3-4% PY AS DISSEM & AS MIN VEINLETS; QTZ VEINS TO 0.5 CM IN FRACS; TRENDS 295/80W ON FRACS; SOM QTZ ANK BREC VEINS TO 3 CM CW AMPHIB, QTZ FRAGS & DISSEM PY, TR CPY, SPHAL	10	0.2	11	14	48	12	70	<0.5	<1	<2	7
160525RS B ZONE ABOUT 8 M SE OF 160484RP SE OF FADE OUT OF SMS	SAMPLE OF ANG RS ABOUT 20X 35 CM	SMS W: ORG BRN F: GRY WH	FI-CO, PORPH TO BREC TEXT, GRY QTZ PHENOS & FRAGS TO 2 CM; SOME SULF BDS, DISSEM; VUGS CW MAL, BOR, AZUR; SULFS MAINLY CPY UP TO 35%; SOM WEL DEVELOPED NET TEXT AROUND	830	9.8	18100	36	234	622	10	1.5	<1	8	9

TABLE A4

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE B ZONE @ THE SMS ZONE  
 ii. STREAM SEDIMENT SAMPLES ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

NUMBER, LOCATION:	FLOW DIR	MATERIAL, GRAIN SIZE. COLOUR COMP	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160519SS N GRID, ABOUT 10 B ZONE MW & 10 M S OF SAMP 160519ROC IN FW OF SMSZ	B ZONE SPRING FL S	ORG MUCK 35% ORG MUCK BRN 65% SILT	<5	<0.2	74	8	112	2	290	1.5	1	2	1



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## CERTIFICATE OF ANALYSIS

A9925241

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
P160477	208 226	10	0.2	0.68	10	< 10	90	< 0.5	< 2	0.94	< 0.5	9	44	11	3.08	< 10	< 1	0.47	< 10	0.04
P160478	208 226	25	0.6	1.72	24	< 10	80	< 0.5	< 2	0.95	2.5	13	41	148	5.57	< 10	< 1	0.41	< 10	0.32
P160479	208 226	10	< 0.2	0.70	10	< 10	100	< 0.5	< 2	2.22	< 0.5	8	58	9	2.98	< 10	< 1	0.42	10	0.37
P160480	208 226	260	4.4	2.68	152	< 10	60	< 0.5	< 2	0.89	2.0	12	44	6430	9.51	10	< 1	0.27	< 10	0.69
P160481	208 226	25	0.4	1.73	26	< 10	90	< 0.5	< 2	0.62	0.5	12	51	239	5.93	< 10	< 1	0.40	< 10	0.33
P160482	208 226	1060	11.8	1.87	626	< 10	10	< 0.5	Intf*	0.39	5.5	14	57	>10000	11.90	< 10	< 1	0.10	< 10	0.38
P160490	208 226	10	< 0.2	2.13	10	< 10	110	< 0.5	< 2	2.30	1.5	11	36	20	5.25	< 10	< 1	0.53	10	0.35
P160491	208 226	1010	6.4	2.05	654	< 10	10	< 0.5	Intf*	0.40	6.0	15	69	>10000	12.00	< 10	< 1	0.08	< 10	0.41
P160492	208 226	1390	14.8	1.48	1000	< 10	< 10	< 0.5	Intf*	0.44	3.0	11	65	>10000	13.25	< 10	< 1	0.08	< 10	0.40
P160493	208 226	1155	18.6	1.82	738	< 10	10	< 0.5	Intf*	0.10	12.5	10	56	>10000	13.60	< 10	< 1	0.11	< 10	0.37
P106500	214 229	1700	2.6	3.96	144	< 10	< 10	< 0.5	< 2	2.76	0.5	188	27	8800	9.72	10	< 1	0.04	< 10	1.84

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Invoice No. : I9925241  
P.O. Number : TOK  
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## CERTIFICATE OF ANALYSIS

A9925241

SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm	Cu %
P160477	208 226	495	3	0.01	1	700	18	2.24	< 2	1	27	< 0.01	< 10	< 10	14	< 10	34	-----
P160478	208 226	830	5	< 0.01	3	570	40	2.13	< 2	3	30	< 0.01	< 10	< 10	32	< 10	214	-----
P160479	208 226	1160	3	< 0.01	2	640	8	2.14	< 2	1	44	< 0.01	< 10	< 10	14	< 10	20	-----
P160480	208 226	1220	7	< 0.01	3	430	38	3.64	< 2	4	23	< 0.01	< 10	< 10	41	< 10	222	-----
P160481	208 226	725	7	< 0.01	3	610	20	2.51	< 2	3	21	< 0.01	< 10	< 10	29	< 10	132	-----
P160482	208 226	810	12	< 0.01	5	Intf*	80	>5.00	< 2	4	11	< 0.01	< 10	< 10	35	20	398	1.24
P160490	208 226	1390	2	< 0.01	3	730	8	1.48	< 2	3	55	< 0.01	< 10	< 10	42	< 10	202	-----
P160491	208 226	820	18	< 0.01	5	Intf*	64	>5.00	2	3	16	< 0.01	< 10	< 10	25	30	352	1.73
P160492	208 226	740	4	< 0.01	6	Intf*	72	>5.00	< 2	2	12	< 0.01	< 10	< 10	18	40	164	2.39
P160493	208 226	370	11	0.01	6	Intf*	40	>5.00	2	4	6	< 0.01	< 10	< 10	34	60	646	3.50
P106500	214 229	1635	1	0.05	65	120	< 2	2.50	< 2	6	10	0.04	< 10	< 10	53	10	140	-----

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Invoice No. : I9926486  
P.O. Number : TBZ  
Account : KIV

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A9926486

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
P160483	205 226	580	7.2	1.70	114	< 10	50	< 0.5	< 2	0.71	4.5	12	48	5010	7.45	< 10	< 1	0.24	< 10	0.55
P160484	205 226	10	0.2	0.83	8	< 10	100	< 0.5	< 2	1.06	< 0.5	10	40	26	3.33	< 10	< 1	0.52	10	0.08
P160485	205 226	10	0.2	0.82	8	< 10	110	< 0.5	< 2	1.91	< 0.5	11	50	32	3.42	< 10	< 1	0.43	10	0.34
P160486	205 226	5	< 0.2	1.40	8	< 10	120	< 0.5	< 2	0.80	< 0.5	11	42	7	4.34	< 10	< 1	0.41	10	0.25
P160487	205 226	< 5	< 0.2	1.65	10	< 10	180	< 0.5	< 2	0.87	< 0.5	9	36	9	4.10	< 10	< 1	0.48	10	0.27
P160488	205 226	5	< 0.2	1.45	16	< 10	80	< 0.5	< 2	0.71	1.0	12	43	13	4.93	< 10	< 1	0.44	10	0.22
P160489	205 226	15	< 0.2	1.40	10	< 10	90	< 0.5	< 2	1.07	0.5	10	42	24	4.75	< 10	< 1	0.38	10	0.23
P160518	205 226	140	7.4	1.78	254	< 10	20	< 0.5	< 2	2.94	23.5	15	73	1315	8.12	< 10	< 1	0.03	10	0.60
P160524	205 226	10	0.2	0.97	12	< 10	70	< 0.5	< 2	1.00	< 0.5	11	72	11	3.95	< 10	< 1	0.66	10	0.07
P160525	205 226	830	9.8	1.76	622	< 10	10	< 0.5	Intf*	0.05	1.5	12	51	>10000	11.50	< 10	< 1	0.08	< 10	0.42
P160525A	214 229	1430	2.6	3.50	112	< 10	< 10	< 0.5	< 2	3.07	< 0.5	188	21	7740	9.45	< 10	< 1	0.03	< 10	1.89

Anto



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Project: TBZ  
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Page Number : 1-B  
Total Pages : 1  
Certificate Date: 27-AUG-1999  
Invoice No. : 19926486  
P.O. Number : TBZ  
Account : KIV

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## CERTIFICATE OF ANALYSIS

A9926486

SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
P160483	205 226	1055	7	< 0.01	1	430	24	3.54	6	4	16	< 0.01	< 10	< 10	34	< 10	308
P160484	205 226	425	6	< 0.01	1	740	14	2.70	2	2	22	< 0.01	< 10	< 10	18	< 10	24
P160485	205 226	1395	3	< 0.01	1	690	10	2.09	2	3	43	< 0.01	< 10	< 10	17	< 10	58
P160486	205 226	935	3	< 0.01	1	700	6	1.71	2	3	21	< 0.01	< 10	< 10	40	< 10	86
P160487	205 226	835	2	< 0.01	< 1	670	8	1.05	2	3	21	< 0.01	< 10	< 10	33	< 10	102
P160488	205 226	1050	4	< 0.01	1	770	20	1.99	2	3	23	< 0.01	< 10	< 10	32	< 10	156
P160489	205 226	820	4	< 0.01	1	660	12	2.00	2	2	23	< 0.01	< 10	< 10	33	< 10	118
P160518	205 226	1330	43	< 0.01	1	160	792	3.35	6	3	95	< 0.01	< 10	< 10	38	< 10	1740
P160524	205 226	965	7	< 0.01	1	750	14	2.63	< 2	2	40	< 0.01	< 10	< 10	24	< 10	48
P160525	205 226	435	9	< 0.01	< 1	Intf*	36	>5.00	8	3	4	< 0.01	< 10	< 10	28	< 10	234
P160525A	214 229	1525	3	0.03	73	160	< 2	2.43	6	6	9	0.02	< 10	< 10	51	< 10	126

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## CERTIFICATE OF ANALYSIS

A9926789

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
P160520	205 226	10	0.2	0.62	12	< 10	70	< 0.5	< 2	1.03	< 0.5	10	43	10	3.07	< 10	< 1	0.40	10	0.11
P160521	205 226	10	0.2	0.74	12	< 10	90	< 0.5	< 2	0.77	< 0.5	9	35	11	3.45	< 10	< 1	0.42	10	0.09
P160522	205 226	10	0.2	1.49	22	< 10	80	< 0.5	2	1.14	1.0	10	34	13	5.63	< 10	< 1	0.38	< 10	0.31
P160523	205 226	220	4.4	3.04	168	< 10	40	< 0.5	26	0.99	8.0	14	42	5810	11.15	10	< 1	0.15	< 10	0.74
P160558	205 226	15	15.0	0.05	72	< 10	230	< 0.5	2	0.02	5.5	3	130	288	1.50	< 10	3	0.01	< 10	< 0.01
P160559	205 226	< 5	2.6	0.88	48	10	350	< 0.5	< 2	0.21	1.5	5	50	26	1.24	< 10	< 1	0.52	10	0.03

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P.O. Number :  
Account : KIV

## CERTIFICATE OF ANALYSIS

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SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
P160520	205 226	455	3 < 0.01		1	680	12	2.48	< 2	1	20 < 0.01	< 10	< 10	14	< 10	16	
P160521	205 226	395	2 < 0.01	< 1		690	20	2.44	< 2	1	18 < 0.01	< 10	< 10	19	< 10	32	
P160522	205 226	985	2 < 0.01	< 1		680	20	2.50	< 2	3	29 < 0.01	< 10	< 10	44	< 10	128	
P160523	205 226	1095	6 < 0.01	< 1		320	44	3.72	8	5	20 < 0.01	< 10	< 10	63	< 10	552	
P160558	205 226	770	< 1 < 0.01		1	20 >10000		0.49	18	1	307 < 0.01	< 10	< 10	11	< 10	326	
P160559	205 226	205	3 < 0.01		1	900	62	0.40	< 2	4	94 < 0.01	< 10	< 10	25	< 10	142	

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Certificate Date: 27-AUG-1999  
Invoice No. : I9927116  
P.O. Number : TBZ  
Account : KIV

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A9927116

SAMPLE	PREP CODE		Cu %									
P160525	212	--	1.81									

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P.O. Number : TBZ  
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## CERTIFICATE OF ANALYSIS

A9926485

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
P160519	201 202	< 5	< 0.2	0.49	2	< 10	290	< 0.5	< 2	3.00	1.5	3	1	74	1.10	< 10	1	0.11	10	0.20



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Invoice No. : I9926485  
P.O. Number : TBZ  
Account : KIV

## CERTIFICATE OF ANALYSIS

A9926485

SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
P160519	201 202	325	1	< 0.01	1	1090	8	0.39	2	3	158	0.01	< 10	< 10	16	< 10	112

#### **9.3.E.ii. PROPOSED B ZONE DIAMOND DRILL HOLES:**

**DDHBZ00-01 (Photo 29; Map 10; Section DDHBZ00-01) was spotted to test the B Zone just north, and parallel to the SMSZ. The SMSZ is postulated to be an emanation from a much larger target associated with the B Zone and its northwest strike. DDHBZ00-02 (Map 10; Section DDHBZ00-02) was spotted to test the down dip extension of the SMSZ and to be drilled along, and parallel to the B Zone. In view of the current interpretation of the SMSZ, the hole is a lower priority than DDHBZ00-01.**

#### **9.3.E.iii. INTERPRETATION OF THE B ZONE:**

**The significance of the SMSZ is not its current size or grade, but the implications it could have for a semi-massive ore shoot or shoots located on the B Zone. Sub orthogonal fabrics (east e.g., Fall Creek Fault and parallel fractures; and north e.g., some stringer veins and fractures; and northwest e.g., A Zone, B Zone; and northeast e.g., SMSZ Fault) are postulated to exist on the North Zone. The structural junctions could entail ore shoot morphologies similar to those discussed in Section 9.3.A.ii. with regard to the South Zone deposit.**

**The SMSZ is interpreted to be an indication of a much larger target associated with the northwest striking, westerly dipping B Zone. The B Zone has never been tested with diamond drilling or trenching, and there is fairly substantial evidence that a semi massive sulfide component, with ore grade gold and copper values is associated with it. The B Zone is also a wide target, which trends toward the polymetallic, Orange Mountain Target Area. The expected metal zoning (i.e., copper/gold distal to zinc/lead proximal) along the B Zone, towards Orange Mountain, is suggested by sample 160518RF, referenced above.**

**The North Zone drill targets are currently a lower priority than those of the Amarillo Zone and the South Zone deposit. However, given the proximity of the North Zone to Orange Mountain (Map 2A), DDHBZ00-01 (Section DDHBZ00-01, Appendix B) is recommended as an initial test of the B Zone's potential for hosting a significant gold/copper ore shoot. Ideally, the target would be drilled in conjunction with the recommended drill testing of the A Zone (see Section 9.3.F).**

**9.3.F. 1999 NORTH ZONE DRILL TARGET PRIORIZATION: A ZONE (MAPS 8, 9; PHOTO 30; TABLE A5; SECTION DDHAN00-01; VERTICAL LONG SECTION 10050N):**

**9.3.F.i. A ZONE HISTORIC WORK:**

Follow-up work was carried out in 1999 on the A Zone to evaluate the area of a 1997 rock sample (598647) which returned 44.81 g gold/t and 3.37% copper over 1 m (Map 9). For Noranda, relative to the South Zone deposit, the A Zone was the second highest priority target on the Todd Creek Property.

As reported in Section 5, the A Zone consists of two parallel veins separated by a quartz-chalcopyrite-hematite stringer zone. The veins are usually banded and brecciated and contain up to 20% angular fragments of the pyroclastic host. Locally, pyrite can range up to 20%. Malachite and azurite staining is common on the surface of the veins, along with hematite and limonite. Chlorite and sericite are found near the veins, with chlorite much more prevalent than sericite. Silicification is restricted to the immediate vicinity of the veins.

The A Zone is up to 30 m wide and was traced over a strike length of 320 m. To the south, the veins pinch down to 10-20 cm in well-developed stock works, but have been traced across Fall Creek, where they widen, and disappear under overburden. To the north, the zone disappears under glacial till. Historically (1986-1988), Noranda established a grid on the A Zone and carried out trenching, with results ranging up to 3.8 g gold/t across 14.3 m. A total of 1266 m of diamond drilling in 11 holes was also carried out over a strike length of 150 m, along with a Mise-a-la-masse down hole geophysical survey. Significant drill results are summarized below and are shown on Vertical Longitudinal Section 10050N in Appendix C:

	3.47 g gold/t	0.75% copper	over 31.85 m
inc.	14.47 g gold/t	2.06% copper	over 5.95 m
	2.83 g gold/t	0.58% copper	over 1.95 m
	3.95 g gold/t	0.22% copper	over 2.00 m
	3.43 g gold/t	0.73% copper	over 1.70 m
	6.21 g gold/t	0.60% copper	over 1.75 m

The geophysical survey was inconclusive, possibly due to poor contacts, steep dips and topography. Noranda's interpretation of the drill results (Baerg, 1989) is included below:

In general the drilling indicates that the A Zone is discontinuous along strike and down dip. The zone appears to consist of several irregular pods or lenses ranging in width from trace to 29.75 m. The wide intersection encountered in Hole 22 could not be duplicated in Hole 23, below Hole 22, or in step out holes on either side, Holes 22, 21, 24 and 25. Hole 40, which was drilled back toward Holes 22 and 23, appears to have confirmed that the zone is actually dipping vertical or steeply south westerly and that the zone narrows, at least locally, with depth. The mineralization encountered toward the bottom of Hole 40

appears to be either a separate, new zone, which does not appear to have a surface expression, or a splay off the main zone.

Holes 41-42 and 43-44 were further step outs along strike to test the continuity of the mineralization. Holes 43-44 confirmed that the mineralized structure, albeit somewhat narrower, continues to the north.

In 1990, Noranda drilled Hole 90-49 (Vertical Longitudinal Section 10050N) on an IP anomaly located about 85 m south of Fall Creek that appears to represent the along strike extension of the A Zone. The hole returned anomalous copper, gold, and zinc values over a core length of 16.4 m including 3.37 g gold/t and 0.27% copper over a 2.85 m core length. The intersection and an IP anomaly located 100 m further south suggest the A Zone has a strike length of at least 500 m.

During the 1994 Phase 1 program, Geofine re-habilitated the 1988 Noranda grid on the A Zone and carried out reconnaissance geological mapping and limited sampling on and in the vicinity of the trenches, as a confirmation of the apparent importance of the target. As indicated on Map 9, 48 rock and dump samples were collected that had average gold, arsenic, copper, lead and zinc contents of 1683 ppb, 537 ppm, 3125 ppm, 130 ppm and 466 ppm, respectively. Individual composite samples returned 11.5 g gold/t, 3.1% copper and 0.18% zinc over 1.5 m.

In 1997, the southern extension of the A Zone, south of Fall Creek was located and detailed sampling was carried out (Map 8A). The southern extension has an apparent 40 m sinistral offset along the interpreted Fall Creek Fault and has been traced for over 200 m south of Fall Creek. The A Zone, as exposed in the historical trenches and faces, is a classic, multiphase quartz barite breccia vein, complete with stringer zones, stockwork zones, brecciated zones, and a central quartz - chalcopyrite vein.

Samples from the southern section of the zone shown on Map 8A (samples 598584 - 598593) returned up to 2.08 g gold/t, 2.74% copper, 610 ppm zinc, 16 ppm silver, 210 ppm arsenic, 225 ppm lead, 5 ppm cadmium and 520 ppm barium over 1 m (sample 598588). Contiguous chip samples (598584-598593) over a 13.5 m width averaged 330 ppb gold, 4000 ppm copper, 481 ppm zinc, 2.8 ppm silver, 77 ppm arsenic, 78 ppm lead, 3.4 ppm cadmium and 882 ppm barium, including 3 m averaging 2.16 g gold/t, 1.28% copper, 1485 ppm zinc, 8.7 ppm silver, 107 ppm arsenic, 260 ppm lead, 13.3 ppm cadmium and 3100 ppm barium.

Samples (598569, 598571-598578) from an exposure of the zone located about 20 m northwest of the last sample line referenced above contained up to 1.17 g gold/t, 9320 ppm copper, 2084 ppm zinc, 5 ppm silver, 450 ppm arsenic, 310 ppm lead, 15 ppm cadmium and 3640 ppm barium over 0.5 m (sample 598574). Contiguous chip samples (598569, 598571-598576) over a 7.5 m width averaged 400 ppb gold, 2200 ppm copper, 1036 ppm zinc, 1.9 ppm silver, 278 ppm arsenic, 77 ppm lead, 8 ppm cadmium and 1085 ppm barium, including 2.5 m averaging 890 ppb gold, 4724 ppm copper, 1686 ppm zinc, 3.4 ppm silver, 780 ppm arsenic, 156 ppm lead, 13 ppm cadmium and 5520 ppm barium.

Samples (598595 - 598599, 598751) from an exposure of the zone located about 50 m northwest of the last sample line referenced above, contained up to 1.98 g gold/t, 9100 ppm copper, 710 ppm zinc, 3 ppm silver, 330 ppm arsenic, 130 ppm lead, 5 ppm cadmium and 320 ppm barium over 1 m (sample 598596). Contiguous chip samples (598595 - 598599, 598751) over a 9.5 m width averaged 460 ppb gold, 3956 ppm copper, 244 ppm zinc, 1.4 ppm silver, 109 ppm arsenic, 33 ppm lead, 1.1 ppm cadmium and 118 ppm barium.

Chip samples (598802 - 598815; Maps 8A, 9) were taken from an oxidized outcrop on the north shore of Fall Creek, located about 50 m west and 70 m north of the last referenced samples. The outcrop is composed of silicified and pyritized, coarse pyroclastic rocks containing quartz barite veins and stock works, mineralized with disseminated chalcopyrite. Individual samples contained up to 2 g gold/t, 4710 ppm copper, 86 ppm zinc, 3.2 ppm silver, 342 ppm arsenic, 16 ppm lead, 0.50 ppm cadmium and 40 ppm barium over 0.75 m (sample 598811). The 14 continuous chip samples collected over a 24.3 m width averaged 140 ppb gold, 519 ppm copper, 91 ppm zinc, 0.36 ppm silver, 53 ppm arsenic, 12 ppm lead, 0.05 ppm cadmium and 76 ppm barium, including 5.35 m averaging 440 ppb gold, 1509 ppm copper, 82 ppm zinc, 1 ppm silver, 97 ppm arsenic, 10 ppm lead and 91 ppm arsenic.

