GM 50785

REPORT ON THE GEOLOGY AND STREAM SEDIMENT GEOCHEMISTRY, EMBERTON PROPERTY

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REPORT ON THE GEOLOGY AND STREAM SEDIMENT GEOCHEMISTRY OF THE EMBERTON PROPERTY, EMBERTON TOWNSHIP, QUEBEC

Permis Spéciaux d'Exploration P04677-P04734

NTS 21E/6
71°10'E, 45°16'N

by

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for

Société d'Exploration Embertex, Enr.

February, 1990 Project 15 Montreal, Que.

SUMMARY

The 1989 exploration program on the Emberton property was designed to test for occurrences of gold-bearing quartz vein systems in gabbroic host rocks. The main exploration activities were geological mapping, lithogeochemical sampling, prospecting, and an extensive stream sediment geochemical survey.

The property is located in the Eastern Townships of southern Quebec, near the town of Chartierville, and adjacent the Canada-USA border.

Previous exploration focussed on prospecting for placer gold in the nearby Ditton River-Mining Brook area, but the source of the gold, which is generally considered to be local, has not been found. Work on the property has been directed toward base metal sulfide deposits. Although there has been some geochemical and geophysical encouragement, no showings have been located. Regional stream sediment (heavy fraction) surveys have yielded several highly anomalous (up to 44 ppm Au) values, which have not been followed-up.

The property is underlain by Siluro-Devonian rocks of the Frontenac Formation, which comprises flyschoid sediments, mafic to intermediate volcanics, and gabbroic intrusions. These rocks have been moderately to strongly deformed by at least three generations of tectonism, and are metamorphosed to lower greenschist assemblages. Geological mapping at 1:10,000 scale indicates that gabbroic sills (and dykes) consititute up to 10 % of the outcrops on the property.

The sills are spatially associated with feldspar-chlorite schists (metavolcanics; mafic to intermediate pillowed flows, tuffs and tuffaceous sediments), and also intrude feldspar-quartz±chlorite±biotite schists and phyllites (metasediments; greywackes, sandstones, siltstones and shales). Alteration is generally absent on the property, and although quartz veins are abundant in the metasediments, they are rare in the metagabbros.

Lithogeochemical analyses of quartz veins and altered rocks were conducted on 43 samples for gold. No significant values were recorded.

A stream sediment (silt fraction) geochemistry survey covering all streams and rivers on the property was conducted with stations every 200 m. Two hundred forty-nine analyses were made for Au, Ag, Cu, Zn, As and Mn. The data were statistically treated to determine distributions, correlations and anomalous values. The geometric mean for Au is 3 ppb, and third-order anomalies are >21 ppb Au. Potentially interesting gold values of up to 164 ppb occur in silts on the property. However, the anomalous gold values are invariably isolated and do not correlate with pathfinder elements such as As, Ag, Cu and Zn. It is likely that the gold has been distributed from placer deposits by glacial activity, and has not been derived from a lode source.

In spite of a generally favourable geological and geochemical environment on the Emberton property, the 1989 exploration program failed to define targets for more detailed surveys. No further work is recommended.

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INTRODUCTION

The exploration target on the Emberton property is a gold-bearing quartz vein system suitable for a high grade, moderate tonnage mining operation. The geological model is based on auriferous quartz-arsenopyrite vein showings in Bellechasse Township, which although subeconomic at present, hold good exploration potential. The geological environment of the Emberton property is conducive to occurrences of this style of mineralization, and the old Mining Brook and Ditton River placer gold mines lie immediately north of the property.

This report summarizes work conducted in 1989 on the Emberton property (Project 15). The main exploration activities were geological mapping, lithogeochemical sampling, prospecting, and an extensive stream sediment geochemical survey.

Société d'Exploration Embertex Enr. maintains a 100 % interest in the property.

LOCATION, ACCESS AND TERRAIN

The property is located in the Eastern Townships of southern Quebec, within the area of NTS 21E/6 and 21E/3, and is centered at 71°10'E and 45°16'N

(Figure 1a). The property lies 200 km east of Montreal, adjoins the town of Chartierville, and the southern property boundary comprises the Canada-USA border. The property consists of 58 contiguous permis spéciaux d'exploration covering 2555 h. The claim boundaries with respect to local features are shown in Figure 1b. Relevant claims data is given in Appendix A. The property currently adjoins claim blocks owned by Exploration Cache Inc. and Erablière Lingwick.

The town of Chartierville is accessible by highways 257 and 210. Highway 257 transects the property, and there is a customs office at the Canada-USA border. Several range roads also bound and cross parts of the property, and the international boundary line is a well cut line. Access to individual claims is facilitated by logging trails and farm tracks.

The property terrain mainly consists of gently rolling hills which rise southwards toward the international border. The hills along the border are fairly steep, with a maximum relief of 350 m. The property is well drained by small streams and rivers which form the headwaters of the Ditton River. Most claims are covered by deciduous forest, and about 15 % of the property is covered by hayfields and scrub grazing land.

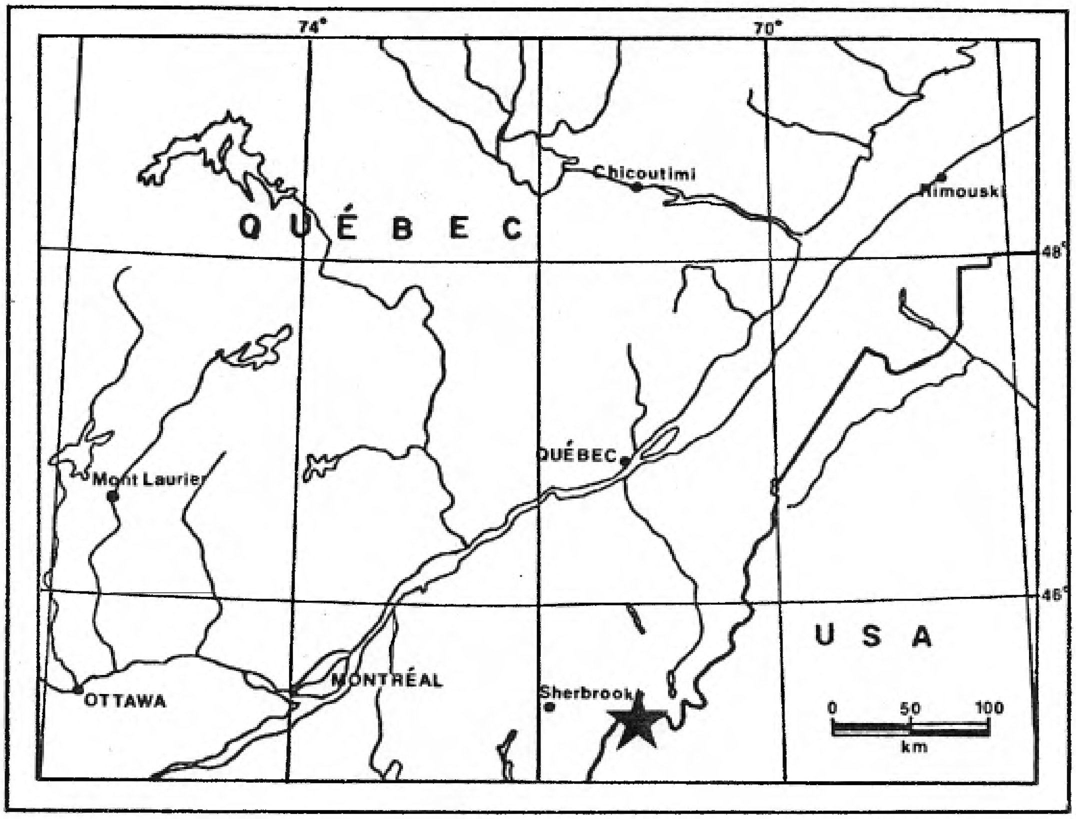

Figure 1a. Property location map.

