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CONFIDENTIAL X  
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MINING DISTRICT: Mayo  
TYPE OF WORK: Geology, Geochemistry

REPORT FILED UNDER: M.J. Moreau Enterprises Ltd.

DATE PERFORMED: May 31 - June 3, 1989

DATE FILED: December 8, 1989

LOCATION: LAT.: 63° 51'N

AREA: Mt. Haldane

LONG.: 135° 51'W

VALUE \$: 9000.00

CLAIM NAME & NO.: JOUMBIRA 1-32 YB 02261-292  
LOOKOUT 1-18 YB 02313-329  
LOOKOUT 19-22 YB 03041-044  
LOOKOUT 27-32 YB 03045-050

WORK DONE BY: Aurum Geological Consultants Ltd.

WORK DONE FOR: M.J. Moreau Enterprises Ltd.

DATE TO GOOD STANDING:


REMARKS: # 30 JOUMBIRA

Pyrite, pyrrhotite and arsenopyrite occur in a greenstone - hosted quartz vein which was trenched in 1989. Soil sampling returned anomalous values of gold and silver.

092785



**REPORT ON THE 1989  
GEOLOGICAL AND GEOCHEMICAL  
ASSESSMENT WORK ON THE  
JOUMBIRA AND LOOKOUT CLAIMS**

Mayo M.D., Yukon  
May 31-June 3, 1989

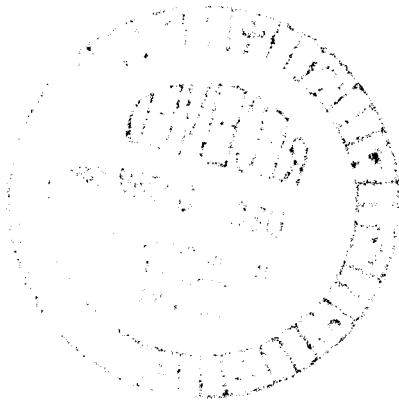
**Claims:** Joubira 1-32 (YB02261-292)  
Lookout 1-18 (YB02313-329)  
Lookout 19-22, 27-32 (YB03041-050)

**Location:** 1. 30 Km North of Mayo, Yukon  
2. NTS Sheet 105 M/13  
3. Latitude 63° 51' N  
Longitude 135° 51' W

**For:** Mr. Jacques Moreau  
M.J. Moreau Enterprises Ltd.  
P.O. Box 5282  
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Y1A 4Z2

**By:** Roger Hulstein, B.Sc.  
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P.O. Box 5179  
Whitehorse, Yukon  
Y1A 3E4

October 31, 1989



This report has been examined by  
the Geological Evaluation Unit  
under Section 53 (4) Yukon Quartz  
Mining Act and is allowed as  
representation work in the amount  
of \$ 9000.00.

*W. R. Bayge*  
Regional Manager, Exploration and  
Geological Services for Commissioner  
of Yukon Territory.

## SUMMARY

The Joubira property consists of 60 contiguous mineral claims about Mt. Haldane, Mayo map sheet, Yukon. They are accessible by road or helicopter based out of Mayo.

The claims lie within the Keno Hill mining district, part of the McQuesten mineral belt. The McQuesten mineral belt is a metallogenic district approximately 30-50 km wide extending from Mayo to Clear Creek, a distance of 80 km.

Interest in the ground developed in 1987-1988 when it was realized the Joubira property has geological and mineralogical characteristics similar to significant gold prospects (i.e. Dublin Gulch, Clear Creek, Wayne Property, Red Mountain) in the McQuesten Mineral Belt.

The ground was initially staked in the 1960's by United Keno Hill Mines for silver-lead. It was subsequently restaked and explored intermittently by various companies for silver-lead until 1977 when CCH Resources Ltd. staked and explored it for tin and tungsten until 1981.

Metasedimentary lithologies of the Keno Hill Quartzite or Central Quartzite unit underlie most of the property with minor exposures of the Hadrynian Upper Schist unit restricted to the southeast corner. Cretaceous to Tertiary quartz monzonite intrusives and related dykes intrude the sedimentary rocks.

Mineralization discovered to date includes silver-lead bearing quartz veins, some similar to the nearby Mt. Haldane vein fault system, with reported assays up to 181 opt silver over 0.38 m. Two significant cassiterite showings, the *Pro* and *Fed*, and numerous scheelite showings are associated with felsic dykes.

A four day exploration program in 1989 returned anomalous gold and silver values in the vicinity of the Fortune Creek stock. Trenching exposed a barren quartz vein in greenstone. Other work (primarily by CCH Resources Limited) includes geological mapping and geochemical sampling. Results show local arsenic, tungsten, lead and silver anomalies in soil over areas underlain by intrusives dykes and near known fault structures. These anomalies should be further examined for possible associated gold mineralization as arsenic and tungsten can be pathfinder elements of gold deposits. So far as it is known prior to 1989 the property has not been explored for potential gold deposits.

Based on these results, a program of data compilation, prospecting, geological mapping and geochemical sampling for gold is recommended.

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## INTRODUCTION

This report was prepared at the request of Mr. Jacques Moreau, owner of the *Joumbira 1-32, Lookout 1-22 and Lookout 27-32* claims hereafter called the *Joumbira property*. Its purpose is to assess the economic potential of the property and to satisfy assessment requirements for the Joumbira 1-32 and Lookout 1-18 claims through a description of exploration work carried out in 1989. Previous work described in assessment reports (particularly Paul and Rota, 1982), published reports, and maps is also summarized.

