Kamad
825764
82M/4W

1988 FIELD WORK AND DRILLING REPORT

ON THE

KAMAD CLAIMS

Kamloops Mining Division, British Columbia

NTS: 82M/4W
Lat: 51° 08'N Long: 119° 49'W

Owner:
Kamad Silver Co. Ltd.
2095 West Trans Canada Highway
Kamloops, B.C.
V1S 1A7

Operator:
Esso Minerals Canada
A Division of ESSO RESOURCES CANADA LIMITED
1600 - 409 Granville Street
Vancouver, British Columbia
V6C 1T2

Report By:
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January, 1989

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1.0 INTRODUCTION

1.1 General Statement

The Kamad property, owned by Kamad Silver Co. Ltd. of Kamloops, B.C., is currently under option to Esso Minerals Canada (the Operator). The property consists of 8 mineral claims, 3 fractional claims and 5 Crown Grants that total 135 units. Esso Minerals Canada's exploration on the property has been focussed on three areas:

a) The southeasterly continuations of the Rea and Silver zones that host the Rea Gold Discovery lenses and the Samatosum Deposit.

b) The Homestake Ag-Pb-Zn-Ba polymetallic deposit hosted by the Homestake Schist.

c) The Acacia Zn-rich massive sulphide and vein occurrence.

Exploration on the property in 1988 consisted of detailed geophysical coverage and further diamond drill testing of the K-7 massive sulphide zone; soil geochemistry, GENIE EM and VLF coverage of a southerly extension of the Kamad 8 grid over the Rea Zone; soil geochemistry and geological mapping of the Homestake Bluffs northwest of Fraser's Gulch; and soil geochemistry, VLF and geological mapping of a new grid over the Acacia showings. In addition to this the geology of the Homestake Mine area was reassessed. This report presents the results of the 1988 program and recommends a program of follow-up work for the 1989 season.

1.2 Location and Access

The Kamad Property is located in the Kamloops Mining Division of south-central British Columbia; approximately 60km northeast of Kamloops and 22km east of the town of Barriere (Fig. 1.1). The claims are centered on the old Homestake Mine that has produced high-grade silver ore intermittently between 1893 and the present day.

Access to the property can be gained from the North Thompson Valley via the Forest Lake road (Agate Bay Road) that leaves Highway 5, 2km south of Barriere. An alternate route is an active logging road that follows the west shore of Adams Lake and joins with the Scotch Creek Road to the south. This road connects with the Trans Canada Highway at Squilax, 4km east of Chase.

1.3 Topography, Vegetation and Climate

This area of the Province forms part of the interior plateau an irregular area of tableland ranging from 1250m to 1800m in elevation. Valleys are typically steeply incised with U-shaped cross sections. Precipitous bluffs are common locally. Tree cover consists of spruce and pine in plateau areas. Here, commercial logging operations have created excellent access by means of an extensive network of logging roads. Valley floors are occupied by small farms that raise beef cattle.

Climate is semi-arid and typical of the South-Central Interior. Summers are hot with average temperatures in the high 20's. Winters are cold with snow-cover in excess of 1m in the Plateau regions.

2.0 PROPERTY HISTORY

History of the Kamad property is essentially the history of the old Homestake Mine which is located on the north side of Sinmax valley, about 5km west of Skwaam Bay (Fig. 1.1).

The mine was worked by several owners intermittently between 1893 and 1984. High-grade operations removed 2770 tons in the period 1926/27. Between 1935 and 1936, 3000 tons were processed by a 50-ton per day mill located on the property.

Significant underground exploration was carried out between 1970 and 1973 by Kamad Silver when an adit was driven into the hillside to explore three silver-rich barite lenses. Canadian Reserve Oil and Gas continued underground exploration and development of the barite lenses in the early 1980's. The company completed an 800m adit at the 1750 level and a production raise that joined the upper workings. From these workings 2,072m of underground drilling took place. A further 2993m of surface drilling accompanied the underground work. O.K. Ore processing Ltd. reopened the mine during the winter of 1983/84 and several shipments of ore were made to the smelter at Trail.