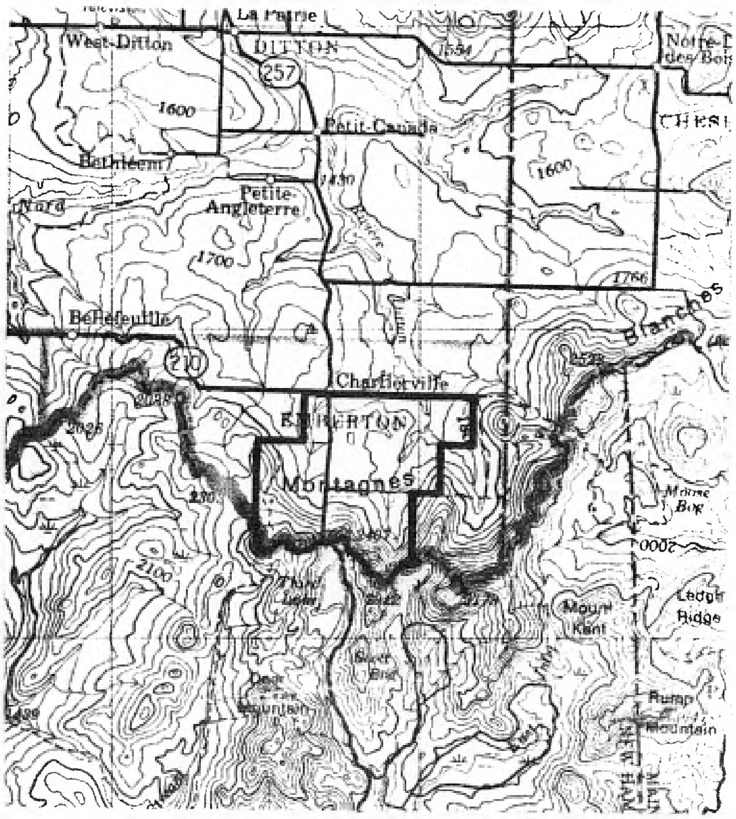

Figure 1b. Detailed property location map.

PROPERTY HISTORY

Although there is no recorded exploration on the property prior to the late 1960's, there is a long history of prospecting for placer gold deposits. Placer gold was discovered in Mining Brook, near the junction of the Ditton River (4 km north of the property) in 1863 (Goodwin, 1933). Records of production were not kept, but it has been estimated that between 1868 and 1893, commercial operations recovered at least 28,000 ounces, and as much as 140,000 ounces of gold (Obalski, 1890; 1898; 1908; Chalmers, 1898; Descarreaux et al., 1981). Gold nuggets were variably angular to rounded, and were occasionally attached to fragments of angular quartz. The richest deposits were found in oxidized gravels lying directly on bedrock, and were formed prior to Quaternary glaciation events. The lode source of the placer gold has never been located, but it was generally thought to have been derived from quartz veins of local provenance (Goodwin, 1933; McGerrigle, 1935; 1936).

Several of the streams on the Emberton property have been reported to carry placer gold (c.f. summary of Descarreaux et al., 1981). In addition, Dawson (1898, p. 77A) noted that "Gold has been washed from the gravels at several points, nearly as far up as the International Boundary ... and near the source of the stream in the vicinity of Prospect Hill, where it is reported to have been found in quartz". What is now called Mont Prospect lies within the boundaries of the Emberton property.

The first recorded exploration on the property was conducted in the late 1960's by SOQUEM. The work consisted of a stream sediment geochemistry survey (Cu, Pb, Zn, Mn) and follow-up by ground magnetometer and HLEM geophysics (Gagnon, 1968; Nadeau 1968). The target was apparently a base metal sulfide deposit, and the surveys covered parts of lots 28-30, range III, and lots 23-28, range IV. Several Pb-Zn stream sediment anomalies were reported, but no significant EM or magnetic anomalies, or showings were located.

In the early 1980's, Claude Resources Inc. and Minerais Lac Ltée. covered the Emberton property with a variety of surveys, primarily in a search for base metal sulfides. An airborne VLF-EM and magnetic survey yielded several scattered, weak (<5 ppm) conductors, and a broad, irregular, NE-SW trending magnetic anomaly (maximum total field ~56900 nT) on the west side of the property (Fortin, 1981). Follow-up work consisted of ground HLEM, VLF and magnetic surveys and geological mapping on four grids on the property, with occasional soil geochemical lines on EM anomalies, and a regional scale stream sediment (heavy fraction; Cu, Pb, Zn, As, Ag, Au) geochemistry survey (Lavoie, 1981; Descarreaux et al., 1981). Numerous weak HLEM and VLF conductors were noted on the grids, many with weak to moderately strong (<300 nT) coincident magnetic anomalies. Gabbroic dykes were mapped in several instances. Interpretation of the data suggests that many of the conductors occur at lithological contacts, and particularly at basalt-sediment contacts. In addition, basaltic rocks appear to be more magnetic than the gabbros. Quartz veining is reported in the sediments, and less commonly in the basalts; no mention is made of veining or alteration in gabbro. The highest Au value for a quartz vein was 40 ppb. Maximum soil geochemical values over EM conductors were on the order of 20-25 ppb Au. No significant base metal anomalies were detected.

The regional stream sediment data in Descarreaux et al. (1981) was supplemented by additional sampling around anomalies (Descarreaux et al. 1982). The two surveys included 37 steam sediment (heavy fraction) samples on the Emberton property, and yielded several scattered anomalies. Gold values of up to 3000 ppb were recorded from the West Ditton River, and up to 420 ppb from the East Ditton River. Arsenic anomalies of up to 224 ppm were also noted. Copper, Pb, Zn and Ag analyses were generally low. Several gold anomalies, up to 2900 ppb, were obtained from the West Ditton River immediately downstream from the property boundary.

Geophysical anomalies (primarily HLEM and VLF) were tested by four diamond drill holes on the Emberton property (Descarreaux et al., 1982). None of the holes succeeded in fully accounting for the geophysical anomalies. One of the holes intersected a slightly graphitic sediment; the other three anomalies were interpreted to have been caused by conductive overburden. However, hole 30-2 contained a 3.1 m intersection of carbonatized and epidotized gabbro which assayed 274 ppb Au. All other sedimentary and volcanic units intersected, including quartz veins, were barren. No attempt was made to follow-up the gold anomalies in stream sediments. Claude Resources Inc. subsequently allowed the claims to lapse.

