

**ASSESSMENT REPORT OF THE  
SAB MINERAL CLAIMS  
GEOLOGICAL MAPPING, DATA COMPILATION & INTERPRETATION**

GEOLOGICAL SURVEY BRANCH ASSESSMENT REPORTS
DATE RECEIVED AUG 27 1996

- for -

**Y-H TECHNICAL SERVICES LTD. &  
SNOWFLAKE MINES LTD.**

**BOX 298,  
VERNON, B.C.**

- location -

**UPPER KETTLE RIVER VALLEY  
LATITUDE 118° 41' W., LONGITUDE 49° 55' N.**

**VERNON MINING DIVISION  
Province of British Columbia**

- prepared by -

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**August 29, 1996**

**24,533**

**GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT**

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## **SUMMARY**

Mapping and sampling of the Upper Lead Zone shear has confirmed the western extension of silver, zinc, lead mineralization to be over 300 metres along strike and approximately 75 metres to depth and remaining open to depth. The best mineralized segment in the 1996 program returned an average grade of 20.81 ounces per ton silver across a true width of 2.50 metres at the K-1 trench of the Upper Lead Zone. These values corroborate previous results from this area obtained in 1991 and 1983. These values occur in the hangingwall adjacent to the main Lead Zone shear. Significant silver values are tentatively identified as primary ruby silver and later native silver associated with calcite veining.

Mineralization in all of these zones is associated with hydrothermal alteration of the intrusive rocks and is more related to higher temperatures and fluid pressures associated with the porphyritic intrusives. No evidence of boiling, including multistage brecciation and associated episodic, pervasive quartz flooding within the host rocks and mineralized veins was seen or recorded in reviewing drill log intercepts of mineralized structures. Higher grade gold and silver values are related to massive pyrite in white quartz associated with quartz, sericite, pyrite altered intrusives.

With additional study, it may be determined that areas of intense clay alteration are not primary targets (epithermal alteration zones) as previously proposed by others. These areas of intense clay alteration appear instead to represent areas of advanced argillic altered intrusive rocks forming a locally developed overprinting with pervasive kaolinite at or near the intersection of north-south and east-west structures.

The area of the stockwork zone has been interpreted to extend to the south and east and is open to the north based on compilation of geophysical, geological and geochemical data in addition to the 1996 mapping programme.

Future drilling is recommended in areas of potentially mineralized stockworks at or near the intersection of north-south fault contacts with mineralized eastwest shears after more detailed geological studies are completed; ie alteration and the stockwork zones.

## INTRODUCTION

This report is based on the results of a geological mapping and sampling program conducted on the SAB claims to determine the extent of high grade silver mineralization exposed in the hanging wall of the Lead Zone shear. Also, an investigation was made to determine the relationship of alteration in host rocks with mineralization associated with a possible epithermal system. This model was previously developed to explain areas of intense clay alteration located at the intersection of north-south and east-west shears. A field examination was made of five areas of mineralization associated with quartz veining exposed within a stockwork of multi-directional quartz veinlets. The five areas examined are referred to as the Stockwork Zone, HG Zone, Switchback Vein, Vuggy Vein and Bluff Vein. The field examination was conducted in an effort to determine the full extent of quartz veining and stockwork development.

The sampling and mapping was carried out over a 5 day period during the month of May 1996. This report is based on the results of this field work in conjunction with considerable time spent in analysing, compiling and interpreting previously gathered geological and geophysical data in consideration of the 1996 geological mapping program. The results have subsequently been assembled on 1:2500 base maps for this report. Field examination of the large quartz stockworks in intrusives located between lines 0+00 N/S and 1+20 S from 1+50 E to 2+50 E was made in an effort to determine the full extent of the stockwork development.

## LOCATION AND ACCESS

The SAB Claims are located in the Kettle River Valley, some 54.5 kilometers (33.9 miles) at a bearing of about 130° southwest of Vernon, B.C. The claims are largely on the west side of the Kettle River at its confluence with Stove Creek.

The geographical coordinates for the center of the property are 49° 55' north latitude and 118° 42' west longitude.

The SAB property is accessed from Vernon by travelling 99 kilometers (61 miles) east along Highway #6. Then turn off on the gravel forestry road at the Spruce Grove Cafe near the Monashee Pass summit. The property is located 16 kilometers (10 miles) southwest along this road, at the 68 kilometer marker near Stove Creek. The property is easily traversed by two-wheel drive in the summer months. A four-wheel drive truck equipped with chains is recommended for the winter months.

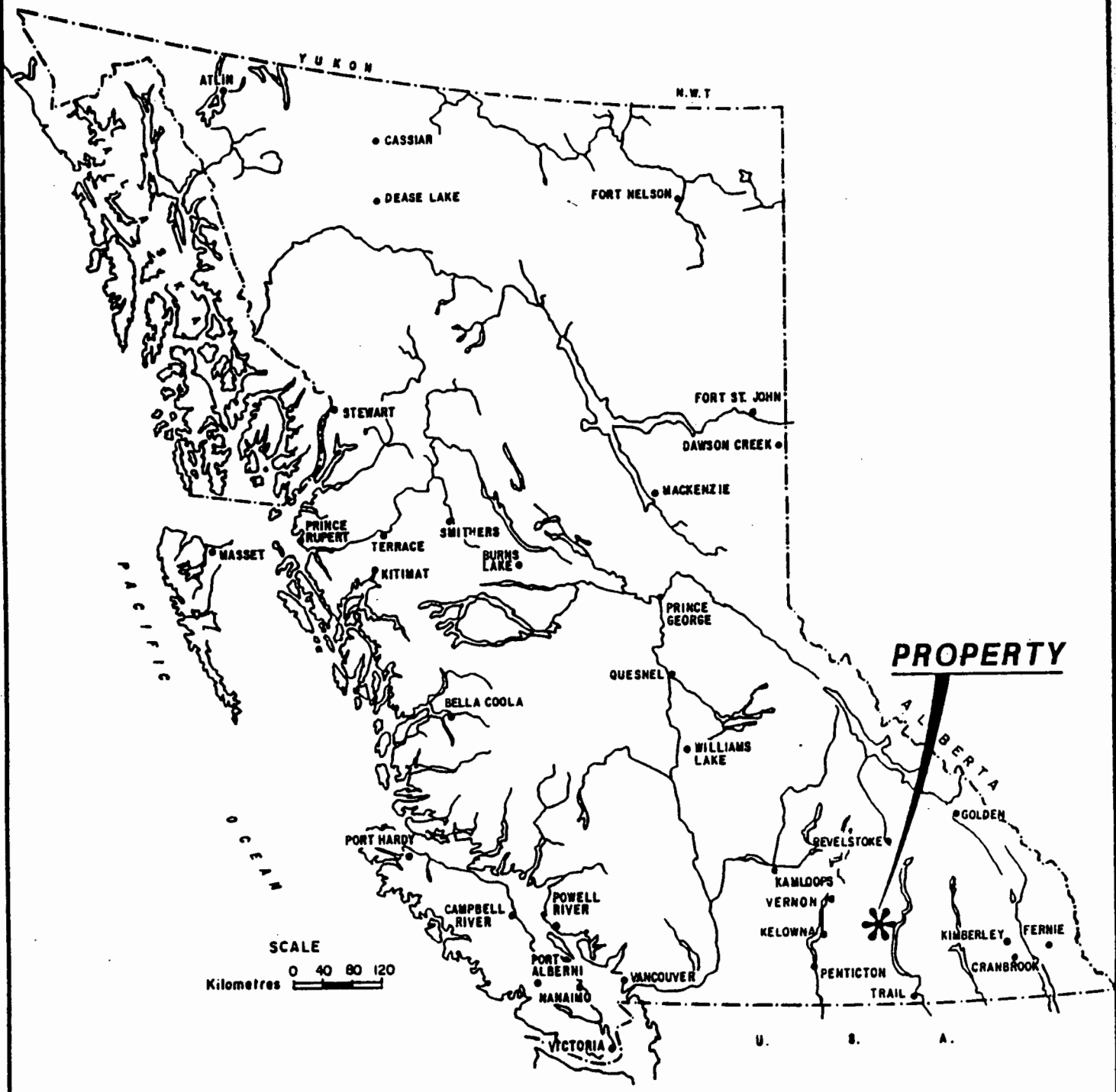
The property is easily accessed via the many logging roads throughout the claims. Most of these roads are maintained during active logging giving near year round access with only minor maintenance required to keep unused portions clear of snow and washouts.

## PHYSIOGRAPHY AND VEGETATION

The property is located in the eastern boundary of the Okanagan Highland, a division of the Interior Plateau System immediately west of the Monashee Mountains. Relief is moderate, rising from an elevation of 1,050 meter (3440 feet) at the Kettle River, which traverses from north to south through the property, to 1,650 meters (5400 feet) in the northwestern part of the property. The primary exploration targets are between the river level and the 1,200 meter (4000 foot) elevation.

Several creeks, including Stove, Bruer, Haggart and Winnifred, flow through the property into the Kettle River. Outcrop in the creek valleys is abundant but overall rock exposure is less than 25 percent. The remainder of the property is covered by glacial till which varies in thickness.

The vegetation on the property originally consisted of lodgepole pine, fir, balsam, spruce, and locally, alder. About half of the lower elevations of the property have been logged over the past 17 years. Secondary stands of pine and fir cover some of the older logged area. Alder is the most common cover in the recent clear cut portions of the property.



<b>Y-H TECHNICAL SERVICES LTD.</b>		
<b>SAB PROPERTY</b> KETTLE RIVER AREA VERNON MINING DIVISION, B.C.		
<b>LOCATION MAP</b>		
Date: March 1992 Revised Aug 1996	Scale: 1:8,000,000	Figure No. 1

### PROPERTY DESCRIPTION

The property consists of five contiguous claims totaling 58 units as shown on Map 2 and as described below:

<u>Claim Name</u>	<u>Record Number</u>	<u>Expiry Date</u>	<u>Units</u>
SAB 1	619	05/95	9
SAB 2	620	05/95	6
SAB 3	621	05/95	9
SAB 4	622	05/95	16
SAB 5	623	05/95	18
Totals			58

All the claims are registered in the Vernon Mining Division in the name of R.W. Yorke-Hardy are owned 80% by Y-H Technical Services Ltd. and 20% by Snowflake Mines Ltd. The expiry dates above reflect the acceptance for assessment credits for 1991 work.

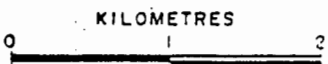
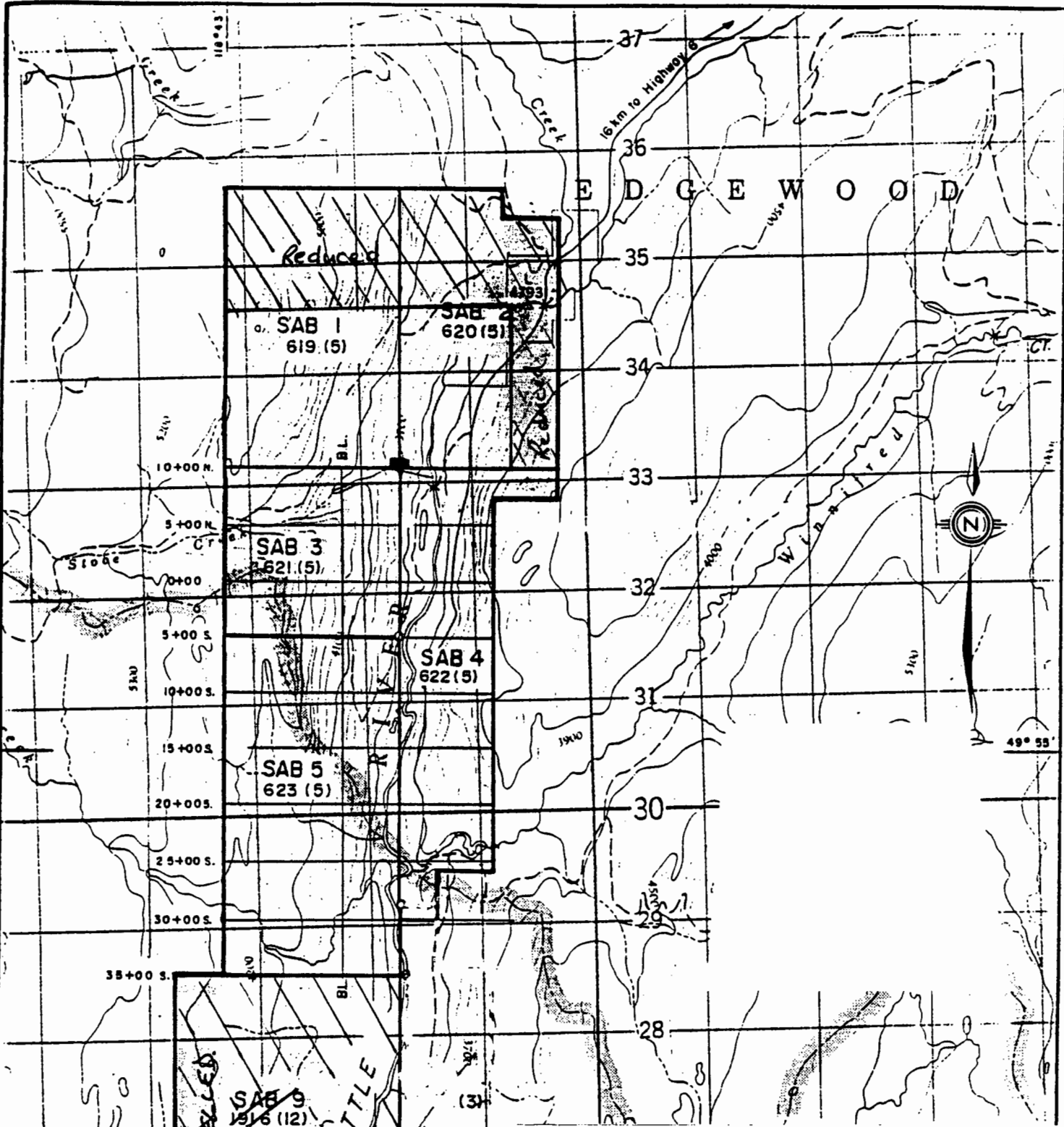
### PROPERTY HISTORY

The property is located about 13 km. west of the Lightning Peak silver camp which saw limited production until the mid 1930's and 24 km. southwest of the Monashee gold camp which produced lode and placer gold and silver ore. These old camps continue to be explored for precious metals.

