GEOLOGICAL SURVEY

~~16209~~

BAY PROPERTY

(BAY 1, 2, 5-7, 11-16)

KAMLOOPS MINING DIVISION,

BRITISH COLUMBIA

NTS 82M/4

51°06' N, 119°47'W

Some data probably same as AR 16209

Owners: COMINCO LTD. and
WESTMIN RESOURCES LIMITED

Operator: KID CREEK MINES LTD.

Dcember, 17, 1987

Less RP2000's

F.R. Hassard, P. ENG.

P.M. Manojlovic, M.SC.

J.D. Fournier

FIELD COPY

GEOLOGICAL SURVEY

BAY PROPERTY
(BAY 1, 2, 5-7, 11-16)

KAMLOOPS MINING DIVISION,

BRITISH COLUMBIA

NTS 82M/4

51°06' N, 119°47' W

Owners: COMINCO LTD. and
WESTMIN RESOURCES LIMITED

Operator: KIDD CREEK MINES LTD.

December, 17, 1987

F.R. Hassard, P.Eng.
P.M. Manojlovic, M.Sc.
J.D. Fournier

SUMMARY

Geological investigations on the Bay claim during 1987 indicate that the mafic volcanic rocks of the northern half of the claims are highly prospective for volcanogenic massive sulphide deposits. Four alteration zones are identified in outcrops; most of these correlate with known deposits to the northwest. These alteration zones are Na-depleted, Mg-enriched and have associated anomalous Ba, Pb and As. Multielement soil anomalies, including: Au, Ag, As, Pb, Zn, Cu and Ba are associated with these alteration zones. Geophysical conductors bound many of the alteration zones in overburden-covered areas.

A trenching program is recommended with follow-up by diamond drilling. These programs should concentrate on Alteration Zones I, II and IV initially.

CONCLUSIONS AND RECOMMENDATIONS

Geological investigations have outlined a number of prospective zones on the Bay claims. These zones are delineated by alteration assemblages which are Na-depleted, Mg-enriched and involve the development of ankerite, sericite and silicification. Anomalous Ba, Pb and As are associated with these zones. Alteration Zone I is correlative with the horizon which hosts the Rea Gold Hilton Deposit; a Au - As enriched horizon containing three massive sulphide lenses. Alteration Zone II is correlative with the horizon which hosts the Rea Gold/Minnova Samatosum Mountain Deposit; a multielement enriched trend containing a large Ag - Pb polymetallic massive sulphide deposit. Alteration Zone III is correlative with the Twin Mountain zone; a shear zone which contains a Pb - Zn deposit. There are no known mineral occurrences along strike from Alteration Zone IV, a multielement trend in soils and rocks, which is distinctly As-poor.

The alteration zones have coincident soil anomalies (Au, Ag, Pb, Zn, Cu, Ba +/- As) and, in some cases, adjacent geophysical conductors. These features indicate prime targets for further exploration within the Bay claims. Initially, a trenching program should be undertaken in order to expose complete cross-sections across soil anomalies, geophysical conductors and alteration zones. Two men will be required for about two weeks for this work. The trenching should be followed by diamond drilling if results are encouraging.

CONTENTS

TABLES

APPENDICES

APPENDIX

LIST OF ILLUSTRATIONS

INTRODUCTION

Location and access:

The Bay claims are located near Skwaam Bay, Adams Lake approximately 65 km NE of Kamloops, B.C. (Fig. 1). The claims cover the east end of the Sinmax Creek valley and the north shore of Skwaam Bay. They are within NTS 82M/4, centered at approximately 51°06'N latitude and 119°47'W longitide, in the Kamloops Mining Division.

Paved and gravel all-weather roads connect the property to Louis Creek and Barrier, approximately 30 km to the west on Hwy. No. 5 or to Squilax, approximately 30 km to the southeast on Hwy. No. 1. Gravel and dirt logging roads provide good access within the property.

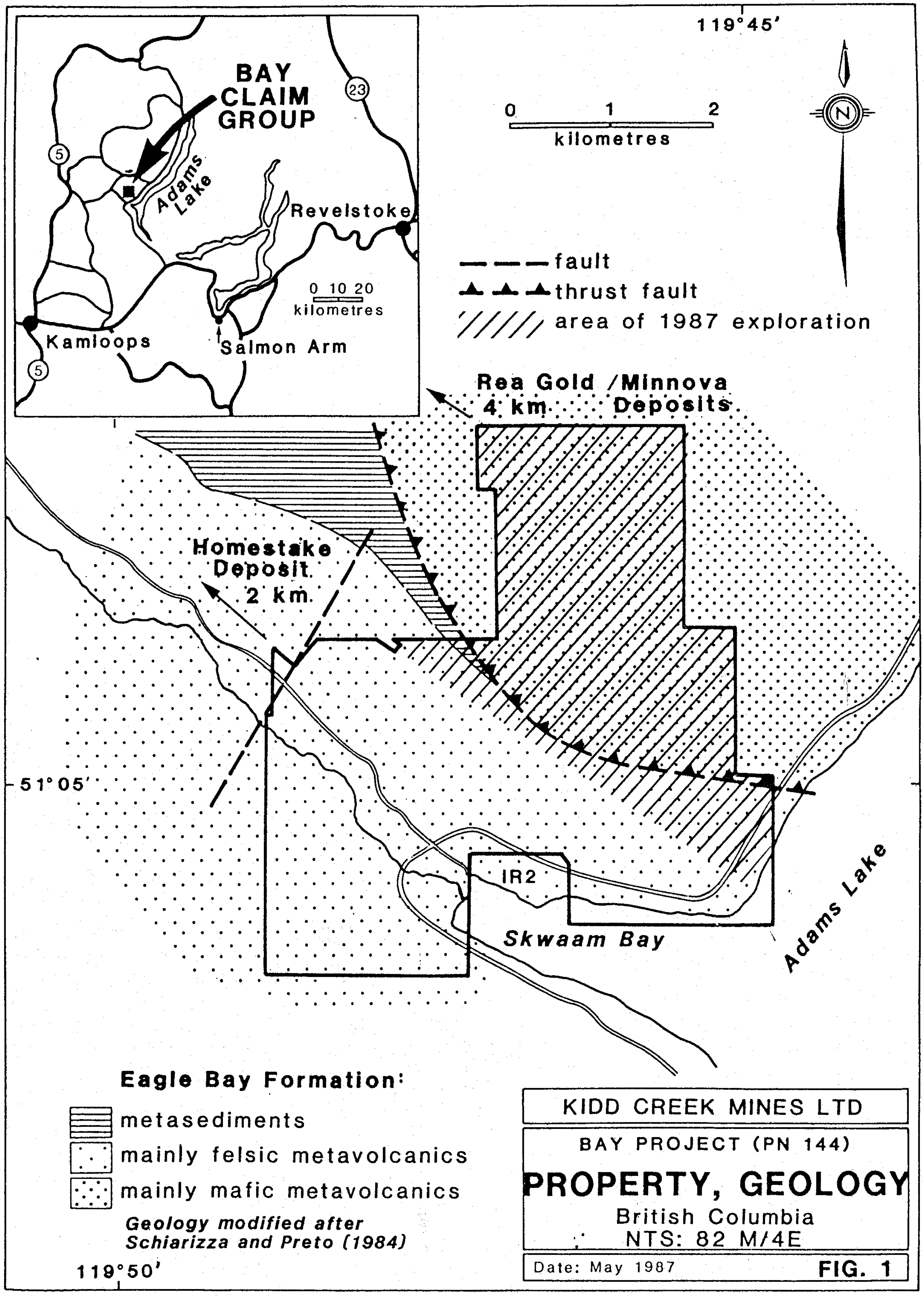
History:

Cominco Ltd. staked and explored the property from 1977 to 1979. Westmin Resources Limited optioned the property in 1982 and conducted additional exploration. Most of this work was centered on the felsic volcanics which host the Homestake deposit and is described in several company reports, notably: Wojdak (1978), Lyons (1982) and Randall (1984).

In 1987, Kidd Creek Mines Ltd., a division of Falconbridge Limited, optioned the claims and commenced exploration focussing on the mafic volcanics which host the Rea Gold/Minnova deposits, among others.

1987 Exploration:

Orthophoto base maps covering the northern part of the claims were prepared at 1:5,000 scale by Triathalon Mapping Corporation. Contours



BAY
CLAIM
GROUP
23
5
Adams Lake
Revelstoke
0 10 20
kilometres
Kamloops
Salmon Arm
5
119°45'
0 1 2
kilometres
N
fault
thrust fault
area of 1987 exploration
Rea Gold /Minnova
4 km Deposits
Homestake
Deposit
2 km
51°05'
IR2
Skwaam Bay
Adams Lake
Eagle Bay Formation:
metasediments
mainly felsic metavolcanics
mainly mafic metavolcanics
Geology modified after
Schiarizza and Preto (1984)
119°50'
KIDD CREEK MINES LTD
BAY PROJECT (PN 144)
PROPERTY, GEOLOGY
British Columbia
NTS: 82 M/4E
Date: May 1987
FIG. 1

are at 10 metre intervals. These base maps were used to locate various LCP's and to position a grid.

Sixty-seven km of lines, measured horizontally, were cut, chained and profiled by Van Alphen Exploration Services personnel (Appendix I) between May 11 and June 7, 1987. Lines are at 100 metre intervals and oriented generally perpendicular to the regional strike. The grid was utilized to control geochemical, geophysical and geological surveys.

Falconbridge personnel (appendix I) supervised the linecutting, collected soil samples along grid lines, mapped and lithogeochemically sampled the northern part of the claims. The geological survey is described below. Results from the soil geochemical and geophysical surveys may be found in Hassard (1987) and Hendrickson (1987) respectively.

Property Status:

The Bay property comprises 11 mineral claims, totalling 79 units, which are owned by Cominco Ltd. and Westmin Resources Limited. Claims and their status, are summarized in Table I. The property boundaries are on figure 1.