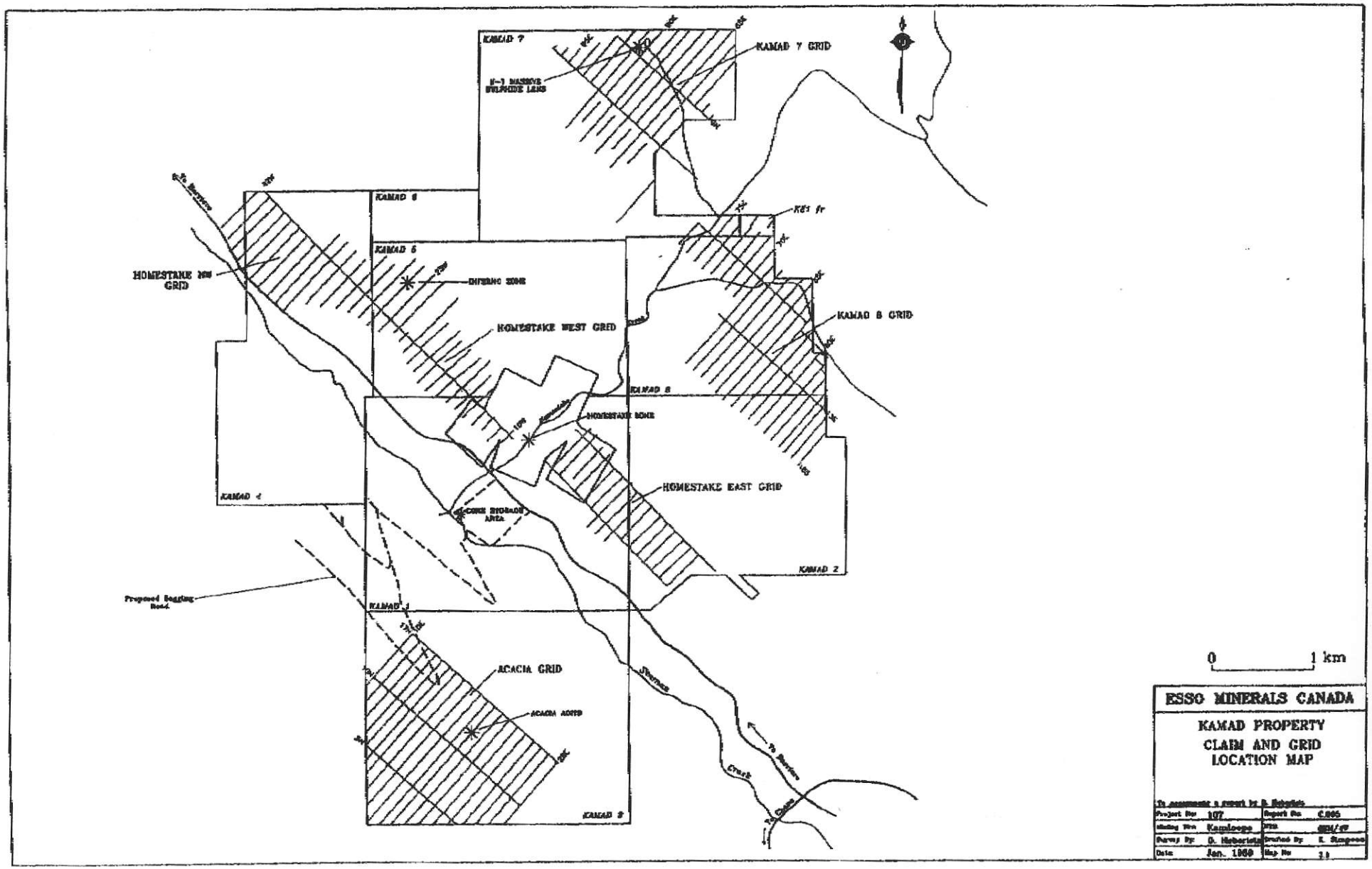
The discovery of the Rea Gold massive sulphide lens close to the northwest claim boundary in 1983 added a new impetus to exploration in the area. Geophysical and diamond drill programs carried out on the Kamad 7 claim in 1983 and 1984 identified a small massive sulphide lens on the Rea horizon. In 1985, 259146 B.C. Limited drilled five holes totalling 369.7m into this zone.

The property was optioned from Kamad Silver Company Ltd. by Esso Minerals Canada in December 1985. In 1986 Esso Minerals conducted an extensive geological, geochemical and geophysical evaluation of the Rea horizon on the Kamad 7 and 8 claims. This

was followed up by trenching and 1814m diamond drilling later that year. An additional 1125m of diamond drilling was completed in 1987 in the same area.

Work on the Homestake Bluff area in 1987 consisted of a 1:2500 scale geological mapping and soil sampling program along strike from the Homestake Mine workings. This was followed up with 1898.6m of diamond drilling.

The reader is referred to reports by Oliver and Marr (1987), and Heberlein (1988) for previous results.