In 1985, Maurice and Mercier (1985) covered the Emberton property as part of a government regional stream sediment (heavy fraction) survey. Several anomalous samples were obtained on the property, including values of up to 44 ppm Au and 154 As. The greatest gold concentration recorded in the suvey was a sample from Mining Brook, which assayed 2129 ppm Au.

REGIONAL GEOLOGY

The property is situated in the Frontenac synclinorium, between the Gaspé-Connecticut Valley synclinorium and the Boundary Mountain anticlinorium. Lithologies are dominated by sedimentary and volcanic sequences of early Paleozoic ages; the Frontenac Formation is the only unit in the property area (Chevé, 1977; 1978). The Frontenac Formation is of Siluro-Devonian age, and consists of phyllites, slates, sandstones and greywackes, and lesser mafic volcanic rocks. These rocks are intruded by gabbroic sills and dykes of unknown age and origin; the Frontenac Formation and the gabbros were deformed mainly during the

Acadian orogeny.

Chevé (1977; 1978) divided the Frontenac Formation into four major rock types: a) massive fine grained sandstones; b) siltstones, greywackes and slates; c) mafic volcanic rocks; and d) gabbroic sills. Only the latter three units are important on the Emberton property.

The siltstones, greywackes and slates are the dominant rock types on the property. These consist of a monotonous sequence of turbiditic sediments, characterized by alternating laminae of quartzo-feldspathic and micaceous material. Bedding thicknesses in the finer grained rocks average 0.1-0.3 mm, and in the coarser units average 3-50 cm. The mafic volcanic rocks comprise a series of irregular lenses in the sediments, with an overall elongation in a NE-SW direction. The volcanics are dominantly pillow basalts, with subordinate volcaniclastic equivalents. The volcanic rocks are greenschists, and are composed primarily of albite, actinolite, epidote, sericite and chlorite. Gabbroic sills (and locally dykes) intrude both the sediments and volcanics, and average 25-500 m in thickness. The sills vary from fine to coarse grained, and are generally massive. Locally, glomeroporphyritic textures predominate. Schistose textures are usually developed only near the margins of the intrusions, and clearly indicate a pre-deformational origin for the intrusions. The gabbros are composed mainly of plagioclase, with minor actinolite, chlorite and epidote. Clinopyroxene remnants are rare. Chevé (1978) has suggested that the relative proximity of the mafic volcanic rocks and the gabbroic sills may indicate a genetic association, but there is no proof of this relationship.

All the rocks in the property area have been moderately to strongly deformed; metamorphism is dominated by lower greenschist assemblages. The sediments have been metamorphosed to slates, phyllites and metagreywackes, and the volcanics to schists. The area has undergone at least three generations of deformation. S_1 defines the dominant penetrative schistosity and is developed in a NE-SW direction, with variable, steep SE-NW dips. S_2 is observed primarily in less competent units, and trends NNE-SSW with subvertical dips. S_3 is only locally developed, and consists of an E-W trending, subvertical fracture cleavage.

Quartz veining is associated with the deformational events, particularly D_1, and is abundant in the metasedimentary rocks.

METALLOGENIC MODEL

Exploration of the Emberton property has been based on a metallogenic model which incorporates local geological features and comparable features associated with gold prospects elsewhere in the Appalachians. There are in fact few verifiable gold showings in the Quebec Appalachians. The economically most interesting lode gold prospects are the Rosen-Timmins and other showings in Bellechasse Township, and the two most significant placer gold districts are the Gilbert and Ditton areas. Although the Bellechasse gold showings are about 60 km NE of the Gilbert placers, the former are characterized by quartz-arsenopyrite veins in association with gabbroic sills that extend NE-SW in a line of Au showings through Bellechasse, Langevin and Ware townships towards the headwaters of the Gilbert River. There are no lode gold prospects in the area of the Ditton River placers. However, the provenance of both placer districts is generally thought to be local (Chalmers, 1898; Obalski, 1898; McGerrigle, 1935, 1936). Alternate suggestions that the gold was derived from minor concentrations in pyrite in shales (Gauthier, 1985), or that gold was remobilized from distant volcanic belts by glaciation (Maurice 1986) remain unlikely. As previously discussed, the gold in both placer districts has been reported as variably fine to coarse, rounded to angular/dendritic, and locally to be attached to quartz vein material. In addition, Boyle (1979) noted that hessite occurs as inclusions in gold from the Ditton area, which strongly suggests a mesothermal-epithermal vein origin.

It is thus probable that placer gold of the Ditton district had a local lode source, and was derived from a mesothermal quartz-arsenopyrite vein system hosted by gabbroic or possible mafic volcanic rocks. The gabbroic sills are compositionally iron-rich tholeiites, and would have provided superior chemical traps for sulfur- and gold-bearing hydrothermal solutions (cf. Clark and Wares, 1985).

It is therefore significant that the Gilbert and Ditton placer districts are the only areas in the Quebec Appalachians which are spatially associated with Lower Paleozoic gabbroic sills. In both cases, the belts of gabbroic intrusions pass through the headwaters of the gold-bearing placers. The source of the Ditton placers may thus be mesothermal quartz-arsenopyrite veins/stockworks in the Frontenac Formation gabbros which outcrop prominently on the Emberton property. The gold would have been transported through pre-glacial drainage systems, and subsequently locally redistributed by glacial processes.

LOCAL GEOLOGY

The property has been mapped and lithogeochemically sampled along all roads, most tracks, some claim lines, the international border, and along all streams and rivers. This provides reasonably representative but far from complete coverage. The geology is complicated by a lack of distinctive units within the larger lithological groupings, and by structural complexities. The amount of exposure is fair to poor, and there are some broad areas with virtually no outcrop.

The Emberton property is entirely underlain by the Frontenac Formation, which can be divided into three main units: metasediments, metavolcanics and metagabbros (Fig. 2).

The metasediments consist dominantly of feldspar-quartz-sericite±chlorite±biotite schists and phyllites. Unmetamorphosed equivalents were greywackes, sandstones, siltstones and shales. The sediments comprise a flysch/turbidite sequence of thin-bedded (1-100 cm) medium and fine grained layers. The schists are generally medium grey and contain variable amounts of chlorite or biotite; however, most are sericite-rich. Andalusite porphyroblasts were occasionally observed. Phyllites (and slates) may be slightly graphitic, but do not generally represent highly conductive material. The metasediments are not noticeably altered, but do contain fairly abundant syn-tectonic quartz veins. The veins are generally barren-looking, and only rarely contain traces of pyrite. Carbonate and sericite occur as minor constituents, and chloritized wallrock fragments are common. Quartz veins are particularly abundant in phyllites, and in the noses of minor folds.