As shown on Map 9, a 1 m chip sample (598647) from the A Zone at about 208+05N, 207+35E, returned 44.81 grams gold/t and 3.28% copper. The malachite rich sample was taken as an attempt to ascertain the association of the high-grade gold component that was historically intersected by Noranda drilling. The sample was taken about 80 m north of the last referenced line of chip samples.

#### **9.3.F.ii. A ZONE: 1999 ACTIVITIES (MAPS 8A, 8B, 9, 9A; PHOTO 30; TABLE A5; SECTION DDHAN00-01; VERTICAL LOGITUDINAL SECTION 10050N):**

In 1999, the outcrop from which the 1997 sample 598647 was taken, was resampled, with an expanded width (Map 9A, Photo 30). Sample 160505RCH returned 44.18 g gold/t and 3.30% copper over 2 m (Table A5). The next available outcrop (Map 9A), located about 2 m south of sample 160505RCH, was evaluated with three contiguous samples: 160508RP returned 1.58 g gold/t and 1.20% copper over 2 m; 160506RP returned 20.14 g gold/t and 0.48% copper over 2 m; and 160507RP returned 0.63 g gold/t and 0.28% copper over 2 m. A third outcrop (Map 9A), located about 8 m to the south of sample 160505RCH, was evaluated with 8 panel samples, all of which have anomalous gold and copper contents, ranging up to 285 ppb and 0.23%, respectively. All of the samples referenced above have weakly anomalous silver contents; weakly to strongly anomalous lead contents (values up to 556 ppm); anomalous to strong zinc values (values up to 0.13%); mainly weakly to strongly anomalous arsenic values; weakly anomalous cadmium and antimony values; and, weakly to strongly anomalous molybdenum values (Table A5).





**PHOTO 30: A ZONE AT 1999 SAMPLE 160505RCH**

TABLE A5

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE A ZONE, NORTH GRID  
ROCK SAMPLES ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, LOCATION	TYPE	NAME, COLOUR:	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160501RP, A ZONE OVER 2 M ABOUT 8 M SOUTH OF HIST SAMPLE 598647RCH SEE DETAILED MAP	PANEL OVER 2 M	ALT VOL BREC W: ORG BRN BLK F: GRY-GR, BRN WH	FI-APHAN, SUG TEXT, STR SIL, WK SER, LOC WELL FRAC, LIM, HEM ON FRACS; 2% TR CPY, MIN MAL IN VUGS AND FRACS	45	0.4	62	30	110	18	90	0.5	<1	2	7
160502RP, A ZONE OVER 2 M AND CONTIGUOUS WITH AND TO E OF 160501RP SEE DETAILED MAP	PANEL OVER 2 M	AS 160501, BUT WITH CARB HEM FRACS AND STWK, WK TO MOD DEVEL, 1-2% DISSEM PY AND CPY, SOME VNLETS		35	0.4	75	16	642	14	120	8	<1	6	6
160503RP, A ZONE OVER 2 M AND CONTIGUOUS WITH AND TO THE E OF 160502RP SEE DETAILED MAP	PANEL OVER 2 M	AS 160501RP		90	0.6	304	20	238	8	90	4.5	<1	4	6
160504RP, A ZONE OVER 1 M AND CONTIGUOUS WITH AND TO THE E OF 160503RP SEE DETAILED MAP	PANEL OVER 1 M	CHL-BREC W: ORG BRN BLK F: GRY WH	FI TO FRAGS, GR TO EARTHY TO BREC TEXT, FI CHL MATRIX CAV 15-20% FI CPY & PY; SOM VNLETS & VUGS CAV MAL & LIM & MN ON FRACS; ALSO, ABOUT 40% OF SAMP CARB QTZ LENSES AND FRAGS IN CHL MATRIX GEN BARREN OF SULFS; FRAGS UP TO 4 CM	265	1.4	1315	48	218	16	90	4.5	<1	4	4
160505RP, A ZONE OVER 2 M AT LOC OF HIST SAMPLE 598647RCH SEE DETAILED MAP	PANEL OVER 2 M	BREC VEIN F: GRY-GR, BRN WH W: ORG BRK BLK	FI-CO-PORPH, GRAN PORPH TO BREC TEXT V WELL FRAC, WELL SIL, LOC WELL CHL, WELL OXID, INCL LIM, MN COATINGS; SOME BRECC SECTS CAV NET TEXT SULFS, LOC 40 - 50% SULFS- MAINLY CPY AS BLEBS & FI NET TEXT; MAL, ANK AND MN ON FRACS NO VG OBSERVED	44180	8.4	33000	6	116	172	20	0.5	<1	8	16

160506RP, A ZONE OVER 2 M ABOUT 2 M S OF E END OF 160505RP SEE DETAILED MAP	PANEL OVER 2 M	BREC VEIN F:GRY-GR, BRN WH W: ORG BRN BLK	GEN CHL VAR OF 160505RP: FI GR, V WELL CHL, GEN 5-7% DISSEM CPY, LOC 15% CPY AS CO BLEBS, COATINGS, 5% ANK, QTZ VEINS	20140	3.4	4750	26	174	144	40	2.5	<1	8	38
160507RP, A ZONE OVER 2 M CONT TO E OF 160506RP SEE DETAILED MAP	PANEL OVER 2 M	AS 160506RP BUT WITH CO CARB, QTZ BREC FRAGS UP TO 2 CM; SOME V WELL BREC SECTS, GEN 2-3% DISSEM PY		630	3.2	2790	32	294	108	20	5	<1	11	74
160508RP, A ZONE OVER 2 M CONT TO W OF 160506RP SEE DETAILED MAP	PANEL OVER 2 M	ALT VOL BREC W:ORG BRN BLK F: GR GRY	COMPOSED OF ABOUT 5% 160505RP MATERIAL, AS LENSES BUT POSSIBLE 160505R MATERIAL INSITU AT W END OF SAMPLE, BUT MAINLY WELL SIL, WELL SER, MOD CARB MATERIAL WITH 2-3% SULFS INCL CPY, SOME SECTS WELL CHL SIMILAR TO 160506RP	1575	5.8	12000	24	318	280	40	7	<1	8	63
160509RP, A ZONE OVER 1.5 M AND CONTIGUOUS WITH AND TO E OF 160504RP SEE DETAILED MAP	PANEL OVER 1.5 M	CHL-BREC W:ORG BRN BLK F: GRY WH	FI TO FRAGS, GR TO EARTHY TO BREC TO PORPH TEXT; FI CHL MATRIX, LOC 5-7% DISSEM PY, CPY SOM BAR VN TO 2 CM, BAR QTZ FRAGS TO 1.5 CM; SOM BAR QTZ VNLETS, STRING ; OVERALL 80% CHL, 15% QTZ BAR, 5% SULFS	40	0.6	257	28	160	22	210	0.5	<1	6	9
160510RP, A ZONE OVER 2 M AND CONTIGUOUS WITH 1.5 M GAP W OF SAMPLE 160509RP - NO SAMPLE TAKEN IN 1.5 M GAP	PANEL OVER 2 M	AS 160509RP, BUT WITH MORE QTZ VNS AND VNLETS; LOC 2-4% DISSEM CPY, PY; VNS TO 2 CM GEN 1-2% CPY, PY		265	5.4	2370	556	1300	58	40	13	<1	8	13
160511RP, A ZONE OVER 2 M AND CONTIGUOUS WITH 1604510RP	PANEL OVER 2 M	ALT VOL W: ORG, BRN BLK F: GR, GRY	FI GR, SUG TO SILKY TEXT, WELL CHL, MOD SIL, MM FRACS C/W CARB, LIM: 2-3% DISSEM PY, CPY; GEN 64% CHL, 30% QTZ, 3% CARB, 3% SULFS	25	1	65	58	264	58	80	1.5	<1	4	6

160512RP, A ZONE  
OVER 2 M AND  
CONTIGUOUS WITH  
1604511RP

PANEL  
OVER 2 M

AS 160509RP BUT MOR SIL,  
WITH BET DEVEL QTZ, BAR  
VNS AND STR; WK STWK,  
LOC 10% CPY, PY AS FI  
DISSEM IN CHL - SIL  
MATRIX AND IN QTZ, BAR  
STRS; SOME CPY VNS TO 0.5 CM,  
WELL FRAC; AT EDGE OF  
A ZONE CRK - ZONE CONT,  
BUT NOT SAMPLED

245	4.6	1815	170	834	28	70	6.5	<1	8	15
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## CERTIFICATE OF ANALYSIS A9926488

SAMPLE	PREP CODE	Au ppb FA+AA	Au FA g/t	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm
P160500A	214 229	1495	-----	2.6	3.92	130	< 10	< 10	< 0.5	< 2	3.24	< 0.5	201	24	8400	10.15	< 10	< 1	0.03	< 10
P160501	205 294	45	-----	0.4	1.47	18	< 10	90	< 0.5	< 2	0.70	0.5	8	40	62	5.18	< 10	< 1	0.27	< 10
P160502	205 294	35	-----	0.4	1.77	14	< 10	120	< 0.5	< 2	2.49	8.0	7	30	75	5.52	< 10	< 1	0.25	< 10
P160503	205 294	90	-----	0.6	2.05	8	< 10	90	< 0.5	< 2	0.89	4.5	9	24	304	5.99	< 10	< 1	0.19	< 10
P160504	205 294	265	-----	1.4	2.43	16	< 10	90	< 0.5	< 2	6.76	4.5	11	15	1315	6.62	< 10	< 1	0.14	< 10
P160505	205 294	>10000	44.18	8.4	3.50	172	< 10	20	< 0.5	Intf*	0.82	0.5	13	5	>10000	11.50	10	< 1	0.09	< 10
P160506	205 294	>10000	20.14	3.4	2.81	144	< 10	40	< 0.5	< 2	1.05	2.5	20	22	4750	9.06	< 10	< 1	0.19	< 10
P160507	205 294	630	-----	3.2	3.97	108	< 10	20	< 0.5	< 2	1.00	5.0	14	18	2790	10.75	10	< 1	0.07	< 10
P160508	205 294	1575	-----	5.8	2.05	280	< 10	40	< 0.5	Intf*	1.43	7.0	10	17	>10000	7.82	< 10	< 1	0.19	< 10
P160509	205 294	40	-----	0.6	3.04	22	< 10	210	< 0.5	< 2	5.01	0.5	14	11	257	6.98	< 10	< 1	0.16	< 10
P160510	205 294	265	-----	5.4	3.85	58	< 10	40	< 0.5	< 2	1.20	13.0	13	21	2370	8.75	< 10	< 1	0.11	< 10
P160511	205 294	25	-----	1.0	3.71	22	< 10	80	< 0.5	< 2	0.72	1.5	16	21	65	7.94	< 10	< 1	0.17	< 10
P160512	205 294	245	-----	4.6	3.47	28	< 10	70	< 0.5	< 2	2.42	6.5	12	19	1815	8.19	< 10	< 1	0.12	< 10

*Anta*



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SAMPLE	PREP CODE	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
P160500A	214 219	2.10	1635	4	0.04	76	160	< 2	2.34	2	7	11	0.03	< 10	< 10	58	< 10	136
P160501	205 294	1.04	725	7	0.01	< 1	590	30	1.83	2	3	31	< 0.01	< 10	< 10	31	< 10	110
P160502	205 294	2.05	1880	6	0.01	< 1	550	16	1.63	6	3	117	< 0.01	< 10	< 10	35	< 10	642
P160503	205 294	1.54	1180	6	0.01	< 1	580	20	2.13	4	4	28	< 0.01	< 10	< 10	45	< 10	238
P160504	205 294	4.60	3930	4	< 0.01	< 1	530	48	2.21	4	9	122	< 0.01	< 10	< 10	101	< 10	218
P160505	205 294	2.10	985	16	< 0.01	< 1	Intf*	6	> 5.00	8	8	21	< 0.01	< 10	< 10	104	< 10	116
P160506	205 294	1.66	1165	38	< 0.01	2	670	26	3.29	8	8	21	< 0.01	< 10	< 10	93	< 10	174
P160507	205 294	2.40	1455	74	< 0.01	< 1	600	32	3.03	6	11	26	< 0.01	< 10	< 10	137	< 10	294
P160508	205 294	1.61	1295	63	< 0.01	< 1	Intf*	24	3.78	8	3	35	< 0.01	< 10	< 10	37	< 10	318
P160509	205 294	4.06	3390	9	< 0.01	< 1	660	28	1.46	6	10	114	< 0.01	< 10	< 10	131	< 10	160
P160510	205 294	2.76	1325	13	< 0.01	1	640	556	1.91	8	8	29	< 0.01	< 10	< 10	93	< 10	1300
P160511	205 294	2.52	1250	6	< 0.01	4	880	58	1.47	4	9	19	< 0.01	< 10	< 10	106	< 10	264
P160512	205 294	3.19	2120	15	< 0.01	1	640	170	2.14	8	8	36	< 0.01	< 10	< 10	82	< 10	834



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**A9927117**

SAMPLE	PREP CODE	Cu %
F160505	212 --	3.30
F160508	212 --	1.20

RL 27

**Based on the rationale discussed below, Hole DDHAN00-01 (Maps 9, 9A; Section 10097E; Vertical Long Section 10050N) was spotted to evaluate the A Zone below the gold showing.**

### **9.3.F.iii. INTERPRETATION OF A ZONE:**

**In view of the prospective geochemical signature; the 1999 ore-grade gold and copper values, and those intersected by Noranda drilling; and, the conclusions from the historic data i.e.,**

- a) The A Zone is over 500 m long and is open to the north and south.**
- b) The mineralization encountered toward the bottom of Hole 40 appears to be either a separate, new zone, which does not appear to have a surface expression or a splay off the main zone (Baerg, 1989). The zone has never been followed up.**
- c) The data verifies the existence of postulated sub orthogonal fractures (east-west e.g., samples 86080, 86088, 86087; and northwest e.g., samples 86091, 86076), generally with interesting gold mineralization (Molloy, 1994).**
- d) Holes 41-42 appear to indicate that to the south, at least locally, the tenor and grade of the mineralization increases with depth (Baerg, 1989). Noranda DDH88-41 (Vertical Longitudinal Section 10050N, Appendix C) returned 1.23 g gold/t and 0.27% copper over 21.3 m, including 1.51 g gold/t and 0.34% copper over 16.8 m.**

**The A Zone, in Geofine's interpretation, has the potential to host a substantial gold/copper ore shoot. The drilling of DDHAN00-01, as spotted in the field (Map 9A, Section 10097E), is thus recommended to intersect Vertical Long Section 10050N (Appendix C) to the south of, and vertically between the Hole 41-42 intersections.**



**9.3.G. 1999 NORTH ZONE DRILL TARGET PRIORIZATION: NORTHEAST ZONE (MAP 8A; PHOTOS 31, 32; TABLE A6; SECTION DDHNEZ00-01):**

**9.3.G.i. NORTHEAST (NE) ZONE HISTORIC WORK:**

The NE Zone outcrops on L210+00N (Map 8A; Photo 31) and was discovered in 1997. The target is located near a cliff, which terminated the eastern extension of the most northern grid lines; and, which is interpreted to reflect a northwest trending fault. The NE Zone was first indicated by quartz breccia sub crop boulders (analyses up to 160 ppb gold, 1960 ppm copper, 304 ppm zinc, 240 ppm arsenic).

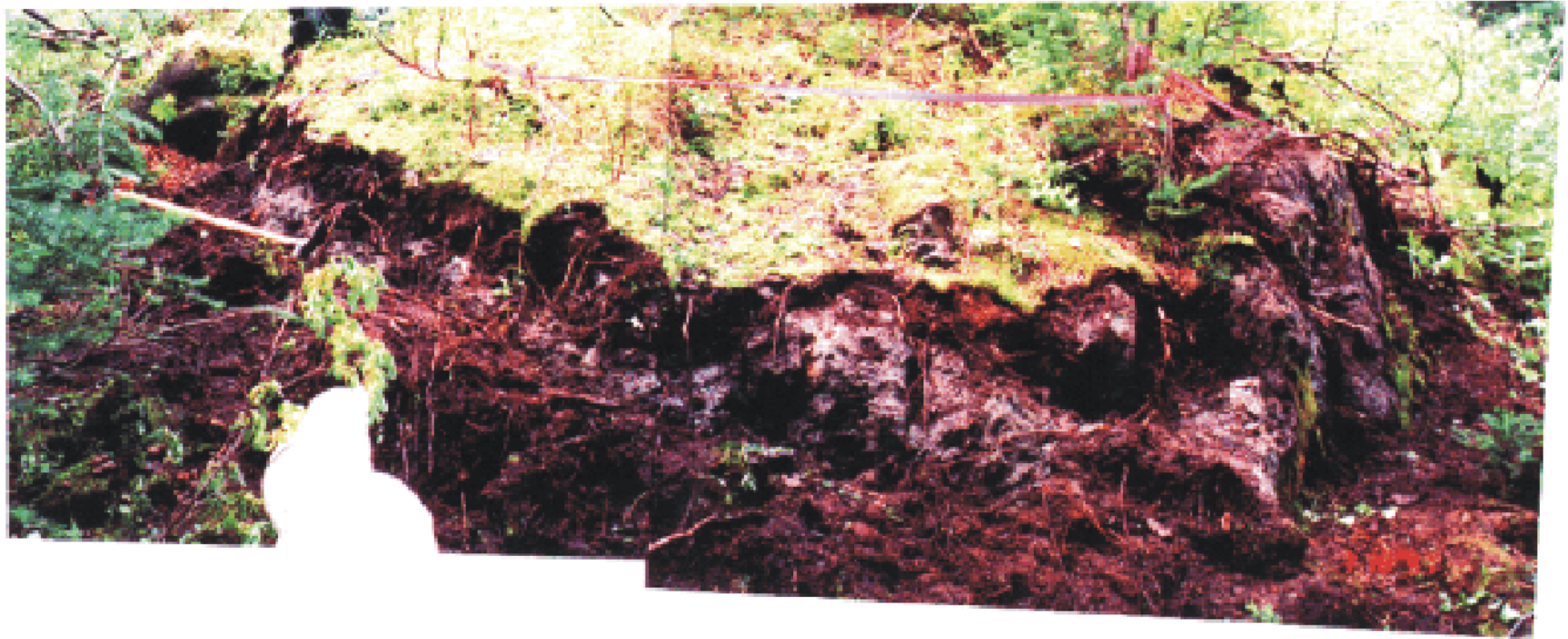
The zone was located by stripping off thin overburden to reveal silicified, fractured and brecciated pyroclastic rocks hosting quartz breccia veins with chalcopyrite stringers and disseminations of galena (Photo 32). A 2 m sample (Photo 32) of the outcrop returned 100 ppb gold, 2910 ppm copper, 194 ppm zinc, 4 ppm silver, 118 ppm arsenic and 3870 ppm lead. A contiguous 3 m sample to the west returned 30 ppb gold, 2380 ppm copper, 202 ppm zinc, 40 ppm arsenic and 204 ppm lead.

The target has not been explored historically and there is no geological indication of its width or strike extent. To the northwest and southeast, dense vegetation and boulder train mask bedrock exposure. About 150 m to the southeast on L209+00N, there is some indication of the target in sheared, oxidized pyroclastic rocks. Three chip samples all have anomalous zinc contents (up to 1120 ppm), anomalous lead contents (up to 238 ppm), anomalous silver, cadmium, arsenic, and some weakly anomalous gold contents. The 1997 barium, lead and zinc soil geochemistry is the best indication of the potential size of the target: a 400 m strike length that is open for expansion to the southeast, and northwest towards Orange Mountain.

**9.3.G.ii. NORTHEAST ZONE 1999 FOLLOW-UP ACTIVITIES:**

In 1999, prospecting was carried out to the north and south of L210+00N, in an attempt to ascertain the significance and morphology of the NE Zone exposure. As noted above (Photo 31) the area is covered by overburden, which often comprises boulder terrain and glacial-fluvial deposits. No additional outcrops were found. However, a sample (160513RS) of altered (oxidized, silicified, sericitized, pyritized) sub-crop located about 30 m north of the NE Zone contained 20 ppb gold (Map 8A, Table A6). A sub crop sample (160514RS), of oxidized quartz breccia located about 20 m north of the NE Zone, returned a number of very interesting values including 125 ppb gold, 3.4 ppm silver, 0.13% copper, 342 ppm zinc, 254 ppm arsenic, and 438 antimony.

Two sediment samples, one from a small stream about 30 m to the northwest, and one from a sump about 12 m to the northwest, have anomalous copper contents (up to 435 ppm), and weakly anomalous antimony and mercury contents.