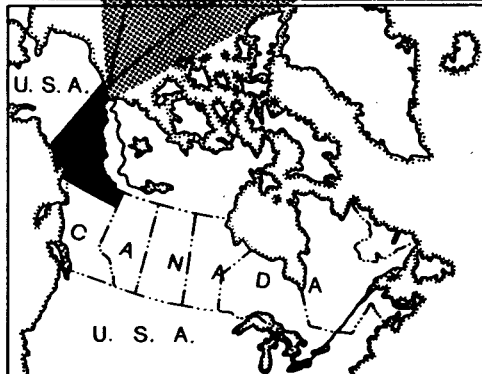
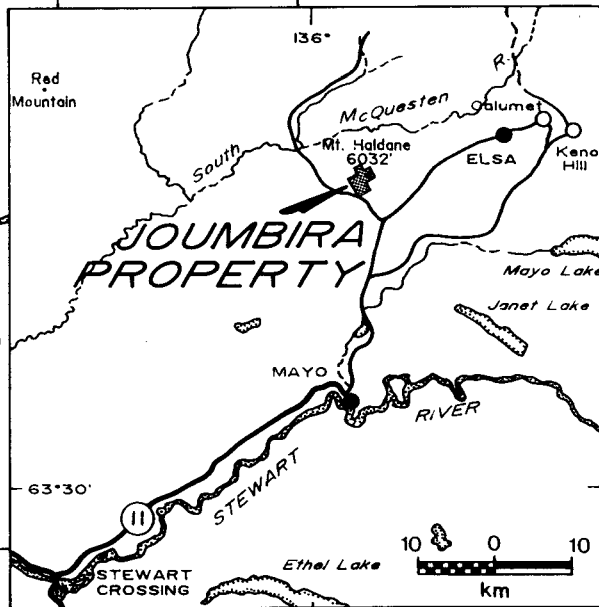
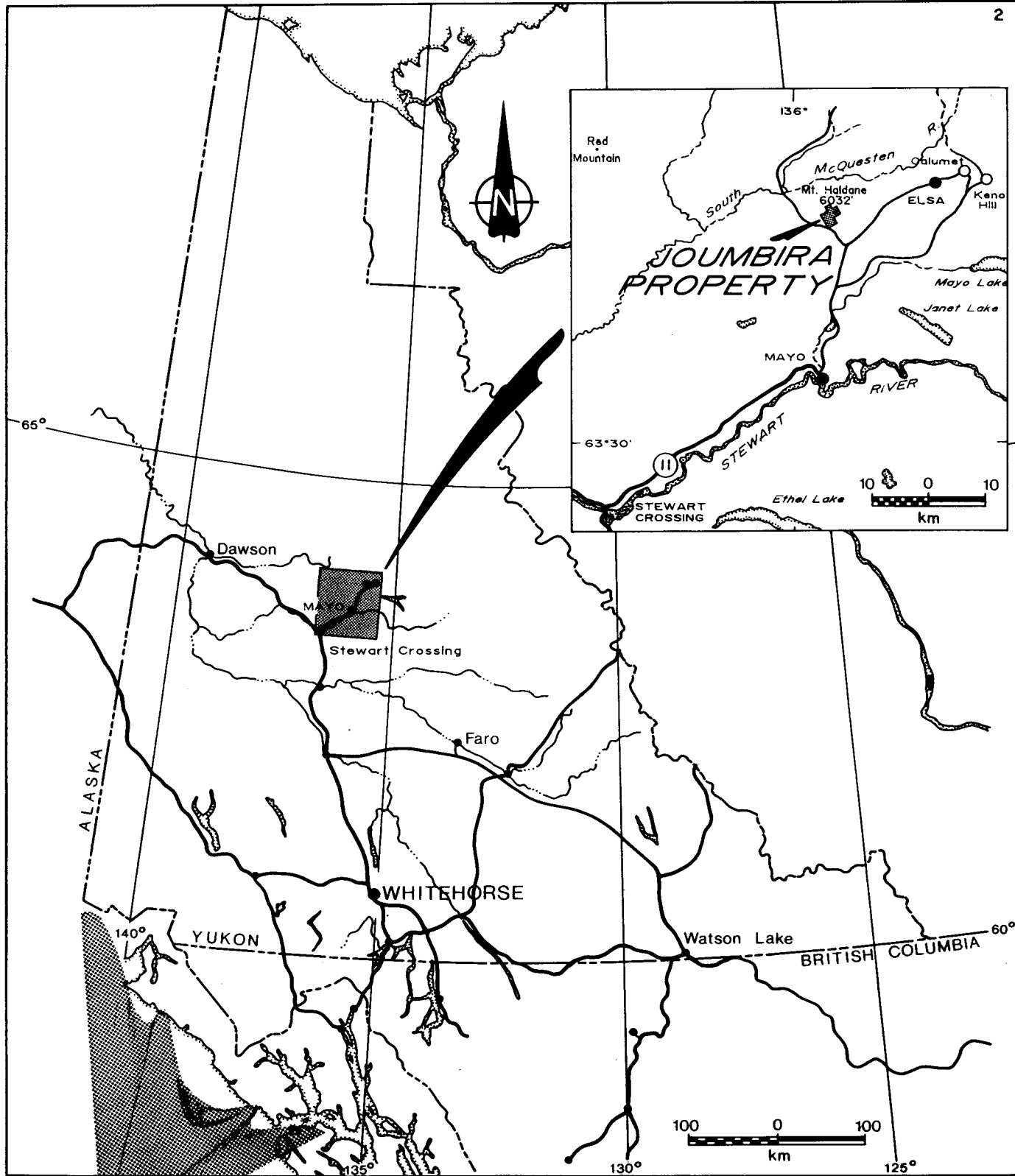
The claims are located about 30 kilometers north of Mayo, Yukon (Figure 1) in the Mayo Mining District, and are accessible by road.

Exploration work carried out in 1989 consisted of geological mapping, geochemical sampling and trenching for the purpose of locating gold deposits. This work was carried out by R. Hulstein, B.Sc. of Aurum Geological Consultants Inc. and M.J. Moreau and Alex Johnny of M.J. Moreau Enterprises during the period May 31 - June 3, 1989.

## LOCATION AND ACCESS

The Joumbira and Lookout claims are located on Mt. Haldane, 30 km north of Mayo, Yukon. The claims are centered at approximately 63° 51' N latitude and 135° 51' W longitude on NTS map sheet 105 M/13.

Access to the property is by a well maintained gravel road (HWY # 11) leading from Mayo to Elsa and Keno City. A local mining road (Haggart Creek Road) off Highway #11 parallels the southwest property boundary within 500 metres. Numerous bulldozer and 4WD truck roads cross the property although most of these at present are not negotiable due to deadfall, new growth and washouts. Access may also be gained by helicopter based in Mayo.



M. J. MOREAU ENTERPRISES LTD.  
**JOUMBIRA PROPERTY**  
 MAYO MINING DISTRICT

**LOCATION**

## PHYSIOGRAPHY, CLIMATE AND VEGETATION

The Joubira property covers Mt. Haldane, a prominent 1839 metre (6032 feet) high mountain within the Stewart Plateau. Steep hills with local cliffs and felsenmeer covered ridges are cut by a dendritic drainage system. Elevations range from 800 metres to 1839 metres.

An interior continental climate with moderate to low precipitation of 30 cm annually, warm summers and cold winters typifies the area. Permafrost is discontinuous, present only on the steeper north and east facing slopes and low marshy forested areas. The property is usually snow free from mid June to mid September.

Most of the property is above treeline. Ground cover consists of moss, alpine plants, dwarf willow and birch.

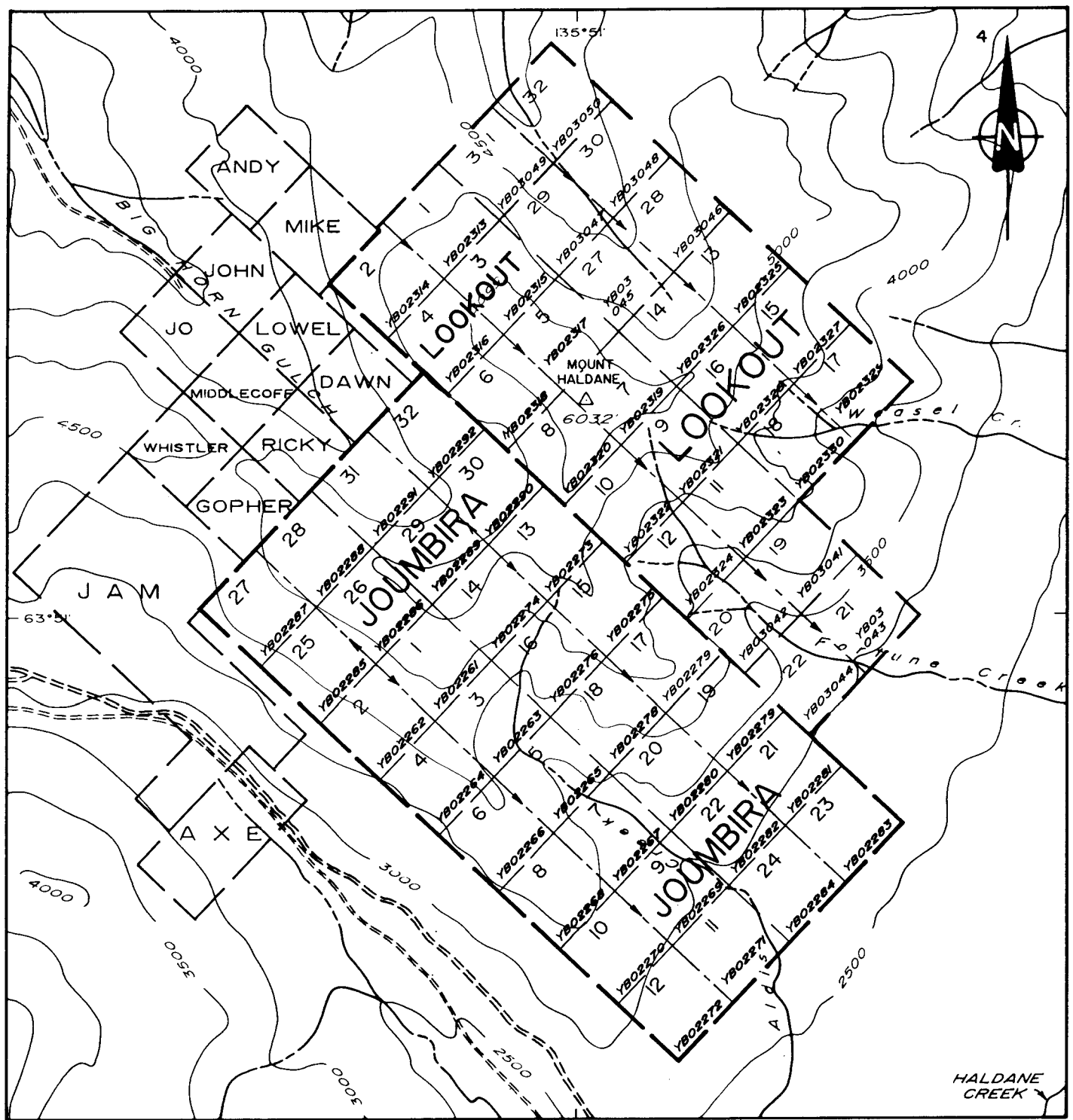
Except for small alpine glaciers on the higher peaks and glaciers in valleys (periglacial environment), the most recent Pleistocene glaciation did not cover much of the area. As a result outcrop is scarce (<5%) except on ridge tops and along creek and stream gullies. A large portion of the property is covered by felsenmeer and talus fines.