TABLE I

BAY PROPERTY

Claim	Units	Record No.	Record Date	Assessment Due
BAY 1	10	798	May 10, 1977	May 10, 1994
BAY 2	10	799	May 10, 1977	May 10, 1993
BAY 5	4	1207	May 19, 1978	May 19, 1995
BAY 6	8	2408	Feb. 19, 1980	Feb. 19, 1995
BAY 7	16	2409	Feb. 19, 1980	Feb. 19, 1995
BAY 11	12	4060	June 11, 1982	June 11, 1996
BAY 12	2	4127	June 12, 1982	June 12, 1997
BAY 13	6	4128	June 12, 1982	June 12, 1996
BAY 14	6	4129	June 12, 1982	June 12, 1996
BAY 15	4	4760	Sept. 26, 1983	Sept. 26, 1998
BAY 16	1	4757	Sept. 26, 1983	Sept. 26, 1997

REGIONAL GEOLOGY

The property is along the western flank of the Shuswap Metamorphic Complex and is underlain by rocks of the Eagle Bay Formation of Devono-Mississippian and older(?) age. The geology near the property has been mapped and described by Schiarizza and Preto (1984) and the general geology is presented in figure 1.

The Eagle Bay Formation is composed dominantly of volcanic rocks which were complexly deformed during the Jura-Cretaceous Columbian orogeny. These rocks were metamorphosed to the greenschist facies and primary features such as pyroclastic fragments and pillows in volcanics and graded bedding in sediments are locally preserved.

In the vicinity of the property, the Eagle Bay Formation has been divided into two units: a dominantly felsic volcanic unit and a dominantly mafic volcanic unit. These units are reportedly separated by a thrust fault (Schiarizza and Preto, 1984). The felsic volcanic unit hosts the Homestake Deposit (Ag, Ba), which is approximately two kilometres northwest of, and on strike with, the property. The felsic volcanic succession dips northeasterly and is believed to be right-way up (Schiarizza and Preto, 1984). The mafic volcanic unit hosts the Rea Gold/Minnova Hilton (Au,Ag) and Samatosum Mountain (Ag, Pb, Cu, Zn, Ba) deposits as well as the Twin Mountain deposit (Pb, Zn, Cu, Ag, Au and Ba) which are approximately four and one kilometres along strike to the northwest respectively. The mafic volcanic succession dips northeasterly and is believed to be overturned (Schiarizza and Preto, 1984).

PROPERTY GEOLOGY

The property is divided into two halves which are separated by a proposed thrust fault (Preto and Schiarizza, 1984). The southern half of the property is underlain by mainly felsic volcanics while the northern half is underlain by mainly mafic volcanics (Fig. 1). The felsic volcanics have been explored for several years by Cominco and Westmin and are described in reports by Wodjak (1978), Lyons (1982) and Randall (1984). This report focusses on the mafic volcanics which have not been previously explored in any detail but which are similar to the rocks which host the Rea Gold/Minnova polymetallic deposits.

The geology of the northern half of the property has been mapped at a scale of 1:5000 (Fig. 2). It is underlain by dominantly mafic ash and lapilli tuffs; however, fragmental and pillowed units also occur. Marbles and pelitic sediments occur locally although these are generally thin and poorly exposed. Minor fine-grained gabbro is also present. All rock types (excluding gabbro) contain a high proportion of carbonate. These rocks are strongly foliated, highly stretched, strike 310° and dip 45° to the northeast. Metamorphism has been to the middle greenschist facies.

LITHOLOGIES

General:

Lithologies mapped on the northern half of the property are described below and listed in Table II. These are lithologic units and do not imply a stratigraphic succession.

TABLE II

LITHOLOGIES

map unit	EAGLE BAY FORMATION
1	Calcareous Chlorite Phyllite/Schist a. Moderate to Strongly Foliated: Mafic Pyroclastic b. Weak to Moderately Foliated: Mafic Flow
2	Quartz-Sericite Schist
3	Metasediments a. Argillite b. Limestone
4	Metagabbro

Calcareous Chlorite Phyllite/Schist (Unit 1):

Calcareous Chlorite Phyllite/Schist is fine-grained and medium to dark green in colour. It is composed of variable amounts of chlorite and calcite. In areas of intense alteration, calcite is replaced by a Fe/Mg-carbonate mineral. Two sub units are recognized, based on relict textures and degree of foliation development.

Unit 1a is moderately to strongly foliated. Pyroclastic fragmental rocks are preserved locally. These fragmental rocks range from ash tuff (3560N + 4300W; 4145N + 3300W) through lapilli tuff (2565N + 3200W; 3835N + 3520W) to small block-sized breccia (2520N + 2600W; 4180 + 3200W).

Unit 1b is weakly to moderately foliated. Stringers and pods of epidote are ubiquitous and magnetite is locally present. Stretched pillows (length to width 3:1) are preserved in several localities (3780N + 3900W; 4370N + 3210W; 2070N + 2960W). The presence of these pillows and the massive appearance of many of the rocks in this unit indicate that they are derived from mafic volcanic flows.

Quartz-Sericite Schist (Unit 2):

Quartz-Sericite Schist has been extensively studied on the Bay property by Wodjak (1978), Lyons (1982) and Randall (1984). A more detailed description of this unit may be found in these reports.

Quartz-Sericite Schist exposed in the grid area is highly foliated, light rusty yellow-weathering and light grey to nearly white in colour. Pyrite, calcite and Fe/Mg-carbonate are commonly present in variable amounts. No relict features were observed. The composition of these rocks indicate that they were derived from felsic volcanic and volcaniclastic rocks.

Metasediments (Unit 3):

Exposures of metasediments are rare on the northern portion of the Bay claims. Two varieties occur: Argillite (Unit 3a) and Limestone (Unit 3b).

Argillite is fine-grained, light grey, and finely laminated. Large pyrite cubes are commonly present. Boulders of argillite are generally present near long narrow gullies. Argillite outcrops at 3355N + 3570W and 3045N + 1600W; however, "tops" could not be determined.

A thin horizon of Limestone occurs at 3860N + 3070W. This limestone is white to buff, fine-grained, laminated and crystalline. This unit does not appear to be very extensive. Patches of carbonate are present elsewhere (3345N + 3400W; 3400N + 3400W) these however, appear to be related to alteration processes rather than sedimentation.

Metagabbro (Unit 4):

A number of small isolated outcrops of massive, weakly foliated, medium-grained, Metagabbro are present. Amphibole and plagioclase are the main constituents of these rocks. Epidote occur as fine grains which commonly replace plagioclase. Metagabbro typically displays relict subophitic texture.

Metagabbro is particularily abundant in areas where unit 1b predominates. Therefore, they may represent feeder systems to the pillowed flows.

STRUCTURAL GEOLOGY

The structural geology of the northern Bay claims appears to be fairly simple. Foliation is parallel to lithologic contacts and consistently strikes 310° and dips 45° to the northeast (Fig. 3). Rare elongate quartz grains and stretched pillows define a lineation which is subhorizontal and is indicative of transcurrent displacement (Fig. 4). The dirth of observed relict features may in part be due to this stretching lineation as few outcrops are present which display the X-Z cross-section.

No main-phase folding was observed; however, a late crenulation cleavage produced minor folds locally. These minor folds have subhorizontal fold axes which dip shallowly to the northwest and axial planes which are vertical and strike 290° (Figs. 5 and 6). Much of this folding is present in the Club Creek area. This area also has numerous late shears and fault gouge which are correlative with the Twin Mountain Shear Zone.

Late block faulting has been observed in the felsic volcanic rocks of the southern half of the property (Lyons, 1982). No surface exposure is present where these faults strike onto the northern half of the property; however, offset of VLF conductors indicates that a fault is present (Fig. 2). A dextral motion is inferred, which is similar to that of faults north of the property boundary (White, 1985).

The east-dipping thrust fault proposed by Schiarizza and Preto (1984) to separate the felsic volcanics from the mafic volcanics of the northern half of the property cannot be confirmed. Kinematics as inferred from the stretching lineation indicates a southeast-northwest direction of tectonic transport. This is at odds with the proposed thrust fault.