The metavolcanics consist of feldspar-chlorite±sericite schists. Their unmetamorphosed equivalents were pillow basalts, mafic to intermediate tuffs and tuffaceous sediments. The pillow textures are generally poorly preserved; epidote- and carbonate-bearing selvages can be discerned locally. The volcanics are dominantly mafic, but intermediate to felsic tuffs occur in the most westerly of the volcanic lenses. Due to structural complexities, it is not certain whether the volcanic lenses are related (i.e., folded) or comprise distinct units. If distinct, there are three lenses which average 200-500 m thick. The volcanic rocks appear to be concentrated in the older sections of the Frontenac Formation, and on the western side of the property. The volcanics do not exhibit significant alteration, although pyrite (<3 %) and traces of chalcopyrite were noted in zones of minor shearing. Quartz veining is common, but is less abundant than in the metasediments.

With the exception of the international boundary, where outcrop is semi-continuous, gabbroic units are poorly exposed. If the density of sills on the border is representative, then gabbroic intrusions may underlie up to 10 % of the property area. The gross spatial relationship of the gabbroic sills and the mafic to intermediate volcanic rocks suggests that the former may have been genetically related to Frontenac volcanism.

The metagabbroic sills (and dykes) vary from 1-200 m thick. The thinner sills are fine grained (<0.5 mm) and the thickest sills are fairly coarse grained (0.5-1 cm). In addition, the finer grained bodies tend to be schistose, whereas the coarser grained bodies only exhibit schistosity near their margins. The sills are generally characterized as feldspar-chlorite±epidote±sericite schists, with relict igneous textures and mineralogy locally preserved in the coarser units. The primary minerals consist of plagioclase (70-80 %), clinopyroxene (20-30 %) and opaques (5 %). The sills vary from weakly to moderately magnetic, but are less magnetic than some of the mafic volcanic rocks. Traces of pyrite and pyrrhotite are present in some areas, but appear to be primary in nature. None of the sills examined have undergone significant hydrothermal alteration. Quartz veins are rare, and are characterized by thin syn-tectonic veins with highly chloritized wallrock inclusions.

Rocks on the property are moderately to strongly deformed, but outcrop is unsufficient to identify fold patterns. From cleavage relationships, it appears that at least three generations of folding affected the area, and the dominant structural fabric trends consisently NE-SW. Folding in the fine grained rock types (especially phyllites) was intense and probably locally isoclinal. Coarser grained rocks were not as strongly affected. Faults are inferred from linear drainage patterns on the soutwestern part of the property, but do not exhibit significant shearing or alteration. All such faults also appear to trend NE-SW.

No mineralization was observed on the property.

LITHOGEOCHEMISTRY

Lithogeochemical sampling accompanied geological mapping on the property. Samples weighed at least 1 kg, and can be classified as "grabs". Usually two or more samples were taken from significantly altered and/or veined outcrop in order to obtain representative material. If several degrees or types of veins or alteration were present in an outcrop, each was individually sampled. Boulders and glacial float were occasionally sampled when interesting features were observed.

Forty-three samples were collected, and were analysed for Au by Acme Analytical Laboratories (Vancouver). Samples were crushed to -3/16 inches, then split to one-half pound. The splits were pulverized to -100 mesh (>98 %). These pulps were then split to 10.0 g, ignited at 600°C, digested with hot aqua regia, and treated by MIBK extraction. The resultant solutions were analyzed by graphite furnace atomic absorption, with a lower detection limit of 1 ppb Au.

The rock geochemistry results are compiled in Appendix B, and the sample locations and the gold values are plotted in Figures 3 and 4.

No gold values of significance were obtained on the property.

STREAM SEDIMENT GEOCHEMISTRY

A stream sediment geochemistry survey was conducted in order to evaluate the distribution of anomalous stream silts and focus detailed exploration work. The property is generally well drained by a network of streams which flow northward and coalesce into the West Ditton and East Ditton rivers. Sampling was conducted every 200 m along virtually all streams on the property. Samples consisted of ~500 g of variably sand, fine gravel, silt or organic-rich mud, collected from active stream sediments wherever possible. In some cases, samples could not be collected due to artificial channeling (typically for argicultural or road-building purposes) or beaver dams. Cultural contamination of stream sediments is relatively minor; only in the larger streams and rivers was there evidence of possible heavy metal pollution, and this does not appear to have affected the analytical data.

A total of 249 samples were collected, and were analyzed for Cu, Zn, Ag, Mn and As by Acme Analytical. Samples were oven-dried at 60°C, and then 30 g were sieved at -80 mesh. In several instances, samples were sieved at -40 mesh (30 g) and then pulverized to -80 mesh (>98 %), in order to obtain sufficient material for analyses. For gold, pulps were split to 10.0 g, ignited at 600°C, digested with hot aqua regia, and treated by MIBK extraction. The resultant solutions were then analysed by graphite furnace atomic absorption, with a lower detection limit of 1 ppb Au. For Cu, Zn, Ag, Mn and As, pulps were split to 0.50 g, digested with 3 ml of 3-1-2 $HCl-HNO_3-H_2O$ at 95°C for one hour, and finally diluted to 10 ml with distilled water. These solutions were then analysed by inductively coupled plasma spectroscopy, with detection limits of 0.1 ppm for Ag, 1 ppm for Cu, Zn and Mn, and 2 ppm for As.

The stream sediment geochemistry results are compiled in Appendix C, and the sample locations and gold values are plotted in Figures 3 and 4. The data have been statistically treated to determine distributions (normal versus lognormal), means/geometric means, standard deviations/geometric standard deviations and correlation coefficients (Appendix D). It was determined that Au, Ag and Mn have lognormal distributions on the property, whereas Cu, Zn and As are normally distributed. The means/geometric means for the analysed elements are: Au, 3 ppb; Ag, 0.1 ppm; As, 14 ppm; Cu, 13 ppm; Zn, 89 ppm; and Mn, 980 ppm. Anomalous values were determined using one, two and three standard deviations/geometric standard deviations about the mean/geometric mean (see Appendix D). Pearson correlation coefficients indicate that Au is not correlated with any of the other analysed elements. Zinc and arsenic show a fairly strong positive correlation with manganese, and As and Zn show a moderate positive correlation with Cu. These data suggest that Zn and As have been scavenged by Mn-oxides and anomalous values of these elements should be treated with caution.

In Figure 4, it can be seen that there are several samples that contained >21 ppb Au, with one as high as 164 ppb Au. While these results are encouraging, it is also apparent that the anomalous gold values do not exhibit reasonable dispersion trends; multi-station anomalies are rare. Moreover, the distributions of As, Cu, Zn and Ag do not correlate with gold, and there are no significant Au-multielement anomalies. It is thus highly probable that the gold values in the stream sediments record glacial dispersion of pre-existing placer gold rather than derivation from an eroding lode gold source. While some of the highest gold anomalies may deserve further examination, no economic significance can be attached to the results.

The 1989 stream silt survey did not succeed in reproducing anomalies detected by previous heavy mineral surveys. This constitutes further evidence that the gold in the stream sediments cannot be directly attributed to a local lode gold source. One anomalous sample (59 ppb Au) was obtained downstream from Claude Resources Inc. 1982 drill hole 30-2, which intersected altered and weakly mineralized gabbro. However, no other anomalous values were noted in the area, and surface examination failed to locate the drill collar or interesting outcrops.