### PROPERTY

The property consists of 60 contiguous unsurveyed two post quartz claims (covering approximately 2960 acres or 1198 hectares) staked in accordance with the Yukon Quartz Mining Act (Figure 2). The Joubira and Lookout claims were staked by Mr. Jacques Moreau who owns 100% interest in the claims. Claim data are as follows:

<b>CLAIM NAME</b>	<b>GRANT No.</b>	<b>RECORDING DATE</b>	<b>EXPIRY DATE</b>
Joubira 1-32	YB02261-292	June 3, 1988	June 3, 1991*
Lookout 1-18	YB02313-330	June 20, 1988	June 20, 1991*
Lookout 19-22	YB03041-044	June 16, 1989	June 16, 1990
Lookout 27-32	YB03045-050	June 16, 1989	June 16, 1990

\*Subject to approval of 1989 assessment work.



LEGEND

- claim boundary
- claim number
- tag number
- staking direction
- creek
- elevation contour; interval 500 ft.
- 4WD trail



M. J. MOREAU ENTERPRISES LTD.							
<b>JOUMBIRA PROPERTY</b>							
MAYO MINING DISTRICT							
<b>CLAIM MAP</b>							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">Aurum Geological Consultants Inc.</td> <td style="width: 30%;">October 1989</td> </tr> <tr> <td>NTS 105 M/13</td> <td>DRAWN BY NH</td> </tr> <tr> <td>SCALE 1:51,000</td> <td>FIGURE : 2</td> </tr> </table>		Aurum Geological Consultants Inc.	October 1989	NTS 105 M/13	DRAWN BY NH	SCALE 1:51,000	FIGURE : 2
Aurum Geological Consultants Inc.	October 1989						
NTS 105 M/13	DRAWN BY NH						
SCALE 1:51,000	FIGURE : 2						

Note: adapted from D.I.A.N.D. map sheet 105 M-13

## HISTORY

The Joubira property is situated within the Keno Hill District which has a history of silver mining dating back to the early 1900's. Production up to 1985 has surpassed 206 million ounces at an average grade of approximately 41 opt silver (Watson, 1986).

According to McClintock (1987) the first recorded exploration activity on Mt. Haldane (also known as Lookout Mountain) took place prior to 1906. Silver-lead mineralization was discovered in Bighorn Gulch on what is now known as the Mt. Haldane Vein Fault System, immediately west of the current Joubira property. This vein system was intermittently explored with adits, raises, shafts, drilling and trenching by various individuals and companies. No systematic exploration has taken place since 1967 although the current owner of the Mt. Haldane Vein System, Barandium Resources Ltd., plans additional work including trenching and diamond drilling.

Work by United Keno Hill Mines in 1965, on ground now covered by the Lookout and Joubira claims, located a 0.60 metre wide quartz vein with a strike length of 200 metres near the summit of Mt. Haldane. The Fort George Mining and Exploration Co. Ltd. explored the ground in 1967 and discovered and diamond drilled a quartz-siderite vein (Woodsend, 1979). Canadian Reserve Oil and Gas staked the area as the North and Star groups in 1971 and conducted geochemical and geophysical surveys (Wilson and Stemp, 1971). The results and recommendations of this program were never followed up.

Prior to 1977 all exploration on Mt. Haldane was for silver-lead. CCH Resources Ltd. staked the Joubira 1-56 claims in 1977 and 1978 over high tin values detected in stream sediments in Fortune Creek (Woodsend, 1978, 1979; Paul and Rota, 1982). Extensive programs of geological mapping, stream and soil geochemistry were carried out.

Due to low metal prices for tin and tungsten the last of the original Joubira 1-56 claims were allowed to lapse in August 1988.

The present claim group covers most of the original Joubira 1-32 claims.

## GEOLOGY AND MINERALIZATION

### Regional Geology and Mineralization

The Mt. Haldane area is situated within the McQuesten mineral belt (Aho, 1962) in the Yukon Cataclastic Terrane and is located on the southern limb of the east trending McQuesten anticline. The low grade metamorphic rocks in the Keno Hill mining district have been subdivided by Green (1971) into three units: the Upper Schist; Central or Keno Hill Quartzite; and the Lower Schist.

The oldest unit, the Precambrian Upper Schist, consists of thin bedded quartzite, phyllite, graphitic phyllite, minor limestone and greenstone thrust over the Lower Cretaceous Central or Keno Hill Quartzite. The Keno Hill Quartzite, which hosts all of the best known silver deposits, is a 1000 m thick sequence of massive quartzite intercalated with minor graphitic phyllite and greenstone. The lowermost unit, the Jurassic Lower Schist consists of graphitic phyllite, phyllitic quartzite, phyllite and greenstone. The above units were intruded by Cretaceous to Tertiary aplites (possibly rhyolites), biotite quartz monzonite (unit Ktqm), and dioritic to gabbroic (unit KTd) sills, dykes and stocks during a period of plutonism and deformation.

The following structural history has been proposed by Green (1971):

1. An older deformation with pervasive development of foliation and associated complex folds and thrust faults including the thrusting of the Upper Schist over the Keno Hill Quartzite.
2. A younger deformation with open folds, including the McQuesten and Mayo Lake anticlines, wrinkle lineation, and possible rotation of the axes of complex minor folds formed in the earlier deformation.
3. Intrusion of granitoid rocks during the Cretaceous to Tertiary.
4. Late faulting and temporal mineralization probably postdates the granitoid rocks.

The McQuesten mineral belt is 30-50 kilometers wide and extends from Clear Creek in the west to the Mayo district in the east (Aho, 1962). It consists of a major transverse zone of ENE trending folds, Cretaceous felsic intrusions and related mineralization. The continuity of the McQuesten anticline throughout most of the McQuesten mineral belt, similarities in rock type, structure, and styles of mineralization suggest that the area is one metallogenic district. Intrusion of felsic stocks parallel to the fold direction has resulted in spatially and probably temporally related fault controlled mineralization (Emond 1986). Mineralization consists of; tin-tungsten and gold, silver-lead-zinc veins, and silver-lead-antimony veins. Mineralization associated with acid stocks is known at Clear Creek (Robinson and Doherty, 1988), Wayne Property (Archer and Elliott, 1983), Arizona Creek, Boulder Creek, Haggart Creek, Highet Creek, Sunshine Creek, Scheelite Dome and Dublin Gulch (Aho, 1962; Emond, 1986).