4.0 GEOLOGY

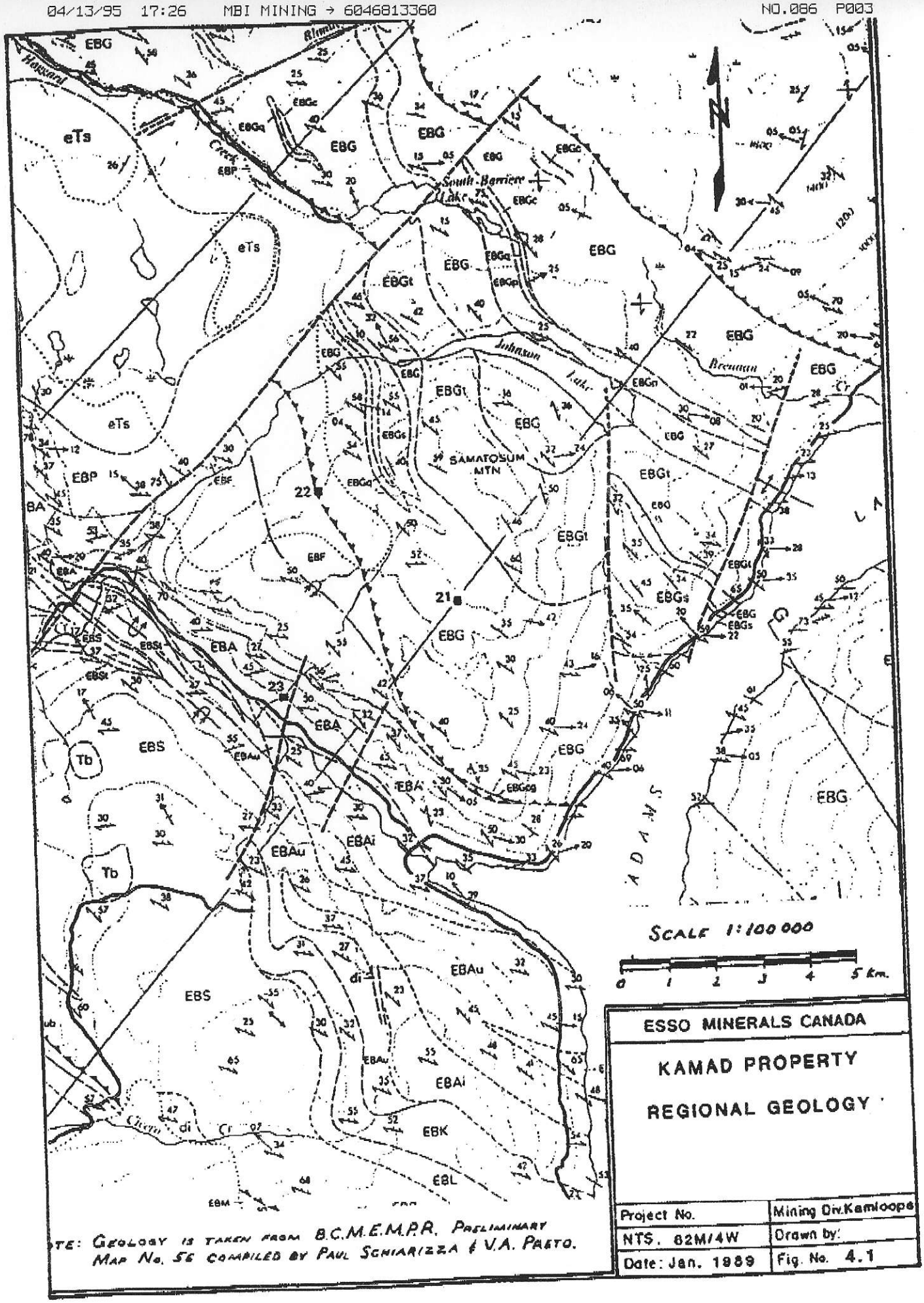
4.1 Regional Geology

Geology of the Adams Lake area has been described in detail by Schiarizza and Preto (1987), Schiarizza and Preto (1984), White (1985), Hoy and Goutier (1986) and Goutier et al (1986). A geological map for the area surrounding the Kamad property is shown in Figure 4.1 (a and b). This map is modified from Schiarizza and Preto (1987).

The area surrounding the Kamad property is underlain by rocks of the Eagle Bay Assemblage; a Paleozoic island arc sequence ranging in age from Middle Cambrian to Mississippian (Schiarizza and Preto, 1987). The Eagle Bay Assemblage has been divided into four distinct structural slices that are bounded by shallow-dipping southwesterly directed thrust faults. The thrust slices, designated 1 to 4 by Schiarizza and Preto (1987), increase in age from southwest to northeast. Thrust slices 1 and 2 are exposed on the Kamad claims. The reader is referred to reports by Heberlein (1987) and Schiarizza and Preto (1987) for details.

As a result of the 1987 and 1988 programs, the geology of the Kamad area has been modified from the original work of Schiarizza and Preto. Two hitherto unrecognized thrust faults have been discovered as a result of detailed mapping on the property. These faults separate Schiarizza and Preto's Units EBF and EBA; and units EBA and EBS of thrust slice 1 (Fig 4.1).

Figures 4.2 to 4.5 illustrate the modified geology of the area. Based on the positions of the original and the newly identified thrusts, the stratigraphy can now be divided into four thrust-bounded assemblages, each characterized by a unique



ESSO MINERALS CANADA

KAMAD PROPERTY

REGIONAL GEOLOGY

Project No.	Mining Div. Kamloops
NTS. 82M/4W	Drawn by:
Date: Jan. 1989	Fig. No. 4.1

NOTE: GEOLOGY IS TAKEN FROM B.C.M.E.M.P.R. PRELIMINARY MAP No. 56 COMPILED BY PAUL SCHIARIZZA & V.A. PRETO.

UPPER TRIASSIC AND LOWER JURASSIC NICOLA GROUP (?)

UPPER TRIASSIC OR LOWER JURASSIC

| TrJv | MAFIC PORPHYRY BRECCIA

UPPER TRIASSIC

| Trl | DARK GREY LIMESTONE

DEVONIAN TO PERMIAN

ALLOCHTHONOUS INTERNALLY IMBRICATED OCEANIC ASSEMBLAGE

FENNELL FORMATION

UPPER STRUCTURAL DIVISION

| uFb | GREY AND GREEN PILLOWED AND MASSIVE METABASALT, MINOR AMOUNTS OF BASALTIC BRECCIA, TUFF, DIABASE, GABBRO, AND CHERT

| uFc | GREY AND GREEN BEDDED CHERT

LOWER STRUCTURAL DIVISION

| lFc | GREY AND GREEN BEDDED CHERT, CHERTY ARGILLITE, SLATE, AND PHYLLITE

| lFb | GREY AND GREEN PILLOWED AND MASSIVE METABASALT, MINOR AMOUNTS OF BASALTIC BRECCIA AND TUFF

| lFg | GABBRO, DIORITE, DIABASE

| lFp | LIGHT TO MEDIUM GREY QUARTZ-FELDSPAR PORPHYRY RHYOLITE

| lFs | LIGHT TO DARK GREY SANDSTONE, SILTSTONE, SLATE, PHYLLITE, AND QUARTZITE; MINOR AMOUNTS OF LIMESTONE AND CHERT; IN PLACES INCLUDES GREY TO GREEN QUARTZOSE AND FELDSPATHIC PHYLLITE (METATUFF)

| lFcg | INTRAFORMATIONAL CONGLOMERATE: CLASTS DERIVED EXCLUSIVELY FROM FENNELL FORMATION LITHOLOGIES

| lFu | UNDIVIDED, MAINLY lFs, lFc AND lFb, BUT MAY INCLUDE ANY OR ALL OF ABOVE ROCK TYPES

DEVONO-MISSISSIPPIAN AND OLDER PARAUTOCHTHONOUS ROCKS (EBP TO SDQ)

EAGLE BAY FORMATION (EBP TO EBG)

MISSISSIPPIAN

| EBP | DARK GREY PHYLLITE AND SLATE WITH INTERBEDDED SILTSTONE, SANDSTONE, AND GRIT; MINOR AMOUNTS OF CONGLOMERATE, LIMESTONE, AND METATUFF; EBPl-LIMESTONE; EBPv-METAVOLCANIC BRECCIA AND TUFF

DEVONIAN AND/OR MISSISSIPPIAN

| EBF | LIGHT TO MEDIUM GREY, RUSTY WEATHERING FELDSPATHIC PHYLLITE AND FRAGMENTAL PHYLLITE DERIVED FROM INTERMEDIATE TO FELSIC TUFF AND VOLCANIC BRECCIA; MINOR AMOUNTS OF DARK GREY PHYLLITE AND SILTSTONE; EBFe-LIGHT GREY MASSIVE "CHERTY QUARTZITE" (SILICEOUS EXHALITE ?)