CONCLUSIONS

The following conclusions may be drawn from the 1989 exploration program on the Emberton property:

1) The property is well-situated in the headwaters of the Ditton placer gold district.

2) Previous exploration work has located stream sediment Au anomalies, and a 1982 drill hole intersected altered and weakly mineralized gabbro.

3) Mapping indicates a favourable geological environment for gabbro-hosted quartz-arsenopyrite-gold veins, but no mineralization or significant alteration has been observed.

4) Lithogeochemical sampling of quartz veins and altered rocks yielded no significant gold values.

5) Stream silt sampling yielded a number of anomalous but isolated Au anomalies.

6) The distribution of gold in stream sediments and the lack of correlation with pathfinder elements suggests that the gold distribution is representative of glacial dispersion of placer material rather than a derivative of a lode source.

7) Although the metallogenic model for the Ditton district in general remains valid, the 1989 exploration program on the property failed to generate targets for follow-up work.

8) No further work is recommended for the Emberton property.

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APPENDIX A

Claims Data.

ANNEXE I - DEFINITION DE LA PROPRIETE EMBERTON

P.S.E.	RANG	LOT	SUPERFICIE (HECTARES)	DATE D'EXPIRATION
P04677	II	06	40	23/05/90
P04678	II	07	40	23/05/90
P04679	II	08	40	23/05/90
P04680	II	09	40	23/05/90
P04681	II	10	40	23/05/90
P04682	II	11	40	23/05/90
P04683	II	12	40	23/05/90
P04684	II	13	40	23/05/90
P04685	II	14	40	23/05/90
P04686	II	15	40	23/05/90
P04687	II	16	40	23/05/90
P04688	II	17	38	23/05/90
P04689	II	18	40	23/05/90
P04690	II	19	40	23/05/90
P04691	II	20	40	23/05/90
P04692	II	21	40	23/05/90
P04693	II	22	40	23/05/90
P04694	II	23	40	23/05/90
P04695	II	24	40	23/05/90
P04696	III	09	40	23/05/90
P04697	III	10	40	23/05/90
P04698	III	11	40	23/05/90
P04699	III	12	40	23/05/90
P04700	III	13	40	23/05/90
P04701	III	14	40	23/05/90
P04702	III	15	40	23/05/90
P04703	III	16	40	23/05/90
P04704	III	17	31	23/05/90
P04705	III	18	40	23/05/90
P04706	III	19	40	23/05/90
P04707	III	20	40	23/05/90
P04708	III	21	40	23/05/90
P04709	III	22	40	23/05/90
P04710	III	23	40	23/05/90
P04711	III	24	40	23/05/90
P04712	III	25	40	23/05/90
P04713	III	26	40	23/05/90
P04714	III	27	40	23/05/90
P04715	III	28	34	23/05/90
P04716	III	29	82	23/05/90
P04717	III	30	87	23/05/90
P04718	III	31	64	23/05/90
P04719	IV	13	57	23/05/90
P04720	IV	14	62	23/05/90
P04721	IV	15	70	23/05/90
P04722	IV	16	63	23/05/90
P04723	IV	17	67	23/05/90
P04724	IV	18	50	23/05/90
P04725	IV	19	40	23/05/90

ANNEXE I - DEFINITION DE LA PROPRIETE EMBERTON (SUITE)

P.S.E.	RANG	LOT	SUPERFICIE (HECTARES)	DATE D'EXPIRATION
P04726	IV	20	40	23/05/90
P04727	IV	21	40	23/05/90
P04728	IV	22	40	23/05/90
P04729	IV	23	40	23/05/90
P04730	IV	24	40	23/05/90
P04731	IV	25	40	23/05/90
P04632	IV	26	40	23/05/90
P04733	IV	27	40	23/05/90
P04734	IV	28	50	23/05/90
TOTAL		58 LOTS	2555	

APPENDIX B

Analytical Results, Rock Geochemistry

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

DATE RECEIVED: AUG 9 1989
DATE REPORT MAILED: Aug 16/89

GEOCHEMICAL ANALYSIS CERTIFICATE

ICP - .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 SR 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: P1-P3 SILT P4 ROCK AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE. P, -40 mesh Pulverized

SIGNED BY........ D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

SOC. D'EXPLORATION EMBERTEX PROJECT 15 FILE # 89-2774 Page 4

SAMPLE#	AU* ppb
C8915-010	11
C8915-014	9
C8915-015	1
C8915-023	4
C8915-032	6
C8915-033	5
C8915-033A	2
C8915-040	3
C8915-041	2
C8915-041A	1
C8915-046	1
C8915-048A	3
C8915-048B	2
C8915-048C	4
C8915-049	3
C8915-060	1
C8915-060A	1
C8915-068	1
C8915-069	1
C8915-070A	4
C8915-070B	3
C8915-071	1

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

DATE RECEIVED: SEP 19 1989
DATE REPORT MAILED: Sept. 26/89

GEOCHEMICAL ANALYSIS CERTIFICATE

- SAMPLE TYPE: P1 ROCK P2 SILT
AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE.

SIGNED BY.........D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

Soc. d'Exploration Embertex PROJECT 15 FILE # 89-3753 Page 1

SAMPLE#	AU* ppb
C8915-083	3
C8915-084	3
C8915-085	1
C8915-095	3
C8915-096	1
C8915-119A	1
C8915-119B	3
C8915-119C	1
C8915-121	1
C8915-124	3
C8915-129	2
C8915-147	2
C8915-147A	1
C8915-157	2
C8915-165	2
C8915-167	2
C8915-167A	3
C8915-172	2
C8915-177	1
C8915-184	2
C8915-197	1

APPENDIX C

Analytical Results, Stream Sediment (Silt Fraction) Geochemistry.

ACME ANALYTICAL LABORATORIES LTD. DATE RECEIVED: AUG 9 1989
852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6
PHONE(604)253-3158 FAX(604)253-1716 DATE REPORT MAILED: Aug 16/89...

GEOCHEMICAL ANALYSIS CERTIFICATE

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- SAMPLE TYPE: P1-P3 SILT P4 ROCK AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE. P. -40 mesh Pulverized