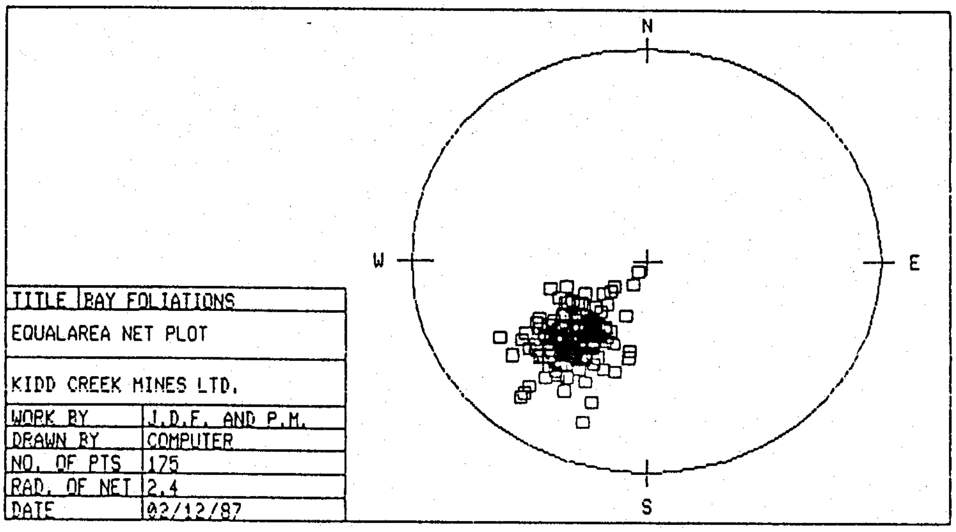


Figure 3: Foliations

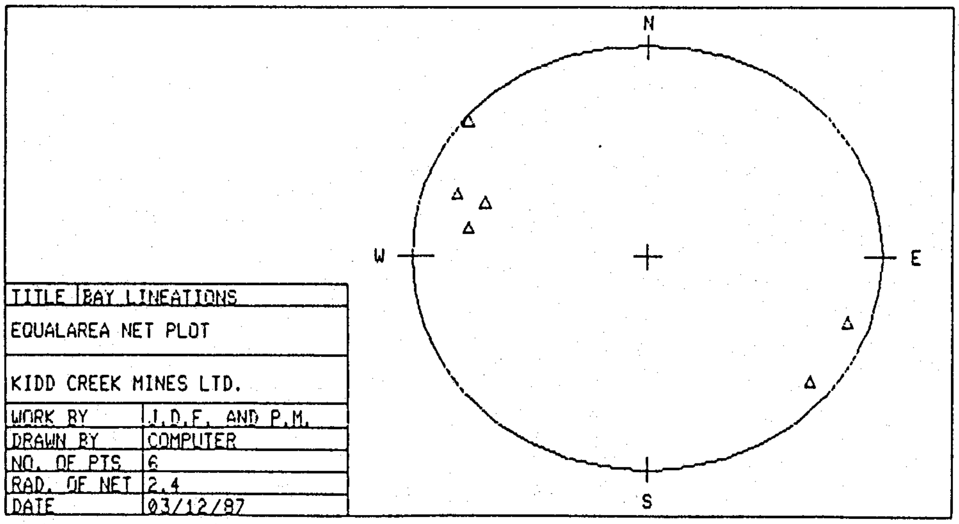


Figure 4: Lineations

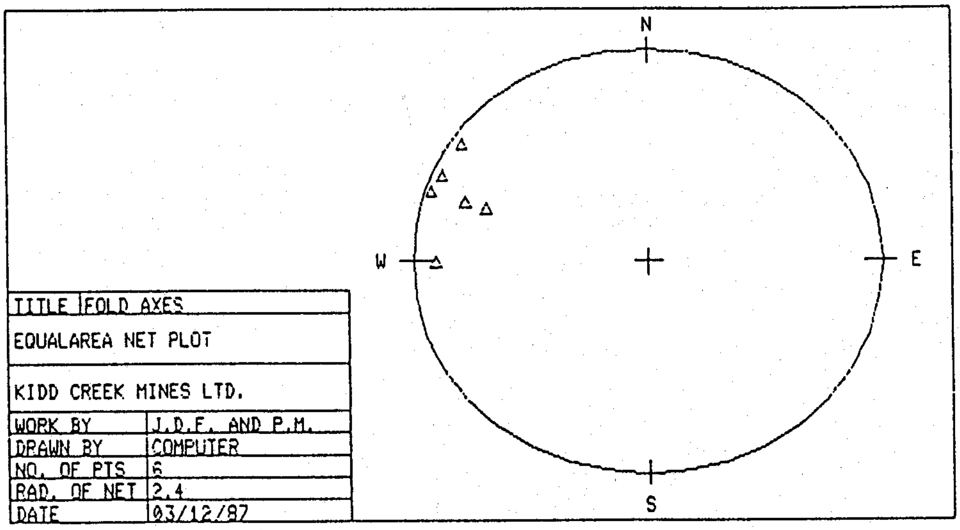


Figure 5: Fold Axes

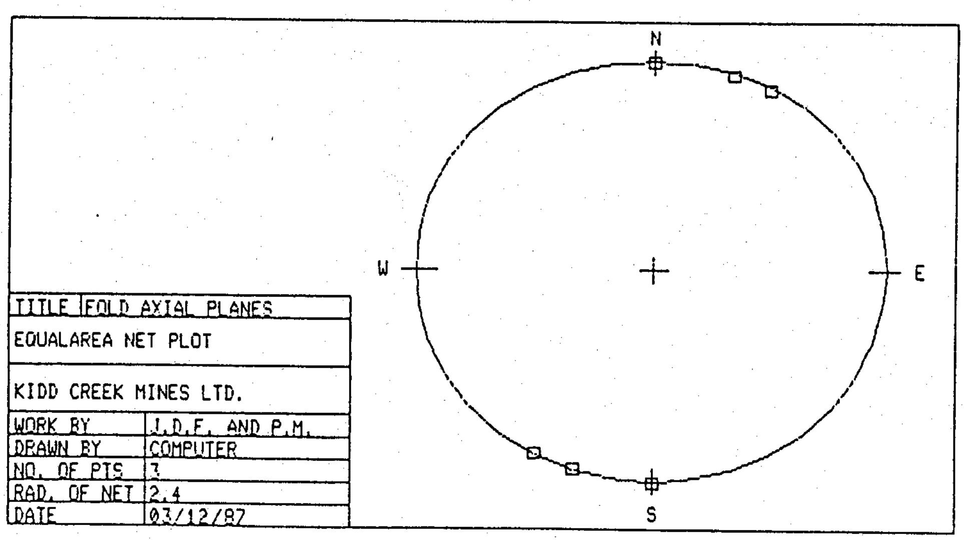


Figure 6: Fold Axial Planes

CHEMICAL CLASSIFICATION

A total of four hundred and three whole rock analyses of grab samples from the Bay claims were made in order to classify protoliths and to detect zones of hydrothermal alteration. Sample localities are plotted on figure 7; analyses are in appendix II. Classification and alteration are based on major oxides.

Most rocks present on the Bay claims contain a high proportion of carbonate. Most of this carbonate is calcite and its presence precludes use of such common alteration indices as the A/CNK Index (Keith, 1984) and the Ishikawa Alteration Index (Ishikawa et al, 1976) which incorporate CaO. In order to delineate alteration it was necessary to formulate equivalent indices which are not susceptable to variations in Ca content. Two indices were formulated:

1) A/NK Index:

The A/NK Index measures the mobility of Na and K relative to Al. The index is defined as;

$$(\text{wt\% } Al_2O_3/102)/[(\text{wt.\% } Na_2O/62) + (\text{wt.\% } K_2O/94)]$$

This index increases with alteration.

2) Modified Ishikawa Alteration Index:

The Modified Ishikawa Alteration Index measures the relative amount of Na depletion and Mg and K enrichment in a rock. The index is defined as;

$$100X(K_2O+MgO)/(K_2O+MgO+Na_2O)$$

This index also increases with alteration.

These indices are independent of CaO (Figs.III-1 and 2) and are strongly dependent on Na_2O (Figs.III-3 and 4). A/NK is effective in showing Na_2O depletion which was caused by processes other than by dilution with carbonate.

Histograms and cumulative probability plots of A/NK, Modified Ishikawa, Na_2O and MgO were produced in order to ascertain anomalously altered populations (appendix IV). Rocks with A/NK > 3.10, Modified Ishikawa > 85.00, Na_2O < 1.40 % and MgO > 10.90 % are considered to be anomalously altered and are not used in the serial classification of the rocks. It should be noted that virtually all the rocks contain some carbonate and therefore no truly unaltered rock is present on the property.

Variation diagrams related to classification (Irvine and Baragar, 1971; Jensen, 1976) are presented in appendix III and discussed below; the reader is referred to figures III-5 to 10. Ti, Zr and Y are believed to be relatively immobile elements and have been employed elsewhere, with success, in discriminating between different source magma compositions (Pearce and Cann, 1973). Rocks on the Bay property contain low amounts of Ti, therefore Ti-Zr-Y ternary plots are presented as Ti*100-Zr/10-Y (Figs. III-9 and 10). These show trends rather than source magma composition.

Mafic Volcanics (+ Gabbro) (Units 1 and 4):

Two-hundred and seventy eight samples of mafic volcanics were found to be relatively unaltered. Many of these rocks plot within the subalkaline field of Irvine and Baragar (1971); however, there is a good deal of scatter to the data and a significant proportion falls within the alkaline field. If it is assumed that some SiO_2 has been lost (perhaps during metamorphism) then all rocks can be considered to be subalkaline for further classification. The Jensen Cation Plot is ideal for this since CaO, Na_2O and SiO_2 are not required. Mafic volcanics plotted on the Jensen Cation diagram show some scatter; however, the majority of samples are concentrated in the tholeiite field and straddle the high-Fe - high-Mg tholeiitic basalt fields. Ti-Zr-Y ratios are somewhat scattered but the majority are clustered toward the Ti apex.

The data suggests that the mafic volcanics are dominantly subalkaline, high-Fe and high Mg-tholeiitic basalts. This is in contrast to Hoy's (1987) classification of the mafic volcanics which host the Rea Gold-Minnova deposits. On the basis of trace element data he believed the volcanics to be alkali basalts.

Felsic Volcanics (Unit 2):

Thirteen grab samples were taken of felsic volcanics for the purpose of classification. All samples plot in the subalkaline field of Irvine and Baragar (1971). On Jensen Cation Plots these rocks are somewhat scattered, straddle the tholeiite - calc-alkaline fields, and are dominantly dacite or rhyolite in composition. On the Ti-Zr-Y diagram these rocks are as scattered as the mafic volcanics but are distinctly less Ti enriched.

The felsic volcanics are dominantly subalkaline tholeiitic and/or calc-alkalic dacites and rhyolites. This is consistent with Hoy's (1987) classification of the felsic volcanics which host the Homestake deposit.

ALTERATION

Visual Alteration:

Four distinct zones of visual alteration are present in the grid area (Zones I - IV)(Fig. 7). These alteration zones are defined by: A) the development of Fe- and/or Mg-carbonate, B) sericitization, and C) silicification. Calcite alteration is ubiquitous and epidotization is related to oxidation of magnetite in flows; these do not contribute to Zones I to IV. Fe- and/or Mg-carbonate appears to be a mixture of Ca and Mg which contains some Fe (based on oxides vs LOI; Figs. III-11 to 13) and will be termed ankerite.

Zone I (3400N Trend) is defined by the development of ankerite. Three prominent areas of ankerite alteration are present, these being centered at 3400N + 4400W, 3300N + 3500W and 3300N + 2600W. A moderate amount of sericitization and silicification is present in Zone I.