**PHOTO 31: NORTHEAST ZONE, LOOKING NORTH**



**PHOTO 32: NORTHEAST ZONE, AT SAMPLE 598658: NOTE  
MALACHITE STAINING, CENTER, BOTTOM RIGHT**

TABLE A6

## ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE NE ZONE, NORTH GRID

## I. ROCK SAMPLES

ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, LOCATION	TYPE	NAME, COLOUR:	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CO ppm	HG ppm	SB ppm	MO ppm
160513RS LOC ABOUT 30 M NORTH OF NE ZONE IN TREE ROOTS	SUBCROP	ALT ROCK: W: BRN LIM, YEL JAR F: BRN GRY	FI-APHAN, SUG - GRAN TEXT, LOC PORPH, WELL FRAC C/W QVS TO 0.5 M, WELL SIL, WELL SER, 2-3% DISSEM PY, TR SPHAL, GAL	20	0.2	12	18	16	40	100	<0.5	<1	2	4
160514RS LOC ABOUT 15 M NORTH OF NE ZONE IN TREE ROOTS	SUBCROP	ALT ROCK: W: BLK ORG, F: RD BRN	FI, VUG EARTHY TEXT, BNDED (UP TO .3 CM) QTZ, HEM SULF BNDS, OXID QTZ BREC FRAGS IN OXID MATRIX. 5-7% PY, TR CPY, SPHAL, GAL PY, TR SPHAL, GAL	125	3.4	1300	14	342	254	140	5	1	438	8
160517RCH W WIDTH EXT OF NE ZONE ON L210 N	CHIP SAMPLE OVER 1.5 M	ALT ROCK: W: BLK ORG, BRN GRY F: BRN GRN BLK ORG BRY	FI, SILKY - GRAN -VUG EARTH TEXT, GEN V WELL CHL, WITH VUG QTZ VEINS & LENSES TO 3 CM; CHL OFTEN STAIN MAL, & C/W CPY, FI SOOTY TO BLEBS SPHAL, MIN GAL SOME WELL SIL SECTS, C/W QTZ LENSES, BREC FRAGS IN MATRIX OF CHL & SURROUND BY SULFS; LOC SMS IN CHL AREAS; UP TO 40% MAINLY CPY; TR GAL, SPHAL	210	5	7200	18	204	92	30	<0.5	<1	12	6

TABLE A6

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE NORTHEAST ZONE, NORTH GRID  
II. STREAM SEDIMENT SAMPLES ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

NUMBER, LOCATION:	FLOW DIR	MATERIAL, GRAIN SIZE. COLOUR COMP	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160515SS N GRID, 15 M NW NE ZONE OF NE ZONE @ 330 DEG	SE INTO DRAIN SUMP	ORG MUCK FI-CL BRN, BLK 20% ORG 80%, CL SILT	<5	0.2	435	10	54	4	560	2	4	8	1
160516SS N GRID, 30 M NW NE ZONE OF NE ZONE @ 330 DEG	SE INTO DRAIN SUMP	ORG MUCKFI-CL BRN, BLK 20% CL 40% ORG 40% SILT	<5	<0.2	52	6	56	38	1060	1.6	2	6	4



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## CERTIFICATE OF ANALYSIS

A9926445

SAMPLE	PREP CODE	Au ppb FA+AA	Cu %	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm
P160513	205 226	20 <	0.01	0.2	0.56	40	< 10	100	< 0.5	< 2	0.14	< 0.5	9	45	12	3.63	< 10	< 1	0.40	10
P160514	205 226	125	0.13	3.4	0.35	254	< 10	140	< 0.5	< 2	0.32	5.0	12	67	1180	7.20	< 10	1	0.24	< 10
P160517	205 226	210	0.72	5.0	2.06	92	< 10	30	< 0.5	< 2	0.20	< 0.5	13	51	6460	8.85	< 10	< 1	0.04	< 10

Notes



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# CERTIFICATE OF ANALYSIS

A9926445

SAMPLE	PREP CODE		Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
P160513	205	226	0.05	85	4 < 0.01	< 1	730	18	2.40	2	1	9 < 0.01	< 10	< 10	18	< 10	16		
P160514	205	226	0.11	1290	8 < 0.01	1	440	14	1.15	438	3	17 < 0.01	< 10	< 10	19	< 10	342		
P160517	205	226	0.52	1395	6 < 0.01	< 1	210	18	2.68	12	3	9 < 0.01	< 10	< 10	47	< 10	204		

CERTIFICATION: \_\_\_\_\_



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## CERTIFICATE OF ANALYSIS

A9926444

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
P160515	201 202	< 5	0.2	0.16	4	10	560	< 0.5	< 2	3.73	2.0	1	1	435	0.43	< 10	4	0.05	< 10	0.07
P160516	201 202	< 5	< 0.2	0.06	38	< 10	1060	< 0.5	< 2	3.84	1.5	7	< 1	52	1.13	< 10	2	0.06	< 10	0.06

*010*





The NE Zone outcrop was dug out for another 1.5 m on its west side. Sample 10617RCH, composed of chloritized and sulfidized quartz breccia with up to 40% chalcopyrite locally, returned 210 ppb gold, 5 ppm silver, 0.72% copper, 92 ppm arsenic, and 12 ppm antimony. The total 6.5 m width sampled to date averages 0.34% copper and 93 ppb gold.

In view of the interesting mineralization and historic and current evidence of the zone having some strike extent (over 400 m), a drill line was cut and DDHNEZ00-01 (Map 10, Section DDHNEZ00-01) was spotted on the NE Zone.

### **9.3.G.iii. INTERPRETATION OF THE NORTHEAST ZONE RELATIVE TO THE B ZONE AND THE A ZONE:**

The North Zone, C Grid area has well-developed, sub-orthogonal structural fabrics (northwest/northeast; west/north) that have interesting implications for mineral exploration. Northwest trending structures such as the A, B and NE Zones contain interesting, gold and copper mineralization hosted by multiphase quartz breccia veins. There is some evidence of metal zoning in the veins, with lead and zinc and some rather elevated antimony becoming apparent along zones' northwest strike towards the important Orange Mountain polymetallic target (see Section 9.3.H; and Molloy, 1997). To a much lesser degree, northeast structures, such as the Semi Massive Sulfide Zone, are also mineralized. West and north structures are generally characterized by quartz-carbonate-epidote-pyrite veins, although the 1997 soil geochemistry suggests there is an east-west control to some of the gold mineralization on the C Grid (Molloy, 1997).

Historic geochemical and geological surveys and structural fabric studies (Molloy 1994, 1997), along with the distribution of vegetation (the structures control the creeks, and alders grow in proximity to the creeks) suggest that there are a number of other northwest structures of interest. It is postulated that a major mineralizing system, the Orange Mountain epithermal system, is responsible for much of the structural fabric and breccia vein fracture fillings. It is postulated that, given the apparent strength of the mineralizing system; some ore-grade drill intersections and surface mineralization; and, a favourable structural fabric conducive to the development of ore shoots, the North Zone has potential for hosting a number of such shoots with significant gold/copper mineralization.

The exploration of the northwest structures towards Orange Mountain by conventional methods becomes somewhat problematic because of the thickening glacial debris to the north. Also, geophysical techniques such as IP are difficult to interpret because of the pervasively altered (pyritized) host rocks. Relative to the South Zone deposit and the Amarillo Zone drill targets, the North Zone, C Grid drill targets are secondary. However, given their proximity to Orange Mountain, it is recommended that their potential should be tested with one or two short holes in the proposed Y2K program (Table 8).

**9.3.H. THE AMARILLO ZONE, ORANGE MOUNTAIN TARGET AREA (MAPS 11, 11A, 11B, 11C; PHOTOS 33-39; TABLE A7; SECTIONS 49+00N, DDHAZ00-03, 50+00N):**

**9.3.H.i AMARILLO ZONE HISTORICAL WORK:**

Geofine's historical activities on the Amarillo Zone (Photo 33) included the recognition of the target via 1994 geological and geochemical surveys (Molloy, 1994). In 1994, Geofine collected 108 samples on the Amarillo Zone, comprising 65 rock, 25 stream sediment and 18 soils. The arsenic, zinc, lead and silver anomalies, along with some copper and gold anomalies, and the presence of fairly ubiquitous quartz barite veins were deemed to constitute an important, polymetallic follow-up target.

In 1997, a 5 km, detailed grid was installed, on which detailed geochemical and geological surveys were carried out, along with reconnaissance surveys to the north, south and east of the grid (Molloy, 1997). The analytical results of the 22 stream sediment analyses (Map 11) were indicative of the strongest polymetallic signature that Geofine has ever encountered in exploration activities the Stewart Camp. The encouraging results were specifically suggestive of some prospective exploration targets i.e., the Western, Eastern and Northern Target (includes Central Target) Areas.

**1997 Soil Geochemistry:**

A total of 130 soil samples was collected at 25 m intervals on the grid. The results, as described below (Molloy, 1997), confirmed the importance of the target as indicated by the stream sediment results:

**i. Silver:**

The silver values range between <2 and 19.8 ppm, and average 6.1 ppm. As outlined by the 2 ppm contour, 94% of the silver values are regarded as anomalous, with an average value of 6.9 ppm. With the exception of the northeast corner of the grid, the 2 ppm contour outlines a large silver anomaly that remains open in all directions.

The 6 ppm contour delineates a northeast trending section of the anomaly, which is over 400 m long, is up to over 200 m wide, and is open to the southwest. A northeasterly trending segment of the anomaly extends for over 200 m off the main anomaly and remains open to the northeast. The segment thickens at the northeastern boundary of the grid and represents the beginning of the main part of the Northern Target Area.

The 6 ppm silver contour envelops 5 lenses of various dimensions that are outlined by the 10 ppm contour. The three largest lenses are associated with the Western Target Area. The two weak Aerodat EM anomalies are located near L49+50N, near the central area of the 6 ppm silver anomaly. The 6 ppm contour also delineates a Central

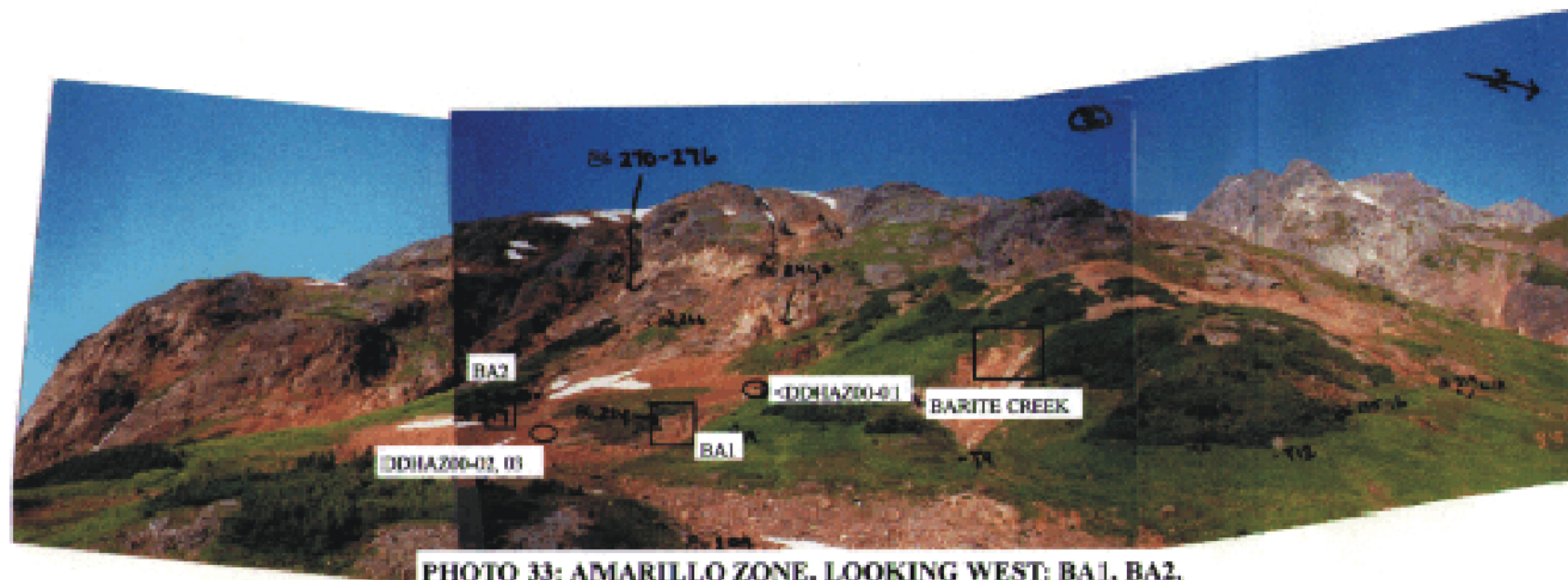


PHOTO 33: AMARILLO ZONE, LOOKING WEST: BA1, BA2,  
BARITE CREEK ZONES; DRILL SITES  
DDHAZ00-01, 02, 03

**Target Area, which is the northeastern extension of the Western Target Area.**

**ii. Lead Soil Geochemistry:**

**As outlined by the 60 ppm lead contour, a substantial lead anomaly shows good correlation with the silver anomaly. Lead values range between 14 and 1510 ppm, and average 292 ppm. Ninety-three percent of the values are encompassed by the 60 ppm contour and have an average value of 312 ppm. The 200 ppm lead contour outlines a pantleg shaped anomaly, open to the west, south and east. The northeast leg shows good correspondence with the northeast trending silver anomaly segment described above. The southern leg of the lead anomaly extends over 400 m to the southeast. The top of the pantleg anomaly correlates with the Western Target Area; the east end of the south leg with the Eastern Target Area; and, the northeastern extension of the northeast leg correlates with the Central Target Area.**

**A northeastern lens outlined by the 200 ppm lead contour is open to the northeast (i.e., the beginning of the main part of the Northern Target Area), and shows good correlation with the northern part of the northeast silver anomaly.**

**iii. Arsenic Soil Geochemistry:**

**Arsenic is regarded by Geofine as a key indicator element in the Stewart Camp for both gold and base metal mineralization. Arsenic values range between <2 to 1720 ppm, and average 249 ppm. As outlined by the 60 ppm contour, a significant arsenic anomaly covers much of the Amarillo Grid and shows good correlation with the silver and lead anomalies. The contour encompasses 78% of the arsenic values, which average 311 ppm. The arsenic anomaly remains open in every direction, and is particularly strong on the south and west sides of the grid. The 200 ppm arsenic contour outlines a pantleg shaped anomaly somewhat similar to the lead pantleg anomaly. The top of the arsenic anomaly, except for weaker arsenic values on L49+00N, strongly delineates the Western Target Area.**

**iv. Copper Soil Geochemistry:**

**Copper soil values range between 7 and 444 ppm and average 65 ppm. Using 50 ppm as threshold, 54% of the copper values are anomalous, and average 97 ppm. The copper anomaly is less extensive than the silver, lead or arsenic anomalies, but the 50 ppm copper contour shows good correlation with the 200 ppm lead and arsenic contours. The copper anomaly is rather definitive of the Western, the Eastern, and Central Target Areas, and is somewhat indicative of the Northern Target Area.**

#### **v. Gold Soil Geochemistry:**

The gold values on the Amarillo Grid are generally weak, ranging between <5 to 880 ppb, and averaging 11 ppb. The 10 ppb contour encompasses 39% of the gold values, which average 26 ppb. The main, northeast trending gold anomaly follows the broader, northeast trending copper, lead, silver and arsenic anomalies referenced above. The strongest parts of the gold anomaly, outlined by the 25 ppb contour, are associated with the Western and Eastern Target Areas. There is some indication of the Northern Target Area by the 110 ppb value on the west end of L52+00N; and, some indication of the Central Target Area via the 10 ppb gold contour. Most areas of the gold anomaly remain open for expansion.

#### **vi. Zinc Soil Geochemistry:**

Zinc soil values range between 26 and 2810 ppm and average 216 ppm. The 150 ppm contour includes 57% of the values, which average 306 ppm. The central, somewhat circular section of the zinc anomaly is located on the southern part of the grid, with a northwest trending segment extending beyond the northern boundary of the grid. Zinc is very definitive of the beginning of the Northern Target Area, and, with the exception of low values on L48+00N, is rather indicative of the Western Target Area. Zinc is also fairly indicative of the Eastern and Central Zones, and is suggestive of a new Northeast Zone at the east end of L51+00N.

The best correlation of zinc is with the cadmium anomaly (described below). Otherwise, the southern part of the zinc anomaly shows some good correlation with arsenic, lead, silver and copper. The strongest areas of the zinc anomaly show some flanking correlation to the strongest parts of the gold anomaly, which is often the case in the Stewart Camp. The northeastern extension of the zinc anomaly is particularly interesting with its strong, positive correlation with silver, lead, cadmium, and its partial correlation with copper and arsenic.

#### **vii. Cadmium Soil Geochemistry:**

Cadmium values range between <5 and 53.5 ppm, and average 2.2 ppm. The 1 ppm contour outlines 54% of the values, which average 4 ppm. As referenced above, cadmium shows good correlation with zinc, with regard to the Western, Northern, Central and Eastern Target Areas. Like lead, zinc, and copper, the strongest area of the cadmium anomaly is on the west end of L49+00N.

#### **viii. Barium Soil Geochemistry :**

Barite is rather ubiquitous on the Amarillo Grid and is suggestive of a high level, epithermal system. Barium values range between 70 and 1320 ppm, and average 508 ppm. The 400 ppm contour encompasses 70% of the barium values, which average

615 ppm. As outlined by the 400 ppm contour, the barium anomaly mainly occupies the central portion of the Amarillo Grid (Western and Central Target Areas), but a northeast trending segment includes the strongest component of the anomaly i.e., on L52+00N (the beginning of the main part of the Northern Target Area), and is open to the west and northeast. Other strong areas of the anomaly are located in the Northeast and Eastern Target Area.

Barium shows good correlation with zinc and cadmium, and except for the western corner of the grid, has reasonable correlation with most of the other elements referenced above. In view of the strong correlation with zinc, cadmium, lead and silver, and to some extent, copper and arsenic, the Northern Target Area looks quite prospective.

#### 1997 Rock Geochemistry:

A total of 116 rock samples were collected during the 1997 program (Molloy, 1997). The sample locations and some analytical results, along with the 1994 samples, are shown on Map 11. Some parameters of the analytical results for the 1994 and 1997 rock samples are shown in the following table:

Element:	No. of Samples:	Range:	Average Value:
GOLD	154	<.005-880 ppb	15 ppb
COPPER	154	4-12280 ppm	196 ppm or 117 ppm excluding 1.2% value
ZINC	154	6-130000 ppm	1348 ppm or 508 ppm excluding 13% value
SILVER*	53	<0.2-18.6 ppm	6.2 ppm
ARSENIC	154	2-2300 ppm	112 ppm
LEAD	154	2-23110 ppm	407 ppm or 145 excluding 2.3% and 1.7% values
CADMIUM*	53	<.5->100	10 ppm
BARIUM*	53	10-2880	618 ppm

\* NOT AVAILABLE IN 1994 ANALYSES

The metal contents of the rock samples tend to augment the rationale for the apparent exploration target areas delineated by the stream sediment and soil samples. The results of the soil, stream sediment and rock samples become extremely interesting when the geological setting is referenced. The polymetallic signature is associated with zones of intensely altered and brecciated (silicified, sericitized, baritized, sulfidized, hematized) mafic volcanic and pyroclastic rocks, and remains open in all directions. Ninety percent of the rocks observed in outcrop are intensely altered and three main types of alteration are present (Map 11):

**AL2: silicified, pyritized, +/- sericite**

**AL3: silicified, baritized, pyritized, +/- lead, zinc, copper**

**AL5: silicified, sericitized, carbonatized, +/-barite, +/- pyrite**

With regard to mineralization, there appears to be a good correlation between fine-grained, disseminated pyrite, strong silicification, sericitization +/-carbonate alteration, and the development of barite veining and stock works. Chalcopyrite, sphalerite and galena usually are found within or in close proximity to barite veins and stock works. The most interesting mineralization appears to extend in a broad arc from the central area of South Creek and the Canyon Section of Camp Creek, westward to the southwest area of the grid, and northward across the grid to Middle and North Meadow Creeks.

Based on the favourable parameters described above, the Amarillo Zone is interpreted to represent a large, high level, epithermal system that has potential for hosting significant base metal and precious metal mineralization (Figure 8A). The proximal mineralization on the North Zone C Grid (Sections 9.3.E., F., G.) appears to be associated with the Orange Mountain mineralizing system. Since the topography and surface conditions are not very amenable to trenching and IP surveying, it was recommended that stratigraphic diamond drilling be used to initially ascertain the potential of the Amarillo Zone.

#### **9.3.H.ii. AMARILLO ZONE: 1999 DRILL TARGET PRIORITIZATION (MAPS 2, 11, 11A, 11B; 11C; PHOTOS 33-39, TABLE A7; SECTIONS 49+00N, DDHAZ00-03, DDHAZ00-04):**

Field activities were carried out in 1999, in order to prioritize targets for the planned Y2K drill program. The work included the restoration of segments of the Amarillo Grid; prospecting and the stripping and detailed sampling of a number of showings; the spotting of 4 diamond drill holes; and, topographic surveys for the formulation of the drill sections.

As concluded from the historical work, the Western Target Area is particularly interesting near the west end of Line 49+00N (Photo 34). There, stream sediment, soil and rock geochemical polymetallic signatures (Section 49+00N; Map 11) are associated with favourable alteration, in the vicinity of the Aerodat airborne EM anomaly. As shown on Section 49+00N





**PHOTO 34: LINE 49+00N, LOOKING WEST TOWARDS DRILL SITE OF DDHAZ00-01 LOCATED ON WEST SIDE OF CREEK AT 49+00E**



**PHOTO 35: DRILL SITE OF DDHAZ00-02 AND OF DDHAZ00-03 (DOUBLE PICKET LOCATED AT 50+00E, L49+00N)**

(Appendix B), and Map 11 (Appendix A), DDHAZ00-01 (Photos 33, 34) was spotted at 49+00E as an initial test of that target. As shown on the same section, and Map 11, a second hole, DDHAZ00-02 (Photos 33, 35) was spotted at 50+00E to overlap with DDHAZ00-01, and to test a second polymetallic soil geochemical anomaly (Section 49+00N). Both holes would be drilled at an azimuth of 292° and a dip of -45° (Table 8).

Prospecting was carried out in the vicinity of the holes to provide further target rationale and, if necessary, to more precisely orient the initial reconnaissance drill holes: i.e., quartz barite veins have at least two prominent orientations: about 290 to 300° and rather parallel to the planned drill holes; and, approximately north. Moreover, the amount of exposed mineralization located historically on the Amarillo Zone is by no means adequate to explain the soil geochemical anomalies and to account for the source of the rather ubiquitous quartz barite float on the property.

