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KETZA PROJECT 1988 REGIONAL PROGRAM
YUKON MINERALS CORPORATION
NTS 105 F/10, YUKON

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SUMMARY

A prospecting and regional mapping program was carried out intermittently by a two man crew from May 6 to August 30, 1988 for a total of 29 days. The purpose of the program was to document shows found in previous years and to continue with prospecting and mapping the property. The program covered the most promising of the well exposed alpine areas, in total about 30 percent of the Ketza project area. Results are shown on map 1.

A total of 53 shows containing galena as well as 22 shows of quartz veins with freibergite were mapped. This includes previously known showings. These shows can be placed in about 22 groups containing closely associated occurrences. When the geology of the area is considered these groups can be placed in seven more or less unrelated trends, shown on map 1.

VERSLUCE TREND The best explored trend is the Versluce trend. It is a series of fault related shows hosted by two faults dipping towards each other and probably forming a graben. Groundhog, and the Number 2 and 3 shows, the BT, and the Station R8-8-1 all form part of this trend. It extends for a distance of about six kilometers in a northwesterly direction from the Number 2 showing. The Versluce trend is marked by prominent white quartz veins, variably bearing freibergite and galena.

CARIBOO TREND The next most important series of shows known at this time can be grouped in the Cariboo trend. This trend runs parallel to the Versluce trend about one kilometer to the northeast, and can be followed for about two kilometers on the Ketza property. The Jenny, the Ray, some shows in trenches at the very edge of the property south of the Number One show all are part of this trend. Major white quartz veins are associated with this trend, especially at the Ray zone.

LUCKY TREND This trend has in preliminary reports been a part of a larger group of shows labelled the Groundhog trend. As this name invites confusion with the Groundhog show in the Versluce trend the name "Groundhog trend" is dropped, and because of geological differences the shows previously placed in the Groundhog trend have been placed in two separate trends, the Lucky and the Sheep trends.

The Lucky, PN, MF, Jill, and Bill shows may all be grouped in the Lucky trend. Mineralization is once again in northwesterly trending faults, and again, as in the Versluce and Cariboo trends, it is associated with very prominent white quartz veins. The Lucky trend lies about four kilometers southwest of the Versluce trend, and along strike has been delineated for a distance of 1 1/2 kilometers. Both ends of the trend are on unexplored ground. Massive white barren quartz veins, similar to the one between the Lucky and the PN shows occur along strike of this trend to the northwest for a distance

of 3 km beyond the limits of mineralization found to date. Although the mineralized faults themselves strike northwesterly, most of the shows (7) in the Lucky trend line up in a northeasterly direction over a distance of 1 km.

PIKA TREND A few shows occur from 1 to 2 km south of the Versluce trend, also in northwesterly trending structures, but offset somewhat to the southeast from the Versluce trend. Limited work thus far suggests that they are not in the same structures as the Versluce trend, and therefore they are here grouped as the Pika trend.

Airphoto lineaments, probably representing two parallel steeply dipping to vertical faults connect this show to a series of galena and freibergite bearing fracture zones in dolomites and quartz veins (the Pownall zone) at the northern end of the Ketz property. The total distance of this zone along these lineaments is 9 km, making it the longest traceable trend on the property.

SHEEP TREND The Sheep trend lies 1 km south of the Lucky and is parallel to it. The trend at the Sheep zone consists of a series of carbonate hosted northwest trending quartz veins dipping towards each other in a manner similar to the main faults in the Versluce trend. The quartz veins are freibergite bearing. Between them are a series of north trending mineralized faults and a major northeasterly trending fault zone, showing intense silicification, corroded quartz stockwork and limonitic alteration very similar to what is found at the surface in the wallrock alteration around the Number 2 zone vein.

The Cirque and neighbouring shows also have north and northeast trending mineralized fracture and fault directions. The area between the Cirque and the Sheep zones shows promising limonitic zones, but has not been prospected in detail. A prominent airphoto lineament joining the Cirque group of shows and the Sheep zone is present. The Sheep trend has been followed for a distance of 4 km to the southern boundary of the Ketz property. Mineralized zones occur along this trend on the neighbouring property to the south.

NO.1 AND DOUBLE P TRENDS The Number 1 zone and the Double P zone show north- and northeast trending strikes respectively. They both may be representative of markedly different structures than those occurring in the Versluce, Cariboo, and Lucky trends. Further work is required on these zones before a definite interpretation of these areas is possible. They are here named the No.1 and Double P trends for discussion purposes.

STRAT TREND The Strat zone is a strataform zone of lead-zinc and minor silver mineralization which is hosted by the Cambrian (or older) phyllites and is quite different from all other shows in the area. Its main significance at present lies in that it proves that significant mineralization may be hosted by the phyllites, and hence that these units should be prospected as well. The stratabound nature of the show is a good prospecting tool; it requires the mapping of the internal stratigraphy of the Cambrian phyllites, a task not as yet begun.

STRUCTURAL STYLES OF MINERALIZATION

Three types of structural styles of mineralization have been noted on the Ketzta Property thus far.

- 1) Nearly all of the shows, including all the ones that have been trenched or drilled occur at the contact between Mississippian-early Devonian dolomites and overlying late Devonian black shales. The blocking effect of the impermeable shales on solutions rising through the much more fractured and permeable carbonates probably played a major part in the formation of the deposits. A number of deposits such as the Double P zone occur below an impermeable cap of Cambrian phyllites that are thrust over the younger carbonates.
- 2) The Ray zone on the contrary is developed in a fault marked by large quartz veins and lies well below the level of the shale carbonate contact. The mechanism of precipitation of the metals probably was quite different here. There is a large barren gap of about 100 m between the level of the Ray zone mineralization and of the overlying carbonate-shale contact mineralization also present near the Ray zone. It suggests that many of the other shows in the area may also be underlain by further mineralization at a deeper level even though there is a barren gap below the carbonate-shale contact mineralization.
- 3) The third type of mineralization is strataform lead-zinc mineralization in the Cambrian (or older) phyllites. It has the potential for large tonnage deposits. Around the vent areas of this type of deposits often a core of pyrrhotite is precipitated. In the Ketzta area gold mineralization is intimately associated with pyrrhotite, thus, this type of deposit may also have possibilities for gold mineralization.

STAGES OF MINERALIZATION

A pilot study using factor analysis of multielement data from 12 shows indicates that from a chemical point of view there are four types of mineralization present on the Ketzta property. All of these probably represent separate mineralization events. Note that most of the major shows on the property were not included in this study.

The oldest is the stratabound mineralization, characterized by its stratabound nature, low silver or gold, and lack of faulting.

The oldest hydrothermal mineralization may be the gold/arsenic/tin mineralization evident in MB, Ray, NofJenny, and Horn shows. Although no multielement data is available the Sheep zone may also fall in this category.

Probably younger is the tungsten, zinc, cadmium, tin and copper mineralization found in the Lucky, Ray, North Pika and Cariboo shows.

The latest mineralization stage is probably the lead, silver, antimony, and minor gold event found in the PS, PSS, Double P, Cariboo, NofJenny, Horn and MB shows (among the shows studied).

RECOMMENDATIONS

- 1) More detailed prospecting and detailed mapping is required in all zones. In the Versluce, Cariboo, Sheep and Lucky trends this should be done on a development scale level involving detailed mapping. In the No.1, Double P, Pika and for the strataform mineralization work should concentrate on prospecting.
- 2) Work on valley bottoms and creek beds should be done to help locate Ray zone type mineralization at lower elevations, particularly in areas near carbonate-shale contact mineralization.
- 3) A significant amount of trenching is needed to evaluate shows in the Cariboo, Versluce, Lucky and Sheep trends.
- 4) The only area where drilling can be begun on very short notice is the remaining unexplored extent of the Versluce trend, in particular the Number 2 zone south.
- 5) Prospecting for the potentially large tonnage stratiform type deposits that may occur in the Cambrian phyllites should be intensified. Work to date has established that this kind of mineralization does occur on the property. Whether any large deposits are present can only be established by prospecting. It is noteworthy that the existing show did not have an associated stream sediment anomaly in the creeks draining it.
- 6) In the Ketzia district gold has been associated with pyrrhotite both at Canamax and at Comox. The stratiform deposits of the sedex type often have a pyrrhotite core at the vent location. The stratiform show on the Ketzia property has a significant amount of pyrite with it.

The best chances for gold mineralization on the Ketzia property may lie in finding the pyrrhotite rich vent areas from which the stratiform mineralization was precipitated.

Both points 5 and 6 indicate the necessity for detailed prospecting of the phyllites on the Ketzia property. As these cover about 1/3 of the property they form a major target.
- 7) More work has to be done on the Strat zone to see if we can learn something about the nature of the density-temperature relationships at the time of formation of the mineralized zone. Better understanding of this may give some clues about the distribution of mineralized zones and their spatial relation to the vent area (which is the best gold target).
- 8) Prospecting for pyrrhotite concentrations in the Cambrian phyllites will be facilitated by the use of mag maps. The effectiveness of a mag survey should be evaluated.
- 9) A multielement factor analysis study of the major shows should be done to obtain a better understanding of the stages of mineralization and of the patterns of mineralization of lead/silver, zinc, and gold mineralization.

WORK DONE

A prospecting and regional mapping program was carried out intermittently by a two man crew from May 6 to August 30, 1988 for a total of 29 days. (May 6, June 28, 29, July 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, Aug 6, 9, 10, 15, 16, 17, 18, 21, 22, 24, 26, 28, 29, 30) Four of these days were only partial days due to poor weather. The main reason for the intermittent nature of the prospecting program was the manpower requirement of drill program, particularly the need to construct and maintain sumps.

The purpose of the program was to document shows found in previous years and to continue with prospecting and mapping the property. The program covered the most promising of the well exposed alpine areas, in total about 30 percent of the Ketza project area. About 80 percent of the alpine area with exposed carbonates was prospected at least cursorily. Very little work was done in the valleys, even in carbonate areas. Results are shown on map 1.

Because a large area had to be covered in a relatively short time attention was focussed on prospecting. No serious effort was made to walk out and map lithologic boundaries, whether stratigraphic or fault controlled unless mineralization was apparent along them. As a result the geology used on map 1 is largely the product of work by Abbot (1986), amended where our work indicated the necessity for changes.

A total of 53 shows containing galena as well as 22 shows of quartz veins with freibergite were mapped. This includes previously known showings. These shows can be placed in about 22 groups containing closely associated occurrences. When the geology of the area is considered these groups can be placed in seven more or less unrelated trends, shown on map 1 and discussed in the section on mineral shows.

Trenching was carried out both as an aid in mapping the geology and alterations in thickly covered terrain, and to find the bedrock source of float mineralization; 12480 cubic yards of trench was excavated from 7200 yards of trenching.

MAJOR GEOLOGIC FEATURES OF THE KETZA AREA

LITHOLOGIC UNITS

The stratigraphy and structural geology was found to be more or less as indicated in Abbott (1986) in the areas prospected, and Abbott's lithologic designations and divisions were used on Map 1. The major stratigraphic difference found was that an area of carbonates in the southwestern corner of the project area was found to be of Silurian-Devonian carbonates rather than the possibly upper Cambrian carbonates indicated by Abbott.

A pyritic sandstone is consistently present at the top of the carbonates in the southern half of the property, and in several areas as float in the

northern half of the Ketz property. It is probably present throughout. Other sandstone units, some pyritic, may be present within the SD dolomites and within the Silurian phyllitic dolomite but lack of good exposure makes this uncertain. A sandstone unit with a thickness of at least 200 m is present in the northeastern corner of the map area. It seems to underly the SD dolomites conformably. It apparently overlies a thick unit of thinly laminated shales or phyllites. Neither of these units is in its depositional sequence if they are correlated with the Silurian quartzites and thinly laminated phyllitic dolomites of Abbott (1986).

Lithofacies of the Silurian-early Devonian Dolomites and their Environment of Deposition

The detailed mapping around the Number 2 and 3 zones have used a number of subdivisions for the Silurian-early Devonian carbonates that are indicated in the legend of Map 1 as carbonate lithofacies. On Abbott's map these are referred to as lenses and this implies possible lateral equivalence. Whether these lithofacies form a consistent stratigraphic sequence on the Ketz property remains to be seen, but is unlikely. If this could be proven it would form a useful aid to structural interpretation. More detailed mapping is needed to establish this.

Thin section work shows that the carbonates are interbedded with detrital quartz bearing units both of sand and silt size. The units grade from almost pure carbonates to limy sandstones, although carbonate rich strata form the vast majority. Most of the diagenetic changes indicate a removal of silica and replacement by carbonate. Thus to describe the carbonates as "silicified" which implies that silica was introduced rather than removed is misleading. "Siliceous" is a better term.

The petrology, and the primary sedimentary structures of the siliceous, strongly crossbedded units suggests a relatively near-shore tidal environment of deposition for the crossbedded units, in which mud banks (the phyllitic dolostone) may alternate laterally with tidal channels and small deltaic bars (the crossbedded deposits). The units rich in *Amphipora* and other stromatoporoids probably represents shallow shelf, lagoonal, and patch reef environments somewhat further from the coastline. The entire package suggests a regressive sequence with shallowing water. The fact that an erosional hiatus terminates the sequence supports this view.

The phyllites listed as Cambrian by Abbott (1986) are internally much contorted, often with repetitive recumbent folding, and show a markedly higher metamorphic grade than the overlying silts and shales in the younger strata. The possibility that they are older Proterozoic Windermere age rocks should not be overlooked. Many of the Cambrian phyllites and carbonates in the neighbouring Wolf Lake map sheet have recently been reclassified as Windermere in age.

MAJOR GEOLOGIC STRUCTURES

Not enough stratigraphic contacts are accurately defined by mapping at this time for the structural interpretations to be very definite. This holds for Abbott's original map, and for our update of it.

The largest most important structures are generally not mapped at all. This is because they caused physically weak shear zones that were preferentially excavated by erosion. They now form the major valley bottoms. Often, in the passes between two valleys indications for these fault zones may be found, as breccia zones or just as lithologically out of place float.

After the season was over the 1:10000 scale coloured airphotos became available. These have allowed definition of many structures in the lowlying areas that have little or no topographic expression. The fault symbols and the occasional stratigraphic boundary given on map 1 in unmapped areas have been made from the airphoto study.