DEVONIAN

| EBA | LIGHT SILVERY GREY TO MEDIUM GREENISH GREY SERICITE-QUARTZ PHYLLITE AND SERICITE-CHLORITE-QUARTZ PHYLLITE DERIVED FROM FELSIC TO INTERMEDIATE VOLCANIC AND VOLCANICLASTIC ROCKS INCLUDING PYRITIC, FELDSPATHIC, AND COARSELY FRAGMENTAL VARIETIES. LESSER AMOUNTS OF DARK GREY PHYLLITE, SILTSTONE, AND GREEN CHLORITIC PHYLLITE. INCLUDES BIOTITE-FELDSPAR-QUARTZ SCHIST AND GNEISS, BIOTITE-QUARTZ HORNFELS AND AMPHIBOLITE ADJACENT TO BALDY BATHOLITH. EBAf-FELDSPAR PORPHYRY, FELDSPATHIC PHYLLITE PYRITIC SERICITE-FELDSPAR-QUARTZ PHYLLITE, METAVOLCANIC BRECCIA. EBAi-SERICITIC QUARTZO-FELDSPATHIC SCHIST AND GNEISS DERIVED FROM FELSIC INTRUSIVE ROCKS. EBAu-UNDIVIDED EBA and EBAi

DEVONIAN (?) AND/OR OLDER (?) (UNITS EBQ TO EBG)

| EBQ | LIGHT TO DARK GREEN CHLORITIC PHYLLITE, DARK GREY PHYLLITE AND SILTSTONE, LIMESTONE, QUARTZITE

| EBM | GREY AND GREEN VESICULAR AND PILLOWED METABASALT, GREENSTONE, CHLORITE SCHIST, MINOR AMOUNTS OF BEDDED CHERT, SILICEOUS PHYLLITE AND FINE GRAINED QUARTZITE

| EB? | [illegible] GREY AND GREEN ACTINOLITE-QUARTZ SCHIST AND [illegible] ACTINOLITE-QUARTZ [illegible] LESSER AMOUNTS OF GARNET-[illegible] CHLORITE SCHIST AND SERICITE-QUARTZ SCHIST

DEVONIAN (?) AND/OR OLDER (?) (UNITS EBQ TO EBG) (CONTINUED)

| EBL | CALCAREOUS BLACK PHYLLITE, DARK GREY LIMESTONE, AND ARGILLACEOUS LIMESTONE

| EBS | GREY AND GREEN PHYLLITIC SANDSTONE AND GRIT, PHYLLITE, AND QUARTZITE, LESSER AMOUNTS OF LIMESTONE, DOLOSTONE, GREEN CHLORITIC PHYLLITE, SERICITE-QUARTZ PHYLLITE, AND FELDSPATHIC SERICITE-QUARTZ PHYLLITE; EBSq-LIGHT GREY TO WHITE QUARTZITE, EBSc-LIMESTONE, DOLOSTONE, MARBLE; EBSg-GREENSTONE, PILLOWED METABASALT, CHLORITIC PHYLLITE, EBScg-CONGLOMERATE, EBSp-GREY PHYLLITE AND SILTSTONE, EBSs-SIDERITE-SERICITE-QUARTZ PHYLLITE AND FELDSPATHIC PHYLLITE (METATUFF), EBSx-PYRITIC SERICITE-QUARTZ PHYLLITE AND CHLORITOID-SERICITE-QUARTZ PHYLLITE

| EBG | MEDIUM TO DARK GREEN CALCAREOUS CHLORITE SCHIST AND FRAGMENTAL SCHIST DERIVED LARGELY FROM MAFIC TO INTERMEDIATE VOLCANIC AND VOLCANICLASTIC ROCKS; LESSER AMOUNTS OF LIMESTONE AND DOLOSTONE; MINOR AMOUNTS OF QUARTZITE, GREY PHYLLITE, AND SERICITE QUARTZ PHYLLITE. EBGc-LIMESTONE, DOLOSTONE, MARBLE; EBGt-TSHINAKIN LIMESTONE MEMBER-MASSIVE, LIGHT GREY FINELY CRYSTALLINE LIMESTONE AND DOLOSTONE. EBGs-DARK TO LIGHT GREY SILICEOUS AND/OR GRAPHITIC PHYLLITE, CALCAREOUS PHYLLITE, LIMESTONE, CALC-SILICATE, CHERTY QUARTZITE, MINOR AMOUNTS OF GREEN CHLORITIC PHYLLITE AND SERICITE QUARTZ PHYLLITE. EBGq-LIGHT TO MEDIUM GREY QUARTZITE. EBGp-DARK GREY PHYLLITE, CALCAREOUS PHYLLITE AND LIMESTONE, MINOR AMOUNTS OF RUSTY WEATHERING CARBONATE-SERICITE-QUARTZ PHYLLITE (METATUFF ?). EBGpc-POLYMICTIC CONGLOMERATE

SPAPILEM CREEK-DEADFALL CREEK SUCCESSION (SDQ)

LOWER CAMBRIAN (?) AND/OR HADRYNIAN (?)

| SDQ | LIGHT TO DARK GREY QUARTZITE, MICACEOUS QUARTZITE, GRIT, AND PHYLLITE, LESSER AMOUNTS OF CALCAREOUS PHYLLITE, CARBONATE, AND GREEN CHLORITIC SCHIST. NORTHEASTERN EXPOSURES INCLUDE STAUROLITE-GARNET-MICA SCHIST, CALC-SILICATE SCHIST, AND AMPHIBOLITE

TERTIARY OR QUATERNARY

| Tb | OLIVINE BASALT

MIOCENE OR PLIOCENE

| mTb | PLATEAU LAVA OLIVINE BASALT

EOCENE

KAMLOOPS GROUP

| eTs | SKULL HILL FORMATION AND RELATED ROCKS. ANDESITE AND BASALT, INCLUDES MINOR AMOUNTS OF MUDSTONE AND SHALE IN THE VICINITY OF ALEX AND HAGGARD CREEKS

| eTc | CHU CHUA FORMATION SANDSTONE, SHALE, CONGLOMERATE, COAL

CRETACEOUS OR TERTIARY

| qp | QUARTZ FELDSPAR PORPHYRY

CRETACEOUS

BALDY BATHOLITH, RAFT BATHOLITH, AND RELATED ROCKS

| Kg | GRANITE AND GRANODIORITE

AGE UNKNOWN

| di | [illegible] QUARTZ [illegible] AND GABBRO

| ub | SERPENTINITE

LATE DEVONIAN

| Dgn | GRANITE AND GRANODIORITE [illegible] INCLUDES [illegible]