The SAB property was first staked by R.W. Yorke-Hardy and S.E. Arnold in 1972 and was explored by the prospectors until optioned to Mohawk Oil Co. Ltd. in early 1980. The property was extensively explored by Mohawk during the period from 1980 to 1984 during which time geological mapping, sampling, soil geochemistry, VLF-EM, magnetometer, I.P./resistivity and self potential surveys were conducted in conjunctions with diamond drilling and bulk sampling/metallurgical test work. A total of 10,281 feet of drilling was conducted to test geophysical targets and shear zones. Data collected by Mohawk was interpreted as indicating a "porphyry copper" type deposit with the large stockwork area representing the "breccia cap" associated with such a deposit. The extensive clay zones encountered were interpreted to be the result of faulting or intense alteration associated with the "porphyry copper" model. In late 1983 and throughout 1984 the intense alteration zones were interpreted as relating to epithermal alteration.

Detailed IP/resistivity and BQ diamond drill holes drilled during the 1984 exploration programme by Mohawk Oil Co. Ltd confirmed areas of intense clay alteration at depth at the intersection of north-south faults with east-west shearing. Mineralized vein material was encountered and associated with massive pyrite in white quartz; in quartz sericite altered intrusives. This mineralization was thought to confirm the existence of a structurally controlled epithermal type mineralized system of quartz, or quartz-calcite veins and veinlets infilling the main fault and shear system or the cross-cutting, east-west structures.





**Y-H TECHNICAL SERVICES LTD.**  
**SAB PROPERTY**  
 KETTLE RIVER AREA  
 VERNON MINING DIVISION, B.C.

**CLAIM MAP**

Date: March 1992  
 Revised Aug 1996  
 Scale: 1: 50,000  
 Figure No. 2

Due to changing plans within Mohawk Oil Co. Ltd, which resulted in the discontinuation of all their mining activities and the termination of the option on the SAB property, the results of the 1984 programme were not fully assessed. A compilation of available IP data on the SAB claims was performed on behalf of Y-H Technical Services Ltd. by Geotronics Surveys Ltd in 1989.

Four trips were made to the SAB property in 1991 and included location of old 1984 trenches and a closer examination of basic intrusives thought to be of the alkaline porphyry type. Property evaluations to the SAB property during this field work included visits by Orvana Resources Corp. based in Coeur d' Alene, Idaho, 14 samples were taken from examination of the old workings. A large gold soil geochem anomaly south of the south vein area was prospected and recommendations were made to examine another gold soil geochem anomaly north-west of the Stockwork area after a visit by Canamax Resources Inc.. A further visit was made by Cordilleran Engineering who examined the SAB property on behalf of Fairfield Minerals. Their evaluation included inspection of vein occurrences and an office study of available data.

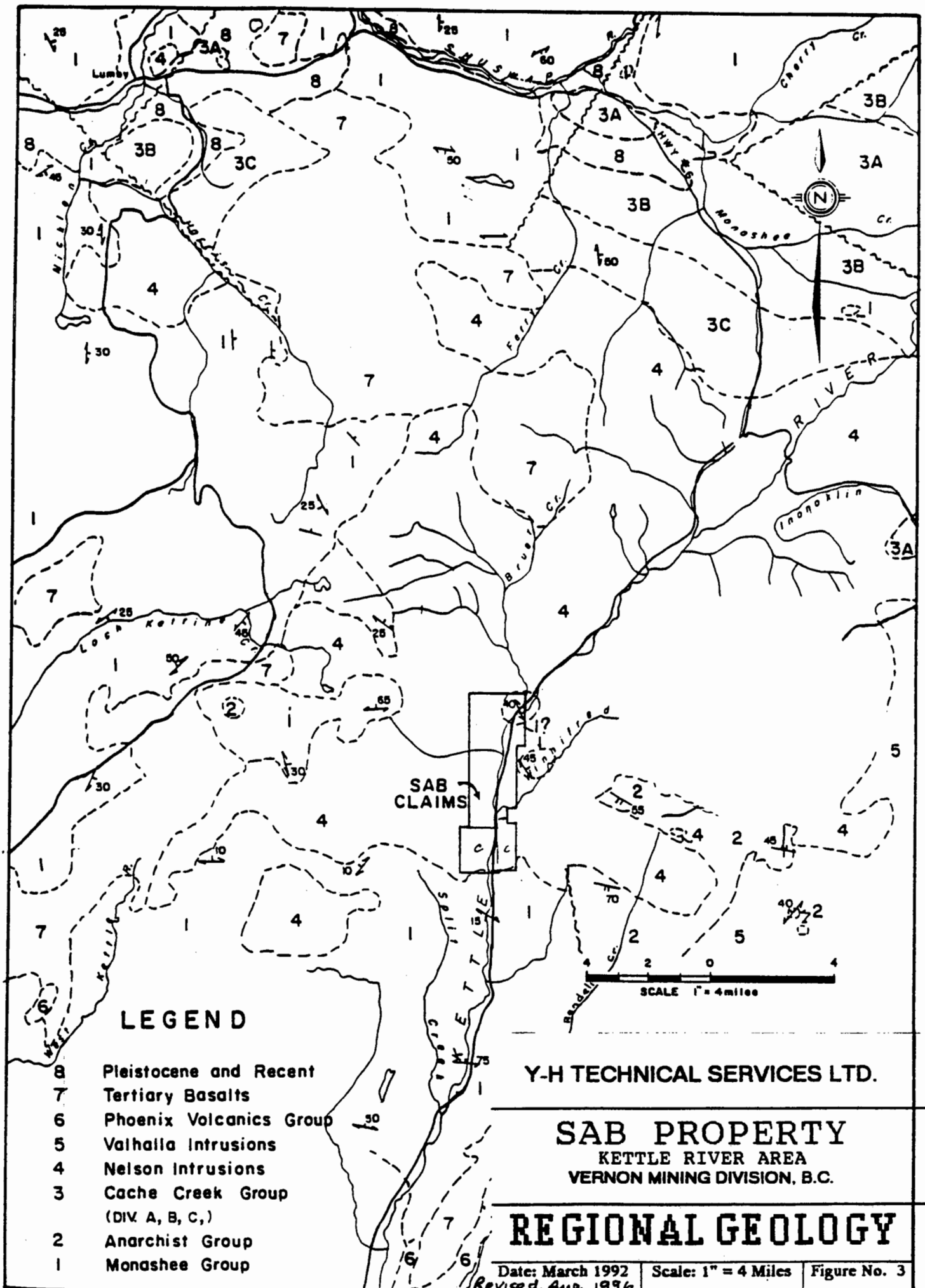
An assessment report of the results based on the mapping of old trenches and the assay results of samples taken by the visiting geologists from their property evaluations was provided for assessment coverage for the SAB #9 mineral claim.

The best assay results obtained were from the HG Zone with grab samples returning from 14,000 ppb gold plus >100 ppm silver (Canamax) to 20,916 ppb gold plus 9.27 o.p.t. silver (Orvana). A chip sample (Orvana) across an eight foot width in the Pb Zone ran 66 ppb gold plus 56.59 o.p.t. silver; with an anomalous value of 289 ppm copper. The skarn altered material from the footwall area of the south veins was weakly anomalous in zinc returning 166 ppm (Canamax) and 219 ppm (Orvana). Values in cobalt from the HG zone, the gossan zone, the altered zone behind the old camp generator site and sporadically from along the cherty contact zone ranged from 11 ppm to 27 ppm copper with back ground values from other areas running from 2 to 5 ppm copper. The significance of these elevated cobalt values is as yet undetermined although all these results are from areas demonstrating some degree of hydrothermal alteration.

### REGIONAL GEOLOGY

The SAB property is in an area of the Interior Plateau of British Columbia comprised of mostly granitic rocks. The rocks in this area are mapped as the Cretaceous (?) Nelson or Valhalla Intrusions and tentatively grouped together into the Greater Nelson Batholith. The Batholith is composed of granite, porphyritic granite, granodiorite, diorite, monzonite and quartz monzonite.

Roof pendants of Permian Anarchist Group volcanic and sedimentary rocks are mapped on the claims. Little (1957) shows other areas of Anachist Group Rocks to the east of the property on Lightning Peak and an area tentatively identified as Monashee (?) Group rocks to the south-east of the property.



**LEGEND**

- 8 Pleistocene and Recent
- 7 Tertiary Basalts
- 6 Phoenix Volcanics Group
- 5 Valhalla Intrusions
- 4 Nelson Intrusions
- 3 Cache Creek Group  
(DIV. A, B, C,)
- 2 Anarchist Group
- 1 Monashee Group

**Y-H TECHNICAL SERVICES LTD.**

**SAB PROPERTY**  
 KETTLE RIVER AREA  
 VERNON MINING DIVISION, B.C.

**REGIONAL GEOLOGY**

Date: March 1992 Scale: 1" = 4 Miles Figure No. 3

Revised Aug. 1996

Tertiary basalt of the Kamloops Group occur in the region south and west of the property.

Late stage basalt and lamprophyre dykes intrude the older volcanic sedimentary and granite rocks. These dykes are possibly Tertiary in age and are related to Kamloops Group Tertiary basalts.

Mineralization in the region is hosted by the intrusives and the Permian aged volcanic and sedimentary rocks. The recent basaltic rocks on the SAB claims post-date the mineralization.

### **PROPERTY GEOLOGY**

The SAB claims are predominantly underlain on the west side of the Kettle River by Cretaceous Nelson intrusives. Compositions range from quartz diorite to mostly granodiorite and quartz monzonite. The granites vary from fine to coarse grained, equigranular to porphyritic units. Dioritic phases are most pronounced along a major north south fault contact along the west side of the Kettle River with up to 40% mafics, 10-15 % quartz and 50 - 55% plagioclase and feldspar. Locally, phases of the diorite appear gneissic and maybe related to overprinting by later secondary biotite and K-feldspar with additional overprinting by quartz sericite pyrite alteration. Elsewhere, weakly altered granodiorites with epidote, sericite, calcite and hematite alteration are medium grained, with 45% plagioclase, 25% quartz 20% feldspar and 10% biotite with trace magnetite.

The granites intrude and overlie roof pendants of Permian, Anarchist Group volcanic and sedimentary rocks generally striking 020 degrees to the north with shallow dips. Mappable units of interbedded metavolcanics and metasediments have been identified to the south of the property along this major north south trending fault contact at the South Veins area. They include locally, isoclinal crossbedded meta-calcareous, fine grained, skarn altered metasediments with later shallow, west dipping quartz veins. The quartz veins along this structure are coated with chloritized graphitic clays on the hanging wall in close contact with altered granodiorite. Unconsolidated sand and gravel lenses occur as pockets along the exposed vein material. These metasediments are overlain by diorites that have a similar orientation of the bedding to this fault. The metasediments are intruded along this contact to the north at the K 10 trench by numerous granite- granodiorite sills in between bedding planes as well as andesitic dykes with similar orientations as the bedding. Alteration is characterized by argillic/phyllic alteration of porphyritic andesite overlain by a quartz chalcedony, part siliceous clay horizon that is overlain by moderate to weak argillic altered granodiorite. This assemblage dips to the west and is crosscut by late stage possibly Kamloops Group Tertiary volcanics. In places, alteration of the granodiorite has proceeded horizontally rather than vertically.

A sequence of limestone appears to pinch out to the north in close contact with highly fractured and contorted porphyritic intrusives at or near the projected extension of the northerly trending fault in the vicinity of line 2+40S, 5+50E.

### **Structural Geology and Faulting**

Metasediments and metavolcanics exposed along a major north to north east trending fault structure may form the limb of a relatively shallow sided structure with beds striking 007 degrees and dipping 35 degrees east, south of Winnifred Creek and west at the south quartz veins and K-10 trenched area, north of east west shearing at the Lead Zone. Variation along this fault maybe related to shifting and rotation of blocks between later crosscutting structures.

Movement along this northerly trending structure is possibly strike-slip with possible later dip-slip movement along the later crosscutting eastwest shears as evidenced by outcrop exposure and geophysical survey interpretation along the full length of the property.

Exposures of stockworks in quartz, veinlets and disseminations of pyrite, chalcopyrite and polymetallic base metal silver, lead zinc, quartz carbonate veinlets in areas previously trenched and sampled in five separate localities on the Sab Claims are coincident at the intersection of multiple fracture sets associated with these major faults and shearing.

### **Alteration and mineralization**

Mineralization at five separate localities including the HZ Zone, Stockworks, Vuggy Vein Bluff Vein and Switchback Vein is associated with hydrothermal alteration of the intrusive bodies and host rocks and appears spatially related to their proximity to faults.

Thirty two rock channel samples were collected during the May June 1996 geological mapping programme conducted on the property; see Drawing No. 5. Samples were taken across exposed faces of the sheared granodiorite and quartz monzonite intrusives.

Shearing is found to be the main control for alteration and mineralization within the host intrusive rocks at the lead zone. Chloritic manganese coated slickensides, stockworks and quartz carbonate veins with sericite and pyrite are found directly related to intersecting mapped faults.

Nineteen (19) samples including numbers 9176 to 9195 were taken from the Upper Lead Zone between a trenched area referred to as the K-1 trench to the west and approximately 20 metres in elevation above the base of the lower lead zone open face cut to the east.

Sixteen (16) of these 20 samples from the Upper Lead Zone were taken normal to a series of sub-parallel east west fractures into the hanging wall side of the major east west shear. It was noted that samples 9181 to 9186 with the highest silver values were taken in an area that represents the most intense degree of intersecting fractures with the vein shear. The best mineralized segment in the 1996 program returned an average grade of 20.81 ounces per ton across a true width of 2.50 metres at the K-1 trench of the Upper Lead Zone.

Intrusives mapped in contact with later stage basaltic-andesitic dykes have undergone weak argillic alteration near the contact margins. Alteration includes chloritized mafics, clay altered plagioclase with traces of limonite, pyrite and black sooty oxides. Grey-black sooty crushed sulphides coat chloritized walls of these east-west trending fractures containing the highest silver values.