The mapping carried out this year has complicated rather than simplified Abbot's map. About a dozen stratigraphic inconsistencies on Abbot's map indicate that the mapping and the structural analysis provided by his map is in need of revision. In many areas the structural interpretation hinges on the mapping of the covered and unmapped valley areas. These form about 60 % of the property and the geology of the area is complex. Under these circumstances guessing at the geology is an exercise in futility and leads to the inconsistencies evident in Abbot's map. Such an interpretation may still be useful to generate speculative models for mineral exploration (which was Abbot's purpose), but one can not find specific deposits on a specific property with erroneous maps.

Until the valley bottoms have been mapped it is better to leave these areas blank on the map and provide an accurate statement of work done rather than guess at the geology here and provide a false impression of confidence. This is particularly true for the central low-lying area of the property that forms the core of the Ketza uplift in Abbot's interpretation.

Strike-Slip Faulting

From an economic point of view the most significant structural finding of this summer's work was to define and map the major faults that host the shows in the Versluce, Pika, and Lucky trends and to establish their probable continuity over a distances of 6, 9, and 4 kilometers respectively.

Only the Versluce trend faults are reasonably well mapped at this time. They may be called the No. 2 (the western one) and the No. 3 faults (the eastern one of the pair) after the mineralized zones that have formed in them. The Versluce fault system at the surface consists of two subparallel faults striking northwest and dipping towards each other. At depth they meet and at present their relationship below this point is uncertain. The junction point is exposed south of the Number 2 and 3 zones, probably on both sides of the valley; these areas have not been mapped in detail and are only moderately well exposed at best. The valley south of the Number 2 and 3 zones itself is

probably fault related and this may obscure the nature of the mineralized zone.

The Ray zone may be similar and illustrate the type of faulting involved. At the Ray zone a vertical fault marked by thick white, largely barren quartz veins bifurcates upwards, resulting in several parallel faults. Slickensides indicate that the late stages of fault movement had a significant, if not predominant strike-slip component. This is not surprising as the strike of the fault is parallel to the Tintina trench, a major strike-slip fault system. Studies of strike-slip systems (Wilcox et al. 1973) indicate the common occurrence of such lenses of material bounded by faults with minor vertical and predominantly transcurrent movement.

The amount of movement along these faults may have been in the order of tens of metres. Much larger movements would have resulted in more obvious lithologic juxtapositions than are present.

To the north of the Pownall zone the Devonian sequence is abruptly terminated in the next valley bottom by a northwest trending major fault, typical of the east to northeast trending valleys of the area. This normal or possibly also thrust faulting preceded the northwest strike-slip faulting associated with the mineralization. The little work was done last summer in the Cambrian phyllites to the north established that the No. 2 fault continues into the Cambrian phyllites there. One float occurrence of mineralization over the No.2 fault has been found in the Cambrian thrust phyllites in this area.

Thrust Faulting

The identification of Abbot's possibly Cambrian carbonates as Silurian-early Devonian necessitates some rethinking of the location and number of thrust sheets present in the southwest corner of the Ketz property.

Evidently one thrust sheet runs to the east of the carbonates in question separating what must be overlying phyllites (rather than the conformably underlying phyllites of Abbot) from the SD carbonates.

The reality of the other thrusts just to the east is in doubt. It depends largely on the nature of what Abbott has tentatively mapped as Ordovician and Silurian black graptolitic shales and minor chert. The limited work done by us indicates the presence of grey phyllitic rock in at least part of the area. This is similar to the lower or underlying units seen in the drilling at the Number 2 and 3 zones, and may be part of the SD carbonate sequence or more likely Abbott's Ss unit, consisting of grey weathering platy, thinly laminated dolomitic siltstone. No graptolites were seen. The attitude of these rocks is not known due to poor exposure limited to creek beds. At present, the presence of only one thrust sheet is established with certainty, but up to three may be present.

Folding and Grabens

The Ketz property is located on the crest of an arch, described as the Seagull Uplift by Abbott (1986). By and large on the west side of the property most units dip steeply to the west and on the east side they dip to the east. The Lucky trend and the southern end of the Versluce and Pika trends lie in the central, more or less level part of the crest of this dome. The center of the dome is occupied by Cambrian phyllites, and is described as a horst by Abbott. In this interpretation, the mineralized SD carbonates have been removed by erosion from the central part of the Ketz uplift. Detailed mapping of the contact zone of the phyllites should be able to prove Abbott's contention. South of the Ketz property the lack of younger units and the exposure of lower Cambrian carbonates and phyllites over a large area indicates that Abbott's interpretation here is probably correct.

However, on the Ketz property, in some places the juxtaposition of different stratigraphic horizons along faults indicate subsidence in at least part of this central horst. For example, stratigraphic relations at the north-south fault 300 m west and northwest of the PN show indicate that the PN-Lucky area has been downdropped at least 100 m.

As there is or was an overlying thrust sheet (the Seagull thrust of Abbott 1986) such subsidence in the Lucky area might result in the dropping of the Cambrian phyllites of the upper Seagull thrust sheet into the central part of the Ketz uplift.

If this is so, then the SD carbonates are present in the crest of the dome, but are located under the Cambrian phyllites. This is significant from an economic point of view because the best mineralization is generally present in the crest of anticlines or domes. Further detailed mapping of the contact zones of the Cambrian phyllites, and the Ordovician and lower Silurian units might establish if this is the case. These are precisely the units that are most poorly mapped because they outcrop in low areas and are generally covered.

The lack of younger units at the southern boundary of this graben where it borders on the central part of the uplift showing no sign (thus far; the area has not been mapped) of a late graben suggests that a major east to northeast trending fault would have to be present there. This area is marked by a prominent valley and is at present not mapped in most places. On the only ridge in the area it is mapped, and here northeast trending faults are present, showing both normal and strike-slip movement.

If there is a graben present in the center of the Ketz arch, then reworking of the buried deposits in the SD carbonates may have given rise to a whole series of shows along vertical faults juxtaposing shales and carbonates along the edges of this graben. Examples may be the BP, the Horn, and other shows on the boundary of the Lucky and Sheep trends.

The subsidence of the central part of the Ketz uplift perhaps is due to partial emptying of the magma chamber postulated by Abbott, or perhaps to strike-slip pull-apart faulting associated with the large scale late dextral

faulting in the region.

A similar structure on a smaller scale is formed by the graben between the No. 2 and No. 3 faults of the Versluce trend. At the No. 2 and No. 3 mineralized zones the graben forms in the crest of a minor anticline. Mineralization along the structures in the Versluce trend is best (in so far as is known to date) precisely where these structures intersect the crest of this anticline. In this case the graben probably formed as a result of movement along the No. 2 and No. 3 faults, both of which are probably strike-slip faults.

STRUCTURAL STYLES OF MINERALIZATION

FAULT BOUNDED MINERALIZATION

The two main styles of mineralization on the property are fault hosted mineralization and the stratabound mineralization found thus far only in the Strat zone on the Ketzka property. The fault bounded mineralization can be subdivided into two types based on their relation to carbonate shale contacts.

Carbonate-shale contact related mineralization

Most of the known shows on the Ketzka property occur just below the upper Devonian-Mississippian shales (uDM shales hereafter), where the fault system reaches the upper limit of the dark grey to black *Amphipora* rich dolomite (SD dolomites). The carbonates are more brittle than the shales and as a result are more intensely faulted and fractured than the shales.

This setting by itself is similar to and at the same stratigraphic level as the Pine Point lead-zinc deposits South of Great Slave Lake where the dolomites of the Pine Point Formation are overlain unconformably by the black shales of the Horn River Formation. In such a setting disseminated scattered occurrences of lead-zinc mineralization are common, but generally not economic. However, they may have been one of the sources for the mineralization concentrated by the hydrothermal systems that occurred in the Ketzka area.

In the hydrothermal system the carbonate-shale contact acted as a cap, impeding fluid flow and resulting in increased precipitation of lead-zinc minerals.

On the Ketzka property all shows but the Ray (and some of the occurrences in the Cariboo trend at lower elevation), the Strat, and possibly the Jill occur in this environment. The No. 1, the Double P, the Pownall also occur below an impervious cap which in these cases is formed by the overthrust Cambrian phyllites.

Ray zone type mineralization

The second setting for fault hosted mineralization is exemplified by the Ray zone. Here, at a low elevation lead and zinc mineralization is found in a vertical fault marked by a large prominent quartz vein. The quartz vein itself is largely barren and up to 3 m thick and bifurcates and fans out upwards. Veins up to 10 cm wide of galena in places with sphalerite run parallel and very close to the quartz. Lead and zinc mineralization is found only at the base of the exposure. The quartz vein carries very minor amount of freibergite higher up, but galena and sphalerite were not found above the shows at the base of the cliff exposure until the carbonate-shale contact is approached 100 m higher up. At this level, and lateral on both sides of the Ray zone lie a series of shows just below the carbonate shale contact including the Jenny, the PS and PSS shows.

The situation is similar to that in the Lucky trend where a massive vertical barren quartz vein marking a prominent fault is flanked by a series of galena-sphalerite veins parallel to it and at the carbonate-shale contact, i.e. the MF, Lucky, PN, Jill and several other shows between them. However, the base of the PN and Lucky area has not been examined due to blasting operations in the area this summer.

This occurrence of fault-hosted mineralization entirely within the carbonates, and at a lower topographic level, suggests that a different precipitation mechanism was responsible for this type of deposit. It is noteworthy that on the neighbouring ground to the southeast lead-zinc mineralization has been found in what is the Cariboo trend at a similar low elevation in several locations. Possibly the boiling level in the hydrothermal systems on the Ketz property was at a level below that of the carbonate-shale contact in the area, and at, and below the elevation of the Ray zone.

If this is the case, than mineralization may be expected at two levels in most of the faults carrying mineralization: at the carbonate-shale contact, and lower down within the carbonates. If the situation at the Ray zone is typical then a barren gap of about 50-100 m may be expected between these two levels of mineralization in most of the Versluce, Cariboo, and Lucky trends.

Another possible mechanism of ore formation may be that mineralization occurs where the strike-slip faults bifurcate, perhaps due to the greater availability of open space, or greater fracture permeability. In this case pods or shoots of mineralization may be expected wherever these junctions occur. As Wilcox et al (1973) show, wrench faults consist of a series of anastomosing fault slices, and in this case the likelihood that there are a series of deposits at varying levels along the strike-slip faults should be considerable.

STRATIFORM MINERALIZATION

The Strat zone is a stratiform unit of quartz-carbonate rich Cambrian phyllite with laminar and disseminated fine grained galena, sphalerite, and

minor chalcopyrite, pyrite, and silver. Grab samples show up to 14 % combined Pb - Zn with 1 oz/ton silver.

The mineralization is not obviously related to faulting. It follows the moderately strongly folded bedding of the phyllites at that location.

The limited work done to date suggests similarities with sedex deposits: the stratiform nature of the showing, the lack of faulting, and the low silver-lead ratio that is totally unlike that of the other shows on the property.

An interesting note is that this show, although it has considerable surface exposure, does not give rise to a stream-sediment geochemical anomaly in the creek draining it. This may be simply due to sampling error, but if it is typical of this type of deposit in this area, then the lack of geochemical stream sediment anomalies in areas draining phyllites may not necessarily be important.

The main importance of the Strat zone at present is that it proves the presence of stratiform mineralization in the Cambrian phyllites. As the phyllites form about 30% of the surface area of the property this considerably increases the potential of the property.

The sedex deposits are often characterized by pyrrhotite deposition near the vent areas. So far such zones have not been found, although it should be remembered that no prospecting has been done in the phyllites. In the Ketz area gold mineralization is often found in close association with pyrrhotite, for example at Canamax. Thus, stratiform mineralization with significant gold values may also be expected and should be looked for on the Ketz property. The presence of minor gold anomalies on the property suggests the same.

More work has to be done on the Strat zone to see if we can learn something about the nature of the density-temperature relationships at the time of formation of the mineralized zone. Better understanding of this may give some clues about the distribution of mineralized zones and their spatial relation to the vent area (which is the best gold target).

MINERAL SHOWS

The mineral shows found thus far have been grouped based on their proximity to each other, their relation to a particular structure, the orientations of the structure that were mineralized and the type of mineralization present in them. Details about individual shows are given in Table 1.

VERSLUCE TREND

The best explored trend is the Versluce trend in the north-central part of the property. Groundhog, the Number 2 and 3 shows, and the BT all form part

of this trend. It extends for a distance of about six kilometers in a northwesterly direction from the Number 2 showing. The zone can be traced to the north-central limit of the property, where it is lost in heavily covered north slopes. It can be followed through major northeast trending fault zone in the northern part of the property, and the thrustsheet covering the northern limit of the property. Thus, it appears that the faults forming the zone developed during a relatively young phase of deformation, after the thrust faulting and the major northeast trending faulting whose existence led to the development of the Groundhog creek valley and its tributaries.

The Versluce trend is a series of fault related shows hosted by two faults dipping towards each other and probably forming a graben. The faults were probably part of a broad wrench fault system, with strike-slip movement predominating. As in the Cariboo and Lucky trends, the large white quartz veins may mark the main faults, or perhaps the levels at which the fault slices anastomose. The southern end of the Versluce trend reaches into the central part of a domal structure. It is here that the Number 2 and 3 zones are located and the largest concentrations of mineralization have been found to date.

The Versluce trend is marked by prominent white quartz veins, variably bearing freibergite and galena in relatively minor amounts, although the assay values of selected freibergite rich samples can be spectacular. Most of the large quartz veins lie in the footwall of the number 3 zone, to the immediate east of the mineralized areas in this trend.

Near its northern mapped limit at Station R8-8-1 phyllitic float was found containing galena and freibergite at a site directly overlying the trace of the Versluce trend faults. This suggests the presence of mineralization below the thrust sheet.

CARIBOO TREND

The next most important series of shows known at this time can be grouped in the Cariboo trend. This trend runs parallel to the Versluce trend about one kilometer to the northeast, and can be followed for about two kilometers on the Ketz property. The Jenny, Ray, Spur, MB and some shows in trenches at the very edge of the property south of the Number One show all are part of this trend.

The Cariboo trend lies in the northeast flank of the Seagull uplift in moderately to steeply northeasterly dipping strata. Major white quartz veins are associated with this trend, especially at the Ray zone and they lie at the locus of prominent wrench faults, where these fan out and bifurcate upwards. The south end of the trend lies on the northern limit of a northwesterly trending fault system causing intense brecciation. The valley southeast of the Cariboo trend marks the location of this fault system.

