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LOG NO: 0111 RD.
ACTION:

FILE NO:

REPORT ON A GEOLOGICAL AND GEOCHEMICAL SURVEY on the CAY PROPERTY INCLUDING CAY #1 TO CAY #13 CLAIMS

Liard Mining Division

Longitude	123° 55' W
Latitude	55° 45' N
NTS Map	94G/12

OWNER:	Equinox Resources Ltd.
OPERATOR:	Equinox Resources Ltd.
CONSULTANT:	Beaty Geological Ltd.
AUTHORS:	D. G. Leighton, B.Sc., F.G.A.C. J. A. Pell, Ph.D., F.G.A.C.
SUBMITTED:	6 January 1987

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1. SUMMARY

The Cay property is a lead-zinc-germanium prospect located in the northern Rocky Mountains of British Columbia. It consists of 13 claims (168 units) owned by Equinox Resources Ltd. The claims are 55 kilometres west of Trutch on the Alaska Highway between the Muskwa and Prophet Rivers. A road extends towards the property from Trutch a distance of 12 km, and it could be extended.

The property is underlain by a well bedded sequence of strata which includes: limestones, dolomite, shales, sandstone, cherty limestone and thick bedded black chert. These rocks range between Silurian and Triassic in age.

Work carried out on the property after it was identified as an important germanium target in early 1986 has involved: orientation geochemical work; prospecting and preliminary geological mapping in the fall of 1986; detailed geochemical surveys; mapping; geophysical work; trenching; and diamond drilling in 1987.

Showings consist of numerous zinc-lead occurences found at or near the contact of Middle Devonian Dunedin Fm. limestone with Besa River Fm. shales and Stone Fm. limestone. Mineralization occurs on both limbs of a tightly folded anticline. Sampling has yielded assays of up to 13 percent zinc over several metres and showings occur over a strike length in excess of 15 kilometres.

Zinc occurs as the mineral sphalerite which itself contains exceptionally high levels of germanium. Zinc concentrate from the Cay property contains 0.03% gallium and 0.25% germanium on average. The gallium and germanium occur within the sphalerite latice and in the mineral germanite which is present as inclusions in sphalerite. Assuming current values for these elements the trace element content would add over $1100 (U.S.) to the gross value of any sphalerite produced in ore concentrate.

Excellent potential exists for delineating ore reserves by drilling down dip and along strike from mineralized exposures on the Cay property.

2. INTRODUCTION

In 1986 Beaty Geological Ltd. launched a gallium-germanium exploration program. The object was to identify mineral prospects in the Western Cordillera of North America with previously unrecognized potential to be significant gallium and/or germanium sources. Attention was focused on zinc properties. It was hoped that a sub-economic deposit would be found which could be elevated to an economic category by virtue of its trace element gallium and germanium content.

The program involved an extensive literature search followed by the sampling of over three hundred deposits and prospects.

Although several of these were found to have anomalous values in gallium and/or germanium, one exceptional property, the Cay, located in the Rocky Mountains of northeastern B.C., was identified.

An exploration program was carried out on the Cay property in the fall of 1986 and summer and fall of 1987. The 1986 work consisted of preliminary geologic mapping, geochemical orientation work and prospecting. In 1987 an integrated exploration program was carried out starting with detailed grid controlled geological, geochemical and geophysical surveys followed by trench sampling and diamond drilling. The program was augmented through metallurgical studies on a bulk sample, petrological work and a study of fossils from the property.

It has been determined that sphalerite from the Cay prospect averages 0.25% Ge and 0.034% Ga. This is very high indeed. By comparison the richest source of germanium in a zinc concentrate currently being mined is Pennarroya's St. Salvy mine in France, which contains about 0.07% Ge. Equally significant is the size potential of the Cay. Mineralization has been traced for over 15 kilometres in a geological environment analogous to that of a classic petroleum trap. Furthermore "ore" from the property is metallurgically clean and the economics of extraction appear close to ideal.

This report contains a summary of work completed to date on the Cay property and recommendations for the next stage of work.

3. ACKNOWLEDGEMENTS

The writers would like to acknowledge work by others which has assisted in the development of the Cay property. Bruce Mawer of Cominco Ltd. should be credited with discovery of the deposit. Apart from the writers, a number of other field personnel contributed to the unraveling of field relations leading toward an understanding of geology and mineralization controls. Other geologists who worked on the property at various times include Ross Beaty, Diane Howe and John Knox. We would particularly like to acknowledge the work done by John Knox who contributed significantly to geologic interpretation as well as to operations in general.

4. HISTORY

The discovery of lead-zinc mineralization by Arrow Inter-America Corp. near Robb Lake in 1971 sparked a staking rush in the northern Rocky Mountains of B.C. that led to the recognition of a new lead-zinc belt. Numerous showings were discovered though few were sufficiently large or rich enough to merit further development.

The original discovery at Robb Lake contains a proven reserve of about six million short tons of 7.3% combined lead-zinc. Other significant prospects include ones located at Mt. Burden, Nabesche River, Mt. McCusker, Redfern Lake and Richards Creek. A considerable amount of exploration work was devoted to these and other prospects in the early 1970's.

Cominco Ltd. was actively involved in the Robb Lake exploration rush and staked a number of properties including Richards Creek mentioned above. About 15 kilometres north of Richards Creek, Bruce Mawer, a Cominco geologist, discovered high grade lead-zinc mineralization associated with barite at the contact of Dunedin limestones with Besa River shales. Fifty-four claims were staked by Cominco to protect the area of interest. The Cominco work program included soil geochemistry and geological mapping in 1972 and 1973. The original claims were abandoned in 1974 and allowed to lapse.

5. PROPERTY

5.1 Location and Access

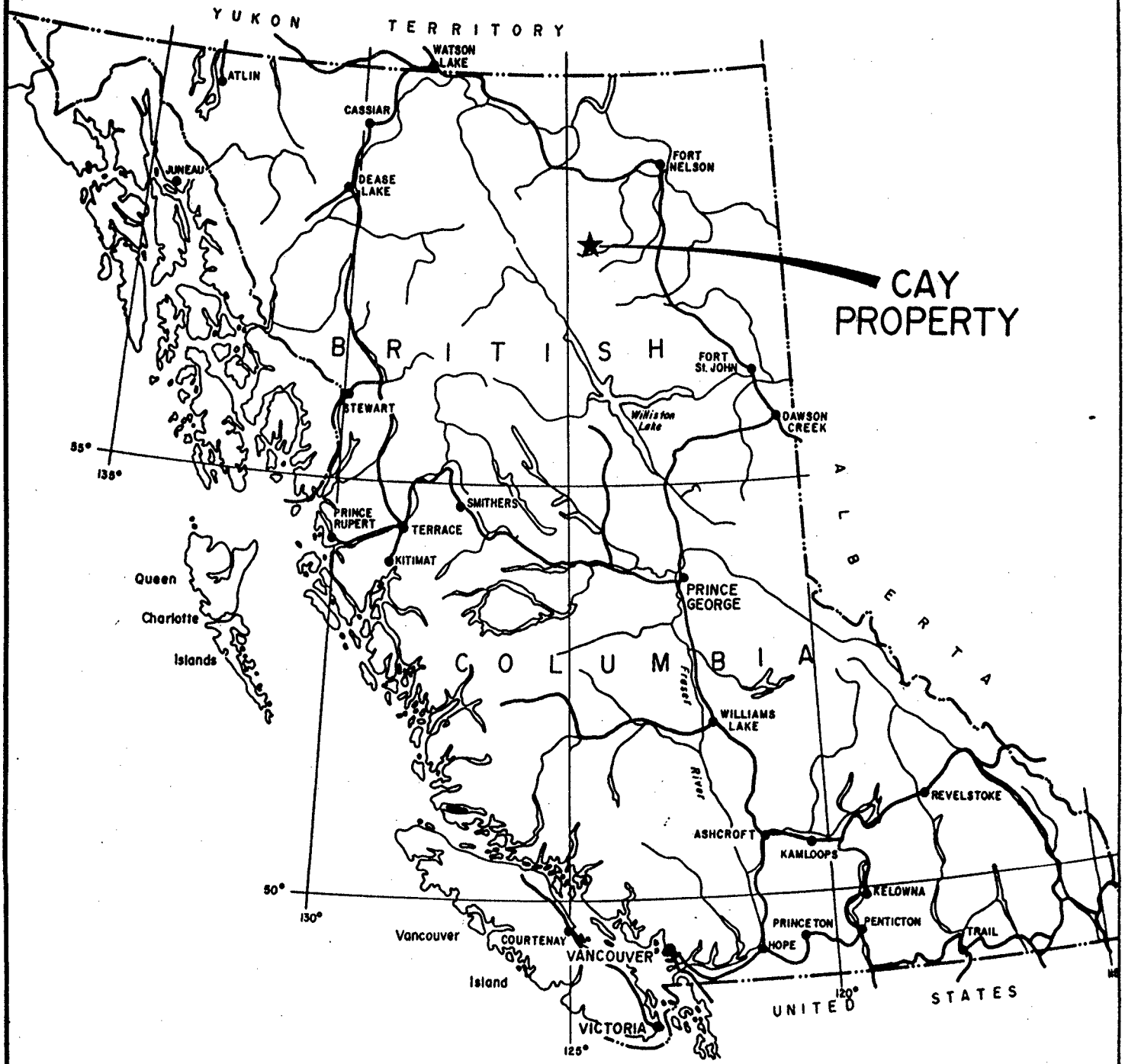
The Cay property lies between the Prophet and Muskwa Rivers in the Rocky Mountains of northeastern B.C. Topographic coordinates for the centre of the claim block are approximately $57^{0}45'$N latitude, $123^{0}55'$W longitude. Elevations range between 900 and 1700 metres. The principal showings occur about tree line which occurs at 1500 metres (5,000 ft.) in this area.

Practical access for purposes of exploration is by means of helicopter. The nearest significant town is Fort Nelson which is 50 kilometres to the northeast. Fort St. John, a major supply point, is 260 kilometres to the southeast. The most convenient staging point is Trutch, about 40 kilometres east of the Cay property on the Alaska Highway. It would be relatively easy to extend a road to the property from the Alaska Highway.

5.2 Ground Control

The Cay property covers an area of approximately 4200 hectares in a relatively remote semi-mountainous area. Ground control during 1986 was provided by a combination of standard 1:50,000 topographic maps, government aerial photographs and a "loose" topofil grid now referred to as the "old grid". This proved adequate for orientation geochemical work, prospecting purposes and establishing the overall geologic picture.

The 1987 program required relatively precise ground control. Eagle Mapping Services Ltd. of Port Coquitlam, B.C. were contracted to prepare a 1:5,000 scale topographic map with 10 metre contours of the southern half of the claims - the priority target region. This map was produced from aerial photographs.



BEATY GEOLOGICAL LTD.

CAY PROPERTY
LOCATION MAP

PROJECT: GAGE	PROJECT No. 169
DATE: JAN-1987	FIGURE No. 1.

Also, a new grid was surveyed over a key portion of the property. The baseline for the new grid runs parallel to geologic structure (020^0 a.s.t.). Stations were placed at 25 metre intervals on lines spaced 100 metres apart. While the old grid was measured with a hip chain the new grid was carefully chained out and "slope corrected" using inclinometers. Drill hole collars are located relative to stations in the new grid system.

6. CLAIMS (See Fig. 2)

The Cay property, owned by Equinox Resources Ltd. of Vancouver, B.C., consists of thirteen metric claims comprising one contiguous block. The claims have been grouped, for assessment purposes, as follows:

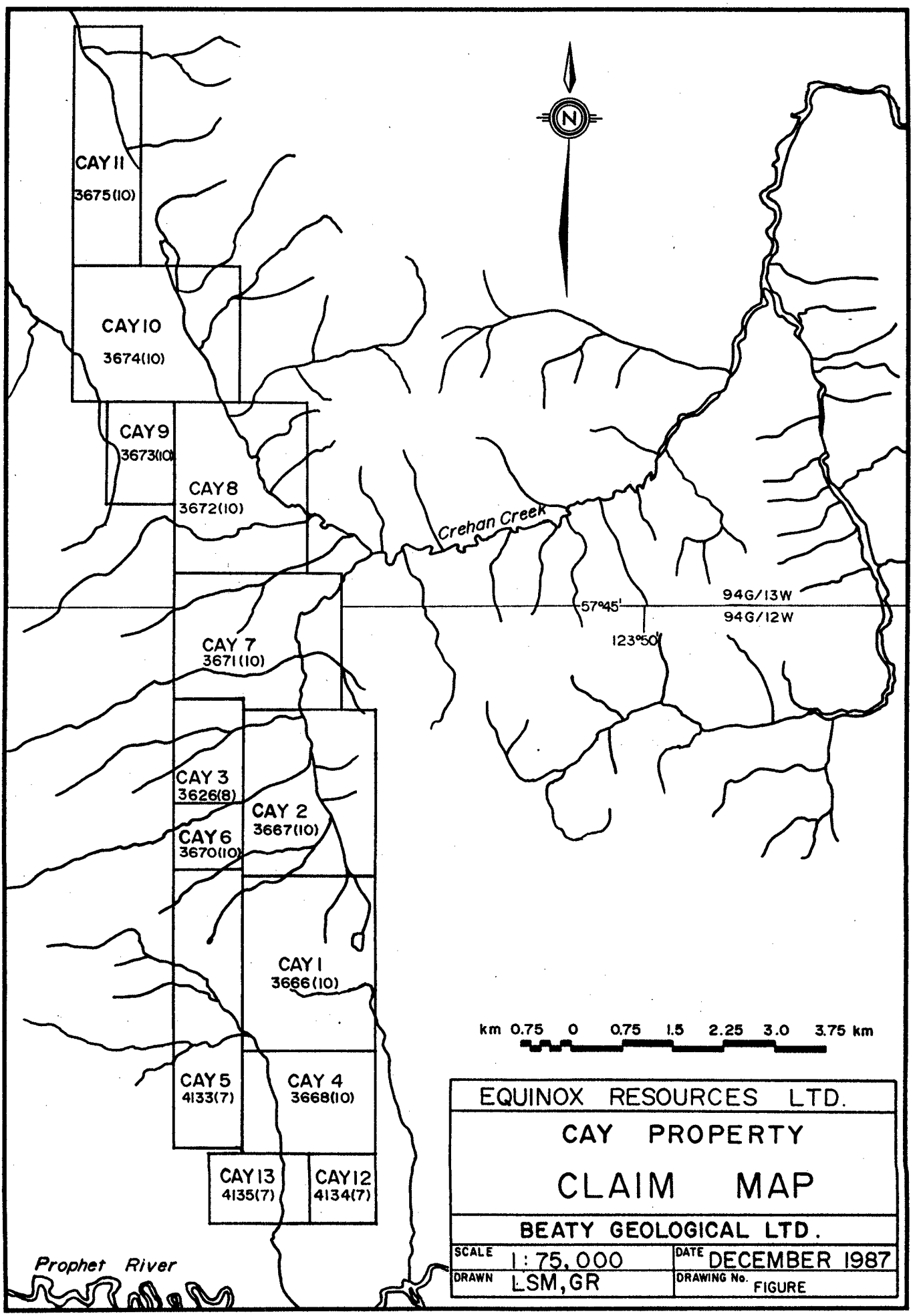
a) North Group

Claim Group	Units	Record No.	Record Date	Expiry Date
Cay 3	6	3626	25 Aug. 86	25 Aug. 89
Cay 6	4	3670	7 Oct. 86	7 Oct. 89
Cay 7	20	3671	7 Oct. 86	7 Oct. 89
Cay 8	20	3672	7 Oct. 86	7 Oct. 89
Cay 9	6	3673	7 Oct. 86	7 Oct. 89
Cay 10	2	3674	7 Oct. 86	7 Oct. 89
Cay 11	14	3675	7 Oct. 86	7 Oct. 89

b) South Group

Claim Group	Units	Record No.	Record Date	Expiry Date
Cay 1	20	3666	7 Oct. 86	7 Oct. 89
Cay 2	20	3667	7 Oct. 86	7 Oct. 89
Cay 4	12	3668	7 Oct. 86	7 Oct. 89
Cay 5	16	4133	28 July 87	28 July 90
Cay 12	4	4134	28 July 87	28 July 90
Cay 13	6	4135	28 July 87	28 July 90

The Cay mineral claims are all located in the Liard Mining Division. There are 90 units in the North Group and 78 units in the South Group.


CAY 11
3675(10)
CAY 10
3674(10)
CAY 9
3673(10)
CAY 8
3672(10)
Crehan Creek
57°45'
123°50'
94G/13W
94G/12W
CAY 7
3671(10)
CAY 3
3626(8)
CAY 2
3667(10)
CAY 6
3670(10)
CAY 1
3666(10)
CAY 5
4133(7)
CAY 4
3668(10)
CAY 13
4135(7)
CAY 12
4134(7)
Prophet River
N
km 0.75 0 0.75 1.5 2.25 3.0 3.75 km
EQUINOX RESOURCES LTD.
CAY PROPERTY
CLAIM MAP
BEATY GEOLOGICAL LTD.
SCALE 1:75,000
DATE DECEMBER 1987
DRAWN LSM, GR
DRAWING No. FIGURE

7. GEOLOGY

7.1 Regional Geology

In the Rocky Mountains of northeastern British Columbia, between the Peace and Muskwa rivers, an Upper Silurian (?) and Lower to Middle Devonian platform carbonate succession, which is approximately 1500 metres in thickness, is exposed. The succession comprises, in order of decreasing age, the Muncho-McConnel and Stone Formations, which consist almost entirely of dolomite and sandy or argillaceous dolomite and the Dunedin/Pine Point/Sulphur Point and Slave Point Formations, which contain dolomites, limestones and dolomitized limestones (MacQueen and Thompson, 1978). The carbonates give way laterally, to the north and west, to deeper water shales, siltsones and carbonaceous limestones of the Besa River Formation. Most of the lead-zinc showings in the northeastern Rocky Mountains occur within the carbonate succession, near the platform margin, ie. the carbonate-shale facies boundary (MacQueen and Thompson, 1978). The lead-zinc showings, the best known of which is the Robb Lake deposit after which the belt is named, may occur in any of the above formations.

The characteristics of the lead-zinc deposits in northeastern British Columbia may be summarized as follows:

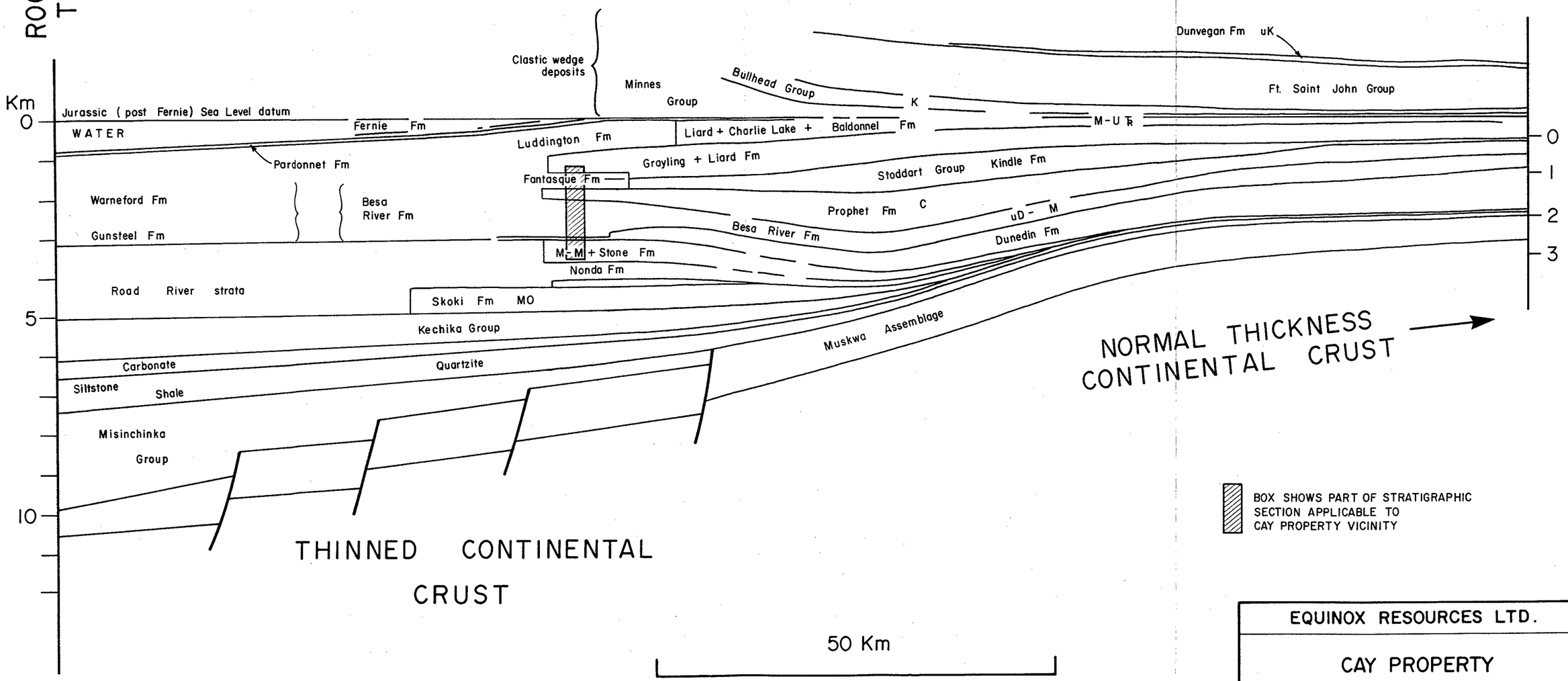
a) Mineralization occurs in a variety of textures and spatial settings, for example as part of a breccia matrix, as vein and fracture filling, as fine grained replacements of host carbonates, as open-space (eg. vug) fillings or as massive, coarsely crystalline pods with uncertain relationships to the host rocks (MacQueen and Thompson, 1978).

b) None of the occurrences show evidence of solution of carbonate on any sigificant scale, nor do they show evidence of control by overlying unconformities (MacQueen and Thompson, 1978).

c) There is no obvious evidence of control of mineralization by late Mesozoic-Tertiary tectonism (MacQueen and Thompson, 1978).

d) The main ore minerals present are sphalerite and/or galena (average ratio of 10:1), with some pyrite of marcasite. The main gangue minerals are sparry white dolomite, bitumen and quartz (MacQueen and Thompson, 1978).

e) Barite and fluorite do not appear to be closely associated with the lead-zinc mineralization (MacQueen and Thomson, 1978).



EQUINOX RESOURCES LTD.

CAY PROPERTY

REGIONAL STRATIGRAPHY

NORTHERN ROCKY MOUNTAINS, B.C.

BEATY GEOLOGICAL LTD.

PROJECT. GAGE	PROJECT No. 169
DATE. DECEMBER 1987	FIGURE No. 3

Although it has not been unequivocally established, some workers (MacQueen, 1976; MacQueen and Thompson, 1978) believe that mineralization took place long after deposition of the host rocks, possibly during early Mesozoic times, synchronous with maturation of hydrocarbons.

Folds with relatively minor thrust faults dominate the structural style of the northern Rocky Mountains, whereas thrusting dominates the southern Rockies.

7.2 Property Geology

7.2.1 Stratigraphy

The Cay property is the most northerly of the lead-zinc showings in the Robb Lake belt. The area is underlain primarily by the Stone, Dunedin and Besa River Formations of late Silurian (?) to upper Devonian age (Figure 3 and 4). On the eastern side of the property, sandstone, cherty limestone and black chert of probable Mississippian or Permian age, disconformably overlain by dark grey shales of the Triassic Greyling Formation (Leighton, 1987). These strata may be in fault contact with the Devonian sequence (Leighton, 1987).

On the Cay property, the Stone Formation is the oldest outcropping unit. Its base is not exposed. Lithologies consist primarily of medium to thick bedded, laminated (algal?) dolostones which are light grey in colour. Metre thick horizons of sandstone and sandy dolomite occur in the lowest beds exposed. The upper few tens of metres of Stone Formation strata on the Cay property consist of limestones or partially dolomitized limestones and, locally, sandy limestones. These lithologies were probably deposited in a shallow water, near shore lagoonal environment (Danner, 1986).

The Stone Formation is conformably overlain by the Dunedin Formation. The contact was chosen at the break between medium bedded, laminated non-fossiliferous limestones and the overlying thin, wavy bedded, medium grey fossiliferous Dunedin limestones (Plate 1). Mineralization commonly occurs at or near this contact. The Dunedin Formation on the Cay property is 10 to 25 metres thick. It contains abundant coral, brachiopod, crinoid and bryozoan fragments in a matrix of lime mud which is locally dolomitized. These strata were likely deposited in a back-reef environment (Danner, 1986).

The Dunedin Formation is overlain, with apparent conformity, by black carbonaceous and locally calcareous shales of the Besa River Formation, which were deposited in deeper water and are representative of a basinal facies. These shales contain pyrite framboids and host some minor copper showings (Leighton, 1987). The top of this unit is not exposed on the property.

7.2.2 Structure

The predominant structure in the area of economic interest on the Cay property is a plunging anticline (Figure 4). Stone Formation strata are exposed in the core of this structure; Dunedin and Besa River formations outcrop along the limbs. The major creeks on the property dissect the anticline approximately perpendicular to its axis and therefore provide cross-sections through the various units. The anticline is an upright box fold with angular hinges, steeply dipping limbs and a shallow east-dipping crest region (Plate 2, Figure 4). It is a slightly conical fold, with a small half apical angle; bedding data do not best fit a great circle girdle distribution (Appendix IV, Structural Data Analysis). The axial plane is subvertical and strikes northerly (350°). The fold plunges at approximately eight degrees towards the south (170°), and opens in that direction, exposing progressively higher sections towards the south end of the property. Near the southern limit of outcrop (Figure 4), mineralization which occurs along the Stone/Dunedin Formation contact is exposed in the crest of the fold, which dips parallel to topography and results in a large area of mineralized outcrop (Figure 4). Subsurface exploration potential exists to the south of the limit of outcrop. Although no evidence exists at surface, drilling results indicate that, locally, some faulting occurs along the eastern limb of the anticline (Figure 7); east-side-down displacements in the order of 10 to 12 metres have occurred along steeply dipping breccia zones.

Flanking the central anticline are marginal synclines in which Besa River shales are exposed. To the west of the property, a thrust fault places Stone and Dunedin Formation carbonates on the Besa shales. A second thrust fault is present on the eastern portions of the Cay 7, 8, 10 and 11 claims, its trace paralleling Crehan Creek, marked by a scarp line of black chert and dirty limestone (Leighton, 1987). This fault places the mineralized Devonion strata upon younger rocks. To the south, the displacement along this fault is apparently transferred to a series of folds (see GSC Open File Map 606).

7.2.3 Mineralization

The lead-zinc showings on the Cay property are carbonate hosted and stratabound, ie. confined predominantly to a single stratigraphic horizon with only minor crosscutting relationships. Mineralization generally occurs along the contact between the fossiliferous Dunedin Formation, which is quite porous and permeable, and the Stone Formation, which is a much less permeable unit. The basal beds of the Dunedin Formation are commonly brecciated and mineralizaed; less commonly the mineralization crosscuts Stone Formation strata. The Dunedin Formation on the property is relatively thin, and therefore mineraliztion generally occurs within a few metres, stratigraphically, of the overlying Besa River shales. The mineralized horizons occur as two parallel bands which converge towards the south end of the property, outlining the major anticline (Figure 4).

Plate 1. Contact between the Stone and Dunedin formations as exposed on the south bank of Alpha Creek, west limb of the anticline. Photo facing south. Strata are west dipping. Medium to thick bedded Stone Formation strata are expose on the east (left) and thin bedded Dunedin limestones on the west (right) end of the outcrop. The person in the center of the photograph is standing above the contact. This is the one location on the property where the contact is exposed and mineralization absent.

Plate 2. The Cay property anticline, outlined by Stone Formation strata. This outcrop occurs on the south side of Gamma Creek, and the photograph is taken facing south. The anticline is an upright box fold, with steep dipping limbs, a shallow dipping crest region and subangular hinges.

Plate 3. Silicified Type 1 mineralized horizon exposed on the north band of Alpha Creek, photographed looking north. Mineralization occurs in the apparently massive, dark grey, resistant unit which comprises the outcrop

Plate 4. Malachite/azurite (turquoise) on the weathered surface of outcropping Type 1 mineralization, Alpha Creek.

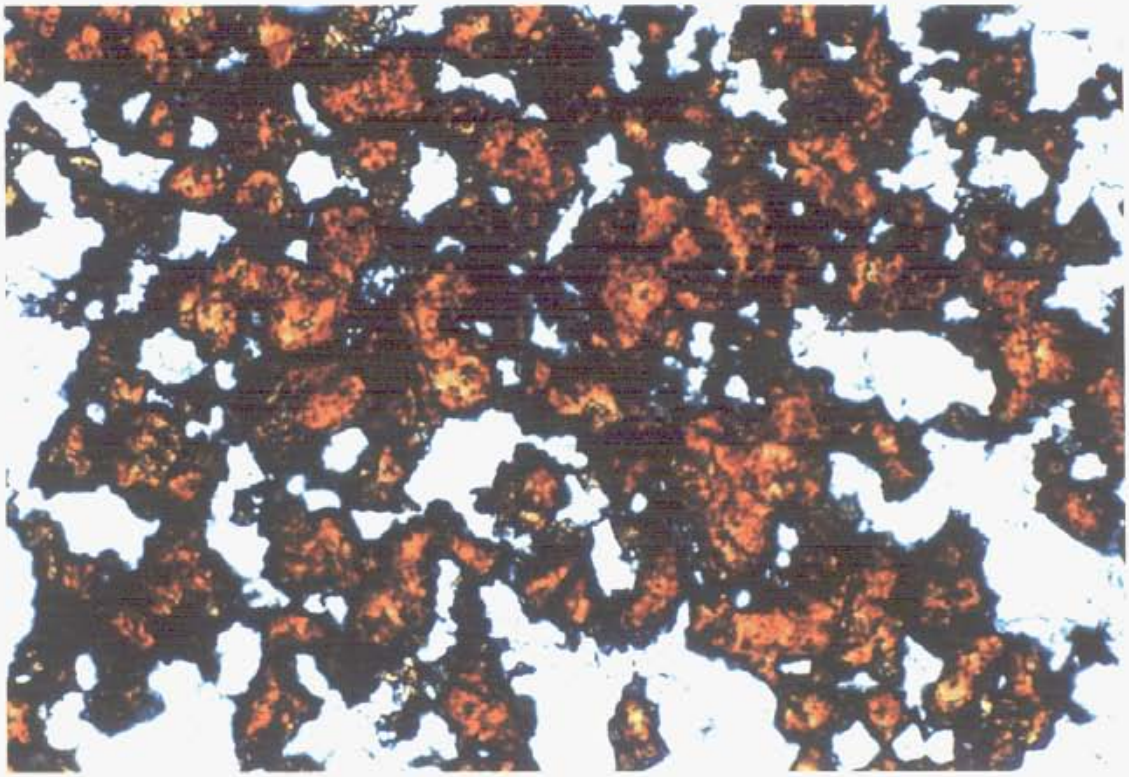
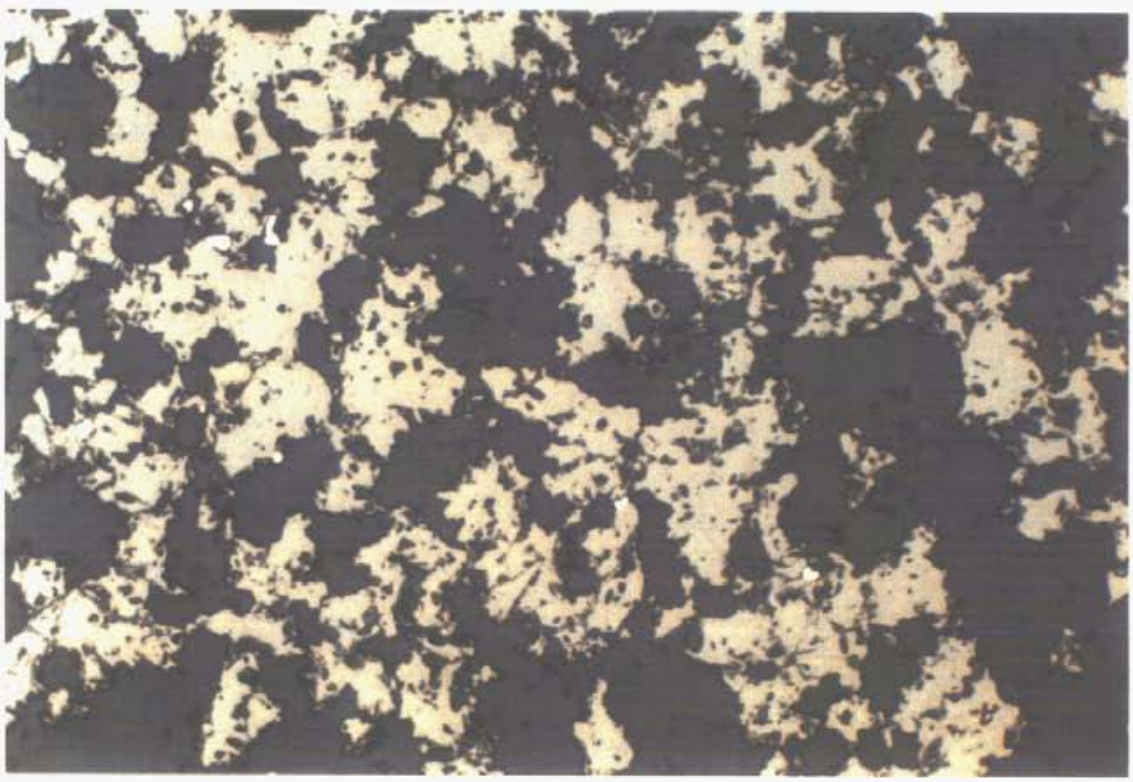


Plate 5a. Fine grained reddish-orange sphalerite in quartz, typical of Type 1 mineralization, viewed with transmitted light. Scale is 1 cm = 85 microns.