Zone II (3600N Trend) is also defined by the development of ankerite. Zone II has a somewhat higher degree of sericitization and silicification associated with it than does Zone I.

Zone III (Club Creek Trend) is a zone of bleached looking rocks in the Club Creek area. This zone is mainly defined by the presence of pyrite and barium (see Mineralization); however, it is also a zone which has some silicification associated with it.

Zone IV (2850N Trend) is a zone of somewhat weaker alteration. Minor ankerite, sericite and silicification is associated with this zone.

Other zones of alteration are present in the grid area as at 2900N + 2500W; however, these zones do not appear to be extensive. This may be due in part to a lack of bedrock exposure.

Chemical Alteration:

It is possible to distinguish anomalously altered populations chemically in the grid area (see Chemical Classification). Rocks with A/NK > 3.10, Modified Ishikawa > 85.00, Na_2O < 1.40 % and MgO > 10.90 % are considered to be anomalously altered. A/NK, Modified Ishikawa, Na_2O and MgO for each sample are plotted in figures 8 to 11. Anomalously altered samples are plotted in figures 12 and 13.

The visual alteration observed in the grid area is clearly related to chemical alteration. Zone I has by far the strongest chemical alteration of the four zones noted visually. Zone I can be traced for up to 2 km, is distinctly Na-depleted and Mg-enriched and contains anomalously high A/NK and Modified Ishikawa values.

Zone II is also distinctly Na-depleted and Mg-enriched and contains high A/NK and Modified Ishikawa values. It does not appear to be as strongly altered as Zone I, though this may be due to a lack of exposure of this zone.

Only the northern portion of Zone III is distinctly altered. Na and A/NK appear to outline a slightly broader zone of alteration than does Mg and Modified Ishikawa.

Chemical alteration is relatively sporadic within Zone IV. Only a few samples are altered. Most of these samples occur adjacent to areas of cover.

Chemically altered samples occur elsewhere in the grid area, although these are generally scattered and without strong clusters or trends. These samples do not have distinct zones of visual alteration associated with them although this may be due to a lack of bedrock exposure.

MINERALIZATION

No economic mineralization was found in the grid area; however, pyrite is locally present. Pyrite occurs as fine grains which are generally in trace amounts. The Club Creek area is an exception as up to 10% pyrite occurs here (Fig. 2). Anomalous Ba, Pb and As occur in some rocks. Histograms and cumulative probability plots of Ba, Pb and As were made and anomalous values determined (appendix IV). Ba > 700 ppm is considered to be possibly anomalous and Ba > 1500 ppm is considered to be anomalous. Pb > 18 ppm and As > 10 ppm are considered to be anomalous. Ba, Pb and As for each sample are plotted in figures 14 to 16 respectively. Anomalous samples are compiled on figure 17.

Anomalous and possibly anomalous values of Ba, Pb and As tend to support the zones of alteration. Ba is anomalously high in the Club Creek area and is elevated in Zones I and II. High Ba is present in most felsic volcanic rocks sampled. Anomalous Pb is present in only a few samples; these samples are dominantly within the outlined alteration zones. As shows a strong correlation with alteration zones I, II and III and is particularily high in areas of intense ankerite alteration. As is notably absent near Zone IV where soils also indicate a lack of As.

REFERENCES

Hassard, F.H. 1987. Geochemical Soil Survey, Bay Property. Report by Kidd Creek Mines Ltd.

Hendrickson, G.A. 1987. Geophysical Surveys, Bay Property. Report by Delta Geoscience Ltd.

Hoy, T. 1987. Alteration, Chemistry and Tectonic Setting of Volcanogenic Massive Sulphide-Barite Deposits at Rea Gold and Homestake Southeastern British Columbia. B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1987, B7-B19.

Irvine, T.N. and Baragar, W.A.R. 1971. A Guide to the Chemical Classification of the Common Volcanic Rocks; Canadian Journal of Earth Sciences, Vol. 8 p.523-548.

Ishikawa, Y., Sawaguchi, T., Iwaga, S. and Horiuchi, M., 1976. Delineation of Prospecting Targets for Kuroko Deposits Based on Modes of Volcanism of Underlying Dacite and Alteration Haloes. Mining Geology, Vol. 26 p.105-117. (in Japanese with English abs.)

Jensen, L.S. 1976. A New Cation Plot for Classifying Subalkalic Volcanic Rocks. Ontario Division of Mines, Miscellaneous Paper 66.

Keith, S.B. 1984. Magma Series and Mineral Deposits. Unpublished Seminar Notes. 111pp. and appendix.

Lyons, E. 1982. Geology of the BAY @ BECA Properties on Adams Lake. Report by Westmin Resources Limited.

Randall, A.W. 1984. Bay-Beca Project, Summary Report of 1983 Exploration Activities. Report by Westmin Resources Limited.

Schiarizza, P.A. and Preto, V.A. 1984. Geology of the Adams Plateau-Clearwater area. British Columbia Ministry of Energy, Mines and Petroleum Resources, Preliminary Map 56.

White, G.P.E. 1985. Hilton Massive Sulphide Discovery (Rea Gold), Johnson Creek - Adams Lake Area. B.C. Ministry of Energy Mines and Petroleum Resources, Geological Fieldwork,1985, p.77-83.

Wodjak, P.J. 1978. Bay Year End Report. Report by Cominco Ltd.

STATEMENTS OF QUALIFICATIONS

I, Franklin R. Hassard, of Burnaby, British Columbia, do hereby certify that:

1. I am a Senior Exploration Geologist with Falconbridge Limited at #701, 1281 West Georgia Street, Vancouver, B.C., V6E 3J7.

2. I am a graduate of the University of British Columbia with a B.A.Sc. degree in Geological Engineering (1970).

3. I have practiced my profession for over 17 years.

4. I am a member of the Association of Professional Engineers of Ontario and a Fellow of the Geological Association of Canada.

5. Exploration during 1987 and the subject of this report was carried out under my supervision by geologists P.M. Manojlovic, J.D. Fournier and other trained and competant personnel listed in Appendix I of this report.

Dated this 17th day of December, 1987 at Vancouver, B.C.

Franklin R. Hassard, P.Eng.

STATEMENT OF QUALIFICATIONS

I, Peter M. Manojlovic, an employee of Falconbridge Limited, with offices at #701-1281 West Georgia Street, Vancouver, B.C., do hereby declare that:

1. I am a graduate of the University of Western Ontario, London, Ontario with an Honours B.Sc. degree in Geology (1983).

2. I am a graduate of Carleton University, Ottawa, Ontario with a M.Sc. degree in Geology (1987).

3. For the past eight years I have been involved in mineral exploration and geological research in Ontario, Saskatchewan, British Columbia and the Northwest and Yukon Territories.

4. I am an Associate Member of the Geological Association of Canada.

Dated this 17 day of December, 1987 at Vancouver, B.C.

Peter M. Manojlovic

STATEMENT OF QUALIFICATIONS

I, Jean-Denis Fournier, an employee of Falconbridge Limited, with offices at 701-1281 west Georgia St. Vancouver B.C., do hereby declare that:

1. I am a geologist; graduate of the University of Alberta, Edmonton, Alberta, in 1987 with a B.Sc. in Geology.

2. For the past three years I have been involved in mineral exploration in the Northwest Territories and British Colombia.

3. I am a registered Geologist In Training with the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

4. I am an associate member of the G.A.C..

5. I carried out the work described in the report.

Dated at Vancouver, B.C., this 17th day of December, 1987.

Jean-Denis Fournier B.Sc.