Two stages of vein mineralization have been noted by K. Watson (1985) in the Keno Hill area. The first stage deposited quartz, pyrite, arsenopyrite, trace gold and rare sulfosalts in the vein fault systems and was followed by fault movement. The second stage, the current economically important type, deposited siderite, galena, sphalerite, pyrite, freibergite and pyrargyrite. A regional zonation with gold in quartz veins, as at Dublin Gulch, may occur as a halo around the silver bearing Keno Hill type deposits. K-Ar dating has returned an age of 90 Ma from the Keno Hill deposits which is close to the same age of nearby granitic intrusions indicating they may have supplied the heat for the hydrothermal systems.

North of the property at Dublin Gulch, quartz arsenopyrite veins hosted by metamorphic rocks adjacent to the Cretaceous Potato Hill stock commonly carry between 0.1 and 1.0 opt gold over widths of 1.0 m (Tempelman-Kluit, 1981).

The Wayne Property, located 10 km to the east of the Joubira property, has a similar geological setting and significant gold and tungsten values have been reported by Island Mining and Exploration Co. Ltd. (Archer and Elliott, 1983). Skarn mineralization in the Upper schist and Keno Hill Quartzite returned between 0.03 to 2.07%  $WO_3$  and 0.020 to 0.972 opt gold over 0.45 to 5.0 m core widths. Pyritic zones in rhyolite dykes or sills, some with associated quartz carbonate veining and arsenopyrite, returned gold values of 0.035 to 0.146 opt over core widths of 3.5 to 12.7 m.

## Geology of the Joubira Property

The property is almost entirely underlain by the Keno Hill Quartzite; other units outcrop on the perimeter of the property (Figure 3). The oldest unit, the Hadrynian Upper Schist (unit Hpq) is exposed on the southern corner of the property. The Upper schist consists of lightly oxidized or rusted quartz-mica schists with alternating quartz and sericite-rich laminae (Paul and Rota, 1982).

The Jurassic Lower Schist (Unit Jp) is not believed to be exposed on the property with the possible exception of outcrop on the northeast corner. The unit is comprised of interbedded black graphitic shale and phyllite, and grey thin bedded phyllitic quartzite and siltstone. The contact between the Lower Schist and Keno Hill Quartzite is thought by Paul and Rota (1982) to occur towards the base of Mt. Haldane and have potential as a 'trap' structure for tin and tungsten mineralization beneath the Fortune Creek basin.

The Cretaceous Keno Hill Quartzite (unit JKkh) occurs as dark grey to bluish-grey quartzites in beds 1 to 4 m in thickness, separated by thinner bedded quartzite, slate and phyllite. Quartzites on the property, like those elsewhere in the Mayo-McQuesten area, are commonly disrupted by a barren quartz vein stockwork with a dense 'welded' appearance.

The above units are intruded by several varieties of intrusive rocks. The Cretaceous to Tertiary granitoid or felsic rocks (unit KTqm) consist of biotite quartz monzonite, aplite quartz porphyry and aplite.

Biotite quartz monzonite occurs as a small 900 x 400 metre stock in the Fortune Creek basin and as a number of small dykes peripheral to the main stock. The central area portion of the stock is typically porphyritic with  $\leq 10$ mm euhedral quartz 'blebs' in a fine grained groundmass of quartz and feldspar. Euhedral biotite is abundant as small plates, and pyrite is commonly present as an accessory. The margin of the stock and the small dykes tend to be fine grained.

Aplite quartz porphyry and aplite were mapped as narrow dykes at several localities. They grade from highly altered leucocratic to more biotite rich varieties. The aplite quartz porphyry and aplite contains arsenopyrite as a common accessory and the aplite quartz porphyry is associated with cassiterite and scheelite in a number of places. The aplite dykes are siliceous and appear to contain large amounts of groundmass sericite and 1-2% arsenopyrite. These dykes may represent late differentiates of the main biotite quartz stock (Paul and Rota, 1982).

Dioritic to gabbroic rocks, or greenstones, (unit KTd) are found within the Keno Hill Quartzite. These rocks occur as sills and large irregular bodies with the largest exposure between Fortune and Aldis Creeks. According to Paul and Rota (1982) these greenstones are comprised of nearly equal amounts of plagioclase feldspar and clinopyroxene with accessory hornblende and quartz. They are similar to greenstones found throughout the Mayo-McQuesten area. Pervasive chlorite and actinolite alteration is widespread.

Structure of the Keno Hill Quartzite is dominated by bedding striking E-W to NW-SE and dipping moderately to the south and southwest. The  $S_1$  foliation is more or less parallel to the  $S_0$  compositional layering. The intrusive body in the Fortune Creek basin is elongated in a WNW-ESE direction, with the associated dykes being arranged in a radial pattern around the main stock.

The majority of the narrow breccia zones, minor faults and joint sets trend NE-SW to N-S, similar to the Mt. Haldane vein fault system immediately west of the property.

## Property Mineralization

Silver-lead mineralization located to date on the property consists of a shallow dipping quartz vein traced for over 200 metres located near the summit of Mt. Haldane. Heard (1966) reported assays up to 181 opt silver over 0.38 metres. Brecciated vein-type mineralization has also been located between Mt. Haldane and North Star Creek just off the property. Grab samples from this vein assayed up to 47 opt silver (Heard 1966). In the same area Sevensma (1968) reports a 3 m adit that exposed a 0.3 m wide vein with values reported to range from 30 opt to 200 opt silver. Woodsend (1979) reports that in 1967 the Fort George Mining and Exploration Co. Ltd. discovered and drilled, with disappointing results, a quartz siderite vein containing small amounts of galena, chalcopyrite and pyrite. The exact location of the quartz siderite vein is not known other than the work was carried out on the southeastern slopes of Mt. Haldane. The silver veins were not examined in 1989.

It is rumored that Louis Beauvette, a local prospector, discovered mineralized float samples in the upper section of Aldis Creek. Aldis creek was traversed and although a thick, >8 metre, section of ferricrete was located, no mineralization was noted.

Minor cassiterite was found on the margins of a quartz feldspar porphyry dyke at the *Pro* showing and in sheeted fractures with chlorite and tormaline at the *Fed* showing (Paul and Rota, 1982). Vuggy quartz veins associated with quartz porphyry dykes, located in 1989 above Aldis Creek and Fortune Creek, are reported by Paul and Rota (1982) to contain scheelite.

Quartz and greisen vein-type float containing arsenopyrite, sphalerite and galena appear to occur in and adjacent to the main intrusive stock in Fortune Creek. Skarnified schists within 100 m on the north side of the stock, contain up to 30% quartz, 1% pyrite and 10% disseminated arsenopyrite. The aplitic dyke rocks also commonly contain appreciable arsenopyrite (1-2%). Gossanous argillite(?) horizons within the Keno Hill Quartzite, labeled sulphidic horizon on Figure 3, carry small amounts (<2%) of arsenopyrite and pyrite.

## 1989 Trenching

A total of 3 mandays were spent trenching a quartz vein located on the road near Fortune Creek (Figure 4). A 0.2-0.3 metre wide quartz vein was exposed discontinuously, in greenstone, for 10 metres in an old 'cat' trench. Low gold and silver values were returned from the quartz vein which contains 1-2% pyrite, pyrrhotite and arsenopyrite as blebs and fracture fillings. The greenstone is locally sheared and contains minor pyrite and trace chalcopyrite.

## GEOCHEMISTRY

Stream sediment samples collected by the GSC in 1964 and 1987 covered Mt. Haldane (Woodsend, 1978; Sevensma, 1968; Hornbrook and Friske, 1988). Results show high values for arsenic, lead, silver, zinc, tungsten and tin in Aldis Creek, Fortune Creek and Weasel Creeks. Both the *Fed* and *Pro* tin showings were discovered by following up on anomalous tin results. High arsenic values may be indicative of gold mineralization similar to gold-arsenic occurrences found elsewhere in the McQuesten mineral belt (i.e. Dublin Gulch, Clear Creek, Wayne Property).