Plate 5b. Same section, reflected light. Dark grey material is quartz, light grey is sphalerite and highly reflective yellowish white grains are pyrite. Scale as above.



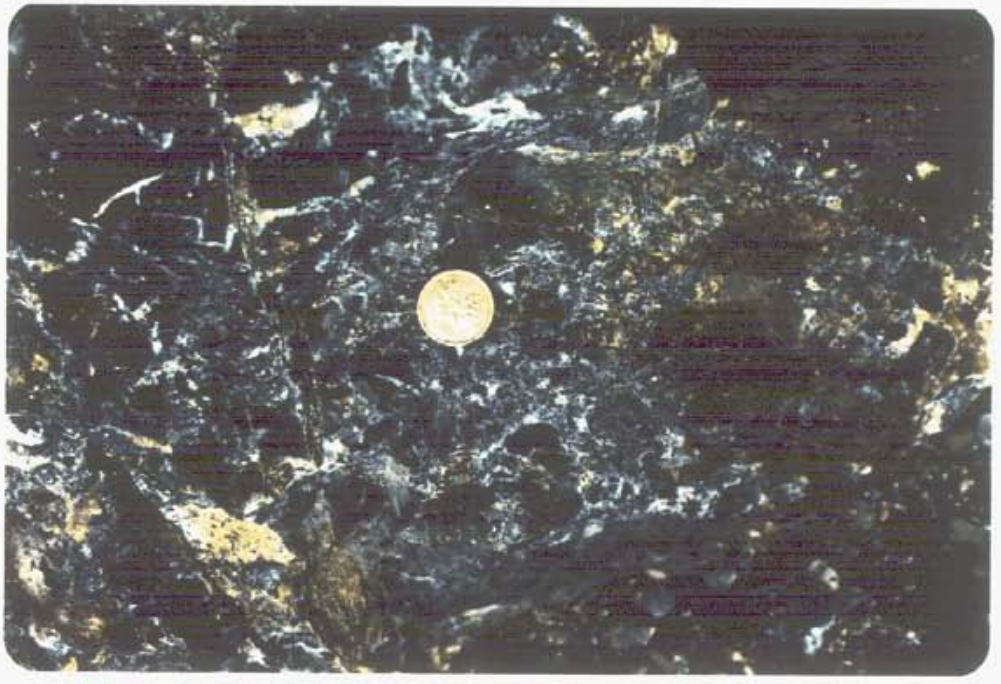


Plate 6. Silicified breccia, Type 1 mineralization. Dark silicified fragments in a quartz, bitumen, galena +/- sphalerite matrix (lighter coloured). Some crosscutting barite veins present.

Plate 7. Gradational upper contact of Type 1 silicified zone, north of Alpha Creek, photo facing north. Dark grey silicified limestones with bedding preserved exist from the level of the hammer, downsection. The light grey beds, exposed in the upper portion of the photograph are unaltered Dunedin Formation strata.

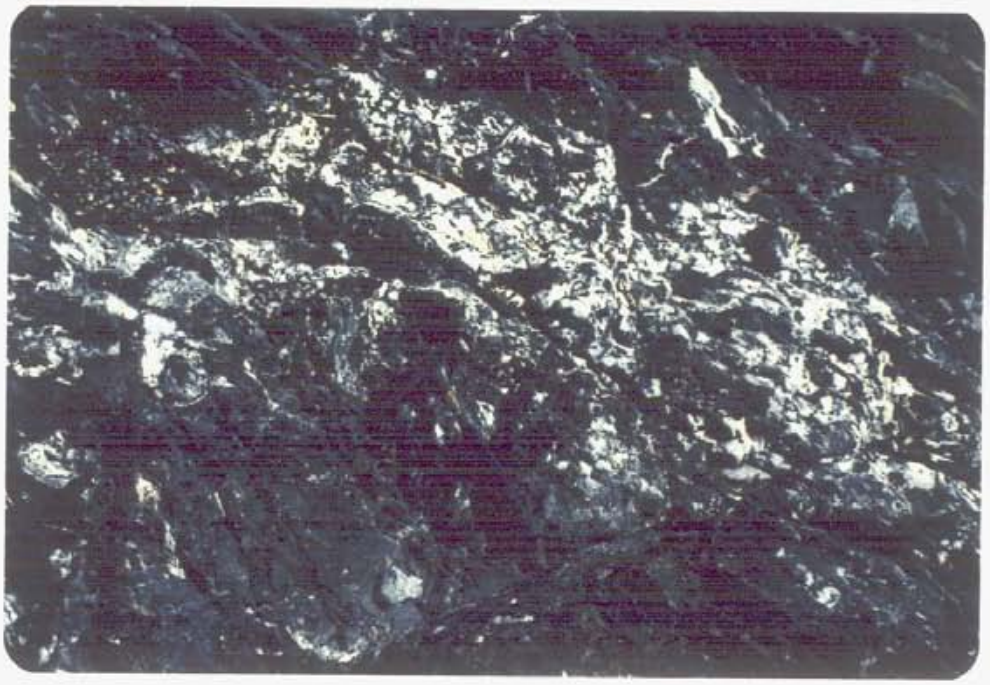


Plate 8a. Massive white barite replacement and veining (Type 2 mineralization) superimposed on black silicified Type 1 alteration. This outcrop occurs on the west limb of the anticline, north side of Gamma Creek.

Plate 8b. Massive white barite replacement (Type 2 mineralization) in Stone Formation. Note the "islands" of unaltered carbonate within the barite and the fact that the bedding is continuous and uninterrupted between the "islands" and host strata. This photograph was taken facing north, the outcrop is on the west limb of the anticline, north of Alpha Creek, a few meters downsection of Plate 2.

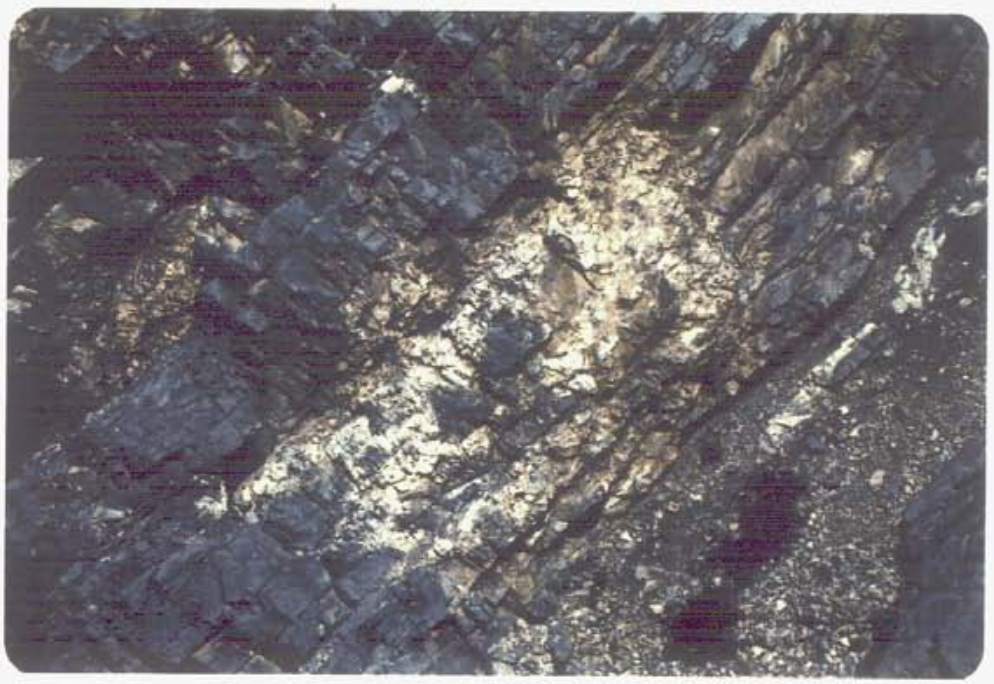
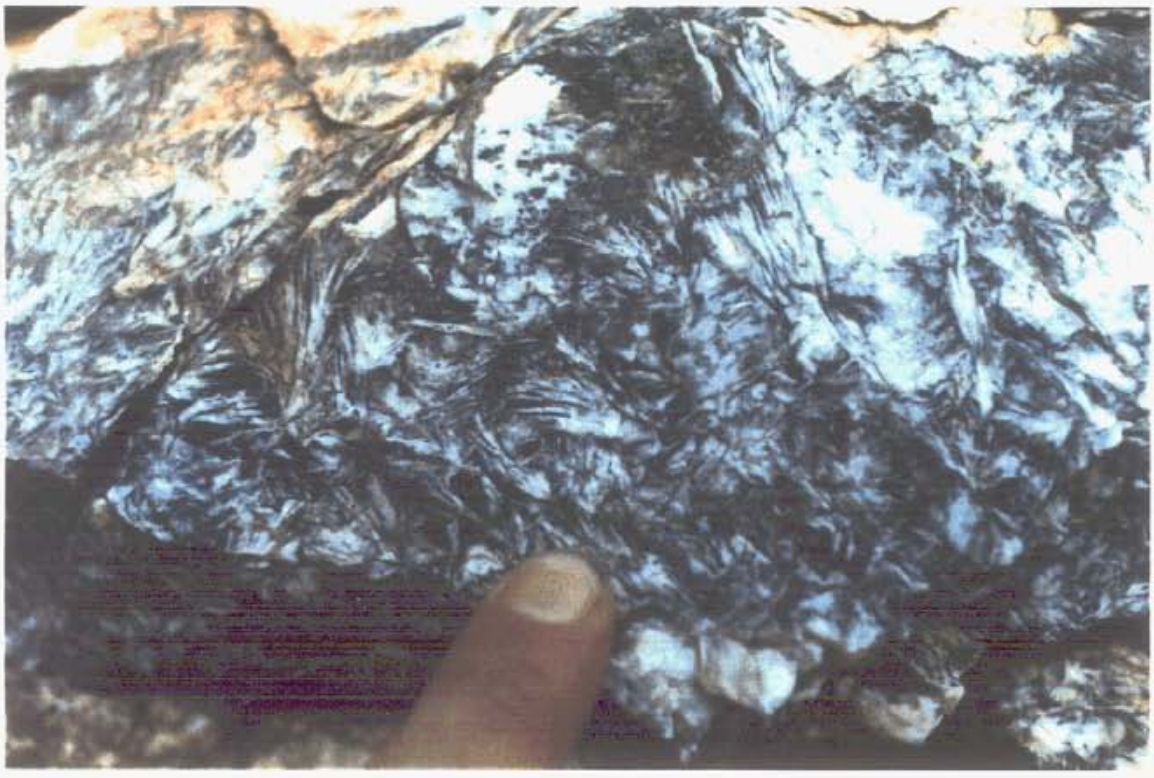


Plate 9a. Detailed view of barite replacement. Massive, coarse grained white barite present in the upper right of photograph, a zone of radiating acicular barite crystal rosettes in altered carbonate occurs in the central portion of the photograph, and fresh carbonate is present in the lower left of the photograph.

Plate 9b. Closeup of the radiating acicular barite crystal rosettes.



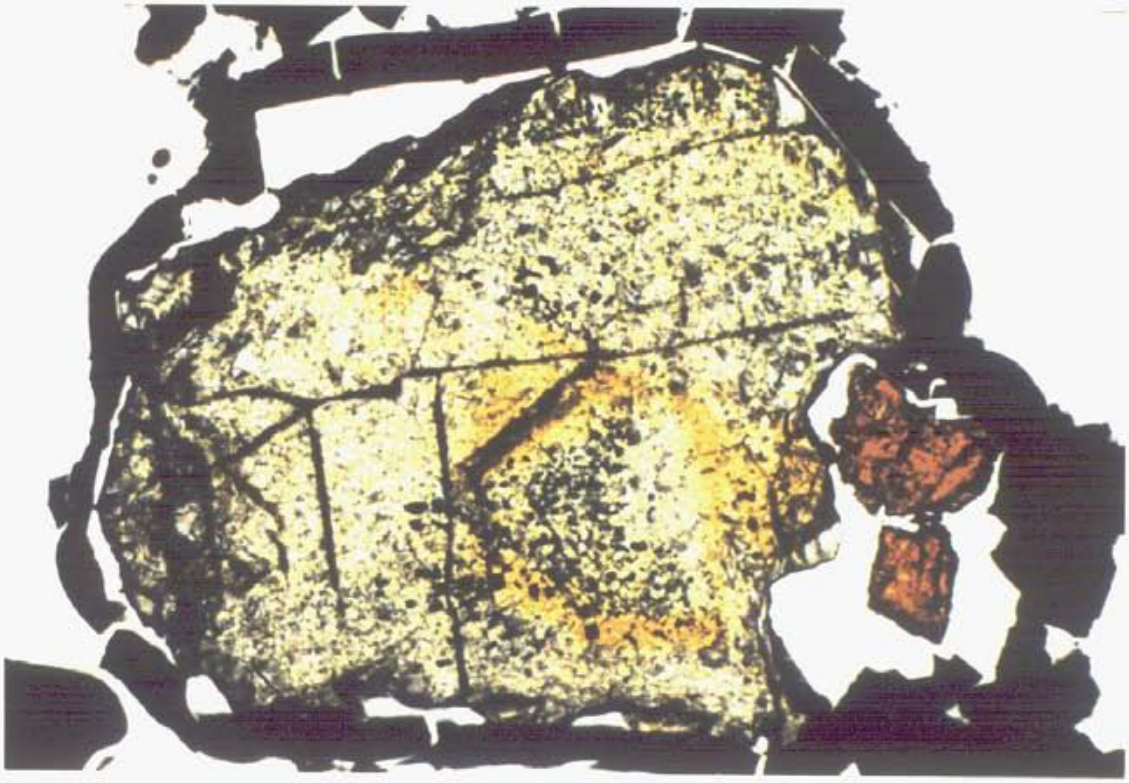
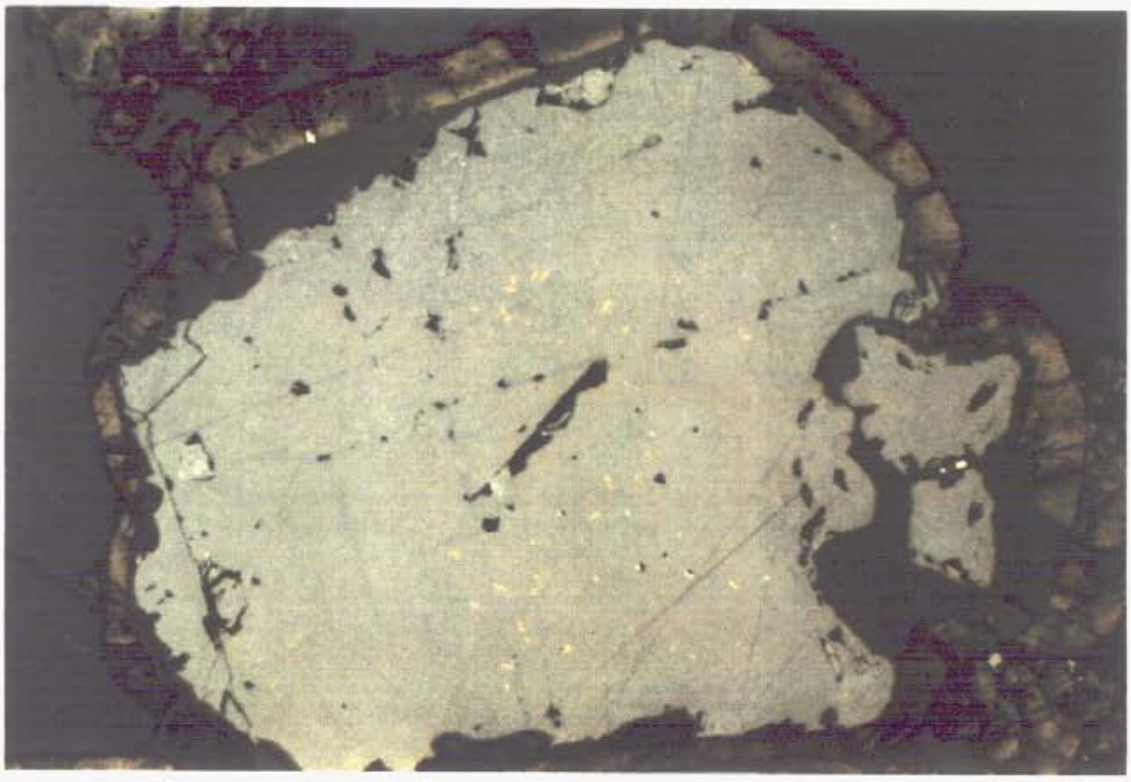


Plate 10a. Colourless to pale yellow sphalerite, typical of Type 2 mineralization, rimmed by black, colloform bitumen. Two small grains of red sphalerite also present. Transmitted light. Scale is 1 cm = 42 microns.

Plate 10b. Same field of view, reflected light. Note abundant small yellow inclusions of chalcopyrite in large grain of sphalerite.



Two types of mineralization occur of the Cay property. Type I mineralization consists intensely silicified podiform replacement alteration zones up to 10 metres in thickness and generally parallel to stratigraphy. Significant amounts of lead and zinc occur in these zones, as do extremely anomalous concentrations of gallium and germanium. This type of mineralization is absent only in one location on the property, where the Stone/Dunedin contact is exposed (west limb of the anticline, on the south side of Alpha Creek, Figure 4). In outcrop, the alteration zones are massive, dark grey to black in colour and resistant (Plate 3). Locally, malachite/azurite and anglesite are present on weathered surfaces (Plate 4). Mineralized material consists of quartz, fine-grained disseminated sphalerite which has a pinkish to purplish tinge, bitumen, some euhedral crystals of galena and minor pyrite (sphalerite>>galena). Quartz bitumen veinlets are common. In polished section, minor chalcopyrite inclusions in sphalerite, and germanite, an germanium sulphide mineral, were identified (Bernstein, 1987; Harris, 1987). The sphalerite has a distinct reddish-orange colour in transmitted light (Plate 5), and scanning electron microscopy indicates that it contains almost no iron and up to one percent copper (Bernstein, 1987).

Where sulphides are present in greatest abundance (sphalerite may comprise up to 50% of the volume), the rock is masssive and no original textures are preserved. In areas of slightly less intense alteration, the rock has a distinctly brecciated texture. Silicified, angular fragments a few millimetres to a few centimetres in size are hosted in a matrix of silica, bitumen and disseminated sulphides (Plate 6). Locally breccia fragments are replaced by massive pyrite, or replaced or rimmed by sphalerite. The silicified breccias locally grade throught partially silicified breccias into unaltered carbonate breccias containing angular fragments, ranging from a millimetre to a few tens of centimetres in size, contained in a vaguely layered matrix. The origin of these breccias has not been established; however, they are commonly stratabound, predate mineralization and their presence appears to be fundamentally important to the localization of sulphide mineral deposition. Stratigraphically upsection silicified breccias commonly grade into unbrecciated silicified limestones which display the thin, wavy bedding characteristic of the Dunedin Formation (Plate 7). The dark grey silicified limestones are commonly overlain by unaltered medium grey Dunedin strata.

Type II mineralization consists of sulphides with barite replacements and veining. This type of mineralization postdates Type I mineralization and locally crosscuts both silicified zones and unaltered strata (Plate 8a & b). Barite may be massive and coarse grained (Plate 8) or may occur as rosettes of acicular crystals replacing the host rock (Plate 9). Galena, sphalerite and galena, or galena and fluorite may occur with the barite. Bitumen is also commonly present. The sphalerite associated with the barite-type mineralization is honey coloured in hand specimen and coarser grained (1 - 5 mm) than the sphalerite associated with

the siliceous breccia type mineralization. In transmitted light, the sphalerite forms zoned, yellow to colourless crystals (Plate 10). Chalcopyrite inclusions are more abundant in this type of sphalerite than in the red-coloured grains.

The Cay property is the most northerly of the showings in the Robb Lake belt, and the one apparently located closest to the platform margin. It displays many similarities to the other occurrences in the belt; the mineralization is hosted in Devonian carbonates, associated with breccia zones, bitumen in present, and sphalerite > galena. As well, the age of mineralization and the timing relationships between mineralization and deformation are not unequivocally established. Fundamental differences do occur, however, between the Cay prospect and the other showings in the Robb Lake belt, by far the most important of which is the anomalous concentrations of gallium and germanium present at the Cay. As well, the intense silicification, red sphalerite, barite and fluorite are all absent from the other deposits in the belt.

7.2.4 Trace Element Content

Representative samples were collected from principal showings and drill core during the 1986 and 1987 field seasons. The object was to determine the distribution of germanium and gallium. Table I summarizes the results from surface sampling and Appendix IIB provides assay data from representative diamond drill intersections. To provide a basis for comparison, the Ge and Ga content of each sample listed in Table I was normalized to that of a typical concentrate running 60% Zn (see last two columns). This is based on the assumption that essentially all the Ge and Ga in zinc ores is present in the sphalerite component. The normalized extrapolations derived from the least zinc-rich samples involve the largest extrapolations and, hence, the greatest uncertainty. However, based on this work the following conclusions can be made:

(1) Germanium (and gallium) is associated with zinc-specifically the mineral sphalerite;

(2) The average germanium content in sphalerite is about 700 ppm in Type II mineralization and 4000 ppm in silica breccia Type I mineralization; and

(3) The average gallium content in sphalerite from the property is about 340 ppm.

7.2.5 Economic Considerations

The Cay property potentially contains major reserves grading 2 - 5% zinc and significant areas grading 5 - 10% Zn/Pb The zinc contains an average 0.25% germanium. Mineralization is stratabound. It occurs mainly in a silicified brecciated unit of the Middle Devonian age Dunedin Formation reef complex. Initial work on surface showings demonstrated the existence of relatively high grade zones with unknown lateral extent. Drilling proved the existence of a relatively widespread, lower grade mode of

Two types of mineralization occur of the Cay property. Type I mineralization consists intensely silicified podiform replacement alteration zones up to 10 metres in thickness and generally parallel to stratigraphy. Significant amounts of lead and zinc occur in these zones, as do extremely anomalous concentrations of gallium and germanium. This type of mineralization is absent only in one location on the property, where the Stone/Dunedin contact is exposed (west limb of the anticline, on the south side of Alpha Creek, Figure 4). In outcrop, the alteration zones are massive, dark grey to black in colour and resistant (Plate 3). Locally, malachite/azurite and anglesite are present on weathered surfaces (Plate 4). Mineralized material consists of quartz, fine-grained disseminated sphalerite which has a pinkish to purplish tinge, bitumen, some euhedral crystals of galena and minor pyrite (sphalerite>>galena). Quartz bitumen veinlets are common. In polished section, minor chalcopyrite inclusions in sphalerite, and germanite, an germanium sulphide mineral, were identified (Bernstein, 1987; Harris, 1987). The sphalerite has a distinct reddish-orange colour in transmitted light (Plate 5), and scanning electron microscopy indicates that it contains almost no iron and up to one percent copper (Bernstein, 1987).

Where sulphides are present in greatest abundance (sphalerite may comprise up to 50% of the volume), the rock is masssive and no original textures are preserved. In areas of slightly less intense alteration, the rock has a distinctly brecciated texture. Silicified, angular fragments a few millimetres to a few centimetres in size are hosted in a matrix of silica, bitumen and disseminated sulphides (Plate 6). Locally breccia fragments are replaced by massive pyrite, or replaced or rimmed by sphalerite. The silicified breccias locally grade throught partially silicified breccias into unaltered carbonate breccias containing angular fragments, ranging from a millimetre to a few tens of centimetres in size, contained in a vaguely layered matrix. The origin of these breccias has not been established; however, they are commonly stratabound, predate mineralization and their presence appears to be fundamentally important to the localization of sulphide mineral deposition. Stratigraphically upsection silicified breccias commonly grade into unbrecciated silicified limestones which display the thin, wavy bedding characteristic of the Dunedin Formation (Plate 7). The dark grey silicified limestones are commonly overlain by unaltered medium grey Dunedin strata.

Type II mineralization consists of sulphides with barite replacements and veining. This type of mineralization postdates Type I mineralization and locally crosscuts both silicified zones and unaltered strata (Plate 8a & b). Barite may be massive and coarse grained (Plate 8) or may occur as rosettes of acicular crystals replacing the host rock (Plate 9). Galena, sphalerite and galena, or galena and fluorite may occur with the barite. Bitumen is also commonly present. The sphalerite associated with the barite-type mineralization is honey coloured in hand specimen and coarser grained (1 - 5 mm) than the sphalerite associated with

the siliceous breccia type mineralization. In transmitted light, the sphalerite forms zoned, yellow to colourless crystals (Plate 10). Chalcopyrite inclusions are more abundant in this type of sphalerite than in the red-coloured grains.

The Cay property is the most northerly of the showings in the Robb Lake belt, and the one apparently located closest to the platform margin. It displays many similarities to the other occurrences in the belt; the mineralization is hosted in Devonian carbonates, associated with breccia zones, bitumen in present, and sphalerite > galena. As well, the age of mineralization and the timing relationships between mineralization and deformation are not unequivocally established. Fundamental differences do occur, however, between the Cay prospect and the other showings in the Robb Lake belt, by far the most important of which is the anomalous concentrations of gallium and germanium present at the Cay. As well, the intense silicification, red sphalerite, barite and fluorite are all absent from the other deposits in the belt.

7.2.4 Trace Element Content

Representative samples were collected from principal showings and drill core during the 1986 and 1987 field seasons. The object was to determine the distribution of germanium and gallium. Table I summarizes the results from surface sampling and Appendix IIB provides assay data from representative diamond drill intersections. To provide a basis for comparison, the Ge and Ga content of each sample listed in Table I was normalized to that of a typical concentrate running 60% Zn (see last two columns). This is based on the assumption that essentially all the Ge and Ga in zinc ores is present in the sphalerite component. The normalized extrapolations derived from the least zinc-rich samples involve the largest extrapolations and, hence, the greatest uncertainty. However, based on this work the following conclusions can be made:

(1) Germanium (and gallium) is associated with zinc-specifically the mineral sphalerite;

(2) The average germanium content in sphalerite is about 700 ppm in Type II mineralization and 4000 ppm in silica breccia Type I mineralization; and

(3) The average gallium content in sphalerite from the property is about 340 ppm.

7.2.5 Economic Considerations

The Cay property potentially contains major reserves grading 2 - 5% zinc and significant areas grading 5 - 10% Zn/Pb The zinc contains an average 0.25% germanium. Mineralization is stratabound. It occurs mainly in a silicified brecciated unit of the Middle Devonian age Dunedin Formation reef complex. Initial work on surface showings demonstrated the existence of relatively high grade zones with unknown lateral extent. Drilling proved the existence of a relatively widespread, lower grade mode of

TABLE I

ANALYTICAL DATA

Sample	Zn %	Pb %	Ga ppm	Ge ppm	Ga+ ppm	Ge+ ppm
959	11.12		49	510	265	2750
960	10.75		110	92	614	513
966	2.25		7	134	190	3570
967	16.49		49	112	178	407
968	19.37		85	1465	263	4530
970	16.84		48	157	170	560
972	19.98		112	1360	335	4080
367	2.58	.59	28	270	650	6280
369	7.20	.08	156	370	466	3083
391	.51	1.62	11	26	118	3060
392	21.14	1.01	105	110	300	312
393	8.26	.64	30	80	218	581
394	1.44	.75	70	260	(2917)	(10833)
395	4.61	.11	6	62	78	807
1625	11.39	.44	50	1080	211	5689
1634	.11	7.31	10	80	( )	930
1635	6.31	.07	70	620	666	5895
ALPHA	6.26	.45	30	80	287	767
1639	16.78	.15	10	10	(36)	(36)
1641	.95	.01	10	30	631	1895
1777	1.26	2.02	10	120	476	5714
1763	5.26	1.29	50	70	570	798
WOLVERINE	6.28	0.36	30	400	286	3822
NOSE	22.69	0.01	40	1500	106	4090
87-28A	0.10	3.81	10	70	157	1102
87-33	0.63	34.80	10	10	( )	( )
106A	1.75	0.01	10	80	( )	( )
106B	1.22	0.14	10	60	( )	( )

( ) NOT INCLUDED IN AVERAGES

\+ ESTIMATED Ga/Ge IN 60% Zn CONCENTRATE

mineralization. Given sufficient size (so far unproven) and assuming that concentrate could be marketed as a zinc-germanium product gross values are sufficient to support an underground mine. The lower grade material identified through drilling corresponds to a possible "open pit" exploration target with the economic advantages inherent with this type of mining.

Although the Cay property has no proven reserves, work to date has demonstrated the main mineralization controls and provided a model which will permit development of reserves through detailed drilling. This is based on the assumption that zinc produced there can be upgraded to economic levels by virtue of its trace element content.

7.3 Drill Program

7.3.1 General

Advance drilling Ltd. of Surrey, B.C. were contracted to drill a minimum 914.4 m (3000 ft.) and produce B.Q. diameter core on the Cay property. The machine used was a Hydra Core 28. Drilling commenced on 4 September and was completed 16 October 1987. In total 1078 m of core were produced from eight sites and a total of 21 holes. Location of the drill sites is indicated on accompanying geological maps in pocket. All core, except for one or two metres selected for study purposes, remains stored on the property in a shack constructed for that purpose. Location of the core shack is shown in the property index map (Figure 5). About 72 metres of core was split and assayed for Pb, Zn, Ga and Ge. Table II summarizes drill hole data.

7.3.2 Drill Program Results

Drill core from the fall 1987 program was logged on site. Results are summarized in Appendix V (logs) and in Figure 8 (drill hole sections). Information obtained from the drill work has been incorporated into the geologic map and cross-sections (Figure 4). The main result was to help clarify mineralization controls.

8. GEOCHEMISTRY

8.1 Previous Work

A geochemical survey was carried out over a portion of the Cay property by Cominco Ltd. in 1973. About 1000 hectares were soil sampled using a 200 x 400 ft. (60 x 122 m) grid spacing. Samples were tested for lead, zinc, silver and magnesium. The Cominco survey delineated a coincident lead-zinc anomaly 500 x 2000 metres in extent. Anomalous silver values turned out to be small and scattered and occasional high magnesium samples did not correlate with the other metals. Cominco results are reported in assessment documents.

8.2 1986 Orientation Program

The 1986 geochemical program on the Cay program was primarily an orientation survey. The objectives were to identify key trace elements, to establish the most effective sampling procedure, and to find the parameters crucial to interpretation. In 1986, 194 soil samples were collected.

During this phase rock, soil and silt samples were collected from various areas including known mineralized zones. Data was recorded on parameters such as bedrock character, soil type, physiographic features, etc. Sample locations were recorded with respect to a loose control grid ("old grid") and samples were analyzed for a variety of elements. While the key objective to the Cominco work was to find a lead-zinc deposit the emphasis in the current program is to find a germanium-zinc deposit.

Contrary to expectations Ge (and Ga) does not show up in anomalous concentrations in soils even over heavily mineralized zones. Zinc produces clearly anomalous conditions but tends to be disbursed. Lead in soil produced well defined anomalous zones in most, but not all, places. Copper was selected as a potentially important soil parameter due to an observed mineralogical correlation between high copper zinc and particularly high germanium levels. Barium was also selected as a soil parameter due to the ubiquitous association between lead-zinc mineralization on the Cay property with barite. Rock geochemistry was not seen to provide a useful guide to ore at least through any of the 30 odd elements evaluated.

8.3 1987 Program

During 1987 a detailed grid controlled soil sampling program was carried out over two places of geologic interest. This included the anticlinal nose area; a region of extensive overburden but a place where surface mineralization is predicted to reappear based on geologic projections. The other target area was the surface trace of Dunedin Fm. especially on the southern part of the claim group where the better mineralization is known to occur. The results of the 1986 and 1987 soil sampling are shown in figure 6. In 1987, 851 soil samples were collected.

8.4 Sampling and Analytic Procedure

Soil development on the Cay property has been complicated by forest fires. As a result of the burning, in most areas there is now as repetition of the various soil horizons. Wherever possible soil was collected from the lowest B horizon using special shovels. In most cases this layer occurs between 25-35 cm below surface. Where no B type soil was present samples were collected from the C horizon immediately below organic rich topsoils.

TABLE II

SUMMARY OF HOLES DRILLED IN 1987

Site #	Location	Elevation	Hole #	Bearing	Dip	Length (core/m)
1	L90N-0+52W	1563m	1	070	-45	36.58
			2	070	-75	50.29
			3	040	-45	47.85
2	L89N-0+60W	1560m	4	070	-45	1.83*
3	L87+65N	1490m	5	---	-90	38.10
	5+50E		6	250	-45	32.61
			7	250	-60	23.16
			8	250	-75	28.96
			9	250	-80	37.19
4	L87+65N	1480m	10	---	-90	82.60
	5+70E		11	250	-45	55.47
			12	250	-80	86.56
5	L87+70N	1473m	13	250	-50	103.93
	6+20E		14	250	-60	131.06
			15	250	-70	106.68
			16	280	-55	82.30
6	L87+85N	1503m	17	250	-45	24.69
	5+25E		18	---	-90	31.10
7	L87+90N	1520m	19	---	-90	29.26
	4+60E		20	250	-45	10.97
8	L87+25N	1471m	21	250	-45	36.88
	5+90E					
						1078.01

* Hole abandoned due to overburden wedging.

Samples were sent to Acme Analytical Laboratories Ltd. at 852 E. Hastings Street, Vancouver, B.C. for geochemical analysis. The analysis method used by Acme is as follows:

1) Soils are dried at 60°C and sieved to -80 mesh size.

2) Pulp is digested with 3 mls 3-1-2 HCl-HNO3-H2O at 95°C for one hour and then diluted with water. This leach is near total.