Because of their very fine grain size, silver minerals have been tentatively identified as primary ruby silver and native silver associated with later calcite veining from a previous analysis in 1982 by Vancouver Petrographics Limited. Their analysis states that stages of mineralization appear to be:

- 1) replacement of quartz-sericite rock by main sulphide-quartz -(chlorite carbonate) vein dominated by sphalerite and quartz with lesser pyrite and galena, and a trace of chalcopyrite, ruby silver and pyrrhotite.
- 2) fracturing of the rock and emplacement of calcite-(native silver) veins. (Vancouver Petrographics Limited, 1982).

The shear zone averages approximately 30 cms. in thickness and strikes 071 - 080 degrees with a 67 -75 south dip. In places along the main shear, massive sulphides amount to 80% of the 10 -15 cm mineralized vein material with 70% sphalerite, 25% galena and 5% pyrite. The sulphides are locally brecciated in close contact with mylonitic clay gouge. The total zone influenced by shearing is approximately 1.5 metres with edges of the shear marked by limonite.

Samples 9166 to 9172 and 9177 to 9200 were taken in the lower lead zone open cut along the main extension of the shear zone to the east. Values of up to 3.72o.p.t silver were obtained from assaying 12 samples representing narrow veinlets in quartz, sericite, pyrite, and chlorite altered porphyritic intrusives. Massive sulphide vein quartz and minor veinlets are exposed on either side of blue grey mylonitic clays, 4cm - 18cm in thickness that trend 070 degrees and dip 70 degrees south. Small selvages and pockets of coarse grained blocky galena contain fine grained pyrite. Pyrite is also disseminated along margins of quartz sericite pyrite altered porphyritic granodiorite.. Late stage highly altered biotite lamprphyre dykes cut the intrusives. The dyke contact is at 320 degrees 85 E and is offset by strike slip east/west movement. Veinlets of sulphide extend from the dyke contacts.

The east/west shear is offset by possible 020 degree faulting and crosscut by 340 degree fractures that dip 48 degrees to the east. Chloritic slickensides on 020 degree structures suggest local dip slip movement.

The degree in intensity of sulphide veins and veinlets is more pronounced on the north side of the east/west shear. Mineralized structures in the area of the Upper Lead Zone Open-cut are exposed and mapped over a distance of approximately 30 meters east/west and 15 meters north/south. This mineralized area forms part of the overall 300 metre strike length of the Lead Zone Shear.

It was noted during mapping at the scale of 1:2500 on the property that propylitic alteration is widespread and is indicated by the presence of disseminated pyrite and veinlets, chloritized mafics, minor epidote and altered plagioclase in the host rocks around the mineralized shears and fractures with the highest silver values.

Quartz, sericite, pyrite is dominant around the greatest density of quartz structures associated with fracturing, faulting and stockworks development. Envelopes of quartz, sericite, pyrite and hematite are noticeable at the High Grade Zone around a system of subparallel quartz veins containing up to 5% pyrite, chalcopyrite, bornite(?), galena and significant gold assays; see Drawing No. 9.

Fine grained argentite and accessory scheelite are reported by (Kerr. 1979) to occur in these veins. Values of 0.11 o.p.t gold and 4.2 o.p.t silver were obtained from a 24.2 ton bulk sample from the High Grade Zone. Also, values as high as 0.52 o.p.t gold and 8.20 o.p.t silver were obtained over 2.33 feet from DDH 82-13. Alteration is restricted to a sheared area within porphyritic granodiorite cut by late stage volcanic dykes.

Similarly, quartz sericite, pyrite alteration of the host rock intrusives, envelopes, stockwork structures including veins and veinlets in the Vuggy vein and Switchback areas on the SAB claims.

Both these zones are structurally related to a much larger area of potential mineralization as drilling has indicated that quartz and associated phyllic alteration continues to depth.

Similar stockworks development is exposed in outcropping to the south and east of the main quartz sericite pyrite stockworks zone at approximately. 13+60S, 5+50E.

Of significance on the SAB claims, is the presence of low resistivity anomalies thought to represent epithermal alteration zones. Extensive clay alteration thought to be "low pH" alteration associated with epithermal type deposits are exposed at the intersection of north south and east west fault related structures.

Results of the 5 holes drilled in 1984 includes a 1 foot run with 0.096 oz/ ton gold, 14.80 oz/ton silver from drill hole 84-1 at 353'4" - 354'9". Mineralization consists of massive pyrite in massive white quartz. No evidence of boiling to suggest an epithermal system including multistage brecciation, repeated silica flooding or opaline quartz were encountered during the 1984 drilling or are evident in mineralization at the lead zone, stockworks zone or the High Grade Zone.

It is possible that the extensive clay zones represent advanced argillic alteration of intrusive rocks forming a locally developed overprinting with pervasive kaolinite.

Therefore, future drill targeting should be aimed at silver gold mineralization associated with stockwork development coincident with north east faulted structures and IP chargeability highs and IP resistivity lows.

## **DISCUSSION OF THE 1996 EXPLORATION PROGRAM**

### **Geological Mapping and Sampling 1996 Programme**

A Silva Ranger and Brunton compass in addition to a topolite belt chain were used to measure and survey flagged distances along access roads to previously excavated areas on the SAB claims. The surveyed roads already established from McElhanney Surveys Ltd. were used as a control for geological mapping and sampling at a metric scale of 1:2500. Detailed mapping at a scale of 1: 100 was used during the sampling programme in two areas referred to as the Upper Lead Zone and Lead Zone open-cut.

A Model 7753 Bobcat was used to repair ramps previously constructed into the Upper Lead Zone; K-1 and K-2 Trench areas. The Bobcat was then used to power a 20 lb. hydraulic chipping hammer which was used to extract 32 rock samples.

A total of 32 channel samples were collected and shipped to Bondar-Clegg Laboratories in Vancouver, B.C.. All samples were analyzed for 34 elements by the ICP system and samples were assayed for silver.

Sample descriptions and analyses are enclosed in Appendix A. Sample locations are illustrated on geological maps that accompany this report.

### **Compilation and Interpretation of Geophysics**

A compilation of geophysical features is illustrated on Drawing No. 1 and includes previous ground survey work conducted on the SAB claims from 1977 to 1984. Interpretations of these geophysical trends have been used in defining an extension of the mapped extent of stockwork development to the south-east from the main stockwork zone.

A large zone of high IP chargeability is coincident with sulphide mineralization associated with brecciated quartz stockwork in quartz, sericite, pyrite altered intrusives at the Switchback, Vuggy and Stockwork Zones. The higher chargeabilities correlate well with a wide north-west trending zone of magnetic lows (see drawing No. 3). This north-west trend is coincident with an IP resistivity trend and may represent an extension of the main stockworks to the south-east that includes the Lead Zone on line 9+60S and stockworks in host altered intrusives on line 13+50s and 5+50E.

This northwest trending projection of the stockworks is crosscut by numerous north-east trending mapped fault structures and fault structures inferred from the VLF-EM. These north-east trending structures may represent later stage mineralized shears and associated alteration of the intrusives between, for example, the HG Zone and Stockworks Zone.



A strong north-east trending VLF-EM anomaly that is coincident with a mapped north-east trending fault structure, crosscuts the IP chargeability anomalies at approximately 7+20 S and 3+25 E in the vicinity of a metavolcanic, intrusive contact. The causative sources for these major geophysical anomalies may be an intersection of north-west trending shear zones within mineralized stockworks at the intersection of a north-east trending fault contact with Anarchist Group metavolcanics and intrusives.

The sheared and fault offset system of quartz veins at the HG Zone are coincident with a north-east trending VLF-EM anomaly that intersects a northwest IP resistivity low anomaly. The mineralized quartz structures are just west of, and sub parallel to the north-south boundary of the IP chargeability anomaly and east of the large area of low magnetic susceptibility. The resistivity trend may indicate the westerly extent of phyllic altered intrusives.

Ground magnetic dipoles are coincident with a major north-east trending VLF-EM conductor located immediately to the south of the Lead Zone at approximately 3+00E between, lines 8+40S and 13+20S. The poles of this magnetic dipole occur at the intersection of inferred north-west trending fault structures. Another ground magnetic dipole on line 2+40N is coincident with the trend of an assumed north-east contact with intrusives and metasediments including limestone.

#### **Compilation and Interpretation of Soil Geochemistry**

Sub-anomalous contours for gold, silver and lead values are plotted on Drawing No. 4. from geochemical surveys carried out on the SAB claims in 1978. Additional sampling for gold was carried out during a 1984 exploration programme and shows little correlation with sample results for other elements. Significant values of over 75 ppb gold are coincident in the Stockwork and Vuggy Vein areas with sub-anomalous values of 1.6 ppm silver. The north-south trend of the silver soil anomaly extends to the west and includes the HG Zone and to the south to approximately 8+40S. Significant gold values from the soil sampling programme conducted in 1978, below the area of the Switchback Vein and north of the Bluff vein, may be a result of downward dispersion of gold mineralization from the Stockworks area.

The main silver soil anomaly is coincident with IP chargeability highs, the north-south trend of a VLF-EM conductor and the area of magnetic lows.

Additional soil geochem gold values occur sub-parallel to the 0+00 Baseline between 8+00S and 13+15S and are coincident with a northsouth VLF-EM conductor. This conductor may represent a northerly trending mineralized fault structure with gold mineralization in a gangue of quartz. Elevated gold values at approximately 3+60N warrant follow-up sampling for gold to define areas of potential mineralization.

Elevated lead values occur trending in a north-west direction and are coincident with the main exposures of silver-lead-zinc mineralization at the Lead Zone and an area to the north-west. The extent of the lead anomaly to the east appears structurally controlled by north-east trending mineralized fault structures inferred from the trend of mag lows and a north-east trending VLF-EM conductor.

### **CONCLUSIONS & RECOMMENDATIONS**

The most recent exploration work during the 1996 field season has centred on mapping and sampling exposures of stockworks, veinlets and disseminations of pyrite, chalcopyrite and polymetallic base metal silver, lead, zinc quartz carbonate veinlets in areas previously trenched and sampled in five separate localities on the SAB claims. Mineralization in all these zones is associated with hydrothermal alteration of the intrusive host rocks. The geological mapping and sampling programme has confirmed higher silver and zinc values to the west of exposed mineralization in the lower Lead Zone Open Cut. The mineralization recorded is more related to higher temperatures and fluid pressures associated with the porphyritic intrusives. More detailed mapping of alteration assemblages and geochemistry of the intrusives is required to better understand the relationship of disseminated, vein, stockwork mineralization associated with a possible porphyry related epithermal type system.

Future drilling is recommended in areas of potential mineralized stockworks at or near the intersections of north/south fault contacts with intrusives and metavolcanic/metasediments with silver lead zinc mineralized east/west shears. This would include collaring holes at approximately 3+00E to 4+00E to the north of eastwest cross-cutting shears at the Lead Zone on lines 6+00 S to 8+40 S.

More detailed geological mapping is required in areas of stockwork with quartz sericite and pyrite alteration in the vicinity of line 13+80S and 4+00E. It is also recommended that the stockworks and High Grade areas be further prospected with a view to extending these showings along the trace of IP high chargeability and IP resistivity low anomalies to the south and east with which they are associated.

Several mineralized targets occur on the property:

- 1) Disseminated and fracture controlled gold/silver mineralization associated with a quartz flooded stockwork zone hosted in granitic intrusives. Significant gold and silver values occur in the HG Zone which is believed to be a mineralized fault splaying off from the stockwork system - gold/silver (with some copper, zinc, and lead) mineralization hosted in granitic intrusives.
- 2) Structurally controlled mineralized shear/vein type with replacement of quartz sericite rock by main sulphide-quartz-(chlorite/carbonate) veins; high grade small tonnage silver (with zinc and lead).

It has become apparent from this years studies and ground work that the soil geochemistry survey within the main area of interest should be re-evaluated and possibly redone. The pre 1980 soil survey was analyzed only for Pb and Ag while the 1984 survey was performed with large areas not sampled in the vicinity of existing workings. The 1984 soil survey shows little correlation with previous work, particularly in the gold values; with a large number of samples reported as < 5 ppb gold. It is interesting to note that the 1984 samples were prepared using Aqua Regia leach and MIBK extraction followed by AA analyses while all previous samples were prepared using fire assay/AA analyses.

It is the writers opinion that the main area of interest within the original pre 1980 grid should be re-sampled and re-analyzed using a 32 element total extraction ICP analyses plus gold by fire assay/AA finish. This survey should extend into the large unexplored gold soil geochem anomalous area to provide comparison analyses and to interconnect the zones of potential interest.

It is apparent that a significant zone of silver mineralization occurs in the vicinity of the 1983 K-1 trench. The silver occurs in the hangingwall of the Pb Zone shear and contains little other than silver mineralization with slightly elevated copper values. Intense manganese staining and some malachite staining is evident as are fine stringers of calcite. The overall strike length of the shear can be traced over 300 meters and is open in both directions along strike and to depth. Mineralization is evident at various locations along the strike length. Previous drilling in the Lead Zone is inconclusive and did not adequately test the zone. The remaining portion of the Lead Zone should be mapped and sampled in detail to determine the extent of the high grade silver mineralization.

## COST STATEMENT

### Technical Work/Project Management:

Field - Management/Admin.

R. W. Yorke-Hardy, 3 days at \$350.00/day \$ 1,050.00

Office - Management/Admin.