Numerous soil sample surveys have been carried out over the property in the past, although so far as it is known, soil samples were not analyzed for gold. Some of the lower areas were not covered, in particular the south east area of the property. Numerous local arsenic, tungsten, silver and lead anomalies, some over or adjacent to Tertiary-Cretaceous felsic intrusives, were not followed up or adequately explained.

A total of 56 samples (21 rock, 1 stream sediment and 34 soil) were collected during the 1989 exploration program on the Joubira property. Geochemical analyses were made for total gold and silver content. The analytical work was performed by Bondar-Clegg & Company Ltd. of North Vancouver, B.C. using industry accepted methods described in the Appendix to this report. Results are shown on Figure 4.

### Rock Samples

The highest gold value of 271 ppb (#R2 25-004) was returned from float of quartz-arsenopyrite breccia located near the stock in Fortune Creek. Other rock samples in the Fortune Creek area returned numerous anomalous values, > 100 ppb and >6.0 ppm, for gold and silver respectively.

### Soil Samples

Gold values in soil range from 6 to 172 ppb. The highest value of 172 ppb was returned from gossanous soil in a stripped area underlain by greenstone. Numerous soil samples in the Fortune Creek basin and on the road above the headwaters of Aldis Creek returned anomalous values of >40 ppb gold and >6.0 ppm silver. Two widely separated samples near the stock in the Fortune Creek stock returned 17.7 and 19.6 ppm silver.

## CONCLUSIONS AND RECOMMENDATIONS

The Joubira property covers Cretaceous-Tertiary quartz monzonite intrusives and felsic dykes hosted by the Keno Hill Quartzite. Mineralization including cassiterite, scheelite, galena, arsenopyrite, pyrite, and chalcopyrite is found in and adjacent to the intrusive and dykes as fracture veinlets, breccia fillings, and in quartz veins. This geological setting and mineralogical suite resembles that of known gold prospects or showings in the McQuesten mineral belt.

Numerous fault structures have been found on the property including a regional thrust fault and northerly trending faults, some mineralized, similar to the nearby Mt. Haldane vein fault system.

Anomalous gold-silver values were returned in 1989 from soil and rock samples collected near the Fortune Creek stock. As there is a widespread distribution of arsenopyrite, favorable lithologies and structures, the property should be further explored for gold mineralization. The potential for gold-tungsten deposits hosted by skarns and/or rhyolite dykes and sills on the property, possibly similar to that found nearby on the Wayne Property, should be kept in mind.

The following is recommended:

1. Compile a 1:5,000 scale orthophoto map of the Joubira property incorporating all available geological, geochemical and geophysical data to better identify possible exploration targets.
2. Further exploration consisting of prospecting, geological mapping, and rock and soil geochemistry should be carried out in the vicinity of the Fortune Creek stock and other areas where arsenic anomalies, known mineralization, fault structures and Tertiary-Cretaceous felsic intrusives are found.
3. A claim survey is recommended to determine possible claim fractions and adjacent property boundaries.
4. Any further work (geophysics, trenching, etc.) is contingent on results of the above work.

Respectfully submitted,



Roger W. Hulstein, B.Sc.

October 31, 1989

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- Woodsend, A., 1979. Blanket Geological and Geochemical Survey, Joubira Claims 1-56: CCH Resources Ltd., D.I.A.N.D. Assessment Report #090477, May 14, 1979.

## STATEMENT OF QUALIFICATIONS

I, ROGER W. HULSTEIN, hereby certify that:

1. I am a geologist with AURUM GEOLOGICAL CONSULTANTS INC., 604-675 West Hastings Street, Vancouver, British Columbia.
2. I am a graduate of Saint Mary's University, Halifax, with a degree in geology (B.Sc., 1981) and have been involved in geology and mineral exploration continuously since 1978.
3. I am a member of the Geological Association of Canada (A3572).
4. I have no direct or indirect interest in the properties of Mr. M.J. Moreau.
5. I am the author of this report on the Joubira Property, Keno Hill mining district, Yukon which is based on my personal examination of the ground during the period May 31-June 3, 1989, and on referenced sources.

A handwritten signature in black ink, appearing to read 'R. Hulstein', written over a horizontal line.

October 31, 1989

Roger W. Hulstein, B.Sc.

## STATEMENT OF COSTS

### Assessment Work Valuation: Joubira Property

#### 1. Geological and Geochemical

##### A. Fieldwork

R. Hulstein, B.Sc., of Whitehorse, Yukon. May 31-June 3, 1989 4 days @ \$300.00/day:	\$1,200.00
--	------------

M.J. Moreau, of Whitehorse, Yukon. May 31-June 3, 1989 3 days @ \$250.00/day:	750.00
---	--------

A. Johnny of Mayo, Yukon June 1, 1989 1 days @250.00/day:	250.00
---	--------

##### B. Geochemical Analyses

21 rock, 34 soil, and 1 stream sediment sample:	761.25
--	--------

##### C. Support Costs

Groceries and Meals, 12 days @ \$25.00/manday:	300.00
Sample bags, flagging tape & thread:	50.00
Gasoline & Truck Rental:	3,182.40
Radio and phone charges:	25.00

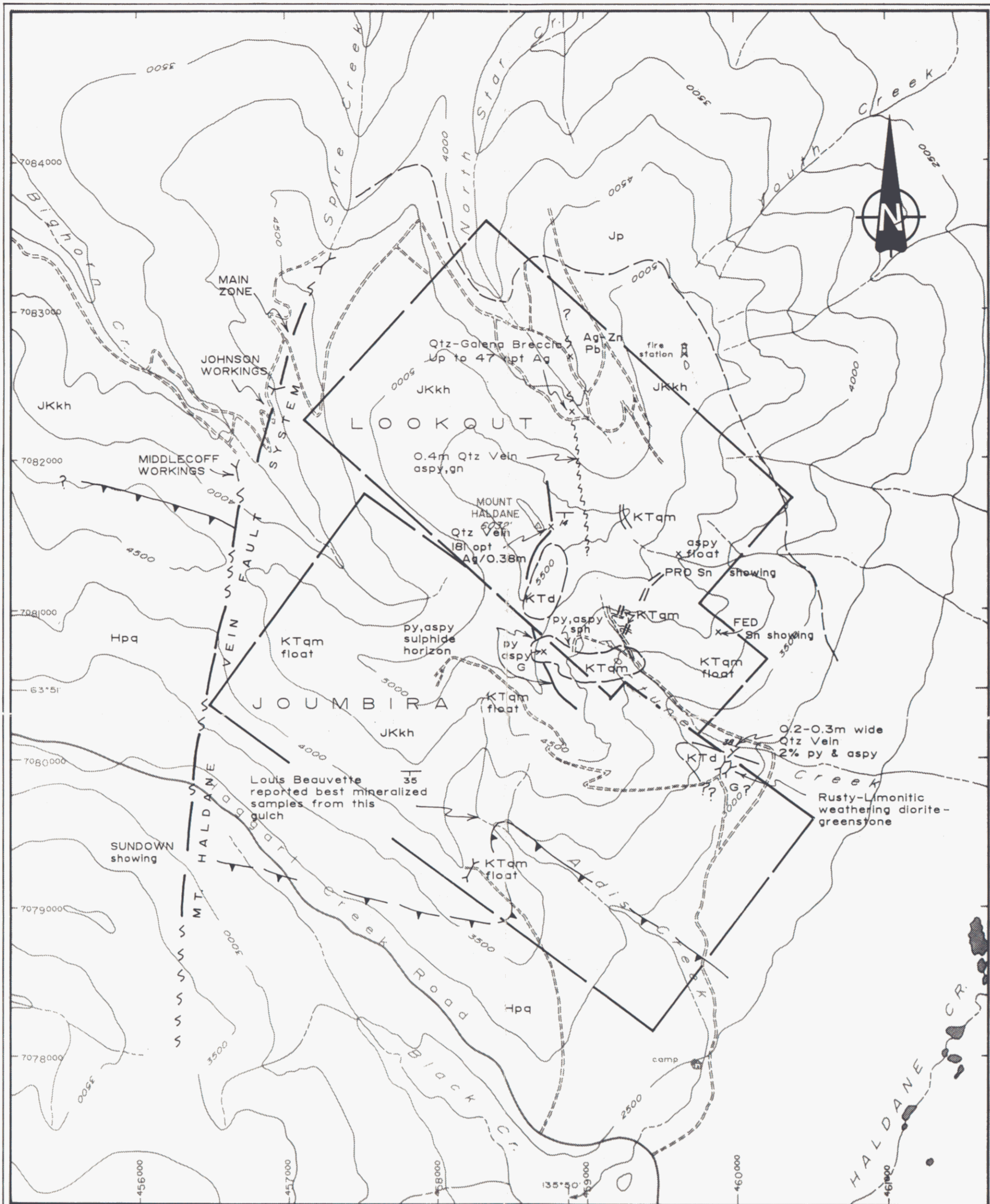
##### D. Research and Report Preparation