LUCKY TREND

This trend has in preliminary reports been a part of a larger group of shows labelled the Groundhog trend. As this name invites confusion with the Groundhog show in the Versluce trend the name "Groundhog trend" is dropped,

and because of geological differences the shows previously placed in the Groundhog trend have been placed in two separate trends: the Lucky and the Sheep trends.

The Lucky trend lies about four kilometers southwest of the Versluce trend, and along strike has been delineated for a distance of 1 1/2 kilometers. Both ends of the trend are on unexplored ground. The Lucky, PN, MF, Jill, and Bill shows may all be grouped in the Lucky trend.

Mineralization in the Lucky trend is once again in northwesterly trending steeply dipping faults, and again, as in the Versluce and Cariboo trends, it is associated with very prominent white quartz veins. The Lucky trend lies in relatively level lying rocks near the crest of the Seagull Uplift. Massive white barren quartz veins, similar to the one between the Lucky and the PN shows occur along strike of this trend to the northwest for a distance of 3 km beyond the limits of mineralization found to date. This suggests that a major structure may extend beyond the limits of mineralization found thus far.

Although the mineralized faults of the Lucky trend themselves strike northwesterly, most of the shows (7) in the Lucky trend line up in a northeasterly direction over a distance of 1 km. Mafic dike rock has been found along this direction in float, and a dike may lie along this northeasterly trend. However, this is not proven by an adequate series of outcrops at present.

SHEEP TREND

The Sheep trend lies 1 km south of the Lucky and is parallel to it. The trend has been followed for a distance of 4 km to the southern boundary of the Ketz property. Mineralized zones occur along this trend on the neighbouring property. The northern limit of the trend seems to be the Groundhog Creek valley, which probably marks a major fault.

The Sheep trend at the Sheep zone consists of a series of carbonate hosted northwest trending quartz veins dipping towards each other in a manner similar to the main faults in the Versluce trend. The quartz veins are freibergite bearing.

Between the quartz veins are a series of north trending mineralized faults and a major northeasterly trending fault zone, showing intense silicification, corroded quartz stockwork and limonitic alteration. The whole has an appearance very similar to the wallrock alteration around the Number 2 zone vein as it appeared in the excavation in mid august, 1988.

The Cirque and neighbouring shows also have north and northeast trending mineralized fracture and fault directions. The area between the Cirque and the Sheep zones shows promising limonitic zones, but has not been prospected in detail.

The Sheep trend is largely composed of small fault slices juxtaposing Devonian-Mississippian shales and the Silurian-early Devonian carbonates. A number of the shows, e.g. the Horn and the BP in the bordering Lucky trend, are formed at the fault contacts between the two rock types.

PIKA TREND

A few shows occur from 1 to 2 km south of the Versluce trend. They are hosted by northwesterly and north trending structures, similar in attitude to those in the Versluce trend, but offset somewhat to the southeast from the latter. Limited work thus far suggests that they are not in the same structures as those that carry the mineralization in the Versluce trend, and therefore they are here grouped as the Pika trend.

Airphoto study indicates a series of parallel lineaments trending northwest that parallel the Versluce trend intermittently. They are most prominent at the northern part of the property, becoming less continuous to the south. This may be because there the faults are hosted by phyllites, and the overburden is much thicker. The Pownal zone, and several other shows to the south are along one of these lineaments.

If these lineament can be proved to be continuous, these faults are major structures, with a strike length of 9 km on the Ketz property. Galena has been found at both ends of this belt.

NO. 1 TREND

The Number 1 zone lies at the eastern margin of the Ketz property, about 1 km northeast of the No. 3 zone. It lies on the border of the SD carbonates and several other stratigraphic units at major north trending fault. Very little work was done on the zone, and that only incidental to surveying. It is located at a fault with significant vertical displacement judging by the juxtaposition of several stratigraphic units near the show. This, together with its position lateral to the Cariboo trend indicate that an important different structure is involved. For this reason it is regarded here as a separate trend.

DOUBLE P TREND

The Double P zone lies in the northwestern corner of the Ketz property. It can be traced over a distance of 1 1/2 km. It is terminated at both ends by faulting that places Cambrian phyllites against the carbonates hosting the show.

The Double P zone shows a northeast trending strike, which is shared by neighbouring prominent white quartz veins. The zone is marked by prominent quartz veins, although generally not massive like those in the Versluce and Cariboo or Lucky trends. The trend lies well to the west of the Versluce and Cariboo trends and to the north of the Lucky trend. Further work is required on this zone before a definite interpretation of the area is possible.

STRAT TREND

The Strat zone is a stratiform zone of lead-zinc and minor silver mineralization that is hosted by the Cambrian (or older) phyllites and is quite different from all other shows in the area. Its main significance at present lies in that it proves that significant mineralization may be hosted by the phyllites, and hence that these units should be prospected as well. The stratabound nature of the show is a good prospecting tool; it requires the mapping of the internal stratigraphy of the Cambrian phyllites, a task not as yet begun.

The Strat "trend" is not marked on the map because it is of fundamentally different nature than the others. From what is known at present stratiform mineralization could occur anywhere within the Cambrian phyllites.

TRENCHING

Seven thousand two hundred (7200) yards of trenches were excavated for the regional program involving a total of 13695 cubic yards of material. Trenching was carried out at a number of locations for two main purposes:

- 1) Long trenches were made in areas of heavy overburden to expose soil in order to determine the stratigraphic level of the underlying bedrock. This was done in areas of heavy overburden lying along strike of faults in the mineralized trend areas. Four sets of trenches of this type were made totalling 9600m in length and involving 12480 cubic yards of excavation.
- 2) Short trenches were made over shows in float in an attempt to find the mineralization in bedrock and to determine the strike and dip of the fault hosting the structure. Such trenches were made in the North Pika zone (60m), at the PT zone (220m), where the main object was to locate the veins for a drill target, the Sheep zone (80m), and the Strat zone (230m). The total length of short trenches was 590 yards and the volume removed in short trenches was 1215 cubic yards.

Due to time and manpower limitations and because of the reconnaissance stage of the regional program, the main purpose of the trenching was limited to establishing lithology and the presence of mineralization. Mapping programs will be conducted in the future.

The volume and character of material removed is listed in Table 2. The location of the trenches may be found on Map 2.

Long Trenches

BT-POWNALL TRENCH

The BT-Pownall trench (3640m) exposes the north end of the Versluce and Pika trends (Figure 1). It begins near the BT zone in Cambrian phyllites and stays in this unit until the bottom of the slope where it traverses scree from the Silurian-Devonian dolomites. The transition from the phyllites to the carbonates is formed by the east fault of the Versluce trend (the No. 3 fault) higher up and this portion of the trench may be underlain by the dolomites, but this is not certain as bedrock was not reached. The valley bottom is covered by peat. The south-facing slope to the north exposes phyllite rich soil and gullies higher up show near outcrop in the Cambrian phyllites. Carbonates are again encountered at the No. 2 fault (the west fault of the Versluce trend faults) at the top of the ridge, after crossing a series of lineaments that may represent thrust slices in the phyllites.

Thus, it appears that north of the BT zone the entire center of the Versluce trend between the two Versluce trend faults is composed of Cambrian phyllites, and that it is flanked at least to the west by younger carbonates. This again indicates that the central part of the Versluce trend is a graben.

PIKA TRENCH

The Pika trench (660m, west of the BT zone) was dug to get a better section through a series of possible thrust slices in the carbonates (Figure 2). On the ground little is evident of the colour bands that mark the carbonates from airphotos. No mineralization was encountered in the possible fault zones separating these bands. Near the end of the trench a gradual transition to a more phyllitic unit is evident.

SOUTH LUCKY TRENCHES

The South Lucky trenches (3700m, 1 km south of the Lucky zone) were made to search for a continuation of the Lucky and MF zone structures (Figure 3). No trace was seen of a possible southern extension of the carbonates hosting the Bill or MF zones. The trenches were largely in very thick phyllitic overburden, probably derived from Devonian-Mississippian shales in the west and Cambrian phyllites in the eastern part of the trenches. Bedrock was reached only below the carbonate exposures on the west side of the Lucky trend.

SHEEP TRENCH

The Sheep trench (1250m) was excavated in an attempt to intersect the main structure along the Sheep trend and to expose the west slope of the ridge hosting the Sheep zone (Figure 4). The slope was deeply covered by debris, but several promising limonitic zones were encountered that may indicate the presence of altered vein material further down.

Short Trenches

In four places short trenches were made over shows in float in an attempt to find the mineralization in bedrock and to determine the strike and dip of the fault hosting the structure. Such trenches were made in the North Pika zone (130m), at the PT zone (230m), where the main object was to locate the veins for a drill target, the Sheep zone (80m), and the Strat zone (150m).

NORTH PIKA ZONE

One trench of 50 m was excavated in scree derived from Amphipora rick dolomite to determine the source of galena bearing dolomite float. The trench was abandoned due to lack of time in permafrost saturated scree.

PT ZONE

Two trenches totalling 230 m were dug just below the carbonate- black shale (uDM) contact in an area with abundant galena bearing float. The zone is on the No. 2 fault of the Versluce trend, and the trenches were made to locate the fault zone precisely and define a drill target. Bedrock was reached in both trenches, and the most promising of the altered fault zones was drilled.

SHEEP ZONE

Three short trenches totalling 80 m were excavated in two of the most promising shows of the Sheep zone. Two trenches were dug across a 20 m wide strongly altered fault zone showing a strongly corroded central quartz stockwork 1-2 m wide surrounded by variously altered limonitic dolomite. Minor amounts of galena were found. The pattern of alteration was visually very similar to that of the No. 2 zone during the early August 1988 stage of excavation.

One 40m long trench was dug along a smaller galena bearing vein running roughly at right angles to the large fault zone described above and adjacent to it to the south. Galena bearing limonitic alteration was recovered along the trench.

STRAT ZONE

Four short trenches totalling 150 m were dug in the two zones of the Strat show. Three of the zones reached bedrock and showed the Strat zone to be consistently similar to the showings made in previous years. The fourth trench was made to expose a new showing of higher grade material in a scree slope about 100 m south of the other trenches. This trench encountered permafrost in steep terrain and was left before reaching bedrock.

TABLE 1: Volume and Character of Material excavated from Trenches

CLAIM	LENGTH yds	YDS ³ / YD LENGTH	VOLUME (yd ³)	LITHOLOGY OF MATERIAL
<u>LONG TRENCHES</u>				
BT-POWALL TRENCH				
HV 161	380	1.0	380	Black shale
HV 162	390	1.0	390	Cambrian phyllites
HV 81	100	1.0	100	Cambrian phyllites
HV 233	330	0.5	165	Overburden with phyllites
HV 234	670	0.5	335	Overburden with phyllite, pyritic sandstone, and dolomites
HV 236	550	1.0	550	Cambrian phyllites
HV 238	490	1.5	735	Cambrian phyllites
HV 240	460	1.0	460	Cambrian phyllites
HV 242	400	0.5	200	Phyllite in east, rest dolomite
HV 244	210	1.0	210	Amphipora rich dolomite
Total	3980		3525	
PIKA TRENCH				
HV 146	150	1.0	150	Dolomite
HV 148	200	1.0	200	Dolomite
HV 163	100	1.0	100	Dolomite and phyllitic dolomite
Total	450		450	
SOUTH LUCKY TRENCHES				
JEFF 2	440	1.0	440	Black shale
HV 15	400	1.0	400	Black shale, dolomite
HV 16	790	1.5	1185	Black shale, dolomite
HV 51	1010	2.0	2020	Cambrian phyllite
HV 53	660	2.0	1200	Cambrian phyllite
HV 41	420	2.5	1050	Black shale, dolomite
HV 39	440	2.0	880	Black shale, dolomite
Total	4160		7175	
SHEEP TRENCH				
HV 18	500	1.5	750	Black shale, dolomite
HV 38	420	1.5	530	Dolomite, limonitic veins
HV 40	100	0.5	50	Dolomite
Total	1010		1330	

TABLE 1 (continued)

SHORT TRENCHES

CLAIM	LENGTH yds	YDS ³ / YD LENGTH	VOLUME (yd ³)	LITHOLOGY OF MATERIAL
NORTH PIKA (Station R7-8-2)				
HV 244	60	1.5	90	Dolomite scree, permafrost
PT				
HV 102	220	1.5	330	Black shale, dolomite, veins minor galena; in permafrost
SHEEP ZONE				
HV 38	40	6.0	240	Limonitic altered dolomite, quartz stockwork, minor galena.
	40	1.0	40	Limonitic altered vein, minor galena.
Total	80		280	
STRAT ZONE				
HV 180	100	4.0	400	Black shale, phyllite In permafrost
	100	1.0	100	Black shale, phyllite
	30	0.5	15	Phyllite
Total	230		515	

The volumes are based on the fact that a D7E Cat with a 12' wide blade was used to make the trenches. For every 9" depth of excavation a volume of 1 cubic yard is removed for each yard of trench length. Volumes for trenches on slopes are adjusted to reflect the effect of the slope by using 1/4 of the greatest depth as a measure of average depth.

GEOCHEMISTRY

To test whether the variability evident among the shows on the Ketz property is random or whether an analysis of the differences may shed some light on the origin of the deposits and their history a pilot factor analysis study was undertaken.

Data

Eighteen samples were taken at 12 shows where a significant amount of galena was present and one phyllite sample that proved to be barren. These were analysed for Ag, As, B, Ba, Be, Bi, Cd, Ce, Co, Cr, Cu, Ga, La, Li, Mo, Nb, Ni, Pb, Rb, Sb, Sc, Sn, Sr, Ta, Te, Tl, V, W, Y, Zn, Zr, Au, i.e. 32 elements in total. Three other barren samples for which similar analyses were available were also used to improve the sample size and give more reliability to the analysis.

The results of the analysis are given in Table 3.

Factor Analysis

A number of elements showed less than detection limits in most of the samples (B, Be, Bi, Co, Mo, Nb, Rb, Ta, Te, Tl); these elements were not included in the factor analysis.

Multivariate methods are necessary to study such multielement data properly. Of these, factor analysis using varimax rotation is the most useful for this kind of study. This method requires more samples than elements. Thus, the sample size of the material collected from the Ketz property is too small by itself at present, and as a result some of the remaining elements could not be used.

For this reason Cr, Ga, Li, Ni, Sc, and V were also not used because they showed the greatest number of results below detection limits, and because these elements were the least likely to show interesting results.