#### **BA1 ZONE:**

The detailed investigation of a quartz barite vein located near 49+75E, 49+30N yielded a "barite zone", the BA1 Zone (Maps 11, 11A; Photos 33, 35, 36), with an apparent width of over 10 meters, which includes altered wall rock, barite veins and stock works, and interesting sulfidization (pyrite, galena, sphalerite, trace chalcopyrite). Samples from, and in proximity to the BA1 Zone (Table A7) generally have anomalous silver contents (up to 15 g/t); anomalous arsenic, barium and cadmium contents; some anomalous copper contents (up to 574 ppm); some anomalous zinc contents (up to 2050 ppm); and, very anomalous lead contents (up to 1.41%). The higher lead contents are rather specific - often associated with lower barium (higher? – see Section 9.1 re. barium inversion) and higher silver values. Contiguous samples 598784CH and 598785CH average 1.05% lead over an aggregate 1 m width; sample 160559RCH is contiguous with sample 598785RCH, but comprises silicified wall rock with a lead content of 62 ppm over 1 m. Sample 160558RCH is contiguous with 160559RCH and returned 1.40% lead over 1 m. The four samples noted above average 0.84% lead over 3 m, and 8.8 ppm silver, 56 ppm arsenic, 226 ppm barium, 120 ppm copper and 520 ppm zinc.

The BA1 Zone represents one possible mineralized source type: white, unoxidized barite/quartz veins, stock works, stringers mineralized with galena. Hole DDHAZ00-03 (Maps 11, 11A; Section DDHAZ00-03) was spotted at the same collar location as DDHAZ00-02 (Photo 37), but orientated at 335 degrees, under the newly discovered zone.

#### **BA2 ZONE:**

The BA2 Zone (Photo 33; Maps 11, 11B) was discovered at about 49+75E, 48+60N, and represents a second possible type of mineralized source rock for the polymetallic soil geochemical anomaly. The "dirty" baritized rocks are strongly oxidized, often with abundant hematite and manganese. As shown on Map 11B and in Table A7, 3 contiguous chip samples (598786RCH, 598787RCH, 598788RCH) have an average silver content of 50.3 ppm over 3 m.



**PHOTO 36: BA1 ZONE – STRIPPING AND DETAILED SAMPLING**



**PHOTO 37: BA1 ZONE – QUARTZ BARITE WITH DISSEMINATED GALENA (0.84% LEAD OVER 3 M)**

TABLE A7

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE AMARILLO ZONE  
I. ROCK SAMPLES FROM BA1 ZONE

ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, TYPE	LOCATION:	NAME, COLOR	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
598777RCH	49+75E, 49+30N OVER .3M	QTZ BA VN W:ORG BRN, WH; F: WH, OR BRN	WH QTZ BA VN: .3 M FI TO APHAN; SILKY TEXT, GLOSSY LUSTRE; VUG & C/W FRACS; BLEBS, FRAC FIL OF GAL, TR SPHAL - SULFS CONC NEAR WR OVERALL 3-5% GAL, SPHAL, PY VEIN TRENDS 5/80E	<5	13	12	7170	258	10	760	5.5	1	8	<1
598778RCH	49+75E, 49+30N HW FOR 598777RCH OVER .5M	ALT VOL BREC WR W:ORG BRN, GRY F: GR GRY BRN	FI GRAN, SIL, WK SER, WELL FRACS LIM ON FRACS 1-2% DISSEM PY	<5	6	31	782	246	42	90	3.5	1	6	1
598779RCH	49+75E, 49+30N FW FOR 598777RCH OVER .5M	AS 598778RCH C/W 2-3% FI DISSEM PY		<5	5.2	22	64	146	184	100	1.5	<1	6	8
598781RCH	5.5 M N OF 598779RCH SEE DET MAP OVER .5M	ALT VOL BREC WR & BA QTZ VN, STW W:ORG BRN, GRY F: GR GRY BRN	FI-CO-APHAN; SUG TO VUG TO SILKY TEXT; BA WITH GLOSSY LUST, CONSISTS OF 8 CM OF SIL, PY (UP TO 5%) WR; 35 CM OF WR C/W BA LENSES, STR, STW C/W DISSEM, PATCHES, BLEBS, FRAC FILL OF GAL, SPHAL, PY, TR CPY AND, 7 CM BA BREC VN C/W BA CRYSTS, MASS BA C/W OXID VUGS, BLEBS, DISSEM GAL, SPHAL	<5	3.2	57	30	116	106	50	2.5	<1	4	1
598782RCH	SEE DET MAP 2 M N OF 598779RCH & CONTIG & S OF 598781RCH OVER .5M	ALT VOL BREC WR & BA QTZ VN, STW W:ORG BRN, GRY F: GR GRY BRN	AS 598781RCH C/W 5 CM QTZ BA VEIN AND 45 CM QTZ BA STR ZONE IN SIL, PY WR; OVERALL 35 BA, 55% SIL MAT UP TO 10% OXID MAT AND SULFS - GAL, SPHAL, TR PY	<5	5.6	66	122	222	194	50	4.5	<1	6	26
598783RCH	SEE DET MAP 5 M N OF 598779RCH CONTIG & N 598781RCH OVER .5M	ALT VOL BREC WR & BA QTZ VN, STW W:ORG BRN, GRY F: GR GRY BRN	AS 598781RCH C/W 10 CM QTZ BA VN, 20 CM SIL WR, 8 CM QTZ BA VN, 12 CM SIL WR SIL WR OFTEN QTZ BARITIZED, 5-7% SULFS OVERALL QTZ BA VEINS TREND 270/V	<5	4.4	67	46	168	68	50	3	<1	6	2
598784RCH	SEE DET MAP 2 M N OF 598782RCH OVER .5M	ALT VOL WR & QT BA VN W:ORG BRN, GRY WH F: GR GRY BRN WH	COMPRISES SIL WR (.35 M) & QTZ BA VN TO 0.15 CM QTZ BA VN: WH, FI TO APHAN TO BLAD CRYTS, SUG TO GLOS TEXT, LIM, MN STAIN, BLEBS, PATCHES, FRAC FIL OF GAL, MIN SPHAL LOC TO 7% WR: SIL M VOL BREC C/W QTZ BA VNLTS, LENSES, BLEBS QTZ BA - LOC TO SMS TO FI DISSEM, PY MIN GAL, CPY	<5	6.6	46	6830	132	52	100	3	<1	8	1

598785RCH	SEE DETAILED MAP 2.5 M N OF 598782RCH N CON'T OF 598784RCH OVER .5M	ALT VOL WR & BA VN W:ORG BRN, GRY F: GR GRY BRN	AS 598784RCH C/W .25 M QTZ BA VN & 0.25 M QTZ BA ROCK; LOC 12% SULFS - MAINLY GAL IN QTZ BA, MAINLY PY IN SIL ROCK GAL VEIN UP TO 2 CM, II TO & NEAR FACE OF BA VN OC	10	12.4	48	14100	2050	44	100	42.5	6	8	50
160551RCH	SEE DETAILED MAP N OF & CONTIG WITH 160556RCH & 3 M N OF 598785RCH OVER 0.7M	QTZ BA VN W:GRY WH BLK F: GRY WH BLK	FI, GRAN, SUG, TO TAB BA CRYSTS, LOC WELL FRAC, GRY MIN IN DISSEM, PATCHES TO 1 CM; BREC QTZ BA C/W LENSES, PATCHES PY - UP TO 2 CM & VN UP TO 1.5 CM; ALSO MASS PY, GAL IN FRACS, BLEBS, GEN 2-4% GAL	15	9	100	2100	1315	548	50	33	1	10	6
160554RCH	SEE DETAILED MAP N OF & CONTIG WITH 160551RCH OVER 1M	SIL VOL BREC WR & QTZ BAR LENSES W: OR BRN BLK F: GRY WH BLK	FI, GRAN, WELL OXID. MN, LIM, WELL CHL, C/W NAR SULF STR, MOD SIL, & QTZ, BA LENSES, WEL FRAC, MN, LIM ON FRACS MINOR SULFS - MOST OXIDIZED	10	1	22	70	168	12	2090	3	<1	<2	1
160555RCH	SEE DETAILED MAP N OF & CON WITH 160554RCH OVER 1M	SIL VOL BREC WR & QTZ BAR LENSES W: ORG BRN BLK F: GRY WH BLK	AS 160554RCH LIM, WELL CHL, C/W NAR SULF STR, MOD SIL, & QTZ, BA LENSES, WEL FRAC, MN, LIM ON FRACS MINOR SULFS - MOST OXIDIZED	10	2.2	23	112	228	32	1520	6	<1	<2	<1
160556RCH	S OF & CON WITH 160551RCH OVER 1M	WR & QTZ VN, STR W:GRY WH F: GRY WH BLK	FI, GRAN, SUG, WELL SIL, WELL FRAC, LIM, MN ON FRACS, PY IN PATCHES, BLEBS, AND MASS, 5-7% LOC QTZ BA VN TO 4 CM, MN STR	10	4.4	35	660	208	384	30	3	2	<2	5
160557RCH	S OF & CON WITH 160556RCH OVER 1M	QTZ BA VN W:GRY WH  F: GRY WH BLK	FI, SUG - CO TAB OXID CRYST - GLOSS, VUG, EARTHY, WELL HEM, FI SOOTY MN PATCHES, LENSES IN QTZ BA, WELL FRAC, MN LIM ON FRACS, LOC WELL BREC, HEM FRAGS, VN, VNLTs MN, OXID MAT C/W GRY DULL FI MIN - GAL?; QTZ OFTEN SUG IN BA, SOM FUSCH, GEN PY AS DISSEM, LENSES IN QTZ; MOR MASS GRAN BA HAS BLEBS, FRAC FILS FI GAL, SHAL	10	3.2	35	528	222	198	120	2.5	<1	2	3

160558RCH	S OF & CONTIG WITH 160557RCH OVER 1M	QTZ BA VN W:GRY WH F: GRY WH BLK	FI, SUG - CO CRYST - GLOSS, VUG, SAMP HAS 3 COMP: 1. MASS QTZ BA 2. CO BA CRYST 3. OXID BA CRYSTS 1. INCL FR FIL, BLEBS, PATCHES, DISSEM, VN TO 2CM OF GAL, SPHAL, PY, TR CPY; LOC 5-7% GAL; 3. IN MN, LIM ON FR, VUGS LIM AND FRAC, OFTEN SOOTY, EARTHY, SOM QTZ BRECC TEX SOM BLEBS GAL, SOM NAR OXID SULF STRING 3-5% GAL, SPHAL	15	15	288	14000	326	72	230	5.5	3	18	<1
160559RCH	S OF & CONTIG WITH 598558RCH OVER 1M	ALT VOL BREC WR W:ORG BRN, BLK F: GR GRY BRN	FI, SUG TO EARTHY TEXT, WELL FRAC, WELL LIM, HEM ON SURFS, SECT WELL CHL, SOM MOD SER; GEN 1-3% DISSEM PRY; MOST CONC OF PY NEAR QTZ BA VN	<5	2.6	26	62	142		48 350	1.5	<1	<2	1

TABLE A7

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE AMARILLO ZONE  
ii. ROCK SAMPLES FROM BA2 ZONE

ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, TYPE	LOCATION:	NAME, COLOR	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
598786RCH	CONTIG W & N OF 598787RCH OVER 1M SEE DETAILED MAP	OXID QTZ BA & WR W:GRY WH OB BLK F: GRY WH BLK	FI-CO, TAB OXID BA CRYSTS, AND ROSSETTES BREC TEXT, SOM ANG OXID BREC FRAGS, MOD DEV QTZ BA STWK; WELL HEM, LIM, MN ON SURF, FRACS NO VISIBLE SULFS WR 20%, SIL, HEM, FI, ALL SULFS OXID	<5	71.8	80	56	152	8	1280	2.5	<1	2	6
598787RCH	CONTIG W & SN OF 598786RCH OVER 1M SEE DETAILED MAP	OXID QTZ BA & WR W:GRY WH ORG BLK F: GRY WH BLK	AS 598786RCH	<5	25.4	115	350	194	6	1390	4	<1	8	2
598788RCH	CONTIG & S OF 598787RCH SEE DETAILED MAP OVER 1M	QTZ BA VN W:GRY WH ORG BLK F: GRY WH BLK	FI-CO-TAB BA, FI QTZ, VUG TO BREC TEXT, SOM ANG OXID BREC FRAGS, MOD DEV QTZ BA STWK; WELL HEM, LIM, MN ON SURF, FRACS LOC SOME BLEBS, DISSEM GAL; WELL FRAC (250/60N)	<5	53.6	134	108	176	20	1000	4.5	1	8	1
598789RS	SUBCROP AT 598786RCH SEE DETAILED MAP	OXID QTZ BA W:GRY WH ORG BLK F: GRY WH BLK	FI-CO, TAB OXID BA CRYSTS, AND ROSSETTES BREC TEXT, SOM ANG OXID BREC FRAGS, MOD DEV QTZ BA STWK; WELL HEM, LIM, MN ON SURF, FRACS NO VISIBLE SULFS	<5	115	183	310	114	14	310	2	1	10	<1
598790RCH	CONTIG S & W OF 598788RCH SEE DETAILED MAP OVER 0.3 M	ALT VOL BREC WR FOR 598788RCH W:OB BLK F: GRY GR	FI, SUG TEXT, WELL SIL WELL PY - 8% FI DISSEM IN GRY QTZ	<5	2.6	134	34	60	52	60	0.5	<1	<2	5

TABLE A7

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE AMARILLO ZONE  
iii. ROCK SAMPLES FROM BA CREEK

ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, TYPE	LOCATION:	NAME, COLOR	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160561RCH	50+72E, 49+90N BARITE CRK AREA OVER .35M SEE MAP	QTZ BA & WR & WR ORG BRN F: GRY, WH	WR: FI-MED, MASS, WELL SIL, PY - 5-10% FI PY AS DISSEM, BLEBS, STRS, LENSES, VN TO 3CM TR SPHAL, 20-25% SULFS OVERALL STR, BLEBS, LOC TR -1% SPHAL	<5	2.2	12	108	618	114	60	10	2	2	4
160567RCH	L51+00N, 49+05E OVER 1M SEE MAP	QTZ & WR W: ORG BRN F: GRY WH	FI-APHAN, MASS QTZ, MIN BA SUG - GLOSS TEXT C/W FI SOOTY TO MASS PY AS LENSES, VN TO 3CM TR SPHAL, 20-25% SULFS OVERALL	15	35.8	34	712	532	1830	10	13	4	28	10
160568RCH	L51+00N, 48+95E OVER 1M SEE MAP	QTZ BA W: ORG BRN F: GRY WH	FI-APHAN, MASS QTZ, MIN BA, SOM OXID TAB BA CRYSTS, SUG - GLOSS TEXT, LOC VUGGY WITH LIM, WELL FRAC, C/W LENSES, STR OF SPHAL, PY, TR GAL; OVERALL 3-5% SULFS	<5	21.6	60	136	592	668	40	13.5	3	22	4
160569RCH	L51+00N, 48+95E CONTIG WITH & TO N 160568RCH OVER 1M SEE MAP	AS 160568RCH		<5	26	62	160	744	416	50	19	3	30	3
160570RCH	L51+00N, 48+80E CONTIG & TO S OF 160571RCH OVER 1M SEE MAP	QTZ, MIN BA W: ORG BRN F: GRY WH	FI-APHAN, MASS QTZ, MIN BA SOM OXID TAB BA CRYSTS, SUG - GLOSS TEXT, LOC 1-3% GAL AS FRAC FILS, BLEBS, 2-3% PY AS PATCHES, VN TO 2 CM; BLEBS DISSEM 1% CPY IN PY AS BLEBS, FI DISSEM, TR SPHAL; ALSO WH QTZ VN 0.5 CM, GRY QTZ STR C/W DISSEM GAL ROCK WELL LIM	15	23.2	917	7170	368	1090	10	15.5	2	12	5
160571RCH	L51+00N, 48+80E CONTIG WITH & TO N OF 160570RCH OVER 1M SEE MAP	QTZ BA W: ORG BRN F: GRY WH	FI-APHAN, MASS QTZ BA SUG, SOM VUG TEXT, CHL PATCHES, MOD FRAC, LIM ON FRACS; FI PY <1%	<5	18.4	62	154	74	84	300	2	<1	6	1



160572RCH	L51+00N, 48+80E CONTIG WITH & TO N OF 160571RCH OVER 1M SEE MAP	QTZ BA W: ORG BRN F: GRY WH	AS 160571RCH, BUT WITH SOM PATCHES, FRAC FILS & BLEBS GAL, MIN PY, TR SPHAL 2-3% SULS OVERALL	<5	8	48	1240	72	76	450	2	<1	2	<1
160573RCH	L51+00N, 48+80E CONTIG WITH & TO N OF 160572RCH OVER 1M SEE MAP	QTZ BA W: ORG BRN F: GRY WH	AS 160571RCH, BUT WITH SOM PATCHES, FRAC FILS & BLEBS GAL, MIN PY, TR SPHAL 2-5% SULFS OVERALL	<5	8	48	1240	72	76	450	2	<1	2	<1

TABLE A7

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE AMARILLO ZONE  
IV. ROCK SAMPLES FROM BA CREEK

ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, TYPE	LOCATION:	NAME, COLOR	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160494RS? COMP OF ANG BO SEE MAP	50+72E, 49+90E	QTZ/BA W: ORG BRN -BLK F:WH, GRY	FI - CO -BREC, LIM 50% BARREN BA, CO GRAN, WELL FRAC 50% BA QTZ BREC CW 30% ANG JASP FRAGS 0.2 TO 4 CM 70% FI - MED BA, 2-3% GAL, SPHAL AS FI DISSEM & PATCHES & FRAC FILS	5	25	55	2270	3290	66	190	63	15	56	3
160495RS? COMP OF ANG BO SEE MAP	50+40N, 50+45E	QTZ/BA W: ORG BRN-YEL F:WH, OB	FI -APHAN, MASS QTZ, BA, SOM TAB BA CRYSTS; WELL OXID, WELL FR, LIM ON FRACS; EARTHY, VUG: DIRTY QTZ BA; GAL VN TO 0.5CM, & FI - CO BLEBS, 2-3% SULFS, INCL SPHAL	15	26.4	169	7880	18200	22	60	205	69	56	<1
598791RS? COMP OF ANG BO SEE MAP	50+98E, 50+18N	QTZ/BREC W: ORG BRN - RD F: GRY BRN	FI - CO, TO TAB/BLAD BA CRYTS, 3% GAL AS DISSEM, BLEBS 50% BREC CW 25% CHL, HEM, MM FRAGS, 4% GAL IN STR, DISSEM, TR CPY WITH GAL,	10	20	385	4360	14900	22	60	282	42	40	<1
598792RS? COMP OF ANG BO SEE MAP	50+99E, 50+11N	ALT VOL BREC CW QTZ/BA STR W: BRN WH F: GRY	FI, GRAN - SUG, WELL SIL, SULF - PY 3-4%; 2-4% OF ROCK NAR BA STR, STW CW MIN PY; LOC SER ALT WITH GRY PATCHES - FRAGS?	70	6.4	183	244	252	182	380	3.5	2	18	9
598793RS? COMP OF ANG BO SEE MAP	51+02E, 50+18N	ALT VOL BREC CW QTZ/BA STR W: BRN WH F: GRY	AS 598792RF, CW 15% BA VN, STWK, LOC 1-8% DISSEM, STR PY, TR - 3% SPHAL, TR CPY LOC SER ALT WITH GRY PATCHES - FRAGS?	20	6.6	284	888	1100	138	70	29.5	3	46	6
598794RS? COMP OF ANG BO SEE MAP	50+00N, 51+12E,	QTZ/BA W: ORG BRN -YEL F:WH, ORG BRN	FI -APHAN, MASS QTZ, BA, SUG TO GLOSS, WELL FRAC, 1% FI BLEBS GAL	30	7.6	37	218	554	294	70	17	5	32	52
598795RS? COMP OF ANG BO SEE MAP	50+00N, 51+12E,	QTZ/BA W: ORG BRN F:WH, ORG BRN	FI -APHAN, MASS QTZ, BA, SOME GLOSS LUST, VUG TEXT WK FRACT, LIM ON FRACS TR GAL IN FRAC	135	18.8	199	244	1085	148	570	17	14	32	16
598796RS? COMP OF ANG BO SEE MAP	50+00N, 51+20E	QTZ/BA W: ORG BRN F:WH, ORG BRN	FI -APHAN, MASS QTZ, BA, SOME GLOSS LUST, VUG TEXT WELL FRACT, LIM ON FRACS 2% GAL BLEBS, FRACT FILS	45	40.4	2360	1735	5760	220	60	152	24	218	14

598797RS? COMP OF ANG BO SEE MAP	50+30N, 51+05E	QTZ/BA W: ORG BRN F:WH, ORG BRN	FI-APHAN, MASS QTZ, MIN BA, SOME GLOSS LUST, VUG TEXT WELL FRACT, LIM ON FRACS 1% GAL BLEBS, FRACT FILS	300	24.4	465	248	948	272	590	24	9	302	6
598798RS COMP OF ANG BO SEE MAP	50+25N 50+75E	QTZ/BA AS 598799RS, 1-2% FI TO CO BLEBS GAL		<5	4.8	74	358	158	34	910	2.5	1	32	<1
598799RS COMP OF ANG BO SEE MAP	50+25N 50+75E	QTZ/BA W: ORG BRN F: WH, ORG BRN, GRY	FI-APHAN-CO, CW BA TAB CRYSTS, QTZ MATRIX AND INTERGROW, GLOS TO VUG TEXT, MOD FRAC, LIM ON FRAC, SURF TR SPHAL, GAL, DISSEM PY & FRAC FIL, 1-3%	95	8.4	1040	314	152	80	120	4	1	26	73