LEGEND FOR FIGURE 4.1

LEGEND FOR FIGURE

SYMBOLS

GEOLOGICAL CONTACT: DEFINED, APPROXIMATE, ASSUMED

BEDDING, TOP KNOWN: INCLINED, OVERTURNED

BEDDING, TOP UNKNOWN: HORIZONTAL, INCLINED, VERTICAL

FACING DIRECTION OF PILLOWED BASALT: INCLINED, OVERTURNED

SYNMETAMORPHIC SLATY CLEAVAGE, SCHISTOSITY, OR GNEISSOSITY: HORIZONTAL, INCLINED, VERTICAL

MINERAL LINEATION

POSTMETAMORPHIC CRENULATION CLEAVAGE: INCLINED, VERTICAL

CRENULATION LINEATION

MESOSCOPIC FOLD AXIS: SYNMETAMORPHIC, POSTMETAMORPHIC, LATE KINK

AXIAL TRACE OF SYNMETAMORPHIC FOLD: OVERTURNED ANTICLINE, OVERTURNED SYNCLINE, ESTABLISHED, INFERRED

AXIAL TRACE OF POSTMETAMORPHIC FOLD: ANTIFORM, SYNFORM

LATER (SYN OR POSTMETAMORPHISM) WEST TO SOUTHWESTERLY DIRECTED THRUST FAULT, TEETH ON UPPER PLATE: DEFINED, APPROXIMATE, ASSUMED

EARLY (?) FOLDING AND METAMORPHISM: EASTERLY DIRECTED THRUST FAULT; TEETH ON UPPER PLATE: DEFINED, APPROXIMATE, ASSUMED

FAULT, DOT ON DOWNTHROWN SIDE, ARROWS INDICATE SENSE OF STRIKE SLIP MOVEMENT: DEFINED, APPROXIMATE, ASSUMED

CONODONT FOSSIL LOCALITY: MISSISSIPPIAN, PENNSYLVANIAN, PERMIAN

LOCATION OF RADIOMETRICALLY DATED SAMPLE (U-Pb ON ZIRCONS AND Rb/Sr WHOLE ROCK) INDICATE A DEVONIAN AGE FOR UNIT EBA AND FOR UNIT IFp

MINERAL OCCURRENCE

LIMIT OF GEOLOGICAL MAPPING OR OUTCROP

LINE OF GEOLOGICAL CROSS-SECTION

TOPOGRAPHICAL CONTOUR (700-METRE INTERVAL)

internal stratigraphy and uniform facing direction. A correlation chart (Fig. 4.6) modified from Schiarizza and Preto schematically illustrates the relative structural position of each assemblage.

4.1.1 Rea Assemblage

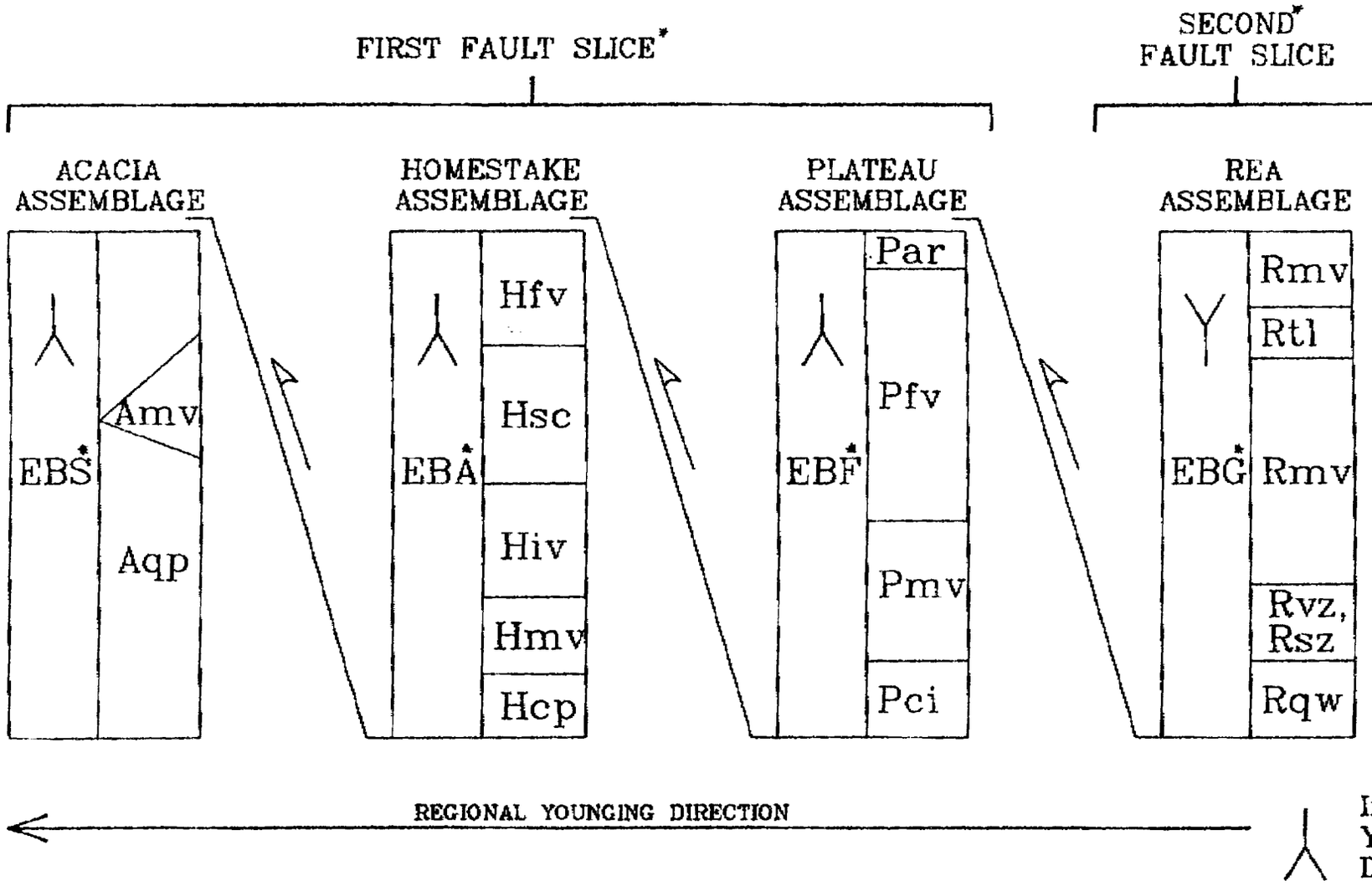
The northernmost of the four assemblages on the Kamad property corresponds with Schiarizza and Preto's thrust slice 2 (Unit EBG - Fig. 4.1). This assemblage consists of a structurally inverted sequence of mafic pyroclastics and flows (Unit R_{mv} - Figure 4.2) that contains the prominent Tshinikin Limestone (exposed to the north of the claims).