R. W. Yorke-Hardy, 3 days at \$350.00/day \$ 1,050.00

### Geological Work:

Field - Geological Mapping and Sampling

Brian Callaghan, 6 days at \$300.00/day \$ 1,800.00

Office - Plotting, Compliation, Interpretation and Report

Brian Callaghan, 20 days at \$300.00/day \$ 6,000.00

### Casual Labour:

Field - Sampling

W.D. Yorke-Hardy, 1 day at \$150/day \$ 150.00

Henry Teicroeb, 7 days at \$175/day \$ 1,225.00

Office - Typing

Lee-Ann Yorke-Hardy, 2 days at \$75.00/day \$ 150.00

### Support Costs:

Field -

Vehicle costs - 4 days at \$75/day \$ 300.00

Gas/Fuel - \$ 150.00

Camp/food - 10 man days at \$30/day \$ 300.00

Bobcat and Hydraulic Hammer - 5 days at \$250.00/day \$ 1,250.00

Field Supplies \$ 100.00

Tools and Misc. Equipment Rental \$ 150.00

Office -

Assays - \$ 877.87

Report Printing/copying - \$ 100.00

Computer Time - 4 days at \$50.00/day \$ 200.00

Map Printing/Copying - \$ 287.96

Shipping - \$ 50.00

TOTAL COSTS ----- \$15,340.83



# Y-H TECHNICAL SERVICES LTD.

Mining Exploration & Drafting

Supplies & Service

P.O. BOX 298 • VERNON, B.C. • V1T 6M2  
TELEPHONE (604) 542-5173 • FAX (604) 542-7115

## Certificate of Qualifications

I, Robert W. Yorke-Hardy, of Vernon British Columbia, do hereby certify that:

1. I am a Mining Technologist residing at 330 Stepping Stones Road, Vernon, British Columbia. I am the owner/operator of Y-H Technical Services Ltd. of P.O. Box 298, Vernon, B.C., an exploration services company. In total I have accumulated 29 years of experience in Mining/Mining Exploration and related industries. Y-H Technical Services Ltd. provides management services to Okanagan Opal Inc. on the Klinker Project.
2. I am a graduate of the British Columbia Institute of Technology, Burnaby, British Columbia and a registered charter member of the Association of Applied Science Technologists and Technicians of British Columbia. I have practiced my profession for 26 years.
3. This report is based on work performed by myself, under my direction or by others while in my presence. The total value of the work performed has been detailed in the foregoing Cost Statement. This sum is to be considered as eligible expenses incurred on the SAB Property and they are therefore submitted in support of the Notice of Work filed in May 1996.
4. This report is based on knowledge and experience gained over the period 1972 to the present. I am familiar with the geology of the Kettle River/Stove Creek area and surrounding district.
5. I am a claim title holder of record on the SAB mineral claims. These claims are owned by Y-H Technical Services Ltd. which is a company in which I own a 50% interest.

Y-H Technical Services Ltd.

  
R. W. Yorke-Hardy, A.Sc.T.  
August 29, 1996

## STATEMENT OF QUALIFICATIONS

I, Brian Callaghan reside at 989 Curtis Road, Kelowna, B.C..

I graduated from Brandon University, Manitoba in 1980 with a Bachelor of Science Degree in Geology.

I have worked continuously as a Geologist since 1980.

I am presently self employed as a Geological Consultant.

Under contract with Y-H Technical Services Ltd., of Vernon, B. C., I mapped the geology including mineralized areas on the SAB claims in May 1996 and have compiled and reinterpreted previous data based on this years field work.

I have no interest, direct or indirect, in the SAB Property or Y-H Technical Services Ltd.; nor do I expect to receive any.

Sincerely,

Brian Callaghan, B.Sc., Geology

August 29, 1996

A handwritten signature in cursive script, appearing to read "B. Callaghan", with a long horizontal flourish extending to the right.

## BIBLIOGRAPHY

Little, H.W., Kettle River (East Half) Map Area, British Columbia; GSC Map 6-1957, published in 1959.

Waldner, M., Geochemical Report on the SAB Property, for Mohawk Oil Co. Ltd., March 1982.

Smith, M. and Grant, S., Report on the SAB Claims Property, for Mohawk Oil Co. Ltd., October 1984.

Mark, D. and Cruikshank, P., Geophysical Report on the SAB Property, for Y-H Technical Services Ltd., 1988.

Smith, F. Marshall, Report on the SAB Property, for Y-H Technical Services Ltd., September, 1989

David Lefebure, Selected B.C. Mineral Deposit Profiles, Open File 1995-20.

Various other private reports.

**APPENDIX A**



**Sample Descriptions  
SAB Property  
Upper Lead Zone**

**May 19, 1996**

**Total 32 samples (Page 1 of 3)**

**See Drawing No. 5 for sample locations.**

**Sample # 9176 - 1 metre across lower face; north side on footwall of east-west shear. Host altered intrusive - quartz, chlorite, sericite. Fractures infilled with calcite, coated with manganese, limonite.**

**Sample # 9177 - 10 cms. of grey-white fault gouge with minor brecciated intrusive fragments on north side of shear.**

**Sample # 9178 - 75 cms. across E/W shear. True thickness 70 cms.. Mostly equigranular intrusive with quartz, calcite, chlorite alteration and pyrolusite, limonite - no visible sulphides.**

**Sample # 9179 - 25 cms. on hangingwall of shear, highly fractured. Fractures closely spaced (1 to 5 cms). Probably intrusives that are highly altered with quartz, sericite, calcite - no visible sulphides.**

**Sample # 9180 - 1 metre taken south of east-west shear in altered equigranular porphyritic granodiorite - less altered, less fractured, biotite to chlorite, abundant calcite.**

**Sample # 9181 - 50 cms. Surfaces coated with limonite. Quartz sericite alteration of intrusive on footwall of east-west shear.**

**Sample # 9182 - 20 cms. Limonitic clay gouge with rock chips of intrusive, no visible sulphides.**

**Sample # 9183 - 42 cms. consists of a veinlet on northside of channel on hangingwall of shear with 3 cms. of quartz and black sooty sulphides with trace of chalcopyrite? Abundant manganese coating on surfaces. Fractures E/W over 10 cms, coated with manganese with traces of very fine grained disseminated pyrite, limonite, calcite in porphyritic granodiorite.**

**Sample # 9184 - 85 cms. taken in porphyritic granodiorite - quartz diorite with relict phenocrysts containing 4 hairline fractures at 80 degrees dipping south. Trace grey sooty crushed sulphide in fractures.**

**Sample # 9185 - 1 metre. Alteration and rock type same as 9183 and 9184. Sample cut by northwest fractures at 340 degrees. Alteration propylitic, with minor calcite and epidote, disseminated pyrite and black sooty sulphides.**

**Sample # 9186 - 1 metre. Direction of channel 050 degrees in porphyritic intrusives. Sample crosscuts 020 shears that dip to east. Black fine dust at intersection of E/W fractures. Surfaces coated with manganese and limonite. Some andesitic dyke material in sample.**

**Sample Descriptions  
SAB Property  
Upper Lead Zone**

May 19, 1996

Total 32 samples (Page 2 of 3)

See Drawing No. 5 for sample locations.

Sample # 9187 - 45 cms. in fresh porphyritic granodiorite cut by at least 6 hairline, E/W trending fractures smeared with chlorite.

Sample # 9188 - 9188 cms. taken in same porphyritic granodiorite as in 9187 but with less close spaced east-west trending fractures and alteration - chlorite, calcite and manganese.

Sample # 9189 - 19 cms. of closely spaced east-west fractures coated with manganese, calcite and black sulphides. There are 6 fractures over this distance, chlorite smeared along surfaces. Alteration of intrusives is propylitic.

Sample # 9190 - 70 cms. taken south of the main east-west shear to the west in fairly fresh porphyritic granodiorite. 7 closely spaced sub parallel east-west fractures included in sample. Minor manganese coats surfaces with trace disseminated pyrite and black sooty sulphides along fractures.

Sample # 9191 - Channel over 45 cms. of tightly fractured porphyritic granodiorite. Hairline to 1 cm. fractures closely spaced, manganese coated. 1 fracture is 1 cm. in width with manganese, chlorite, calcite and hematite; with very fine grained pyrite.

Sample # 9192 - 40 cms. fractured porphyritic granodiorite with manganese coating hairline to 2 mm. fractures that trend E/W and 060 degrees. Alteration is weak propylitic with minor disseminated and interstitial pyrite.

Sample # 9193 - 40 cms taken on hangingwall of east-west shear extension. Intrusives less porphyritic, dark grey-black equigranular with quartz, oxidized pyrite, pyrolusite and greenokite.

Sample # 9194 - 45 cms. of fault gouge portion of east-west extension of shear, containing chlorite, calcite, clays with trace galena associated with interstitial quartz.

Sample # 9195 - 1 metre into footwall of dark grey-green intrusives with hematite and manganese. Disseminated pyrite (<1%) up to 1 mm..

Sample # 9196 - 25 cms taken in lower lead zone open cut; in footwall of shallow south dipping quartz vein in moderate argillic altered porphyritic intrusives. Plagioclase to clays, mafics to chlorite. Epidote along fractures. Sample contains 6 or 7 hairline fractures and one 1cm. wide fracture containing blebs of tarnished pyrite.

Sample # 9197 - 37 cms. taken across south dipping quartz veinlets trending approx. east-west. Sample includes 8 cm. vein with 3% tarnished pyrite and 4-6 cms. quartz, sericite, pyrite.

**Sample Descriptions  
SAB Property  
Upper Lead Zone**

May 19, 1996

Total 32 samples (Page 3 of 3)

See Drawing No. 5 for sample locations.

Sample # 9198 - 55 cms. taken in hangingwall with quartz, sericite, pyrite alteration around multidirectional fracturing.

Sample # 9199 - 124 cms taken in footwall to sample 9196; in porphyritic granodiorite with quartz, sericite, pyrite alteration with disseminated pyrite along fractures.

Sample # 9200 - 50 cms. taken in footwall of 080 degree shear in altered porphyritic granodiorite containing 3 hairline fractures approx. 080 degrees, 25 cms apart. Surfaces smeared with a rusty, olive green coating with manganese, epidote, chlorite and pyrite.

Sample # 9166 - 94 cms. in same porphyritic granodiorite as 9200 with multidirectional fracturing with quartz, sericite, pyrite alteration. Pyrite up to 2% disseminated with grey sulphides.

Sample # 9167 - 55 cms., same as 9166, in hangingwall with multi-directional fracturing.

Sample # 9168 - 190 cms.. Footwall of clay gouge shear with multi-directional fractures in quartz, sericite, pyrite altered porphyritic granodiorite. Iron stain along fractures with 1% disseminated cubic pyrite up to 1mm. along fractures.

Sample # 9169 - 55 cms. massive sulphides in hangingwall south side of main east-west shear with 1 cm. of black fine grained sphalerite and galena - no pyrite. Also, 2mm veinlets with sulphides. Trace cubic pyrite disseminated in intrusives.

Sample # 9170 - 45 cms. taken in hangingwall side of fractured quartz, sericite, pyrite altered granodiorite. Plagioclase (relict) some interstitial calcite.

Sample # 9171 - 1 metre into porphyritic granodiorite as at 9170 but less fractured. Fractures E/W and N/S.

Sample # 9172 - 60 cms. taken along hangingwall of main shear with massive sulphides in veinlets up to 5 cms., pinch and swell; all trending approx. 070 degrees, dipping steeply south. Sulphides 70% lead, 25% zinc, trace pyrite.



# Bondar Clegg Inchcape Testing Services

# Certificate of Analysis

CLIENT: Y-H TECHNICAL SERVICES LTD.  
REPORT: V96-01165.4 ( COMPLETE )

PROJECT: NONE GIVEN  
DATE PRINTED: 12-AUG-96 PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Ag PPM	AgGrav OPT
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R2 9166		<0.7	
R2 9167		1.0	
R2 9168		<0.7	
R2 9169		>34.0	2.50
R2 9170		2.5	

R2 9171		<0.7	
R2 9172		>34.0	5.89
R2 9176		31.6	0.94
R2 9177		>34.0	8.49
R2 9178		>34.0	1.23

R2 9179		22.7	
R2 9180		9.0	
R2 9181		>34.0	7.21
R2 9182		>34.0	20.45
R2 9183		>34.0	36.56

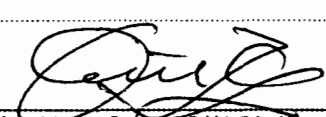
R2 9184		>34.0	7.83
R2 9185		>34.0	26.89
R2 9186		>34.0	26.17
R2 9187		5.8	
R2 9188		2.8	

R2 9189		1.9	
R2 9190		0.9	
R2 9191		11.9	
R2 9192		2.9	
R2 9193		>34.0	3.72

R2 9194		3.8	
R2 9195		12.8	
R2 9196		8.2	
R2 9197		8.3	
R2 9198		4.7	

R2 9199		4.5	
R2 9200		<0.7	

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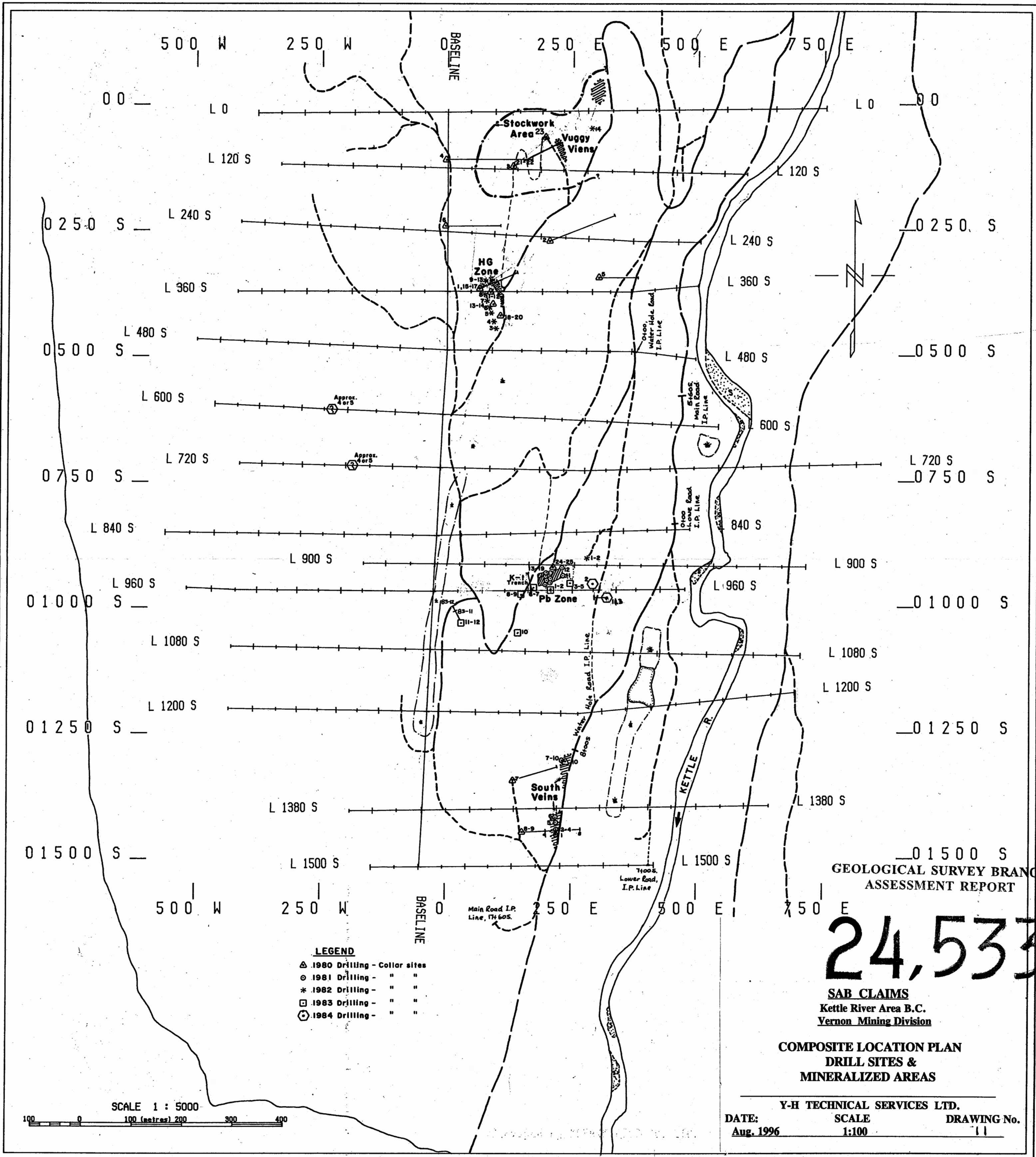
## Inchcape Testing Services