TABLE A7

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE AMARILLO ZONE  
v. ROCK SAMPLES IN VICINITY OF DDHAZ00-01, 00-02

ANALYSES: (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, TYPE	LOCATION:	NAME, COLOR	DESCRIPTION:	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
598769RCH	49+80E, 48+85N OVER 1M	QTZ BAVN, WR W:ORG BRN, WH; F: WH, GR GRY	WH QTZ BA VNS: 2CM & 6 CM SEP BY 15 CM SIL WR CAW 3-5% SULFS INCL TR GAL FI - APHAN; SUG TO SILKY TEXT; GLOSS LUST QTZ BA IS VUG WITH OXID SULFS VN TRD 300 D	15	4.6	574	214	134	520	170	4.5	5	40	5
598770RCH	49+50E, 49+35N OVER 1M	QTZ BA VN, WR W:ORG BRN, WH; F: WH, GR GRY	WH QTZ BA VN: 6 CM @ 30/80 W CAW 3-5% SULFS INCL TR GAL FI - APHAN; SUG TO SILKY TEXT; GLOSS LUST QTZ BA IS VUG WITH TR SPHAL, OXID PY WR SIL, SER, VOL BREC CAW 1-2% DISSEM PY	<5	2.2	60	40	218	42	1010	2	<1	4	1
598771RC	45+55N, 48+48E OVER 15X 15M	QTZ BA VNS, WR W:ORG BRN, WH; F: WH, GRY BLK	SAMP HAS NO OF COMP: GRY SIL, WEL FRAC ALT MAFIC VOL BREC, FI GR, SUG TEXT, LOC MASS PY ON FRACS, OVERALL 2-3% PY; FRACS @ 342/78E SOM QTZ/BA LEN CAW JA STAIN, MIN GAL AS BLEBS, MIN DISSEM PY IN SIL HOST 1 2.5 CM BA VN, WH, APHAN, SOM VUG, MIN SULFS; BA VN 340/80E	10	2.8	36	178	68	198	40	2.5	1	6	18
598772RP	48+80N, 48+26E OVER 2X1 M	QTZ BA VN, +.3M, WR W:ORG BRN, WH; F: WH, GRY BLK	FI - APHAN, WELL FRAC, JA PATCHES & LIM & FUSCH QTZ IN FRACS MIN BLEBS GAL, MIN PY ORIENT AND EXTEND UNKOWN	25	3.6	220	160	20	120	240	0.5	<1	10	9
598773RCH	48+80N, 48+26E OVER 1 X 2M M	QTZ BA VN, .15M, WR & WR W:ORG BRN, WH; F: WH, GR GRY BLK	FI - APHAN BA, WELL FRAC, VUG, JA PATCHES & LIM QTZ BA VN 390/90 WR: FI GR GRY, WEL SIL, 2-3% FINELY DISSEM PY	5	11.6	135	378	950	52	100	20.5	3	74	5



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SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
598769	205 294	15	4.6	0.34	520	< 10	170	< 0.5	< 2	0.06	4.5	3	34	574	1.48	< 10	5	0.25	30	0.04
598770	205 294	< 5	2.2	0.50	42	< 10	1010	< 0.5	< 2	0.14	2.0	9	69	60	2.92	< 10	< 1	0.40	20	0.04
598771	205 294	10	2.8	0.26	198	< 10	40	< 0.5	< 2	0.03	2.5	5	70	36	2.25	< 10	1	0.23	< 10	0.01
598772	205 294	25	3.6	0.13	120	< 10	240	< 0.5	< 2	0.01	0.5	2	153	220	1.32	< 10	< 1	0.15	10	< 0.01
598773	205 294	5	11.6	0.17	52	< 10	100	< 0.5	< 2	0.01	20.5	3	65	135	1.24	< 10	3	0.14	< 10	< 0.01
598777	205 294	< 5	13.0	0.02	10	< 10	760	< 0.5	< 2	< 0.01	5.5	< 1	34	12	0.26	< 10	1	< 0.01	10	< 0.01
598778	205 294	< 5	6.0	0.89	42	< 10	90	< 0.5	< 2	0.16	3.5	9	40	31	2.00	< 10	1	0.52	30	0.03
598779	205 294	< 5	5.2	0.51	184	< 10	100	< 0.5	< 2	0.08	1.5	4	59	22	2.26	< 10	< 1	0.33	10	0.01
598780 <i>CHECK</i>	214 238	1220	2.2	3.64	118	< 10	70	< 0.5	< 2	2.77	< 0.5	177	22	7160	9.39	< 10	< 1	0.03	< 10	2.09
598781	205 294	< 5	3.2	0.49	106	< 10	50	< 0.5	< 2	0.73	2.5	12	47	57	1.74	< 10	< 1	0.35	< 10	0.06
598782	205 294	< 5	5.6	0.66	194	< 10	50	< 0.5	< 2	0.48	4.5	17	51	66	2.09	< 10	< 1	0.40	< 10	0.04
598783	205 294	< 5	4.4	0.71	68	< 10	50	< 0.5	< 2	0.30	3.0	12	59	67	2.28	< 10	< 1	0.40	< 10	0.03
598784	205 294	< 5	6.6	0.16	52	< 10	100	< 0.5	< 2	0.05	3.0	4	54	46	1.29	< 10	< 1	0.09	10	< 0.01

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SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
598769	205 294	45	5 < 0.01	< 1	440	214	0.51	40	1	162 < 0.01	< 10	< 10	10	< 10	134		
598770	205 294	1235	1 < 0.01	1	680	40	0.14	4	6	53 < 0.01	< 10	< 10	37	< 10	218		
598771	205 294	15	18 < 0.01	1	310	178	1.58	6	< 1	92 < 0.01	< 10	< 10	8	< 10	68		
598772	205 294	5	9 < 0.01	1	130	160	0.52	10	< 1	53 < 0.01	< 10	< 10	4	< 10	20		
598773	205 294	5	5 < 0.01	< 1	210	378	0.77	74	< 1	315 < 0.01	< 10	< 10	7	< 10	950		
598777	205 294	225	< 1 < 0.01	< 1	30	7160	0.15	8	< 1	513 < 0.01	< 10	< 10	2	< 10	258		
598778	205 294	50	1 < 0.01	1	1000	782	0.90	6	4	140 < 0.01	< 10	< 10	27	< 10	246		
598779	205 294	75	8 < 0.01	1	650	64	0.73	6	3	133 < 0.01	< 10	< 10	15	< 10	146		
598780	214 229	1490	4 0.04	75	150	< 2	1.96	6	7	12 0.03	< 10	< 10	54	< 10	122		
598781	205 294	515	1 < 0.01	2	750	30	1.09	4	3	117 < 0.01	< 10	< 10	13	< 10	116		
598782	205 294	375	26 < 0.01	3	830	122	1.48	6	3	79 < 0.01	< 10	< 10	17	< 10	222		
598783	205 294	320	2 < 0.01	2	830	46	1.51	6	3	86 < 0.01	< 10	< 10	20	< 10	168		
598784	205 294	205	1 < 0.01	< 1	200	6830	0.89	8	1	268 < 0.01	< 10	< 10	9	< 10	132		



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SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
P160551	205 294	15	9.0	0.05	548	10	50	< 0.5	2	0.01	33.0	8	120	100	4.32	< 10	6	0.03	10	< 0.01
P160552	205 294	10	2.2	0.01	14	< 10	1270	< 0.5	< 2	< 0.01	< 0.5	< 1	40	8	0.14	< 10	1	0.01	< 10	< 0.01
P160553	205 294	20	4.6	0.27	20	< 10	2160	< 0.5	2	0.03	3.0	4	116	121	6.98	< 10	3	0.16	10	< 0.01
P160554	205 294	10	1.0	1.02	12	10	2090	0.5	< 2	0.14	3.0	4	30	22	2.42	< 10	< 1	0.59	10	0.02
P160555	205 294	10	2.2	0.95	32	10	1520	< 0.5	< 2	0.19	6.0	12	30	23	2.50	< 10	< 1	0.53	10	0.03
P160556	205 294	10	4.4	0.72	384	10	30	< 0.5	< 2	0.12	3.0	12	78	35	4.40	< 10	2	0.40	< 10	0.01
P160557	205 294	10	3.2	0.13	198	< 10	120	< 0.5	< 2	0.01	2.5	6	103	35	3.46	< 10	< 1	0.08	< 10	< 0.01
598785	205 294	10	12.4	0.11	44	< 10	100	< 0.5	< 2	0.02	42.5	1	44	48	1.07	< 10	6	0.07	20	< 0.01
598786	205 294	< 5	71.8	0.26	8	< 10	1280	< 0.5	< 2	1.16	2.5	3	47	80	1.31	< 10	< 1	0.10	10	0.23
598787	205 294	< 5	25.4	0.38	6	< 10	1390	< 0.5	< 2	2.50	4.0	3	61	115	1.99	< 10	< 1	0.13	10	0.12
598788	205 294	< 5	53.6	0.19	20	< 10	1000	< 0.5	< 2	1.65	4.5	3	76	134	0.98	< 10	1	0.08	< 10	0.04
598789	205 294	< 5	>100.0	0.25	14	< 10	310	< 0.5	< 2	1.73	2.0	5	59	183	0.86	< 10	1	0.13	< 10	0.08
598790	205 294	< 5	2.6	0.52	52	< 10	60	< 0.5	2	0.11	0.5	6	55	35	2.33	< 10	< 1	0.28	< 10	0.01
598790A	225 229	1400	3.0	3.68	124	< 10	30	< 0.5	< 2	3.17	1.0	180	25	7490	9.61	10	< 1	0.03	< 10	2.03



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P160551	205 294	2090	6 < 0.01		3	50	2100	1.45	10	4	135 < 0.01	< 10	< 10	29	< 10	1315	
P160552	205 294	25	< 1 < 0.01		1	20	138	0.09	< 2	< 1	238 < 0.01	< 10	< 10	4	< 10	26	
P160553	205 294	2980	3 < 0.01		2	190	144	0.08	14	7	165 < 0.01	< 10	< 10	113	100	426	
P160554	205 294	670	1 < 0.01		1	910	70	0.10	< 2	7	34 < 0.01	< 10	< 10	31	< 10	168	
P160555	205 294	1010	< 1 < 0.01		< 1	1080	112	0.14	< 2	6	34 < 0.01	< 10	< 10	33	< 10	228	
P160556	205 294	900	5 < 0.01		2	660	110	2.28	< 2	5	70 < 0.01	< 10	< 10	33	< 10	208	
P160557	205 294	1810	3 < 0.01		1	80	528	0.58	2	4	309 < 0.01	< 10	< 10	29	< 10	222	
S98785	205 294	345	50 < 0.01		1	120	>10000	0.71	8	1	301 < 0.01	< 10	< 10	9	10	2050	
S98786	205 294	1250	6 < 0.01		< 1	150	56	0.08	2	1	280 < 0.01	< 10	< 10	61	< 10	152	
S98787	205 294	1125	2 < 0.01		1	250	350	0.08	8	1	255 < 0.01	< 10	< 10	80	< 10	194	
S98788	205 294	960	1 < 0.01		1	130	108	0.11	8	1	298 < 0.01	< 10	< 10	65	< 10	176	
S98789	205 294	570	< 1 < 0.01		1	150	310	0.22	10	1	367 < 0.01	< 10	< 10	40	< 10	114	
S98790	205 294	260	5 < 0.01		2	650	34	1.44	< 2	1	33 < 0.01	< 10	< 10	16	< 10	60	
S98790A	225 229	1565	3 0.04		68	70	8	2.42	< 2	5	6 0.04	< 10	< 10	56	< 10	140	





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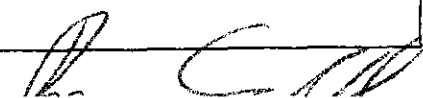
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## CERTIFICATE OF ANALYSIS

A9926789

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
P160520	205 226	10	0.2	0.62	12	< 10	70	< 0.5	< 2	1.03	< 0.5	10	43	10	3.07	< 10	< 1	0.40	10	0.11
P160521	205 226	10	0.2	0.74	12	< 10	90	< 0.5	< 2	0.77	< 0.5	9	35	11	3.45	< 10	< 1	0.42	10	0.09
P160522	205 226	10	0.2	1.49	22	< 10	80	< 0.5	2	1.14	1.0	10	34	13	5.63	< 10	< 1	0.38	< 10	0.31
P160523	205 226	220	4.4	3.04	168	< 10	40	< 0.5	26	0.99	8.0	14	42	5810	11.15	10	< 1	0.15	< 10	0.74
P160558	205 226	15	15.0	0.05	72	< 10	230	< 0.5	2	0.02	5.5	3	130	288	1.50	< 10	3	0.01	< 10	< 0.01
P160559	205 226	< 5	2.6	0.88	48	10	350	< 0.5	< 2	0.21	1.5	5	50	26	1.24	< 10	< 1	0.52	10	0.03

APPROVED: 



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SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
P160520	205 226	455	3 < 0.01		1	680	12	2.48	< 2	1	20 < 0.01	< 10	< 10	14	< 10		16
P160521	205 226	395	2 < 0.01		< 1	690	20	2.44	< 2	1	18 < 0.01	< 10	< 10	19	< 10		32
P160522	205 226	985	2 < 0.01		< 1	680	20	2.50	< 2	3	29 < 0.01	< 10	< 10	44	< 10		128
P160523	205 226	1095	6 < 0.01		< 1	320	44	3.72	8	5	20 < 0.01	< 10	< 10	63	< 10		552
P160558	205 226	770	< 1 < 0.01		1	20	>10000	0.49	18	1	307 < 0.01	< 10	< 10	11	< 10		326
P160559	205 226	205	3 < 0.01		1	900	62	0.40	< 2	4	94 < 0.01	< 10	< 10	25	< 10		142



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## CERTIFICATE OF ANALYSIS

A9927486

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
P160494	1388 294	5	25.0	0.09	66	< 10	190	< 0.5	< 2	0.05	63.0	< 1	16	55	1.04	< 10	15	0.07	10	< 0.01
P160495	1388 294	15	26.4	0.04	22	< 10	60	< 0.5	< 2	0.06	205	3	6	169	1.74	< 10	69	0.03	30	0.01
P160561	1388 294	< 5	2.2	0.19	114	< 10	50	< 0.5	< 2	0.03	10.0	5	4	12	1.82	< 10	2	0.10	< 10	< 0.01
P160567	1388 294	15	35.8	0.05	1830	< 10	10	< 0.5	< 2	< 0.01	13.0	3	5	34	4.40	< 10	4	0.03	10	< 0.01
P160568	1388 294	< 5	21.6	0.04	668	< 10	40	< 0.5	< 2	0.21	13.5	4	9	60	2.67	< 10	3	0.01	< 10	0.01
P160569	1388 294	< 5	26.0	0.04	416	< 10	50	< 0.5	< 2	0.22	19.0	3	16	62	2.17	< 10	3	0.01	< 10	0.06
P160570	1388 294	15	23.2	0.11	1090	< 10	10	< 0.5	< 2	0.08	15.5	5	6	917	3.93	< 10	2	0.07	< 10	0.02
P160571	1388 294	< 5	18.4	0.05	84	< 10	300	< 0.5	< 2	< 0.01	2.0	2	14	62	0.94	< 10	< 1	0.03	< 10	< 0.01
P160572	1388 294	< 5	8.0	0.01	76	< 10	450	< 0.5	< 2	< 0.01	2.0	< 1	10	48	0.62	< 10	< 1	< 0.01	< 10	< 0.01
P160573	1388 294	10	14.6	0.23	468	< 10	30	< 0.5	< 2	0.06	10.0	12	7	581	7.04	< 10	2	0.19	10	0.02
598791	1388 294	10	20.0	0.11	22	< 10	60	< 0.5	< 2	0.14	282	6	6	385	3.94	< 10	42	0.10	< 10	0.07
598792	1388 294	70	6.4	0.07	182	< 10	380	< 0.5	< 2	0.02	3.5	< 1	14	183	1.28	< 10	2	0.09	< 10	< 0.01
598793	1388 294	20	6.6	0.24	138	< 10	70	< 0.5	< 2	0.08	29.5	5	5	284	1.43	< 10	3	0.16	< 10	< 0.01
598794	1388 294	30	7.6	0.08	294	< 10	70	< 0.5	< 2	< 0.01	17.0	1	9	37	3.06	< 10	5	0.14	< 10	< 0.01
598795	1388 294	135	18.8	0.08	148	< 10	570	< 0.5	< 2	< 0.01	17.0	< 1	9	199	0.83	< 10	14	0.06	< 10	< 0.01
598796	1388 294	45	40.4	0.04	220	< 10	60	< 0.5	2	< 0.01	152.0	2	6	2360	1.28	< 10	24	0.05	< 10	< 0.01
598797	1388 294	300	24.4	0.01	272	< 10	590	< 0.5	< 2	< 0.01	24.0	< 1	11	465	0.59	< 10	9	0.01	< 10	< 0.01
598798	1388 294	< 5	4.8	0.05	34	< 10	910	< 0.5	< 2	< 0.01	2.5	< 1	1	74	1.23	< 10	1	0.03	< 10	< 0.01
598799	1388 294	95	8.4	0.06	80	< 10	120	< 0.5	2	< 0.01	4.0	1	3	1040	1.11	< 10	1	0.05	80	< 0.01
598800A	214 229	115	4.0	4.04	< 2	70	50	< 0.5	2	2.47	< 0.5	171	294	6670	8.18	< 10	< 1	0.01	< 10	2.52

Anto



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SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
P160494	1388 294	50	3	0.06	1	130	2270	0.34	56	< 1	306	< 0.01	< 10	< 10	9	< 10	3290
P160495	1388 294	1005	< 1	0.33	< 1	120	7880	0.93	26	3	176	< 0.01	< 10	10	12	< 10	>10000
P160561	1388 294	80	4	0.01	1	220	108	1.11	2	< 1	220	< 0.01	< 10	< 10	8	< 10	618
P160567	1388 294	55	10	< 0.01	1	60	712	3.58	28	< 1	69	< 0.01	30	< 10	6	< 10	532
P160568	1388 294	875	4	0.01	1	30	136	1.38	22	< 1	131	< 0.01	< 10	< 10	5	< 10	592
P160569	1388 294	930	3	0.01	1	40	160	1.03	30	< 1	137	< 0.01	< 10	< 10	3	< 10	744
P160570	1388 294	325	5	< 0.01	1	70	7170	3.06	12	< 1	71	< 0.01	10	< 10	8	< 10	368
P160571	1388 294	370	1	< 0.01	1	20	154	0.26	6	< 1	286	< 0.01	< 10	< 10	4	< 10	74
P160572	1388 294	65	< 1	< 0.01	1	< 10	1240	0.19	2	< 1	333	< 0.01	< 10	< 10	< 1	< 10	72
P160573	1388 294	1025	2	0.01	1	390	1080	2.47	110	5	26	< 0.01	< 10	< 10	46	< 10	450
598791	1388 294	2590	< 1	0.30	< 1	220	4360	1.09	40	4	160	< 0.01	< 10	< 10	16	< 10	>10000
598792	1388 294	75	9	< 0.01	1	200	244	0.26	18	< 1	160	< 0.01	< 10	< 10	1	< 10	252
598793	1388 294	45	6	0.02	1	470	888	0.88	46	< 1	177	< 0.01	< 10	< 10	4	< 10	1100
598794	1388 294	40	52	0.01	1	240	218	1.09	32	< 1	106	< 0.01	< 10	< 10	1	< 10	554
598795	1388 294	30	16	0.02	< 1	130	244	0.16	32	< 1	258	< 0.01	< 10	< 10	1	< 10	1085
598796	1388 294	30	14	0.12	< 1	180	1735	0.97	218	1	193	< 0.01	< 10	< 10	< 1	< 10	5760
598797	1388 294	30	6	0.02	1	70	248	0.16	302	< 1	228	< 0.01	< 10	< 10	< 1	< 10	948
598798	1388 294	625	< 1	< 0.01	< 1	40	358	0.09	32	3	286	< 0.01	< 10	< 10	11	< 10	158
598799	1388 294	35	73	< 0.01	< 1	160	314	0.49	26	< 1	270	< 0.01	< 10	< 10	2	< 10	152
598800A	214 229	275	1	< 0.01	2350	480	10	2.96	< 2	< 1	20	0.14	< 10	< 10	53	< 10	72



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## CERTIFICATE OF ANALYSIS

A9927525

SAMPLE	PREP CODE	Pb %									
P160558	212 --	1.40									

*Handwritten signature/initials*



Sample 598789RS, taken from subcrop near sample 598786RCH, contained 115 ppm silver. However, all 4 samples average 12 ppm arsenic, 995 ppm barium, 128 ppm copper, 206 ppm lead and 159 ppm zinc.

#### **CAMP POND ZONE:**

Work on the Amarillo Zone at Camp Pond (Map 11, Photos 33, 38) included prospecting to follow-up the polymetallic soil anomaly noted above and outlined on the Central Target Area in 1997 (Map 11C). Angular boulders, most of which appear to be subcrop and composed of quartz barite, and oxidized quartz barite, are mineralized with varying amounts of galena and sphalerite. Eleven composite samples were collected and their analyses (Table A7), along with the historic soil anomaly described in Section 9.3.H.ii, are deemed to constitute a classic polymetallic signature, strongly symptomatic of a prospective epithermal system.

Most of the samples have weak to strongly anomalous gold contents (10 to 300 ppb); moderate to strong silver contents (4.8 to 40.4 ppm), with the eleven samples averaging 17.2 ppm; weak to strongly anomalous arsenic contents (22-294 ppm), with the eleven samples averaging 134 ppm; weak to strong cadmium contents (2.5 to 282 ppm) with the 11 samples averaging 72.7 ppm; and weak to strong copper contents (37-2360 ppm) with the eleven samples averaging 477 ppm (Table A7). A majority of samples have anomalous mercury values ranging up to 69 ppm; some have strongly anomalous molybdenum values, ranging up to 73 ppm; all have very interesting lead values ranging from 248 to 7880 ppm, with the eleven samples averaging 0.17%; most samples have anomalous antimony values ranging between 12 to 302 ppm; and, most samples have elevated zinc values ranging up to 1.82%, with the eleven samples averaging 0.42%.