APPENDIX III

VARIATION DIAGRAMS

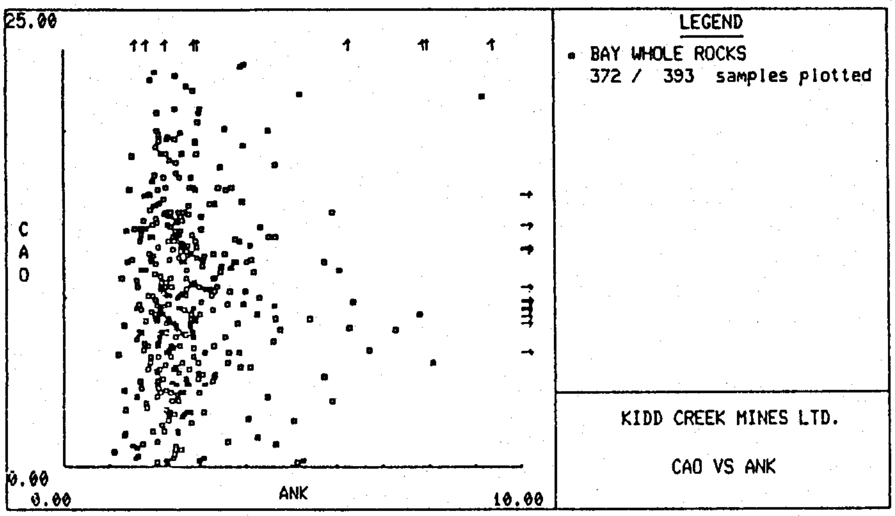


Figure III-1: CaO vs A/NK - Whole Rocks

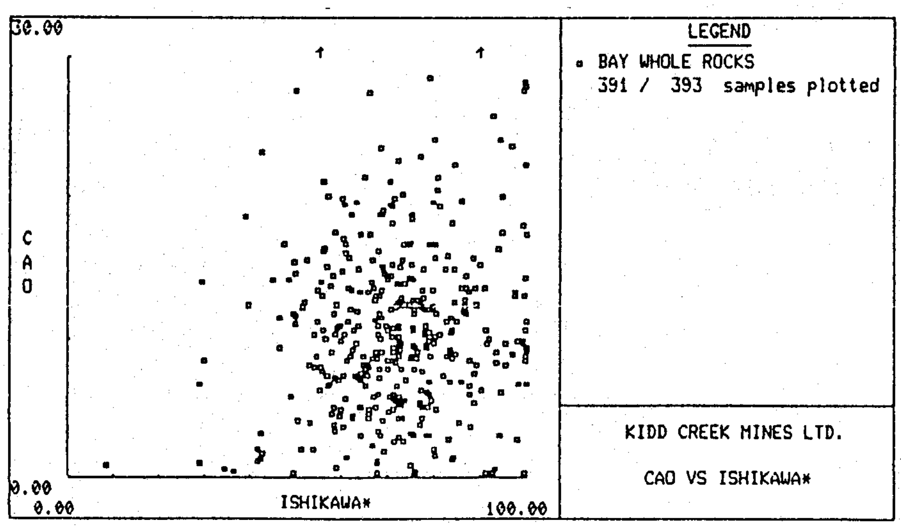


Figure III-2: CaO vs Modified Ishikawa

- Whole Rocks

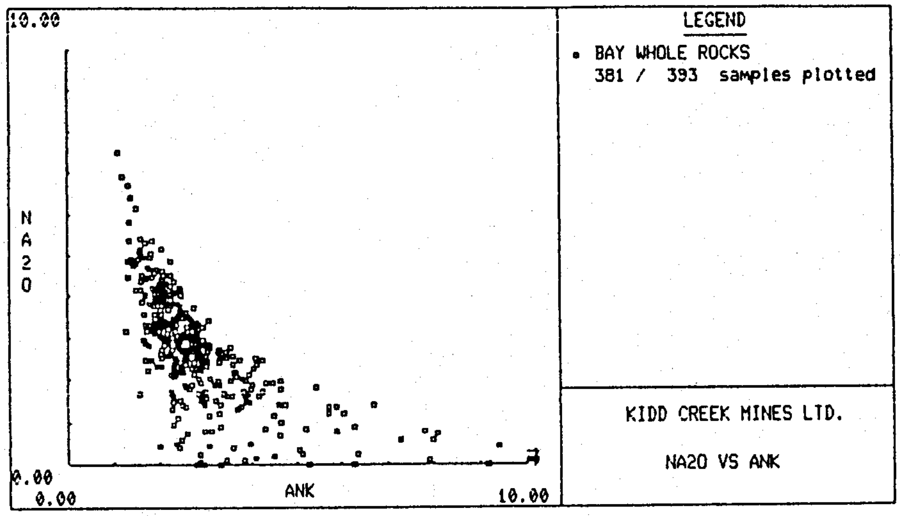


Figure III-3: Na_2O vs A/NK - Whole Rocks

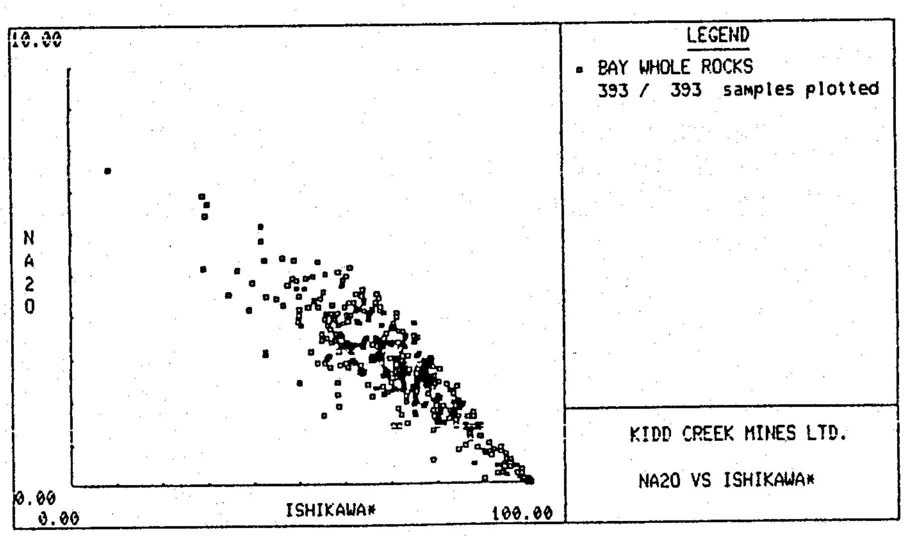


Figure III-4: Na_2O vs Modified Ishikawa

- Whole Rocks

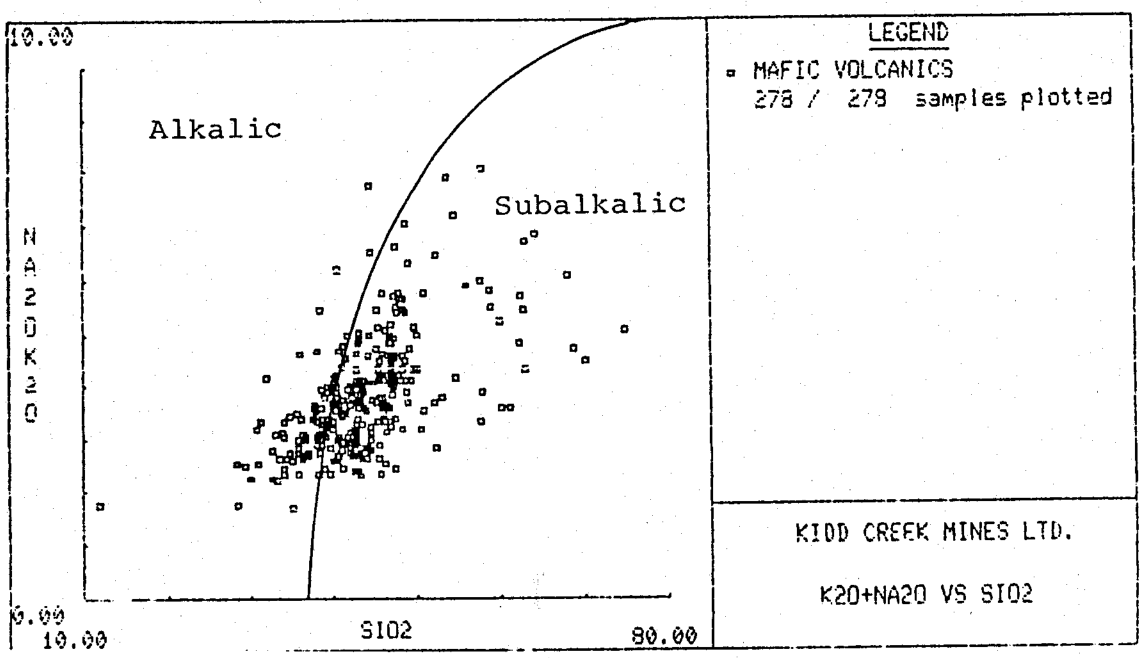


Figure III-5: Alkalis vs SiO_2 - Mafic Volcanics

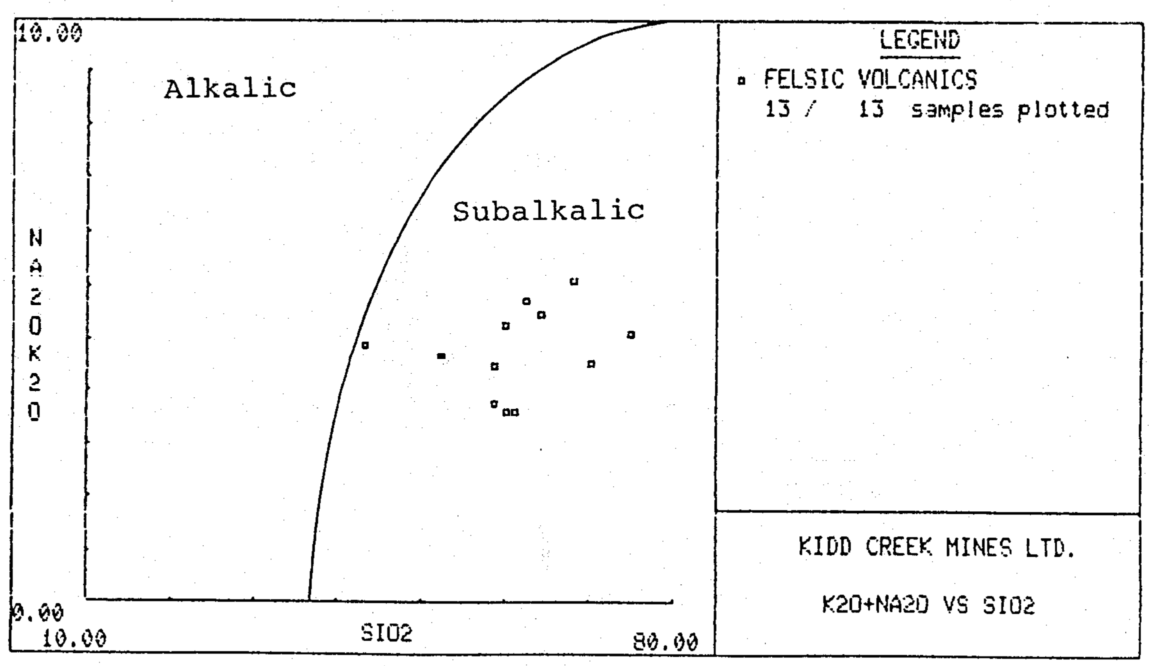


Figure III-6: Alkalis vs SiO_2 - Felsic Volcanics

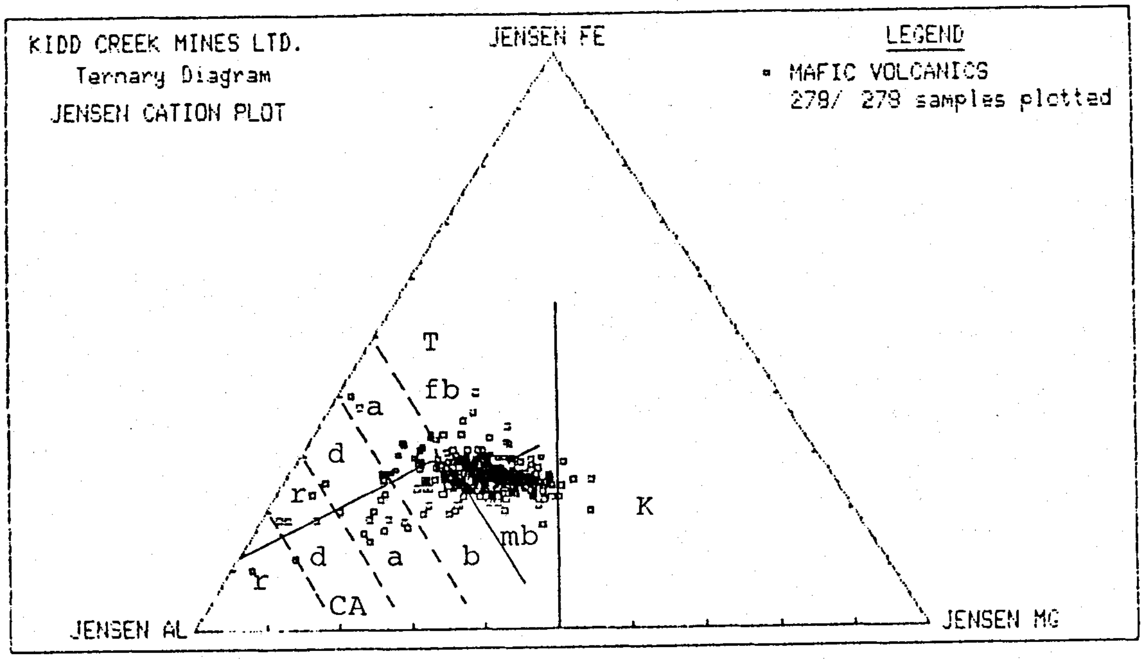


Figure III-7: Jensen Cation Plot - Mafic Volcanics

T= Tholeiitic CA= Calc-Alkalic K= Komatiitic