3) In the case of copper, lead and zinc analysis is by Atomic Absorption.

4) In the case of barium, analysis is by ICP.

8.5 Results

Results of soil sampling on the Cay property are shown on Figures 6A-6D (in pocket). These maps show zinc, lead, copper and barium in soil. Stream sediment and rock chip orientation work did not produce useful data, therefore rather than clutter the maps, results from this work are not given. It should be mentioned that the commercially prepared indicator "Zinc Zap" proved to be very useful. It is common to find that rock with no obvious sulphide mineralization assays 1 - 2 percent combined Pb/Zn - its presence being flagged with a positive Zinc Zap test.

There are three main conclusions from the soil sampling work, they are as follows:

(1) The broad anomaly in lead and zinc located on the east side of the new grid between lines 80 and 92 north seems to be directly related to bedrock mineralization. The area contains several significant lead-zinc occurrences and abundant mineralized float. Zinc in soil here seems more disbursed than lead which likely better reflects proximity to mineralization. No useful information is apparent in the barium and copper data.

(2) Highly mineralized bedrock occurs over a broad area in the vicinity of grid station 0L20S2+75W. This is referred to as the Nose Showing. Mineralization located here is <u>not</u> reflected in soil geochemistry in any of the elements tested for in either 1986 orientation work or in the more intensive grid coverage completed during 1987. This negative result is somewhat enigmatic. Possible residual soils were scraped off by glaciers and bedrock mineralization has not yet had time to generate an anomalous soil signature. As a consequence the lack of any anomalous values on the south end of the Cay property do not necessarily rule out exploration potential.

(3) Anomalous lead and zinc samples from 1988 sampling in the vicinity of 0L5N-4+00W do not conform to mineralization that fits the present exploration model. Perhaps, as suggested

by John Knox, east-west trading structures are involved in the mineralizing process one or more of which may pass through this area. Alternately, the 0L5N anomaly, which is close to the contract valley axis, might coincide with the surface trace of a major thrust fault suspected of occurring there. This fault, if it exists, may have been involved with sulphide mineral deposition on the Cay property. In any case, more detailed soil sampling is merited in this area.

(4) The west limb of the Cay anticline, mineralized or not, does now show up in the soil sample results. Drilling in the vicinity of the Alpha Creek showing encountered unexpectedly deep overburden. This may explain the negative geochemical results rather than lack of mineralization.

As a general conclusion, although the geochemical work did produce some useful results, it cannot be relied on to identify bedrock mineralization in areas covered by overburden in the Cay property.

9. TRENCHING

Numerous lead-zinc showings have been found on the Cay property. Three that are particularly significant are referred to as the Alpha, Wolverine and Nose showings. The main characteristics of these are as follows:

a) Alpha (Grid Location L87N-0+55W)

Both silicified (Type I) and Barite (Type II) mineralization occur. Site of bulk sample collected in 1986. Barite (Type II) mineralization was sampled. Galena and sphalerite occur as lenses or pods with massive barite within Stone Fm. limestone. Little or no silica associated with sulphides. Mineralization is typically near Dunedin Fm. contact.

b) Wolverine (Grid Location L88+50N-4+50E)

Referred to as silica breccia (Type I) mineralization. Sphalerite occurs with silica as breccia and/or stratabound in Dunedin Fm. reef limestone. Galena present.

c) Nose (Grid Location 0L20S-0+75W)

Generally similar to silica breccia mineralization observed at Wolverine showing; however, sulphides seem to be more clearly zoned with replacement sphalerite grading through galena-sphalerite breccia to galena breccia, going up stratigraphically. Same trend is apparent at Wolverine showing but pattern less clear.

The bulk sample collected from the Alpha showing in 1986 was subjected to metallurgical tests under the direction of G. Hawthorn. The Alpha and Wolverine showing were systematically sampled during the summer of 1987 with the aid of a "Cobra" drill. Due to the extremely tough character of siliceous type

mineralization, blasting is required to obtain anything other than hand specimens which are not generally representative of bedrock. Trenching at the Nose and Wolverine sites produced enough material to permit additional metallurgical test work and gave an idea of tenor realistic for this class of mineralization. Results of the "bulk" sampling are summarized below:

Showing	Width	Pb%	Zn%	Ga(ppm)	Ge(ppm)	Ge(normalized)*
Alpha	2.5 m		6.26	30	80	767
Wolverine	2.1 m	0.36	6.28	30	400	3822
Nose	1.3 m	0.01	22.69	40	1500	4090

*NB. Estimated Ge in 60% Zn concentrate.

10. METALLURGY

A 500 kilogram sample was collected from the west limb Alpha Creek showing on the Cay property. Mineralization here consists of pale honey coloured sphalerite within a gangue of massive barite (Type II). Laboratory testing determined that a high grade (60%) zinc flotation concentrate could be produced which contained the majority of gallium and germanium. This work demonstrates that metallurgical problems are not likely, at least from this type of material. Furthermore, the material tested was found to be low in mercury, iron, and other elements that smelters traditionally find undesirable (Hawthorne, 1986)..

A bulk sample of siliceous breccia (Type I) mineralization was collected from the Wolverine and Nose showings during the 1987 field season. Metallurgical test work will be carried out on this material in the future. Since it is the sphalerite from this type of mineralization that carries, by far, the greater percentage of germanium, results of test work on these samples are likely to critically affect the economic viability of the Cay property.

11. CONCLUSIONS

The Cay property is an important lead-zinc-germanium prospect. Mineralization occurs in showings over a wide area as the sulphide minerals galena and sphalerite. The germanium, in very significant quantities, is contained in sphalerite. Host rocks are Middle Devonian age limestones of the Dunedin and Stone Formations. Mineralization may have been derived from metal rich overlying graphitic shales of the Besa River Formation or a more remote source. There are two important types of mineral occurence in the property. One style is referred to as Type II or barite type. In this case lead and zinc are present in large barite pods in Stone Formation limestone, albeit typically near the Dunedin Fm. contact. Zinc in this environment contains 700 ppm germanium, in average. The other style of mineralization (Type I) involves highly silicified and frequently brecciated limestone. Sphalerite in Type I occurences contains about 4000 ppm Ge. Type I mineralization is usually confined to Dunedin Formation rock.

Although grades found in the barite pods are often quite high (up to 13% Zn) the silica type mineralization (1.5 to 6% Zn) is more likely to form ore. This is due to the higher contained Ge component plus the potential for open pit mining. The recommended follow-up program is to drill untested parts of the property with a view to developing ore reserves. The north end of the Cay property remains essentially unexplored and a thorough prospecting program is merited there.

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13. CERTIFICATE OF QUALIFICATION (D.G.L.)

I, Douglas G. Leighton, do hereby certify that:

1. I am a graduate of the University of Ottawa with a Bachelor of Science Honours degree in Geology, 1979.

2. I am a graduate of the University of Calgary with a Doctorate of Philosophy degree in Geology, 1984.

3. I am a Fellow of the Geological Association of Canada.

4. I was employed as an Assistant Professor in the Department of Geology, University of Windsor, teaching Economic Geology and Structural Geology from July, 1985 to July, 1986.

5. I have been engaged in mineral exploration and geologic mapping in the Northwest Territories, Manitoba and British Columbia periodically since 1977.

6. This report is based on my work on the Cay property as well as a study of available literature.

Dated at Vancouver, B.C. this day of January, 1988.

Douglas G. Leighton, B.Sc., F.G.A.C.

13. CERTIFICATE OF QUALIFICATION (J.A.P.)

I, Jennifer A. Pell, of #4, 1719 Yew Street, Vancouver, British Columbia, do hereby certify that:

1. I am a professional geologist with offices at 900 - 625 Howe Street, Vancouver, B.C.

2. I am a graduate of the University of British Columbia, B.Sc., (1968).

3. I am a Fellow in the Geological Association of Canada.

4. I have practiced my profession as a geologist since 1968 mostly in British Columbia.

5. I personally supervised exploration work carried out on the Cay property during 1986 and 1987, for Equinox Resources Ltd.

Dated at Vancouver, B.C. this day of January, 1988.

Jennifer Pell, Ph.D., F.G.A.C.

APPENDIX I

STATEMENT OF COSTS

1987 Work Program

Wages *	$51,780		
Benefits (WCB, CPP, UIC)	12,937		
		$ 64,687	
Disbursements			
Transport (mainly helicopter)		$122,094	
Geochemical and Assay		16,826	
Drilling		129,056	
Building Supplies		11,737	
Groceries (Safeway)		10,231	
Topographic Map (Eagle Mapping)		3,710	
Expense Accounts (mainly meals, accommodations)		15,568	
Expendible Supplies		7,982	
Miscellaneous: expediting, secretarial, freight, etc.		5,821	
	TOTAL		$387,712

1986 Work Program

Wages	$33,500		
Benefits (WCB, CCP, UIC)	8,375		
		$41,875	
Disbursements			
Transport (mainly helicopter)		$23,140	
Geochemical and Assay		11,600	
Expense Accounts (mainly meals,accommodation)		6,334	
Expendible Supplies		2,489	
Miscellaneous: secretarial, freight, communications, etc.		1,762	
	TOTAL		$87,200

TOTAL 1986 AND 1987 **$474,912**

Allocation:

Cay North Group	$ 94,982.40
Cay South Group	$379,929.60

* Breakdown showing pay rates and days worked follows.

TIME SHEET SUMMARY

GAGE PROJECT - CAY PROPERTY

Year 1987

NAME	RATE	MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Time Total
Leighton	200.00	July	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		August	X	X	X	X	X	X	X	X																		X	X	X	X	X	X	14
		Sept.	X	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X	X	X	X	X	X	X	25
		Oct.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										22
MacKenzie	100.00	July									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	23
		August	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		Sept.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		Oct.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										22
Knox	100.00	July	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		August	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										22
		Sept.																	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
		Oct.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							25
Hopping	70.00	July		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	30
		August	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										23
Read	70.00	July	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		August	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					27
Heberlein	120.00	July																X	X	X	X													4
		August								X	X		X	X	/																			4 1/4
Beaty	200.00	July																			X		/											1 1/4
		August																							X	X	/							2 1/2
Total chargeable																																		

TIME SHEET SUMMARY

GAGE PROJECT - CAY PROPERTY

Year 1987

NAME	RATE	MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Time Total
Pell	175.00	August																								X	X	X	X	X	X	X	X	8
		Sept.	X	X	X	X																												4
Howe	120.00	August																						X	X	X	X	X	X	X	X	X	X	14
		Sept.	X	X	X	X																												4
Total chargeable																																		

TIME SHEET SUMMARY

GAGE PROJECT - CAY PROPERTY

Year 1987

NAME	RATE	MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Time Total
Leighton	200.00	July	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		August	X	X	X	X	X	X	X	X																		X	X	X	X	X	X	14
		Sept.	X	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X	X	X	X	X	X	X	25
		Oct.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										22
MacKenzie	100.00	July									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	23
		August	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		Sept.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		Oct.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										22
Knox	100.00	July	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		August	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										22
		Sept.																	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
		Oct.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							25
Hopping	70.00	July		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	30
		August	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										23
Read	70.00	July	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	31
		August	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					27
Heberlein	120.00	July																X	X	X	X													4
		August								X	X		X	X	/																			4 1/4
Beaty	200.00	July																			X		/											1 1/4
		August																							X	X	/							2 1/2
Total chargeable																																		

APPENDIX II

ANALYTICAL RESULTS

APPENDIX IIA

ANALYTICAL RESULTS

(GEOCHEMICAL RESULTS)

ACME ANALYTICAL LABORATORIES LTD.
852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6
PHONE(604)253-3158 FAX(604)253-1716

DATE RECEIVED: OCT 16 1987
DATE REPORT MAILED: Oct 26/87

GEOCHEMICAL ANALYSIS CERTIFICATE

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEC. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER. THIS LEACH IS PARTIAL FOR MN FE CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: SOIL AU** ANALYSIS BY FA+AA FROM 10 GM SAMPLE. HG ANALYSIS BY FLAMLESS AA.

ASSAYER: D. Toye. DEAN TOYE, CERTIFIED B.C. ASSAYER

BEATY GEOLOGICAL File # 87-5007 Page 1

SAMPLE#	AG PPM	AS PPM	SB PPM	AU** PPB	HG PPB
92+00E 92+00N	.1	12	2	22	20
92+00E 91+75N	.2	7	2	17	5
92+00E 91+50N	.1	14	2	4	10
92+00E 91+25N	.1	18	2	33	5
92+00E 90+75N	.1	17	2	4	10
92+00E 90+50N	.1	8	2	2	5
92+00E 90+25N	.1	4	2	10	5
92+00E 90+00N	.1	16	2	6	5
92+00E 89+75N	.1	30	2	13	30
92+00E 89+50N	.1	27	2	23	20
92+00E 89+25N	.1	10	2	4	30
92+00E 89+00N	.1	20	2	3	20
92+00E 88+00N	.2	13	2	4	10
93+00E 91+75N	.1	17	2	2	20
93+00E 91+50N	.1	21	2	35	10
93+00E 91+25N	.1	13	2	21	5
93+00E 90+75N	.1	19	2	24	20
93+00E 90+50N	.1	3	2	3	10
93+00E 90+25N	.1	18	2	4	10
93+00E 90+00N	.1	13	2	12	20
93+00E 89+75N	.1	2	2	4	5
93+00E 89+50N	.2	10	2	1	10
93+00E 89+25N	.1	6	2	2	5
93+00E 89+00N	.1	12	2	2	20
93+00E 88+00N	.1	13	2	1	10
94+00E 91+75N	.1	4	2	22	5
94+00E 91+50N	.1	20	2	1	20
94+00E 91+25N	.1	8	2	2	10
94+00E 90+75N	.2	22	2	13	40
94+00E 90+50N	.1	20	2	24	30
94+00E 90+25N	.1	20	2	12	10
94+00E 90+00N	.1	24	2	59	20
94+00E 89+75N	.1	6	2	1	10
94+00E 89+50N	.1	6	2	1	5
94+00E 89+25N	.1	12	2	3	5
94+00E 89+00N	.1	20	2	1	10
STD C/AU-S	7.3	39	17	50	1400

BEATY GEOLOGICAL FILE # 87-5007

SAMPLE#	AG PPM	AS PPM	SB PPM	AU** PPB	HG PPB
94+00E 88+00N	.1	26	2	36	20
98+00E 96+00N	.1	7	2	1	10
98+00E 95+50N	.1	4	2	2	20
98+00E 95+25N	.1	7	2	1	10
98+00E 95+00N	.1	10	2	1	10
98+00E 94+75N	.1	6	2	7	30
98+00E 94+50N	.1	8	2	1	5
98+00E 94+25N	.1	8	2	1	5
98+00E 94+00N	.1	8	2	1	10
98+00E 93+75N	.1	12	2	2	10
98+00E 93+50N	.1	7	2	1	5
98+00E 93+25N	.1	12	2	1	10
98+00E 93+00N	.1	24	2	1	10
98+00E 92+75N	.1	8	4	2	20
98+00E 92+50N	.1	12	2	50	5
98+00E 92+25N	.1	28	2	1	20
98+00E 92+00N	.1	16	2	1	10
98+00E 91+75N	.1	18	2	14	10
98+00E 91+50N	.1	16	3	3	20
98+00E 91+25N	.1	6	4	1	5
98+00E 91+00N	.1	16	2	11	20
98+00E 90+75N	.1	13	3	1	5
98+00E 90+50N	.1	14	2	1	10
98+00E 90+25N	.1	14	2	1	50
98+00E 90+00N	.1	16	2	1	20
98+00E 89+75N	.1	10	3	1	40
98+00E 89+50N	.1	20	2	6	30
100+00E 97+00N	.1	19	2	1	30
100+00E 96+75N	.2	21	2	4	50
100+00E 96+50N	.1	8	2	1	10
100+00E 96+25N	.1	3	2	1	10
100+00E 96+00N	.1	8	2	4	20
100+00E 95+75N	.1	5	2	62	5
100+00E 95+50N	.1	21	5	13	10
100+00E 95+25N	.1	57	2	1	20
100+00E 95+00N	.2	11	2	1	10
STD C/AU-S	7.2	38	18	52	1300

BEATY GEOLOGICAL FILE # 87-5007

SAMPLE#	AG PPM	AS PPM	SB PPM	AU** PPB	HG PPB
100+00E 94+25N	.3	7	2	3	20
100+00E 94+00N	.1	4	2	8	20
100+00E 93+75N	.1	8	2	3	20
100+00E 93+50N	.1	5	2	1	10
100+00E 93+25N	.1	9	2	1	10
100+00E 93+00N	.2	7	2	2	30
100+00E 92+75N	.1	16	2	1	20
100+00E 92+50N	.2	8	2	1	20
100+00E 92+25N	.1	19	3	1	50
100+00E 92+00N	.1	4	2	6	10
100+00E 91+75N	.1	12	2	7	20
100+00E 91+50N	.1	19	2	9	20
100+00E 91+25N	.1	21	2	1	60
100+00E 91+00N	.1	23	2	1	30
100+00E 90+75N	.1	63	2	19	20
100+00E 90+50N	.1	40	2	17	70
100+00E 90+25N	.1	31	2	1	20
100+00E 90+00N	.3	20	2	7	30
100+00E 89+75N	.1	2	2	19	40
100+00E 89+50N	.1	17	2	1	20
100+50E 96+00N	.1	3	2	1	10
101+00E 96+75N	.1	26	2	1	10
101+00E 96+50N	.2	31	3	1	20
101+00E 96+25N	.2	19	2	1	5
101+00E 96+00N	.1	7	2	1	5
101+00E 95+75N	.1	12	2	1	5
101+00E 95+50N	.1	9	2	6	5
101+00E 95+25N	.1	9	2	1	5
101+00E 94+75N	.1	14	2	1	5
101+00E 94+50N	.1	11	2	1	10
101+00E 94+25N	.1	37	2	1	30
101+00E 94+00N	.1	9	2	1	5
101+00E 93+75N	.1	3	2	1	5
101+00E 93+50N	.1	29	2	1	10
101+00E 93+25N	.1	26	2	1	40
101+00E 93+00N	.1	6	2	1	10
STD C/AU-S	7.2	41	18	52	1300

BEATY GEOLOGICAL FILE # 87-5007

SAMPLE#	AG PPM	AS PPM	SB PPM	AU** PPB	HG PPB
101+00E 92+75N	.1	10	2	1	20
101+00E 92+50N	.1	7	2	1	10
STD C/AU-S	7.3	41	17	51	1300
101+00E 92+25N	.1	23	2	22	20
101+00E 92+00N	.2	8	2	1	10
101+00E 91+75N	.2	7	2	1	20
101+00E 91+50N	.1	7	2	1	10
101+00E 91+25N	.1	6	2	1	20
101+00E 91+00N	.1	12	2	1	20
101+00E 90+75N	.1	2	2	1	30
101+00E 90+50N	.1	6	2	1	30
101+00E 90+25N	.2	7	2	5	20
101+00E 90+00N	.2	13	2	9	10
101+00E 89+75N	.1	11	2	1	20
101+00E 89+50N	.2	14	2	1	10
101+50E 96+00N	.1	75	2	1	20
102+00E 97+00N	.1	3	2	1	20
102+00E 96+75N	.1	2	2	5	30
102+00E 96+50N	.1	7	2	4	20
102+00E 96+25N	.1	2	2	3	5
102+00E 96+00N	.1	15	2	1	10
102+00E 95+75N	.1	16	2	1	30
102+00E 95+50N	.2	36	2	4	30
102+00E 95+25N	.3	10	2	4	20
102+00E 95+00N	.2	11	2	1	5
102+00E 94+75N	.1	20	2	1	5
102+00E 94+50N	.1	13	2	1	5
102+00E 94+25N	.1	4	2	1	5
102+00E 94+00N	.1	14	2	5	20
102+00E 93+75N	.1	11	2	1	30
102+00E 93+50N	.1	17	2	1	20
102+00E 93+25N	.1	23	4	1	60
102+00E 93+00N	.1	17	2	3	20
102+00E 92+75N	.1	17	2	1	10
102+00E 92+50N	.1	7	2	4	20
102+00E 92+25N	.1	21	2	3	30
102+00E 92+00N	.1	24	2	1	50

BEATY GEOLOGICAL FILE # 87-5007

SAMPLE#	AG PPM	AS PPM	SB PPM	AU** PPB	HG PPB
102+00E 91+75N	.1	4	2	1	50
102+00E 91+50N	.1	5	2	1	20
102+00E 91+25N	.2	20	2	166	40
102+00E 91+00N	.2	12	2	11	50
102+00E 90+75N	.2	16	2	1	30
102+00E 90+50N	.3	14	2	1	40
102+00E 90+25N	.3	5	2	1	1100
102+00E 90+00N	.1	27	3	11	30
102+00E 89+75N	.4	6	2	1	400
102+00E 89+50N	.4	12	2	1	70
102+00E 89+25N	.1	2	2	1	20
102+00E 89+00N	.1	18	2	1	30
103+00E 97+00N	.1	7	2	1	80
103+00E 96+75N	.1	5	2	1	30
103+00E 96+50N	.1	5	2	2	10
103+00E 96+25N	.1	51	2	17	30
103+00E 96+00N	.1	191	2	1	40
103+00E 95+75N	.1	25	2	1	40
103+00E 95+50N	.1	16	2	1	10
103+00E 95+25N	.1	40	2	1	5
103+00E 95+00N	.1	25	2	1	10
103+50E 96+00N	.1	6	2	2	5
104+00E 96+00N	.1	8	2	1	5
104+00E 95+75N	.1	29	2	1	10
104+00E 95+50N	.1	103	2	1	50
104+00E 95+25N	.1	20	2	1	20
104+00E 94+75N	.1	187	2	4	80
104+00E 94+50N	.1	224	2	1	70
104+00E 94+00N	.1	21	2	1	20
104+00E 93+75N	.1	124	2	1	60
104+00E 93+50N	.1	46	2	1	120
104+00E 93+00N	.1	461	2	1	130
104+50E 96+00N	.1	154	2	1	60
123+00E 99+00N	.1	11	2	2	30
123+00E 98+75N	.1	4	2	1	20
123+00E 98+25N	.1	5	3	1	180
STD C/AU-S	7.4	41	17	52	1300

BEATY GEOLOGICAL FILE # 87-5007

SAMPLE#	AG PPM	AS PPM	SB PPM	AU** PPB	HG PPB
123+00E 98+00N	.1	2	2	1	20
123+00E 97+75N	.2	4	2	3	10
123+00E 97+50N	.2	6	2	4	5
123+00E 97+25N	.3	3	2	4	5
123+00E 97+00N	.1	3	2	5	5
123+00E 96+75N	.2	4	2	1	5
123+00E 96+50N	.2	7	2	3	5
123+00E 96+25N	.1	9	2	3	10
123+00E 96+00N	.2	8	2	1	10
123+00E 95+75N	.3	3	2	1	5
123+00E 95+50N	.1	2	2	4	20
123+00E 95+25N	.1	7	2	1	5
123+00E 95+00N	.2	5	3	1	5
124+00E 99+00N	.2	6	2	3	80
124+00E 98+50N	.1	16	2	1	60
124+00E 98+25N	.1	10	2	1	40
124+00E 97+50N	.2	10	2	4	5
124+00E 97+25N	.2	10	2	3	10
124+00E 97+00N	.1	10	2	1	5
124+00E 96+75N	.1	6	2	1	10
124+00E 96+50N	.3	8	2	4	20
124+00E 96+25N	.1	5	2	1	10
124+00E 96+00N	.1	8	2	1	10
124+00E 95+75N	.2	3	2	1	10
124+00E 95+50N	.3	8	2	1	20
124+00E 95+25N	.2	2	2	1	5
124+00E 95+00N	.1	5	2	2	5
124+50E 96+00N	.2	53	2	1	70
125+00E 99+00N	.2	34	2	1	20
125+00E 98+75N	.1	2	2	1	10
125+00E 98+50N	.2	10	2	1	10
125+00E 98+25N	.1	12	2	1	110
125+00E 98+00N	.2	11	2	2	10
125+00E 97+75N	.1	8	2	1	20
125+00E 97+50N	.1	7	2	1	60
125+00E 97+00N	.1	4	2	1	10
STD C/AU-S	7.3	39	18	50	1300

BEATY GEOLOGICAL FILE # 87-5007 Page 7

SAMPLE#	AG PPM	AS PPM	SB PPM	AU** PPB	HG PPB
125+00E 96+50N	.2	7	2	1	10
125+00E 96+25N	.2	4	2	1	10
125+00E 96+00N	.1	11	2	1	5
125+00E 95+75N	.1	2	3	1	5
125+00E 95+50N	.1	5	4	1	5
125+00E 95+25N	.1	5	2	1	10
125+00E 95+00N	.1	2	3	9	10
125+50E 96+00N	.1	8	2	1	30
126+00E 99+00N	.1	15	2	8	20
126+00E 98+75N	.1	14	2	1	40
126+00E 98+50N	.1	6	2	3	20
126+00E 98+25N	.2	4	2	4	30
126+00E 98+00N	.1	11	2	1	100
126+00E 97+25N	.1	16	2	1	130
126+00E 97+00N	.1	18	2	1	80
126+00E 96+75N	.2	21	2	1	620
126+00E 96+50N	.1	10	2	1	30
126+00E 96+25N	.1	10	2	1	150
126+00E 96+00N	.1	10	2	1	10
126+00E 95+75N	.2	2	2	3	20
126+00E 95+50N	.3	7	2	1	40
126+00E 95+25N	.1	12	2	1	50
126+00E 95+00N	.1	6	2	1	10
126+50E 96+00N	.2	12	2	1	110
127+00E 99+00N	.1	27	2	2	40
127+00E 98+00N	.1	19	2	1	190
127+00E 97+75N	.3	16	2	1	2000
127+00E 97+50N	.2	13	2	1	60
127+00E 97+25N	.1	2	2	1	40
127+00E 97+00N	.1	5	3	1	10
127+00E 96+75N	.1	12	2	1	20
127+00E 96+50N	.1	4	2	7	30
127+00E 96+25N	.1	3	2	1	20
127+00E 96+00N	.2	2	2	1	10
127+00E 95+75N	.2	3	3	191	20
127+00E 95+50N	.1	5	2	1	50
STD C/AU-S	7.3	42	17	48	1400

BEATY GEOLOGICAL FILE # 87-5007

SAMPLE#	AG PPM	AS PPM	SB PPM	AU** PPB	HG PPB
127+00E 95+25N	.1	15	2	1	110
127+00E 95+00N	.2	4	2	1	30
127+50E 96+00N	.1	3	2	1	20
128+00E 98+50N	.2	9	2	2	60
128+00E 98+25N	.2	5	2	1	40
128+00E 98+00N	.1	5	2	1	10
128+00E 97+75N	.2	4	2	1	10
128+00E 97+50N	.1	10	3	1	10
128+00E 97+25N	.2	17	2	1	140
128+00E 96+75N	.1	6	2	1	40
STD C/AU-S	7.3	39	19	49	1400
128+00E 96+50N	.2	9	2	1	20
128+00E 96+25N	.1	5	2	1	20
128+00E 96+00N	.4	5	2	1	40
128+00E 95+75N	.1	5	2	2	10
128+00E 95+50N	.2	12	2	1	20
128+00E 95+25N	.1	7	2	1	20
128+00E 94+75N	.1	8	2	1	10
128+00E 94+50N	.4	2	2	2	30
128+00E 94+25N	.3	4	2	1	30
128+00E 94+00N	.2	10	2	2	20
128+00E 93+00N	.1	3	2	1	30
94+00N L97 93+00E	.1	13	2	1	20
94+00NL97 93+25E	.1	16	2	7	20
94+00NL97 94+25E	.1	10	2	1	30
94+00NL97 94+50E	.1	2	3	1	30
94+00NL97 94+75E	.1	6	2	1	10
94+00NL97 95+00E	.1	3	2	1	20
94+00NL97 95+25E	.1	7	2	4	5
94+00NL97 95+50E	.2	6	3	1	5
94+00NL97 95+75E	.1	10	3	1	5
94+00NL97 96+25E	.1	9	2	1	5
94+00NL97 96+50E	.1	7	2	1	5
94+00NL97 96+75E	.1	12	2	20	5
94+00NL97 97+00E	.1	18	2	5	5

ACME ANALYTICAL LABORATORIES
852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6
PHONE 253-3158 DATA LINE 251-1011

DATE RECEIVED: AUG 11 1987 AUG 19 1987
DATE REPORT MAILED: Aug. 17/87.

GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG.C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER. THIS LEACH IS PARTIAL FOR MN FE CA P LA CR MG BA TI B W AND LIMITED FOR NA AND K. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: SOIL

ASSAYER: D. Toye. DEAN TOYE, CERTIFIED B.C. ASSAYER

BEATY GEOLOGICAL PROJECT-160 File # 87-3168 Page 1

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
OL30S 0+00E	50	20	96	542
OL30S 0+25E	54	24	167	641
OL30S 0+50E	46	20	114	365
OL30S 0+75E	44	20	112	546
OL30S 1+00E	17	18	96	446
OL30S 1+25E	44	13	143	363
OL30S 1+50E	19	6	95	232
OL30S 1+75E	49	22	173	384
OL30S 2+00E	30	6	134	352
OL30S 2+25E	41	16	181	420
OL30S 2+50E	49	22	170	290
OL30S 3+00E	35	29	90	460
OL30S 3+25E	21	11	97	188
OL30S 3+50E	56	30	157	619
OL30S 3+75E	21	16	153	320
OL30S 4+00E	38	14	181	408
OL30S 4+25E	18	16	91	354
OL30S 4+50E	21	7	272	813
OL30S 4+75E	11	6	211	433
OL30S 5+00E	19	22	161	578
OL30S 5+25E	15	10	120	220
OL30S 5+50E	18	14	72	358
OL30S 5+75E	19	18	76	449
OL30S 6+00E	7	2	75	194
OL30S 6+25E	16	23	99	325
OL30S 6+50E	11	3	126	124
OL30S 6+75E	24	6	104	451
OL30S 7+00E	18	13	110	343
OL30S 7+25E	11	14	102	355
OL30S 7+50E	15	18	136	502
OL30S 7+75E	28	25	216	495
OL30S 8+00E	45	25	213	613
OL32S 0+00E	18	24	73	371
OL32S 0+25E	50	25	94	983
OL32S 0+50E	27	24	81	362
OL32S 0+75E	46	26	135	159
STD C	62	39	131	181

BEATY GEOLOGICAL PROJECT-160 FILE # 87-3168

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
L32S 1+00E	27	22	108	263
L32S 1+25E	16	17	65	344
L32S 1+50E	40	32	93	531
L32S 1+75E	29	21	84	384
L32S 2+00E	18	13	66	367
L32S 2+25E	10	13	41	168
L32S 2+50E	35	22	130	497
L32S 2+75E	37	20	197	237
L32S 3+00E	35	19	180	269
L32S 3+25E	34	10	105	729
L32S 3+50E	33	16	93	788
L32S 3+75E	15	16	67	197
L32S 4+00E	15	13	65	168
L32S 4+25E	23	23	144	394
L32S 4+50E	33	19	71	677
L32S 4+75E	46	26	158	764
L32S 5+00E	25	20	106	444
L32S 5+25E	26	22	150	698
L32S 5+50E	20	20	84	378
L32S 5+75E	26	21	199	501
L32S 6+00E	25	19	184	507
L32S 6+25E	25	25	165	435
L32S 6+50E	23	16	174	488
L32S 6+75E	43	19	214	876
L32S 7+00E	36	18	160	768
L32S 7+25E	15	17	92	354
L32S 7+50E	22	21	191	578
L32S 7+75E	31	20	249	511
L32S 8+00E	31	19	154	331
STD C	60	40	131	181

ACME ANALYTICAL LABORATORIES
852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6
PHONE 253-3158 DATA LINE 251-1011

DATE RECEIVED: AUG 4 1987

DATE REPORT MAILED: Aug. 11/87

GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG.C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER. THIS LEACH IS PARTIAL FOR MN FE CA P LA CR MG BA TI B W AND LIMITED FOR NA AND K. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: P1 TO P8-SOIL P9-ROCK

ASSAYER: D. Toye DEAN TOYE, CERTIFIED B.C. ASSAYER

BEATY GEOLOGICAL PROJECT-160 File # 87-2974 Page 1

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
110N 1+25W	4	21	57	172
110N 0+75W	9	23	98	400
110N 0+50W	11	23	125	399
110N 0+50E	6	15	58	393
110N 0+75E	9	22	99	483
110N 1+00E	16	28	124	759
110N 1+25E	9	24	103	321
~~STD C~~	~~57~~	40	~~128~~	175
✓110N 1+75E	2	10	42	87
109N 1+00W	11	29	113	427
109N 0+75W	16	26	125	393
109N 0+50W	11	23	112	368
109N 0+25W	16	19	119	492
109N 0+00W	23	25	175	395
109N 0+25E	18	25	152	558
109N 0+50E	24	20	116	408
109N 0+75E	10	26	119	307
109N 1+00E	13	27	136	397
109N 1+25E	18	28	205	366
109N 1+50E	18	26	145	345
109N 1+75E	12	27	131	246
✓109N 2+00E	15	34	135	401
108N 1+25W	39	15	267	859
108N 1+00W	42	24	186	837
108N 0+75W	31	25	283	704
108N 0+50W	14	31	182	382
108N 0+25W	36	36	325	679
108N 0+00E	22	38	166	384
108N 0+25E	30	37	240	782
108N 0+50E	31	30	338	801
108N 0+75E	23	38	277	695
108N 1+00E	26	32	238	843
108N 1+25E	18	20	105	766
108N 1+50E	25	21	194	600
108N 1+75E	18	37	229	565
✓108N 2+00E	17	41	244	488
106N 2+00W	31	30	199	1098

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BEATY GEOLOGICAL PROJECT-160 FILE # 87-2974