In view of the positive results, Hole DDHAZ00-04 (Photo 39) was spotted at 51+75E on L50+00N, with a planned azimuth of 295°, a dip of 45° and a length of 300 m. Most of the samples referenced above are located in proximity to the surface projection of the recommended hole. The surrounding subcrop thus has the strongest, and most complete and favourable geochemical signature discovered to date on the Amarillo Zone. The Camp Pond target is currently considered the most prospective of those referenced above, since it is located at the lowest elevation relative to the other targets, in the postulated Amarillo Zone epithermal system. It is thus deemed to have the potential of intersecting significant gold and gold/copper mineralization, believed located deeper in the system (Figures 8, 8A).

#### **BARITE CREEK ZONE:**

The Barite Creek Zone is located at about 49+00E, L51+50N (Map 11, Photo 33). The zone comprises fairly extensive quartz barite stringers, veins, and zones that outcrop in Barite Creek. The creek valley has historically been filled with snow in July/August, and the full extent of the northwest trending zone only became apparent in 1999. Unfortunately, the fog that hampered access to the Amarillo Zone for much of the season negated the full evaluation of the target.



**PHOTO 38: CAMP POND TARGET AREA; AMARILLO ZONE,  
LOOKING SOUTHWEST TOWARDS ORANGE MOUNTAIN.**



**PHOTO 39:  
BACKSIGHT, DRILL SITE,  
FORE SIGHT, DDHAZ00-04,  
CAMP POND ZONE, AMARILLO  
ZONE, LOOKING 295°**



In the initial sampling of the Barite Creek Zone, a one meter panel sample (160567RCH) of silicified, pyritized material returned weakly anomalous gold; 35.8 ppm silver; 1830 ppm arsenic; 13 ppm cadmium; weakly anomalous mercury and molybdenum; anomalous antimony; and, strong lead (712 ppm) and zinc (618 ppm) values (Table A7). Two contiguous panel samples (160568RCH, 160569RCH) each taken over a meter, about 15 m west of 160567 average 23.8 silver, 542 ppm arsenic, 16.3 ppm cadmium, 148 ppm lead, 26 ppm antimony, and 668 ppm zinc. Four contiguous panel samples (160570-160573RP) each over a meter, and taken 15 m west of 160568RCH and 160569RCH, average 16.1 ppm silver; 430 ppm arsenic, 7 ppm cadmium, 402 ppm copper, 0.24% lead, and 241 ppm zinc.

### **9.3.H.iii. INTERPRETATION OF THE AMARILLO ZONE:**

Follow-up prospecting activities carried out in 1999, as permitted by weather conditions and overburden cover, located a number of new showings that are interpreted to confirm the overall importance of the Amarillo Zone and the Orange Mountain Target Area:

- a) The ubiquitous quartz barite float and subcrop boulders probably have ubiquitous bedrock sources on the grid, most of which are covered by talus and meadow.
- b) The quartz barite boulders, veins, stock works and zones are indicative of a large epithermal system that has potential for hosting a major gold/copper and lead/zinc/silver deposit.
- c) There are a number, if not a myriad of different types and orientations of mineralization that include: silver rich, in quartz barite veins and zones with hematite and manganese; lead rich (stringers and disseminations of galena) in quartz barite veins and zones; copper/zinc and zinc/lead +/- copper, and gold/copper/lead/zinc rich, in more intensely sulfidized wall rocks and quartz barite veins and zones. The mineralized types are probably related via zoning and multiphase activity associated with the large epithermal system.
- d) The North Zone, C Grid gold/copper breccia veins targets (A Zone, B Zone, NE Zones) are probably manifestations of the mineralizing event centered at Orange Mountain, and thus apparently provide additional evidence of the gold/copper potential at depth in the epithermal system on the Amarillo Zone.
- e) Other than the work referenced in this report, the Amarillo Zone has never been subject to detailed exploration, including diamond drilling.

The Amarillo Zone presents a very large target, which remains open in all directions and has never been subjected to detailed exploration, including diamond drilling. However, it is

**concluded that sufficient rationale has been now generated to initiate the testing on the Camp Pond Zone (DDHAZ00-04). If this hole is successful, it is recommended that a deeper hole be immediately drilled from the same set-up; and/or, the drill evaluation be continued on Line 49+00N (Holes DDHAZ00-01, 02). The ownership of the Todd Claim located on the west side of the Amarillo Zone should first be determined prior to the initiation of drilling; and, if the claim is available, it should be optioned.**

### **9.3.1. YELLOW BOWL ZONE: (MAPS 1, 2, 2A, 12; TABLE A8; PHOTOS 40-41):**

The Yellow Bowl Zone is located about 1.5 km northwest of the South Zone deposit on the Todd 12 Claim (Maps 1, 2). It is part of a 10 km long alteration zone on the west side of Todd Creek, which extends from the South Zone deposit, north to beyond Orange Mountain. The zone is generally characterized by colour anomalies (Photo 40) associated with gossan zones that most often comprise altered (jarosite/alunite, pyritized, silicified) coarse intermediate to felsic, and pyroclastic rocks.

#### **9.3.1.i. HISTORIC WORK, YELLOW BOWL ZONE:**

The geological setting of the Yellow Bowl area was described by Noranda (Baerg, 1989):

The area is predominantly underlain by andesite flows and agglomerates with local areas of feldspar porphyry flows similar to the South Zone. . . The felsic volcanics, which occur along the top of the north-south ridge running through TOC 9 (Todd 4) and 10 (Todd 12) have been traced from the By glacier to the Fall Creek Zone. The rhyolite, dacite and porphyry are locally moderately to strongly quartz-sericite-pyrite altered and the volcanoclastics are moderately to strongly carbonate +/- sericite altered. Bedding in the volcanoclastics generally trends northwest with moderate to steep northeast dips.

Mineralization consists of east west to northwest trending quartz-pyrite +/- chalcopyrite veins ranging from 1 cm to 6 m wide and 1 to 108 m long. No significant precious metal values have been obtained from these veins to date.

In 1994, Geofine collected 41 samples, which included 29 rock and rock talus and 12 stream sediments (Molloy, 1994; Map 12). Anomalous gold, copper and arsenic values were returned in a number of the rock and stream sediment samples, including individual chip samples of pyrite veins and host rock e.g., 512 ppb, 1150 ppm and 1510 ppm, respectively, over 4 m in sample 86021; and, 209 ppb, 500 ppm and 3410 ppm, respectively, over 5 m in sample 86023 (Map 12). The best gold and copper values were returned in a 1 m chip sample (86009) from a pyrite vein: 1.67 g Au/t and 9.8% copper (Map 12). A float sample of silicified, chloritized rock with a 6 cm pyrite vein returned 1.68 ppb gold, 6.68% copper, 6940 ppm zinc, 275 ppm lead and 45 ppm arsenic. Most samples of the altered felsic rock had anomalous gold and copper contents.

As indicated by the 1997 program (Molloy, 1997), the area of the Yellow Bowl Zone (Map 12) is underlain by altered mafic to intermediate volcanic flows and by fine to coarse pyroclastic rocks. Alunite/jarosite staining is pervasive and gives the area its characteristic bright yellow colour (Photo 4). Most of the altered rocks represent a series of pyroclastic units with clast supported breccia/agglomerate at the base, matrix supported agglomerate and lapilli/bomb tuff



PHOTO 40: CENTRAL AREA OF THE YELLOW BOWL ZONE, WITH JAROSITE/ALUNITE, QUARTZ-PYRITE-CARBONATE-SERICITE ALTERATION

above, followed by crystal tuff (5-50 m) and laminated ash tuff (20 to 80 cm) at the top. At least 5 such cycles were observed, with others indicated, but obscured by the strong alteration. Interflows of intermediate (dacitic) and mafic (andesitic) composition occur in the pyroclastic sequence. The felsic flows are massive and often porphyritic, with 5-10% mafic, and 10% feldspar phenocrysts.

Alteration is quite pervasive in all rock types, and variable in composition and intensity at the Yellow Bowl Zone (Molloy, 1997). Although the alteration includes quartz, sericite, carbonate, pyrite and chlorite, there are areas with more intense silicification (quartz +/- sericite, minor carbonate - Type 1), and other areas with more intense carbonate alteration (carbonate + sericite +/- quartz - Type 2). A large area of intense quartz + sericite alteration is situated at the south end of exposed gossan. Two large areas of intense carbonate + sericite alteration were found directly west, or uphill from the central "Yellow Bowl" area of the 1994 surveys, and 500 m to the north in the next valley. A third alteration style was also observed associated with quartz and epidote veins. The veins have distinct epidote rich alteration halos, extending anywhere from 5 cm to 2 m into the wall rock. The veins lack significant mineralization.

Two main types of mineralization occur at Yellow Bowl:

- i) Widespread, Type 1 and 2 alteration with finely disseminated pyrite; concentrations vary from trace, but locally may be as high as 3-4%, especially in areas of fracturing and more intense veining
- ii) Pyrite, carbonate +/- chlorite, +/- sericite, +/- quartz, +/- chalcopyrite veins, lenses, stringers (Photos 41, 42). The pyrite, carbonate veins range in thickness from mm's to over 5 m and can be traced for up to over 100 m before either pinching out or disappearing under talus or ice. Most vein orientations range from northeast to east, with generally steep dips to the southeast or south. Areas of intense pyritic stock works are common. Generally, the veins have a substantial pyrite content (10 to 90%) in a matrix of cream coloured to rusty orange weathering carbonate (ankerite, siderite). Chalcopyrite occurs in many of these veins as blebs and disseminations, usually along with malachite.

The 1997 geochemical and geological surveys were concentrated in an area located above and west of the 1994 work (Molloy, 1997; Map 12). A total of 35 rock samples and three stream sediment samples were collected (Map 12). The 1994 and 1997 surveys indicated that the Yellow Bowl Zone geological environment is rather prospective. Samples from it are generally characterized by a weak gold; weak to very strong copper; weak to strong arsenic; often anomalous to some strong lead; low barium, and low mercury. The most interesting mineralization is associated with pyrite/chalcopyrite veins and stock works, which may be the surface manifestations of a much larger VMS or porphyry copper-gold system.



PHOTO 41: MASSIVE  
PYRITE VEIN AT SAMPLE  
380141 (150 PPM GOLD,  
4410 PPM COPPER, 0.6  
PPM SILVER, 786 PPM  
ARSENIC)



PHOTO 42: MASSIVE  
PYRITE VEINS 5 M  
EAST OF SAMPLE 380141

### **9.3.1.ii. 1999 EXPLORATION ACTIVITIES, YELLOW BOWL ZONE (MAP 12, TABLE A8):**

The 1999 exploration activities on the Yellow Bowl Zone were, like the previous programs, limited by fog that develops on the snowfields and glaciers west of the Yellow Bowl Zone. Prospecting and geological and geochemical surveys were carried out on the southernmost area of the upper Yellow Bowl Zone, which had previously been covered with snow. As with other areas of the YBZ, the pyroclastic rocks are generally moderately to intensely altered (pyritized, sericitized, carbonatized, chloritized and silicified). Interflows of felsic volcanic rocks are often similarly altered, and fractured and brecciated.

Four stream sediment samples (160528SS, 160529SS, 160531SS, and 160535SS; Map 12, Table A8) were taken to generally assess the area's potential: all have weakly anomalous gold (ranging from 10 to 65 ppb) and copper contents (from 51 to 273 ppm); three samples have anomalous arsenic (from 112 to 132 ppm), and weakly anomalous molybdenum and antimony contents; and, two have anomalous lead contents (from 44 to 54 ppm).

The area is characterized by pyritic gossan zones most often with jarosite/alunite; and, abundant sulfidized float, with the most predominate type being massive to semi-massive, to veins and stock works of fine, granular pyrite in intensely silicified to moderately chloritized and carbonatized volcanic host rocks. As shown on Map 12 and Table A8, a composite sample (160373RF) of semi-massive pyritic float material returned anomalous gold (60 ppb) and silver (4 ppm); strong arsenic (676 ppm) and copper (0.28%); and, anomalous lead (94 ppb) and antimony (20 ppm). However, a panel sample (160527; 2 X 4 m) from a large (>4m x >100 m) pyrite vein with jarosite/alunite in the central part of the southern area failed to return any values of interest. Similar material (sample 160532RCH; 1 X 1 m), from a smaller vein in the western part of the southern area contained weakly anomalous gold (15 ppb) and antimony (12 ppm). A panel sample (160542RCH) of jarosite/alunite/pyrite material, taken about 10 m east of 160532RCH, returned weakly anomalous gold (15 ppb), but no other values of interest.

A composite float sample (160374RF) of pyritized material (Map 12, Table A8), but with malachite staining contained anomalous gold (30 ppb) and silver (2.4 ppm); strong arsenic (394 ppm) and copper (808 ppm); and, anomalous lead (90 ppm) and antimony (18 ppm). Another composite sample (160537RF) of similar material returned anomalous gold (50 ppb) and silver (6 ppm); strong arsenic (198 ppm) and copper (0.38%); and, anomalous lead (66 ppm) and antimony (10 ppm). A composite sample (160562RF) of pyritized material with disseminations and veins of chalcopyrite and sphalerite contained anomalous gold (45 ppb) and antimony (10 ppm); and, rather interesting silver (19.2 ppm), cadmium (30.5 ppm), copper (0.79%), lead (382 ppm) and zinc (0.43%).

Another distinct type of mineralization comprises brecciated and fractured dacitic float rock, generally with a black siliceous matrix containing quartz carbonate and sulfide veins, and breccia fragments. Of three composite samples taken, sample 160538RF is currently the most interesting, with elevated silver (12.8 ppm), arsenic (1210 ppm), cadmium (12.5 ppm), copper



TABLE A8 ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE YELLOW BOWL ZONE  
1 ROCK SAMPLES

TRUCK SAMPLES				ANALYSES (AU FA/AA; REMAINING ELEMENTS ICP)									
SAMPLE NO, TYPE	LOCATION	NAME, COLOUR	DESCRIPTION	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm
160373RF COMP OF 4 BO	ABOUT 35 M NW OF HELI LAND S AREA OF YELLOW BOWL - SEE DETAILED MAP	ALT ROCK W:ORG BRN, BLK F: OR BRN, WH	75% FI GR TO APHAN, WELL SIL, SOM INTENSE STWK PY QTZ VN, STR C/W TO 40% PY; SOM QTZ PY BREC - PY TO 30% AS DISSEM, LENSES, STR; SOM JUST QTZ PY VN TO 2CM; GEN 10% PY, TR CPY	60	4	2800	94	76	676	<10	0.5	<1	20
160374RFL COMP OF 3 BO	ABOUT 35 M NW OF HELI LAND S AREA OF YELLOW BOWL - SEE DETAILED MAP	ALT ROCK W:ORG BRN, BLK F: OR BRN, GRY	75% FI GR, SUG TO EARTH SIL MATRIX, WELL OXID CW 15% PY AS FI DISSEM, PATCHES, VUGS, STR; TR CPY, 15% OXID MAT (LIM, MN); 1 SEAM MAL STAIN ON SURF	30	2.6	808	90	28	394	<10	0.5	<1	18
160527RP OVER 3 M	ABOUT 150 M N OF HELI LAND S AREA OF YELLOW BOWL - SEE DETAILED MAP	AS 160532RCH FROM LARGE PY/320V VN OVER 100 M LONG & >4 M WIDE		<5	<0.2	20	4	<2	6	<10	<0.5	<1	2
160532RCH OVER 1 M	ABOUT 200 M SW OF HELI LAND S AREA OF YELLOW BOWL - SEE DETAILED MAP	PY VN W:OR BRN, YEL, GRY F: ORG BRN, YEL, GRY	OXID GOSSAN - WELL LIM, JAR, AL, MN; FI MED GR, FRIABLE, LESS OXID MAT IS GRY APHAN QTZ; GEN 10-80% FI DISSEM PY, VN OCCURS AS FRACT IN GOS, PROM OXID GOS HOST VN	15	0.2	10	12	<2	6	<10	<0.5	<1	12
160533RF COMP 3 BO	ABOUT 10 M BELOW 160532RCH S AREA OF YELLOW BOWL - SEE DETAILED MAP	ALT ROCK W:ORG BRN, GR F: OR BRN, GR, WH	FI GR -MASS, WELL SIL, SUG TO SILKY, LOC WELL CHL, C/W 15% PY AS FI DISSEM, STR, QTZ PY VN TO 2 CM, SOM QTZ PY STWK, TR CPY, 60% MATRIX, 25 QTZ VN; 15% PY, TR SPHAL	<5	<0.2	10	6	44	84	<10	<0.5	<1	6
160534RF COMP 4 BO	ABOUT 10 M BELOW 160532RCH S AREA OF YELLOW BOWL - SEE DETAILED MAP	SMS BREC W:ORG BRN, BLK F: BRASS, BLK, WH	SEMI MASS PY AS MATRIX, C/W SOM ANG FRAGS OF SIL BLK VOL, WH QTZ CARB, TR CPY 65% PY; 30 FRAGS; 5% OXID MAT	15	2	116	84	38	1175	<10	1	<1	18



160537RF COMP 3 BO	ABOUT 12 M BELOW 160532RCH S AREA OF YELLOW BOWL - SEE DETAILED MAP	ALTERED ROCK W:OR BRN, RD BRN, BLK F: GR, ORG BRN, PK	FI GR GR GRY QTZ, WELL FRAC, QTZ FRAC FILS, 30% FI DISSEM PY, 1% CPY AS BLEBS, CONSID MAL STAIN ON FRACS; SOM WH QTZ CARB PATCH	50	6	3840	66	58	198	20	0.5	<1	10
160538RF COMP 2 BO	ABOUT 15 M BELOW 160532RCH S AREA OF YELLOW BOWL - SEE DETAILED MAP	SULF BRECC W:ORG BRN, BLK F: GRY, WH, ORG BRN	FI GR GR GRY QTZ MATRIX, C/W QTZ CARB VN TO 0.3 CM, ANG FRAGS WH GRY QTZ, SULF FRAGS TO 2 CM, SOM QTZ CARB ON FRACS, ORTHO FRACS, C/W WH QTZ CARB STR; PY VN, STR TO 0.4 CM, FRAGS TO 1.5 CM, TR SPHAL	<5	12.8	1345	1190	1540	1210	<10	12.5	<1	128
160539RF COMP 3 BO	ABOUT 15 M BELOW 160532RCH S AREA OF YELLOW BOWL - SEE DETAILED MAP	ALT ROCK W: GRY, RD BLK F: BLK, ORG BRN	FI GR - APHAN, SIL MASS BLK MATRIX, WELL FRAC, C/W LIM, VN, STR TO 0.3 CM OF QTZ CARB, WELLSULF - 5-7% PY IN VN, STR, PATCHES, TR SPHAL	15	0.2	390	12	36	210	10	0.5	<1	28
160540RF COMP 3 BO	ABOUT 10 M BELOW 160532RCH S AREA OF YELLOW BOWL - SEE DETAILED MAP	AS 160539RFL		<5	2	629	86	250	254	30	4.5	<1	28
160542RCH OVER 1 M	ABOUT 6 M BELOW 160532RCH S AREA OF YELLOW BOWL - SEE DETAILED MAP	AS 160532RCH		15	<0.2	6	2	<2	4	30	0.5	<1	2
160560RCH OVER 1 M	ABOUT 150 M NW OF HELI LAND S AREA OF YELLOW BOWL - SEE DETAILED MAP	ALT ROCK W:ORG BRN, BLK F: GR, WH, BRN	FI GRAN SUG TO BREC TEXT, MATRIX 80%, MOD CHL, WELL SIL, QTZ CARB, OXID MAT; ALSO SOM QTZ CARB VN, STR; 1-2% FI DISSEM PY THROUGHOUT	10	<0.2	4	<2	22	<2	490	<0.5	<1	<2
160562RF COMP 2 BO	AT 160529SS ABOUT 75 M NW OF HELI LAND S AREA OF YELLOW BOWL - SEE DETAILED MAP	ALT ROCK W:ORG BRN, BLK F: GR, WH, GRY	70% FI GR, SUG TO QTZ, C/W 10% BREC FRAGS; WH QTZ, GRY QTZ; QTZ CARB VN & STR TO 0.4 CM; V WELL SIL, CPY AS VN AND STR TO 1 CM, CO BLEBS, FI DISSEM, LOC TO 25%; GEN 15%; PY AS FI DISSEM & STR TO 10%; TR SPHAL WITH CPY	45	19.2	7870	382	4320	294	<10	30.5	<1	14

160563RCH OVER 1 M	ABOUT 50 M NW OF 160575RCH S AREA OF YELLOW BOWL - SEE DETAILED MAP	ALT ROCK W:ORG BRN, BRN F: GRY, ORG BRN	FI TO MED GR, GRAN, WELL OXID - OXID MAT TO 40% (LIM); WELL SIL, LOC MOD SER; SOME QTZ, CARB, CHL VN TO 0.3CM; 75% QTZ, 8% PY, 15% OXID MAT; 2% CARB, CHL; TR SPHAL	5	<0.2	3	<2	6	4	40	<0.5	<1	4
160575RCH OVER 1 M	ABOUT 100 M NW OF HELI LAND S AREA OF YELLOW BOWL - SEE DETAILED MAP	ALT ROCK W:ORG BRN, BRN F: GR	FI GR, SILKY, WELL CHL, 2-5% FI DISSEM PY, SOM PEA PY, SOME GRY WH MM QTZ CARB FRAGS, MOD SIL C/W SOM SUG QTZ; TR CPY 15% OXID MAT; 2% CARB, CHL; TR SPHAL	35	<0.2	33	4	52	<2	10	<0.5	<1	6

TABLE A8

ANALYTICAL RESULTS FROM SAMPLES COLLECTED ON THE YELLOW BOWL ZONE  
ii. STREAM SEDIMENT SAMPLES

ANALYSES (AU FA/AA; REMAINING ELEMENTS ICP)