Thus the factor analysis included the following 16 elements: Ag, As, Au, Ba, Cd, Ce, Cu, La, Pb, Sb, Sn, Sr, W, Y, Zn, and Zr.

The purpose of the factor analysis is to find whether there are more than one element association present in the shows on the property. Such associations may give clues as to the ways the metals precipitated, which in turn will help in identifying prospective areas.

The small sample size means that the results of the factor analysis will have to be interpreted with caution. However, the results obtained make good geological sense and this suggests that they are reliable.

row	SAMPLE	AG	AS	B	BA	BE	BI	CD	CE	CO	CR	CU	GA	LA	LI	MO	NE	NI
1	13256	31.9	47	45	35	4.8	11	267.0	14	4	68.0	389	3	5.0	8.0	24	0.5	18.0
2	13257	17.4	81	41	78	3.7	13	688.0	15	6	57.0	1085	5	3.0	12.0	24	0.5	25.0
3	13342	79.9	25	1	125	2.0	2	171.0	145	1	0.5	540	79	0.5	3.0	2	0.5	0.5
4	13343	423.4	1335	1	53	2.0	2	13.0	15	1	66.0	162	3	0.5	7.0	7	0.5	7.0
5	13344	10.2	25	1	48	2.0	2	207.0	187	1	0.5	19	93	3.0	2.0	2	0.5	0.5
6	13345	0.2	85	1	1886	2.0	2	0.5	54	9	343.0	6	24	11.0	4.0	2	5.0	53.0
7	13346	1025.0	58	1	4	2.0	2	30.0	2	1	4.0	32	1	0.5	0.5	2	0.5	0.5
8	13347	100.5	53	3	37	2.0	5	1.0	2	1	343.0	5016	5	0.5	0.5	2	0.5	12.0
9	13348	95.3	1551	1	228	2.0	2	17.0	19	7	34.0	445	1	8.0	2.0	12	0.5	63.0
10	13349	401.1	25	1	3	2.0	2	41.0	2	1	3.0	408	1	0.5	0.5	2	0.5	0.5
11	13350	263.7	91	1	5	2.0	2	52.0	2	1	1.0	1074	5	1.0	0.5	2	2.0	0.5
12	13351	9.4	89	1	148	2.0	2	3.0	5	1	0.5	33	1	0.5	0.5	2	0.5	0.5
13	13352	1171.5	25	1	6	2.0	2	45.0	13	1	4.0	667	13	2.0	1.0	2	4.0	0.5
14	13353	25.5	25	4	635	2.0	2	99.0	14	4	72.0	80	8	6.0	12.0	2	3.0	7.0
15	13354	2.1	25	1	40	2.0	6	2.0	45	138	86.0	626	19	14.0	49.0	2	31.0	129.0
16	13355	908.6	680	1	140	2.0	2	31.0	10	1	15.0	1959	6	0.5	2.0	2	0.5	1.0
17	13358	34.1	3000	1	42	2.0	2	375.0	2	1	83.0	818	2	0.5	2.0	2	0.5	0.5
18	13376	248.6	25	6	49	2.0	2	7.0	8	1	90.0	9	1	3.0	6.0	5	0.5	2.0
19	13363	3.8	25	1	73	2.0	2	0.5	5	4	15.0	145	1	0.5	0.5	2	0.5	16.0
20	13364	1.2	25	1	68	2.0	2	0.5	7	1	17.0	47	1	2.0	0.5	2	0.5	2.0
21	13244	0.2	531	1	260	6.6	2	1.0	33	1	18.0	33	1	15.0	0.5	18	0.5	0.5

TABLE 3: Multielement Geochemical Values of Selected Samples
All values in ppm, except gold, which is in ppb.

row	PE	RB	SB	SC	SN	SR	TA	TE	TL	V	W	Y	ZN	ZR	AU	NOTES
1	13300.	10	104	1.2	83	32	5	5	5	3.0	332	2.0	73000.	6.0	12	LUCKY
2	1105.	10	2	1.1	176	42	5	5	5	4.0	164	2.0	118000.	7.0	27	LUCKY
3	46000.	87	52	2.0	56	88	5	10	10	5.0	55	5.0	18984.	0.5	8	CARIBBO
4	168000.	119	180	2.0	71	20	5	10	10	48.0	5	4.0	1264.	40.0	983	MB
5	13200.	25	6	4.0	62	51	5	10	10	2.0	97	45.0	35400.	0.5	16	NORTHPIKA
6	592.	148	25	14.0	35	232	5	10	10	111.0	5	15.0	188.	61.0	13	R7-8-1A
7	7778000.	25	1500	0.5	60	3	5	10	10	0.5	5	0.5	137.	4.0	30	NOJENNY
8	29300.	25	610	0.5	15	10	5	10	10	1.0	5	0.5	64.	2.0	21	NOJENNY
9	18000.	25	83	4.0	34	93	5	10	10	16.0	5	36.0	1663.	21.0	127	NOJENNY
10	10810000.	25	1500	0.5	15	6	5	10	10	0.5	5	0.5	114.	1.0	66	PS
11	11758000.	25	1500	0.5	15	18	5	10	10	0.5	5	0.5	2556.	0.5	48	PS
12	6397.	25	50	3.0	15	56	26	10	10	0.5	12	2.0	45.	0.5	21	R9-8-16
13	13743000.	389	1500	0.5	15	23	5	10	10	2.0	5	1.0	449.	1.0	49	PS
14	4529.	25	21	2.0	47	36	5	10	10	19.0	30	4.0	9203.	21.0	14	HORN
15	56.	25	2	19.0	39	39	5	10	10	213.0	5	13.0	113.	86.0	5	STRAT
16	16389000.	25	548	2.0	234	23	5	10	10	2.0	17	2.0	3304.	5.0	420	HORN
17	5646.	25	267	0.5	88	1	5	10	10	0.5	335	0.5	57900.	0.5	522	RAY
18	18101000.	103	66	0.5	15	69	5	10	10	2.0	5	1.0	232.	3.0	10	DOUBLEP
19	1174.	25	11	0.5	15	2	5	10	10	0.5	5	0.5	47.	6.0	14	NOBOOK
20	324.	25	2	0.5	15	4	5	10	10	0.5	5	2.0	29.	7.0	12	NOBOOK
21	40.	25	2	1.0	15	16	5	10	10	0.5	5	3.0	45.	15.0	14	MFR

TABLE 3: (Continued)

Results: Factors and their Interpretation

The factor analysis returned four significant factors. Factors are element associations not correlated to other associations, and in this study probably reflect different mineralizing or sedimentary processes.

Factor 1:

Pb, Ag, Sb are very strongly correlated in this factor and these have a weaker association with Au and Cd. This suite probably represents mineral deposition during epithermal mineralization.

Factor 2:

W, Zn, Cd, and Sn are strongly correlated in this factor, with Cu showing a weak association. The association of zinc with the skarn minerals tin and tungsten and with minor copper suggests that the zinc in these shows may have been emplaced in a separate, possibly earlier event at a more elevated temperature.

Factor 3:

This factor shows Sr and rare earths Y, Ce, and La in a moderately strong association with barium and zirconium. The rare earths are present only in minor quantities. This suggests that this factor is sedimentary and reflects the presence of clastics, and that this association is not related to hydrothermal mineralization.

Factor 4:

Gold and arsenic are strongly correlated in this factor, together with a weak tin and barium association. This factor may represent a higher temperature, possibly earlier mineralization phase.

In summary, these results may be interpreted as reflecting a sedimentary environment (factor 3) and three stages of hydrothermal mineralization: probably an early gold, arsenic and minor tin phase, followed by a tungsten, tin, zinc, and copper stage, with a final event consisting of lead, silver, antimony, and minor gold.

The carbonate sedimentary environments are not represented in these factors because the elements Ca, Mg, Fe, and Mn were not analysed for. The Sr, in factor 3, may possibly be tied in carbonates.

Interpretation of the Factor Scores

Factor scores are numbers, one for each factor per sample, that show the importance of each factor in the sample.

The factor scores of each sample may be plotted, two at a time, to show how the different samples are related. This is done in Figures 1 to 3.

FIGURE 1: KETZLFVS.FV52 vs K:KETZLFVS.FV51

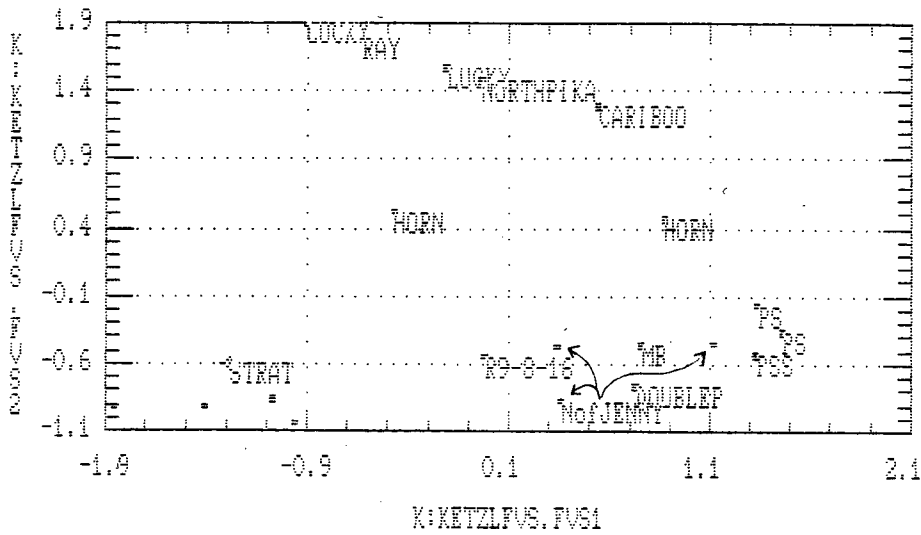


FIGURE 2: KETZLFVS.FV54 vs KETZLFVS.FV51

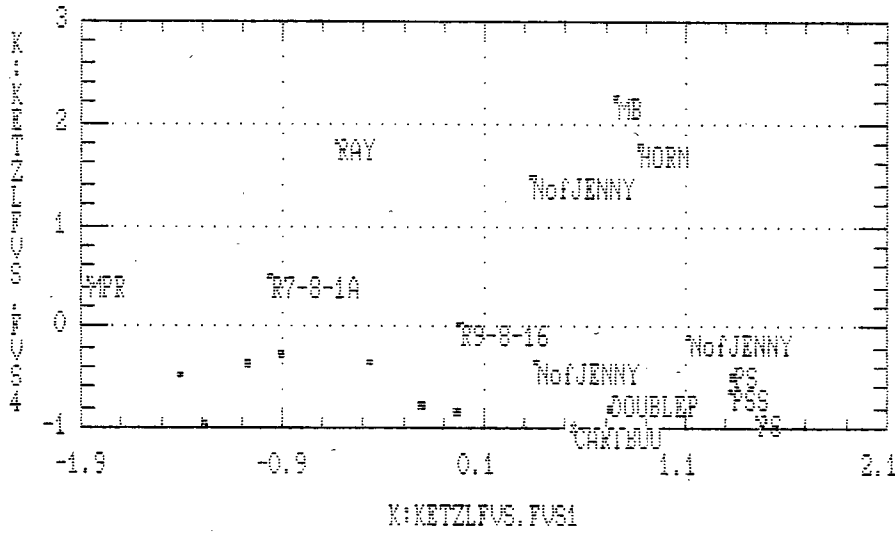


FIGURE 3: KETZLFVS.FV54 vs KETZLFVS.FV52

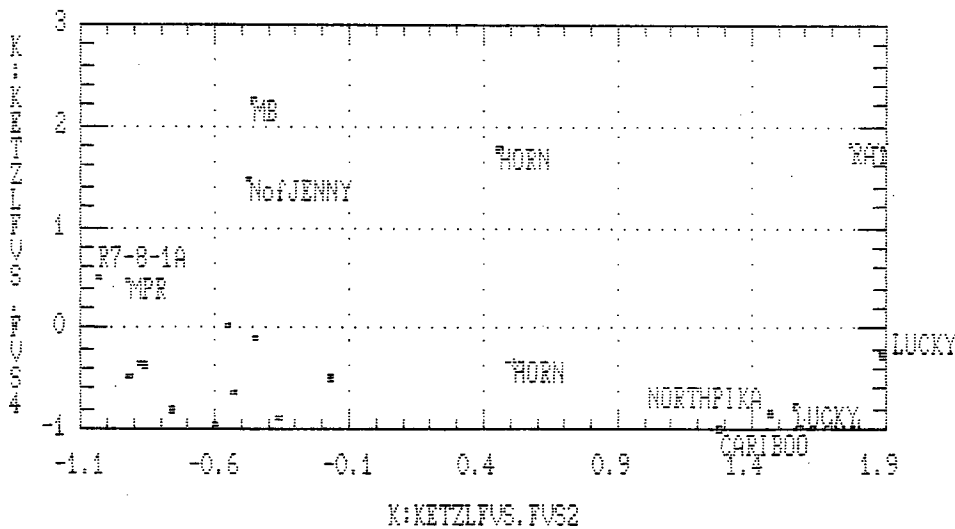


Figure 1 shows factor 1 (epithermal silver, lead, antimony, minor gold) plotted against factor 2 (skarn minerals and zinc). The Lucky, Ray, North Pika, and Cariboo shows evidence of the higher temperature "skarn" mineralization. The Cariboo, Horn, Double P, MB, and the group of shows northeast of the Jenny (NofJenny, PS, PSS) are affected by epithermal silver, lead, antimony and gold mineralization. The Cariboo is affected by both types of mineralization.

Figure 2 plots factor 1 against factor 4 (gold, arsenic). The MB, Ray, Horn, and NofJenny shows were affected by the early(?) gold mineralization; the MB and Horn also by the later silver/lead mineralization reflected by factor 1.

Figure 3 is a plot of factor 2 against factor 4. It shows that the Ray and Horn shows were the only ones affected by both the earlier (?) phases of mineralization involving the higher temperature events.

The zinc rich shows (Lucky, Ray, North Pika, and Cariboo) all are located at or near massive quartz veins. Possibly the major quartz veins are related to the "skarn" event that introduced much of the zinc. Testing the No. 3, BT, and PN zones with a multielement factor analysis may substantiate this hypothesis.