SIGNED BY......... D.TOYE. C.LEONG. J.WANG; CERTIFIED B.C. ASSAYERS

SOC. D'EXPLORATION EMBERTEX PROJECT 15 FILE # 89-2774 Page 1

SAMPLE#	Cu PPM	Zn PPM	Ag PPM	Mn PPM	As PPM	Au* PPB
S8915-001 P	18	130	.2	6922	24	25
S8915-002 P	18	118	.1	3137	21	2
S8915-003 P	19	264	.4	11840	74	2
S8915-004 P	22	159	.3	2272	26	4
S8915-005 P	21	176	.1	2484	26	3
S8915-006 P	18	168	.2	3650	29	5
S8915-007 P	22	164	.2	2006	26	1
S8915-008 P	24	82	.1	845	24	7
S8915-009 P	22	70	.1	810	22	5
S8915-010 P	23	83	.1	992	21	3
S8915-011 P	12	73	.1	1460	10	3
S8915-012 P	13	88	.1	1304	17	1
S8915-013 P	8	53	.1	438	8	2
S8915-014 P	16	98	.2	3567	17	5
S8915-015 P	18	90	.1	1022	15	2
S8915-016 P	17	90	.1	1392	11	4
S8915-017 P	15	74	.1	722	13	7
S8915-018 P	16	98	.1	1201	14	1
S8915-019 P	15	86	.1	579	17	1
S8915-020 P	21	95	.1	575	63	5
S8915-021 P	14	84	.1	589	14	4
S8915-022 P	13	82	.1	587	13	4
S8915-023 P	17	105	.1	1264	25	7
S8915-024 P	21	113	.1	1158	38	5
S8915-025 P	14	84	.1	1838	15	4
S8915-026 P	6	77	.1	3663	9	2
S8915-027 P	10	65	.1	973	13	2
S8915-028 P	13	95	.1	1877	15	1
S8915-029 P	15	98	.1	2089	12	3
S8915-030 P	22	118	.2	1072	12	2
S8915-031 P	17	100	.2	1033	16	1
S8915-032 P	10	86	.2	1702	10	4
S8915-033 P	7	70	.1	499	7	3
S8915-034 P	13	61	.1	485	17	3
S8915-035 P	17	98	.2	764	17	1
S8915-036 P	32	159	.1	1421	22	1
STD C/AU-S	63	132	6.8	951	42	52

SAMPLE#	Cu PPM	Zn PPM	Ag PPM	Mn PPM	As PPM	Au* PPB
S8915-037 P	24	135	.1	1240	21	2
S8915-038 P	28	128	.2	1290	15	4
S8915-039 P	23	122	.1	872	17	5
S8915-040 P	24	113	.2	1261	18	8
S8915-041 P	22	90	.1	797	16	5
S8915-042 P	22	100	.2	771	18	5
S8915-043 P	20	90	.1	1164	18	5
S8915-044 P	23	80	.2	679	16	3
S8915-045 P	24	84	.3	851	19	3
S8915-046 P	17	89	.1	617	14	3
S8915-047 P	17	96	.1	745	13	6
S8915-048 P	19	97	.2	1400	15	23
S8915-049 P	16	90	.1	614	15	2
S8915-050 P	13	91	.2	2608	20	2
S8915-051 P	16	74	.1	563	22	2
S8915-052 P	21	77	.1	838	23	2
S8915-053 P	7	151	.1	1892	17	6
S8915-054 P	10	121	.2	1025	17	9
S8915-055 P	10	93	.1	654	17	4
S8915-056 P	14	93	.1	695	18	4
S8915-057 P	20	80	.1	985	22	3
S8915-058 P	22	90	.1	1206	26	2
S8915-059 P	28	112	.2	1236	25	5
S8915-060 P	12	74	.1	746	11	1
S8915-061 P	11	71	.1	657	10	2
S8915-062 P	10	69	.1	703	11	4
S8915-063 P	18	90	.1	1720	19	3
S8915-064 P	15	117	.2	2069	20	5
S8915-065 P	13	117	.1	2687	21	6
S8915-066 P	20	118	.1	1615	17	2
S8915-067 P	18	128	.1	1574	19	4
S8915-068 P	19	128	.2	1440	18	5
S8915-069 P	15	166	.4	3065	13	4
S8915-070 P	18	124	.3	2011	22	14
S8915-071 P	15	92	.2	1115	17	4
S8915-072 P	15	74	.1	575	16	8
STD C/AU-S	64	132	6.9	1021	43	48

SAMPLE#	Cu PPM	Zn PPM	Ag PPM	Mn PPM	As PPM	Au* PPB
S8915-073 P	12	112	.1	3350	22	11
S8915-074 P	6	116	.1	7254	13	4
S8915-075 P	13	55	.1	662	19	5
S8915-076 P	13	142	.1	3189	15	3
S8915-077 P	9	91	.1	2678	11	4
S8915-078 P	18	111	.1	2209	15	2
S8915-079 P	11	50	.1	499	13	7
S8915-080 P	13	61	.1	869	16	9
S8915-081 P	19	97	.2	1101	15	3
S8915-082 P	21	97	.2	1369	16	4
S8915-083 P	22	102	.3	990	17	4
S8915-084 P	23	101	.2	1015	11	2
S8915-085 P	25	91	.2	986	16	2
S8915-086 P	23	133	.2	1292	20	5
STD C/AU-S	63	132	6.8	1035	40	51

ACME ANALYTICAL LABORATORIES LTD.
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DATE RECEIVED: AUG 23 1989
DATE REPORT MAILED: Sept. 1/89.

GEOCHEMICAL ANALYSIS CERTIFICATE

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H20 AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
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- SAMPLE TYPE: SILT AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE.

SIGNED BY C. Leong D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

SOC. D'EXPLORATION EMBERTEX PROJECT 15 FILE # 89-3130 Page 1

SAMPLE#	Cu PPM	Zn PPM	Ag PPM	Mn PPM	As PPM	Au* PPB
S8915-087	15	97	.1	1297	14	3
S8915-088	15	81	.1	972	12	2
S8915-089	15	89	.1	1252	15	3
S8915-090	19	86	.1	1338	16	1
S8915-091	19	95	.1	1108	19	1
S8915-092	15	73	.1	953	14	1
S8915-093	14	78	.1	846	13	2
S8915-094	10	132	.2	4368	17	1
S8915-095	16	123	.1	2658	22	3
S8915-096	10	64	.1	562	9	4
S8915-097	14	71	.1	1422	11	3
S8915-098	15	78	.1	673	12	1
S8915-099	11	77	.1	597	7	4
S8915-100	25	118	.1	2706	20	2
S8915-101	16	138	.1	1113	15	4
S8915-102	15	162	.1	1211	11	3
S8915-103	17	129	.3	1205	12	5
S8915-104	15	164	.1	1189	12	1
S8915-105	19	147	.1	887	20	13
S8915-106	12	97	.1	725	10	2
S8915-107	10	78	.1	573	8	1
S8915-108	21	159	.1	1922	16	4
S8915-109	22	166	.1	971	23	1
S8915-110	22	104	.1	3297	19	1
S8915-111	17	78	.1	1471	16	1
S8915-112	18	117	.1	1167	19	6
S8915-113	17	150	.1	884	20	1
S8915-114	16	122	.1	743	22	8
S8915-115	13	109	.1	671	18	43
S8915-116	65	101	.2	1334	12	2
S8915-117	22	145	.1	758	16	3
S8915-118	10	58	.1	815	11	4
S8915-119	8	71	.2	1403	7	1
S8915-120	11	96	.1	1174	12	8
S8915-121	9	96	.1	1107	12	1
S8915-122	7	69	.1	1255	9	1
STD C/AU-S	61	131	6.7	949	43	53