The mafic series is structurally underlain (stratigraphically overlain) by a 350m thick sequence of clastic sediments (Unit R_{qw} - Fig. 4.1) that are typified by quartz wackes, siltstones and argillites. Massive sulphide mineralization at the Rea Gold, K-7 and Samatosum mineral deposits is hosted at this mafic-volcanic sediment contact (Heberlein, 1988).

4.1.2 Plateau Assemblage

The Plateau Assemblage (Figures 4.2 to 4.6) lies immediately to the south of the Rea Assemblage and correlates with Schiarizza and Preto's Unit EBP. The succession is right-way-up and consists of three stratigraphic units; a lower intermediate volcanic unit (P_{ci} - Figure 4.2), a middle mafic volcanic unit (P_{mv}) and an upper felsic volcanic unit (P_{fv}). Argillites (P_{ar}) occur at several levels in the succession but comprise only a small fraction of the stratigraphy.

STRATIGRAPHIC CORRELATION CHART FOR THE KAMAD AREA



* After Schiarizza & Preto (1987)

Figure 4.6

Intermediate rocks at the base of the succession lie in thrust contact with the underlying Homestake Assemblage. Near the thrust fault, rocks are heavily ankeritized to orange-brown schists. These grade upwards into massive, dark grey to green, calcitic tuffs that typically contain small pods and lenses of white calcite. Calcite is also a major component of the rock matrix as indicated by its strong reaction to hydrochloric acid. Primary textures are generally not seen; however, where present, the rocks can be identified as feldspar crystal tuff and lapilli tuff.

Mafic rocks (P_{mv}) overlie the intermediate sequence. Best exposures occur at the top of the Homestake bluffs where they form precipitous cliffs. On the plateau above, outcrops are extremely rare. Rocks that make up this unit are primarily fragmental (lapilli tuff and breccia) although massive and pillowed flows have been mapped. The pillowed flows provide a reliable indication of younging direction.

Felsic rocks (P_{fv}) dominate the higher part of the succession. These are best exposed on the Kamad 7 claim at the north end of the property, where they form rounded hills with abundant outcrop. Coarse fragmentals dominate the felsic section. Two types of fragmental are recognized: lapilli tuffs and breccias with fragments and matrices of the same composition; and bi-modal fragmentals with rounded felsic fragments in an intermediate (chloritic) matrix. Both types contain up to 20% (5 to 10mm) quartz-eyes. Massive quartz eye units with well-preserved feldspar crystals occur throughout the section. These are interpreted as being crystal tuffs or flows although they appear to be unstratified.

4.1.3 Homestake Assemblage

The Homestake Assemblage (Figures 4.2 to 4.6) structurally underlies the Plateau Assemblage and consists of five stratigraphic units. Together these constitute Schiarizza and Preto's Unit EBA (Fig. 4.6). Way-up indicators throughout the succession (graded bedding and cleavage vergence) indicate that the package is right-way-up.

The lower-most unit, Unit H_{cp}, is exposed in the Acacia Creek valley on the south side of Sinmax Valley (Map 4.2). Rocks that typify this unit are fine-grained, calcareous sediments (argillites and siltstones) that contain large amounts of calcite. Calcite occurs as white laminations in the black argillites and as knots and lenses in the more competent siltstone members. These rocks bear a remarkable similarity to the calcareous phyllites that characterize the Sicamous Formation on the Adams Plateau (Okulitch, 1979).

Mafic volcanics (H_{mv}) conformably overlie the calcareous argillite sequence. They are exposed in Sinmax Valley, south of Sinmax Creek and on the hillside southeast of Acacia Creek (Fig. 4.2). They consist of massive to well-foliated, variably ankeritized lapilli tuffs and green schists. The contact with the underlying calcareous sediments hosts sporadic occurrences of massive sulphide (e.g. massive pyrite-sphalerite mineralization in the Acacia workings - see Section 7).

Intermediate volcanics (Unit H_{iv}) lie on top of the mafic sequence. These rocks are only exposed at the base of the Homestake Bluffs, southeast of the Homestake Mine. Here they consist of sericite schist, sericite-ankerite schist and ankerite-chlorite-sericite schist. Primary textures are

generally not preserved. Where present they indicate a fragmental origin. Designation of this unit as intermediate is based on chemical data collected in 1987 (Heberlein, 1988; Section 6.3 - this report).

In conformable contact with the intermediate sequence is a 200 - 300m thick pile of felsic volcanics that comprise the Homestake Schist. Best exposure of this unit is on the Homestake Bluffs on the northeast side of Sinmax Valley. The lower part of the section (Unit H_{sc}) is highly altered and made up of a complexly interlayered sequence of sericite schist, quartz sericite schist, ankeritic phyllite and chlorite schist, chert, and argillite (Oliver and Marr, 1987; Heberlein, 1988). Ag-Pb-Zn-Ba mineralization at the Homestake Mine is hosted by pyritic cherts close to the upper contact of the schist sequence.

Overlying the Homestake Schist is a 50 to 75m thick section of relatively unaltered felsic volcanic (Unit H_{fv}). Primary textures are well preserved in this unit. Lapilli tuff, quartz crystal tuff, feldspar crystal tuff and massive quartz eye porphyry make up the section.