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
106N 1+75W	32	27	186	1020
106N 1+50W	30	26	191	822
106N 1+25W	28	25	187	907
106N 1+00W	22	13	113	1032
106N 0+75W	30	23	193	998
106N 0+50W	31	30	211	833
106N 0+25W	31	29	162	962
106N 0+00W	24	20	191	776
✓ 106N 1+50E	23	31	252	806
105N 2+00W	23	17	200	1186
105N 1+75W	27	25	175	507
105N 1+50W	24	16	128	798
105N 1+25W	23	22	145	530
105N 1+00W	24	13	173	413
105N 0+75W	21	11	188	703
105N 0+50W	14	17	104	337
105N 0+25W	17	22	153	356
✓ 105N 0+00W	24	26	156	461
104N 2+00W	14	24	132	719
104N 1+75W	8	17	93	226
104N 1+50W	23	26	136	559
104N 1+25W	11	25	87	771
104N 1+00W	24	28	147	975
104N 0+75W	12	28	107	716
104N 0+50W	18	23	152	1320
104N 0+25W	30	28	167	817
✓ 104N 0+00W	25	28	186	822
103N 2+00W	18	23	160	1070
103N 1+75W	31	25	135	1865
103N 1+50W	32	23	273	1032
103N 1+25W	19	21	175	880
103N 1+00W	19	11	282	829
103N 0+75W	20	15	183	723
103N 0+50W	30	20	140	947
103N 0+25W	33	29	318	980
✓ 103N 0+00W	23	22	161	1108
STD C	59	39	133	182

BEATY GEOLOGICAL PROJECT-160 FILE # 87-2974 Page 3

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
102N 2+00W	36	27	300	993
102N 1+75W	30	19	170	1613
102N 1+50W	30	22	168	1383
102N 1+25W	43	44	403	1104
102N 1+00W	23	36	230	1055
102N 0+75W	25	20	221	1266
102N 0+50W	21	23	173	1629
102N 0+25W	35	37	297	1643
✓102N 0+00W	30	27	174	1500
101N 2+00W	23	23	222	964
101N 1+75W	26	22	193	1431
STD C	~~58~~	~~41~~	~~134~~	~~175~~
101N 1+50W	16	18	188	1120
101N 1+25W	29	26	259	1067
101N 1+00W	23	29	332	1161
101N 0+75W	29	26	166	1772
101N 0+50W	12	15	106	231
101N 0+25W	14	30	143	420
✓101N 0+00W	33	22	335	779
100N 2+00W	44	18	303	1310
100N 1+75W	23	22	89	1247
100N 1+50W	29	28	306	1119
100N 1+25W	27	3	210	1331
100N 1+00W	18	6	259	1256
✓ 100N 0+00W	24	30	258	776
98N 2+00W	20	21	118	1148
98N 1+75W	20	26	136	1000
98N 1+50W	30	30	196	1230
98N 1+25W	23	31	138	2111
98N 1+00W	11	24	158	628
98N 0+75W	20	32	225	1031
98N 0+50W	32	35	223	1703
98N 0+25W	23	23	147	1376
✓98N 0+00W	29	24	101	1739
96N 2+00W	6	12	75	334
96N 1+75W	17	17	122	191
96N 1+50W	18	10	158	496

BEATY GEOLOGICAL PROJECT-160 FILE # 87-2974

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
96N 1+25W	8	10	62	89
96N 1+00W	9	14	73	177
96N 0+75W	16	20	113	342
96N 0+50W	6	9	51	178
96N 0+25W	5	10	40	163
96N 0+00W	15	11	111	170
94N 2+00W	36	25	181	1040
94N 1+75W	23	25	174	1039
94N 1+50W	17	11	198	753
94N 1+25W	22	21	516	708
94N 1+00W	29	15	361	598
94N 0+75W	30	17	303	476
94N 0+50W	12	12	83	374
94N 0+25W	24	18	214	592
94N 0+00W	30	28	121	799
80N 0+00E	44	24	85	330
80N 0+25E	45	21	110	267
80N 0+50E	69	25	107	398
80N 0+75E	44	20	158	343
80N 1+00E	38	17	132	289
80N 1+25E	38	15	131	277
80N 1+50E	45	25	127	210
80N 1+75E	40	102	289	423
80N 2+00E	35	29	204	450
80N 2+25E	29	15	122	288
80N 2+50E	41	28	122	467
80N 2+75E	50	38	197	847
80N 3+00E	50	105	545	1182
80N 3+25E	57	30	284	1208
80N 3+50E	58	21	351	701
80N 3+75E	40	24	175	796
80N 4+00E	42	28	194	684
80N 4+25E	44	43	334	1560
80N 4+50E	30	17	111	1235
80N 4+75E	43	29	309	1366
80N 5+00E	49	43	550	1358
STD C	62	38	133	186

BEATY GEOLOGICAL PROJECT-160 FILE # 87-2974 Page 5

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
80N 5+25E	39	76	984	1069
80N 5+50E	67	73	2101	1206
80N 5+75E	43	23	801	1390
80N 6+00E	36	18	264	972
80N 6+25E	53	97	1644	1233
80N 6+50E	42	54	1138	923
80N 6+75E	29	21	247	684
80N 7+00E	30	22	96	889
79N 0+00E	43	22	107	278
79N 0+25E	44	24	98	285
79N 0+50E	38	22	81	284
79N 0+75E	43	22	101	317
79N 1+00E	46	20	113	350
79N 1+25E	53	24	134	250
79N 1+50E	48	19	133	394
79N 1+75E	43	22	109	335
79N 2+00E	52	27	135	360
79N 2+25E	38	22	108	317
79N 2+50E	44	24	163	297
79N 2+75E	41	24	162	364
79N 3+00E	48	24	172	337
79N 3+25E	45	39	177	755
79N 3+50E	20	27	167	475
79N 3+75E	46	20	114	618
79N 4+00E	34	36	156	683
79N 4+25E	50	50	301	1047
79N 4+50E	52	67	300	1102
79N 4+75E	32	45	147	552
79N 5+00E	20	25	111	499
79N 5+25E	36	27	211	1105
79N 5+50E	56	31	209	653
79N 5+75E	28	25	214	1074
79N 6+00E	42	79	415	1216
79N 6+25E	56	71	348	961
79N 6+50E	44	19	252	1046
79N 6+75E	29	49	738	798
STD C	58	42	132	181

BEATY GEOLOGICAL PROJECT-160 FILE # 87-2974

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
79N 7+00E	45	26	257	1857
78N 0+00E	58	26	137	373
34S 0+00E	17	20	64	269
34S 0+25E	34	23	113	310
34S 0+50E	25	25	108	323
34S 0+75E	13	20	60	301
34S 1+00E	14	18	68	307
34S 1+25E	19	21	89	411
34S 1+50E	17	22	70	371
34S 1+75E	30	22	116	510
34S 2+00E	23	10	85	688
34S 2+25E	20	24	84	539
34S 2+50E	17	18	91	347
34S 2+75E	20	24	97	372
34S 3+00E	24	25	89	534
34S 3+25E	12	14	72	315
34S 3+50E	18	26	93	428
34S 3+75E	33	29	156	578
34S 4+00E	18	22	139	474
34S 4+25E	23	24	141	460
34S 4+50E	20	21	159	441
34S 4+75E	23	31	173	449
34S 5+00E	32	28	182	504
34S 5+25E	17	20	107	322
34S 5+50E	11	16	108	217
34S 5+75E	10	16	60	332
34S 6+00E	10	19	69	339
34S 6+25E	20	24	86	218
34S 6+50E	17	25	134	427
34S 6+75E	13	23	95	354
34S 7+00E	37	14	94	891
34S 7+25E	25	15	97	541
34S 7+50E	26	20	229	532
34S 7+75E	17	8	63	349
34S 8+00E	11	2	143	195
CAY88 4+00E	17	29	219	1063
STD C	61	42	132	180

BEATY GEOLOGICAL PROJECT-160 FILE # 87-2974

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
CAY88 4+25E	29	59	681	1114
CAY88 4+50E	18	160	802	1064
CAY88 4+75E	35	796	1320	1689
CAY88 5+00E	27	405	1136	1582
CAY88 5+25E	37	130	966	1209
CAY88 5+50E	68	131	1661	1914
✓ CAY88 5+75E	43	126	751	1729
CAY90 4+00E	37	82	360	2227
CAY90 4+25E	12	71	341	1301
CAY90 4+50E	10	22	134	549
CAY90 4+75E	25	31	196	1041
CAY90 5+00E	20	25	285	678
CAY90 5+25E	27	148	727	2080
CAY90 5+50E	30	110	598	1473
✓ CAY90 5+75E	21	62	460	873
STD C	59	41	129	178

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
110N 1+00W	9	18	60	326
110N 0+25W	10	21	135	301
110N 0+00W	14	21	86	434
110N 0+25E	14	29	116	631
110N 1+50E	9	26	82	355
110N 2+00E	5	17	58	332
109N 1+25W	19	26	130	414
106N 0+25E	27	15	196	896
106N 0+50E	26	24	197	1037
106N 0+75E	27	30	217	1170
106N 1+00E	30	25	228	888
106N 1+25E	37	39	230	1169
STD C	61	42	133	183

ACME ANALYTICAL LABORATORIES
852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6
PHONE 253-3158 DATA LINE 251-1011

DATE RECEIVED: JULY 28 1987
DATE REPORT MAILED: Aug. 5/87.

GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG.C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER. THIS LEACH IS PARTIAL FOR MN FE CA P LA CR MG BA TI B W AND LIMITED FOR NA AND K. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: SOIL

ASSAYER: D. Toye. DEAN TOYE, CERTIFIED B.C. ASSAYER

BEATY GEOLOGICAL PROJECT-160 File # 87-2773 Page 1

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
19S 1+50W	56	36	190	1173
19S 1+25W	33	26	138	637
19S 1+00W	24	32	168	556
19S 0+75W	15	24	136	791
19S 0+50W	21	27	128	516
✓19S 0+25W	40	27	173	881
✓20+25S 0+25W	27	25	262	520
24S 0+00E	37	27	157	373
24S 0+25E	19	13	116	243
24S 0+50E	16	18	85	340
24S 0+75E	15	12	100	340
24S 1+00E	21	15	90	389
24S 1+25E	38	24	126	482
24S 1+50E	22	18	119	349
24S 1+75E	21	31	133	455
24S 2+00E	19	21	110	329
24S 2+25E	32	23	125	536
24S 2+50E	34	27	145	519
24S 2+75E	77	31	301	916
✓24S 3+00E	22	21	162	564
25S 0+25E	16	20	119	242
25S 0+50E	24	25	107	347
25S 0+75E	35	17	186	464
25S 1+00E	22	19	134	394
25S 1+25E	85	35	128	957
25S 1+50E	15	23	106	314
25S 1+75E	33	17	166	419
25S 2+00E	20	4	131	286
25S 2+25E	20	21	130	455
25S 2+50E	20	22	125	349
25S 2+75E	16	18	110	289
✓25S 3+00E	20	20	134	394
36S 0+00E	19	24	80	397
36S 0+25E	20	25	95	385
36S 0+50E	20	21	66	453
36S 0+75E	23	12	81	378
STD C	60	42	132	180

AUG - 7 1987

Comm to DBL ?

BEATY GEOLOGICAL PROJECT-160 FILE # 87-2773

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
36S 1+00E	16	14	59	244
36S 1+25E	26	24	110	302
36S 1+50E	24	23	129	295
36S 1+75E	22	20	144	483
36S 2+00E	17	19	118	498
36S 2+25E	27	23	149	500
36S 2+50E	44	10	180	1067
36S 2+75E	14	18	113	346
36S 3+00E	25	16	226	604
36S 3+25E	20	23	127	479
36S 3+50E	17	19	105	463
36S 3+75E	16	21	97	511
36S 4+00E	30	20	244	566
36S 4+25E	29	18	158	586
36S 4+50E	32	20	196	666
36S 4+75E	10	2	128	519
36S 5+00E	19	11	109	654
36S 5+25E	45	23	237	872
36S 5+50E	17	24	163	530
36S 5+75E	30	18	241	795
36S 6+00E	15	17	135	401
36S 6+25E	12	7	164	441
36S 6+50E	17	21	152	582
36S 6+75E	12	4	88	312
36S 7+00E	32	24	164	641
36S 7+25E	12	4	163	252
36S 7+50E	17	4	90	485
36S 7+75E	22	9	393	316
36S 8+00E	20	8	168	317
36S 8+25E	20	2	169	331
36S 8+50E	13	16	194	464
36S 8+75E	57	19	208	685
36S 9+00E	42	15	147	870
36S 9+25E	11	6	105	405
36S 9+50E	18	6	128	412
36S 9+75E	16	4	239	496
STD C	61	39	132	176

BEATY GEOLOGICAL PROJECT-160 FILE # 87-2773

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
36S 10+00E	22	9	121	443
38S A'E	15	3	157	520
38S 2+00W	56	30	309	658
38S 1+75W	27	23	82	360
38S 1+50W	37	20	107	506
38S 1+25W	18	21	55	321
38S 1+00W	32	26	84	517
38S 0+75W	17	16	48	286
38S 0+50W	24	18	93	344
38S 0+25W	37	24	103	567
38S 0+00W	12	6	80	561
38S 0+25E	14	7	134	485
38S 0+50E	23	10	147	592
38S 0+75E	37	17	189	615
38S 1+00E	29	14	147	734
38S 1+25E	13	18	78	392
38S 1+50E	11	21	85	488
38S 1+75E	10	25	80	392
38S 2+00E	12	20	132	508
38S 2+25E	8	21	56	215
38S 2+50E	8	18	86	301
38S 2+75E	24	23	97	589
38S 3+00E	7	22	131	354
38S 3+25E	18	19	98	521
38S 3+50E	10	23	88	388
38S 3+75E	12	16	62	160
38S 4+00E	8	24	64	461
38S 4+25E	17	21	187	652
38S 4+50E	9	18	145	371
38S 4+75E	17	25	232	546
38S 5+00E	10	22	261	427
38S 5+25E	26	21	337	520
38S 5+50E	25	28	169	502
38S 5+75E	24	23	152	554
38S 6+00E	24	10	79	1258
38S 6+75E	21	7	192	484
STD C	59	42	132	180

BEATY GEOLOGICAL PROJECT-160 FILE # 87-2773

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
38S 7+00E	30	25	248	413
38S 7+25E	22	20	129	359
38S 7+50E	19	11	178	429
38S 7+75E	14	34	169	414
38S 8+00E	30	27	267	555
38S 8+25E	22	33	133	594
38S 8+50E	20	21	174	499
38S 8+75E	9	21	154	308
38S 9+00E	16	20	192	420
38S 9+25E	27	19	219	479
38S 9+50E	22	22	249	453
38S 9+75E	9	29	207	344
✓38S 10+00E	22	30	220	591
40S 2+00W	22	20	85	475
40S 1+75W	20	22	91	313
40S 1+50W	20	27	66	267
40S 1+25W	15	21	52	335
40S 1+00W	25	17	87	488
40S 0+75W	28	19	154	433
40S 0+50W	25	28	95	308
40S 0+25W	17	24	56	221
40S 0+00W	12	15	100	379
40S 0+25E	14	23	90	364
40S 0+50E	22	24	93	231
40S 0+75E	12	12	83	208
40S 1+00E	9	17	71	239
40S 1+50E	13	28	90	466
15 RERUN*	19	26	88	306
40S 1+75E	25	18	228	523
40S 2+00E	16	22	168	432
40S 2+25E	22	39	109	364
40S 2+50E	12	25	113	451
40S 2+75E	12	29	104	382
40S 3+00E	9	26	95	426
40S 3+25E	12	12	152	534
40S 3+50E	9	21	168	261
STD C	63	38	134	183

BEATY GEOLOGICAL PROJECT-160 FILE # 87-2773

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
40S 4+75E	19	8	50	586
40S 5+00E	16	29	118	260
40S 5+25E	10	14	122	279
40S 5+50E	10	19	257	531
40S 5+75E	7	4	122	274
40S 6+00E	10	24	152	372
40S 6+25E	15	32	119	249
40S 6+50E	31	11	182	569
40S 6+75E	7	10	99	349
40S 7+00E	13	25	113	280
40S 7+25E	8	22	97	345
40S 7+75E	14	17	146	369
40S 8+00E	19	14	150	464
40S 8+25E	25	16	172	630
40S 8+50E	3	17	152	361
40S 8+75E	29	15	122	1416
40S 9+00E	18	16	68	522
40S 9+25E	9	18	81	259
40S 9+50E	31	23	199	789
40S 9+75E	24	24	191	775
✓ 40S 10+00E	9	16	199	489
STD C	60	35	133	180

ACME ANALYTICAL LABORATORIES
852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6
PHONE 253-3158 DATA LINE 251-1011

1987 DATE RECEIVED: JUL 25 1987

DATE REPORT MAILED: Aug 4/87....

GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG.C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER. THIS LEACH IS PARTIAL FOR MN FE CA P LA CR MG BA TI B W AND LIMITED FOR NA AND K. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: P1-3 SOIL P4-ROCK

ASSAYER: D. Toye.. DEAN TOYE, CERTIFIED B.C. ASSAYER

BEATY GEOLOGICAL PROJECT-160 GAGE File # 87-2709 Page 1

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
OL18S 1+50W	33	29	104	439
OL18S 1+25W	29	38	126	771
OL18S 1+00W	40	33	91	640
OL18S 0+75W	27	33	101	471
OL18S 0+50W	20	38	133	456
OL18S 0+25W	37	29	185	839
OL18S 0+00	27	21	138	642
OL18S 0+25E	42	34	221	773
OL18S 0+50E	32	83	185	1411
OL18S 0+75E	38	29	123	1429
OL18S 1+00E	40	47	185	1055
OL18S 1+25E	47	41	180	916
OL18S 1+50E	39	30	181	912
✓OL18S 1+75E	34	39	206	765
OL19S 0+00E	30	30	138	567
OL19S 0+25E	37	37	176	665
OL19S 0+50E	52	43	140	901
OL19S 0+75E	27	24	112	659
OL19S 1+00E	25	32	185	867
OL19S 1+25E	45	23	141	1307
OL19S 1+50E	36	50	198	1315
✓OL19S 1+75E	42	37	234	1231
OL20S 3+50W	30	22	116	372
OL20S 3+25W	40	22	141	433
OL20S 3+00W	21	24	124	250
OL20S 2+75W	36	21	156	302
OL20S 2+50W	18	25	128	290
OL20S 2+25W	21	17	157	312
OL20S 2+00W	21	23	199	424
OL20S 1+75W	13	74	172	562
OL20S 1+50W	13	30	179	636
OL20S 1+25W	27	44	160	559
OL20S 1+00W	44	27	184	838
OL20S 0+75W	22	29	161	539
OL20S 0+50W	18	22	154	478
OL20S 0+25W	18	80	133	377
STD C	61	41	138	182

160

BEATY GEOLOGICAL PROJECT-160 GAGE FILE # 87-2709 Page 2

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
OL20S 0+00E	26	30	155	533
OL20S 0+25E	39	23	540	650
OL20S 0+50E	22	20	231	449
OL20S 0+75E	43	14	516	603
OL20S 1+00E	29	14	105	357
OL20S 1+25E	24	13	127	318
OL20S 1+50E	37	20	505	456
OL23S 3+00W	36	11	186	493
OL23S 2+75W	28	14	85	509
OL23S 2+50W	34	12	153	357
OL23S 2+25W	24	15	144	303
OL23S 2+00W	46	16	220	482
OL23S 1+75W	11	12	130	277
OL23S 1+50W	11	14	113	230
OL23S 1+25W	18	14	113	263
OL23S 1+00W	17	7	86	194
OL23S 0+75W	14	18	103	176
OL23S 0+50W	24	11	87	251
OL23S 0+25W	7	12	56	156
OL23S 0+00	17	15	80	202
OL23S 0+25E	16	13	78	288
OL23S 0+50E	19	6	98	287
OL23S 0+75E	14	15	82	207
OL23S 1+00E	14	14	86	182
OL23S 1+25E	21	17	94	306
OL23S 1+50E	43	9	89	754
OL23S 1+75E	27	15	148	241
OL23S 2+00E	25	13	98	355
OL23S 2+25E	38	12	116	402
OL23S 2+50E	16	16	111	464
CAY L-84 3+00E	23	35	477	925
CAY L-84 3+25E	23	55	544	835
CAY L-84 3+50E	24	44	459	841
CAY L-84 3+75E	18	19	463	476
CAY L-84 4+00E	12	31	361	633
CAY L-84 4+25E	14	55	359	647
~~STD~~ C	60	39	134	183

BEATY GEOLOGICAL PROJECT-160 GAGE FILE # 87-2709

SAMPLE#	CU PPM	PB PPM	ZN PPM	BA PPM
CAY L-84 4+50E	19	241	653	715
CAY L-84 4+75E	44	296	2940	2101
CAY L-84 5+00E	33	75	769	851
CAY L-84 5+25E	18	48	473	627
CAY L-84 5+50E	17	27	385	948
CAY L-84 5+75E	41	69	1056	1203
CAY L-84 6+00E	47	98	1198	1452
CAY L-84 6+25E	35	149	1672	1790
CAY L-84 6+50E	15	15	106	456
CAY L-84 6+75E	28	23	95	922
✓CAY L-84 7+00E	34	25	111	332
CAY L-86 3+00E	27	22	154	298
CAY L-86 3+25E	25	17	146	406
CAY L-86 3+50E	24	44	387	428
CAY L-86 3+75E	30	53	457	678
CAY L-86 4+00E	29	82	724	1187
CAY L-86 4+25E	48	379	1533	1690
CAY L-86 4+50E	34	240	653	1522
CAY L-86 4+75E	29	131	591	925
CAY L-86 5+00E	61	229	934	2382
STD C	59	40	133	190

CAT SOIL

ACME ANALYTICAL LABORATORIES LTD.
852 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6
PHONE 253-3158 DATA LINE 251-1011

DATE RECEIVED: AUG 8 1986

DATE REPORT MAILED: Aug. 19/86

GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER. THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.B.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: SOILS -80 MESH GA$ HF+AR AND ANALYSIS BY AA. GE$ HF+AR AND ANALYSIS BY AA.

ASSAYER: D. Toye .DEAN TOYE. CERTIFIED B.C. ASSAYER.

BEATY GEOLOGICAL PROJECT-160 FILE # 86-1923 PAGE 1

SAMPLE#	Pb PPM	Zn PPM	Cd PPM	Ga PPM	Ge PPM
10+00N 1+00W	29	206	1	15	10
10+00N 0+50W	25	249	1	14	12
10+00N 0+00E	24	258	1	15	19
10+00N 0+50E	19	209	2	9	15
10+00N 1+00E	16	114	1	9	18
10+00N 1+50E	23	148	1	4	16
10+00N 2+00E	19	116	2	16	19
10+00N 2+50E	19	117	1	18	22
10+00N 3+00E	20	174	1	11	21
10+00N 3+50E	18	177	1	12	20
10+00N 4+00E	17	263	2	13	18
10+00N 4+50E	16	154	3	8	20
10+00N 5+00E	20	215	2	10	20
5+00N 15+00W	44	345	5	9	21
5+00N 14+75W	21	209	3	7	14
5+00N 14+50W	22	210	3	12	11
5+00N 14+25W	27	206	4	11	16
5+00N 14+00W	25	413	7	12	16
5+00N 13+75W	31	365	5	18	7
5+00N 13+50W	32	257	3	15	12
5+00N 13+25W	26	228	1	11	10
5+00N 13+00W	29	205	1	12	12
5+00N 12+75W	24	192	3	13	16
5+00N 12+50W	21	359	3	9	12
5+00N 12+25W	26	332	3	12	14
5+00N 12+00W	24	353	2	12	15
5+00N 11+75W	42	345	3	15	18
5+00N 11+50W	28	638	3	18	8
5+00N 11+25W	36	356	2	12	18
5+00N 11+00W	47	762	5	10	17
5+00N 10+75W	31	886	8	13	15
5+00N 10+50W	30	599	3	12	13
5+00N 10+25W	40	374	2	11	15
5+00N 10+00W	65	357	3	18	12
5+00N 9+75W	77	556	2	12	14
5+00N 9+50W	54	282	1	10	12
STD C	40	138	19	-	-

AUG 19 1986

BEATY GEOLOGICAL PROJECT-160 FILE # 86-1923 PAGE 2

SAMPLE#	Pb PPM	Zn PPM	Cd PPM	Ga PPM	Ge PPM
5+00N 9+25W	147	661	4	16	13
5+00N 9+00W	66	975	4	13	16
5+00N 8+75W	39	894	4	17	13
5+00N 8+50W	33	712	2	13	20
5+00N 8+25W	35	394	2	19	17
5+00N 8+00W	74	190	1	6	16
5+00N 7+75W	58	374	2	12	14
5+00N 7+50W	86	395	2	14	20
5+00N 7+00W	66	335	2	15	12
5+00N 6+50W	38	408	1	10	16
5+00N 6+00W	37	358	1	12	15
5+00N 5+50W	102	620	2	14	17
5+00N 5+00W	80	1232	3	13	18
5+00N 4+50W	38	474	3	12	16
5+00N 4+00W	145	3947	5	16	15
5+00N 3+50W	83	1028	5	17	16
5+00N 3+00W	24	200	2	14	17
5+00N 2+50W	41	2394	4	12	11
5+00N 2+00W	196	1429	9	16	12
5+00N 1+50W	22	247	1	17	18
5+00N 1+00W	10	67	1	12	12
5+00N 0+50W	18	68	1	15	13
5+00N 0+00E	20	154	1	19	14
5+00N 0+50E	23	159	1	16	17
5+00N 1+00E	56	691	2	12	19
5+00N 1+50E	20	349	2	11	10
5+00N 2+00E	18	184	3	15	10
5+00N 2+50E	16	265	5	14	12
5+00N 3+00E	13	82	2	12	9
5+00N 3+50E	21	165	2	16	14
5+00N 4+00E	13	98	1	15	17
5+00N 4+50E	15	182	1	14	14
5+00N 5+00E	17	149	2	16	10
0+00N 14+00W	22	146	2	21	12
0+00N 11+00W	26	162	1	13	14
0+00N 10+50W	19	240	2	16	12
STD C	42	144	19	-	-

BEATY GEOLOGICAL PROJECT - 160 FILE # 86-1923 PAGE 3

SAMPLE#	Pb PPM	Zn PPM	Cd PPM	Ga PPM	Ge PPM
0+00N 9+50W	75	248	1	11	18
0+00N 9+25W	39	162	1	12	22
0+00N 9+00W	61	223	1	10	16
0+00N 8+75W	85	256	1	8	23
0+00N 8+50W	83	439	2	14	26
0+00N 8+25W	110	924	5	13	21
0+00N 8+00W	129	589	4	17	24
0+00N 7+75W	146	594	6	15	22
0+00N 7+50W	180	613	5	13	23
0+00N 7+25W	30	701	5	16	20
0+00N 7+00W	120	597	4	13	19
0+00N 6+50W	66	182	1	6	20
0+00N 6+00W	73	592	4	12	17
0+00N 5+50W	8981	4364	10	11	28
0+00N 5+00W	168	389	1	10	20
0+00N 4+00W	13	199	2	11	20
0+00N 3+00W	29	238	1	15	22
0+00N 2+00W	25	140	1	18	28
0+00N 1+50W	16	84	1	14	21
0+00N 1+00W	31	163	1	13	25
0+00N 0+50W	35	245	1	10	27
0+00N 0+00W	18	75	1	12	25
0+00S 0+00E	15	58	1	12	22
0+00S 0+50E	21	151	1	17	23
0+00S 1+00E	11	83	1	21	26
0+00S 1+50E	14	133	1	16	24
0+00S 2+00E	25	194	1	14	25
0+00S 2+50E	96	1002	2	8	29
0+00S 5+00E	12	68	1	14	27
0+00S 5+50E	14	101	1	11	28
0+00S 6+00E	15	80	1	6	32
0+00S 6+50E	13	94	1	9	31
0+00S 7+00E	12	70	1	10	25
5+00S 14+00W	9	88	4	3	22
5+00S 13+00W	10	121	2	4	26
5+00S 12+00W	15	141	3	10	28
STD C	44	143	20	-	-

BEATY GEOLOGICAL PROJECT - 160 FILE # 86-1923 PAGE 4

SAMPLE#	Pb PPM	Zn PPM	Cd PPM	Ga PPM	Ge PPM
5+00S 11+00W	19	139	3	11	18
5+00S 10+00W	19	108	2	10	20
5+00S 9+00W	17	177	2	14	23
5+00S 8+00W	35	169	1	12	22
5+00S 7+00W	18	128	2	18	19
5+00S 6+50W	69	275	5	11	17
5+00S 6+00W	30	434	2	12	18
5+00S 5+75W	22	319	4	10	20
5+00S 5+50W	61	999	7	11	27
5+00S 5+25W	155	1112	3	14	24
5+00S 5+00W	33	701	4	17	19
5+00S 4+75W	58	896	2	16	21
5+00S 4+50W	30	182	1	14	16
5+00S 4+25W	61	285	1	15	20
5+00S 4+00W	32	601	3	17	22
5+00S 3+75W	89	493	1	15	20
5+00S 3+50W	21	203	1	14	21
5+00S 3+25W	44	265	3	15	19
5+00S 2+75W	31	102	1	11	17
5+00S 2+25W	34	193	2	15	14
10+00S 15+00W	12	103	1	4	18
10+00S 14+50W	20	134	1	3	17
10+00S 14+00W	17	144	1	11	14
10+00S 13+50W	18	157	1	5	10
10+00S 13+00W	21	147	1	11	12
10+00S 12+50W	16	105	2	16	14
10+00S 12+00W	19	194	2	12	19
10+00S 11+50W	19	115	1	11	14
10+00S 11+00W	19	131	2	15	16
10+00S 10+50W	20	166	2	13	18
10+00S 10+00W	20	92	2	15	18
10+00S 9+50W	16	149	2	12	19
10+00S 9+00W	19	115	2	4	20
10+00S 8+50W	15	129	1	10	19
10+00S 8+00W	15	131	1	14	16
10+00S 7+50W	14	140	1	13	15
STD C	42	141	20	-	-

BEATY GEOLOGICAL PROJECT - 160 FILE # 86-1923 PAGE 5

SAMPLE#	Pb PPM	Zn PPM	Cd PPM	Ga PPM	Ge PPM
10+00S 7+00W	20	119	1	12	24
10+00S 6+50W	18	158	3	15	18
10+00S 6+00W	20	102	1	17	16
10+00S 5+50W	16	117	1	15	18
10+00S 5+00W	17	140	1	14	16
10+00S 4+50W	18	131	1	16	22
10+00S 4+00W	95	1058	1	15	26
10+00S 3+50W	37	448	1	13	21
10+00S 3+00W	28	550	3	14	18
10+00S 2+50W	49	339	2	11	16
10+00S 2+00W	147	1265	4	12	20
10+00S 1+50W	50	799	2	14	15
10+00S 1+00W	52	3466	6	12	31
10+00S 0+50W	16	92	1	14	20
10+00S 0+00E	17	62	1	13	19
10+00S 0+50E	16	73	1	13	22
10+00S 1+00E	19	111	1	16	18
10+00S 1+50E	14	96	1	12	19
10+00S 2+00E	17	258	3	17	20
10+00S 2+50E	21	197	1	14	20
20+00S 9+50W	18	94	1	20	25
20+00S 9+00W	19	111	1	21	26
20+00S 8+50W	32	96	1	22	28
20+00S 8+00W	18	114	1	23	22
20+00S 7+50W	20	118	1	19	18
20+00S 7+00W	23	138	1	21	25
20+00S 6+50W	22	124	1	20	26
20+00S 6+00W	19	117	1	17	22
20+00S 5+50W	21	130	1	20	17
20+00S 5+00W	20	140	1	14	23
20+00S 4+50W	21	128	1	20	21
20+00S 4+00W	20	132	1	21	24
20+00S 3+50W	17	143	1	21	21
20+00S 3+00W	22	143	1	20	22
20+00S 2+50W	24	185	3	18	24
20+00S 2+00W	23	170	1	17	19
STD C	41	140	19	-	-

BEATY GEOLOGICAL PROJECT 160 FILE# 86-1923 PAGE# 6

SAMPLE	Pb ppm	Zn ppm	Cd ppm	Ga ppm	Ge ppm
20+00S 1+50W	29	407	3	20	20
20+00S 1+00W	40	165	1	18	22
20+00S 0+50W	29	185	2	18	25
20+00S 0+00E	36	153	2	14	22
20+00S 0+50E	18	174	2	16	23
20+00S 1+00E	19	139	1	23	25
20+00S 1+50E	16	414	3	21	22
20+00S 2+00E	17	149	1	15	24
20+00S 2+50E	14	92	1	16	26
20+00S 3+00E	11	72	1	17	24
20+00S 3+50E	9	154	1	8	22
20+00S 4+00E	15	88	1	14	20
20+00S 4+50E	17	154	2	13	18
20+00S 5+00E	20	102	2	14	16

APPENDIX IIB

ANALYTICAL RESULTS

(ASSAY RESULTS)

ACME ANALYTICAL LABORATORIES LTD.
852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6
PHONE(604)253-3158 FAX(604)253-1716 DATE RECEIVED: OCT 19 1987
DATE REPORT MAILED: Nov. 6/87

ASSAY CERTIFICATE

- SAMPLE TYPE: Core

ASSAYER: D. Toye. DEAN TOYE, CERTIFIED B.C. ASSAYER

BEATY GEOLOGICAL PROJECT-160 File # 87-5108 Page 1

SAMPLE#	PB %	ZN %	GA %	GE %
E 65001	.28	2.46	.001	.008
E 65002	.07	.36	.001	.001
E 65003	.33	.45	.001	.002
E 65004	.30	.81	.001	.002
E 65005	.27	1.34	.001	.002
E 65006	.07	1.63	.002	.003
E 65007	.13	1.23	.001	.003
E 65008	.10	.18	.001	.001
E 65009	.02	.42	.001	.002
E 65010	.02	.32	.001	.001
E 65011	.03	1.27	.001	.002
E 65012	.04	.43	.002	.001
E 65013	.14	.43	.001	.001
E 65014	.04	.08	.001	.001
E 65015	.08	.20	.002	.001
E 65016	.01	3.05	.002	.003
E 65017	.05	1.13	.002	.002
E 65018	.37	.82	.001	.001
E 65019	.06	.06	.001	.001
E 65020	.01	.08	.001	.001
E 65021	.04	.63	.001	.001
E 65022	.02	.98	.001	.003
E 65023	.12	4.31	.004	.025
E 65024	.02	.11	.001	.001
E 65025	.26	.03	.001	.001
E 65026	.04	.01	.001	.001
E 65027	.02	.04	.001	.001
E 65028	.01	.01	.001	.001
E 65029	.17	.08	.001	.001
E 65030	.01	.03	.001	.001
E 65033	.01	.01	.001	.001
E 65034	.29	.06	.001	.001
E 65035	.46	3.56	.004	.012
E 65036	.52	.81	.001	.002
E 65037	.20	.99	.001	.001
E 65038	.09	.77	.001	.001

BEATY GEOLOGICAL PROJECT-160 FILE # 87-5108 Page 2

SAMPLE#	PB %	ZN %	GA %	GE %
E 65039	.09	1.50	.001	.003
E 65040	.08	.32	.001	.001
E 65041	.07	.05	.001	.001
E 65042	.05	.55	.002	.001
E 65043	.07	3.84	.001	.004
E 65044	.07	1.64	.001	.001
E 65045	.02	6.95	.004	.038
E 65046	.34	.24	.001	.001
E 65047	.01	2.73	.001	.006
E 65048	.05	2.33	.001	.002
E 65049	.30	1.24	.001	.006
E 65050	.46	.05	.001	.001

ACME ANALYTICAL LABORATORIES LTD.
852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6
PHONE(604)253-3158 FAX(604)253-1716

DATE RECEIVED: OCT 23 1987
DATE REPORT MAILED: Nov.6/87.