Implications of the Geochemical Study

If this interpretation is correct, than some of the major quartz veins in the area should be looked at carefully, with particular attention paid to possible sphalerite mineralization. As much of the near-surface sphalerite in drill core is difficult to recognize because of its earthy habit and brown colour it is quite possible that sphalerite mineralization may have been overlooked if it occurred apart from galena. The clear separation of the lead and zinc in different factors suggests that this may have occurred on the Ketza property.

Further and more systematic work using factor analysis on the remaining shows on the Ketza property will probably give a better picture of mineral zoning on the property.

Thus far, this study suggests that the Cariboo trend may be rich in zinc, as both the Ray and Cariboo zones are on the same structure that is central to the trend.

The Cariboo and Sheep trends are the best gold prospective areas on the Ketza property judging from the shows sampled by this study. Although no multielement samples from the Sheep Zone were included in this study, the highest gold and the highest Ag/Pb ratios on the Ketza property have come from the Sheep zone from a brecciated quartz stockwork that forms the center of a broad fault zone.

THIN SECTION STUDY

DESCRIPTION OF METHODS USED

EQUIPMENT

A Kyowa me-pol petrographic microscope was used with eyepieces of 10x; objectives of 5, 10, 20, and 40x; and eye-piece crosshairs and micrometers. Magnification was calibrated using a stage micrometer. Illumination was by 6V 20W quartz-halogen lamp.

SLIDE PREPARATION

Slides were made by Agat Laboratories, Calgary on 27x46mm glass slides using an epoxy mounting medium with an R.I. of 1.54. After rough cutting the slides were impregnated using blue epoxy, then polished and mounted in clear epoxy. With this procedure most of the blue stain is in true porosity; artificial porosity due to plucking in the final stages of slide grinding and polishing is filled by clear epoxy. Only in very friable specimens is artificial porosity stained blue at times. Standard carbonate staining techniques were used using alizerin red S to stain calcite red and a blue stain to stain all dolomite with more than 1 % Fe blue. Cover slips were used, and ground and labelled section blocks matching the thin section were prepared.

PHOTOMICROGRAPHS

These were taken with a Minolta XD 11 mounted on the microscope; details of exposure are given with the caption:

MAGN: the total magnification of the optical system;
The sides of the photos (3.5x5 inches) show a field of
1.165 x .790 mm for Magn = 50x;
0.590 x .400 mm for Magn =100x;
0.295 x .200 mm for Magn =200x;
0.160 x .100 mm for Magn =400x.

For the 3.5x5 inch prints this corresponds to true magnifications on the print of 109, 215, 430, and 794x respectively.

LIGHT: TRANSMitted or REFLECTed light

NICHOL: "in" = fully polarized light

"out" = plane polarized light

ACCES: Accessory plates: GYPSum or MICA plate or QTZ wedge if used.

TIME: Exposure time in seconds.

BAR SCALE: Gives scale on photomicrograph independent of changes
of scale during reproduction of page.

MINERAL IDENTIFICATION (PRIMARY, SECONDARY MINERALS)

Percentages are estimated visually by comparison to images produced by Terry and Chilingar, J. Sed. Petr. v.25, p.229-234, 1955. Size is given in mm. In cases where distribution is erratic rudimentary point counts were made using the eyepiece micrometer.

USAGE OF TERMS IN THE PETROGRAPHIC REPORT

PETROGRAPHIC NAME

This is a short name referring only to the mineralogy and texture of the rock. The full petrographic name of the rock is given under the heading "description".

DESCRIPTION

Color: common terms are used. Grain size: the terms apply to the commonly used Udden-Wentworth scale.

Sorting: A measure of the number of Udden-Wentworth size classes represented by 80% of the rock.

Very well sorted	1
Well sorted	1-3
Moderately sorted	3-5
Poorly sorted	5-7
Very poorly sorted	>7

Roundness: Visual comparison to the scale given by M.C. Powers, J. Sed. Petr. v.23, p.118, 1953.

Classes are: very angular, angular, subangular, subrounded, rounded, well rounded.

Cement: Lists the major cements, i.e. chemically precipitated material between detrital grains that binds the rock together.

Matrix: Clastic material much finer-grained than the bulk of the sediment is referred to as matrix. With clays it is often difficult to determine optically whether the material is detrital or authigenic. Flakes oriented predominantly parallel to larger clastic grains are clastic; Randomly oriented, well-formed crystals are considered authigenic.

REGIONAL AND HYDROTHERMAL ALTERATION

As deduced from contact relationships of minerals, morphology of crystal clusters, relicts (especially in patches of quartz-cemented grains), inclusions, pseudomorphs.

The relative age of the alteration is given by the number in brackets where (1) is the oldest generation or event. These are relative ages, which may be separated by great lengths of time or occur almost simultaneously. The sequence given is the simplest possible sequence consistent with the information on the thin section. Other interpretations are often possible; more complex interpretations are nearly always possible, but not necessarily more plausible. When it is impossible to establish the order in which two or more alteration events took place all are given the same number.

MAX. GRAIN SIZE

The largest grain seen in the thin section or associated chip; this will often be smaller than the maximum grain size of the core interval as given in the logs.

SOURCE ROCK(S)

Estimate on the basis of the petrologic characteristics of individual clastic grains, including abundance of microliths, vacuoles, and suture characteristics in polycrystalline grains.

POROSITY TYPE

The present porosity of which the blue epoxy is an indication is given. This still may be somewhat high due to plucking of grains during the preparation of the thin section. Porosity in the past may have been greater and decreased by the precipitation of cements, pressure solution and compaction.

FRACTURING

Only what is seen in the thin section.

PETROGRAPHIC DESCRIPTION

Project: YUKON MINERALS CORPORATION - KETZA PROJECT

SAMPLE NO: 1

DDH: YMC 88-1 DEPTH: 10.36 m

PETROGRAPHIC NAME: Medium crystalline dolomite

DESCRIPTION: Medium crystalline dolomite with 5-10 % well sorted, well rounded quartz sand and disseminated fine grained pyrite partially altered to hematite. Vugs filled with coarsely crystalline dolomite.

LITHOLOGIC UNIT: Silurian to Devonian dolomite

MAX. GRAIN SIZE (MM) in sample: .2

HYDROTHERMAL ALT: 1) Dolomite veins
 2) Siderite veins; pyrite along siderite veins and? disseminated through rock.
 3) Quartz veins - barren; overgrowths on detrital quartz may be same age.
 4) Alteration of pyrite to siderite and hematite

POROSITY TYPE: vugs, fracture, and intergranular

FRACTURING: dolomite, siderite and quartz filled fractures; siderite filled fractures form two sets.

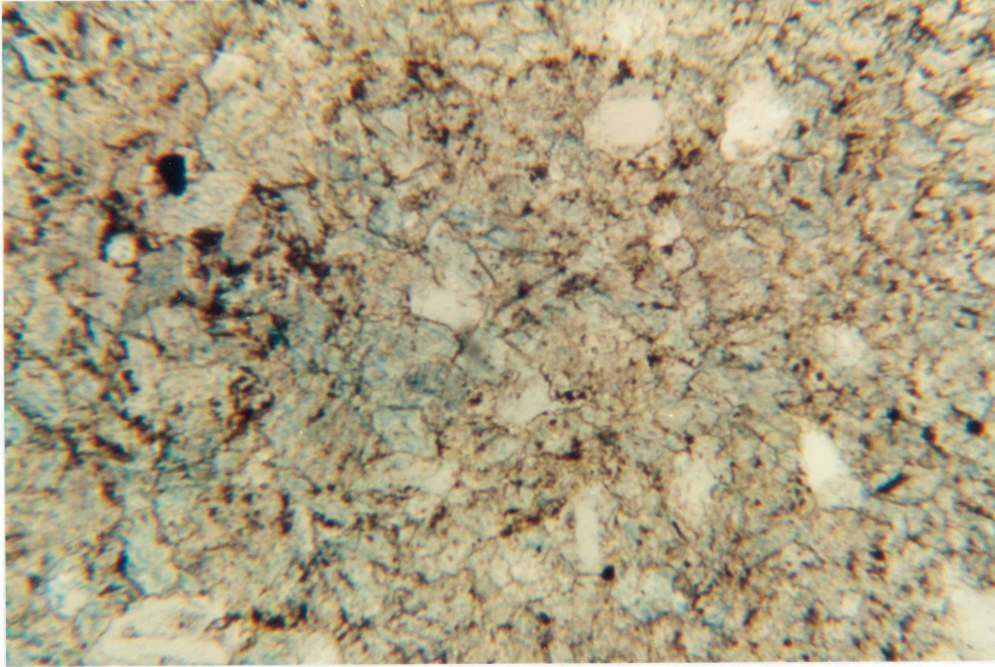
PRIMARY MINERALS

PRIMARY MINERALS	PERCENT	SIZE mm	COMMENTS
QUARTZ	7.	.2	Well rounded, well sorted fine grained sand.
PLAGIOCLASE			
K-SPAR			
FE-DOLOMITE			
MAGNESITE			
SIDERITE			
CALCITE			
MAGNETITE + ILM			
TOURMALINE			
ZIRCON+XENO+MONA			
RUTILE + Ti Oxides			

SECONDARY MINERALS

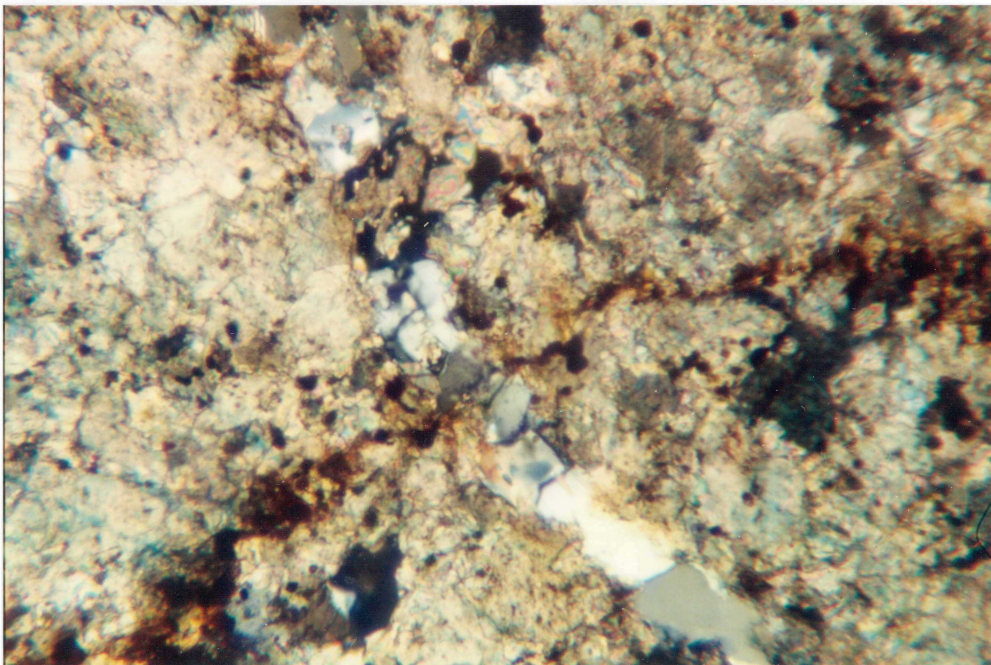
QUARTZ overgrowths	tr		Clear; contain carbonate remnants in contrast to the clear cores. Euhedral fracture linings, crosscutting all other veins.
vein, late	2		
KAOLINITE			
ILLITE			
CARBONACEOUS MAT.	tr?		Dark intergranular debris
CHLORITE (Mg)			
DRAVITE			
HEMATITE	2	.06	Often euhedral, often rim on siderite and pyrite.
LIMONITE			
CALCITE			Despite staining none seen at all.
DOLOMITE Ferroan	86	.1	
SIDERITE	2		In very thin veins that contain concentrations of pyrite grains.
PYRITE	1	.06	In siderite veins and disseminated; altered largely to hematite & minor siderite
GALENA			Small amounts may be present but not distinguished from pyrite.
GREY COPPER			
MALACHITE			
ARSENIDES			
PORE SPACE			Vugs now filled by coarse dolomite.
STYLOLYTES			PERCENT VOLUME REDUCTION:

NO: 1 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE: 1; 88-1 10.36m
 MAGN:50x LIGHT:trans NICHOL:out ACCES.PLATE:- EXP.TIME(sec):1
 Ferroan dolomite (cloudy, blue) with about 10 % fine grained, well sorted, well rounded detrital quartz grains (clear).
 Large opaque grain (black) is pyrite; small opaque to dark red grains are hematite. Note the quartz overgrowths.



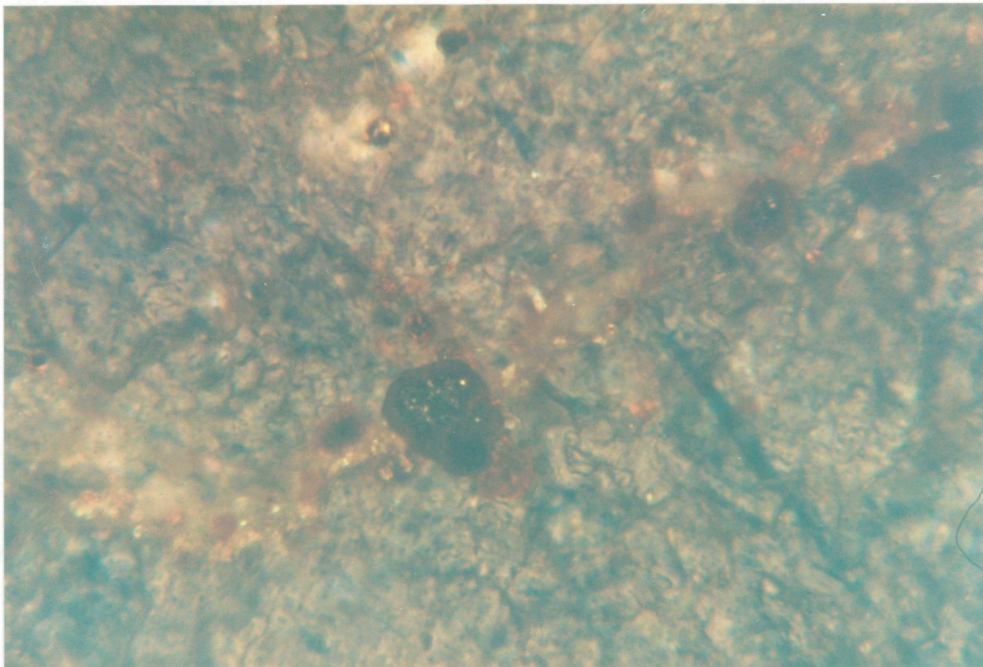
|-----| = 0.1 mm

NO: 2 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE:1; 88-1 10.36m
 MAGN:100x LIGHT:trans NICHOL:out ACCES.PLATE:- EXP.TIME(sec):2
 Early siderite vein (thin, brown) altered in part to euhedral hematite (black, red) and pyrite (black), cut by later quartz vein. Matrix is ferroan dolomite and detrital quartz.