SAMPLE#	Cu PPM	Zn PPM	Ag PPM	Mn PPM	As PPM	Au* PPB
S8915-123	11	90	.1	2735	13	4
S8915-124	6	56	.1	1283	10	1
S8915-125	9	51	.1	1538	10	2
S8915-126	8	43	.1	1156	8	5
S8915-127	10	60	.1	1090	13	3
S8915-128	9	52	.1	1019	12	1
S8915-129	10	54	.1	1009	14	1
S8915-130	7	43	.1	669	11	1
S8915-131	9	70	.1	1568	11	4
S8915-132	8	40	.1	653	5	6
S8915-133	7	73	.1	1760	11	6
S8915-134	5	49	.1	949	7	1
S8915-135	4	43	.1	477	6	5
S8915-136	9	76	.1	615	11	8
S8915-137	11	91	.1	1280	12	82
S8915-138	13	120	.1	865	34	4
S8915-139	6	48	.1	1069	12	3
S8915-140	5	37	.1	469	7	7
S8915-141	8	77	.1	791	8	2
S8915-142	9	65	.1	234	10	4
S8915-143	17	157	.1	1892	12	7
S8915-144	22	252	.2	2750	18	1
S8915-145	25	123	.1	1104	8	4
S8915-146	19	94	.1	830	14	2
S8915-147	17	101	.1	740	12	6
S8915-148	17	95	.1	733	15	6
S8915-149	11	66	.1	523	12	1
S8915-150	5	58	.1	761	5	1
S8915-151	5	53	.1	730	6	8
S8915-152	3	44	.1	185	4	1
S8915-153	8	75	.1	1051	10	1
S8915-154	8	63	.1	609	10	2
S8915-155	7	55	.1	583	8	5
S8915-156	10	82	.1	974	9	5
S8915-157	15	100	.1	806	16	4
S8915-158	9	82	.1	680	10	17
STD C/AU-S	62	132	6.8	1055	42	47

SAMPLE#	Cu PPM	Zn PPM	Ag PPM	Mn PPM	As PPM	Au* PPB
S8915-159	11	99	.1	601	12	1
S8915-160	14	102	.1	952	15	2
S8915-161	13	77	.1	508	11	1
S8915-162	16	134	.1	1420	15	1
S8915-163	15	92	.1	832	14	6
S8915-164	24	151	.2	1190	23	20
S8915-165	24	126	.1	1095	28	3
S8915-166	21	117	.1	879	14	1
S8915-167	15	57	.1	388	12	1
S8915-168	19	85	.1	810	19	1
S8915-169	16	89	.1	774	13	1
S8915-170	15	99	.1	895	14	1
S8915-171	18	111	.1	682	16	27
S8915-172	9	65	.1	520	11	1
S8915-173	9	69	.1	532	7	19
S8915-174	8	67	.1	756	9	1
S8915-175	10	61	.2	522	10	1
S8915-176	10	94	.1	1659	13	2
S8915-177	16	90	.1	1014	14	1
S8915-178	7	49	.1	520	7	6
S8915-179	9	66	.1	1089	10	2
STD C/AU-S	62	132	6.6	1013	39	49

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- SAMPLE TYPE: SILT AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE. P-pulverized, -40 mesh.

SIGNED BY.......... D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

SOC D'EXPLORATION EMBERTEX FILE # 89-3366 Page 1

SAMPLE#	Cu PPM	Zn PPM	Ag PPM	Mn PPM	As PPM	Au* PPB
S8915-180	13	41	.1	414	7	3
S8915-181	11	52	.1	531	6	2
S8915-182	9	57	.1	795	8	3
S8915-183	14	71	.1	644	10	2
S8915-184	12	49	.1	433	10	3
S8915-185	10	62	.1	1177	5	9
S8915-186	9	56	.1	1370	5	1
S8915-187	9	46	.1	553	3	1
S8915-188	9	77	.2	894	6	1
S8915-189	7	41	.1	411	4	1
S8915-190	20	82	.1	1178	14	1
S8915-191	14	90	.1	1083	14	1
S8915-192	16	79	.1	952	8	2
S8915-193	12	50	.1	729	8	1
S8915-194	7	53	.1	472	5	4
S8915-195	10	62	.1	806	5	1
S8915-196	9	50	.1	832	7	1
S8915-197	12	57	.1	499	9	1
S8915-198	10	77	.3	702	10	1
S8915-199	12	39	.1	386	6	1
S8915-200	10	48	.1	478	9	58
S8915-201	21	262	.1	11782	89	1
S8915-202	13	211	.1	8687	50	1
S8915-203	6	76	.1	904	4	1
S8915-204	5	120	.1	4379	8	1
S8915-205	7	106	.1	4255	11	164
S8915-206	9	84	.1	1249	5	3
S8915-207	7	56	.1	623	6	1
S8915-208	12	57	.1	504	8	2
S8915-209	8	56	.1	503	4	1
S8915-210	7	45	.1	392	5	1
S8915-211	4	41	.1	374	2	2
S8915-212	10	55	.2	573	6	1
S8915-213	9	59	.1	549	8	38
S8915-214	5	70	.1	818	2	1
S8915-215	1	48	.1	799	2	50
STD C/AU-S	62	132	6.6	1015	41	47

SAMPLE#	Cu PPM	Zn PPM	Ag PPM	Mn PPM	As PPM	Au* PPB
S8915-216	1	50	.1	871	6	1
S8915-217	8	50	.1	646	8	83
S8915-218	7	146	.2	6588	15	10
S8915-219	4	66	.2	1252	8	8
S8915-220	6	64	.1	496	10	3
S8915-221	5	56	.1	557	11	2
S8915-222	5	52	.1	562	8	1
S8915-223	6	55	.1	435	10	1
S8915-224	6	72	.1	419	13	17
S8915-225	6	67	.1	984	9	1
S8915-226	8	64	.1	332	8	1
S8915-227	5	68	.1	648	8	1
S8915-228 P	6	66	.1	381	11	1
S8915-229	3	51	.2	320	6	1
S8915-230	3	60	.1	569	6	1
S8915-231 P	9	70	.2	707	17	1
S8915-232	4	55	.1	806	7	1
S8915-233	4	58	.2	572	9	1
S8915-234	7	62	.2	556	12	3
S8915-235	8	66	.2	762	12	2
S8915-236	8	63	.1	610	10	1
S8915-237	5	79	.2	945	12	1
S8915-238	13	77	.1	954	11	2
S8915-239	8	48	.1	472	12	1
S8915-240	20	83	.2	747	11	82
S8915-241	19	98	.2	1014	16	5
S8915-242	13	63	.1	508	12	10
S8915-243	8	54	.1	412	11	2
S8915-244	13	73	.1	593	12	1
S8915-245	7	58	.1	448	5	5
S8915-246	10	71	.1	581	11	3
STD C/AU-S	59	132	6.7	940	42	47

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PHONE(604)253-3158 FAX(604)253-1716

DATE RECEIVED: SEP 19 1989

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GEOCHEMICAL ANALYSIS CERTIFICATE

- SAMPLE TYPE: P1 ROCK P2 SILT

AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE.