ASSAY CERTIFICATE

- SAMPLE TYPE: Core

ASSAYER: D. Toye. DEAN TOYE, CERTIFIED B.C. ASSAYER

BEATY GEOLOGICAL PROJECT-160 File # 87-5144

SAMPLE#	PB %	ZN %	GA %	GE %
E 65051	.13	.57	.001	.003
E 65052	6.28	7.52	.004	.007
E 65053	.14	1.72	.001	.007
E 65054	.20	.44	.001	.001
E 65055	.14	.69	.001	.002
E 65056	.17	1.35	.001	.003
E 65057	.11	1.33	.001	.002
E 65058	.10	1.75	.001	.003
E 65059	.16	.41	.001	.001
E 65060	.11	1.33	.001	.002
E 65061	.22	1.35	.001	.002
E 65062	.03	1.08	.001	.002
E 65063	.01	1.42	.001	.001
E 65064	.01	1.02	.001	.001
E 65065	.01	1.08	.001	.001
E 65066	.02	.31	.002	.001
E 65067	.01	.96	.001	.001
E 65068	.01	1.67	.001	.001
E 65069	.10	1.46	.001	.002
E 65070	.06	1.40	.001	.003
E 65071	.01	1.83	.001	.002
E 65072	.01	1.22	.001	.001
E 65073	.01	1.37	.001	.007
E 65074	.05	1.00	.001	.001

ACME ANALYTICAL LABORATORIES
852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6
PHONE 253-3158 DATA LINE 251-1011 DATE RECEIVED: SEPT 14 1987
DATE REPORT MAILED: Sept 25/87

ASSAY CERTIFICATE

- SAMPLE TYPE: Rock Chips

ASSAYER: D. Toye. DEAN TOYE, CERTIFIED B.C. ASSAYER

BEATY GEOLOGICAL PROJECT-160 File # 87-4219

SAMPLE#	PB %	ZN %	GA %	GE %	IN %
JP87-28A	3.81	.10	.001	.007	.001
JP87-28C	.36	6.28	.003	.040	.001
JP87-33	34.80	.63	.001	.001	.001
JP87-37	1.41	.11	.001	.002	.001
JP87-59	2.39	.06	.001	.001	.001
JP87-90	.11	.07	.001	.001	.001
JP87-99C	.22	.51	.001	.001	.001
JP87-101	.01	.01	.001	.001	.001
JP87-106A	.01	1.75	.001	.008	.001
JP87-106B	.14	1.22	.001	.006	.001
JP87-110B	2.89	.02	.001	.001	.001
JP87-113	.03	.09	.001	.001	.001
JP87-118A	.05	.49	.001	.001	.001
JP87-TRIANGLE	.08	.01	.001	.001	.001
NOSE ZN	.01	22.69	.004	.150	.001
NOSE GN	11.00	.27	.001	.001	.001
ES-1330	3.06	.03	.001	.001	.001
DGL B EAST LINES	23.55	6.75	.006	.003	.001

SEP 29 1987

160

Doug

APPENDIX III

PETROGRAPHY

PETROLOGIC AND MINERALOGIC ANALYSES OF SOME SAMPLES FROM THE CAY PROSPECT, BRITISH COLUMBIA

Lawrence R. Bernstein, Ph.D.
Mineral Search
380 Willow Road, Menlo Park, CA 94025

May, 1987

PETROLOGIC AND MINERALOGIC ANALYSES OF SOME SAMPLES FROM THE CAY PROSPECT, BRITISH COLUMBIA

Lawrence R. Bernstein, Ph.D.
Mineral Search
380 Willow Road, Menlo Park, CA 94025

INTRODUCTION

The Cay prospect consists primarily of zinc and lead sulfide mineralization within fossiliferous back-reef facies Middle Devonian limestone (Dunedin Formation). This formation is overlain by Upper Devonian or Mississippian graphitic shale (Besa River Formation), and underlain by the Middle Devonian Stone Dolomite. Structurally, the mineralization is concentrated towards the crest of a southward plunging anticline in a "trap"-like configuration. The mineralization is of particular interest due to its high concentration of germanium (as much as 1500 ppm) and, to a lesser extent, of gallium (as much as 160 ppm). Knowing the mineralogic locations of the Ge and Ga is essential to further prospecting and to mapping of the ore, and to the development of optimal ore processing and extractive metallurgical methods. The focus of this preliminary study is to determine the mineralogy of the ore, and the likely sites for the Ge and Ga.

MATERIALS AND METHODS

Three hand samples from the Cay prospect were received for study: (1) reddish-brown to black, fine-grained siliceous rock (labelled #1827) (high Ge and Ga); (2) pale-gray carbonate rock containing abundant white barite crystals and pale brown sphalerite crystals (no sample number) (moderate Ge and Ga); and (3) dark gray to black siliceous rock containing abundant galena (labelled S-6) (very low Ge and Ga). Two polished thin sections were received for sample 1, and two more were prepared. An additional thin section (labelled BG-3) was received, which appears very similar to sample 2. As sample 1 represents the high Ge-Ga ore, it was given the most detailed study.

The polished thin sections were observed in both transmitted and reflected light in a petrographic microscope. The sections were also observed in a scanning electron microscope (SEM) equipped with energy dispersive x-ray elemental

analysis equipment (EDX). A few rough samples were also examined this way. In addition, the samples were analyzed by powder x-ray diffraction, using an automated diffractometer with monochromatized CuK_{α} radiation. In the descriptions below, minerals confirmed by powder x-ray diffraction are indicated by an "x", and those confirmed by SEM-EDX analysis are indicated by an "s".

DESCRIPTIONS

Sample 1 (#1827)

Megascopic: This is a fine-grained dark reddish-brown to black highly siliceous rock. Indistinct to distinct, highly irregular boundaries separate zones of concentrated reddish-brown fine-grained sphalerite (ranging in size from less than 1 mm to several cm across) from black, carbonaceous siliceous material containing disseminated fine grains of the red-brown sphalerite, which forms the matrix of the rock. Some wispy, distorted relict foliation appears present at various orientations throughout the rock, suggesting that the rock is a silicified argillite or shale breccia. Discontinuous veins and irregular segregations of white quartz (as much as 1 cm across) are common. These contain abundant black, coal-like carbonaceous matter ranging from tiny specks to masses several mm across, as well as scarce pyrite crystals. Small vugs in the quartz are common, in places containing terminated prismatic quartz crystals. The rock is very tough, and has a strong sulfurous odor, particularly when freshly broken.

Microscopic: The sample consists predominately of varying proportions of intergrown anhedral reddish-orange sphalerite (x,s) and quartz (x,s). The grain size is fairly homogeneous, ranging mostly from 20 to 100 μm. Where abundant, the sphalerite grains commonly coalesce and form a loose network. The sphalerite contains almost no Fe (< 500 ppm to about 0.5%), but does contain about 0.5 - 1% Cu, which probably gives it the distinct reddish color. No other elements were detected in the sphalerite, including Ge and Ga, at the detection limit of about 500 ppm. Disseminated subhedral to euhedral cubic pyrite (x,s) crystals 10-150 μm across are fairly common, and are locally concentrated. No minor elements were detected in the pyrite (< 500 ppm). Some of the pyrite crystals are partially altered to iron oxides. A few elongated, corroded areas of pyrite appear pseudomorphous after a bladed mineral (barite?). Finely disseminated black carbonaceous matter (s) (<1 μm - 100 μm) is common throughout the rock, and is locally concentrated. Also fairly common, generally surrounding sphalerite, is material containing mostly Si with lesser Al, S, Fe, and Ca (s). This is probably a

cryptocrystalline to amorphous mixture of silica, clays, calcite, pyrite, and organic matter. A few tiny ($<20\,\mu$m) grains of barite (s) and galena (s) were also observed.

The quartz segregations consist mostly of intergrown subhedral to euhedral quartz (x,s) crystals 0.1 to several mm across. Grains of the black carbonaceous material (s) as much as several mm across and of pale yellow to colorless transparent sphalerite (x,s) as much as 1 mm across are common. A few of the smaller red-orange sphalerite grains are also present. The carbonaceous material generally occurs in rounded colloform shapes. In reflected light it has a beige color, and most of it is highly anisotropic from light yellow to gray, with a polycrystalline texture similar in appearance to thermally altered coal (or coke). Some of the carbonaceous matter, however, is isotropic with no evident crystallinity. The two varieties are commonly concentrically layered, though elsewhere occur in irregular shapes. Shells of the polycrystalline material commonly form around the coarse sphalerite grains. Most of the carbonaceous material has a high S content (about 5-15%), though some of the isotropic material has less. Powder x-ray diffraction of the carbonaceous matter showed no diffraction peaks, indicating an extremely small grain size. The sphalerite contains no detectable minor elements (<500 ppm), though it does locally contain tiny (1-5 μm) spindle-shaped exsolution blebs of chalcopyrite (s) and, more rarely, tiny crystals of pyrite (s). These can be observed in both reflected and transmitted light. The sphalerite crystals have highly irregular edges that commonly appear broken or corroded. Many crystals are contained wholly or partially in the carbonaceous material. Small anhedral (5-50 μm) to larger euhedral (0.1-2 mm) pyrite (x,s) crystals are fairly common in the quartz segregations. Significantly, small (5-40 μm) anhedral, nearly isotropic grains of yellow-orange germanite (s) are fairly common in these segregations. These grains are always found with the carbonaceous material, though they can be adjacent to quartz, sphalerite, or pyrite. They contain a large amount of Cu, with several percent each of Ge, Zn, and generally of Fe and V. In some grains, As and Sb are also present. The usual composition is probably something like $Cu_{10}Ge_3Zn_2(Fe,V)_2S_{16}$ to $Cu_{10}Ge_2Zn_4(Fe,V)_2S_{16}$ (see Fig. 1). A few grains, as much as 150 μm across, associated with carbonaceous material on a rough sample observed in the SEM, were found to have a composition of about $Cu_{10}Zn_3Ge_2S_{12}$ (see Fig. 2). A few bladed crystals of barite (s) (as much as 200 μm) were also observed, always highly corroded and porous.

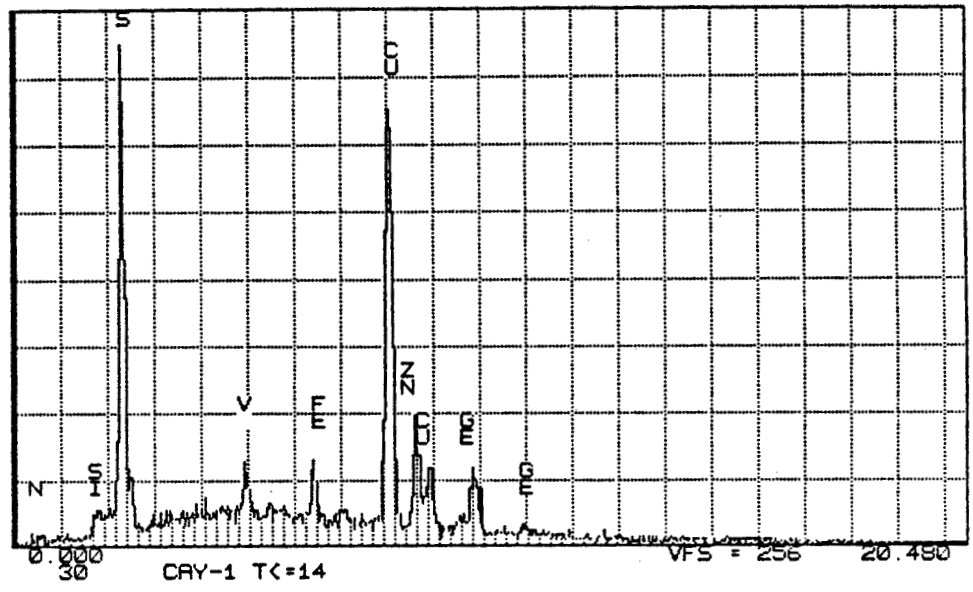

Figure 1. Energy dispersive x-ray spectrum of a 30 μm germanite grain in sample 1, adjacent to carbonaceous matter.

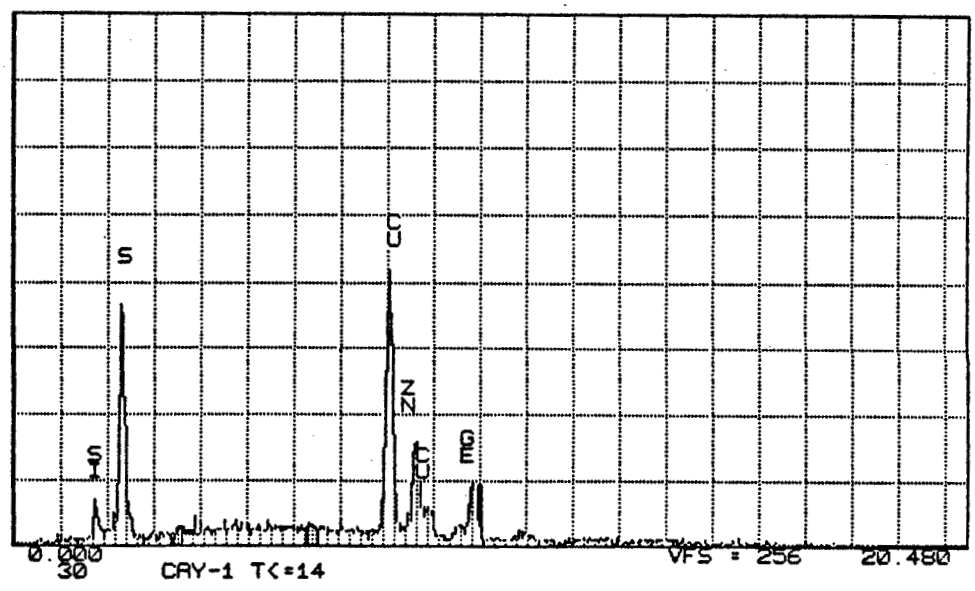

Figure 2. Energy dispersive x-ray spectrum of a 10 μm grain of a Ge-rich sulfide adjacent to carbonaceous matter in sample 1. The grain has a composition of approximately $Cu_{10}Zn_3Ge_2S_{12}$, and is probably related to germanite.

Sample 2 (unlabelled)

Megascopic: The rock consists mostly of massive fine-grained gray calcite (x) and quartz (x). Yellow-brown, nearly equant, subhedral sphalerite (x) crystals 1-5 mm across are abundantly disseminated and locally concentrated. Thin tabular white barite (x) crystals, 0.2-3 mm thick by 3-20 mm long, are common. These generally occur as radiating to subradiating aggregates. A few coarse (up to 1 cm) subhedral galena crystals are also present. Concentrations of black carbonaceous material, as wispy stringers and as blebs a few mm across, are fairly common. A few segregations of fine-grained pyrite a few mm across were also observed. No trace of any foliation or other original texture remains in this sample.

Slide BG-3 (very similar to Sample 2)

Microscopic: The sample consists primarily of intergrown subhedral to euhedral quartz (s) and anhedral calcite (s) with varying amounts of bladed barite (s), all about 50-200 μm in grain size. Some patches of calcite are as much as 1 mm across. No minor elements could be detected in the calcite (including Fe and Mg) and barite (including Sr) ($<$500 ppm). Also in this matrix are fairly common grains (as much as 200 μm) of the barium feldspar celsian (s), and scarce grains of orthoclase (s) containing a trace of Ba. Coarse (as much as several mm) anhedral crystals of sphalerite (s) are abundant, containing irregular colorless and pale yellow zones. These grains hvae irregular, corroded-appearing edges. They commonly contain tiny (<1 μm to 5 μm) inclusions of subhedral pyrite (s) and, more rarely, of chalcopyrite (s). A few coarser (to 200 μm) cubic pyrite (s) inclusions also occur. Pyrite (s) also occurs as scarce cubic crystals as much as 100 μm across throughout the sample. A coarse (1 cm) galena crystal is present that has irregular, corroded-appearing edges against the quartz, barite, and calcite. Finer galena is common throughout the sample, locally intergrown with sphalerite.

Sample 3 (S-6)

Megascopic: This is a massive, black, cherty siliceous rock containing mostly quartz (x) with abundant coarse (1-10 mm) anhedral grains of galena (x). Relict textures indicate argillite or shale breccia, with clasts ranging from less than one mm to many cm across. Abundant fractures, veinlets (from wispy to 3 mm wide), and rounded vugs (1-4 mm) are filled with fine-grained anglesite (x) and lesser barite (x). Some fractures and parts of fractures are open, covered with drusy quartz crystals. The black color suggests abundant carbonaceous matter; pyrite was not detected by powder x-ray diffraction.

DISCUSSION

Sample 1 represents a pervasively silicified breccia. The protoliths of the clasts could not be determined, though they were probably very fine grained (possibly argillite or limestone), and were probably carbonaceous. The rock was altered by siliceous solutions that contained abundant Zn and S, with lesser Ba, Cu, Pb, Ge, Ga, V, As, and Sb. Silicification took place along with deposition of fine-grained red-orange Cu-bearing sphalerite and lesser pyrite. (Note that silicification is commonly associated with mineralization at many Mississippi Valley deposits, such as the Picher field briefly discussed below). Sphalerite-rich areas could represent pre-existing reactive limestone clasts while quartz-rich areas could represent pre-existing argillite clasts. Some of the metals, particularly those with high organic affinities such as Ge, Ga, As, Ag, and V, may have been derived in part, however, from the carbonaceous material and not from outside solutions. The mineralizing solutions may have leached out these elements and redeposited them as sulfides, as discussed below.

In sample 1, the segregations of coarse, vuggy quartz with coarse carbonaceous material and pale yellow sphalerite indicate a later period of remobilization and redeposition. Exsolution blebs of chalcopyrite in the sphalerite indicate initially moderate temperatures, probably at least 125°C, during crystallization. Fairly slow cooling with some re-equilibration is indicated by the exsolution blebs and the slightly corroded sphalerite grain boundaries. Partial solution of the pre-existing fine-grained sphalerite would have concentrated the less compatible elements, such as Cu and Ge, into the solutions and thus into the quartz segregations. Carbonaceous material could have aggregated into large clumps, and some of the contained metals such as Ge, Ga, As, and V could have been removed and redeposited in sulfides such as germanite. That these metals were at least partially derived from the carbonaceous matter is strongly suggested by the fact that germanite is only observed adjacent to the carbonaceous matter. It is also possible that the carbonaceous matter served as a reducing agent to precipitate the germanite.

Late concentration of Ge and Ga is observed at the St. Salvy deposit in France. At this deposit, early bedded sphalerite contains relatively low amounts of Ge and Ga (generally <500 ppm Ge and <100 ppm Ga), whereas late, reworked sphalerite-quartz veins contain several hundred ppm Ga and as much as 3000 ppm Ge (Geldron, 1981; Barbanson and Geldron, 1983). Carbonaceous material is

abundant in the calcareous shale host rock at St. Salvy, as are organic-rich phosphate nodules.

The nature of the carbonaceous matter at the Cay prospect requires further investigation. A preliminary examination showed that this material has little if any solubility in methanol or acetone, and is therefore not typical "bitumen". The polycrystalline texture, as mentioned, is very similar to that of thermally altered coal, and probably reflects a period of elevated temperatures, possibly from hot mineralizing solutions. The temperatures apparently were not high enough, however, to produce graphite. The high sulfur content (5-15%) is typical of marine or brackish peat deposits, and has also been found in some Mississippi Valley organics that were probably derived from oil. It is possible that both the metals and the sulfur were partially derived from the carbonaceous matter at the Cay prospect. Such material is probably the single best indicator for high Ge concentrations, followed by Cu, V, and As.

The presence of 0.5 to at least 1% Cu in the fine-grained reddish sphalerite is unusual, and would not generally be stable. I have observed at other localities that the concentrations of Cu and Ga are correlated in sphalerite, with Cu(I)+Ga(III) substituting for 2Zn(II), thus balancing the valences. Although Ga was not detected in the SEM, it actually may be present in small quantities. Unfortunately, the $Cu_{K\beta}$ fluorescence partially obscures the $Ga_{K\alpha}$ fluorescence. Ga may also be present in germanite, though probably less than 0.5%. It is also probable that Ga is present in the aluminous clay minerals of any relict argillite or shale, substituting for Al.

At the Picher field in Oklahoma and Kansas (a highly silicified, high-Ge and Ga Mississippi Valley deposit), red "ruby jack" sphalerite was found to contain as much as 0.2% Cu, and only about 0.1-0.3% Fe (McKnight and Fischer, 1970). This red variety of sphalerite has particularly high Ge and Ga concentrations: as much as 1000 ppm and 600 ppm Ga. It is also notable that coal beds are present in the stratigraphic section at the Picher field, commonly in close proximity to ore bodies.

At the Cay prospect, germanium appears to be present predominately in germanite (and related Cu- and Ge-rich sulfides), which contains several percent Ge. These phases are always closely associated with the carbonaceous matter. As much as 500 ppm Ge may also occur in the sphalerite and carbonaceous matter, though it could not be detected in this study.

Sample 2 was probably a fairly permeable carbonate breccia that was a host for barite, sphalerite, and galena mineralization, and partial silicification.

Germanium and to some extent gallium should be most concentrated in late veins or segregations in this material, and with high concentrations of Cu and carbonaceous matter. Gallium may also be concentrated in the most sphalerite-rich zones.

Sample 3 is a pervasively silicified shale or argillite breccia that was host to galena and lesser barite mineralization. Some brecciation may have occurred after galena deposition, and late solutions deposited some anglesite. If reworked veins containing late sphalerite, chalcopyrite, and coarse organic material can be found in this rock, they may contain higher Ge and Ga concentrations. Otherwise, this rock is not likely to have much Ge or Ga. Unsilicified aluminous shales may, however, contain elevated Ga concentrations.

SUMMARY AND CONCLUSIONS

1. Sample 1 (#1827) is a fine-grained pervasively silicified breccia containing abundant though inhomogenously distributed fine-grained reddish Cu-bearing sphalerite and sulfur-rich carbonaceous material, with lesser pyrite and barite. Quartz-rich segregations contain coarser pale yellow sphalerite with tiny exsolution blebs of chalcopyrite, masses of carbonaceous material, and lesser pyrite. Germanite, containing Cu, Ge, Zn, and commonly Fe, V, As, and Sb, is fairly common as tiny grains always associated with the carbonaceous material.

2. The quartz-rich segregations in sample 1 represent remobilization and recrystallization of pre-existing material at moderate (>125°C) temperatures. Some of the metals (particularly Ge), and perhaps some sulfur, were probably derived from the carbonaceous matter. Much of the carbonaceous matter is highly anisotropic with a polycrystalline texture, suggesting thermal alteration.

3. The germanium in the ore is concentrated in germanite (several percent Ge), primarily in the quartz-rich segregations. As much as several hundred ppm Ge may also exist in all the sphalerite, and some may remain in the carbonaceous matter, though this needs to be investigated.

4. Germanium should be highly correlated with the carbonaceous matter, and fairly well correlated with Cu, V, and As. It will not, however, consistently be correlated with Zn, Pb, or Ba.

5. Gallium was not directly detected, but probably is concentrated in the Cu-rich reddish sphalerite. It may also occur in the germanite, and in any aluminous clay minerals in shales or argillites. Correlations with Cu or Al may be present.

SUGGESTIONS FOR FURTHER WORK

1. Mineral separates should be obtained from the high Ge-Ga ore to determine the Ge and Ga contents of the sphalerite and carbonaceous matter.

2. The carbonaceous matter could be further investigated to determine if it is derived from coal, oil, or another source.

3. Complete chemical analyses should be obtained on the samples, particularly for Cu, As, V, Sb, Hg, Ag, and Fe in addition to Ge, Ga, Zn, and Pb. This could lead to better correlations being derived. Analyses for Ge and Ga must be done carefully, as both form volatile fluorides and chlorides, particularly if heated. Solutions containing HCl or HF should be avoided. Emission spectroscopy may be useable, as it has a sensitivity of a few ppm for Ge and Ga.

4. Fluid inclusion studies could be undertaken to get a rough idea of the salinities and deposition temperatures of the ore-forming fluids. The presence or absence of hydrocarbon inclusions in the sphalerite could also be established, thus determining whether hydrocarbons were a part of these fluids.

REFERENCES

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Geldron, Alain (1981) Le germanium: données bilbliographiques, étude du cas de Saint-Salvy (Tarn). D.E.A. Thesis, University of Orleans, France.

McKnight, E.T. and Fischer, R.P. (1970) Geology and ore deposits of the Picher Field, Oklahoma and Kansas. U.S. Geological Survey Professional Paper 588, 165 p.

APPENDIX IV

STRUCTURAL ANALYSIS

cay project, bedding

Orientation data:

121 points

.0	.0	173.0	40.0	190.0	51.0	180.0	40.0	173.0	46.0	193.0	46.0
182.0	48.0	173.0	57.0	173.0	40.0	172.0	39.0	254.0	34.0	352.0	14.0
50.0	18.0	31.0	46.0	342.0	55.0	357.0	45.0	357.0	66.0	358.0	70.0
358.0	74.0	.0	87.0	358.0	33.0	358.0	51.0	26.0	26.0	167.0	38.0
187.0	30.0	345.0	53.0	347.0	38.0	355.0	38.0	335.0	37.0	.0	39.0
353.0	36.0	353.0	50.0	.0	44.0	178.0	63.0	177.0	52.0	161.0	65.0
166.0	67.0	182.0	74.0	163.0	60.0	170.0	37.0	153.0	12.0	45.0	18.0
2.0	27.0	334.0	57.0	357.0	63.0	334.0	65.0	354.0	57.0	359.0	42.0
359.0	42.0	20.0	30.0	65.0	18.0	158.0	10.0	158.0	49.0	143.0	65.0
158.0	45.0	6.0	25.0	3.0	46.0	4.0	45.0	354.0	60.0	334.0	48.0
336.0	54.0	343.0	52.0	357.0	69.0	359.0	58.0	38.0	15.0	344.0	46.0
353.0	60.0	342.0	67.0	28.0	26.0	54.0	13.0	350.0	39.0	354.0	33.0
345.0	42.0	.0	41.0	345.0	40.0	343.0	39.0	8.0	57.0	9.0	57.0
347.0	64.0	351.0	65.0	359.0	66.0	3.0	63.0	345.0	78.0	340.0	75.0
348.0	81.0	342.0	85.0	356.0	73.0	340.0	71.0	344.0	67.0	337.0	76.0
345.0	67.0	170.0	68.0	335.0	64.0	3.0	66.0	173.0	47.0	350.0	42.0
350.0	40.0	356.0	62.0	183.0	54.0	168.0	45.0	175.0	35.0	337.0	51.0
351.0	65.0	264.0	29.0	144.0	46.0	153.0	52.0	169.0	49.0	152.0	57.0
153.0	18.0	153.0	64.0	150.0	51.0	149.0	59.0	5.0	40.0	353.0	57.0
347.0	44.0	7.0	49.0	350.0	29.0	350.0	31.0	344.0	47.0	3.0	57.0
337.0	75.0										

cay project, bedding

Data distribution:

Uniformity test:

The data do not differ significantly from uniform at the .95 level

Test of distribution:

Expected type of distribution: Girdle

Data have weak preferential orientation

Test of rotational symmetry (s(g)):
s(g) = 22.21
This differs significantly from a girdle form at the .95 level

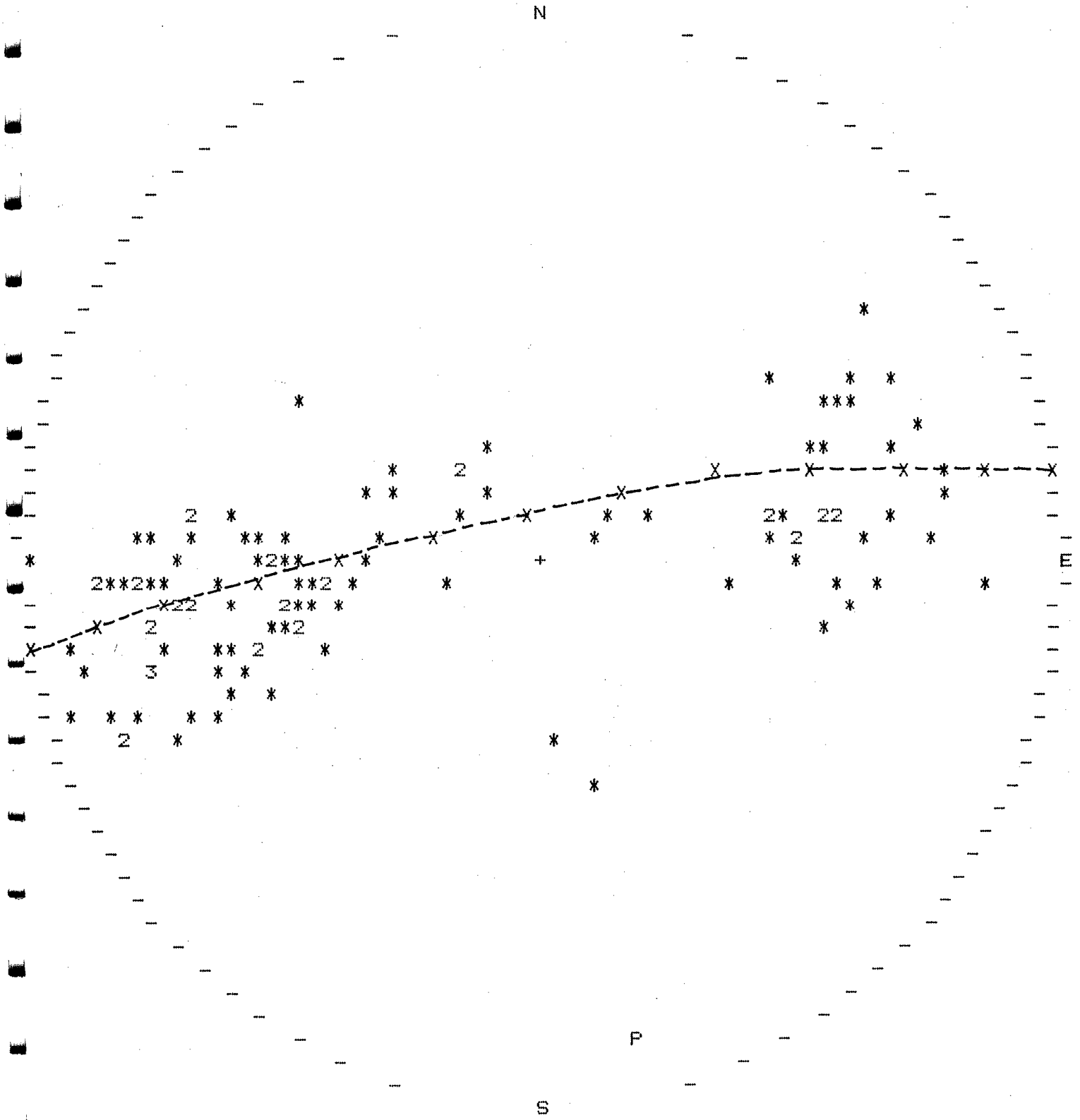
Best-fit girdle on data:
Strike : 79.6 (N80.E)
Dip : 82.3 (82.NW) Pi-point : 8.,169.6 (8., S10.E)
Dip azimuth : 349.6

cay project, bedding

Plotting of data points and interpretation on an equal-area stereonet
Lower hemisphere projection:

Single points : * Multiple points : 2 - 9
Center : +
Best-fit girdle : X Pi-point of girdle : P