R. Hulstein, B.Sc. April, May, Oct., 1989:	2,259.06
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##### E. Trenching

3 mandays @ \$250.00/manday:	750.00
Consumables (explosives):	423.54
Drill & Equip. rental @ \$100.00/day:	300.00

<b>Total Valuation of 1989 Assessment Work:</b>	<b><u>\$10,251.25</u></b>
---	---------------------------



**LEGEND**

**LITHOLOGIES**  
CRETACEOUS - TERTIARY

- KTam** biotite quartz monzonite (± porphyritic) aplite, rhallite
- KTd** diorite (greenstone)
- JURASSIC - CRETACEOUS**  
**KENO HILL OR CENTRAL QUARTZITE**
- JKkh** thick to thin bedded minor graphitic schist
- JURASSIC**  
**Lower schist**
- Jp** graphitic schist, thin bedded quartzite, quartz-mica schist
- HADRYNIAN**  
**Upper schists**
- Hpa** quartz mica & graphitic schist, phyllitic quartzite

**SYMBOLS**

- assumed geologic boundary
- x MINERAL SHOWING:  
Qtz-Quartz  
Pb-galena  
Zn-sphalerite  
aspy- arsenopyrite  
py-pyrite  
Sn-cassiterite
- vein
- Y trench
- G gossan
- adit
- attitude of structure
- fault
- thrust fault, teeth on hanging wall
- claim boundary



M.J. MOREAU ENTERPRISES LTD.	
JOUMBIRA PROPERTY	
MAYO MINING DISTRICT - YUKON TERRITORY	
<b>GEOLOGY</b> 092735	
Aurum Geological Consultants Inc.	October 1989
NTS 105 M/13	DRAWN: RH JF SCALE 1: 25,000 FIGURE 3

NOTE : adapted from D.I.A.N.D. map sheet 105 M/13  
Geology after, McClintock, 1987, Paul and Rota, 1982

**ROCK SAMPLES**

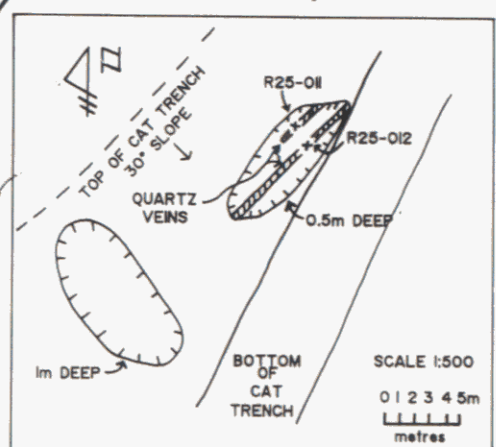
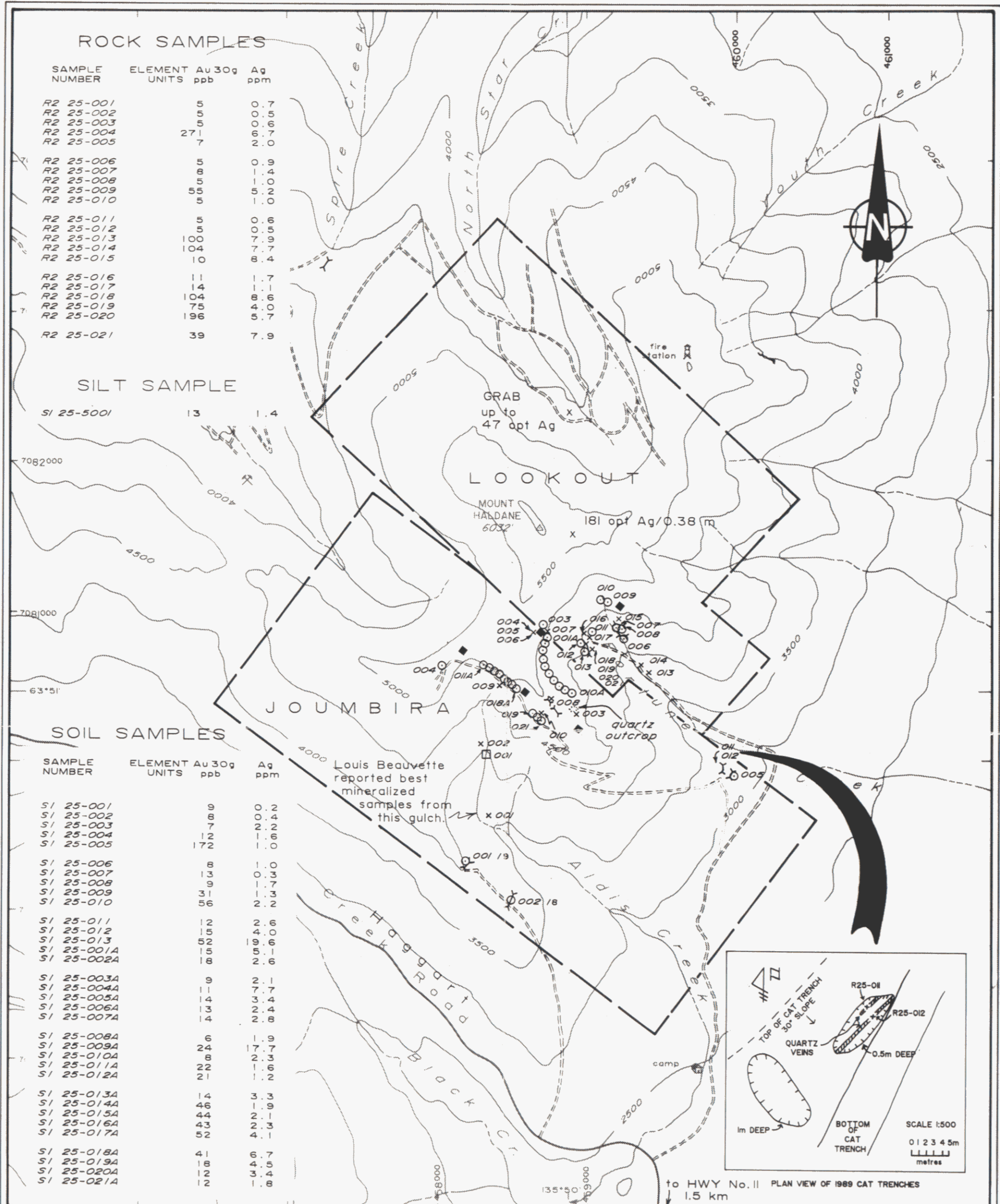
SAMPLE NUMBER	ELEMENT Au 30g UNITS ppb	Ag ppm
R2 25-001	5	0.7
R2 25-002	5	0.5
R2 25-003	5	0.6
R2 25-004	271	6.7
R2 25-005	7	2.0
R2 25-006	5	0.9
R2 25-007	8	1.4
R2 25-008	5	1.0
R2 25-009	55	5.2
R2 25-010	5	1.0
R2 25-011	5	0.6
R2 25-012	5	0.5
R2 25-013	100	7.9
R2 25-014	104	7.7
R2 25-015	10	8.4
R2 25-016	11	1.7
R2 25-017	14	1.1
R2 25-018	104	8.6
R2 25-019	75	4.0
R2 25-020	196	5.7
R2 25-021	39	7.9