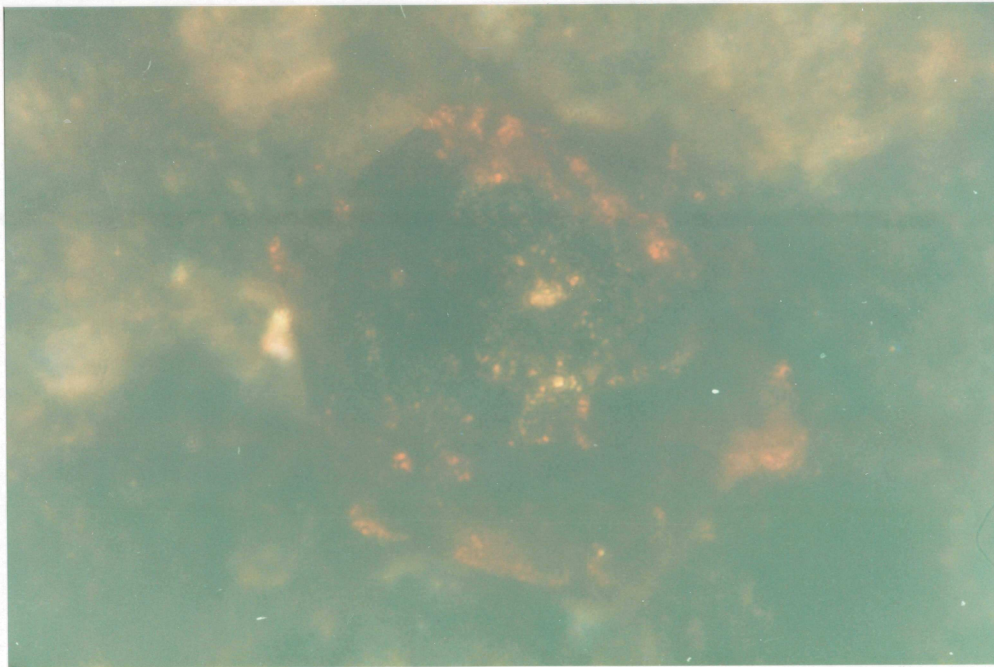
|-----| = 0.1 mm

NO: 3 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE:1; 88-1 10.36 m
 MAGN:200x LIGHT:refl. NICHOL:out ACCES.PLATE:- EXP.TIME(sec):6
 Siderite vein. Siderite (brown) contains crystals of pyrite (grey-yellow) rimmed by hematite (red).



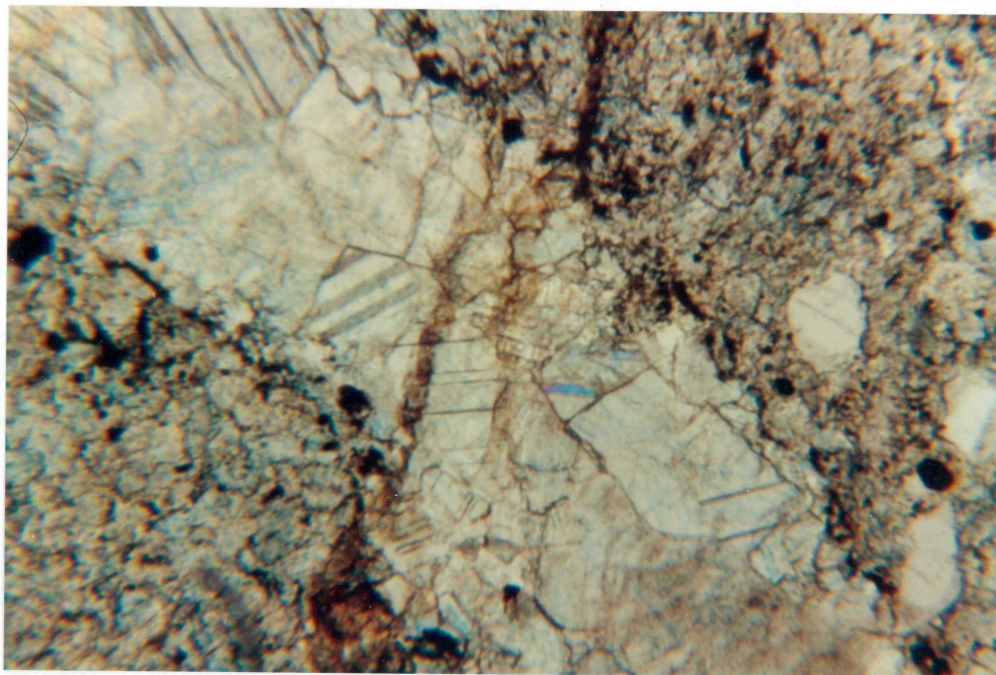
|-----| = 0.1 mm

NO: 4 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE:1; 88-1 10.36m
 MAGN:400x LIGHT:refl. NICHOL:in ACCES.PLATE:- EXP.TIME(sec):6
 Siderite vein; pyrite grain (yellow) altering to siderite (dark brown to black) and then to hematite (red rim).



|-----| = 0.1 mm

NO: 5 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE:1; 88-1 10.36m
MAGN:200x LIGHT:trans NICHOL:out ACCES.PLATE:- EXP.TIME(sec):1
Dolomite vein cut by later thin siderite vein (brown). Note disseminated fine grained euhedral hematite (black) after
pyrite



----- = 0.1 mm

PETROGRAPHIC DESCRIPTION

Project: YUKON MINERALS CORPORATION - KETZA PROJECT

SAMPLE NO: 2

DDH: YMC 88-3

DEPTH: 26.76 m

PETROGRAPHIC NAME: Finely crystalline dolomitic mudstone

DESCRIPTION: Finely crystalline dolomite with disseminated pyrite partially altered to hematite. Very rich in air or fluid inclusions.

LITHOLOGIC UNIT: Silurian to Devonian dolomite

MAX. GRAIN SIZE (MM) in sample: -

ALTERATION:

- 1) Partial (8%) recrystallization to coarse (1 mm) carbonate.
- 2) Carbonate veins ?
- 3) Siderite veins; pyrite along siderite veins and? disseminated through rock.
- 4) Replacement of entire rock except pyrite and some dolomite by fine grained (5-10 microns) platy low birefringent material (quartz plates??)
- 5) Quartz veins - barren; overgrowths on detrital quartz may be same age.
- ?) Euhedral hexagonal mineral, partially resorbed, totally altered to a white highly reflective finegrained material (leucocene? cerussite?).

POROSITY TYPE: fracture, and intergranular

FRACTURING: dolomite, siderite and quartz filled fractures; siderite filled fractures form two sets.

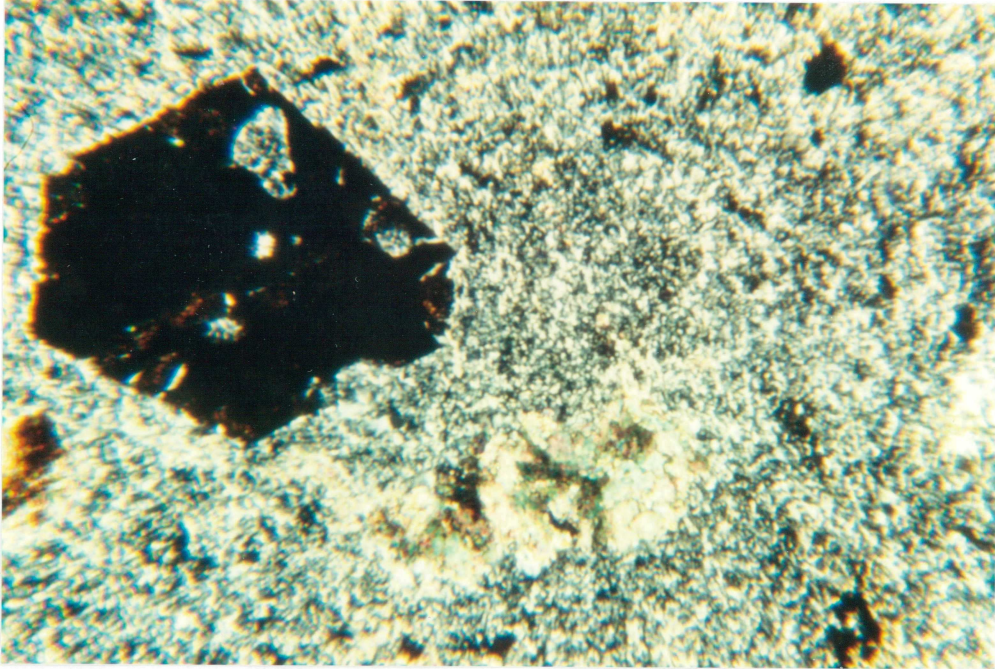
PRIMARY MINERALS

PRIMARY MINERALS	PERCENT	SIZE	COMMENTS
QUARTZ		mm	
PLAGIOCLASE			
K-SPAR			
FE-DOLOMITE			
MAGNESITE			
SIDERITE			
CALCITE			
MAGNETITE + ILM			
TOURMALINE			
ZIRCON+XENO+MONA			
RUTILE + Ti Oxides			

SECONDARY MINERALS

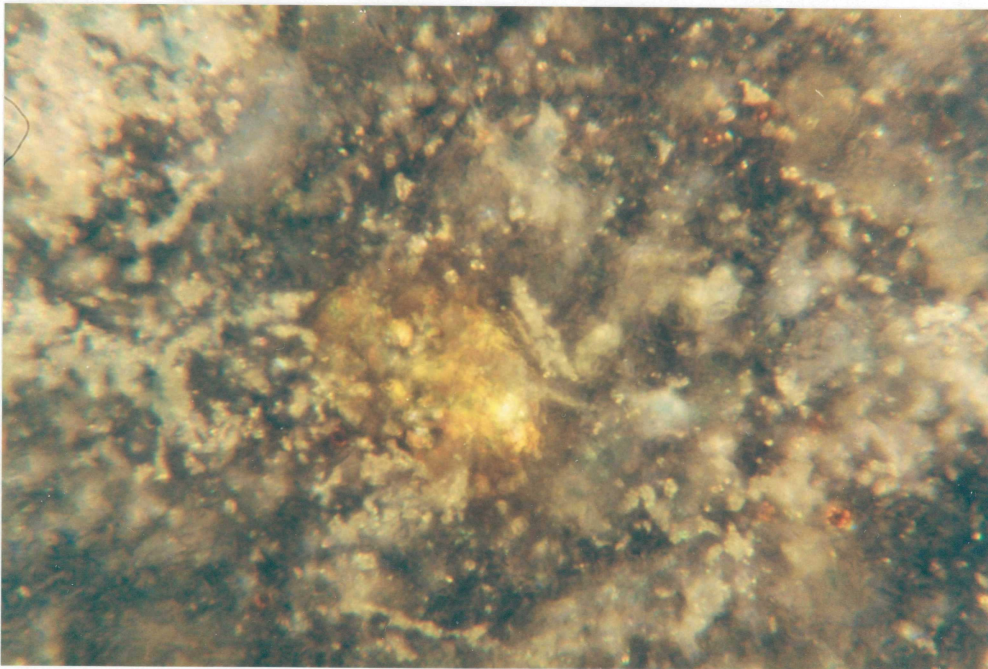
QUARTZ replacement vein, late	92? .5	.01	Fine grained, platy material replacing most of carbonate; possibly another carb. Euhedral fracture linings, crosscutting all other veins.
KAOLINITE			
ILLITE			
CARBONACEOUS MAT.	tr?		Dark intergranular debris
CHLORITE (Mg)			
DRAVITE			
HEMATITE	tr	.06	often rim on pyrite.
LIMONITE			
CALCITE			Despite staining none seen at all.
DOLOMITE Ferroan	6	.1	Most of it replaced by quartz?
SIDERITE	tr		In very thin veins that contain concentrations of pyrite grains.
PYRITE	1	.06	In former siderite veins and disseminated; altered in part to hematite
GALENA			Small amounts may be present but not distinguished from pyrite.
GREY COPPER			
MALACHITE			
ARSENIDES			
PORE SPACE			Vugs now filled by coarse dolomite.
STYLOLYTES			PERCENT VOLUME REDUCTION:

NO: 6 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE:2; 88-3 26.7m
 MAGN:50x LIGHT:trans NICHOL:in ACCES.PLATE:- EXP.TIME(sec):8
 Dolomite vein partially replaced by fine grained groundmass; hexagonal mineral (black) partially resorbed
 and totally replaced by highly reflective, high relief fine grained material.