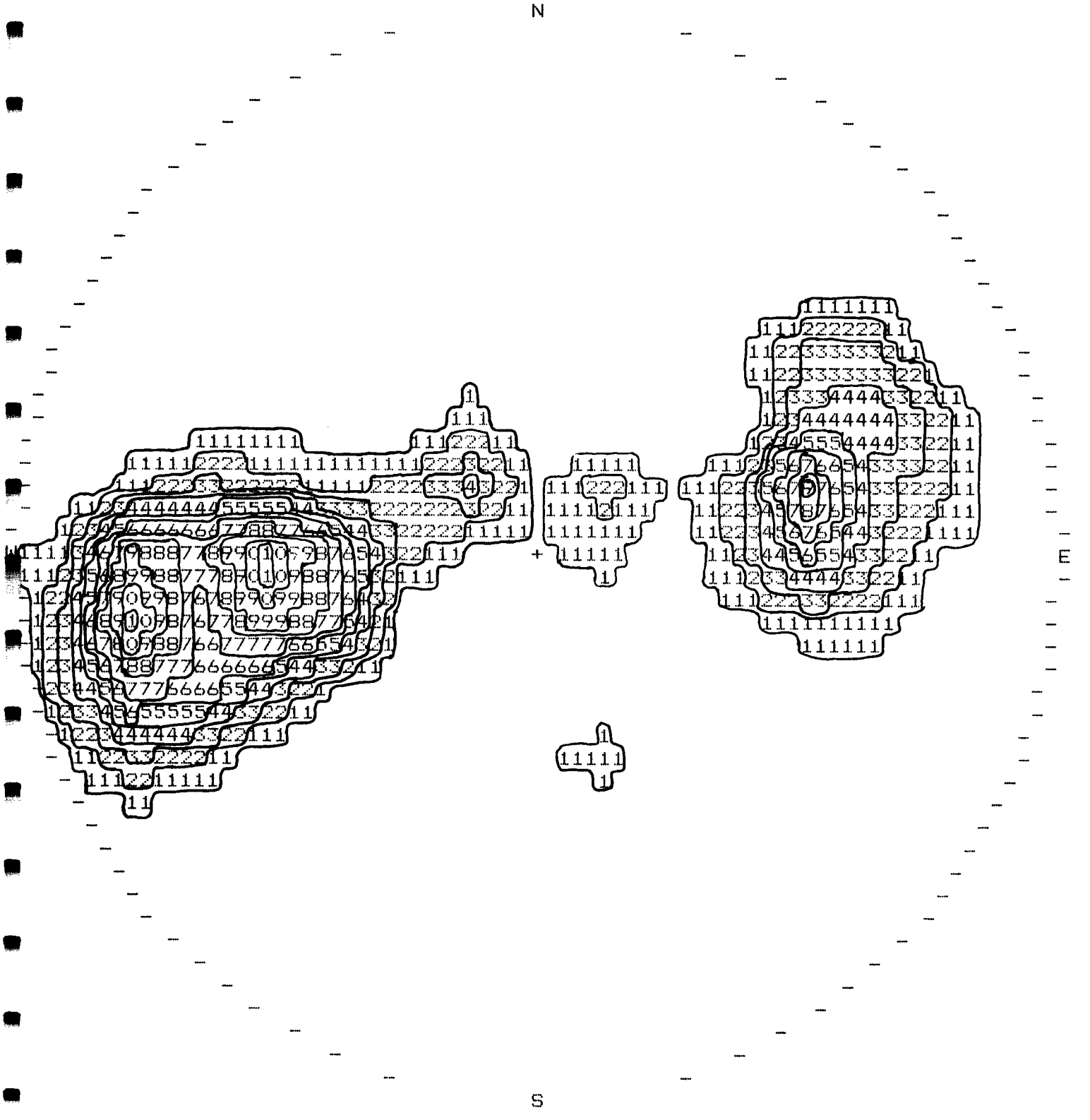
Number of points = 121



cay project, bedding

121 Points contoured using Schmidt (1925) method:

Counting area = .010
Order of symbols is 1 2 3 4 5 etc.
With contour interval = 1 percent points per one percent area
Order of symbols is repeated every 10 contours



cay data fold axes and lineations

Orientation data:

7 points

340.0 5.0 348.0 19.0 340.0 23.0 180.0 14.0 190.0 8.0 175.0 5.0
2.0 4.0

cay data fold axes and lineations

Data distribution:

** CAUTION:
Calculated distributions may not be statistically valid
with less than 30 data points **

Uniformity test:

The data differ significantly from uniform at the .95 level

Test of distribution:

Expected type of distribution: Cluster

Data have moderate preferential orientation

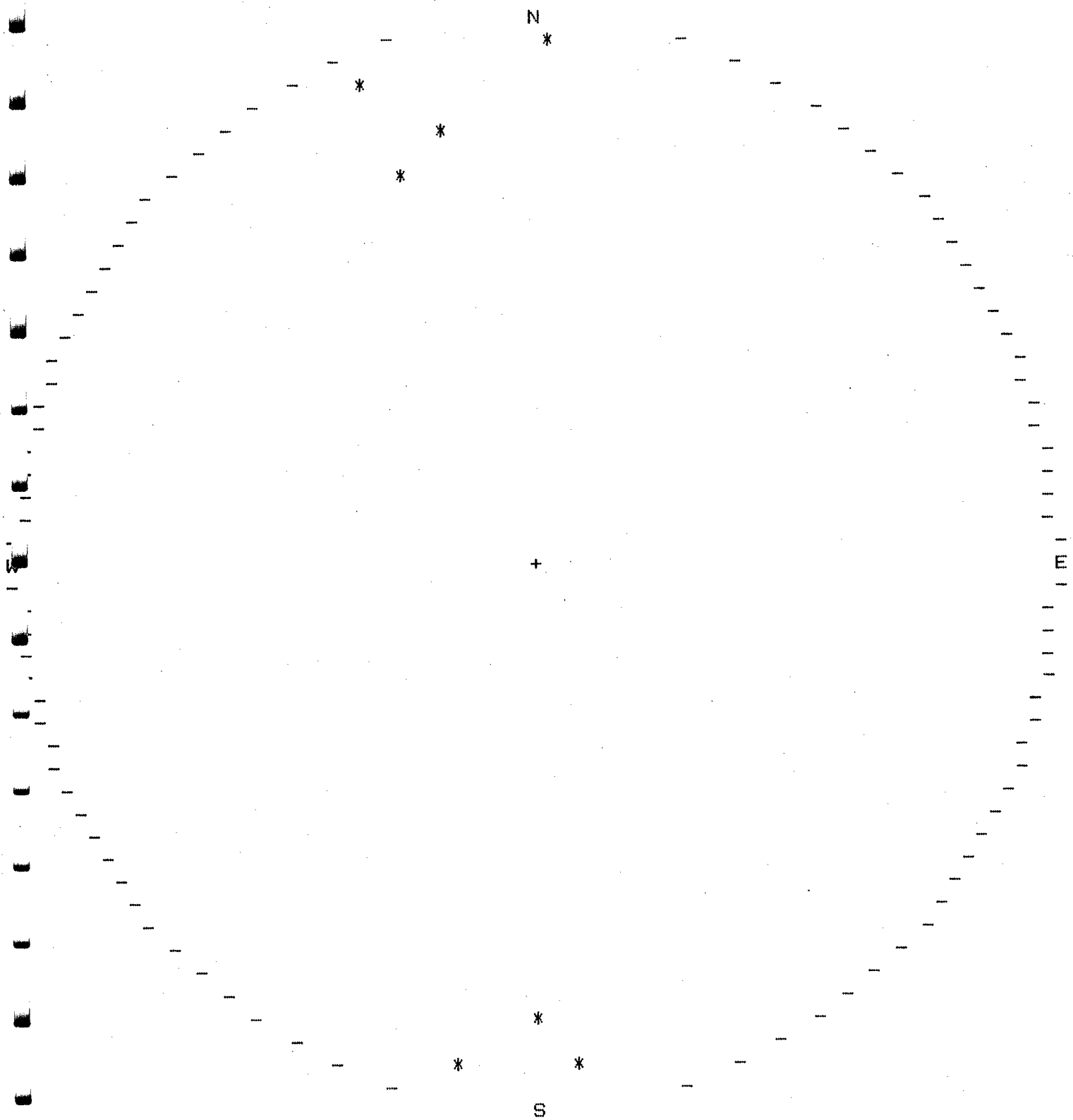
Test of spherical variance (S*):
S* = ******
This is not significantly different from a strongly clustered distribution

cay data fold axes and lineations

Plotting of data points and interpretation on an equal-area stereonet
l ower hemisphere projection:

Single points : * Multiple points : 2 - 9
Center : +

Number of points = 7



APPENDIX V

DIAMOND DRILL RECORD

caydata S1 and axial planes

Orientation data:

10 points

160.0 80.0 10.0 70.0 183.0 78.0 329.0 90.0 175.0 90.0 185.0 70.0
178.0 87.0 335.0 83.0 338.0 90.0 169.0 70.0

caydata S1 and axial planes

Data distribution:

** NOTE:
Calculated distributions may not be statistically valid
w th less than 30 data points **

Uniformity test:

The data differ significantly from uniform at the .95 level

Test of distribution:

E pected type of distribution: Cluster

Data have weak preferential orientation

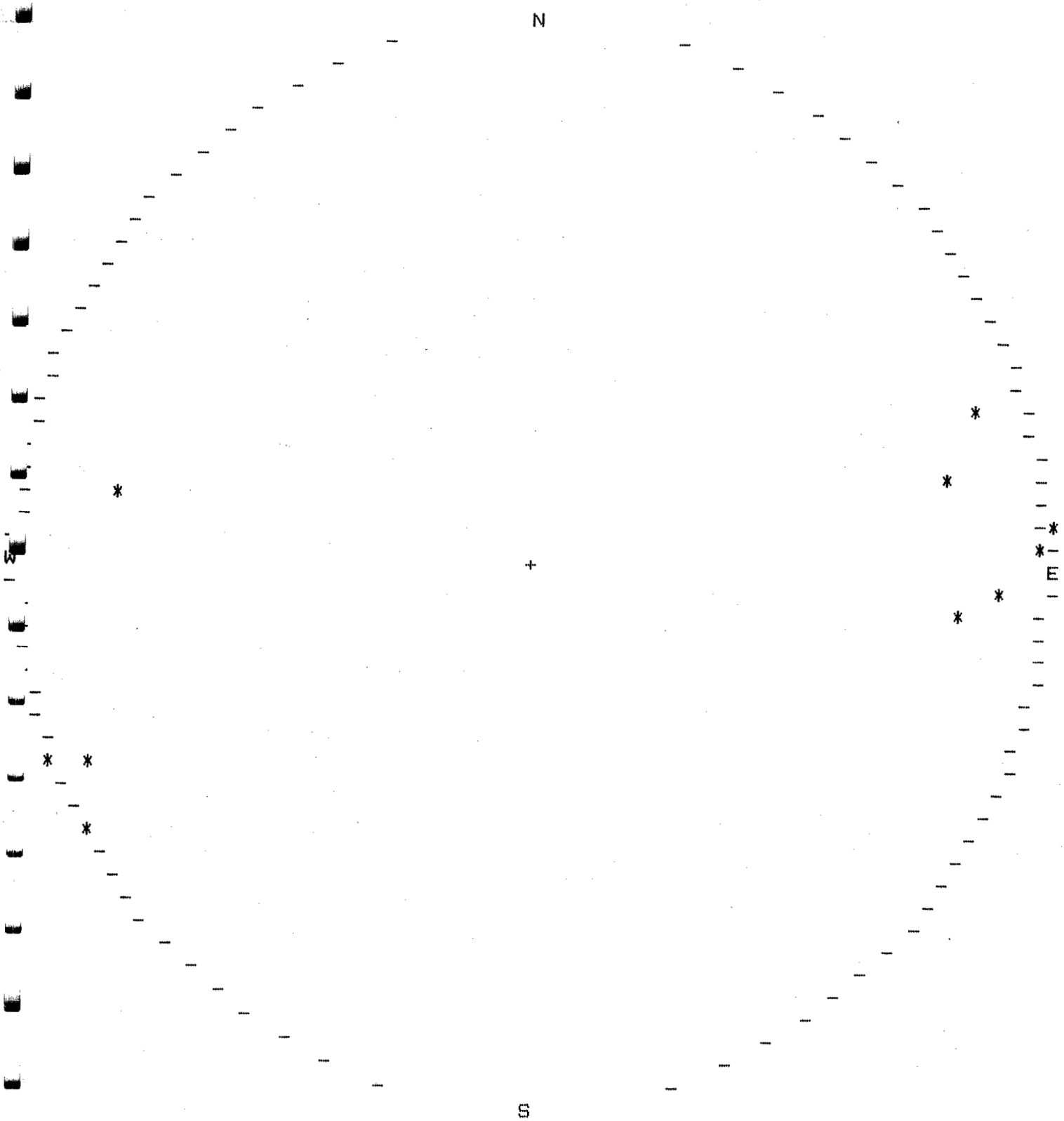
Test of spherical variance (S*):
S* = ******
This is not significantly different from a strongly clustered distribution

caydata S1 and axial planes

Plotting of data points and interpretation on an equal-area stereonet
L wer hemisphere projection:

Single points : * Multiple points : 2 - 9
Center : +

Number of points = 10



BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY - Area 1

Logged by D.G. Leighton
Date Logged 18 Sept. 87
Drilling Begun 6 Sept 87
Drilling Finished 10 Sept 87

Hole Bearing 070°
Collar Dip Angle -45° @ 1563 m.
Dip Test: Depth 50 m Angle -45°
Total Depth 54.9 m

Hole No. DDH #1 Site #1
Core Size B.Q.
Claim Group Cay North
Location L90N - 0+52W

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
0	18.3	OVERBURDEN				
18.3	30.5	BESA RIVER FORMATION - Shale - Black Carbonaceous @ 20.8 Bedding at 90° to core axis @ 24.4 - 22.9 Gouge and Broken Shale Fragments @ 22.9 - 30.5 Shale Broken.				
30.5	40.5	DUNEDIN FORMATION - Limestone & Silica Breccia @ 30.5 - 31.0 Limey Shale @ 30.0 - 34. Limestone Reef with abundant fossil frags. @ 34.0 - 36 Black Limestone partially silicified. @ 36.0 - 41. Silicified Breccia containing abundant sparry barite especially from 36.4 - 37.6				
40.5	54.9	STONE FORMATION - Limestone @ 41.2 - 42. Scattered Fossils @ 45.8 Bedding at 85° to core axis @ 47.0 - 54.9 Stylolitic Limestone with pyrobitumen and pyrite on seams.				
	54.9	E.O.H.				

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
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DIAMOND DRILL RECORD

Property CAY - Area 1

Logged by D. G. Leighton
Date Logged 18 Sept. 87
Drilling Begun 10 Sept 87
Drilling Finished 12 Sept 87

Hole Bearing 070°
Collar Dip Angle -75° @ 1563 m
Dip Test: Depth 54.9 Angle -75°
Total Depth 54.9 m

Hole No. DDH #2 Site #1
Core Size B.Q.
Claim Group Cay North
Location L 90N - 0+52W

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH	Pb %	Zn %	Ga %	Ge %
0	17.1	OVERBURDEN								
17.1	33.0	BESA RIVER FORMATION - Shale - Black Carbonaceous @ 18.5 Bedding at 70° to core axis @ 17 - 28 Occasional pyrite bed 2-4 cm thick. @ 28.1 Bedding at 50° to core axis @ 28 - 32 Pyrite mainly as blebs to 2cm long. @ 30 - 33 Shale to Limestone Transition Zone - alternating layers Shale & Lst. @ 33 Formation Contact, bedding at 60° to core axis.								
33.0	52.4	DUNEDIN FORMATION - Limestone & Silica Breccia @ 33.0 - 37.8 Med. Grey Limestone, scattered fossil frags. @ 37.8 - 42.4 Mainly Fossil Fragments. @ 42.4 - 43.8 Med. Grey Limestone, scattered fossil frags. @ 43.8 Reef - Silica Bx Contact. @ 43.8 - 52.4 Siliceous Breccia contains secondary fractures containing calcite & barite. @ 50.9 - 52.2 Sphalerite plus mod. to heavy pyrobitumen	65073	50.9	52.0	1.1	0.01	1.37	0.001	0.007
52.4	67.1	STONE FORMATION - Limestone @ 55.0 Bedding at 65° to core axis @ 53.0 - 67. Stylolitic Grey Limestone with typical pyrobitumen and pyrite filled seams. @ 62.0 Bedding at 60° to core axis								
	67.1	E.O.H.								

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY - Area 1

Logged by D. G. Leighton
Date Logged 18 Sept. '87
Drilling Begun 12 Sept. 87
Drilling Finished 14 Sept 87

Hole Bearing 040°
Collar Dip Angle -45° @ 1563 m
Dip Test: Depth 69.5 Angle -45°
Total Depth 69.5 m (228 ft.)

Hole No. DDH #3 Site #1
Core Size BQ
Claim Group Cay North
Location L90N 0+52W

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
0	21.7	OVERBURDEN				
21.7	33.3	BESA RIVER FORMATION - Black Shale - Carbonaceous @ 23.2 Gouge Seam 0.2 m Rick. @ 25.0 Bedding at 50° to core axis @ 29.0 - 33.3 Shale to Limestone Transition Zone with alternating layers of black shale and med. grey Lst. @ 30.0 Bedding at 50° to core axis @ 31.6 Bedding at 45° to core axis				
33.3	47.4	DUNEDIN FORMATION - Reef Limestone & Silica Breccia. @ 33.3 - 38 Med. Grey Lst., scattered fossil fragments. @ 38 - 40.9 Rock Mainly Fossil Fragments. @ 35.0 Bedding at 50° to core axis. @ 41.4 - 47.4 Siliceous Breccia with up to 50% of rock comprised of sparry Barite				
47.4	69.5	STONE FORMATION - Limestone. @ 48.2 Bedding at about 50° to core axis @ 47.4 - 50.0 Transition Zone with limestone grading from med. grey to normal light grey colour. @ 50 - 69.5 Stylolitic Limestone with typical pyrite plus bitumen containing seams @ 58.9 Bedding at 50° to core axis @ 61.9 - 63.1 Fault Zone with limonite stained gouge. @ 66.5 Bedding at 60° to core axis.				
	69.5	E.O.H.				

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY - Area 1

Logged by D. G. Leighton
Date Logged 18 Sept. 1987
Drilling Begun 15 Sept. 87
Drilling Finished 17 Sept. 87.

Hole Bearing 070°
Collar Dip Angle -45° @ 1560m
Dip Test: Depth — Angle —
Total Depth 15m (50ft.)

Hole No. DDH #4 Site 2
Core Size B.Q.
Claim Group Cay North
Location L87+65N, 5+50E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
		HOLE ABANDONED AFTER SEVERAL ATTEMPTS FAILED TO PENETRATE OVERBURDEN				

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY - Area 2

Logged by D.G. Leighton
Date Logged 20 Sept. 1987
Drilling Begun 18 Sept '87
Drilling Finished 19 Sept. '87

Hole Bearing Vertical
Collar Dip Angle -90 @ 1490m
Dip Test: Depth NA Angle NA
Total Depth 42.7m (140ft.)

Hole No. DDH #5 Site #3
Core Size B.Q.
Claim Group Cay South
Location L 87+65N, 5+50E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH
0	4.9	OVERBURDEN				
4.9	15.0	BESA RIVER FORMATION - Black Carbonaceous Shale @ 4.9-14 Black Shale - quite broken with gouge seams @ 9.8 Bedding at 60° to core axis. @ 14.0-15' Shale to Limestone Transition Zone with alternating black shale - Lst. layers, the layers average 60° to core axis				
15.0	33.2	DUNEDIN FORMATION - Reef Limestone & Silica Breccia @ 15.0-17.8 Light to Med. Grey Lst. - scattered fossils @ 17.8-20.5 Rock Mainly Fossil Fragments, frequent calcite and barite filled fractures with gradually increasing silica content. @ 20.5-√33.2 Siliceous Breccia, generally dark grey, permeated by silica, few scattered fossil fragments. Occasional PbS & ZnS @ 31.0. Good stringy ZnS between 30.1-31.1. associated with barite.				
33.2	42.7	STONE FORMATION - Limestone @ 33.2-42.7 Grey Limestone - Stylolitic with seams outlined with bitumen @ 35.6 Remnant Bedding at 60° to core axis @ 42.2 0.2m siliceous zone: pale green-grey zone seem to lie parallel to bedding.				
	42.7	E.O.H.				

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
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DIAMOND DRILL RECORD

Property CAY - Area 2

Logged by D. G. Leighton
Date Logged 26 Sept. 1987
Drilling Begun 19 Sept. 87
Drilling Finished 20 Sept. 87

Hole Bearing 250°
Collar Dip Angle -45° @ 1490m
Dip Test: Depth 41.5 Angle -45°
Total Depth 41.5 (136ft.)

Hole No. DDH #6 Site #3
Core Size B.Q.
Claim Group Cay South
Location L87+65N, 5+50E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
0	8.8	OVERBURDEN.				
8.8	13.2	BESA RIVER FORMATION - Black Shale @ 8.8 - 13.2. Shale to Limestone Transition Zone. Limey shale with increasing percentage of grey Lst. layers. This zone contains abundant finely disseminated pyrite. @ 11.2 Bedding at 70-75° to core axis.				
13.2	28.0	DUNEDIN FORMATION - Reef Limestone & Siliceous Breccia @ 13.2 - 17.8 Med Grey Sugar Texture Limestone, grades to increasing content of scattered fossil fragments @ 17.8 - 21.1 Reef Breccia consisting mainly of fossil frags. @ 21.1 Gouge seam perpendicular to core axis. @ 21.1 - 28. Siliceous Breccia. Dark grey to black breccia permeated with silica, contains numerous calcite filled fractures, bitumen common with calcite also up to 20% pyrite with bitumen. @ 24.2 - 26. Fine Mineralization est. 0.5% disseminated.				
28.0	41.5	STONE FORMATION - Limestone @ 28 - 41.5 Typical Stylolitic Grey Limestone stylolites outlined by bitumen and containing minor pyrite blebs @ 29.4 Bedding at 85° to core axis. @ 37.5 "Mylonite" Zone - Siliceous Patch parallel to bedding with pyrite blebs and flowage texture				
	41.5	E.O.H.				

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Consulting Geological Services

DIAMOND DRILL RECORD

Property CAT. Area 2

Logged by D. G. Leighton
Date Logged 26 Sept. 1987
Drilling Begun 20 Sept 87
Drilling Finished 21 Sept 87

Hole Bearing 250°
Collar Dip Angle — 60° @ 1490m
Dip Test: Depth 30.0 Angle - 60°
Total Depth 30.5 (100ft.)

Hole No. DDH #7 Site #3
Core Size B.Q
Claim Group Cay South
Location L87+65N - 5+50E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH
0	7.3	OVERBURDEN				
7.3	12.8	BESA RIVER FORMATION - Black Shale				
		@ 7.3 - 11. Black Carbonaceous Shale, occasional narrow med. grey limestone bed to 1cm thick.				
		@ 11.0 - 12.8 Shale to Limestone Transition Zone, limey shale with increasing frequency of med. grey lst. band 1mm to 10cm thick.				
		@ 9.8 Several cm. gouge				
		@ 10.6 Bedding at 75° to core axis.				
12.8	24.6	DUNEDIN FORMATION - Reef Limestone & Siliceous Breccia				
		@ 12.8 - 15.2 Med. Grey Sugar Texture Limestone, occasional fossil fragments and calcite filled fractures.				
		@ 15.3 Specimen for petrologic study				
		@ 15.2 - 19. Reef Limestone, a breccia consisting almost entirely of fossil fragments, minor pyrite cont. mainly within pyrobitumen seams.				
		@ 19.0 - 21. Limestone Breccia with fossil fragments.				
		@ 21.0 - 23.4 Siliceous Breccia, black med. grained Bx. totally permeated with quartz, occasional calcite filled stringer				
24.6	30.5	STONE FORMATION - Limestone				
		@ 24.6 - 30.5 Stylolitic Grey Limestone, seams contain minor bitumen and pyrite, occasional fossil frag.				
		@ 27.0 Bedding at 80° to core axis.				
	30.5	E.O.H.				

BEATY GEOLOGICAL LTD.
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DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D.G. Leighton
Date Logged 26 Sept. 1987
Drilling Begun 21 Sept. '87
Drilling Finished 22 Sept. '87

Hole Bearing 250°
Collar Dip Angle −75° @ 1490m
Dip Test: Depth 35m Angle −75°
Total Depth 35.1m (100ft.).

Hole No. DDH #8 Site #3
Core Size B.Q.
Claim Group Cay South
Location L87+65N - 5+50E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH
0	6.7	OVERBURDEN				
6.7	14.0	BESA RIVER FORMATION - Black Shale @ 6.7-10 Broken Black Shale, numerous gouge seams @ 10-13 Broken Shale though more competent than above. Bedding here at 70° to core axis. @ 13.0-14. Shale to Limestone Transition Zone, alternating limestone and shale layers, Bedding at 70°.				
14.0	27.8	DUNEDIN FORMATION - Reef Limestone & Sil. Breccia @ 14.0-16.5 Grey Limestone, weakly brecciated and a few scattered fossil fragments. @ 16.5-20.5 Reef Bx. rock mainly fossil fragments in lime mud. @ 20.5-27.8 Siliceous Breccia, dark grey to black Bx. permeated with silica, light coloured frags. filled by barite 20-20.6 weak & spotty galena and sphalerite 23.8-24.4 about 0.5m BaSO4 with bitumen & PbS.				
27.8	35.1	STONE FORMATION - Limestone @ 27.8-35.1 Light Grey Limestone with indistinct bedding which runs 60-80° (avg. 70°) to core axis.				
	35.1	E.O.H.				

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
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DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D. G. Leighton
Date Logged 27 Sept. 1987
Drilling Begun 22 Sept '87
Drilling Finished 23 Sept. '87

Hole Bearing 250°
Collar Dip Angle −80° @ 1490m
Dip Test: Depth 40m Angle −80°
Total Depth 43.6 m (143 ft.)

Hole No. DDH #9 Site #3
Core Size B.Q.
Claim Group Cay South
Location L87+65N · 5+50E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
0	6.0	OVERBURDEN				
6.0	18.8	BESA RIVER FORMATION - Black Shale.				
		@ 6.0 - 10.1 Broken Black Shale, minor mixed overburden debris to 10.1 (end of casing), minor pyrite				
		@ 10.1 - 16. Broken Black Shale, bedding at 50° to core axis, calcite filled fractures.				
		@ 16.0 - 17.8 Shale to Limey Shale, occasional light coloured limestone band				
		@ 17.8 - 18.8 Shale to Limestone Transition Zone, typical alternating limestone and shale layers				
18.8	38.0	DUNEDIN FORMATION - Limestone & Siliceous Breccia				
		@ 18.8 - 20.4 Lt. to Med. Grey Limestone, few scattered fossil fragments, calcite fractures, also graphite and bitumen filled fractures.				
		@ 20.4 - 22.8 Reef Breccia, rock mainly fossil fragments bleeded with carbonaceous material + trace pyrite				
		@ 22.8 - 38. Siliceous Breccia - silica bleeded black Bx., few scattered fossil fragments, fractures contain calcite and barite 29.8 - 30 vuggy fractures with clay gangue, , , 32 - 36 limey section				
38.0	43.6	STONE FORMATION - Limestone.				
		@ 38.0 - 43.6 Light Grey Limestone, bedding at 50° to core axis.				
	43.6	E.O.H.				

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D. G. Leighton
Date Logged 28 Sept. 1987
Drilling Begun 25 Sept. '87
Drilling Finished 26 Sept. '87

Hole Bearing Vertical
Collar Dip Angle -90 @ 1480m
Dip Test: Depth NA Angle NA
Total Depth 91.8 (301ft).

Hole No. DDH #10 Site #4
Core Size B.Q.
Claim Group Cay South
Location L 87+65N - 5+70E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
0	9.2	OVERBURDEN				
9.2	30.3	BESA RIVER FORMATION - Black Carbonaceous Shale.				
		@ 9.2-29.3 Broken Black Shale, containing both limey as well as siliceous patches without corresponding colour change. Fractures are calcite filled, pyrite occurs as scattered blebs, v.f.g. disseminations and occasionally fracture filling. @ 11.2 bedding at 50° to core axis.				
		@ 29.3 - 30.3 Black Shale permeated with silica				
30.3	91.8	DUNEDIN FORMATION - Reef Limestone & Siliceous Breccia.				
		N.B. Siliceous Breccia has been included with the Dunedin Formation for core logging purposes. In fact the breccia unit is not properly a formational unit but part of an alteration zone				
		@ 30.0 - 31.7 Siliceous Breccia, barite filled fracture matrix and disseminated pyrite				
		@ 31.7 - 35.4 Siliceous Breccia, unusually limey, contains fossil fragments, dissem pyrite & 0.2m pyrite log.? @ 33m. (31.7 - 35.4 may be large block?).				
		@ 35.4 - 73.5 Siliceous Breccia, contains blocks up to 0.5m diam. of sil. shale, limestone & reef material. Highly siliceous material mainly restricted to so called fingernail breccia which is finer grained Bx, which has barite throughout.				
		@ 50.3 blebs galena associated with calcite veinlet.				
		@ 51.2 - 51.6 - galena as above with calcite				

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property _____

Logged by _____
Date Logged _____
Drilling Begun _____
Drilling Finished _____

Hole Bearing _____
Collar Dip Angle _____
Dip Test: Depth _____ Angle _____
Total Depth _____

Hole No. DDH #10 Site #4 (cont.)
Core Size _____
Claim Group _____
Location _____

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH	Pb%	Zn%	Ga%	Ge%
		@ 56.0 disseminated orange sphalerite	65053	63	64	1m	0.14	1.72	.001	.007
		@ 56.8 - 73.5 mainly strongly brecciated section containing galena & sphalerite associated barite, some v.f.g. pyrite.	65054	64	65	1m	0.20	.44	.001	.001
			65055	65	66	1m	0.14	.69	.001	.002
			65056	66	67	1m	0.17	1.35	.001	.003
			65057	67	68	1m	0.11	1.33	.001	.002
			65058	68	69	1m	0.10	1.75	.001	.003
			65059	70	71	1m	0.16	.41	.001	.001
			65060	71	72	1m	0.11	1.33	.001	.002
			65061	72	73	1m	0.22	1.35	.001	.002
		@ 73.5 - 80.1 rock brecciated but much less intensely than above, some patches very finely which might reflect degree of differential silicification. @ 79.6 - 0.3m highly brecciated								
		@ 80.4 - 82. large block reef material to 1.0m diameter, some barite								
		@ 86.4 - 90.5 zone with scattered ZnS plus minor PbS & diss. pyrite.								
		@ 89 - 89.8 SPECIMEN collected for detailed study.								
		@ 91.8 E.O.H.								

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D.G. Leighton
Date Logged 28 Sept. 1987
Drilling Begun 26 Sept. '87
Drilling Finished 27 Sept. '87

Hole Bearing 250°
Collar Dip Angle −45° @ 1480m
Dip Test: Depth 62.0 Angle −45°
Total Depth 62.5 (100ft.)

Hole No. DDH #11 Site #4
Core Size B.Q.
Claim Group Cay South
Location L87+65N, 5+70E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
0	7.0	OVERBURDEN				
7.0	13.5	BESA RIVER FORMATION - Black Carbonaceous Shale. @7.0 - 13.5 Black Friable Shale, weak dissem. pyrite, weathered and rusty to about 11m, bedding at 80° to core axis.				
13.5	41.2	DUNEDIN FORMATION - Limestone & Silicified Limestone. @ 13.5 - 24. Fossiliferous Limestone, weakly silicified, scattered fossils, bedding at 80-90° to core axis, pyrite weak to mod. mainly as disseminations but occasionally as blebs, light coloured fractures with calcite, in some cases with bitumm. @24.0 - 35.0 Limestone, low sporatic fossil content, bedding at 85° to core axis @35. - 41.2 Reef to Limestone Transition Zone, colour changes from dark grey to light grey, fossils dissappear at 36.5, pyrite content drops off to only trace amounts by 41.				
41.2	62.5	STONE FORMATION. Grey Limestone, generally typical light grey Stone Fm. rock, stylolite with carbonaceous fracture infillings includ. some $CaCO_3$, bedding at 80° to core axis.				
	62.5	E.O.H.				

Sheet ____ of ____

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D. G. Leighton
Date Logged 30 Sept. 1987
Drilling Begun 27 Sept. '87
Drilling Finished 28 Sept. '87

Hole Bearing 250°
Collar Dip Angle −80° @ 1480m
Dip Test: Depth 90m Angle −80°
Total Depth 93.3m (306ft)

Hole No. DDH #12 Site #4
Core Size B.Q.
Claim Group Cay South.
Location 287+65N, 5+70E.

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
0	6.7	OVERBURDEN				
6.7	16.0	BESA RIVER FORMATION - Black Shale @ 6.7 - 9.2 Limey Rubble, 0.3 m gouge @ 7.5 min. Dissem f.g. pyrite @ 9.2 - 16. Black Carbonaceous Shale with very limey sections, bedding at 50° to core axis. @ 12.2 - 16. Shale to Limestone Transition Zone, with alternating shale & grey limestone bands.				
16.0	93.3	DUNEDIN FORMATION - Reef Limestone & Si. Breccia. @ 16.0 - 21.3 Limestone, dark grey fine grained lst. with minor scattered fossil fragments, bedding at 50°, irregular barite and calcite veinlets @ 21.8 - 24. Reef Breccia, rock composed mainly fossil fragments, matrix mainly carbonaceous. @ 24 - 57.5 Limestone, scattered fossil fragments, generally brecciated, very high bitumen and graphite content, beyond 44m core quite vuggy (perhaps bitumen washed out by drill water), beyond 51.5 to 57 markedly less brecciation, rock here mostly light grey limestone (blocks?), metallic content very low. This section contains calcite & barite filled fractures - typically accompanied by bitumen. @ 57.5 - 93.3 Breccia - Strong Silicified - sulphide mineralization from 57.8, Strong 58.5 - 66, mod. 66 - 74m.				