# Geochemical Lab Report

CLIENT: Y-H TECHNICAL SERVICES LTD.  
REPORT: V96-01165.0 ( COMPLETE )

PROJECT: NONE GIVEN  
DATE PRINTED: 15-AUG-96 PAGE 2

SAMPLE NUMBER	ELEMENT UNITS	Ag	AgOL	Cu	Pb	Zn	ZnOL	Mo	Ni	Co	Cd	Bi	As	Sb	Fe	Tot	Mn	Te	Ba	Cr	V	Sn	W	La	Al	Mg	Ca	Na	K	Sr	Y	Ga	Li	Nb	Sc	Ta	Ti	Zr
		PPM	PPM	PPM	PPM	PPM	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PCT	PCT	PCT	PCT	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PCT	PPM	
9199		3.0		8	185	776		2	2	6	8	<5	31	6	2.69	3100	<25	243	94	39	<20	<20	13	7.25	0.44	3.19	0.30	1.96	140	8	14	<2	10	<5	7	0.22	17	
9200		<0.5		2	12	64		<1	2	5	<1	<5	<5	<5	1.97	1284	<25	777	72	39	<20	<20	9	3.97	0.72	3.05	2.44	1.71	303	<5	12	<2	10	<5	6	0.21	9	



GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT

**24,533**

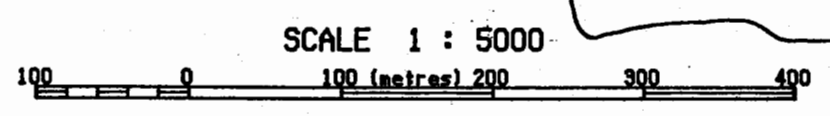
**SAB CLAIMS**  
Kettle River Area B.C.  
Vernon Mining Division

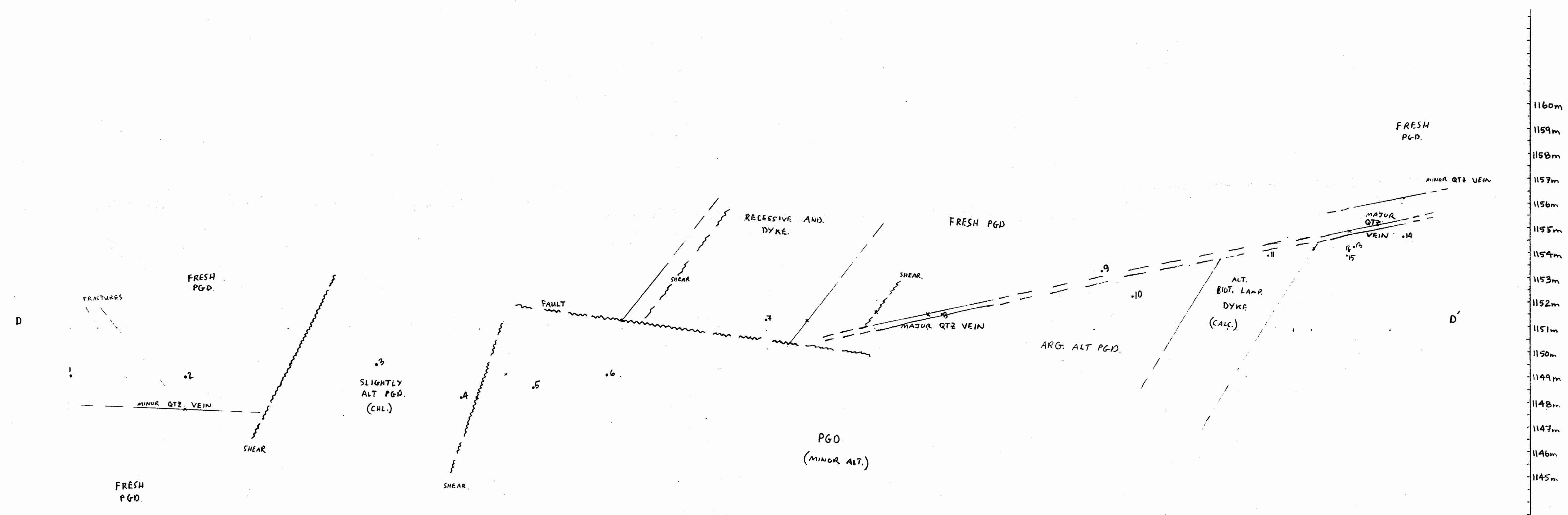
**COMPOSITE LOCATION PLAN**  
**DRILL SITES &**  
**MINERALIZED AREAS**

Y-H TECHNICAL SERVICES LTD.

DATE: Aug. 1996 SCALE: 1:100 DRAWING No. 11

- LEGEND**
- △ 1980 Drilling - Collar sites
  - 1981 Drilling - " "
  - \* 1982 Drilling - " "
  - 1983 Drilling - " "
  - ⊙ 1984 Drilling - " "





List of Abbreviations Used

bio	Biotite	Ga	Galena
chl	chlorite	stk	stockwork
ank	ankerite	porph	porphyritic
ep	epidote	amph	amphibole
py	pyrite	flt	float
gnt	garnet	sph	sphalerite
altn	alteration	mang	manganese
qtz	quartz	vn	vein
pyr	pyrolusite	lim	limonite
brc	breccia	ser	sericite
cal	calcite	cpy	chalcopyrite
hb	hornblende	pgd	porphyritic granodiorite

GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT

**24,533** Sab Claims  
Kettle River Area B.C.  
Vernon Mining Division

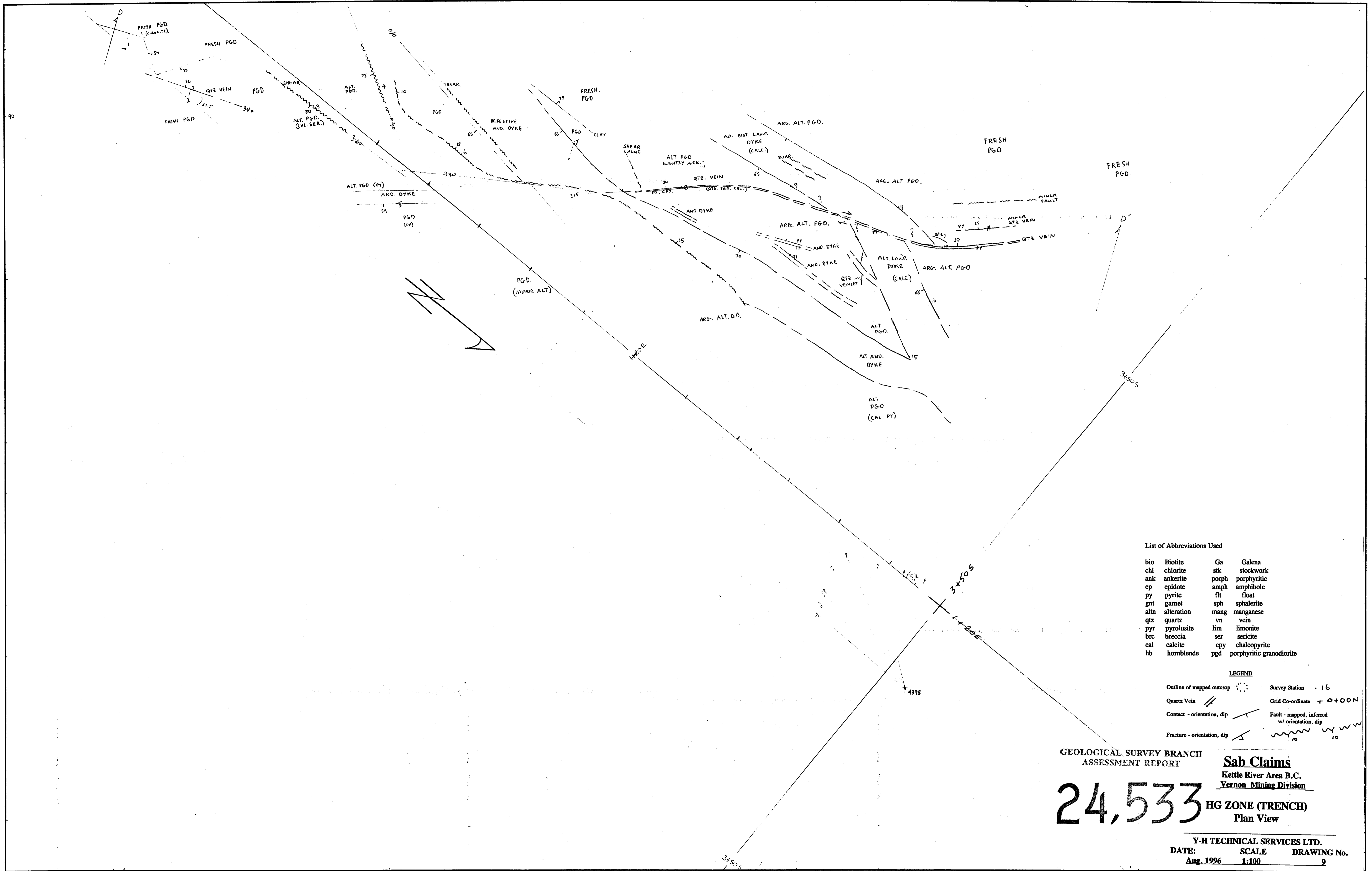
HG ZONE 3+60S  
CROSS SECTION  
(Looking South West)

LEGEND

Outline of mapped outcrop	Survey Station - 16
Quartz Vein	Grid Co-ordinate + 0+00 N
Contact - orientation, dip	Fault - mapped, inferred w/ orientation, dip
Fracture - orientation, dip	

Y-H TECHNICAL SERVICES LTD.  
DATE: Aug. 1996 SCALE 1:100 DRAWING No. 10





List of Abbreviations Used

bio	Biotite	Ga	Galena
chl	chlorite	stk	stockwork
ank	ankerite	porph	porphyritic
ep	epidote	amph	amphibole
py	pyrite	flt	float
gnt	garnet	sph	sphalerite
alm	alteration	mang	manganese
qtz	quartz	vn	vein
pyr	pyrolusite	lim	limonite
brc	breccia	ser	sericite
cal	calcite	cpy	chalcocopyrite
hb	hornblende	pgd	porphyritic granodiorite

LEGEND

Outline of mapped outcrop		Survey Station	• 16
Quartz Vein		Grid Co-ordinate	+ 0+00N
Contact - orientation, dip		Fault - mapped, inferred	w/ orientation, dip
Fracture - orientation, dip			

GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT

**Sab Claims**  
Kettle River Area B.C.  
Vernon Mining Division

# 24,533

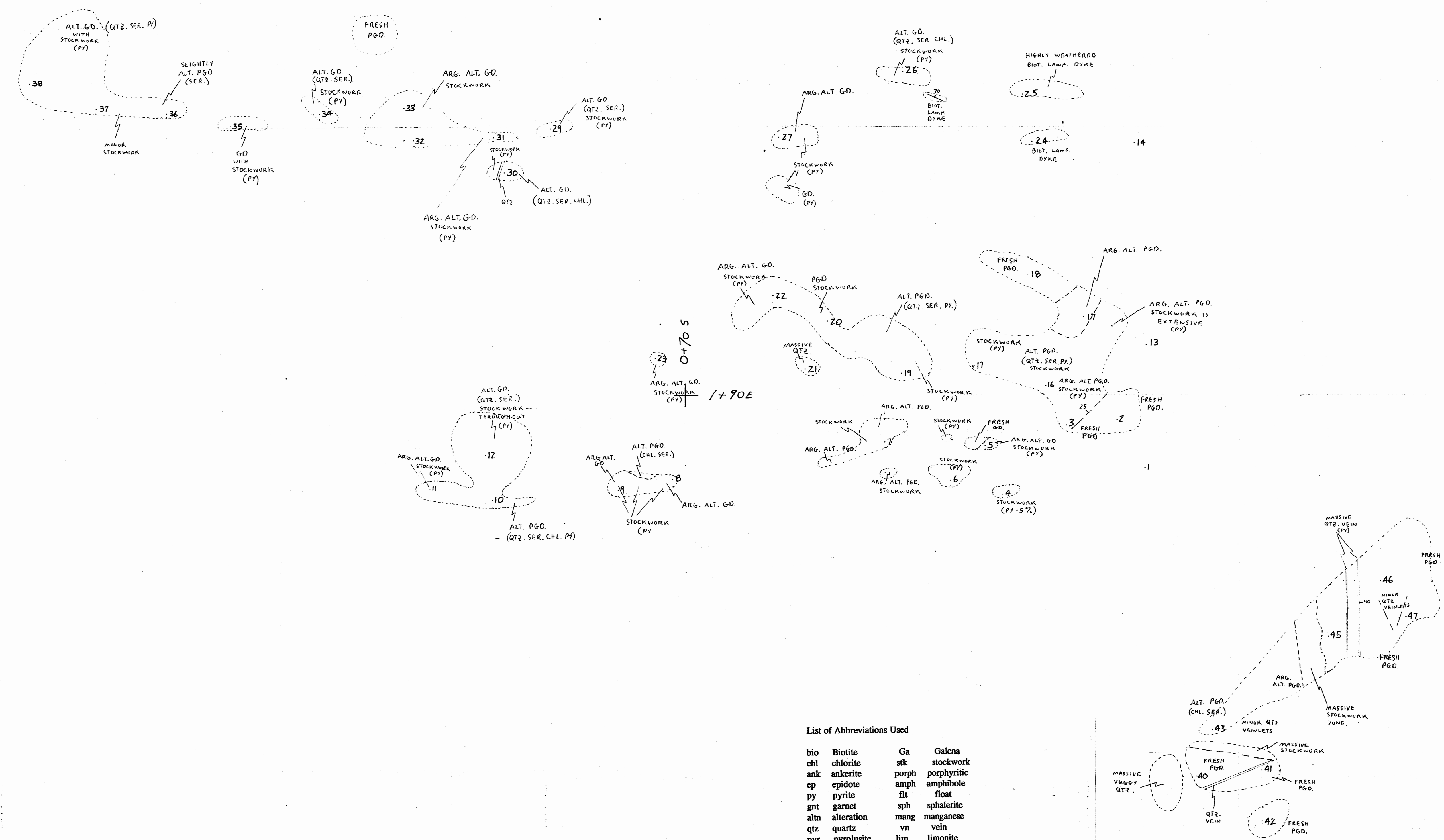
HG ZONE (TRENCH)  
Plan View

Y-H TECHNICAL SERVICES LTD.  
DATE: Aug. 1996 SCALE: 1:100 DRAWING No. 9

0+70 S

1+90 E

H90E



List of Abbreviations Used

bio	Biotite	Ga	Galena
chl	chlorite	stk	stockwork
ank	ankerite	porph	porphyritic
ep	epidote	amph	amphibole
py	pyrite	flt	float
gnt	garnet	sph	sphalerite
alt	alteration	mang	manganese
qtz	quartz	vn	vein
pyr	pyrolusite	lim	limonite
brc	breccia	ser	sericite
cal	calcite	cpy	chalcopyrite
hb	hornblende	pgd	porphyritic granodiorite

LEGEND

Outline of mapped outcrop	○	Survey Station	. 16
Quartz Vein	///	Grid Co-ordinate	+ 0+00N
Contact - orientation, dip	—/—	Fault - mapped, inferred w/ orientation, dip	—/—
Fracture - orientation, dip	—/—		

GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT

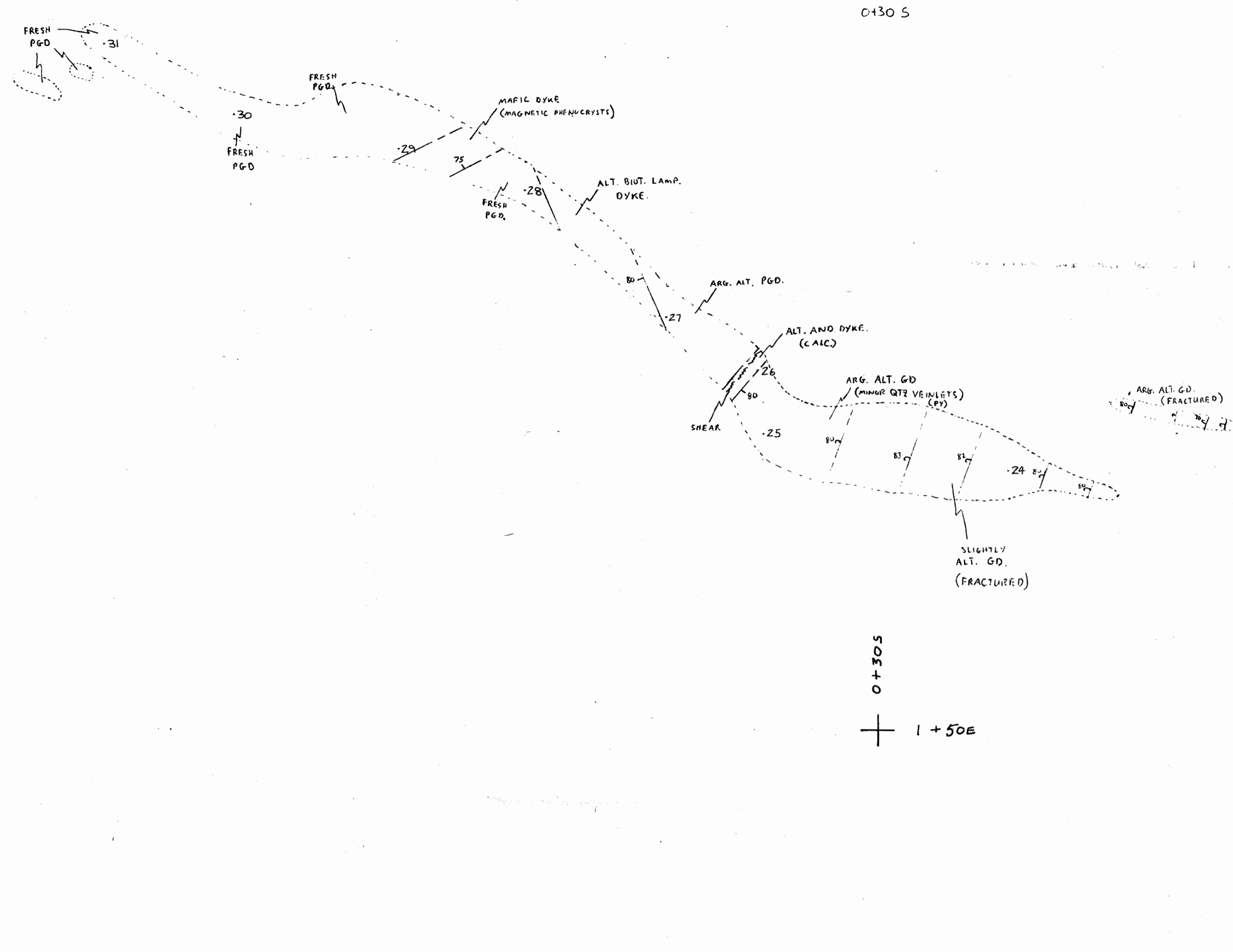
**24,533**

**Sab Claims**  
Kettle River Area B.C.  
Vernon Mining Division

**VUGGY VEIN 0+70S 1+90E  
EASTERN EXTENSION  
Plan View**

Y-H TECHNICAL SERVICES LTD.  
DATE: Aug. 1996 SCALE 1:100 DRAWING No. 8

0+70 S



List of Abbreviations Used

bio	Biotite	Ga	Galena
chl	chlorite	stk	stockwork
ank	ankerite	porph	porphyritic
ep	epidote	amph	amphibole
py	pyrite	flt	float
gnt	garnet	sph	sphalerite
altn	alteration	mang	manganese
qtz	quartz	vn	vein
pyr	pyrolusite	lim	limonite
brc	breccia	ser	sericite
cal	calcite	cpy	chalcopyrite
hb	hornblende	pgd	porphyritic granodiorite

GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT

**24,533 Sab Claims**  
Kettle River Area B.C.  
Vernon Mining Division

**VUGGY VEIN 0+30S 1+50E**  
Plan View

Y-H TECHNICAL SERVICES LTD.  
DATE: **Aug. 1996** SCALE **1:100** DRAWING No. **7**

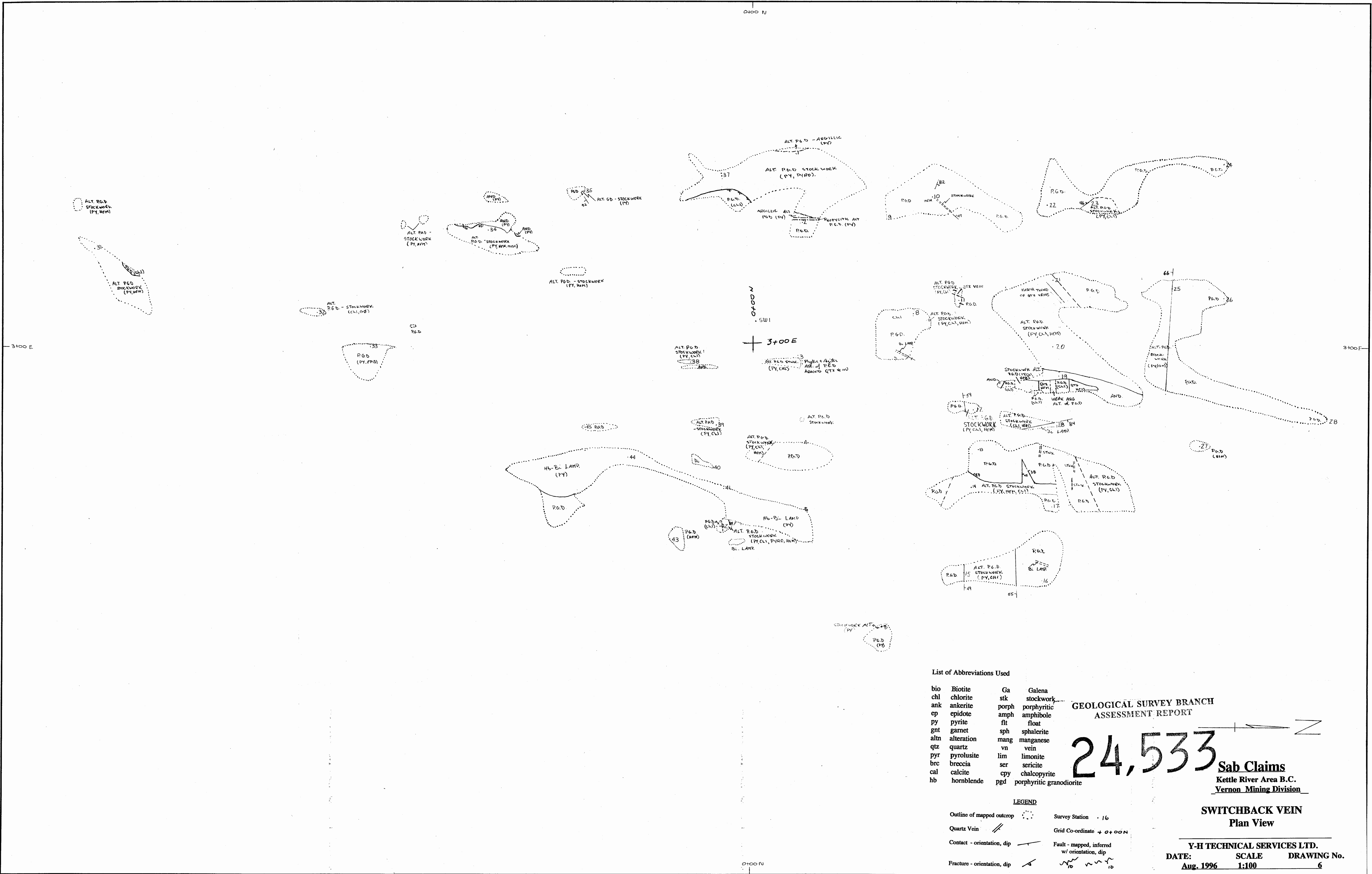
LEGEND

Outline of mapped outcrop	Survey Station	16
Quartz Vein	Grid Co-ordinate	0+00N
Contact - orientation, dip	Fault - mapped, inferred	w/ orientation, dip
Fracture - orientation, dip		

1+50 E

0+30S  
1+50E

1+50 E



List of Abbreviations Used

bio	Biotite	Ga	Galena
chl	chlorite	sik	stockwork
ank	ankerite	porph	porphyritic
ep	epidote	amph	amphibole
py	pyrite	flt	float
gnt	garnet	sph	sphalerite
altm	alteration	mang	manganese
qtz	quartz	vn	vein
pyr	pyrolusite	lim	limonite
brc	breccia	ser	sericite
cal	calcite	cpy	chalcopryite
hb	hornblende	pgd	porphyritic granodiorite

GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT

**24,533**

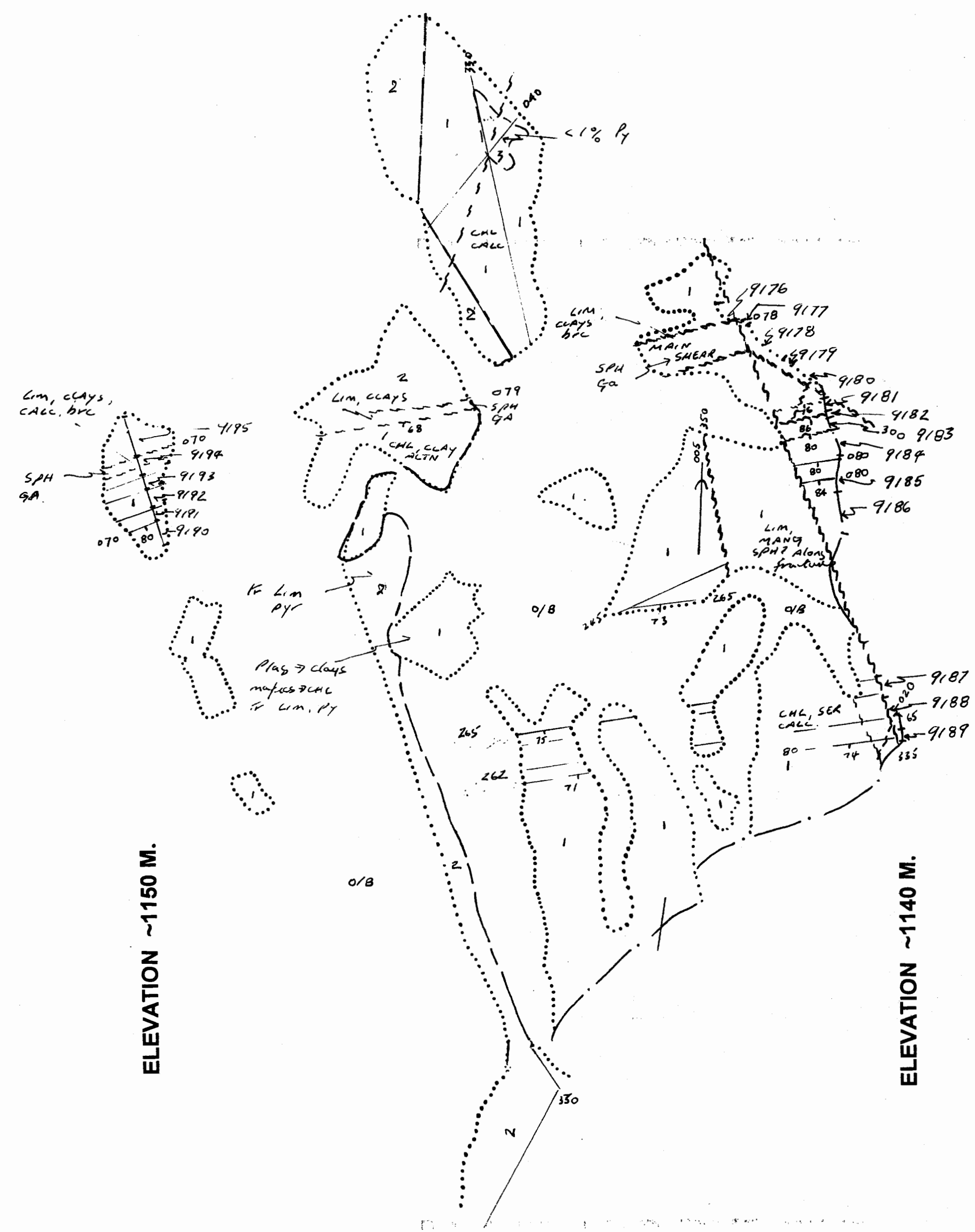
**Sab Claims**  
Kettle River Area B.C.  
Vernon Mining Division

**SWITCHBACK VEIN**  
Plan View

Y-H TECHNICAL SERVICES LTD.  
DATE: Aug. 1996 SCALE 1:100 DRAWING No. 6

LEGEND

Outline of mapped outcrop	Survey Station - 16
Quartz Vein	Grid Co-ordinate + 0+00 N
Contact - orientation, dip	Fault - mapped, inferred w/ orientation, dip
Fracture - orientation, dip	



Plan View K-1 to K-2 Trench Area

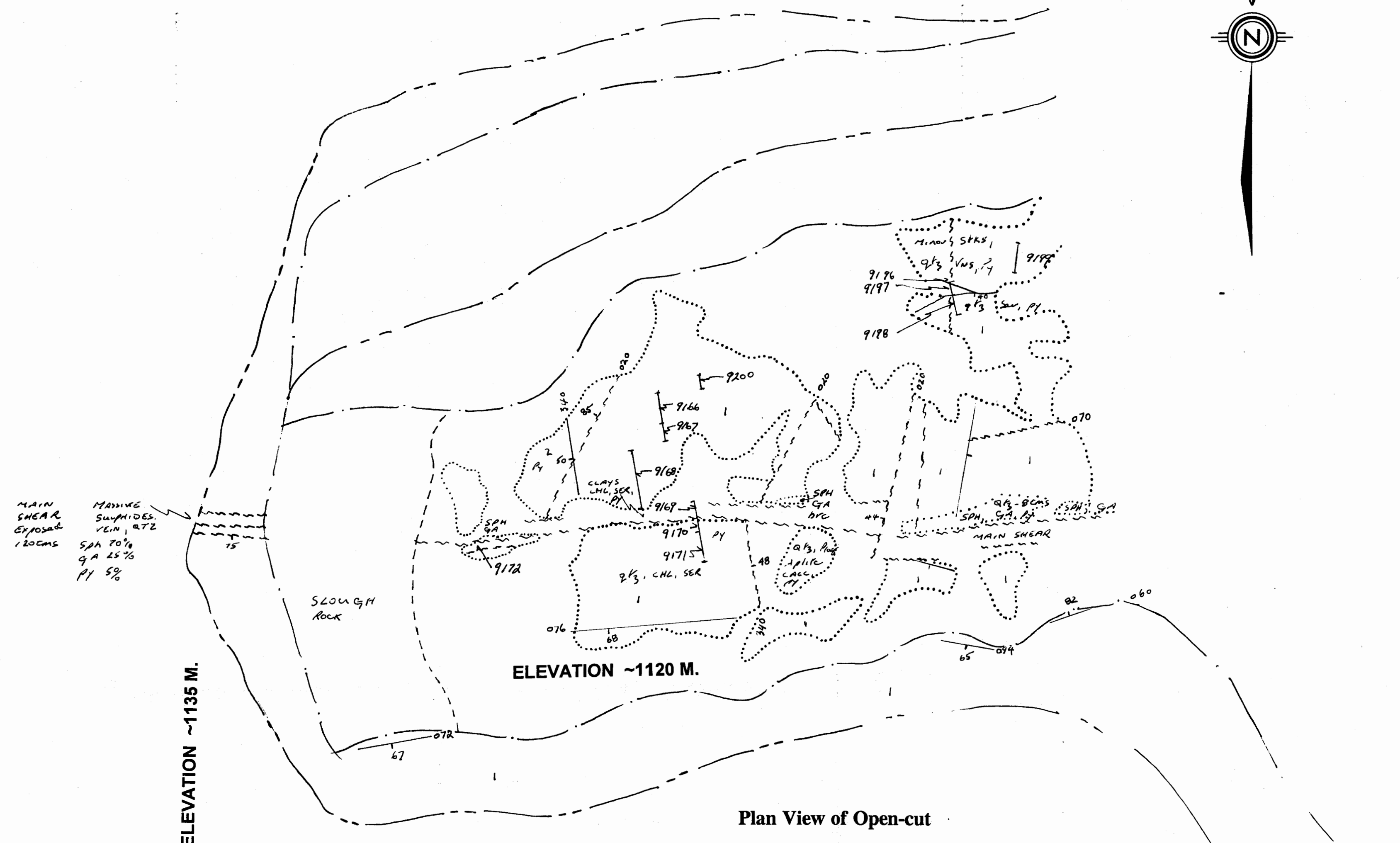
**SIGNIFICANT ASSAY RESULTS (1996)**

Sample #	Width	Assay Values
9172	80 cms.	5.89 opt silver
9177	10 cms.	8.49 opt silver
9181	50 cms.	7.21 opt silver
9182	20 cms.	20.45 opt silver
9183	42 cms.	36.56 opt silver
9184	85 cms.	7.83 opt silver
9185	1 metre	26.89 opt silver
9186	1 metre	26.17 opt silver

3.97 metres averaging 20.81 opt Ag

List of Abbreviations Used

bio	Biotite	Ga	Galena
chl	chlorite	stk	stockwork
ank	ankerite	porph	porphyritic
ep	epidote	amph	amphibole
py	pyrite	flt	float
gnt	garnet	sph	sphalerite
altn	alteration	mang	manganese
qtz	quartz	vn	vein
pyr	pyrolusite	lim	limonite
brc	breccia	ser	sericite
cal	calcite	cpy	chalcopyrite
hb	hornblende	pgd	porphyritic granodiorite



Plan View of Open-cut

**General Legend**

Roads	Trails
Creek drainage	Airphoto Lineations
No vegetation	Slide Area
Lake/Pond	Swamp
Claim Boundaries	Claim Post
Topographic Contour w/ elevation	Spot Elevation
Outline of outcrop	Bedding ; Vertical, Inclined, Overturned
Joints ; Vertical, Inclined	Quartz Vein ; Vertical, Inclined
Assumed Contact	Fault ; Inferred
Foliation ; Inclined, Vertical	Survey stations
Sample Sites, numbers	Recent trench

Topographic Map Base Per Mohawk Oil Co. Ltd 1980 - Contour Intervals 5 Metres

**GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT**

**24,533** **Sub Claims**

Kettle River Area B.C.  
Vernon Mining Division

**UPPER LEAD ZONE AREA  
Plan View of Open-cut &  
K-1 to K-2 Trenches**  
- with 1996 sample locations

**Y-H TECHNICAL SERVICES LTD.**  
DATE: **Aug. 1996** SCALE: **1:100** DRAWING No. **5**

**LEGEND**

**Tertiary**

Kamloops Group - Olivine Basalt Lamprophyre dykes

**Late Jurassic and/or Cretaceous granitic rocks**

Nelson Intrusives -

1 - Quartz Monzonite, Porphyritic Granodiorite

1a - Quartz Diorite, Diorite

**Permian Anarchist Group Rocks**

- Roof Pendant - Meta-volcanics, meta-sediments invaded by granitic rocks

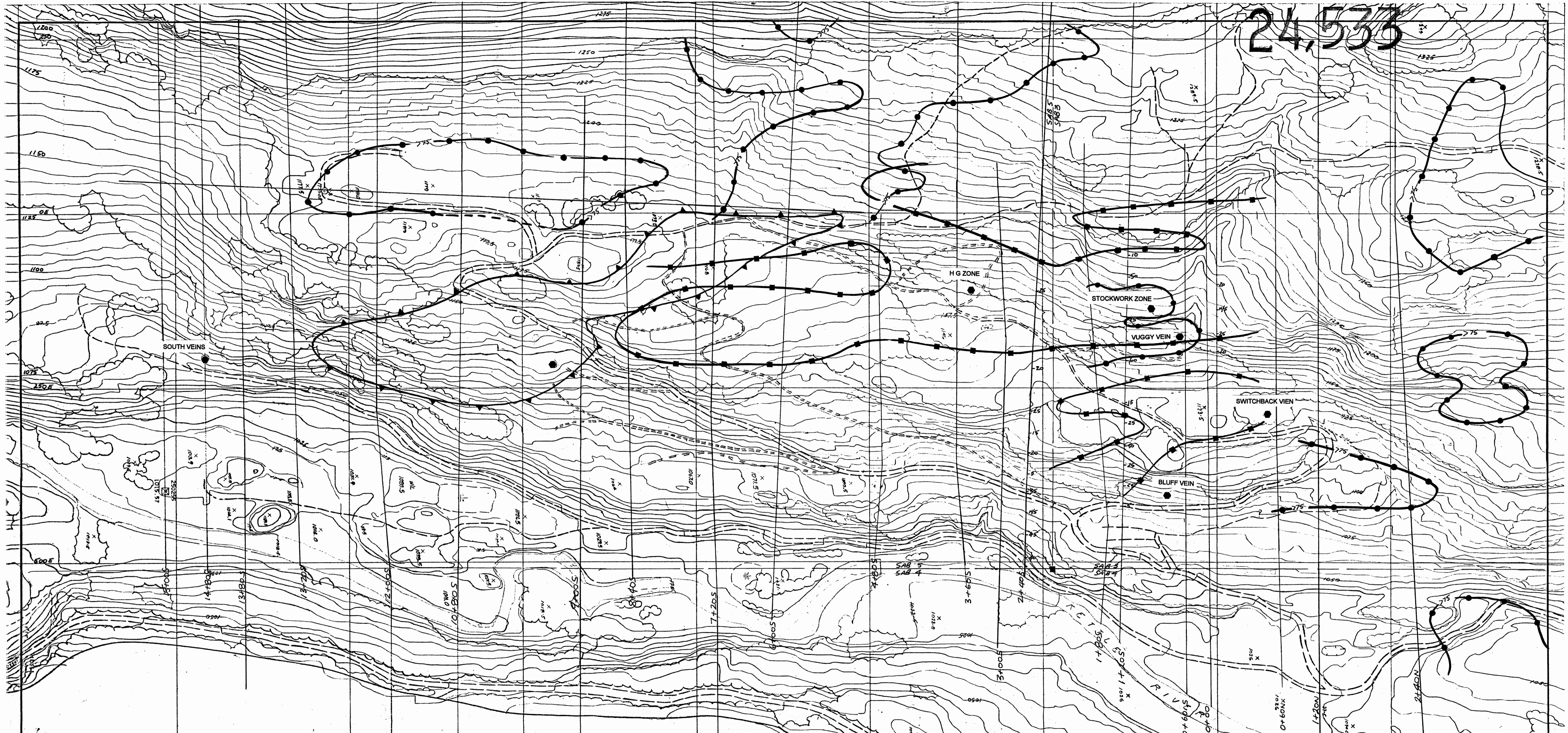
2a - Sediments

2b - Volcanics


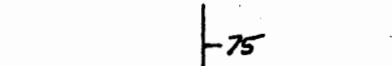


**Proterozoic Monashee Group**

- Paragneiss, crystalline limestone, pegmatite

24,533



SOIL GEOCHEMISTRY LEGEND

-  >75 SOIL GEOCHEM > 75 ppb GOLD 1981
-  75 SOIL GEOCHEM 1984 VALUES - ppb GOLD, Survey only partial
-  SUB ANOMALOUS CONTOUR - 1.6 ppm SILVER 1978
-  SUB ANOMALOUS CONTOUR - 32 ppm LEAD 1978