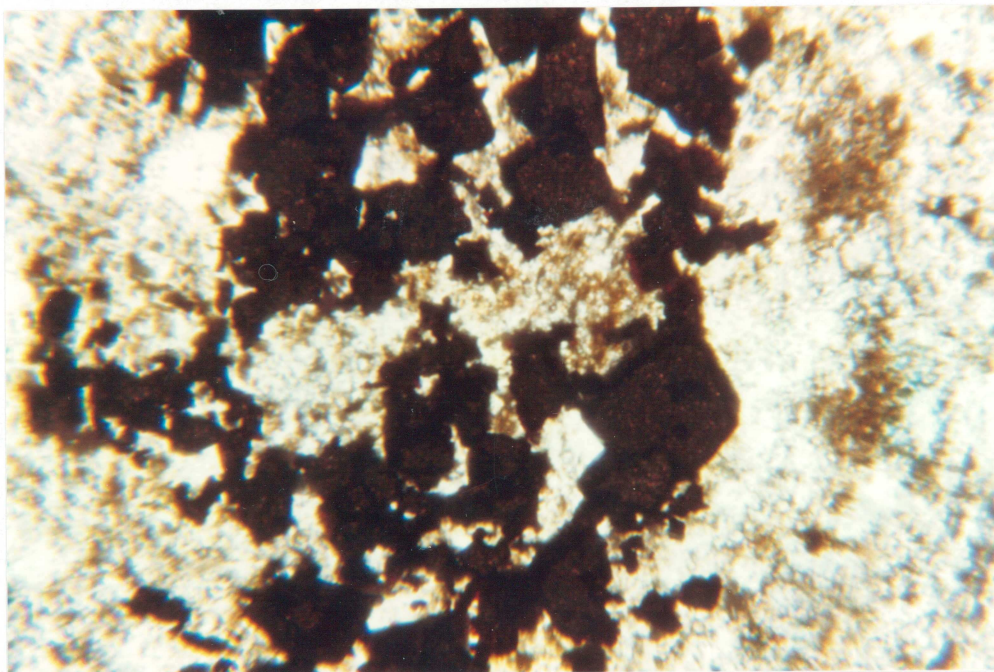
|-----| = 0.1 mm

NO: 7 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE:2; 88-3 26.7m
 MAGN:200x LIGHT:refl NICHOL:in ACCES.PLATE:- EXP.TIME(sec):8
 Yellow metallic grain, possibly not pyrite.



|-----| = 0.1 mm

NO: 8 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE:2; 88-3 26.7m
MAGN:50x LIGHT:trans NICHOL:out ACCES.PLATE:- EXP.TIME(sec):4
Layer of euhedral authigenic pyrite crystals with hematite rims.



|-----| = 0.1 mm

PETROGRAPHIC DESCRIPTION

Project: YUKON MINERALS CORPORATION - KETZA PROJECT

SAMPLE NO: 3

DDH: YMC 88-6

DEPTH: 20.56 m

PETROGRAPHIC NAME: Very coarsely crystalline dolomite

DESCRIPTION: Very coarsely crystalline dolomite with fine grained pyrite partially altered to hematite along siderite veins that mark stylolytes in some cases.

LITHOLOGIC UNIT: Silurian to Devonian dolomite

MAX. GRAIN SIZE (MM) in sample: -

HYDROTHERMAL ALT: 1) Dolomite? veins
 2) Siderite veins; pyrite along siderite veins.
 3) Dolomite? emplaced in center of siderite veins.
 4) Recrystallization of rock to very coarsely crystalline ferroan dolomite.
 5) Quartz veins - barren.
 6) Alteration of pyrite to siderite and hematite

POROSITY TYPE: fracture.

FRACTURING: dolomite, siderite and quartz filled fractures.

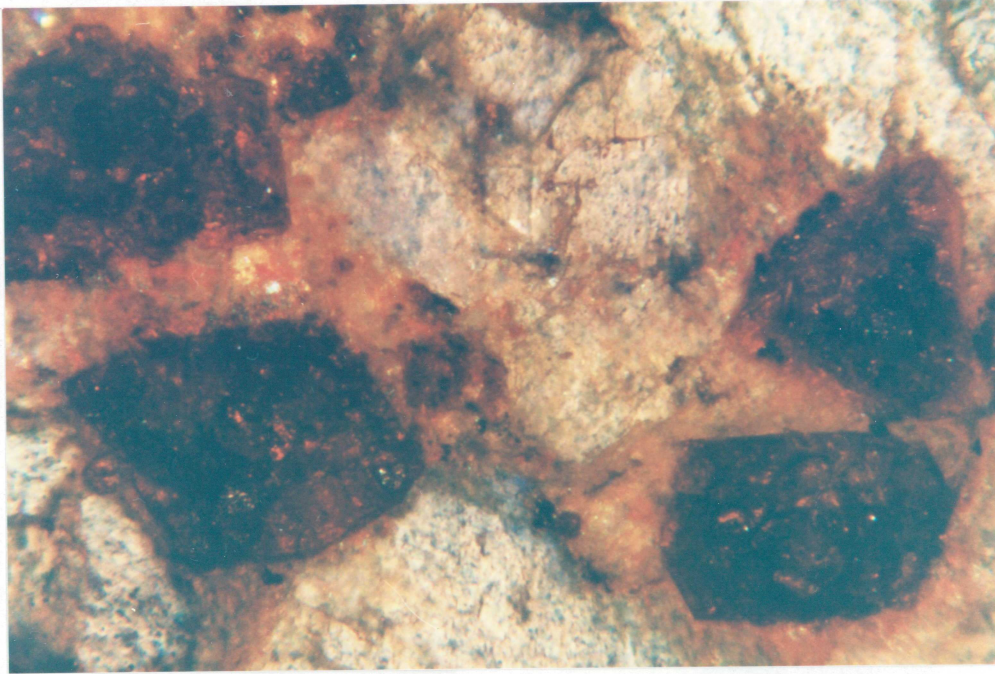
PRIMARY MINERALS PERCENT SIZE COMMENTS

PRIMARY MINERALS	PERCENT	SIZE mm	COMMENTS
QUARTZ			
PLAGIOCLASE			
K-SPAR			
FE-DOLOMITE			
MAGNESITE			
SIDERITE			
CALCITE			
MAGNETITE + ILM			
TOURMALINE			
ZIRCON+XENO+MONA			
RUTILE + Ti Oxides			

SECONDARY MINERALS

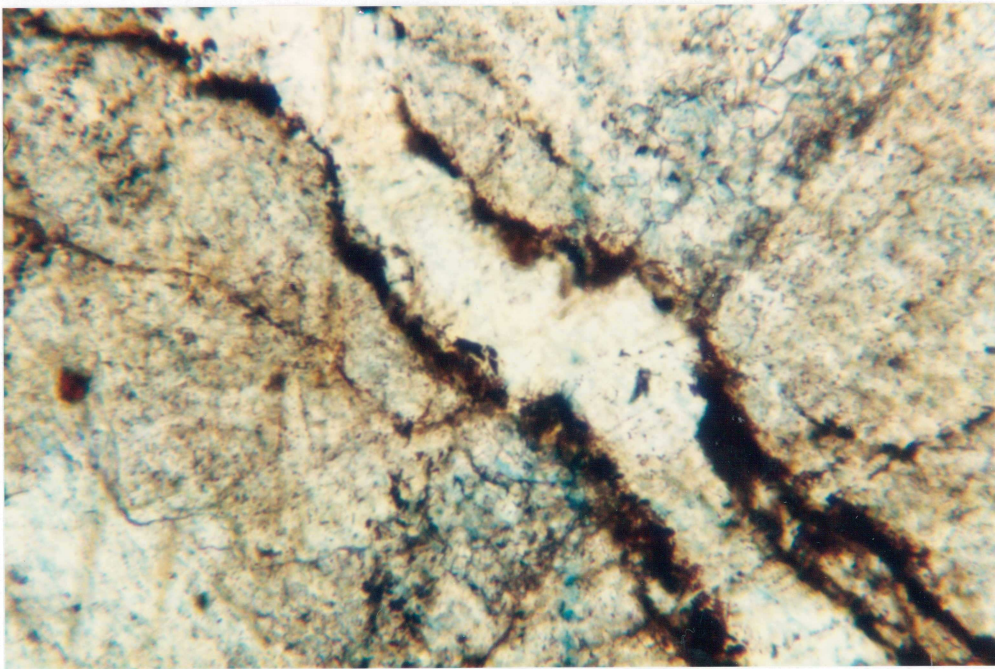
QUARTZ overgrowths			
vein, late	2		Euhedral fracture linings, crosscutting all other veins.
KAOLINITE			
ILLITE			
CARBONACEOUS MAT.	tr?		Dark intergranular debris
CHLORITE (Mg)			
DRAVITE			
HEMATITE	.2	.06	Often euhedral, often rim on siderite and pyrite.
LIMONITE			
CALCITE			Despite staining none seen at all.
DOLOMITE Ferroan	96	.1	
SIDERITE	1		In very thin veins that contain concentrations of pyrite grains.
PYRITE	1	.06	In siderite veins and disseminated; altered largely to hematite & minor siderite
GALENA			Small amounts may be present but not distinguished from pyrite.
GREY COPPER			
MALACHITE			
ARSENIDES			
PORE SPACE			
STYLOLYTES			PERCENT VOLUME REDUCTION: probably considerable

NO: 9 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE:3; 88-6 20.5m
 MAGN:100x LIGHT:refl NICHOL:in ACCES.PLATE:- EXP.TIME(sec):16
 Pyrite partially altered to hematite in thin siderite vein.



|-----| = 0.1 mm

NO: 10 PROJECT: YUKON MINERALS - KETZA PROJECT SAMPLE:3; 88-6 20.5m
 MAGN:100x LIGHT:trans NICHOL:out ACCES.PLATE:- EXP.TIME(sec):1
 First generation carbonate vein cut by siderite vein (double black lines) with dolomite core;
 all prior to recrystallization of carbonate to coarse dolomite.



|-----| = 0.1 mm

PETROGRAPHIC DESCRIPTION

Project: YUKON MINERALS CORPORATION - KETZA PROJECT

SAMPLE NO: 4

DDH: YMC 88-6

DEPTH: 37.80 m

PETROGRAPHIC NAME: Medium crystalline dolomite

DESCRIPTION: Medium crystalline dolomite with very fine to fine grained well sorted quartz sand. pyrite partially altered to hematite along siderite veins that mark stylolites in some cases.

LITHOLOGIC UNIT: Silurian to Devonian dolomite

MAX. GRAIN SIZE (MM) in sample: .2

ALTERATION: 1) Euhedral dolomite replacing sand grains
2) Microstylolites

POROSITY TYPE: fracture; along stylolites.

FRACTURING:

PRIMARY MINERALS PERCENT SIZE COMMENTS

PRIMARY MINERALS	PERCENT	SIZE mm	COMMENTS
QUARTZ	40.	.1-.2	Original sand grain boundaries removed by dolomitization.
PLAGIOCLASE			
K-SPAR			
FE-DOLOMITE			
MAGNESITE			
SIDERITE			
CALCITE			
MAGNETITE + ILM			
TOURMALINE			
ZIRCON+XENO+MONA			
RUTILE + Ti Oxides			

SECONDARY MINERALS

QUARTZ overgrowths vein, late			
KAOLINITE			
ILLITE			
CARBONACEOUS MAT.	1?		Dark intergranular debris
CHLORITE (Mg)			
DRAVITE			
HEMATITE			
LIMONITE			
CALCITE			Despite staining none seen at all.
DOLOMITE Ferroan	2	.1	Euhedral crystals replacing quartz
SIDERITE			
PYRITE			
GALENA			
GREY COPPER			
CARBONATE	57	.1	Either non ferroan dolomite or magnesite/siderite
ARSENIDES			
PORE SPACE			
STYLOLYTES			PERCENT VOLUME REDUCTION: probably considerable

SUMMARY OF THIN SECTION STUDY

The purpose of the thin section study was to identify more precisely the typical wall rock types, and to establish the regional background diagenetic alteration patterns.

The four slides showed the same basic features. The sediment at time of deposition was a siliceous carbonate mud. The amount of detrital silica varied considerably. In all slides that retained some of the original quartz there was evidence of the replacement of the detrital quartz by carbonate.

Carbonate diagenesis consisted generally of an early recrystallization of the original micrite to coarser dolomite. This process probably occurred in several stages. The carbonate is often iron-rich: ankerite or ferroan dolomite.

The earliest veining consisted in all cases of dolomite veins. These were cut by later siderite veins. The siderite is probably an alteration product of an earlier finely crystalline pyrite, which sometimes also occurs disseminated. It is also possible that the siderite formed as a primary mineral with the pyrite. In one slide dolomite is precipitated at the core of the siderite veins.

In sample No.2 from DDH YMC 88-2 the entire sample was replaced by an unidentified highly birefringent finegrained material.

The last stage, which is common to 3 of the 4 samples, is a second fracturing with fractures filled by white quartz.

TABLE 2: List of Mineral Shows, their Main Geologic Features, and Assay Results obtained during the Regional Program.

Name	Field notes	Assay Sample #	Sample type	Ag oz/t	Pb %	Zn %	Au ppb	Ag/Pb ratio	Strike	Dip to	Length m	Host rock

VERSLUCE TREND From north to south												
SE of Pownall zone 300m												
	R8-8-1		float	freibergite and malachite								Phyllite
	R7-8-2	13344	float	0.67	1.32	3.54	16	0.51				Carbonate?
	R22-8-2		grab	galena stringers					151	90	4	SD dolomite
Near BT zone												
	R20-7-4		-	altered vein material					40?	?		SD dolomite
	R20-7-7		vein	limonitic altered vein material at fault					20	?		SD dol/phyllite
Extension north of Viking zone												
	R20-7-14		vein	freibergite and malachite in qtz vein								SD dolomite
	R28-8-5		float	freibergite and malachite in qtz vein								SD dolomite
Viking	R28-8-4	13380	float	46.0	81.5	0.02	8	0.56	120?			SD dolomite
West V.	R20-7-22		float	freibergite in qtz vein material in frost heaved zone								SD dolomite
	R20-7-23		vein	limonitic zone in frost heaved material					130?			SD dolomite
Shadow	R20-7-21		float	galena freibergite and malachite in fractures								SD dolomite
PT	R18-8-1		float	Mn coating and sphalerite veinlet								SD dolomite
PT	R18-8-2		float	100 m wide zone with galena in fractures					140?			SD dolomite
PT	R18-8-4		float	galena in fractures								SD dolomite
PT1	R18-8-3		float	galena in blebs and stringers					140?	60SW		SD dolomite
Big Mnt	R19-7-12	13337	float	47.2	47.2			1.00				SD dolomite
SW PT	R18-8-7		float	galena in fractures and fault breccia								SD dolomite
NO.2NORTH	R18-8-6		vein	galena in fractures and fault breccia					008	70NW		SD dolomite
Big mtn.	R19-7-12		float	galena in fault breccia, fractures								SD dol. near dike
N.2NORTH	R19-7-15		vein	sheared and brecciated, qtz veins					350	60SW		SD dolomite
N.2NORTH	R19-7-17		vein	galena in fract. altered limonitic vein					136			SD dolomite
Between No.2 North and Big Mountain												
	R19-7-18		float	trains of vein material, qtz stockwork with limonitic fill								SD dolomite
	R21-7-3		float	fault breccia, limonitic crusts in dol in float								SD dol, ss
	R19-7-11		fractures	galena in fractures								SD dol, near dike
Northeast of Versluce vein												
	R6-8-5		ft bx	galena in breccia					90	90		SD dolomite
Ridge	R16-7-2	13326	veins	6.75	12.3	0.01	6	0.55	314	78SW		SD dolomite
Southern limit of Versluce trend, south side of valley												
	R17-7-18		float	rusty alteration at surface					22?	14SE		SD dolomite