r= Rhyolite d= Dacite a= Andesite b= Basalt

fb= High Fe - Tholeiitic Basalt

mb= High Mg - Tholeiitic Basalt

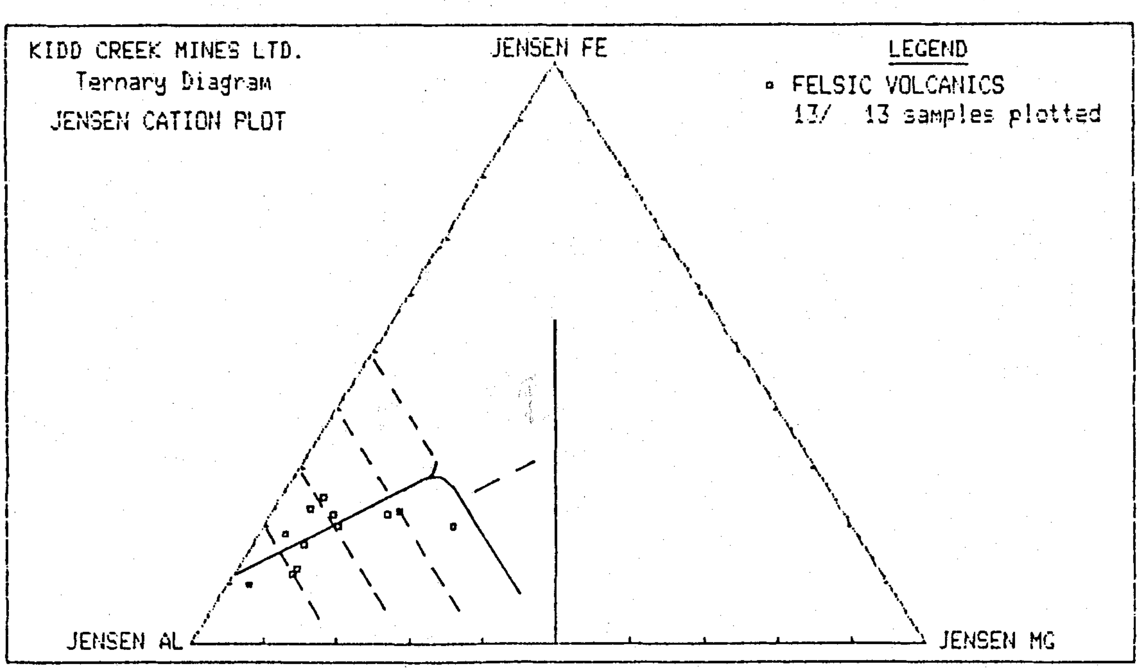


Figure III-8: Jensen Cation Plot - Felsic Volcanics

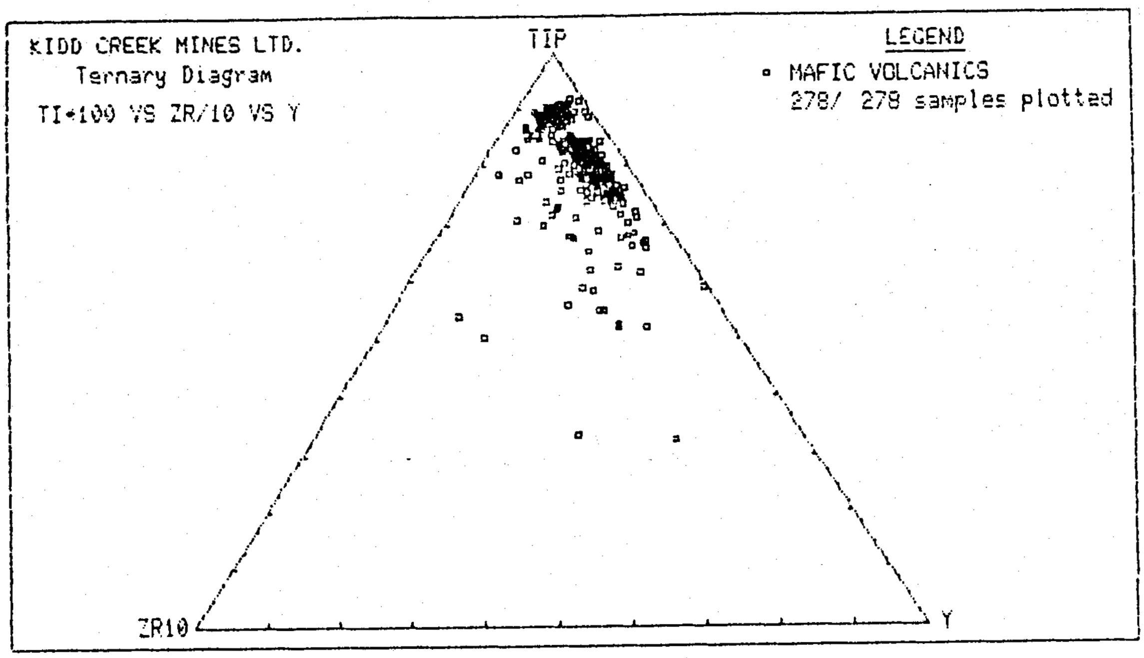


Figure III-9: Ti x 100 vs Zr/10 vs Y - Mafic Volcanics

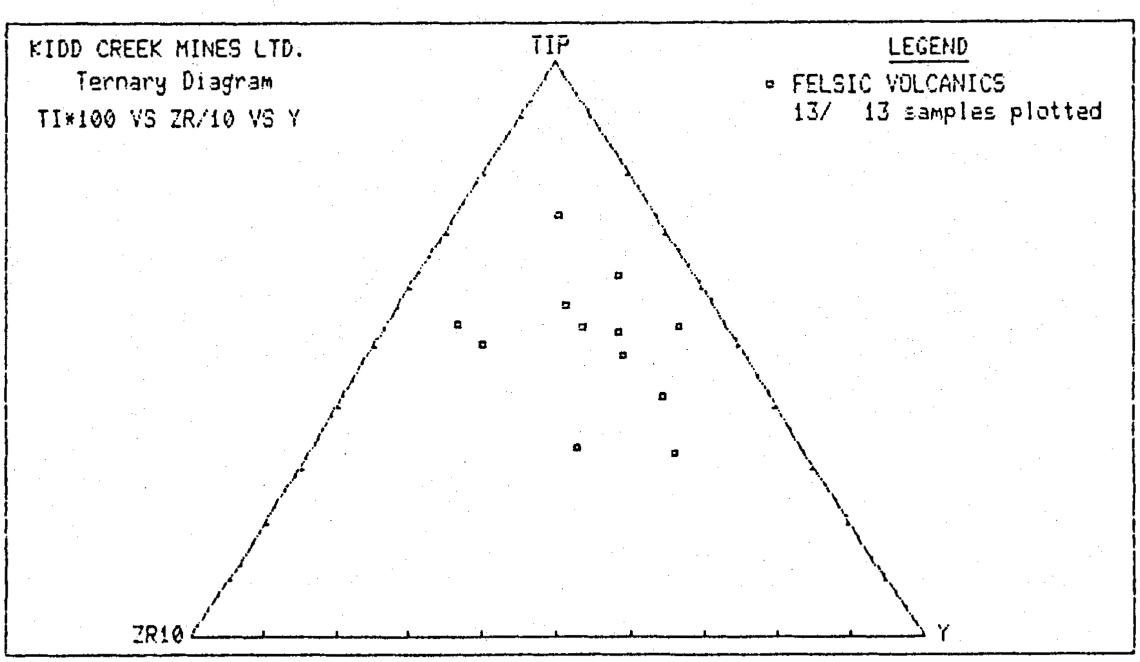


Figure III-10: Ti x 100 vs Zr/10 vs Y - Felsic Volcanics

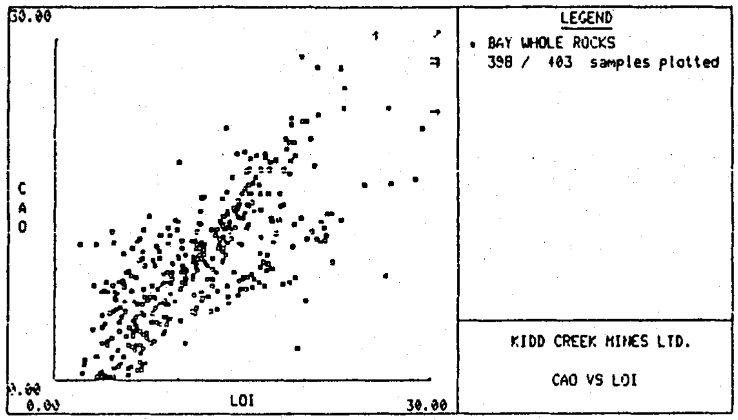


Figure III-11: CaO vs LOI - Whole Rocks

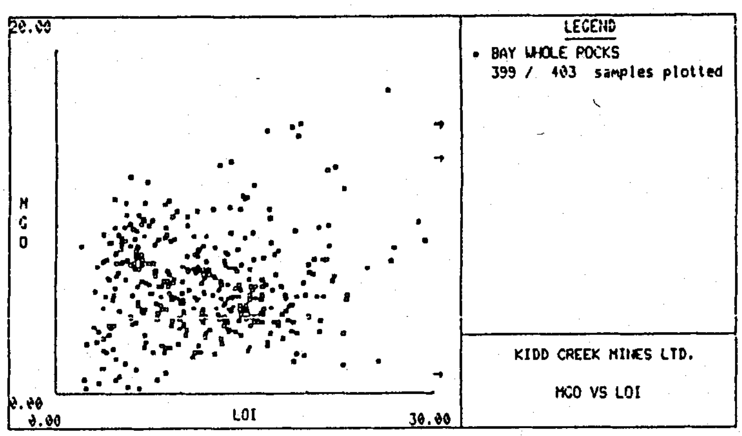


Figure III-12: MgO vs LOI - Whole Rocks

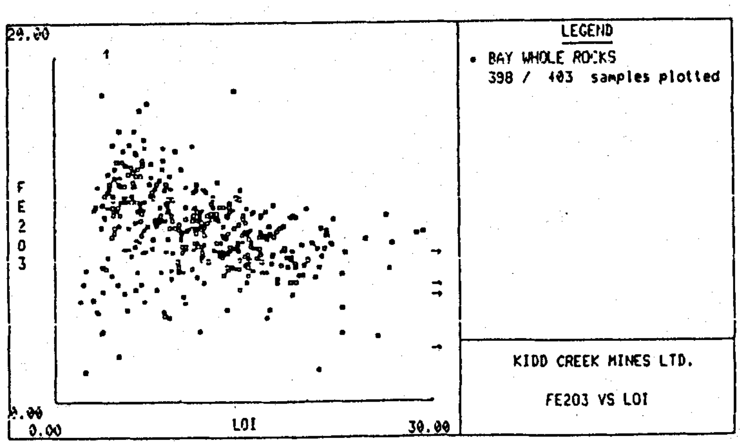


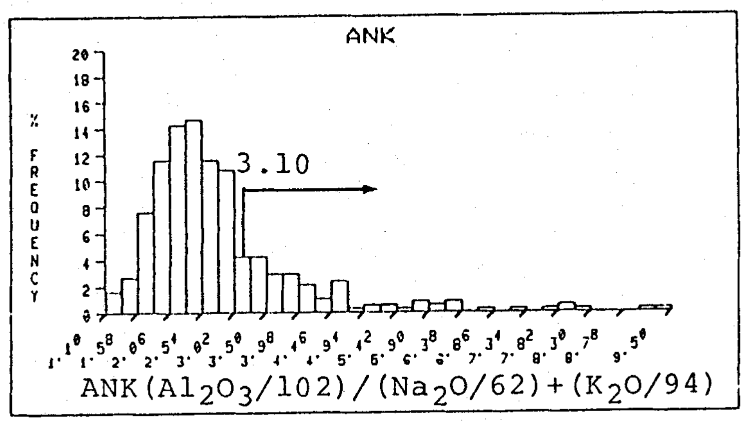
Figure III-13: Fe_2O_3 vs LOI - Whole Rocks

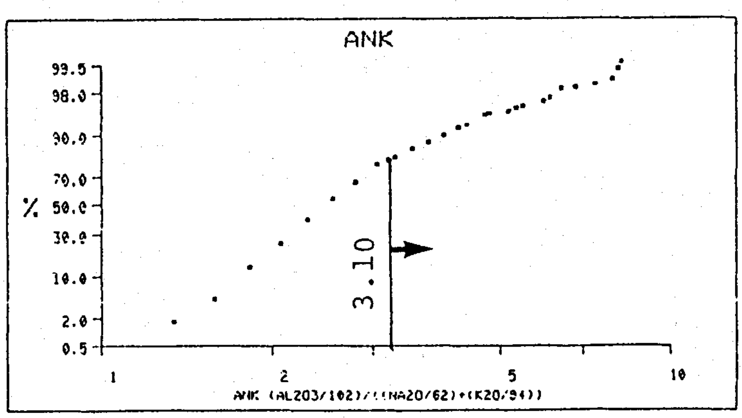
APPENDIX IV