SAMPLE NO, TYPE	LOCATION	FLOW DIR	MATERIAL, COLOUR	GRAIN SIZE, COMP	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160528SS	SMALL STR DRAINING GEN E GOSSAN ZONE ABOUT 215 M N OF HELI PAD SEE DETAILED MAP OF S YELLOW BOWL ZONE		SD GRAV BRN	FI - HETRO PEBS, ANG - RD, 60% PEBS OXID 30%, QTZ 20%, BLK, GRY VOL 50%; FI SD MAINLY QTZ, OXID MAT, SOM JAR. AL PEBS	65	1	216	54	88	132	40	1	<1	<2	6
160529SS	SMALL STR DRAINING GEN NE CENTRAL AREA OF S YELLOW BOW ZONE, ABOUT 65 M NW OF HELI LANDING AREA, SEE DETAILED MAP		SD GRAV BRN	FI - HETRO PEBS, ANG - RD, 60% PEBS OXID 7%, QTZ 20%, BLK, GRY VOL 70%; FI SD MAINLY QTZ, OXID MAT	15	1.2	273	46	150	112	90	2	<1	6	9
160531SS	SMALL STR DRAINING GEN ENE CENTRAL AREA OF S YELLOW BOW ZONE, ABOUT 35 M S OF HELI LANDING AREA, SEE DETAILED MAP		CL SLT SD GRY	CL - SLT - FI CL 20%, SLT 60%, FI SD 20%	10	<0.2	51	6	78	14	230	<0.5	<1	4	<1
160535SS	SMALL STR DRAINING GEN E CENTRAL AREA OF S YELLOW BOW ZONE, ABOUT 75 M SW OF HELI LANDING AREA, SEE DETAILED MAP		SD BRN	FI - HETRO: 50% OXID MAT, 20% QTZ, 30% GRY BLK VOL GEN ANG PEBS	10	1	270	4	162	118	70	1.5	<1	4	10



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SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
160373	205 294	60	4.0	1.27	676	< 10	< 10	< 0.5	8	1.18	0.5	72	41	2800	>15.00	< 10	< 1	0.03	< 10	0.90
160373A	214 229	135	2.4	2.59	8	< 10	< 10	< 0.5	< 2	1.39	0.5	152	221	5300	7.10	< 10	< 1	0.01	< 10	2.30
160374	205 294	30	2.6	0.47	394	< 10	< 10	< 0.5	4	3.43	0.5	15	74	808	14.45	< 10	< 1	0.09	< 10	1.60
160527	205 294	< 5	< 0.2	0.46	6	< 10	40	< 0.5	2	0.36	< 0.5	13	42	20	3.82	< 10	< 1	0.28	< 10	0.09
160532	205 294	15	0.2	0.50	6	< 10	< 10	< 0.5	< 2	0.01	< 0.5	42	28	10	10.90	< 10	< 1	0.33	< 10	0.03
160533	205 294	< 5	< 0.2	3.91	84	< 10	40	< 0.5	< 2	0.64	< 0.5	26	54	116	7.75	10	< 1	0.03	< 10	3.65
160534	205 294	15	2.0	0.44	1175	< 10	< 10	< 0.5	6	2.39	1.0	23	41	602	>15.00	< 10	< 1	0.01	< 10	0.38
160537	205 294	50	6.0	0.24	198	< 10	20	< 0.5	< 2	1.69	0.5	40	77	3840	6.95	< 10	< 1	0.14	< 10	0.55
160538	205 294	< 5	12.8	0.99	1210	< 10	< 10	< 0.5	2	2.62	12.5	42	22	1345	>15.00	< 10	< 1	0.10	< 10	1.07
160539	205 294	15	0.2	0.09	210	< 10	10	< 0.5	4	2.13	0.5	18	101	390	7.53	< 10	< 1	0.05	< 10	0.79
160540	205 294	< 5	2.0	0.63	254	< 10	30	< 0.5	< 2	4.88	4.5	29	96	629	9.17	< 10	< 1	0.02	< 10	0.69
160542	205 294	15	< 0.2	0.43	4	< 10	30	< 0.5	< 2	0.08	< 0.5	6	37	6	3.40	< 10	< 1	0.31	< 10	0.02
160542A	214 229	140	2.8	2.69	6	10	< 10	< 0.5	6	1.49	0.5	151	226	5260	7.05	< 10	< 1	0.01	< 10	2.29
160560	205 294	10	< 0.2	2.93	< 2	< 10	490	< 0.5	< 2	3.92	< 0.5	18	12	4	5.30	< 10	< 1	0.20	< 10	2.64
160562	205 294	45	19.2	0.37	294	< 10	< 10	< 0.5	10	7.77	30.5	53	20	7870	9.62	< 10	< 1	0.06	10	3.27
160563	205 294	5	< 0.2	0.38	4	< 10	40	< 0.5	< 2	0.83	< 0.5	4	28	3	2.40	< 10	< 1	0.17	< 10	0.19
160575	205 294	35	< 0.2	4.70	< 2	< 10	10	< 0.5	< 2	2.63	< 0.5	6	8	33	12.05	10	< 1	0.12	< 10	3.08

0.7



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SAMPLE	PREP CODE	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
160373	205 294	655	< 1	< 0.01	9	180	94	>5.00	20	4	14	< 0.01	< 10	10	29	< 10	76
160373A	214 229	205	< 1	< 0.01	1995	430	12	3.02	6	1	13	0.07	< 10	< 10	32	< 10	62
160374	205 294	1135	4	< 0.01	7	180	90	>5.00	18	1	93	< 0.01	< 10	< 10	9	< 10	28
160527	205 294	140	1	< 0.01	2	330	4	2.97	2	1	11	< 0.01	< 10	< 10	4	< 10	< 2
160532	205 294	5	< 1	< 0.01	5	30	12	>5.00	12	< 1	5	< 0.01	< 10	< 10	< 1	< 10	< 2
160533	205 294	865	< 1	0.04	18	1210	6	2.30	6	17	23	< 0.01	< 10	< 10	211	< 10	44
160534	205 294	705	< 1	< 0.01	8	40	84	>5.00	18	< 1	43	< 0.01	< 10	10	3	< 10	38
160537	205 294	590	1	< 0.01	4	180	66	>5.00	10	1	126	< 0.01	< 10	< 10	4	< 10	58
160538	205 294	1280	3	< 0.01	7	130	1190	>5.00	124	4	58	< 0.01	10	< 10	16	< 10	1540
160539	205 294	1450	51	< 0.01	5	220	12	>5.00	28	1	48	< 0.01	< 10	10	10	< 10	36
160540	205 294	1975	15	< 0.01	5	110	86	3.00	16	1	164	< 0.01	< 10	< 10	42	< 10	250
160542	205 294	20	< 1	< 0.01	2	400	2	3.12	2	< 1	9	< 0.01	< 10	< 10	1	< 10	< 2
160542A	214 229	210	< 1	< 0.01	1990	440	16	2.78	2	1	13	0.07	< 10	< 10	34	< 10	70
160560	205 294	920	< 1	0.01	6	1040	< 2	0.16	< 2	13	123	< 0.01	< 10	< 10	83	< 10	22
160562	205 294	3310	1	< 0.01	9	10	382	>5.00	14	4	156	< 0.01	< 10	< 10	16	< 10	4320
160563	205 294	175	< 1	0.02	1	350	< 2	1.54	4	1	27	< 0.01	< 10	< 10	8	< 10	6
160575	205 294	1190	< 1	< 0.01	3	380	4	3.59	6	3	42	< 0.01	< 10	10	22	< 10	52



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SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
140128	201 202	65	1.0	0.83	132	10	40	< 0.5	2	0.52	1.0	27	< 1	216	9.16	< 10	< 1	0.15	10	0.38
140129	201 202	15	1.2	0.89	112	< 10	90	< 0.5	< 2	0.38	2.0	25	1	273	7.68	< 10	< 1	0.10	10	0.48
140131	201 202	10	< 0.2	2.53	14	< 10	230	< 0.5	14	0.42	< 0.5	20	1	51	7.19	< 10	< 1	0.06	< 10	2.08
140131A	201 202	65	1.0	1.62	88	< 10	80	< 0.5	6	2.63	3.5	18	24	126	5.40	< 10	< 1	0.10	< 10	1.37
160535	201 202	10	1.0	1.29	118	< 10	70	< 0.5	2	0.60	1.5	26	3	270	8.15	< 10	< 1	0.08	10	0.94

CERTIFICATION:

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SAMPLE	PREP CODE		Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
160528	201	202	1065	6	< 0.01	4	850	54	3.81	< 2	6	21	< 0.01	< 10	< 10	29	< 10	88
160529	201	202	1565	9	< 0.01	4	1080	46	1.26	6	7	22	< 0.01	< 10	< 10	38	< 10	150
160531	201	202	1400	< 1	< 0.01	3	1280	6	0.08	4	8	20	0.19	< 10	< 10	107	< 10	78
160531A	201	202	830	6	0.01	39	1000	54	1.80	< 2	4	151	0.03	< 10	< 10	50	< 10	184
160535	201	202	1265	10	< 0.01	4	1150	44	1.76	4	6	29	< 0.01	< 10	< 10	50	< 10	162

(0.14%), lead (0.12%), antimony (124 ppm) and zinc (0.15%). The sample does not contain gold and is thus distinctly different from other samples with significant base metal contents.

A number of panel samples were collected of altered pyroclastic host rock (weakly to strongly silicified, weakly to moderately pyritized, moderately sericitized, weakly to moderately carbonatized and chloritized, often with quartz/pyrite fracture fillings). The two composite samples analyzed (Table A8, Map 12; 160563RCH and 160575RCH) have weakly anomalous antimony contents and one anomalous gold value (35 ppb).

### **9.3.I.iii. INTERPRETATION OF THE YELLOW BOWL ZONE:**

In 1997 and 1999, follow-up activities on the Yellow Bowl Zone have been restricted by fog, which is generated from the snowfields and glaciers to the west of the Yellow Bowl Zone and which often envelopes the higher elevations where the most prospective targets appear to be located.

Based on the limited work to date, the Yellow Bowl Zone continues to be of great interest e.g., of the total of 19 stream sediment samples collected to date, 95% of them have anomalous copper contents; 74% of them have anomalous gold contents; and, 90% of them have anomalous lead contents. Where arsenic analyses are available, 86% of those samples have anomalous arsenic contents. The lower, upper, northern and southern areas of the zone, that comprise a strike length greater than 1.25 km, all contain very favourable geology for VMS type deposits; and, *interesting mineralization with some very significant metal values*. In addition to massive to semi massive pyrite, those values are now also known to be associated with altered dacite, and quartz breccia veins in altered pyroclastic rocks.

Additional work will be required to locate and prioritize the most significant drill targets. However, the 1997 and 1999 surveys have laid the foundation for such activities; and, the best time for them would be when a helicopter is on the property i.e., during a diamond drill program. Permissive weather conditions could then be fully utilized, and if warranted, the most prospective target(s) could be drilled, most cost effectively. Relative to the other targets referenced in this report, those currently available on the Yellow Bowl Zone (i.e., pyrite veins) are considered secondary. However, in view of the abundance of mineralized float encountered in 1999 on the southern area of the zone, there have to be substantial, in situ sources of mineralization that should offer high priority drill targets. One complete week of a crew's detailed work would go a long way to the generation of such targets.



#### **9.4. 1999 RECONNAISSANCE SURVEYS, TODD CREEK PROPERTY (MAPS 13A, 13B; TABLE A9):**

**Minor reconnaissance work was carried out in 1999 to investigate two apparently important targets on and in proximity to the Todd Creek Property:**

##### **9.4.A: NORTHWESTERN RECONNAISSANCE TARGET AREA - HAMILA GLACIER:**

**Initial reconnaissance activities were carried out near the northwest corner of the Todd Property (Map 13A) to follow-up very anomalous, historical stream sediment gold values (up to 1.57 g/t; Map 13A; Assessment Work Report 17,634), along with associated anomalous copper, lead and silver values. The possible source of these anomalies may be located in or near drainages located on or near the Todd Creek Property.**

**Of the three 1999 stream sediment samples taken northeast of the Hamila Glacier (Map 13A; Table A9), one sample (160526SS) had some metal contents of interest (weakly anomalous gold, silver, cadmium; and, anomalous lead and zinc). However, composite samples (160545RF, 160546RF) of angular chloritized and carbonatized rubble, with blebs, stringers and veins of quartz with coarse chalcopyrite returned up to 75 ppb gold, 9.2 ppm silver, 22.5 ppm cadmium, 0.39% copper, 0.74% lead and 0.24% zinc (Table A9). Composite samples (160543RF, 160544RF, 1605550RF) of limonitized, pyritized, and silicified volcanic breccia float only returned some weakly anomalous lead and gold values.**

**The work appears to have been successful in identifying the most obvious source rock of the historic stream geochemical anomalies (up to 1.57 g gold/t) to the east of Hamila Lake (Map 13A. The altered chloritized float rubble is rather distinctive and some follow-up work to locate its postulated nearby bedrock source is recommended.**

**A second set of anomalous, historic stream sediment samples (values up to 560 ppb gold; Map 13A) is located about 3 km east of Hamila Glacier. A 1999 reconnaissance sample (160423SS) returned weakly anomalous gold, copper and lead values (20 ppb, 76 ppm and 28 ppm, respectively), thus somewhat confirming the original anomaly.**

**Historic gold stream sediment anomalies (gold values up to 150 ppb) are also located on the East Tributary (Map 13A), about 4 km east of Hamila Glacier. A 1999 reconnaissance sample taken from the tributary at Hamila Creek returned weakly anomalous gold and silver values (5 ppb and 1.2 ppm, respectively; and, anomalous lead and zinc values (48 and 196 ppm, respectively).**

##### **9.4.A.i. INTERPRETATION OF THE HAMILA GLACIER AREA TARGET:**

**The highest grade, stream sediment gold values on and in the immediate area of the Todd Creek Property were apparently obtained in historic samples taken on Hamila Creek, northeast of Hamila Glacier. Initial follow-up in 1999 has located a possible source rock type**

TABLE A9

ANALYTICAL RESULTS FROM RECONNAISSANCE SAMPLES:  
a) NORTHWEST RECON TARGET, HAMILA GLACIER AREA:  
i ROCK SAMPLES

FROM SAMPLES				ANALYSES (AU FA/AA; REMAINING ELEMENTS ICP)										
SAMPLE NO, TYPE	LOCATION	NAME, COLOUR	DESCRIPTION	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160543RF COMP OF OXID BO TALUS	AT 160547SS IN TERM MORaine	ALT MAFIC VOL BREC W:ORG BRN F: GRY GR	FI, GRAN, MATRIX C/W 70% ANG FRAGS OF ALT VOL; INTENSE QTZ SER, CPY ALT; FRAGS WITH 10% DISSEM PY & 3% CO BLEBS CPY; QTZ MATRIZ GEN BARREN	15	0.8	38	8	8	10	10	<0.5	<1	<2	5
160544RF COMP OF OXID BO TALUS	AT 160547SS IN TERM MORaine	ALT MAFIC VOL W:ORG BRN F: GRY GR	FI, GRAN, MASS, STR QTZ CHL PY ALT, C/W 5% DISSEM PY; NUM QTZ PY VN AND STR, MM SCALE, SOME STWK,	15	1	12	12	52	10	20	<0.5	<1	<2	4
160545RF COMP SAMP OF ANG FLT	AT 160547SS	ALT MAFIC VOL W:ORG BRN GR F: GRY GR	1. 60% VN OF CHL, CHL+QTZ+/-CARB, FI CHL, MED QTZ, CO CARB 2. 40% WELL CHL FRAGS, LOC WITH SOM SIL, C/W 1% (LOC 5%) STR, BLEBS OF CPY IN FRAGS & VN	<5	4	2890	<2	94	<2	160	<0.5	<1	<2	<1
160546RF COMP SAMP OF ANG FLT	AT 160547SS	BREC VN VOL W: GR BRN GR F: GRY GR	50% VN, 50% FRAGS 1. FI GR VN OF QTZ+/-CARB 2. WELL CHL FRAGS, FI, MASS, C/W QTZ CAL STR & .5% GAL, SPHAL AS DISSEM, BLEBS; 1% CPY AS DISSEM, BLEBS	75	9.2	3890	7390	2380	<2	230	<0.5	1	<2	<1
160548RF COMP SAMP OF ANG FLT	AT 160549SS	ALT MAFIC VOL W: GRY PK F: GRY GR	FI GR, SIL VOL, WELL SULF, 1% PY AS DISSEM, STR, NUM VN & STR, WITH PY, OR PY QTZ OR PY QTZ CAL	15	6.6	15	39	20	<2	30	<0.5	<1	<2	4
160550RF COMP SAMP OF ANG FLT	10 M SW OF 160549SS	SIL MAFIC VOL W:ORG BRN F: GRY	FI GR, SUG TO EARTH TEXT, V WEL SIL, V WEL SULF - 7 - 10% FI DISSEM FI DISSEM PY, 7-10% FAIRLY ABUND BO	<5	0.6	25	18	64	20	10	2	4	<2	7

TABLE A9

ANALYTICAL RESULTS FROM RECONNAISSANCE SAMPLES:  
a) NORTHWEST RECON TARGET - HAMILIA GLACIER AREA  
ii. STREAM SEDIMENT SAMPLES

# STREAM SEDIMENT SAMPLES					ANALYSES (AU FA/AA; REMAINING ELEMENTS ICP)											
SAMPLE NO, TYPE	LOCATION	FLOW DIR	MATERIAL, COLOUR	GRAIN SIZE, COMP	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm	
160423SS	HAMILA CRK 1 KM W OF E TRIB - SEE DETAILED MAP	NE	CLY, SLT GRY BLK	CL-SLT, 65% CL, 35% SLT	20	0.6	76	28	108	6	260	1	<1	<2	3	
160526SS	EAST TRIB OFF HAMILA CRK, 1 KM E OF 160423SS SEE DETAILED MAP	NE HI ENER	HETRO SD, GRY BLK	FI-MED, LEUC - 50%, MAINLY QTZ; 40% GR VOL, 10% OXID MAT	5	1.2	29	48	196	14	380	2	<1	<2	3	
160547SS	AT HAMILA CRK, NE OF TALUS PILE BELOW HAMILA GLACIER SEE DETAILED MAP	GEN NE	SD, PK GRY BLK	FI, QTZ, GR VOL, CHL, OXID MAT, MIN CAL SOM EPID	<5	0.2	31	10	62	2	200	0.5	<1	<2	3	
160549SS	15 M SW ON HAMILA CRK TOWARDS GLAC ON FLD PLAIN SEE DETAILED MAP	AS 160547SS			<5	0.4	44	12	68	6	60	<0.5	<1	<2	3	

TABLE A9

ANALYTICAL RESULTS FROM RECONNAISSANCE SAMPLES:  
b) KNOB TARGET AREA:  
i ROCK SAMPLES

SAMPLE NO, TYPE	LOCATION	NAME, COLOUR	DESCRIPTION	ANALYSES (AU FA/AA; REMAINING ELEMENTS ICP)										
				AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160396RC COMPOSITE OF OXID QTZ BAR Z & WR NEAR MAJOR FAULT	N OF KNOB ZONE, N SIDE OF NE FL CRK DELTA AT TOD CRK SEE DETAILED MAP	QTZ BAR OX ZONE W:OR BRN, WH F: OB, BRN WH	FI GR, SUG TO EARTH QTZ MATRIX, WELL OXID INTERGROW OF EUHED QTZ BAR, OXID, EARTHY PATHCES OF EUCHED PY, TR SPHAL ZONE CAN BE FOLLOWED FOR OVER 200 M TO NE, TRD 330 UP TO 3 M WIDE	<5	<0.2	1	38	88	22	200	0.5	<1	<2	1

TABLE A9

## ANALYTICAL RESULTS FROM RECONNAISSANCE SAMPLES:

b) KNOB TARGET AREA:

ii STREAM SEDIMENT SAMPLES

UPSTREAM SEDIMENT SAMPLES					ANALYSES (AU FA/AA; REMAINING ELEMENTS ICP)										
SAMPLE NO, TYPE	LOCATION	FLOW DIR	MATERIAL, COLOUR	GRAIN SIZE, COMPOSITION	AU ppb	AG ppm	CU ppm	PB ppm	ZN ppm	AS ppm	BA ppm	CD ppm	HG ppm	SB ppm	MO ppm
160476SS	LCP TODD NE 18	LOW FL	HETRO SD, BRN	FI-CO, 60% GR VOL, PK VOL, 20% QTZ, CARB, SER MIN EPID 20% OXID MAT	10	<0.2	61	36	74	50	200	0.5	<1	56	3
160395SS	N OF KNOB W INTO ZONE, N TODD CRK SIDE OF NE MOD FL CRK DELTA AT TOD CRK SEE TOPOG MAP		HETRO SD, BRN	FI-CO, 70% GR GRY VOL, 20% QTZ, CARB, BA 10% OXID MAT	<5	0.6	19	24	158	14	460	1	<1	6	3
160397SS	N OF KNOB ZONE, N SIDE OF NE CRK DELTA AT TOD CRK SEE TOPOG MAP		AS 160395SS	BUT OXID MAT 30%; VOL 40%	15	0.4	20	28	148	12	500	0.5	<1	4	3



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Comments: ATTN: D. MOLLOY

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Total Pages : 1  
Certificate Date: 13-SEP-1999  
Invoice No. : 19927890  
P.O. Number : TOK  
Account : KIV

## CERTIFICATE OF ANALYSIS

A9927890

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
160396	205 294	< 5	< 0.2	0.19	22	< 10	200	< 0.5	< 2	7.92	0.5	12	110	1	3.97	< 10	< 1	0.09	< 10	1.06

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SP	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Ti	Tl	U	V	W	Zn
DE	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
294	2800	1	< 0.01	6	420	38	0.27	< 2	10	320	< 0.01	< 10	< 10	10	< 10	88



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P.O. Number : TOK  
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A9925240

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Bg ppm	K %	La ppm	Mg %
P160476	201 202	10	< 0.2	1.20	50	< 10	200	< 0.5	< 2	0.41	0.5	21	6	61	6.21	< 10	< 1	0.09	10	0.64

*Handwritten signature/initials*





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## CERTIFICATE OF ANALYSIS

A9925240

SAMPLE	PREP CODE		Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
P160476	201	202	1060	3	< 0.01	5	1090	36	0.42	56	7	40	0.02	< 10	< 10	66	< 10	74



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P.O. Number :TOV

Account :KIV

## CERTIFICATE OF ANALYSIS

A9927887

SAMPLE	PREP CODE	Au ppb FA+AA	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
160395	201 202	< 5	0.6	0.78	14	< 10	460	< 0.5	< 2	3.65	1.0	11	7	19	3.69	< 10	< 1	0.10	10	0.52
160395A	201 202	135	1.2	1.84	98	< 10	90	< 0.5	< 2	2.68	2.5	22	33	134	5.10	10	< 1	0.11	< 10	1.51
160397	201 202	15	0.4	0.79	12	< 10	500	< 0.5	< 2	3.82	0.5	11	7	20	3.70	< 10	< 1	0.11	10	0.52

CERTIFICATION:



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## CERTIFICATE OF ANALYSIS

A9927887

SAMPLE	PREP CODE		Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Ti ppm	U ppm	V ppm	W ppm	Zn ppm
160395	201	202	1335	3	< 0.01	5	1150	24	0.22	6	4	150	0.05	< 10	< 10	47	< 10	158
160395A	201	202	780	11	0.01	48	1060	56	1.87	6	4	136	0.04	< 10	< 10	56	< 10	224
160397	201	202	1375	3	0.01	6	1110	28	0.22	4	5	149	0.05	< 10	< 10	47	< 10	148

for the mineralization. A composite sample of the propylitically altered, distinctively green, mafic volcanic float rock has returned interesting gold, silver, lead, zinc and copper values. In view of the strength of the historic anomalies, and the presence of other anomalous gold values about 3 and 4 km to the northeast of Hamila Glacier (Hamila Creek and East Tributary Creek, respectively), it is recommended that the Todd Property be expanded to the north to ensure it covers all the postulated bedrock sources areas of the mineralization.