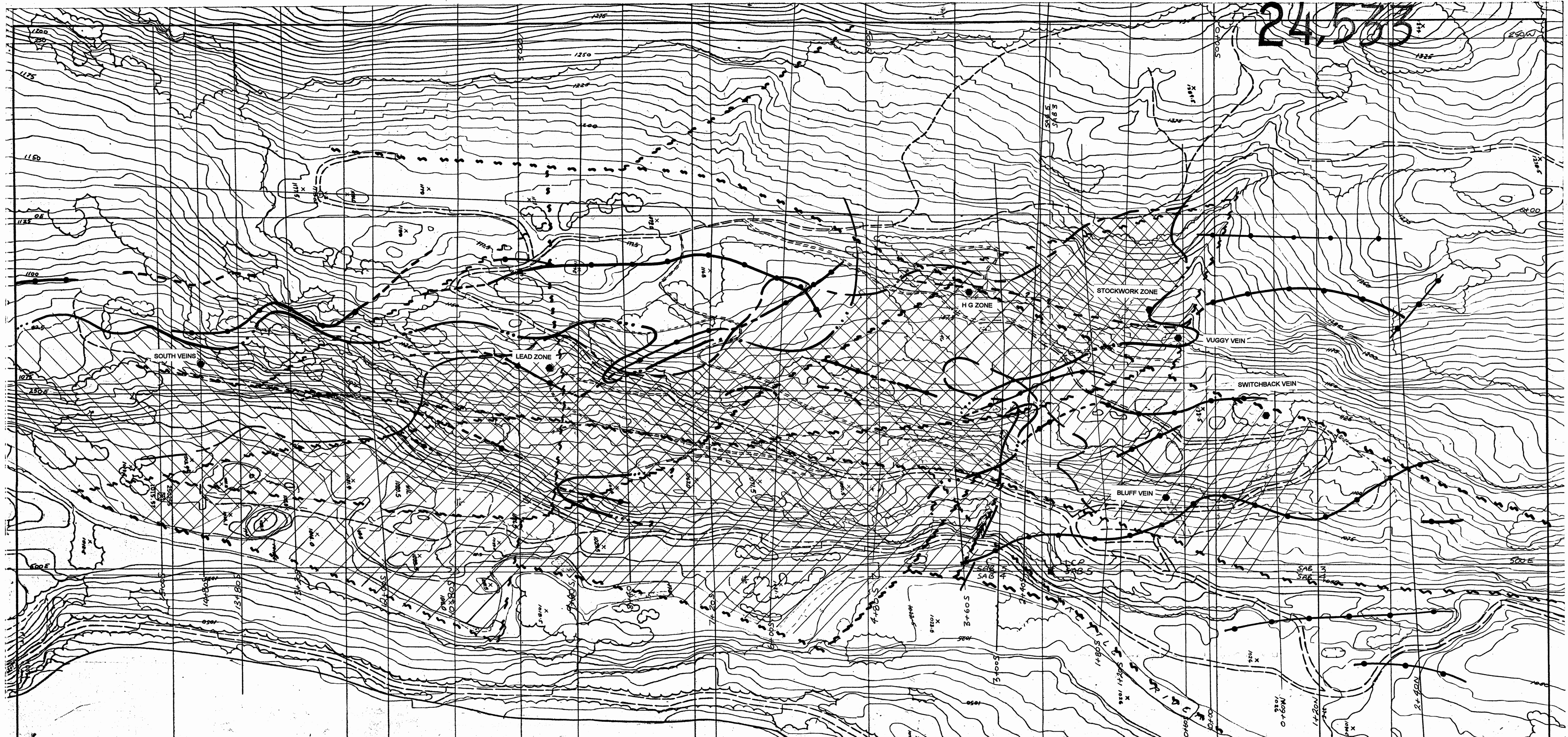
TOPOGRAPHIC MAP BASE PER MOHAWK OIL CO. LTD - CONTOUR INTERVALS 5 METRES

**SAB CLAIMS**  
Kettle River Area B.C.  
Vernon Mining Division





**SOIL GEOCHEMISTRY  
LEAD, SILVER AND GOLD CONTOURS**

Y-H TECHNICAL SERVICES LTD.  
DATE: August, 1996 SCALE: 1:2500 DRAWING No. 4

24,573



GENERAL LEGEND

-  INFERRED FAULT - From airphoto, geophysics and mapped structures.
-  < 57800 GAMMA CONTOUR - From Mohawk Oil Co. Ltd 1984
-  CENTRES OF MAG HIGHS > 58000 GAMMAS - From Mohawk Oil Co. Ltd 1984
-  AREA OF POSSIBLE QUARTZ SERICITE PYRITE ALTERATION ASSOCIATED WITH STOCKWORKS IN ALTERED INTRUSIVES.

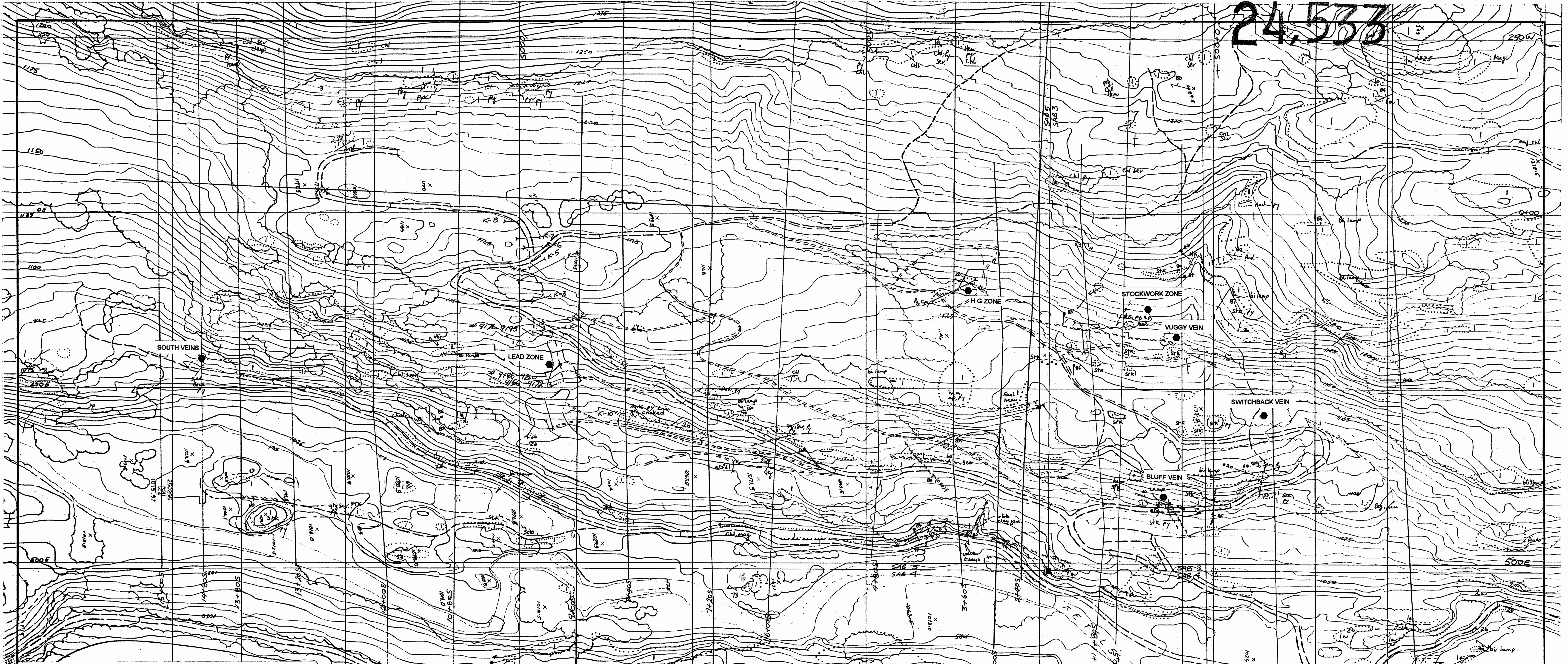


**SAB CLAIMS**  
Kettle River Area B.C.  
Vernon Mining Division

**ALTERATION & MINERALIZATION  
ASSOCIATED WITH MAGNETIC LOWS**

Y-H TECHNICAL SERVICES LTD.  
DATE: August, 1996 SCALE 1:2500 DRAWING No. 3

24,533



**General Legend**

Roads ==  
Trails ---  
Creek drainage ~~~~~  
Airphoto Lineations ~~~~~  
No vegetation [Symbol]  
Slide Area [Symbol]  
Lake/Pond [Symbol]  
Swamp [Symbol]  
Claim Boundaries ---  
Claim Post [Symbol]  
Topographic Contour [Symbol] w/ elevation  
Spot Elevation x 1081.9  
Outline of outcrop [Symbol]  
Bedding; Vertical, Inclined, Overturned [Symbol]  
Joints; Vertical, Inclined [Symbol]  
Quartz Vein; Vertical, Inclined [Symbol]  
Assumed Contact - - -  
Fault; Inferred [Symbol]  
Foliation; Inclined, Vertical [Symbol]  
Survey stations . 13  
Sample Sites, numbers . 0825  
Recent trench 1984 [Symbol]

Topographic Map Base Per Mohawk Oil Co. Ltd 1980 - Contour Intervals 5 Metres

**LEGEND**

**Tertiary**

- Kamloops Group - Olivine Basalt Lamprophyre dykes

**Late Jurassic and/or Cretaceous granitic rocks**

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py	pyrite	flt	float
gat	garnet	sph	sphalerite
alm	alteration	mang	manganese
qtz	quartz	vn	vein
pyr	pyroxenite	lim	limonite
brc	breccia	ser	sericite
cal	calcite	cpy	chalcopyrite



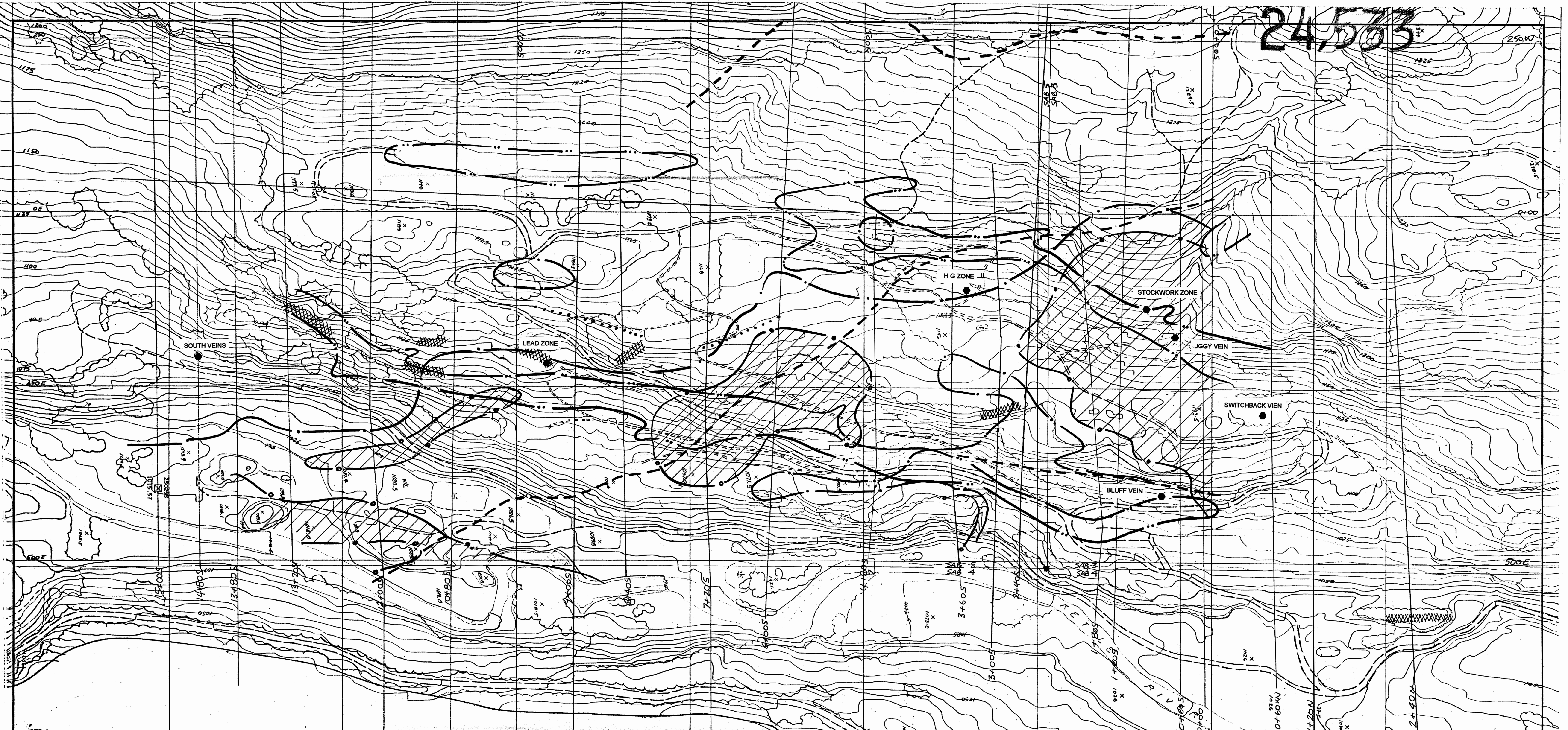
**Sab Claims**  
Kettle River Area B.C.  
Vernon Mining Division

**GEOLOGY AND MINERAL SHOWINGS**

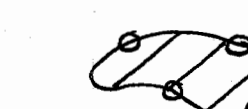





Y-H TECHNICAL SERVICES LTD.  
DATE: Aug. 1996 SCALE: 1:100 DRAWING No. 2

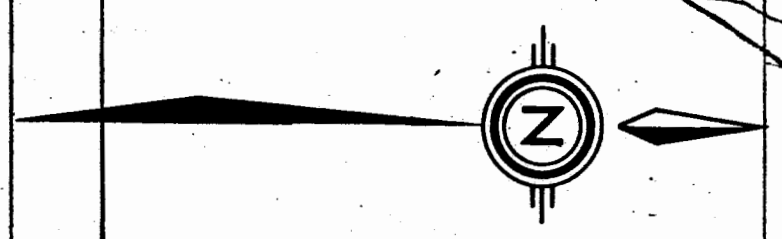


24,533



GEOPHYSICAL LEGEND

-  IP CHARGEABILITY 7.5 milliseconds (For Mohawk Oil Co Ltd 1984)
-  IP CHARGEABILITY 6.0 milliseconds (For Mohawk Oil Co. Ltd 1984)
-  GROUND VLF EM Seattle (Geotronics Surveys Ltd 1977)
-  GROUND MAGNETIC DIPOLES (For Mohawk Oil Co Ltd 1984)
-  GROUND MAGNETICS Trace of potential mineralization (For Mohawk Oil Co Ltd 1982)
-  IP RESISTIVITY TREND (For Mohawk Oil Co Ltd 1984)



**Sab Claims**  
Kettle River Area B.C.  
Vernon Mining Division

**GEOPHYSICAL COMPILATION  
AND  
CLAIM BOUNDARIES**

Y-H TECHNICAL SERVICES LTD.  
DATE: Aug. 1996      SCALE: 1:2500      DRAWING No. 1