**SILT SAMPLE**

SAMPLE NUMBER	ELEMENT Au 30g UNITS ppb	Ag ppm
SI 25-5001	13	1.4

**SOIL SAMPLES**

SAMPLE NUMBER	ELEMENT Au 30g UNITS ppb	Ag ppm
SI 25-001	9	0.2
SI 25-002	7	0.4
SI 25-003	7	2.2
SI 25-004	12	1.6
SI 25-005	172	1.0
SI 25-006	8	1.0
SI 25-007	13	0.3
SI 25-008	9	1.7
SI 25-009	31	1.3
SI 25-010	56	2.2
SI 25-011	12	2.6
SI 25-012	15	4.0
SI 25-013	52	19.6
SI 25-001A	15	5.1
SI 25-002A	18	2.6
SI 25-003A	9	2.1
SI 25-004A	11	7.7
SI 25-005A	14	3.4
SI 25-006A	13	2.4
SI 25-007A	14	2.8
SI 25-008A	6	1.9
SI 25-009A	24	17.7
SI 25-010A	8	2.3
SI 25-011A	22	1.6
SI 25-012A	21	1.2
SI 25-013A	14	3.3
SI 25-014A	46	1.9
SI 25-015A	44	2.1
SI 25-016A	43	2.3
SI 25-017A	52	4.1
SI 25-018A	41	6.7
SI 25-019A	18	4.5
SI 25-020A	12	3.4
SI 25-021A	12	1.8



**LEGEND**

- trench
  - x rock sample location (001 - 021)
  - o soil sample location (001 - 013) (001A - 021A)
  - stream sediment sample location (001)
- GEOCHEMICAL RESULTS**  
 O18A  
 sample number
- claim post
  - creek, pond
  - 3000 — elevation contour, interval 500ft.
  - roads



M.J. MOREAU ENTERPRISES LTD.			
JOUMBIRA PROPERTY			
MAYO MINING DISTRICT - YUKON TERRITORY			
<b>GEOCHEMISTRY</b>			
092785			
Aurum Geological Consultants Inc.		October 1989	
NTS 105 M/13	DRAWN BY RH	SCALE 1:25,000	FIGURE: 4

**APPENDIX A**  
Rock Sample Descriptions

SAMPLER: R.W.H.

Date: JUNE 7/89

Project: 25 JOUMBIRA

Area: MT. HALDANIE

Page 1 of 4

Sample No.	Location	Description	Attitude	Width	Analytical Results	
					Alc ppb	Ag ppm
25-001	Near head of ALDIS creek - BETWEEN TOP 2 NORTH FORKS	FLOAT OF WHITE CONTORTED QTZ AND GREY GRAPHITIC SCHIST ~50/50. 2% LIMONITE ON FRACTURED SURFACES. POSSIBLE Aspy OR ?? MIXED WITH GRAPHITIC SCHIST. 0.1% Pyg & WEATHERED OUT JUGS.	FLOAT	—	<5	0.7
25-002	Near head of ALDIS CREEK top of upper N. FORK	TAN QTZ - FELDSPAR PORPHYRY - PACITE, APPROX 10% BI-PYRIMIDAL QTZ -XTALS, 1-5mm Aspy Blebs <0.5%.	FLOAT	—	<5	0.5
25-003	~75m ON CONTOUR TO NW OF JOUMBIRA 15 & 16 P#1.	WHITE KNOB OF MASSIVE QTZ >7 X 10m O.C. FRAC SPACING 2cm w MINOR LIM. LOCAL INCLUSIONS OF SCHIST <0.1%.	MASSIVE	—	<5	0.6
25-004	HEAD OF FORTUNE CREEK @ OLD CLAIM POSTS Y6363 P.#1 ON 290° AZ X 50m. - OLD PIT ON Q.U.	FLOAT OF QTZ - SULPHIDE, Aspy, bx 40% Q, 20% Aspy, 40% MICA MATRIX - MICA COMMONLY IN ROSETTES 5mm ACROSS. GREENS QTZ	FLOAT	—	271	6.7
25-005	AS @ 25-004	FLOAT - PHYLITE - BANDED QTZITE, HORNFEISED & RE- CRYSTALLIZED. - RUSTY, CONTAINS ~1% OVERALL X-TALUSIE Aspy.	FLOAT	—	7	2.0
25-006	25 m ABOVE 004 & 005.	HORNFEISED QTZITE & SCHIST, LIMONITIZED QTZ BANDS. TR Py & POSS. Aspy.	FLOAT	—	<5	0.9

Date: \_\_\_\_\_ Project: 25 - SOUMBIRA Area: \_\_\_\_\_Page 2 of 4

Sample No.	Location	Description	Attitude	Width	Analytical Results		
					Au ppb	Ag ppm	
25-007	~ 35m EAST OF OLD CLAIM POST # Y6363 P.#1.	Float - RUSTY - LIM QZITE. C 2% Py, Tr Aspy AS DISS & THEN BANDS IN BANDED QZITE	FLOAT	—		8	1.4
25-008	ON RIDGE TOP ABOVE 25-003 NEAR CAIRN IN OLD HAND TRENCH.	Float & O.C. QZ SCHIST & INTRUSIVE FELSIC QZ - FELDSPAR - MICA (SLIGHTLY GREENED) Tr PY LIM. COATED FRAC	—	—		<5	1.0
25-009	NEAR SOIL # OISA ON Rd. ABOVE ALDIS GULCH.	LIGHT GREY UGGY QZ BX. MINOR LOCKS COMB QZ UNLETS. PROBABLY A BX BED OF QZITE ALTHOUGH DEFINITELY NOT BULL QZ.	FLOAT	—		55	5.2
25-010	LOCATED @ SOIL # 25-020A ON Rd ABOVE ALDIS GULCH.	GREY QZITE WITH LIGHT YELLOW LIM-CLAY COATINGS. UGGY - POSS. WEATHERED OUT SULPHIDES. MINOR QZ UNLETS.	FLOAT	—		<5	1.0
25-011	IN U. GREENSTONE TRENCH. LOWER QZ VEIN ON WEST WALL,	WHITE - CLEAR QZ. FAIRLY MASSIVE WITH RUDE BANDING RUFFY - LIMONITE COATED FRACTURES BLEBS OF Py & Aspy, 1-2% EACH. MOST SULPHIDES WEATHERED TO A GREY POWDER.	045/38N	20-30 cm		<5	0.6
25-012	IN U. GREENSTONE TRENCH. UPPER QZ VEIN ON WEST WALL.	2 m ABOVE 25-011. APPEARS TO BE A PDZ OF QZ-CALCITE-CHALCEDNEY (50-35-15%). RUDE BANDING, NO. VIS. TREND. EXPOSURE 0.5 X 0.3m Tr Py, Aspy, Py, CHLORITE INCLUSIONS. CHALCEDNEY SEEMS TO FILL VOIDS AROUND CALCITE X-TALS AND BX QZ CLASTS.	—	0.3		<5	0.5