SIGNED BY........ D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

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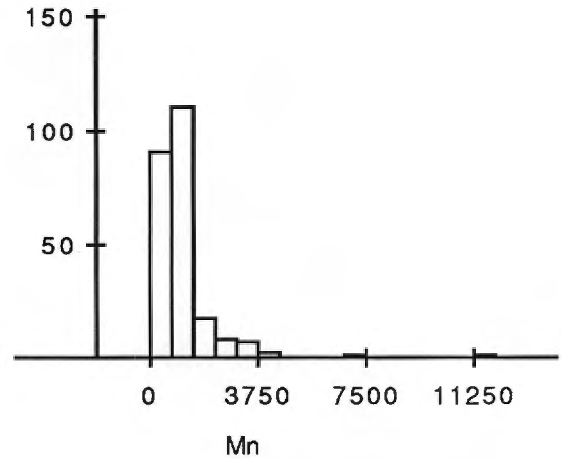
SAMPLE#	AU* ppb
S8915-247	1
S8915-248	59
S8915-249	1

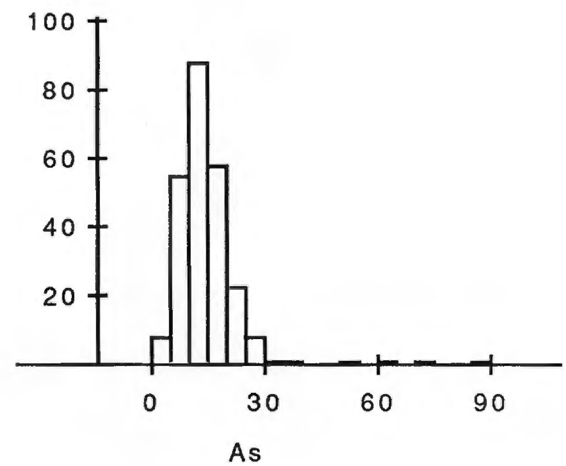
APPENDIX D

Statistics.

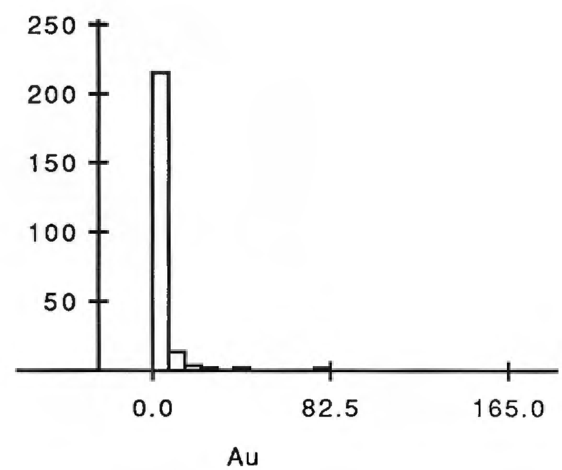
Summary statistics for **Mn(ppm)**
NumNumeric = 246
Min. 185 Max. 11840
Geometric mean = 2.99 (980)
Geometric standard deviation = 0.28
1st order anomaly = 980< x < 1884
2nd order anomaly = 1884< x < 3619
3rd order anomaly = 3619< x



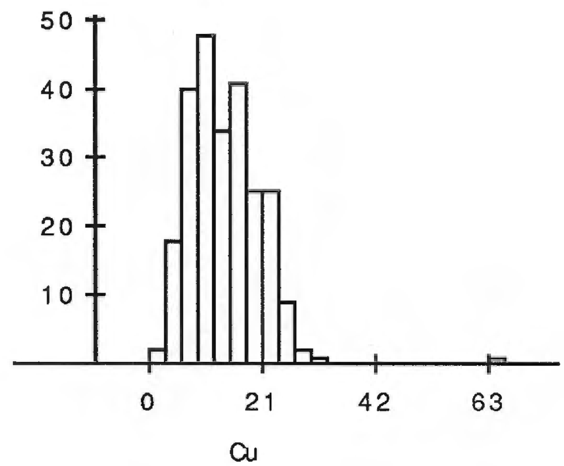
Summary statistics for **As(ppm)**
NumNumeric = 246
Min. 2 Max. 89
Mean = 14
Standard Deviation = 9.3
1st order anomaly = 14< x < 23
2nd order anomaly = 23< x < 33
3rd order anomaly = 33< x



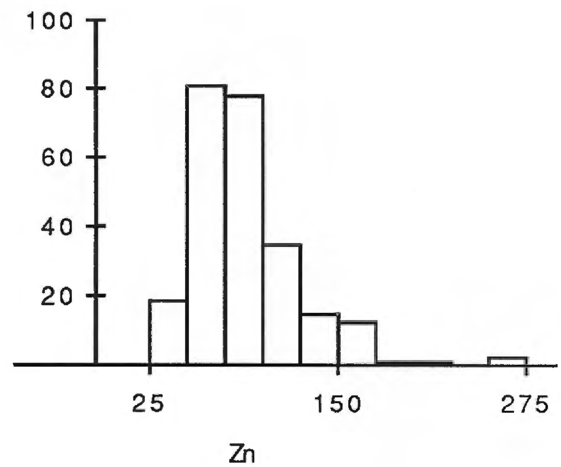
Summary statistics for **Au(ppb)**
NumNumeric = 249
Min. 1 Max. 164
Geometric mean = 0.44 (2.7)
Geometric standard deviation = 0.44
1st order anomaly = 3< x < 8
2nd order anomaly = 8< x < 21
3rd order anomaly = 21< x



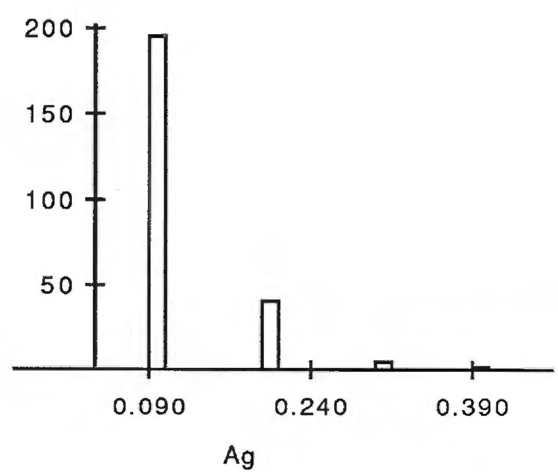
Summary statistics for **Cu (ppm)**
NumNumeric = 246
Min. 1 Max. 65
Mean = 13
Standard Deviation = 6.8
1st order anomaly = 13< x < 20
2nd order anomaly = 20< x < 27
3rd order anomaly = 27 < x



Summary statistics for **Zn(ppm)**
NumNumeric = 246
Min. 37 Max. 264
Mean = 89
Standard Deviation = 37
1st order anomaly = 89< x < 126
2nd order anomaly = 126< x < 163
3rd order anomaly = 163 < x



Summary statistics for **Ag(ppm)**
NumNumeric = 246
MIn. 0.1 Max. 0.4
Geometric mean = -0.93 (0.117)
Geometric standard deviation = 0.13
1st order anomaly = 0.1< x < 0.2
2nd order anomaly = 0.2< x



Pearson Product-Moment Correlation

	Cu	Zn	Ag	Mn	As	Au
Cu	1.000					
Zn	0.525	1.000				
Ag	0.259	0.341	1.000			
Mn	0.129	0.651	0.270	1.000		
As	0.458	0.684	0.223	0.637	1.000	
Au	-0.059	-0.004	-0.000	0.070	-0.043	1.000