#### **9.4.B. KNOB ZONE RECONNAISSANCE TARGET (MAPS 2, 2A, 13B; TABLE A9):**

A major fault zone is postulated to trend 330 degrees north of the Knob Zone (See Section 5) towards the Amarillo Zone. A prominent quartz barite breccia vein with varying amounts of oxidized pyrite can be traced southeast for over 200 m towards the Knob Glacier. Other than anomalous lead and weakly anomalous arsenic, a composite sample (160396RC) of vein material had no additional metal contents of interest (Map 13B; Table A9). Sediment samples (160395SS, 160397SS) taken from the drainage of the Knob Glacier, upstream from Todd Creek, have one weakly anomalous gold value (15 ppb); anomalous lead, zinc barium; and, weakly anomalous antimony contents. The area is of general interest because of the northeast trend of the South Zone, under the sediments of Todd Creek Valley, towards the Knob Zone.

Stream sediment sample 160476SS (Map 13B, Table A9) was taken from the creek on the west side of Todd Creek, at the LCP for the new Todd 18 Claim. The sample contains anomalous gold, copper lead and arsenic and strongly anomalous antimony. As shown on Map 13B, the values are indicative of the Yellow Bowl Zone to the west.

##### **9.4.B.i: INTERPRETATION OF THE KNOB ZONE RECONNASISSANCE TARGET:**

The Knob Zone area is of particular interest because of the sericite-quartz-pyrite alteration associated with coarse breccias and mafic volcanic rocks, which comprise the “Knob”; and, because of the narrow chalcopyrite veins (see Section 5) hosted by them.

This alteration and mineralization is very characteristic of host rocks of the South Zone deposit. The Knob Zone is thus of particular interest since the South Zone Structure is postulated to trend from the NEXT Zone area towards the Knob Zone i.e., is the mineralized South Zone Structure located under the Todd Creek Valley, just west of the Todd Zone? As contemplated in Section 9.3.D., measurements on the NEXT Fault may determine where the South Zone Structure precisely is at the NEXT Zone; and where it may extend to, with regard to the Knob Zone. The Knob Zone may be indicative of another 3 km strike length of the South Zone structure to the north, beyond the NEXT Zone. Follow-up activities should be directed to an examination of some specific outcrops along the valley floor; and, structural measurements are required to ascertain the exact position of the structure, relative to the NEXT Zone, the Yellow Bowl Zone and the Knob Zone.

## **10. CONCLUSIONS, RECOMMENDATIONS, TODD CREEK PROPERTY:**

### **10.A. CONCLUSIONS:**

**The Todd Creek Property is deemed to offer many high priority exploration targets, a number of which could host significant gold/copper ore bodies with polymetallic credits.**

**Based on the current and historical data base, the Amarillo Zone and the South Zone gold/copper deposit, including its along strike extensions, the MEXT and NEXT Zones, are interpreted to represent the most prospective discovery opportunities.**

**The Amarillo Zone on Orange Mountain (Photo 43) is postulated to be located near the top of a large epithermal system characterized by the strongest polymetallic signature in stream sediments, soils and rocks (silver, lead, zinc cadmium, barium, arsenic, antimony, mercury, with or without gold/copper), which Geofine has ever encountered in the Stewart Camp. The gold/copper breccia veins (A, B, NE, etc. Zones) on the North Zone, Grid C, are deemed to be manifestations of a gold/copper deposit located at a deeper level in the hydrothermal system.**

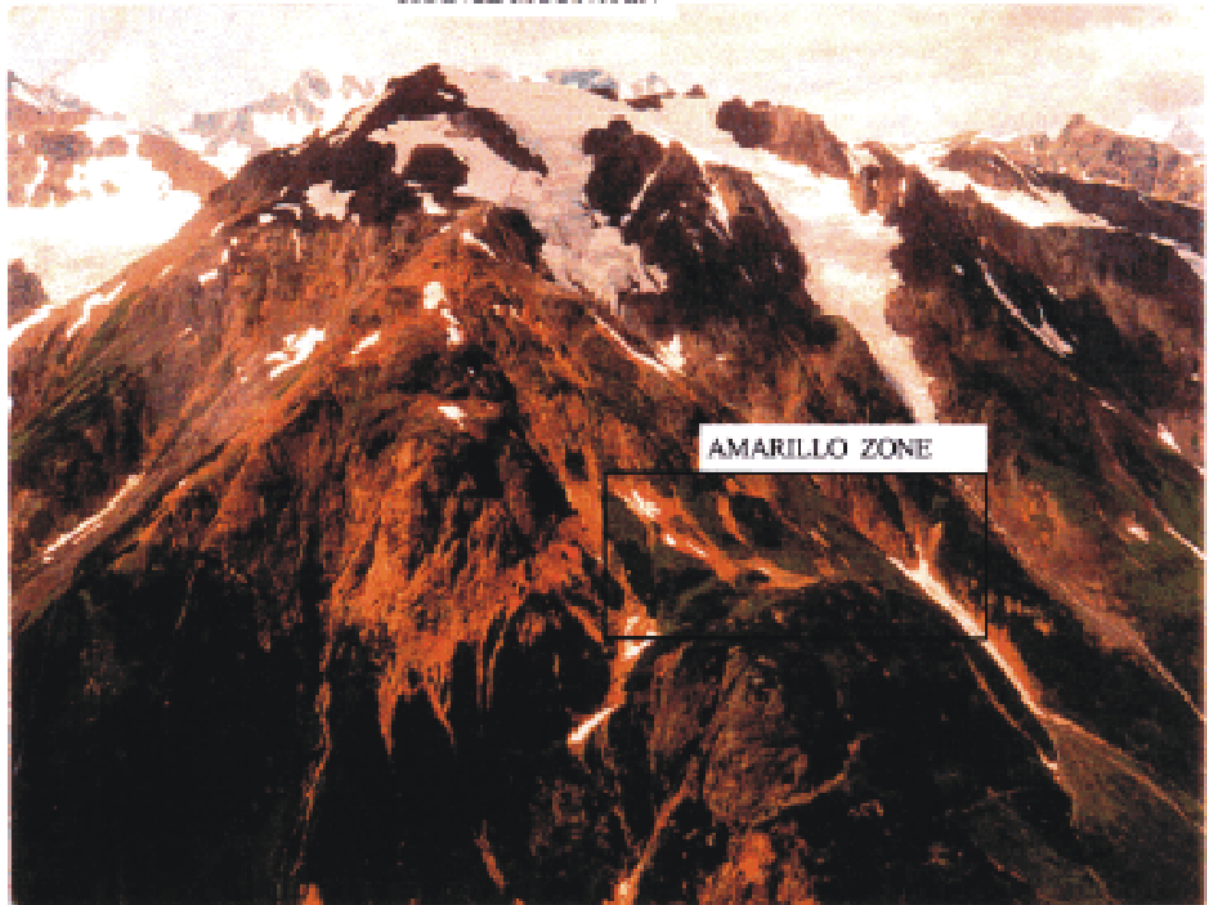
**The large Amarillo target area has never been tested by diamond drilling, and it is herein concluded that its drill evaluation is the next logical discovery strategy. The Camp Pond and Western Target Area are characterized by favourable geology, alteration and geochemical signatures, which provide excellent rationale for the initial drill holes.**

**The South Zone Structure has a postulated strike length of over 4 km, from south of the South Zone deposit to beyond the Knob Zone. The majority of the exposed, 950 m long segment on the South Zone is mineralized with gold/copper; and, as the 1999 program has proven, new discoveries can be made e.g., the MEXT Zone.**

**It is postulated that the distribution of mineralization along the South Zone Structure is controlled by the intersection of conjugate structures; and, that their plane of intersection can focus and control the development of plunging ore shoots, similar to those at the Golden Patricia Mine in Northwestern Ontario. A drill strategy utilizing a plunging ore shoot model appears to have never been utilized in the historic drilling. It is thus concluded that its incorporation into the planned Y2K drill program could lead to a significant expansion in reserves at the South Zone deposit, and elsewhere on the property.**

**The MEXT and NEXT Zones are located north of the South Zone deposit, proximal to obvious structural junctions, and drill strategies successful at the South Zone, should be applied along the South Zone Structure. The MEXT Zone is regarded as a very significant gold/copper target, given the apparent abundance of auriferous hematite and the grades of mineralization encountered in initial sampling. The NEXT Zone could be indicative of even more significant exploration targets: if the South Zone Structure is dextrally offset into the Todd Creek Valley, and the NEXT is a subsidiary structure, the main target at the NEXT may be located under Todd Creek.**

ORANGE MOUNTAIN



**PHOTO 43: AMARILLO ZONE ON ORANGE MOUNTAIN  
(LOOKING NORTHWEST)**

**The South Zone Structure is particularly intriguing with its apparent strike extent and exploration potential beyond the mineralization discovered to date. The analysis of air photos suggests the structure continues to the south, well beyond current southern claim boundary. Evidence at the NEXT Zone indicates the structure trends toward the Knob Zone, where the alteration suggests that proximal gold/copper mineralization could be associated with the structure under Todd Creek Valley. It is thus concluded that the South Zone Structure and subsidiary structures could host a number of ore shoots, which could have a somewhat regular periodicity of distribution, and which could present a unique discovery opportunity. The understanding of such morphologies, and the orchestration of drill programs according to the structural parameters the shoots entail, should be an essential component of any drill program.**

**Although secondary to the Amarillo and South Zones, the quartz breccia vein targets on the North Zone, are considered important. The gold/copper and polymetallic mineralization found at the A, B and NE Zones is believed related to the mineralizing events at the Amarillo Zone. The structural fabric on the North Zone is conducive to the development of ore shoots e.g. there is some indication that a gold/copper ore shoot may exist in the vicinity of the Fall Creek/A Zone structural intersection. It is thus concluded that targets such as the A and B Zone warrant some follow-up and initial drill testing, respectively, using a plunging ore shoot model.**

**Although the Yellow Bowl Zone is often difficult to access, it continues to be regarded as an important environment for the discovery of volcanogenic massive sulfide deposits. Favourably altered rhyolitic to dacitic interflows occur in a number of volcanic cycles, which include coarse breccias and agglomerates. Samples of altered dacitic float have been found in the 1999 program with interesting base metal contents. The ubiquitous pyrite veins with and without copper and gold are regarded as manifestations of a significant mineralizing event. It is concluded that the Yellow Bowl Zone requires further prioritizing activities in search of a VMS deposit; and that the drill testing of the pyrite veins with copper/gold mineralization is not currently a priority.**

**Finally, in the prospective geological environment of the Todd Creek area, other targets are apparent. The Hamila Glacier area historically has yielded the highest stream sediment gold values on and in the vicinity of the Todd Creek Property. Initial 1999 follow-up activities have provided some further evidence of potential, and it is concluded that the target area warrants more work. The East Zone, rhyolite VMS target (Molloy, 1997) also requires further evaluation.**

## **10.B. RECOMMENDATIONS:**

**As outlined in Table 8, which is also included in this section, a Phase 1, Y2K diamond drill program comprising at least 1200 meters and utilizing HQ core is recommended. The program would initially test the Amarillo Zone; attempt to expand the South Zone deposit; and, initially test the MEXT, NEXT and B Zones, as budget and results dictate. As shown in Table 9, and based on Falcon Drilling's 1999 bid, such a program, including staking and geological activities referenced below, would total approximately \$450,000. In view of snow and fog conditions that can persist on the Amarillo Zone into August, the most cost effective drill program will probably have to commence on the South Zone in July to take full advantage of the field season.**

**It is also recommended that, concurrent with the Y2K drilling program, detailed follow-up geological and prospecting surveys be carried out from the NEXT Zone to the Knob Zone, along the Todd Creek Valley, as an attempt to locate the South Zone Structure and to ascertain its exploration potential. Similar activities are recommended south of the South Zone deposit along the air photo lineament. Detailed follow-up activities are also proposed on the Yellow Bowl Zone to prioritize VMS type drill targets. As time and budget permit, such activities should be extended to the Hamila Glacier target area to follow-up the highest gold stream sediment values ever located on, or in the vicinity of the Todd Creek Property. The contemplated work would utilize the on site drill camp and support helicopter.**

**Prior to any Y2K work, it is recommended that additional claims be staked in the near future: three claims to the east and south of the South Zone deposit (the old Pat 8, 9 and 10 Claims) to cover the apparent, along strike extension of the South Zone deposit and postulated offsets to the east; and, the old Pat 5 and 6 Claims to cover the East Zone rhyolite VMS target. Two new claims are also proposed to cover the Hamila Glacier target area. The staking would entail about seven claims totalling about 140 units. The work, including claim registration and helicopter costs would total about \$4500.**



TABLE 8: PROPOSED 2000, PHASE 1 DRILL PROGRAM, TODD CREEK PROPERTY\*  
(SUBJECT TO AVAILABLE METERAGE AND ON-GOING RESULTS)

TARGET A> AMARILLO ZONE

CURRENT PRIORITY*:	HOLE NO.:	REF X SECT	LOC. ON GRID	ELEV (m)	AZIMUTH (DEG)	INCL.PLAN (DEG) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
1X	DDHAZ00-04	NA	L50+00N, 51+75E	NA	292.00	-45.00	300.00	NA	NA	NA
2?X	DDHAZ00-04A	NA	L50+00N, 51+75E	NA	292.00	-65.00	250.00	NA	NA	NA
2?	DDHAZ00-02	NA	50+00E, L49+00N	NA	292.00	-45.00	175.00	NA	NA	NA
?	DDHAZ00-01	NA	50+00E, L48+00N	NA	292.00	-45.00	300.00	NA	NA	NA

TARGET B> SOUTH ZONE: ZONE 1, ZONE 2

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1	EST PROJ PT CORDS ON VLS 10000E	EST HOR PROJ		
						(m)	(m)	ZONE 1 (N)	ELEV (m)	DIST (m)	
3?X	DDHSZ00-01	10116N	10115N 9860E	1138.00	100.00	-65.00	200.00	NA	10115.00	975.00	-86.00
2?X	DDHSZ00-01A	10116N	10115N 9834E	1145.00	100.00	-60.00	135.00	NA	10115.00	1050.00	-12.50
?	DDHSZ00-02	9832N	9840N 9943E	1050.00	100.00	-60.00	100.00	NA	9640.00	973.50	-12.50
4?X	DDHSZ00-03	9959N	L9960N 9890E	1105.00	100.00	-70.00	175.00	95.50	9960.00	947.50	-55.75
?	DDHSZ00-04	10154N	L10150N 9913E	1143.00	100.00	-75.00	225.00	NA	10150.00	950.00	-30.00

TARGET C> MEXT SOUTH ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
3?X	DDHMEXTSZ00-01	NA	WEST CLIFF?	985?	100?	-70?	100?	NA	NA	NA

TARGET D> NEXT SOUTH ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
5?X	DDHNEXTSZ00-01	NA	TODD CRK VALLEY?	885.00	280.00	-30.00	100?	NA	NA	NA

TARGET E> NORTH GRID, B ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
6?X	DDHBZ00-01	NA	208+50N, 209+12E	1060.00	40.00	-45.00	80.00	NA	NA	NA
	DDHBZ00-02	NA	209+02N 209+00E	1070.00	139.00	-45.00	100.00	NA	NA	NA

TARGET F> NORTH GRID, NORTHEAST ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH	EST. CORELENG. TO ZONE 2 ZONE 1 (m) (m)	EST PROJ PT CORDS ON VLS ZONE 1	ELEV (m)	EST HOR PROJ DIST (m)
7?	DDHNEZ00-01	NA	209+77N 209+90E	1060.00	70.00	-45.00	100.00	NA	NA	NA

TARGET G> NORTH GRID, A ZONE:

CURRENT PRIORITY*:	HOLE NO.	REF X SECT	LOC.	ELEV. (m)	AZIMUTH (DEG)	INCL.PLAN (deg) LENGTH (m)	EST. CORELENG. TO ZONE 2 ZONE 1 (m)	EST PROJ PT CORDS ON VLS 10050N ZONE 1 (E)	ELEV (m)	EST HOR PROJ DIST (m)		
8?X	DDHAN00-01	10050N	10015N, 10097E	990.00	45.00	-45.00	100.00	NA	45.00	10097.00	945.00	15.00

\*X = PROPOSED, NINE HOLE, PHASE 1 DRILL PROGRAM SCENARIO: APPROX. 1440 m  
(HOLE ORDER AND PROPOSED SCENARIO SUBJECT TO ON-GOING RESULTS)

TABLE 9

## PROPOSED PHASE 1, Y2K EXPLORATION PROGRAM BUDGET

## TODD CREEK PROPERTY:

	ITEM:	EST COST \$ CDN
1.	assessment work, property research	
2.	project permitting, bond	20000
3.	thin sections, whole rock studies	
4.	property acquisition	5000
5.	structural studies, air photos, maps	
6.	field equipment, supplies	7500
7.	mob-demob, vehicle rental, gas, ins	8500
8.	helicopter support for Geofine crews, incl geol sureys, hole checking, sample shipment, mob, demob	15000
9.	analyses: 800 @ \$25	20000
10.	linecutting	
11.	geophysical surveys	
12.	land surveys	
13.	sustenance, accomodation, camp rental beyond dd	12500
14.	communications, courier, shipping	3500
15.	drafting, reporting, assessment reports	12500
16.	filing fees	15000
17.	legal fees, insurance	2200
18.	licences	
19.	salaries: local labor, 2 geologists @ 1200/day @ 35 days	42000
20.	stripping, trenching	
21.	HQ diamond drilling at \$230/m all-in, excluding standby: 1200 m @ 230/m	276000
	SUBTOTAL	439700
	CONTINGENCY	35000
	SUBTOTAL	474700
	OVERHEAD	14241
	SUBTOTAL	488941
	LESS RECOVERABLE BOND, GST	-50000
	ESTIMATED GRAND TOTAL*	438941

\*SUBJECT TO CONTRACTOR FINAL BIDS

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12.

**STATEMENT OF QUALIFICATIONS:**

I, David E. Molloy, of the Town of Unionville, of the Regional Municipality of York, Ontario, hereby certify that:

- i. I am President of Geofine Exploration Consultants Ltd. with a business address at 49 Normandale Road, Unionville, Ontario, L3R 4J8.
- ii. I am a graduate of McMaster University, in the City of Hamilton, Ontario, with a B.A. in Philosophy (1968); I am a graduate of the University of Waterloo, in the City of Waterloo, Ontario, with a B.Sc. in Earth Science (1972);
- iii. I have practised my profession in mineral exploration continuously for the past 27 years, including 9 years as a consultant; 10 years with St. Joe Canada Inc./Bond Gold Canada Inc./LAC Minerals Ltd. as Regional Geologist, Exploration Manager, Vice President and as Senior Vice President, Canadian Exploration; and, 8 years with Beth-Canada Mining Company as a Regional Geologist;
- iv. I am a Fellow of The Geological Association of Canada;
- v. I am a Member of the Canadian Institute of Mining and Metallurgy; of the Prospectors and Developers' Association; and, of the Association of Exploration Geochemists;
- vi. I have supervised the fieldwork and the preparation of this report entitled "Report On the 1999 Exploration Program On The Todd Property, Skeena Mining Division, Stewart Gold Camp, Northwestern British Columbia, For Okak Bay Resources Ltd., By Geofine Exploration Consultants Ltd."
- vii. The recommendations herein are solely the responsibility of Geofine Exploration Consultants Ltd.

David E. Molloy, B.A., B.Sc., F.G.A.C.  
President, Geofine Exploration Consultants Ltd.

Dated at Unionville, Ontario, this 12th day of December 1999.