Date: \_\_\_\_\_

Project: \_\_\_\_\_

Area: \_\_\_\_\_

Page 3 of 4

Sample No.	Location	Description	Attitude	Width	Analytical Results	
					As ppb	Ag ppm
25-013	FORTUNE CREEK - AT UPPER CREEK JUNCTION. 1150m elev.	FLOAT OF SILICEOUS - QTZ FLOODED RHYOLITE DYKE WITH NARROW 1-2mm Py - QTZ UNLETS AND DISS Py < 5%, POSSIBLE MINOR DISS ASPY. WEATHERS YELLOW (SCORODITE) & HAS LIMONITE ON SLICKEN SIZED SURFACES.	FLOAT	-	100	7.9
25-014	NEAR 25-013 BUT SLIGHTLY UPHILL	LIMONIZED - WEATHERED, UGGY LITHIC - QTZ - SULPHIDE (OXIDE) BX. CLASTS OF FINE GRAINED INTRUSIVE. NO FRESH SULPHIDES. CLASTS 0.1 - 15mm IN MATRIX OF LIMONITE AND ROCK FLOUR. FLOAT - TALUS - NEAR O.C.	FLOAT	-	104	7.7
25-015	N. FORK U. FORTUNE CREEK. UPPER TRENCH ON SW SOIL ANOMALY.	RUSTY - LIMONITE COATED SCHIST, 5% RUST-LIMONITE. CUT BY RARE QTZ UNLETS 2-5mm WIDE. UGGY IN PLACES. MUSCOVITE ON FRACTURES, NEAR (5-10m) OF BIOTITE QTZ PORPHYRY DYKE.	FLOAT - NEAR O.C.	-	10	8.4
25-016	AT HEAD OF FORTUNE CREEK. EAST FACING SLOPE. IN CREEK GULCH TO WEST OF TRENCH @ 1385m ELEV.	- O.C. IN CREEK GULCH. - SKARNIFIED MICA - ACTINOLITE SCHIST BANDS. WEATHERS VERY RUSTY, NO VISIBLE SULPHIDES BUT SCORODITE PRESENT.	DIPPING GENTLY TO SOUTH.	1.0m	11	1.7
25-017	ON TRENCH ROAD BELOW # 25-016 @ 1335m ELEV.	FLOAT SIMILAR TO #25-016 BUT CONTAINS 1-2% Aspy & up to 1.5mm X-TALS	FLOAT	-	14	1.1

Date: JUNE 7/89

Project: 25 - JAMBIRA

Area:

Page 4 of 4

Sample No.	Location	Description	Attitude	Width	Analytical Results	
					Au ppb	Ag ppm
* 25-018	IN TRENCH @ HEAD OF FORTUNE CREEK, 25m SOUTH OF SOIL # 25-012	FLUAT: QUARTZ VEIN - BROWN QUARTZ WITH 50% BROWN CRYPTOCRYSTALLINE PHYLITE. QTZ CONTAINS <1% ASPY DISS-BLEBS UGGY - WEATHERED, QTZ ON WITH LIMONITE AND SCORODITE,	FLUAT	—	104 0.007 opt	8.6
25-019	AS 25-018, 50 M SOUTH OF SOIL # 25-012.	FLUAT: QTZ UN ~ 6-8cm? WIDE (AS FOUND). MILKY - GREY QTZ. BLEB UP TO 1.5 CM OF SPECULAR HEM, OR HEM OR SPHARSITE - TOTAL 1% OCCURS WITH Py. BLACK- BRITTLE (H=3-4?) LUSTRUS X-TALS CHOCOLATE BROWN STREAK. Py UNLETS ON UN-WALL CONTACTS? SLECKEN SIDES. ~ 5% UGS.	FLUAT	—	75	4.0
25-020	AS 25-018, O.C. BETWEEN SOIL # S25-012 & 013.	O.C. of QTZITE - SCHIST & WHITE FELSIC TO BIOTITE QTZ MON DYKES. SEEDS & DYKES CUT BY SEPERATE SET OF QTZ VEINS. SAMPLE OF RUSTY-LIM SHEAR ZONE CUTTING ABOVE UNITS - MOSTLY POTTAN SCHIST AND ~30% QTZ UN.	025/75N	0.8m	196	5.7
* 25-021	AS 25-018	FLUAT GREY SKARNIFIED SEEDS & QTZ UNING / REPLACEMENT QTZ. ~30% QTZ. 0.5-Tr Py, <10% ASPY DISS., Tr FINE GRAN BLACK SULPHIDE(?) POSS ARGENTITE (LORE W.). ROCK WEATHERS RUSTY BROWN - LIM COATINGS + SCORODITE	FLUAT	—	39 0.007 opt	7.9

## **APPENDIX B**

### **Analytical Methods and Results**

Bondar-Clegg & Company Ltd.  
 130 Pemberton Ave.  
 North Vancouver, B.C.  
 V7P 2R5  
 (604) 985-0681 Telex 04-352667



**Geochemical  
 Lab Report**

REPORT: V89-01941.0 ( COMPLETE )

REFERENCE INFO:

CLIENT: M. J. MOREAU ENTERPRISES  
 PROJECT: 25

SUBMITTED BY: R. HULSTEIN  
 DATE PRINTED: 20-JUN-89

ORDER	ELEMENT	NUMBER OF ANALYSES	LOWER DETECTION LIMIT	EXTRACTION	METHOD
1	Au 30g Gold 30 grams	56	5 PPB	FIRE-ASSAY	Fire Assay AA
2	Ag Silver	56	0.1 PPM	HNO3-HCL HOT EXTR	Atomic Absorption

SAMPLE TYPES	NUMBER	SIZE FRACTIONS	NUMBER	SAMPLE PREPARATIONS	NUMBER
S SOILS	35	1 -80	35	DRY, SIFVE -80	35
R ROCK OR BED ROCK	21	2 -150	21	CRUSH,PULVERIZE -150	21

REPORT COPIES TO: M. J. MOREAU ENTERPRISES  
 ROGER HULSTEIN

INVOICE TO: M. J. MOREAU ENTERPRISES

DATE PRINTED: 20-JUN-89

REPORT: V89-01941.0

PROJECT: 25

PAGE 1

SAMPLE NUMBER	ELFMFNT UNITS	Au 30g PPB	Ag PPM	SAMPLE NUMBER	ELFMFNT UNITS	Au 30g PPB	Ag PPM
S1 25-001		9	0.2	R2 25-006		<5	0.9
S1 25-002		8	0.4	R2 25-007		8	1.4
S1 25-003		7	2.2	R2 25-008		<5	1.0
S1 25-004		12	1.6	R2 25-009		55	5.2
S1 25-005		172	1.0	R2 25-010		<5	1.0
S1 25-006		8	1.0	R2 25-011		<5	0.6
S1 25-007		13	0.3	R2 25-012		<5	0.5
S1 25-008		9	1.7	R2 25-013		100	7.9
S1 25-009		31	1.3	R2 25-014		104	7.7
S1 25-010		56	2.2	R2 25-015		10	8.4
S1 25-011		12	2.6	R2 25-016		11	1.7
S1 25-012		15	4.0	R2 25-017		14	1.1
S1 25-013		52	19.6	R2 25-018		104	8.6
S1 25-001A		15	5.1	R2 25-019		75	4.0
S1 25-002A		18	2.6	R2 25-020		196	5.7
S1 25-003A		9	2.1	R2 25-021		39	7.9
S1 25-004A		11	7.7				
S1 25-005A		14	3.4				
S1 25-006A		13	2.4				
S1 25-007A		14	2.8				
S1 25-008A		6	1.9				
S1 25-009A		24	17.7				
S1 25-010A		8	2.3				
S1 25-011A		22	1.6				
S1 25-012A		21	1.2				
S1 25-013A		14	3.3				
S1 25-014A		46	1.9				
S1 25-015A		44	2.1				
S1 25-016A		43	2.3				
S1 25-017A		52	4.1				
S1 25-018A		41	6.7				
S1 25-019A		18	4.5				
S1 25-020A		12	3.4				
S1 25-021A		12	1.8				
S1 25-5001		13	1.4				
R2 25-001		<5	0.7				
R2 25-002		<5	0.5				
R2 25-003		<5	0.6				
R2 25-004		271	6.7				
R2 25-005		7	2.0				

June 28, 1989

Roger Hulstein  
Aurum Geological Consultants

ASSAY CERTIFICATE

Sample	oz/t Au
25-018	0.007
25-021	0.007



Total Due

Sample prep	2 x \$ 2.50 =	\$ 5.00
Fire Assay	2 x \$ 9.75 =	\$19.50
<hr/>		
Total Due		\$24.50