Sheet ____ of ____

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property _____

Logged by _____
Date Logged _____
Drilling Begun _____
Drilling Finished _____

Hole Bearing _____
Collar Dip Angle _____
Dip Test: Depth _____ Angle _____
Total Depth _____

Hole No. DDH #12 (Cont.)
Core Size _____
Claim Group _____
Location _____

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH	Pb %	Zn %	Ga %	Ge %
			65062	58.5	59.5	1m	0.03	1.08	0.001	0.002
			65063	59.5	60.5	1m	0.01	1.42	0.001	0.001
			65064	60.5	61.5	1m	0.01	1.02	0.001	0.001
			65065	61.5	62.5	1m	0.01	1.08	0.001	0.001
			65066	62.5	63.5	1m	0.02	0.31	0.002	0.001
			65067	63.5	64.5	1m	0.01	0.96	0.001	0.001
			65068	64.5	65.5	1m	0.01	1.67	0.001	0.001
			65069	66.5	67.5	1m	0.10	1.46	0.001	0.002
			65070	67.5	68.5	1m	0.06	1.40	0.001	0.003
		@58 - 74.0 rock is highly silicified breccia, mineralization grade occurs in association with finer particle size (esp so called finger nail breccia)								
		@ 74.0 - 93.3 black siliceous breccia - rock seems to be silicified limestone (no fossil fragments). Weak to moderate zinc 84.5 - 86.5, bedding at 60° to core axis.								
			65071	84.5	85.5	1m	0.01	1.83	0.001	0.002
			65072	85.5	86.5	1m	0.01	1.22	0.001	0.001
		Towards bottom of hole, limestone blocks start to appear								

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D.G. Leighton
Date Logged 30 Sept. 1987.
Drilling Begun 29 Sept. 87
Drilling Finished 30 Sept. 87

Hole Bearing 250°
Collar Dip Angle −50° @ 1473m
Dip Test: Depth 100m Angle −50°
Total Depth 110.1m (361Ft.)

Hole No. DDH #13 Site #5
Core Size B.Q.
Claim Group Cay South
Location L87470N - 6+20E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH	Pb%	Zn%	Ga%	Ge%
0	6.1	OVERBURDEN								
6.1	53.8	BESA RIVER FORMATION - Black Shale								
		@ 6.1 - 52. Shale and Limey Shale, rock relatively soft, disseminated pyrite (occasional veinlet), bedding at 80° to core axis, minor gouge seams								
		@ 52. - 53.8 Shale To Limestone Transition Zone, alternating shale & limestone bands.								
53.8	110.1	DUNEDIN FORMATION - Limestone & Siliceous Breccia.								
		@ 53.8 - 60.2 Fossiliferous Reef Limestone, rock is largely composed of fossil fragments in lime mud.								
		@ 60.2 - 61.8 Siliceous Limestone? Rock, does not react to HCl in spite of limey appearance and fossil fragments.								
		@ 61.8 - 65.4 Fossiliferous Limestone overall rock similar to 54-60 but much lower percentage of fossils.								
		@ 65.4 - 89.2 Similar to Siliceous Limestone (60-61) above, scattered fossil fragments, limey sections gradually give way to streight silica and calcite filled fractures give way to barite filled fractures, rock becomes progressively more brecciated after 70.5m. Weakly mineralized with galena & sphalerite associated with rock containing Barite @ 89.2 intense brecciation zone ends.	65002	72.0	73	1m	0.07	0.36	0.001	0.001
		@ 89.2 - 91 Mainly Black Shale with 5-10% v.f.g. FeS$_2$ zone contains minor limey & cherty sub-zones.	65001	73..	74.5	1.5m	0.28	2.46	0.001	0.008

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D. G. Leighton
Date Logged 30 Sept. 1987
Drilling Begun
Drilling Finished

Hole Bearing
Collar Dip Angle
Dip Test: Depth Angle
Total Depth

Hole No. DDH #13 (Cont.)
Core Size B. Q.
Claim Group
Location

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
		@ 91-97 Mixed Zone, contains very to mod. siliceous black shale, brecciated and non brecciated plus minor scattered fossil fragments, bedding at 80° to core axis, minor pyrite.				
		@ 97-104.6 Breccia - Fingernail or Fine Grained Type, weakly to mod. well mineralized with galena, sphalerite ± pyrite, from 103-104.5 sulphides only visible on split surfaces & pyrite main component.				
104.6	110.1	STONE FORMATION - Siliceous Limestone.				
		@ 104.6-110 Gradational from mod. to weakly siliceous limestone				
	110.1	E.O.H.				

Sheet 2 of 2

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D. G. Leighton
Date Logged 4 Oct. 1987
Drilling Begun 1 Oct. '87
Drilling Finished 2 Oct. '87

Hole Bearing 250°
Collar Dip Angle −60° @ 1473m
Dip Test: Depth 135 Angle −60°
Total Depth 137.3m (450ft.)

Hole No. DDH #14 Site #5
Core Size B.Q.
Claim Group Cay South
Location L87+70N 6+20E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH	Pb%	Zn%	Ga%	Ge%
0	6.1	OVERBURDEN								
6.1	54.6	BESA RIVER FORMATION - Black Shale								
		@ 6.1 - 18.6 Broken Shale, pyrite bed to 4cm thickness								
		@ 18.6 - 54.6 Typical Black Carbonaceous Shale, occasional pyrite bed to 4cm thickness & pyrite blebs, bedding 60 - 80° to core axis, occasional clay/gouge seam generally parallel to bedding, pyrite in some areas up to 10% of rock volume, increasing downward.								
54.6	120.5	DUNEDIN FORMATION - Limestone & "Chert" Breccia								
		@ 54.6 - 102.5 Coarse Breccia, blocks of limestone, shale and fossiliferous limestone to 0.2m dia., matrix mainly barite (some calcite). 70.5 silica low silica - high lime content, section variably mineralized. PbS & ZnS disseminated and fract. filling with $BaSO_4$ Bi-coloured sphalerite ie red and pale yellow (as rind).	65033	69.5	71.5	2m	0.01	0.01	0.001	0.001
			65034	71.5	72	1.5m	0.29	0.06	0.001	0.001
			65035	72	73	1m	0.46	3.56	0.004	0.012
			65036	73	74	1m	0.52	0.81	0.001	0.002
			65037	74	75	1m	0.20	0.99	0.001	0.001
		@ 87 Start patches 10 - 20 cm finger nail breccia	65038	75	76	1m	0.09	0.77	0.001	0.001
		@ 96 - 100 Rock Finger Nail Bx with $BaSO_4$	65039	76	77	1m	0.09	1.50	0.001	0.003
		@ 102.5 - 120. Chert Breccia - highly siliceous zone fractured with barite veinlets, silica content gradually increases - NB within breccia section block to 2.5m diam. - also SPECIMENS collected for further study @ 61.0, 87.1, 95.6, 108.4.	65042	96.5	97.5	1m	0.05	0.55	0.002	0.001
			65043	97.5	98.5	1m	0.07	3.84	0.001	0.004
			65021	115	116.5	1.5m	0.04	0.63	0.001	0.001

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAT Area 2

Logged by D.G. Leighton
Date Logged 4 Oct. 1987
Drilling Begun 1 Oct '87
Drilling Finished 2 Oct '87

Hole Bearing 250°
Collar Dip Angle - 60°
Dip Test: Depth _____ Angle _____
Total Depth 137.3m

Hole No. DDH # 14 (cont.)
Core Size _____
Claim Group _____
Location _____

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
120	137.3	STONE FORMATION - Limestone				
		@ 120 - 137.3 Light Grey Limestone, siliceous in vicinity of contact, SiO_2 content decreasing gradually, bedding at 70° to core axis, SPECIMEN collected @ 133 for additional study.				

Sheet 2 of 2

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D. G. Leighton
Date Logged 5 Oct. 1987
Drilling Begun 3 Oct '87
Drilling Finished 4 Oct '87

Hole Bearing 250°
Collar Dip Angle -70° @ 1473m
Dip Test: Depth 115 Angle -70°
Total Depth 115.9 (380ft.)

Hole No. DDH #15 Site #5
Core Size B.Q.
Claim Group Cay South
Location L 87+70N - 6+20E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH	Pb%	Zn%	Ga%	Ge%
0	6.4	OVERBURDEN								
6.4	67.2	BESA RIVER FORMATION - Black Carbonaceous Shale. @ 6.4-66.4 Black Shale, bedding at 60-70° to core axis, occasional pyrite beds 1-2cm thick, also occasional pyrite blebs @ 65.7 narrow gouge seam. @ 66.4-67.2 Black Shale to Limestone Transition Zone, alternating shale & limestone layers @ 67m, 2cm sphalerite parallel to bedding.								
67.2	111.0	DUNEDIN FORMATION - Siliceous Breccia @ 67.2-111. Highly Siliceous Breccia @ 67-2-70 matrix grades from calcite through calcite plus barite to barite @ 67.8-70 minor ZnS, large blocks black shale to 1.5m diam. between 73-77.5 (banded pyrite & blebs in shale blocks), zinc weak to moderate from 82-103 with accompanying galena. SPECIMEN for further study collected 108-108.6, @ 111. narrow vein of red sphalerite.	65048	97.8	98.4	0.6m	0.05	2.33	0.001	0.002
111.0	115.9	STONE FORMATION - Silicified Limestone? Rock from 111-115.9 not certain but seems to be silicified Stone Fm. Lst. with apparent remnant bedding at 70° to core axis - no evident brecciation								
	115.9	E.O.H.								

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D. G. Leighton
Date Logged 6 Oct. 1987
Drilling Begun 5 Oct. '87
Drilling Finished 5 Oct. '87

Hole Bearing 280°
Collar Dip Angle -55°
Dip Test: Depth 90 Angle -55°
Total Depth 93.3 (306ft.)

Hole No. DDH #16 Site #5
Core Size B.Q.
Claim Group Cay South
Location L 87+70N - 6+20E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH	Pb%	Zn%	Ga%	Ge%
0	11.6	OVERBURDEN								
11.6	49.6	BESA RIVER FORMATION - Black Shale								
		@ 11.6 - 48.5 Typical Black Carbonaceous Shale, bedding 80-85° to core axis, pyrite as fine dissemination, blebs & bedding layers.								
		@ 48.5 - 49.6 Shale to Limestone Transition Zone, alternating shale - limestone layers ovr 1.5m.								
49.6	68.0	DUNEDIN FORMATION - Reef Limestone & Sil. Breccia								
		@ 49.6 - 58.4 Fossiliferous Limestone, medium grey limestone consisting of fossil fragments cemented in lime mud, fossil fragments increase from minor component to major component with increasing depth, bedding at 70° to core axis.								
		@ 58.4 - 64.8 Siliceous Breccia, matrix calcite grading to barite, zinc and lead content increases from weak to moderate with increasing barite	65050	61.5	62.5	1m	0.46	0.05	0.001	0.001
			65049	62.5	63.5	1m	0.30	1.24	0.001	0.006
			65051	63.5	64.5	1m	0.13	0.57	0.001	0.003
		@ 64.8 - 68.0 Limestone Breccia, grading in colour from black to med grey, calcite filling, well mineralized	65052	66.0	67.0	1m	6.28	7.52	0.004	0.007
68.0	93.3	STONE FORMATION - Grey Massive Limestone								
		@ 68.0 m - 93.3 Light Grey Stylolitic Limestone heavy bitumen and pyrite on seams, bedding at 65° to core axis from 80.0 m Lst. has cherty looking appearance due to v.f.g. nature. SPECIMEN at 92m								
	93.3	E.O.H.								

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D. G. Leighton
Date Logged 7 Oct. 1987
Drilling Begun 6 Oct. '87
Drilling Finished 6 Oct. '87

Hole Bearing 250°
Collar Dip Angle -45° @ 1503 m
Dip Test: Depth 27.8 Angle -45°
Total Depth 27.8 (91ft.)

Hole No. DDH #17 Site #6
Core Size B.Q.
Claim Group Cay South
Location L87+85N - 5+25E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH	Pb%	Zn%	Ga%	Ge%
0	3.1	OVERBURDEN								
3.1	16.0	DUNEDIN FORMATION - Siliceous Breccia - minor Lst.								
		@ 3.1-4.4 Limestone, dark grey, bedding at 85° to core axis, blebs pyrite								
		@ 4.4-16. Siliceous Breccia, fractures barite filled,	65045	11	12	1m	0.02	6.95	0.004	0.038
		minor late stage calcite filled vugs @ 11.-11.5'	65046	12	13	1m	0.34	0.24	0.001	0.001
		calcite veins with galena, 11.5-14 med. galena	65047	13	14	1m	0.01	2.73	0.001	0.006
		and sphalerite, 14-15 blebs pyrite								
16.0	27.8	STONE FORMATION - Grey Limestone								
		@ 16.0-27.8 Typical stylolite Limestone occasional								
		calcite filled fracture, bedding at 85° to core								
		axis, minor carbonaceous content on fractures.								
	27.8	E.O.H.								

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D.G. Leighton
Date Logged 10 Oct. 1987
Drilling Begun 7 Oct. '87
Drilling Finished 9 Oct. '87

Hole Bearing Vertical
Collar Dip Angle 90°
Dip Test: Depth NA Angle NA
Total Depth 35.4 (116 ft.).

Hole No. DDH #18 Site #6
Core Size B.Q.
Claim Group Cay South
Location L87+86N 5+25E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH
0	4.3	OVERBURDEN				
4.3	19.4	DUNEDIN FORMATION - Limestone Siliceous Breccia @ 4.3 - 12 Limestone and Limestone Breccia, breccia begins at 5.2, matrix $CaCO_3$, bedding at 45° to core axis, scattered fossils from 5.2 - 11.0, gouge seams at 4.6 & 10.8. @ 12.0 - 19.4 Siliceous Breccia, two stages of brecciation with SiO_2 cement on first stage & $BaSO_4$ on second stage. 12.5 - 13. fine dissem. pyrite & occasional blob of galena, 13 - 16.6 minor sphalerite and dissem. galena (sulphides apparently associated with barite), some bitumen throughout this section.				
19.4	35.4	STONE FORMATION - Massive Grey Limestone. @ 19.4 - 35.4 Typical Light Grey Limestone, bedding at 55 - 60° to core axis, occasional hairline fracture parallel to bedding containing carbonaceous material.				
	35.4	E.O.H.				

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAY Area 2

Logged by D. G. Leighton
Date Logged 13 Oct. 1987
Drilling Begun 9 Oct. '87
Drilling Finished 12 Oct. '87

Hole Bearing Vertical
Collar Dip Angle 90°
Dip Test: Depth NA Angle NA
Total Depth 30.8 m (101 ft.)

Hole No. DDH #19 Site #7
Core Size B.Q.
Claim Group Cay South
Location L87+90N 4+60E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	FROM	TO	WIDTH
0	1.5	OVERBURDEN				
1.5	7.0	DUNEDIN FORMATION Siliceous Breccia @ 1.5-7. Siliceous Breccia, massive black rock with barite, limonite of fractures to 4.5m, minor galena associated with the barite, no sphalerite, few blebs pyrite especially near limestone contact.				
7.0	30.8	STONE FORMATION - Massive Lt. Grey Limestone. @ 7.0-30.8 Stylolitic Limestone typical of Fm., bitumen on seams, bedding 50-60° to core axis, some pyrite associated with bitumen				
	30.8	E.O.H.				

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property: CAT Area 2

Logged by: D. G. Leighton
Date Logged: 15 October 1987
Drilling Begun: 12 Oct. '87
Drilling Finished: 13 Oct. '87

Hole Bearing: 250°
Collar Dip Angle: -45° @ 1520m
Dip Test: Depth: NA Angle: NA
Total Depth: 14.3 (46ft.)

Hole No.: DDH #20 Site #7
Core Size: B.Q.
Claim Group: Cay South
Location: L87+90N - 4+60E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH
0	3.1	OVERBURDEN				
3.1	5.8	DUNEDIN FORMATION - Siliceous Breccia @ 3.1-5.8 Siliceous Breccia, massive black rock with barite.				
5.8	14.3	STONE FORMATION - Massive Lt. Grey Limestone @ 5.8-14.3 Stylolitic Limestone, minor silicification @ 5.8 associated with narrow breccia zone, bedding @ 85° to core axis, minor gouge seams parallel to bedding				

Sheet 1 of 1

BEATY GEOLOGICAL LTD.
Consulting Geological Services

DIAMOND DRILL RECORD

Property CAT Area 2

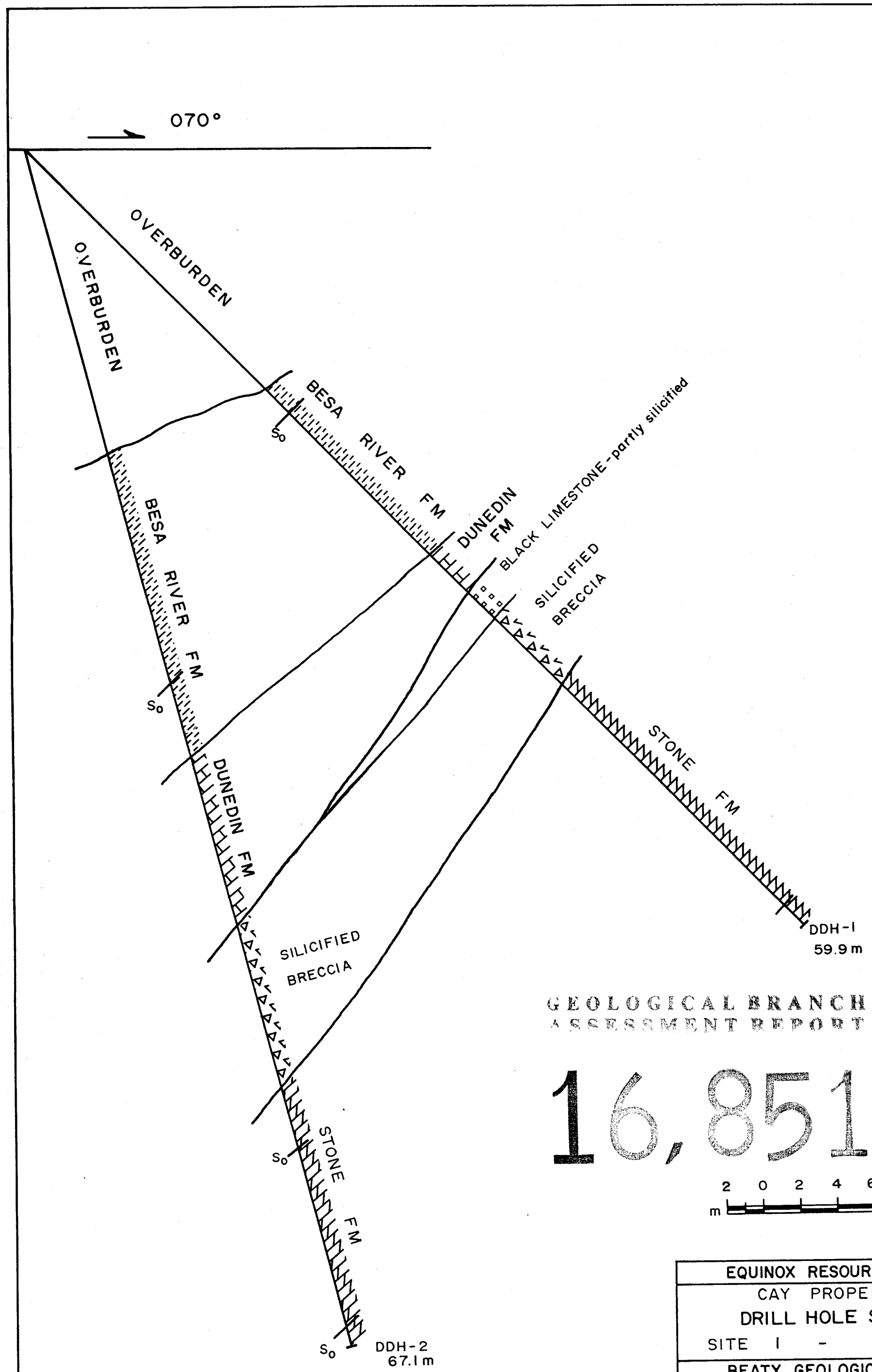
Logged by D. G. Leighton
Date Logged 15 Oct. 1987
Drilling Begun 14 Oct. '87
Drilling Finished 14 Oct. '87

Hole Bearing 250°
Collar Dip Angle -45° @ 1471m
Dip Test: Depth NA Angle NA
Total Depth 65.9 (216ft)

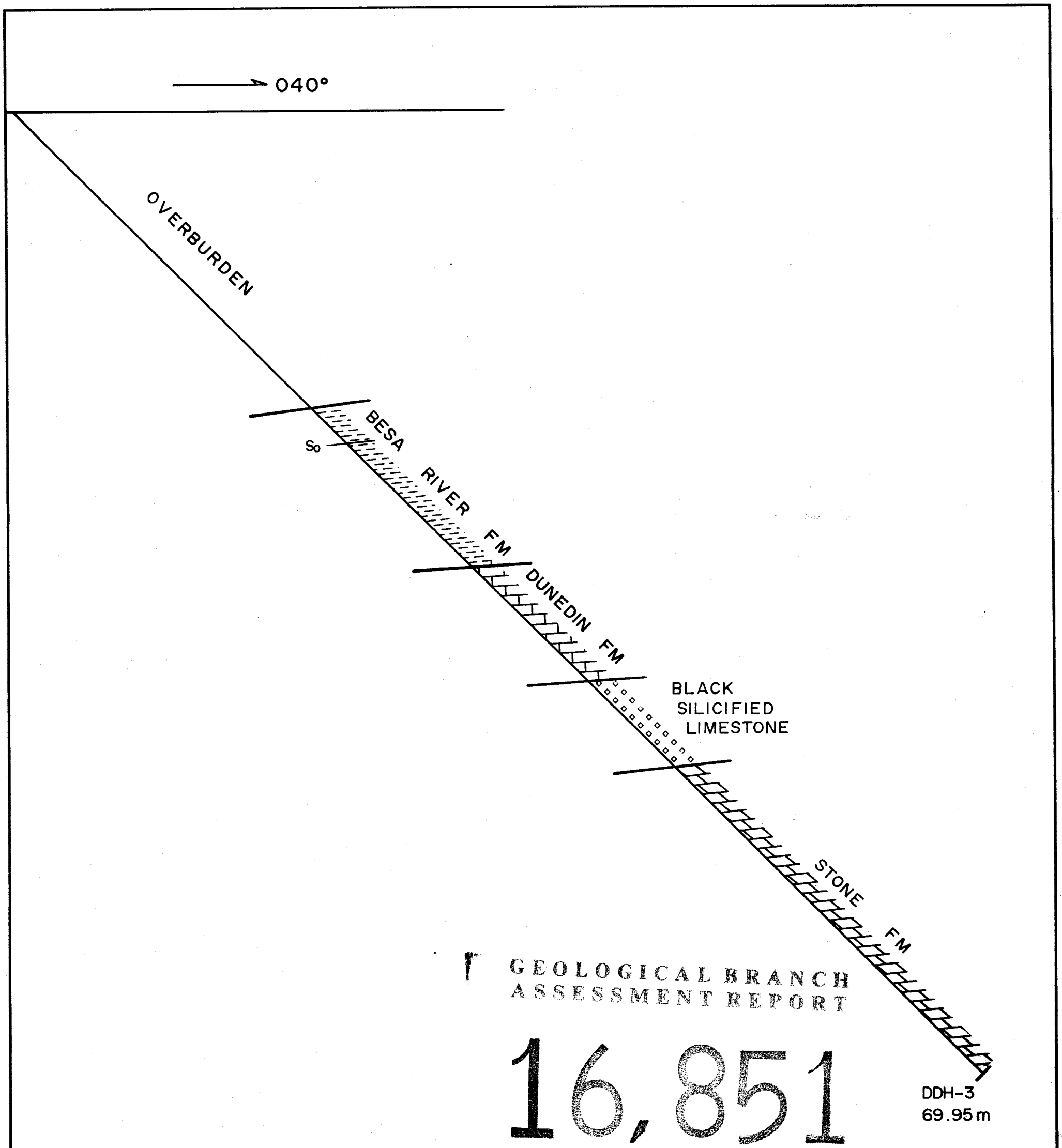
Hole No. DDH #21 Site # 8
Core Size B.Q.
Claim Group Cay South
Location L87+25N - 5+90E

FROM	TO	DESCRIPTION	SAMPLES NUMBER	SAMPLES FROM	SAMPLES TO	SAMPLES WIDTH
0	9.2	OVERBURDEN				
9.2	37.8	BESA RIVER FORMATION Black Shale @ 9.2 - 37 Black Carbonaceous Shale, bedding at 80-85° to core axis, occasional gouge seam parallel to core axis, bands of pyrite parallel to the bedding (many with disseminated pyrite envelopes), some pyrite blebs especially below 14m., after 25m pyrite content up significantly with 5cm bands not uncommon. @ 37 - 37.8 Shale to Limestone Transition Zone, alternating shale & limestone beds across 0.8m.				
37.8	65.9	DUNEDIN FORMATION - Siliceous Breccia @ 37.8 - 39.5 Siliceous Breccia with blocks of Transition Zone "stoped in"?, barite and carbonate veining @ 39.5 - 65.9 Siliceous Breccia, occasional scattered fossil, occasional large block to 2m dia. of shale with pyrite bands (variously silicified), minor sphalerite esp. 15-16.5 & 57-63, mod. zinc and lead sulphide mineralization from 63 - 65.9				
	65.9	E.O.H.				

Sheet 1 of 1



EQUINOX RESOURCES LTD.	
CAY PROPERTY DRILL HOLE SECTION SITE 1 - DDH 1&2	
BEATY GEOLOGICAL LTD.	
SCALE 1:200	DATE DEC, 1987
DRAWN JP, LSM, GR	DRAWING No. FIGURE 8d



2 0 2 4 6 8 10
m m

EQUINOX RESOURCES LTD.	
CAY PROPERTY	
DRILL HOLE SECTION	
SITE 1 - DDH 3	
BEATY GEOLOGICAL LTD.	
SCALE 1:200	DATE DEC, 1987
DRAWN JP, LSM, GR	DRAWING No. FIGURE 8e

LEGEND

- 4 — Besa River Fm (shale)
- 3 — Dunedin Fm (fossiliferous limestone)
- 2 — Silicified Alteration
- 1 — Stone Fm (limestone, dolostone)

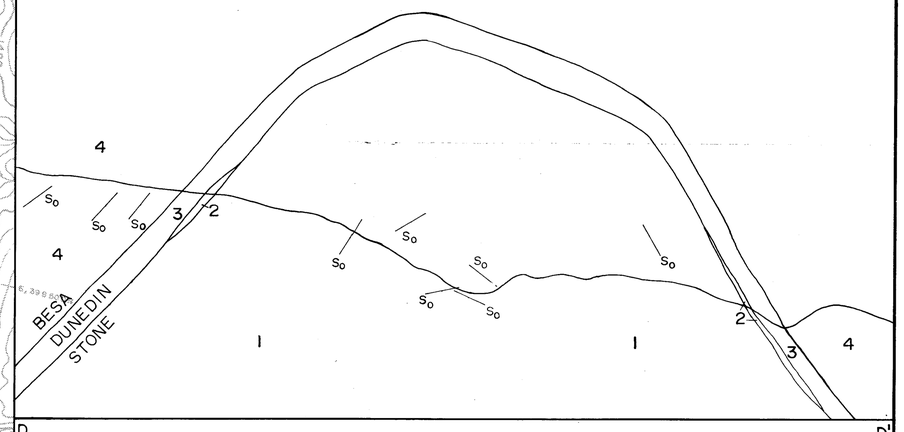
- /45 — bedding
- /87 — foliation, axial plane
- →02 — bedding / cleavage intersection lineation, fold axis
- anticlinal axial trace
- geological contact (approximate, assumed)
- drill hole
- outcrop

Alpha Showings

Wolverine Showing

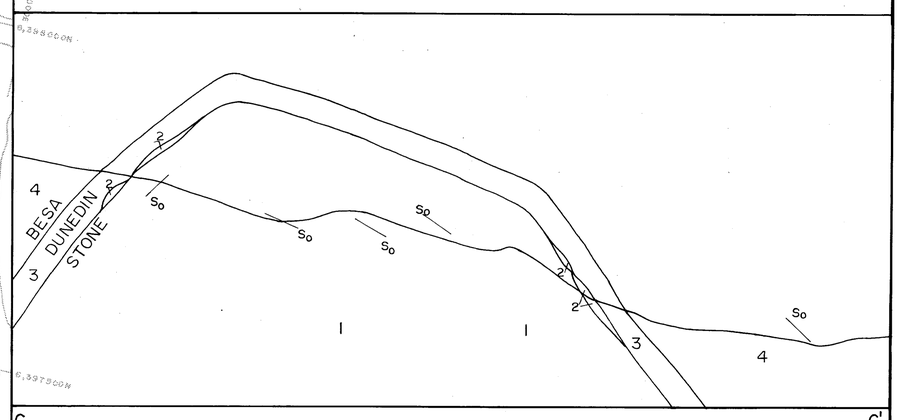
CROSS SECTION D-D'

ALPHA CREEK - Facing North



CROSS SECTION C-C'

CAMP CREEK - Facing North



GEOLOGICAL BRANCH
ASSESSMENT REPORT

16,851

100 0 100 200 m

EQUINOX RESOURCES LTD.

CAY PROPERTY

GEOLOGY - NORTH HALF

BEATY GEOLOGICAL LTD.

SCALE 1:5000	DATE DECEMBER, 1987
DRAWN JP, GR	DRAWING NO. FIG. 4 A

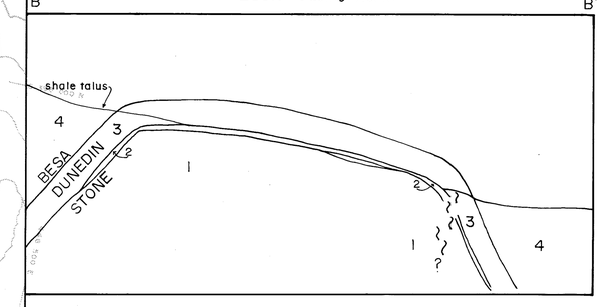
mineralized boulders

Nose Showing

no outcrops

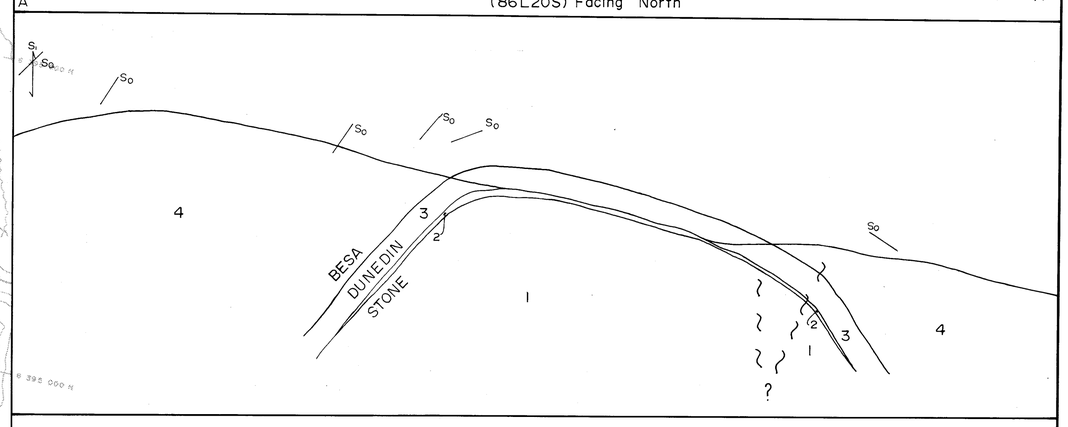
CROSS SECTION B-B'

L80N - Facing North



CROSS SECTION A-A'

(86L20S) Facing North



LEGEND

- 4 — Besa River Fm (shale)
- 3 — Dunedin Fm (fossiliferous limestone)
- 2 — Silicified Alteration
- 1 — Stone Fm (limestone, dolostone)

- bedding
- foliation, axial plane
- bedding / cleavage intersection lineation, fold axis
- anticlinal axial trace
- geological contact (approximate, assumed)
- drill hole
- outcrop
- intermittant outcrop

GEOLOGICAL BRANCH
ASSESSMENT REPORT

16,851

100 0 100 200 m

EQUINOX RESOURCES LTD.

CAY PROPERTY

GEOLOGY - SOUTH HALF

BEATY GEOLOGICAL LTD.