HISTOGRAMS, CUMULATIVE PROBABILITY PLOTS

ANK

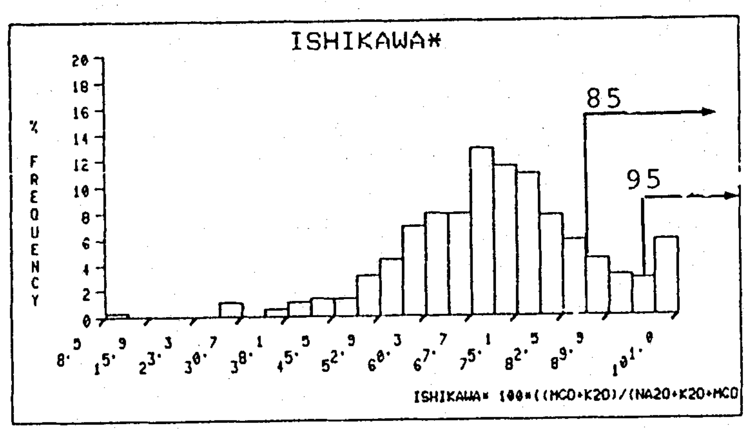
NUMBER OF SAMPLES	:	393
MINIMUM	:	1.100
MAXIMUM	:	598.080
MEAN	:	6.197
STANDARD DEVIATION	:	33.352
MEAN - 1 STD. DEV.	:	-27.154
MEAN + 1 STD. DEV.	:	39.549
MEAN + 2 STD. DEV.	:	72.900
MEDIAN	:	2.530
MODE	:	2.070
SKEWNESS	:	0.330
KURTOSIS	:	256.850
NUMBER OF CLASSES	:	35
CLASS INTERVAL	:	17.060

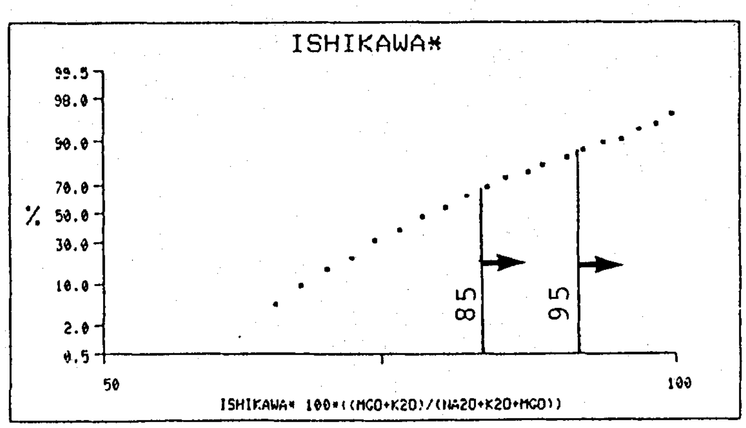




ISHIKAWA*

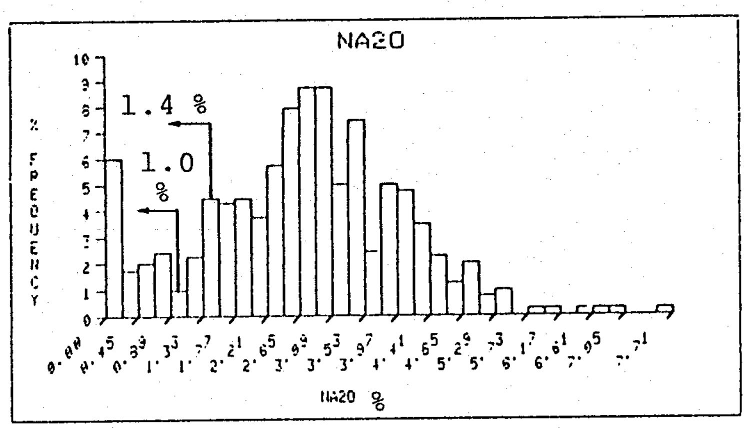
NUMBER OF SAMPLES	:	393
MINIMUM	:	8.51
MAXIMUM	:	100.10
MEAN	:	71.78
STANDARD DEVIATION	:	14.59
MEAN - 1 STD. DEV.	:	57.19
MEAN + 1 STD. DEV.	:	86.37
MEAN + 2 STD. DEV.	:	100.96
MEDIAN	:	72.10
MODE	:	29.04
SKEWNESS	:	-0.07
KURTOSIS	:	3.75
NUMBER OF CLASSES	:	50
CLASS INTERVAL	:	1.90