Name	Field notes	Assay #	Sample type	Ag oz/t	Pb %	Zn %	Au oz/t	Ag/Pb ratio	Strike	Dip to	Length m	Host rock
CARIBOO TREND From north to south												
PS Area												
	R9-8-1		float	Malachite freibergite in quartz veins								SD dolomite
	R9-8-3	13346	veins	29.9	77.8	0.03	30	0.38	015	85W		SD dolomite
		13347		2.93	2.9	0.01	21	1.01				
	R9-8-6		dike	altered diabase dike					360?	50W		SD dolomite
	R9-8-7		float	freibergite in quartz vein								SD dolomite
	R9-8-8		float	galena in altered dolomite								SD dolomite
	R9-8-10		vein	galena in quartz vein, in place								SD dolomite
PS	R9-8-12	13350	grab	7.69	75.8	0.28	49	0.10	005	90	50	SD dolomite
PSS	R9-8-13	13349	float	11.7	81.0	0.01	66	0.14				SD dolomite
	R9-8-14		float	galena in quartz vein and dol								SD dolomite
	R9-8-17	13551	vein	0.3	0.63	0.005	21	0.48	140	70NW		SD dolomite
top Ray	R17-8-2		vein	qtz vein with freibergite and mal.					140	90		SD dolomite
Ray	R17-8-7	13556	vein	37.8	42.6	13.8	256	0.89				SD dolomite
		13557		26.6	55.7	11.8	191	0.48				
		13558		1.18	0.60	5.00	522	1.97				
Ray	R21-8-5		veins	galena to 20 cm thick, sphalerite					136	70NE	50	SD dolomite
Jenny s.	R28-8-1	13382	vein	10.25	11.65	5.00	18	0.88	160	90		SD dolomite
	R28-8-2		float	galena in fractures; from PT1								SD dolomite
Spur	R28-8-3	13381	float	103.0	86.6	0.01	16	1.19				SD dolomite
Spur	R6-8-17		float	galena in qtz-carbonate veins								SD dolomite
Spur	R6-8-18		vein	galena freibergite in quartz veins								SD dolomite
Cariboo	R6-8-10	13342	float	2.33	4.71	2.52		0.49				SD dolomite
Cariboo	R6-8-12		veins	galena in fractures, quartz fract. //					356	90		SD dolomite
	R6-8-13		vein	galena in fractures in dol					165			SD dolomite
	R6-8-14		vein	freibergite in qtz veins					90	40N		SD dolomite
	R6-8-15		vein	freibergite in qtz veins in limonitic zone								SD dolomite
MB	R6-8-8	13343	float	12.35	16.8	0.14	938	0.74				?phyllitic dol?
F-trench	R26-8-2		veins	galena in altered veins, zone 200m wide					140	80NE		altered SD dol?

LUCKY TREND From north to south

Max	R14-7-4	13254	float	0.28	0.45	0.03	<70	0.62				SD dolomite
Crack	R14-7-1	13251	grab	25.0	40.5	2.70	<70	0.62	142	90		SD dolomite
	R14-7-2		vein	galena in fractures					172	30E		SD dolomite
NearJill	R15-7-1		veins	galena and malachite					145	75NE		SD dolomite
Jill	R15-7-2		veins	quartz, freibergite and malachite					002	71 SE		SD dolomite
to BP	R10-7-13		veins	limonitic, at phyllite-carb boundary					330			SD dol/phyllite
BP	R10-7-7	13324	grab	28.0	39.0	0.37	234	0.72				phyllite/SD dol
				quartz plug in phyllite								

Name	Field notes	Assay #	Sample type	Ag oz/t	Pb %	Zn %	Au oz/t	Ag/Pb ratio	Strike	Dip to	Length m	Host Rock	
SHEEP TREND													
Qtz vns	R10-7-8		float	freibergite in quartz vein									?
Qtz vns	R10-7-9	13325	freib.vn	5.25	2.97	0.03	<70	1.77	325	30SW		SD dolomite	
Sheep	R10-7-10	13358	grab	50.7	18.9	4.46		2.68	60	90		SD dolomite	
		13357		1.31	0.69	1.20		1.90					
	Trench 3	77587	grab	19.95	1.87	0.62	29	10.67	170	90 ?		SD dolomite	
		77588	grab	1.55	0.72	2.85	70	2.15	170	90 ?		SD dolomite	
		77589	grab	10.1	3.65	2.59	241	2.77	170	90 ?		SD dolomite	
	Trench 2	77590	grab	not available			12		140	90 ?		SD dolomite	
		77591	grab	not available			147		140	90 ?		SD dolomite	
		77592	grab	not available			7		140	90 ?		SD dolomite	
	Trench 1	77593	grab	not available			2210		210	90 ?		Qtz bx in SD dol	
		77594	grab	not available			284		210	90 ?		Qtz bx in SD dol	
Qtz vns	R11-7-2		vein	galena in quartz vein					30	20SE		SD dolomite	
Horn	R15-8-8	13555	float	26.5	36.9	0.41	420	0.72				SD dol/phyllite	
Cirque	R21-7-10	13335	grab	111.0	77.5			1.43	028	73NW		SD dolomite	
Nose	R21-7-6		veins	galena in quartz veins, limonitic					175	80W		SD dolomite	
	R21-7-12		vein	limonitic altered vein with galena								SD dolomite	
PIKA TREND													
Pika	R17-7-9	13329	grab	1.91	4.21	0.96		0.45	142	46NE		SD dolomite	
Pass	R17-7-2	13327	grab	55.9	79.2	0.11	9	0.71	136	84SW		SD dolomite	
	R17-7-3	13328	float	1.85	0.42	2.45	-	4.40				phyllite	
NO.1 TREND													
NO.1 Zone	R26-8-3		vein	coarse galena in strikeslip fault					360	60SW		SD dolomite	
DOUBLE P TREND													
Double P	R22-8-15	13376	grab	7.25	10.1	0.02	16	0.72	020	90		SD dolomite	
Double P	R24-8-4		vein	galena in fault breccia; qtz vn in fault					020	70SE		SD dolomite	
SW end	R22-8-9		float	pyrite veins, limonitic crusts								SD dolomite	
NE side	R24-8-1		float	freibergite in quartz vein								?	
Strat	R13-7-11	13321	float	1.14	11.1	4.31	<70	0.10				phyllite	
grey phyllite		13322	float	6.58	0.87	0.22	<70	7.56				phyllite	

CERTIFICATE

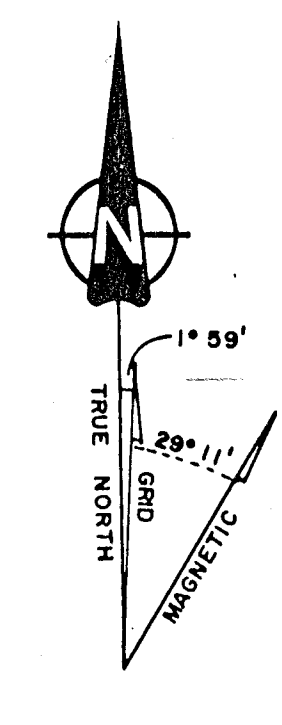
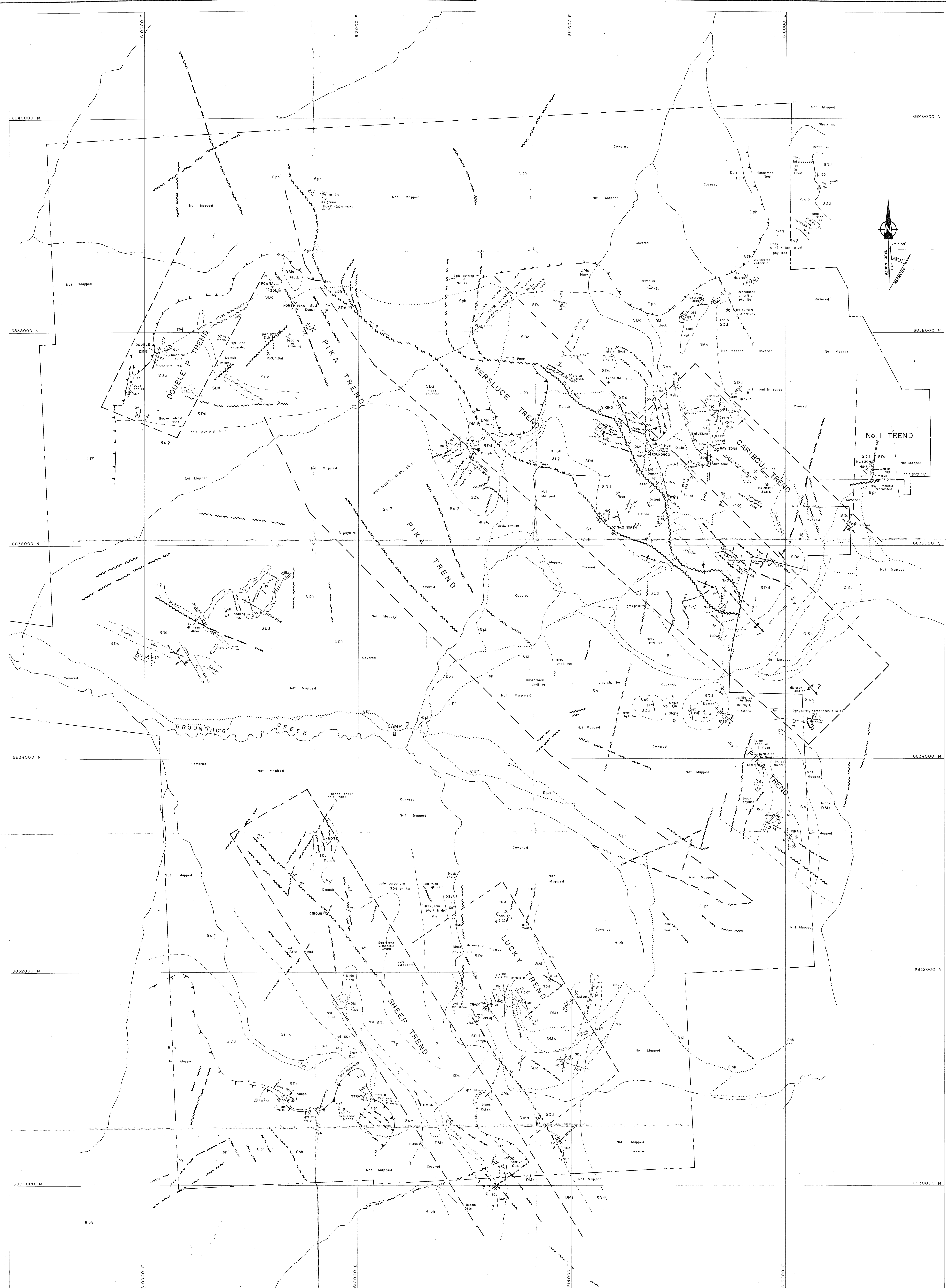
I, Paul Ramaekers, of 832 Parkwood Drive, S.E., Calgary, Alberta, hereby certify that:

- 1) I am a geologist and hold a Bachelor of Science (1967) and a Doctor of Philosophy degree (1975) in geology from the Department of Geological Sciences from the University of Toronto,
- 2) that I have taught as a Special Lecturer in the Geology Department of the University of Regina (1974-1975),
- 3) I have been a Senior Research Geologist at the Geological Survey of Saskatchewan (1975-1981),
- 4) that I have been Chief Sedimentary Geologist in the Research Division of Saskatchewan Mining and Development Corporation (1981-1984), and have done contract work for various mining and oil companies since then;
- 5) I am a member in good standing and a Fellow of the Geological Association of Canada, a member of the Society of Economic Paleontologists and Mineralogists, and a member of the International Association of Sedimentologists;
- 6) that I have no interest, directly or indirectly, in the Ketz property described in this report, nor in any neighbouring properties, nor do I expect to receive any,
- 7) I have no financial interest in Yukon Minerals Corporation or Perrex Resources Inc.
- 8) this report is based on personal examination of the property described during the time specified in this report, and on related information found in government and scientific publications in the public domain,

Dated at Calgary the30.....th day of November, 1988.

Paul Ramaekers

Paul Ramaekers, Ph.D., F.G.A.C.



REVISIONS	STRATIGRAPHY	CARBONATE LITHOFACIES	LEGEND	SYMBOLS
	Tv Cretaceous and Tertiary Dark green, fine grained siltite bearing mafic dikes, flows and sills.	Dph Dolomite, phylitic		(Photoincrement, probably faults, a few may represent bedding)
	DMs/Late Devonian and Mississippian Block shale, phyllite, chert conglomerate.	Damp Dolomite, with prominent Stromatopora, etc. Amshelera		Geological Contact: defined, approx. or assumed
	SDd Silurian, Early and Middle Devonian Buff, grey and red weathering dolomite, often siliceous, with silty and sandy interbeds, in places carbonaceous.	Daxd Dolomite, with prominent crossbedding, usually siliceous.		IFault, steeply dipping: defined, approx. or assumed
	Ss Silurian Grey weathering silty, finely laminated dolomitic siltstone.	Datz Dolomite, siliceous, in places terrigenous.		Thrust fault: defined, approx. or assumed
	OSs Ordovician and Silurian Black graphitic shale, minor chert.			IBedding, strike, dip
	Eph Late Cambrian P or Older Grey buff, brown weathering, finely laminated calcareous phyllite.			IFault, strike, dip
	Cv Cambrian P or Tertiary/Cretaceous Dark green mafic flows on sills.			JBedding, strike, plunge
				ICreek
				IMineral show
				IClim Boundary: Surveyed, approximate

TO ACCOMPANY REPORT BY P. PIRMEKERS, P.L.C. NOVEMBER 30, 1988

YUKON MINERALS - PERREX JV.

KETZA PROJECT
GROUNDHOG CREEK, YUKON TERRITORY
LAT. 61° 37' N, LONG. 132° 52' W, NTS 103 F/10

Scale 1:10,000
METERS 0 100 200 300 400 500 600 700 800 900 1000 METERS
FEET 0 100 200 300 400 500 600 700 800 900 1000 FEET

KETZA PROPERTY GEOLOGY

DATE: NOVEMBER 30, 1988 TECH: P.R. DWG No. _____
DRAWN BY: POLARIS CONSULTING, R.H. MAP 1