SCALE 1:5000	DATE DECEMBER, 1987
DRAWN JP, GR	DRAWING NO. FIG 4B

KNOX POND

BASE CAMP

87L 80N

87L 76N

86L 18 S

86L 20S

86L 25S

86L 30S

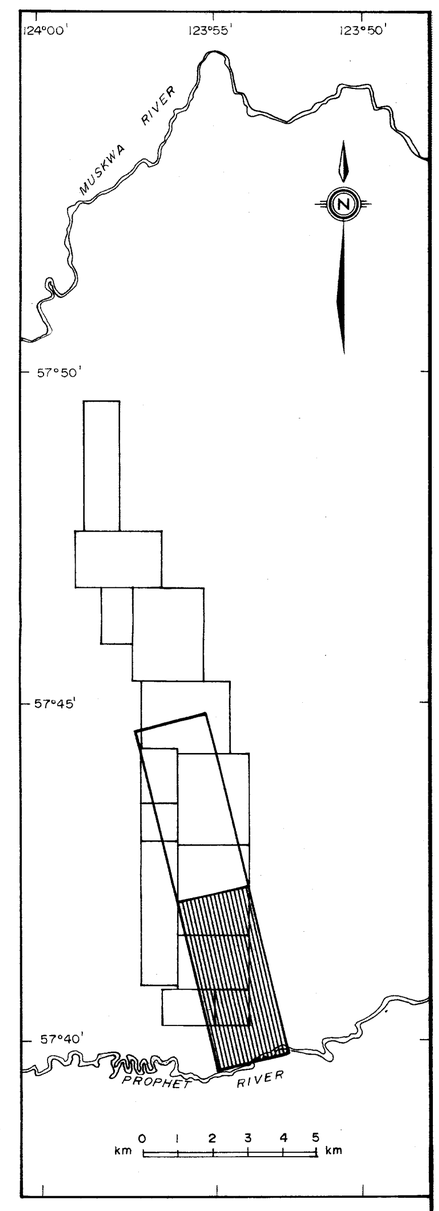
86L 40S

CAY 1

CAY 4

CAY 13

CAY 12



LEGEND

Claim Boundary

Grid Line

NTS 94 G / 12 W

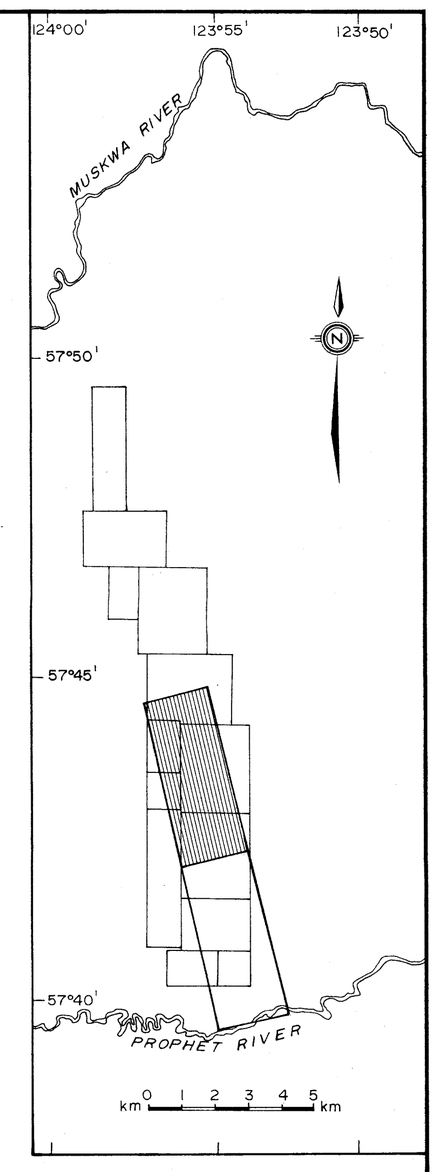
100 0 100 200 300 metres

EQUINOX RESOURCES LTD.

CAY PROPERTY
PROPERTY INDEX
SOUTH HALF

BEATY GEOLOGICAL LTD.

SCALE 1:5000	DATE DECEMBER, 1987
DRAWN LSM, GR	DRAWING NO. FIGURE 5b



CAY 3
CAY 7
1987 BASELINE
1986 BASELINE
87L 110N
87L 105N
87L 100N
CAY 6
CAY5
OL 10N
OL 5N
OL 0S
OL 5S
OL 10S
CAY 2
CAY 1
CORE STORAGE
KNOX POND

GEOLOGICAL BRANCH
ASSESSMENT REPORT

16,851

LEGEND

Claim Boundary

Grid Line

NTS 94 G / 12 W

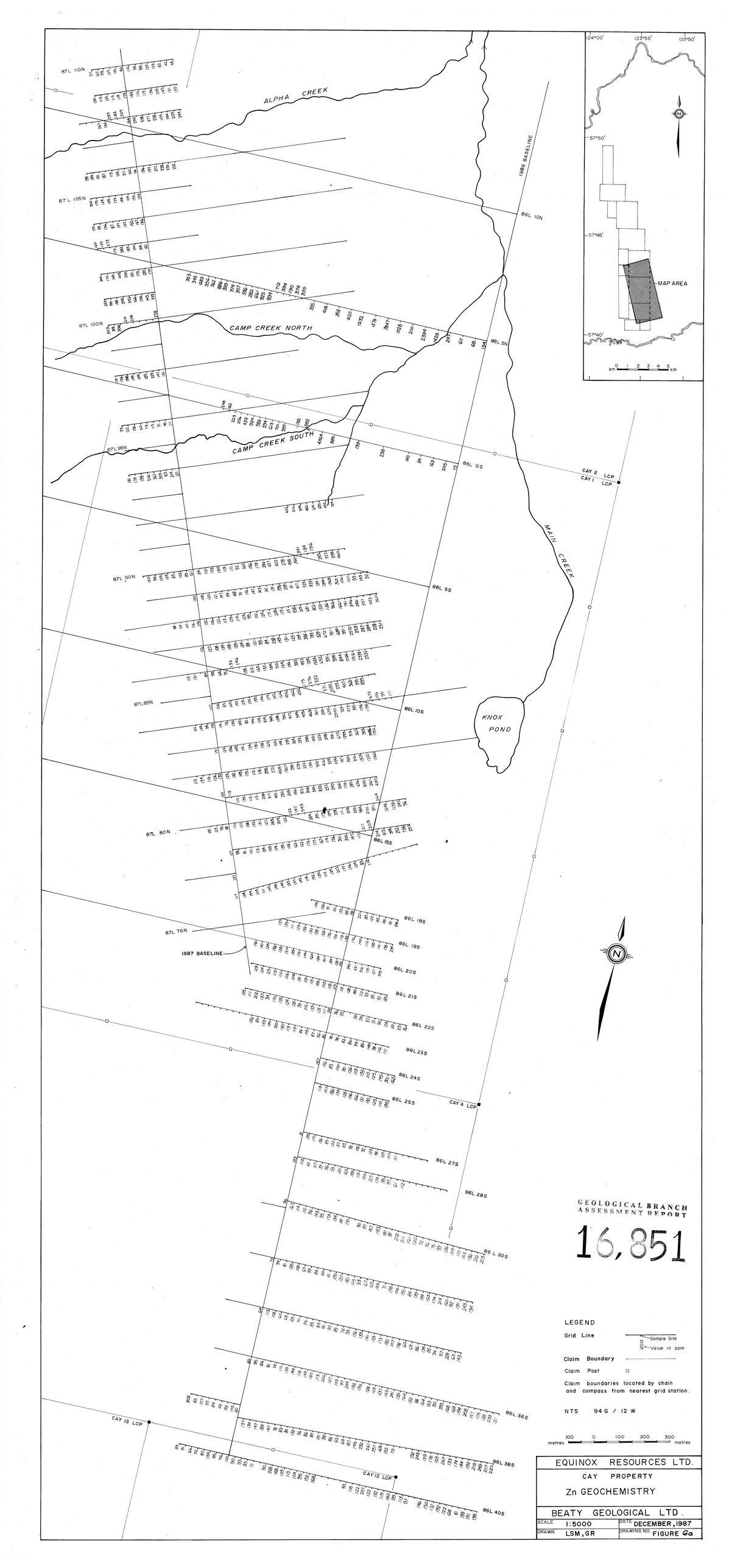
100 0 100 200 300 metres

EQUINOX RESOURCES LTD.

CAY PROPERTY
PROPERTY INDEX
NORTH HALF

BEATY GEOLOGICAL LTD.

SCALE 1:5000	DATE DECEMBER, 1987
DRAWN LSM, GR	DRAWING NO. FIGURE 5a



GEOLOGICAL BRANCH
ASSESSMENT REPORT

16,851

LEGEND

Grid Line — 200 — Sample Site / Value in ppm

Claim Boundary

Claim Post □

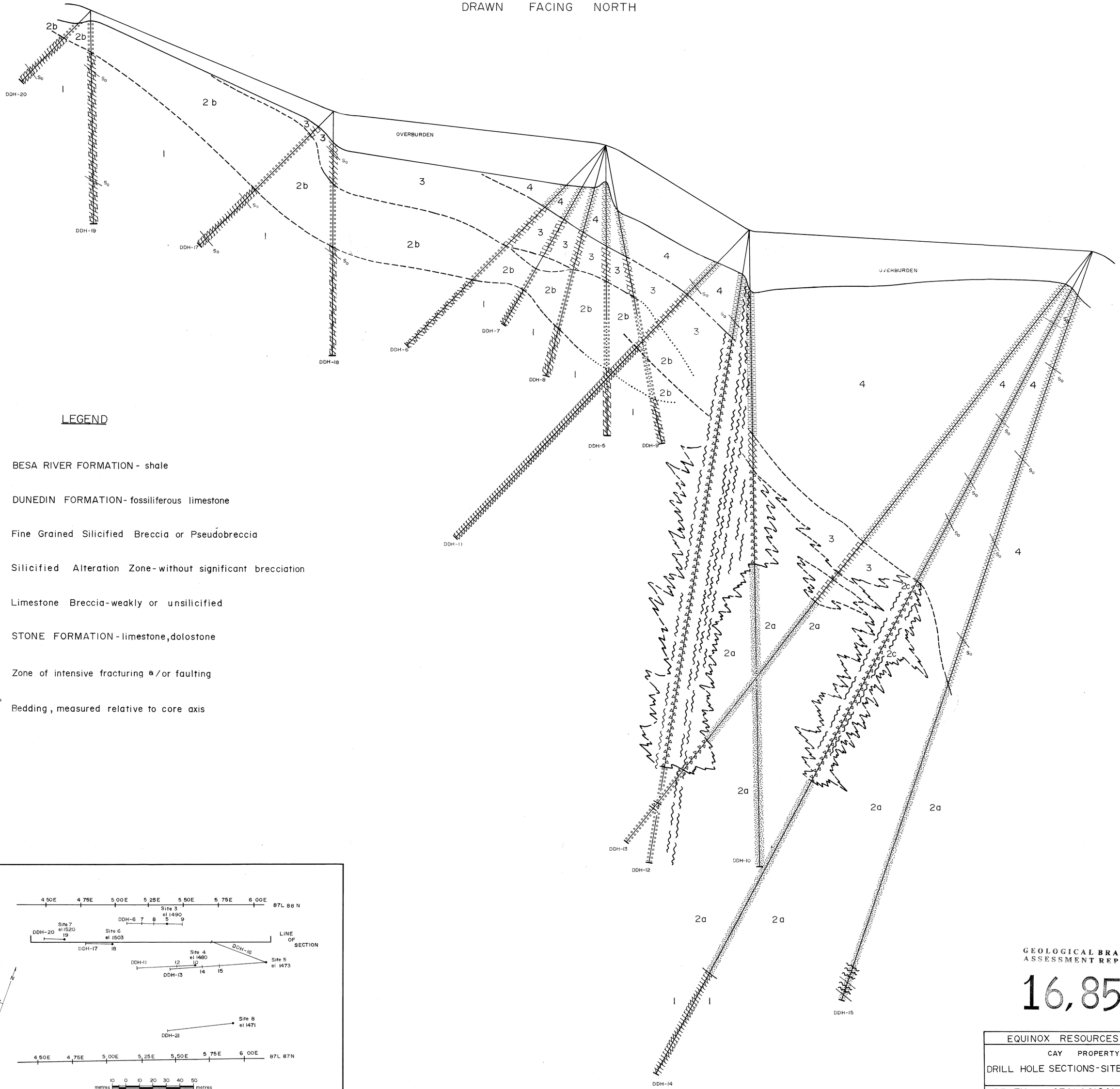
Claim boundaries located by chain and compass from nearest grid station.

NTS 94 G / 12 W

100 0 100 200 300 metres

EQUINOX RESOURCES LTD.	
CAY PROPERTY	
Zn GEOCHEMISTRY	
BEATY GEOLOGICAL LTD.	
SCALE 1:5000	DATE DECEMBER, 1987
DRAWN LSM, GR	DRAWING NO. FIGURE 6a

DRAWN FACING NORTH



LEGEND

- 4 — BESA RIVER FORMATION - shale
- 3 — DUNEDIN FORMATION - fossiliferous limestone
- 2a — Fine Grained Silicified Breccia or Pseudobreccia
- 2b — Silicified Alteration Zone - without significant brecciation
- 2c — Limestone Breccia - weakly or unsilicified
- 1 — STONE FORMATION - limestone, dolostone
- Zone of intensive fracturing and/or faulting
- So — Bedding, measured relative to core axis

DIAMOND DRILL HOLE LOCATION MAP

FIG. 7

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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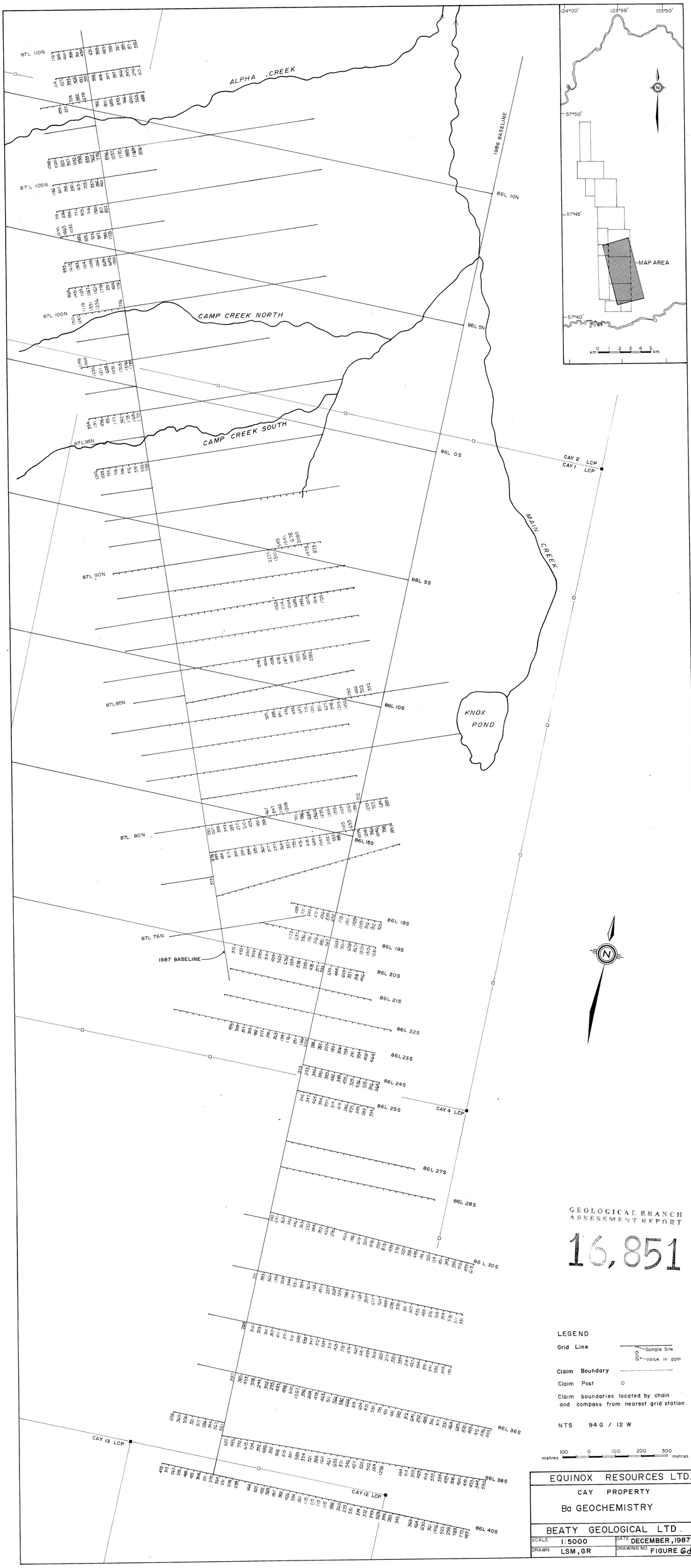
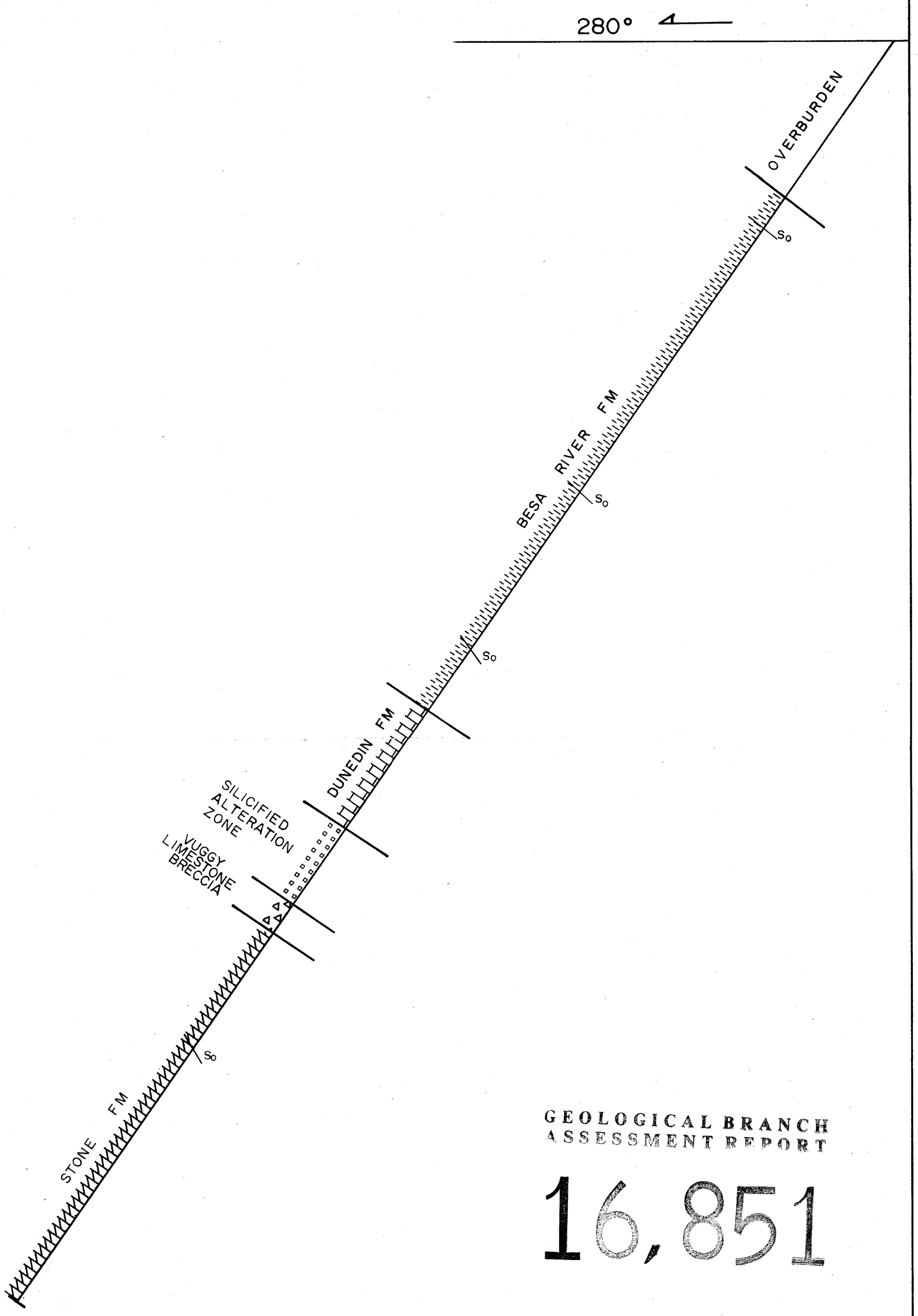
EQUINOX RESOURCES LTD.	
CAY PROPERTY	
DRILL HOLE SECTIONS-SITES 3-8	
BEATY GEOLOGICAL LTD.	
SCALE 1:200	DATE DECEMBER, 1987
DRAWN JP, LSM, GR	DRAWING NO. FIG. 8a



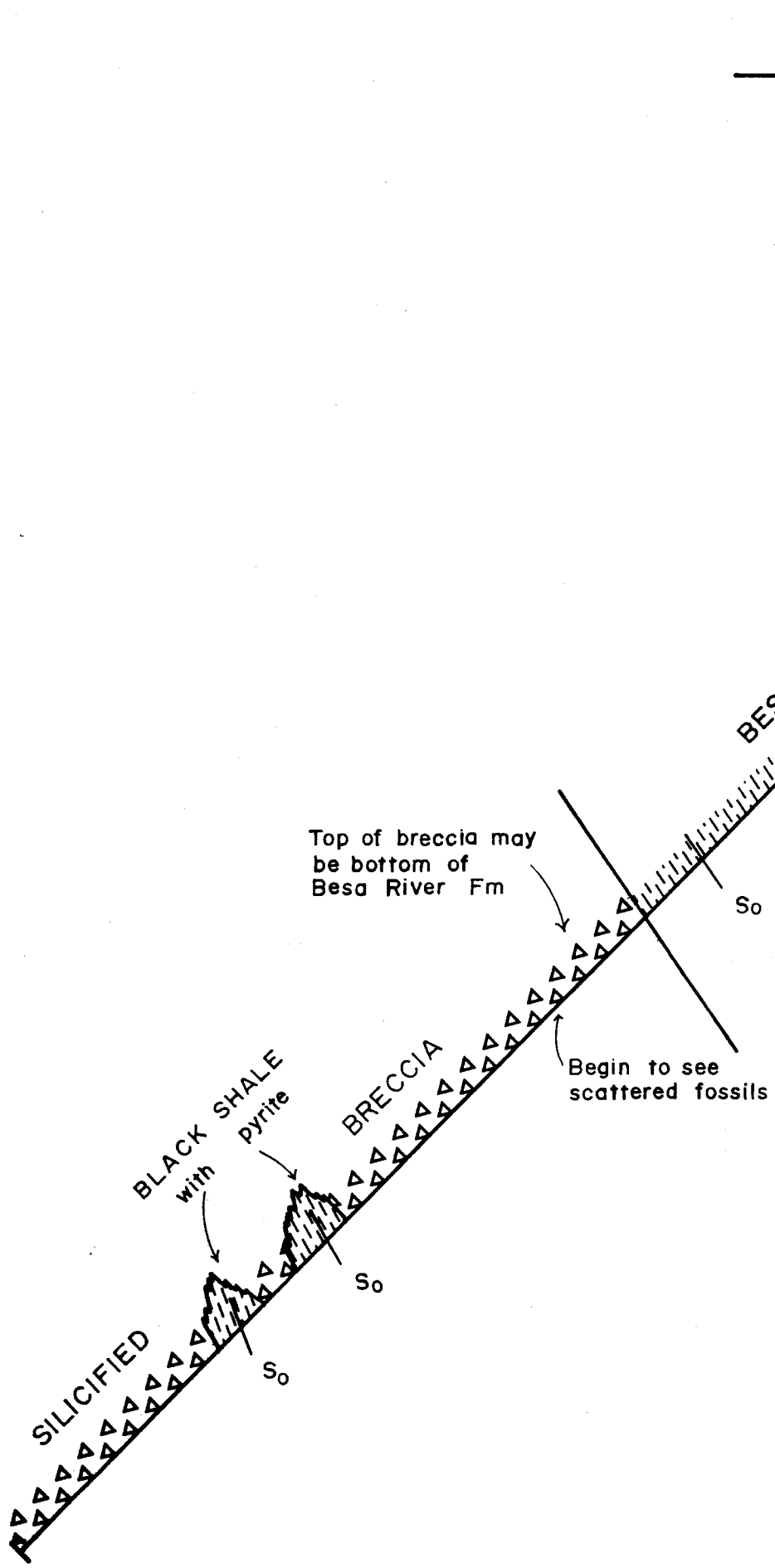
GEOLOGICAL BRANCH
ASSESSMENT REPORT

16,851



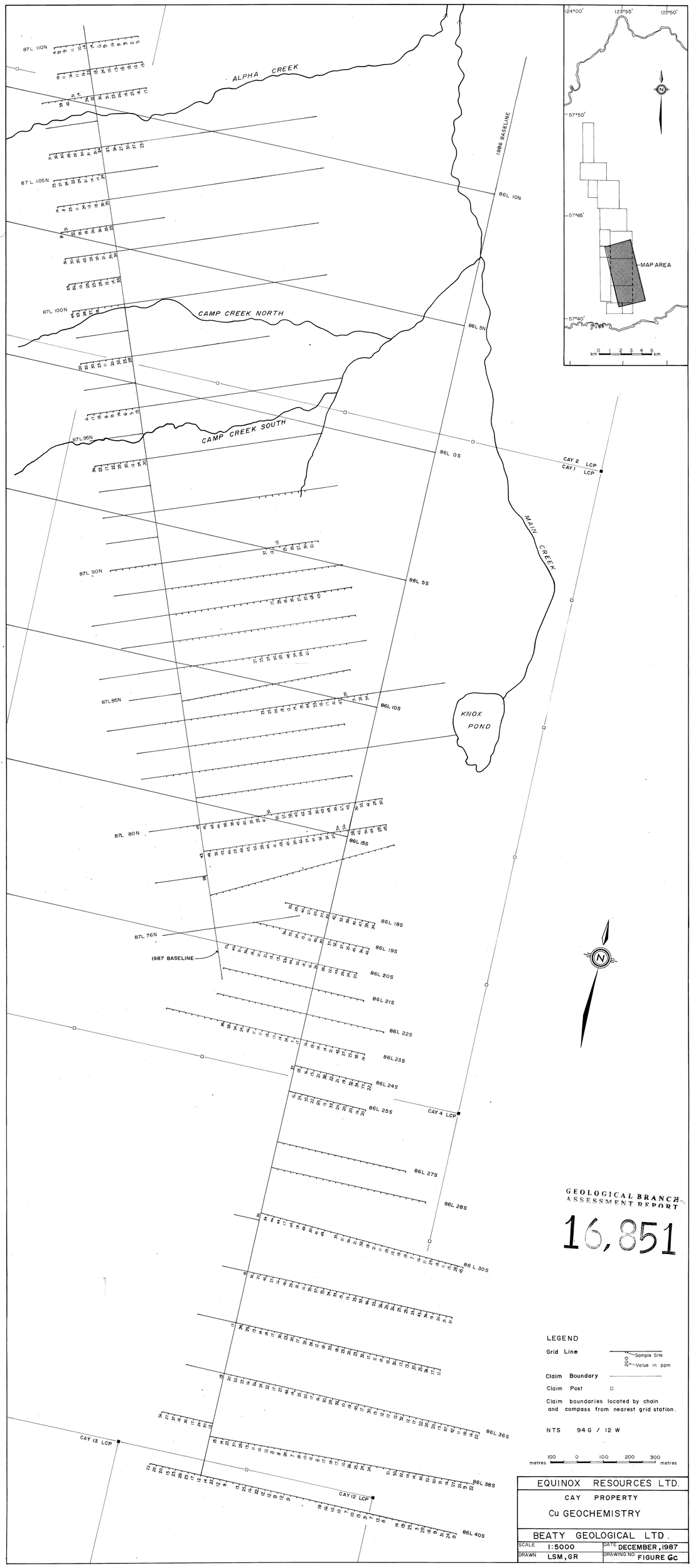
2 0 2 4 6 8 10
m m

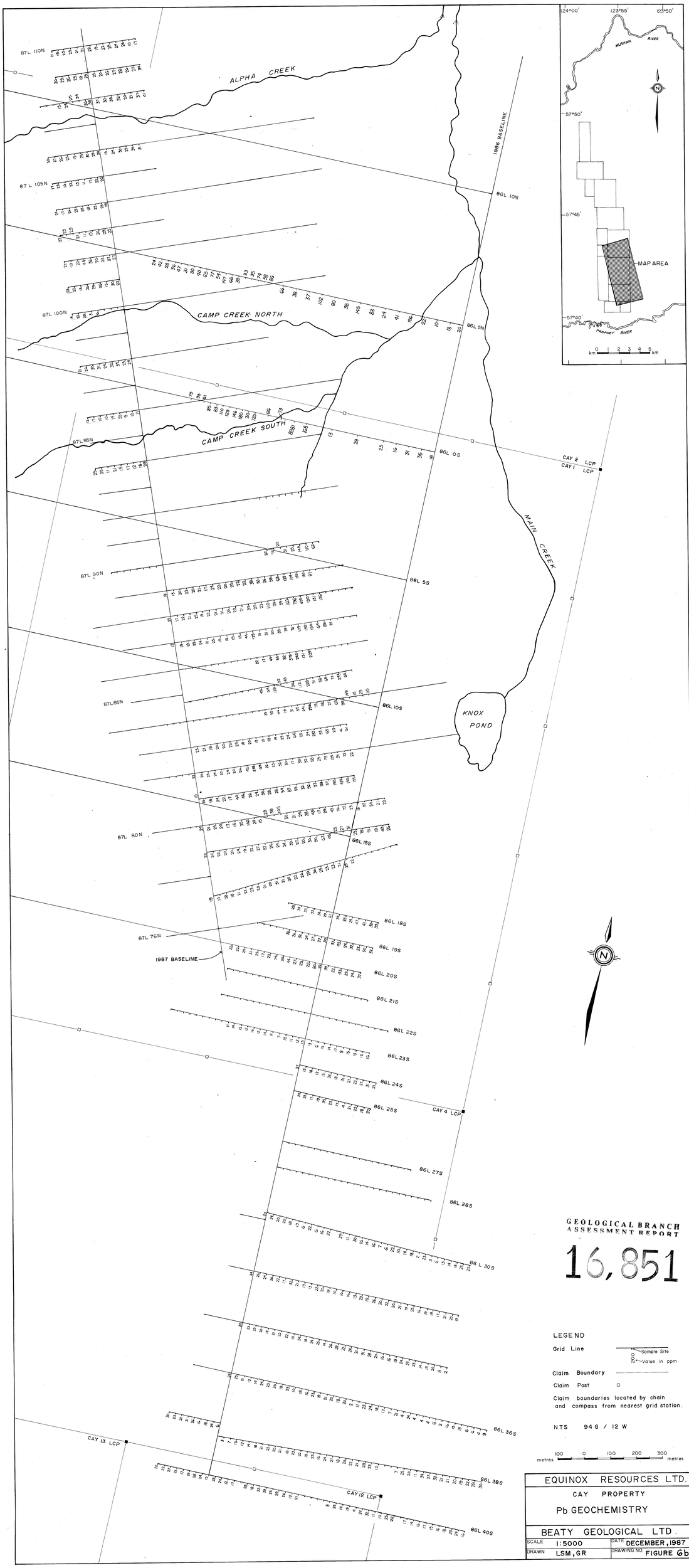
EQUINOX RESOURCES LTD.	
CAY PROPERTY DRILL HOLE SECTION SITE 5 - DDH 16	
BEATY GEOLOGICAL LTD.	
SCALE 1:200	DATE DEC, 1987
DRAWN JP, LSM, GR	DRAWING No. FIGURE 8b



2 0 2 4 6 8 10
m m

EQUINOX RESOURCES LTD.	
CAY PROPERTY DRILL HOLE SECTION SITE 8 - DDH 21	
BEATY GEOLOGICAL LTD.	
SCALE 1:200	DATE DEC, 1987
DRAWN JP, LSM, GR	DRAWING No. FIGURE 8c


ALPHA CREEK
CAMP CREEK NORTH
CAMP CREEK SOUTH
MAIN CREEK
KNOX POND
1986 BASELINE
1987 BASELINE
87L 110N
87L 105N
87L 100N
87L 95N
87L 90N
87L 85N
87L 80N
87L 76N
86L 10N
86L 5N
86L 0S
86L 5S
86L 10S
86L 15S
86L 18S
86L 19S
86L 20S
86L 21S
86L 22S
86L 23S
86L 24S
86L 25S
86L 27S
86L 28S
86L 30S
86L 36S
86L 38S
86L 40S
CAY 2 LCP
CAY 1 LCP
CAY 4 LCP
CAY 13 LCP
CAY 12 LCP
124°00'
123°55'
123°50'
57°50'
57°45'
57°40'
MAP AREA
0 1 2 3 4 5 km
N
LEGEND
Grid Line
Sample Site
200 Value in ppm
Claim Boundary
Claim Post
Claim boundaries located by chain and compass from nearest grid station.
NTS 94 G / 12 W
100 0 100 200 300 metres
GEOLOGICAL BRANCH
ASSESSMENT REPORT
16,851
EQUINOX RESOURCES LTD.
CAY PROPERTY
Cu GEOCHEMISTRY
BEATY GEOLOGICAL LTD.
SCALE 1:5000
DATE DECEMBER, 1987
DRAWN LSM, GR
DRAWING NO. FIGURE 6c


ALPHA CREEK
CAMP CREEK NORTH
CAMP CREEK SOUTH
MAIN CREEK
KNOX POND
1986 BASELINE
1987 BASELINE
87L 110N
87L 105N
87L 100N
87L 95N
87L 90N
87L 85N
87L 80N
87L 76N
86L 10N
86L 5N
86L 0S
86L 5S
86L 10S
86L 15S
86L 18S
86L 19S
86L 20S
86L 21S
86L 22S
86L 23S
86L 24S
86L 25S
86L 27S
86L 28S
86L 30S
86L 36S
86L 38S
86L 40S
CAY 2 LCP
CAY 1 LCP
CAY 4 LCP
CAY 13 LCP
CAY 12 LCP
124°00'
123°55'
123°50'
57°50'
57°45'
57°40'
MUSKWA RIVER
PROPHET RIVER
MAP AREA
km 0 1 2 3 4 5 km
N
LEGEND
Grid Line
Sample Site
200 Value in ppm
Claim Boundary
Claim Post
Claim boundaries located by chain and compass from nearest grid station.
NTS 94 G / 12 W
100 metres 0 100 200 300 metres
GEOLOGICAL BRANCH
ASSESSMENT REPORT
16,851
EQUINOX RESOURCES LTD.
CAY PROPERTY
Pb GEOCHEMISTRY
BEATY GEOLOGICAL LTD.
SCALE 1:5000
DATE DECEMBER, 1987
DRAWN LSM, GR
DRAWING NO. FIGURE 6b