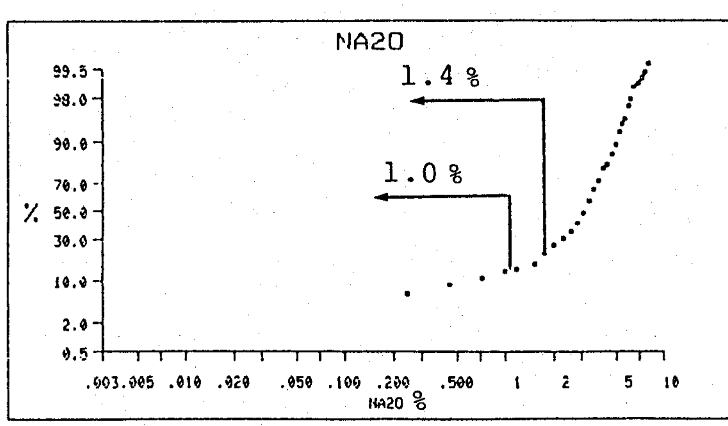




NA2O

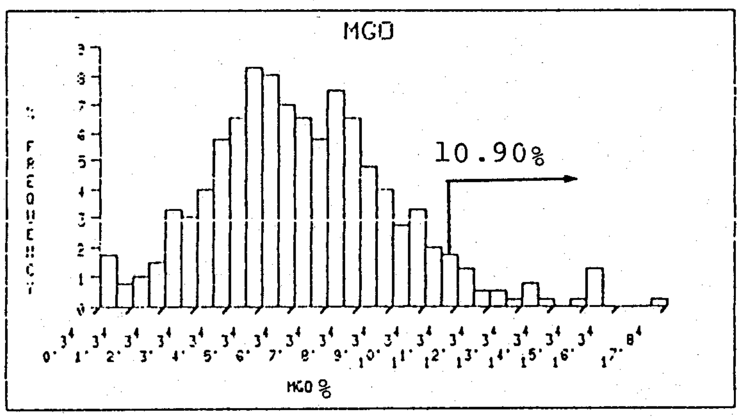
NUMBER OF SAMPLES	:	493
MINIMUM	:	0.005
MAXIMUM	:	7.530
MEAN	:	2.683
STANDARD DEVIATION	:	1.357
MEAN - 1 STD. DEV.	:	1.326
MEAN + 1 STD. DEV.	:	4.039
MEAN + 2 STD. DEV.	:	5.396
MEDIAN	:	2.720
MODE	:	0.030
SKEWNESS	:	-0.083
KURTOSIS	:	3.155
NUMBER OF CLASSES	:	35
CLASS INTERVAL	:	0.220

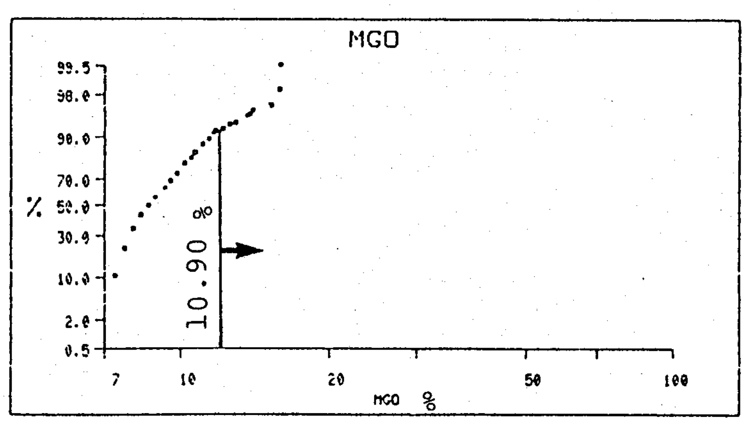




MGO

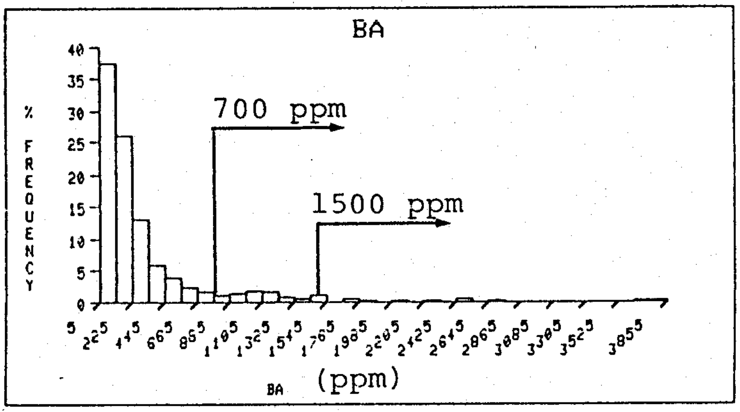
NUMBER OF SAMPLES	:	393
MINIMUM	:	0.340
MAXIMUM	:	17.700
MEAN	:	6.547
STANDARD DEVIATION	:	2.876
MEAN - 1 STD. DEV.	:	3.672
MEAN + 1 STD. DEV.	:	9.423
MEAN + 2 STD. DEV.	:	12.299
MEDIAN	:	6.260
MODE	:	4.390
SKEWNESS	:	1.300
KURTOSIS	:	3.943
NUMBER OF CLASSES	:	35
CLASS INTERVAL	:	0.500

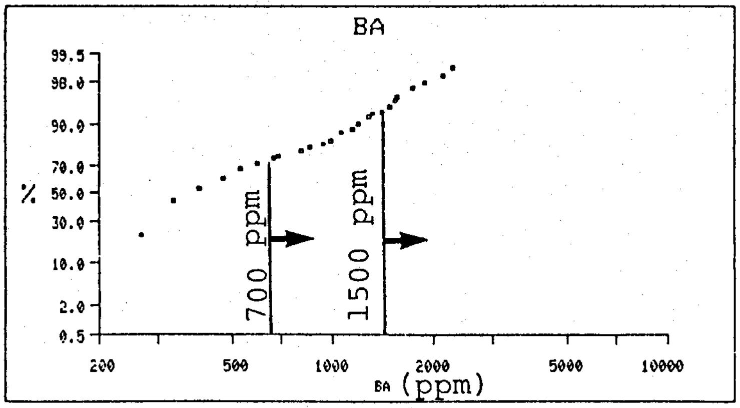




BA

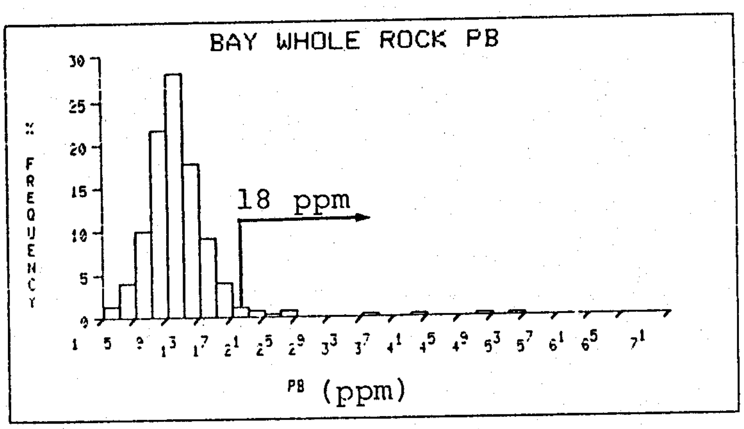
NUMBER OF SAMPLES	:	393
MINIMUM	:	5.0
MAXIMUM	:	57400.0
MEAN	:	500.8
STANDARD DEVIATION	:	2989.1
MEAN - 1 STD. DEV.	:	-2488.3
MEAN + 1 STD. DEV.	:	3490.0
MEAN + 2 STD. DEV.	:	6479.1
MEDIAN	:	155.0
MODE	:	115.0
SKEWNESS	:	0.3
KURTOSIS	:	335.1
NUMBER OF CLASSES	:	35
CLASS INTERVAL	:	1640.0

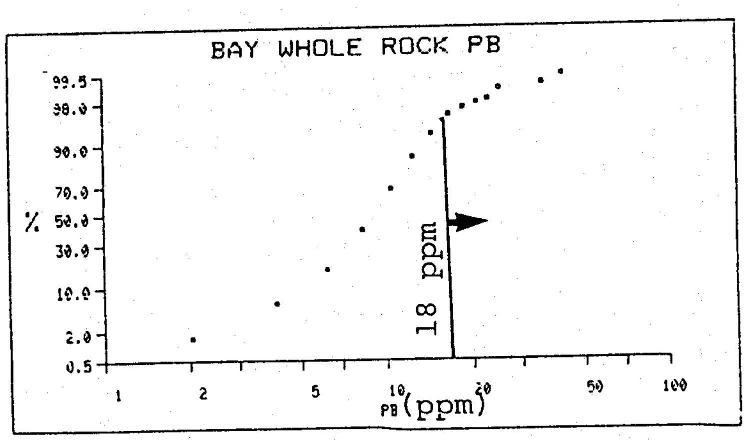




BAY WHOLE ROCK PB

NUMBER OF SAMPLES	:	283
MINIMUM	:	1.0
MAXIMUM	:	137.0
MEAN	:	10.7
STANDARD DEVIATION	:	12.3
MEAN - 1 STD. DEV.	:	-1.5
MEAN + 1 STD. DEV.	:	23.0
MEAN + 2 STD. DEV.	:	35.3
MEDIAN	:	10.0
MODE	:	10.0
SKEWNESS	:	0.2
KURTOSIS	:	187.9
NUMBER OF CLASSES	:	35
CLASS INTERVAL	:	6.0





BAY WHOLE ROCK AS

NUMBER OF SAMPLES	:	283
MINIMUM	:	1.5
MAXIMUM	:	213.0
MEAN	:	7.3
STANDARD DEVIATION	:	21.3
MEAN - 1 STD. DEV.	:	-14.1
MEAN + 1 STD. DEV.	:	28.6
MEAN + 2 STD. DEV.	:	49.9
MEDIAN	:	1.5
MODE	:	1.5
SKEWNESS	:	9.8
KURTOSIS	:	45.9
NUMBER OF CLASSES	:	35
CLASS INTERVAL	:	7.0