4.1.4 Acacia Assemblage

Quartzites, quartz wackes, siltstones and rare argillites (Unit A_{qp} - Fig. 4.2) typify the Acacia Assemblage. They equate to Schiarizza and Preto's Unit EBS. These rocks dominate the south side of Sinmax Valley and extend for several kilometres to the southwest of the Kamad property. Mafic volcanic rocks (Unit A_{mv}) make up less than 5% of the section and are represented by chlorite schists and chlorite-graphite schists (see Section 7). The sequence is well bedded and complexly folded into southwesterly overturned, similar-style folds.

4.2 Structural Geology of the Kamad Area

For a discussion of the regional structural history, the reader is referred to Schiarizza and Preto (1987).

In the Kamad area two phases of folding and three ages of faulting have been identified. Southwesterly overturned, isoclinal folds are the dominant regional structures. They are represented at all scales from macroscopic structures with wavelengths in the order of 500m to mesoscopic structures with 0.5 to 1m wavelengths. They are shown in regional cross-sections in Figures 4.3 to 4.5. Associated with these folds is a strong axial planar foliation and slaty cleavage. Regional thrust faults are sub-parallel to this foliation indicating a possible structural relationship.

Kink folds that deform the regional foliation represent the second stage of folding. These features form steeply dipping conjugate sets with dominant axial trends to the northwest and north. They are best developed in homogeneous schists of Unit H_{sc}. Locally, there is a poorly developed crenulation cleavage associated with the kink folds. Intersection lineations (L2) between the crenulation cleavage and the regional foliation trend generally northwest and plunge at a shallow angle (5 to 10^{o}).

Two generations of southwesterly directed thrust faults have been mapped. The earlier thrust set is represented by low angle faults that separate units P_{ci} and H_{fv}; and units H_{sc} and A_{qp} in the Sinmax Valley area (Fig. 4.2). These faults have been offset by younger north and northeast trending normal and reverse faults. Examples of these are well exposed on the Homestake Bluffs (Figs. 4.2 and 6.1).

The later thrust faults include the major regional faults that separate the Eagle Bay Assemblage into distinct thrust slices. In the Kamad area one of these structures forms the contact between the Rea Assemblage and the Plateau Assemblage. At the southeast of the Homestake Bluffs, this structure is exposed where it truncates block faults that offset the earlier thrusts.

Minor unit parallel faults zones are abundant throughout the area. These faults have been observed mainly in drill core where they occur between lithological units with high competency contrasts. An example of this type of fault can be seen at the contact between the Rea Zone (Unit R_{rz}) and the Rea Sediments (Unit R_{qw}) in the Kamad 7 area. Further to the southeast this same contact is conformable, suggesting that the faults represent zones of dislocation along major contacts rather than offsetting structures.

TABLE 5.1 : DRILL HOLE DATA

HOLE	NORTHING	EASTING	ELEV.(m)	DIP	AZM	LENGTH(m)
PHASE I						
K88031	-1+25	-95+00	1406	-60°	240	78.0
K88032	-0+79	-92+00	1418	-65°	240	66.1
K88033	-0+79	-92+00	1418	-90°	-	90.5
K88034	-0+30	-89+96	1444	-55°	225	151.5
K88035	-0+80	-89+00	1454	-50°	225	169.8
K88036	-0+75	-91+00	1440	-45°	225	93.0
K88037	-2+00	-86+50	1443	-50°	240	160.7
K88038	-2+50	-85+00	1425	-50°	240	142.4
K88039	-2+00	-87+50	1455	-50°	225	121.0
						1073.0m
PHASE II						
K88040	-0+40	-90+50	1438	-50°	225	135.3
K88041	-0+40	-90+50	1438	-90°	-	154.5
K88042	-0+20	-91+50	1425	-45°	225	130.1
K88043	-1+50	-93+00	1409	-50°	225	68.9
K88044	0+20	-92+00	1429	-55°	225	145.4
K88045	-0+20	-91+50	1425	-90°	-	142.3
K88046	0+25	-90+00	1437	-50°	225	181.4
K88047	-0+85	-91+50	1435	-45°	225	63.1
						1021.0m
					TOTAL	**2094.0m**

5.3.2 Results

Phase I of the 1988 drill program was designed to test the Rea zone within and adjacent to an area of high massive sulphide potential. This area was identified on the basis of geophysics, soil geochemistry, surface geology and drill hole data gathered since 1985 (Heberlein, 1988). Five holes were drilled inside this area (K88032, K88033, K88034, K88035, K88036) and four were drilled outside, targeted on geophysical anomalies. Of the five holes drilled within the high potential area, four encountered massive sulphide mineralization.

A second phase of drilling was undertaken in order to determine the extent of the massive sulphide mineralization encountered in the Phase I holes. The results of the Phase II drilling included three massive sulphide intersections (K88040, K88041, K88047).

Piercement points on the plane of the mineralized horizon are shown on an inclined longitudinal section in Figure 5.24. Significant assay results are tabulated below:

TABLE 5.2: SUMMARY OF 1988 DRILL ASSAY RESULTS

Hole	Interval (m)	True Width(m)	Cu (%)	Pb (%)	Zn (%)	Ag (g/t)	Au (g/t)	As (%)
K88033	32.1 - 34.0	(1.82)	1.26	6.51	6.87	53.51	7.54	5.30
K88034	106.1 - 109.7	(3.60)	0.06	0.43	1.74	4.50	1.70	3.03
K88035	158.2 - 160.6	(2.40)	0.15	1.01	0.70	9.02	0.92	-
K88036	39.9 - 47.4	(7.05)	0.16	2.48	3.90	22.19	2.05	0.96
includes:								
	*[44.4 - 47.4]	(2.82)	0.26	4.63	5.75	39.20	3.77	1.85
	* 47.4 - 49.7	(2.16)	0.38	8.86	9.01	79.89	30.17	7.61
K88040	108.9 - 120.5	(11.60)	0.56	6.85	8.40	77.78	3.56	2.65
includes:								
	[111.3 - 120.5]	(9.20)	0.66	8.11	9.47	91.58	4.06	2.94
	[114.9 - 116.7]	(1.80)	0.67	11.07	13.22	117.14	2.93	1.49
	[118.3 - 120.5]	(2.20)	0.61	12.46	12.17	128.11	2.72	3.15
K88041	134.5 - 141.3	(6.11)	0.41	3.20	4.23	40.44	1.99	2.10
includes:								
	[137.9 - 140.5]	(2.34)	0.70	5.36	6.45	68.44	2.63	3.30
K88044	122.7 - 123.2	(0.50)	0.12	0.99	1.56	92.00	5.01	1.59
	125.1 - 125.6	(0.50)	0.28	0.74	1.46	22.50	3.16	2.22
K88046	145.8 - 146.7	(0.90)	0.12	0.92	2.12	12.00	2.13	7.22
	148.4 - 149.5	(1.10)	0.32	1.70	2.57	13.27	1.39	4.45
	151.1 - 152.1	(1.00)	0.40	1.64	4.68	27.00	0.72	0.39
K88047	20.1 - 22.8	(2.66)	0.16	0.83	1.42	13.13	1.56	2.47
	25.4 - 32.1	(6.60)	0.23	1.20	1.69	40.71	5.00	0.61
includes:								
	[25.4 - 27.7]	(2.27)	0.53	2.41	3.58	68.41	9.92	1.31
	36.5 - 37.0	(0.49)	0.44	2.68	3.59	91.50	4.92	3.23

*45% core recovery over this interval.

All drill holes are described in order, from the top of the hole to the bottom. Units are referred to with regards to their structural position in the holes.

9.0 SUMMARY AND 1989 RECOMMENDATIONS

The 1988 Kamad exploration program set out to achieve the following objectives:

1) To diamond drill test areas of high massive sulphide potential on the Rea Zone on the Kamad 7 claim.

2) To precisely locate and identify drill targets on the Rea Zone on the Kamad 8 claim.

3) To evaluate the mineral potential and identify drill targets on the Homestake Bluffs, northwest of Fraser's Gulch.

4) To reevaluate the geology and identify drill targets on the Homestake Bluffs adjacent to the Homestake Mine.

5) To evaluate the mineral potential and identify drill targets in the Acacia area.

Results of the program on each of the above areas and recommendations for follow-up are presented below:

9.1 Kamad 7

Results of the 1988 program are compiled on Figure 9.1.

The 1988 diamond drill program on the Kamad 7 claim succeeded in locating a new massive sulphide lens on the Rea Zone. It is located immediately to the northwest of the original K-7 massive sulphide occurrence between lines -90+50E and -92+50E. Five drill holes penetrated the zone and defined an *in situ* (geological) reserve of approximately 218,000 tonnes of 0.54% Cu, 6.14% Pb, 7.32% Zn, 69.14 g/t Ag, 7.36 g/t Au and 3.18% As (see Appendix IV for explanation of grade and tonnage calculation).

The sulphide lens appears to be an irregular shaped zone with no definite plunge direction. It is open down-dip, but closed off to the southeast by a sharp, vertically plunging contact with a chert unit. On the northwest side an east-west trending, normal fault truncates the mineralization. This feature has an estimated downthrow of 60m to the north, suggesting that an offset portion of the mineralization could be present on the north side of the fault.

Holes drilled to the southeast of the K-7 lens were designed to test the Rea Zone at 100m section spacings. None of these holes produced significant mineralization; however, the Rea Zone in hole K88035 on line -89+00E had characteristics similar to the zone immediately adjacent to the massive sulphide body suggesting that the mineralization may be strengthening down-dip.

A Fixed-Source GENIE orientation survey conducted over the K-7 lens found that the massive sulphide mineralization is a very poor conductor. Nevertheless, the highest frequency gave a good response that outlined the position of the zone very well (Figs. 5.6 and 9.1). In addition to this, three new conductors were located by the survey. One conductor (C - Fig. 9.1) lies on the north side of the east-west trending fault that truncates the sulphide zone. The location of this feature is close to where an expected offset of the sulphide body would be located.

Recommendations:

The following work program is recommended for the Kamad 7 area (Figs. 9.1 and 9.2):

a) Extension of the Fixed-Source GENIE survey at 50m line spacings (25m detail in anomalous areas) to cover the Rea and Silver zones to the Twin claim boundary.

b) Trenching along the surface trace of the massive sulphide lens to provide information on the grade distribution and continuity of the mineralization.

c) Continuation of the diamond drilling on the K-7 massive sulphide to further explore the down-dip and possible down plunge potential (Figs. 9.1 and 9.2); drill testing to the north of the fault that truncates the mineralization to see if a faulted offset of the K-7 massive sulphide is present (Fig. 9.1); and drill testing around a faulted massive sulphide intersection in hole K86010 (Fig. 9.1).

Recommended drill holes are summarized in Table 9.1 below. Collar locations and piercement points are shown on Figures 9.1 and 9.2.

Drill holes A through N are recommended to test the down-dip and down-plunge potential of the K-7 mineralization. Two tiers of holes are planned; an upper tier (holes A to D and J), designed to pierce the zone at the 1275m level; and a lower tier (holes E to I) aimed at the 1225m level (Fig. 9.1). This drilling will establish 50m piercement points over the strike of the zone to a depth of 200m.

Holes J and K are designed to test the down-dip continuity of massive sulphide mineralization interesected in hole K88033 and K88044 (Fig. 5.16). Hole L is recommended as a fill-in hole to test the continuity fo the massive sulphide body close to surface. Hole M should be drilled to test the Rea Zone down-dip from hole K88035. On this section (Fig. 5.11) geological data suggests that the potential for mineralization is improving down-dip. Hole N is recommended as a fill-in hole between M and K88046. It will test the edge of the chert unit for potential massive sulphide mineralization.

Holes O through T are recommended to test the fault offset of the Rea Zone and conductor C, to the northwest of the K7 massive sulphide (Fig. 9.1 and 9.2). The holes are designed to penetrate the Rea Zone at 1325 and 1275m levels. Holes O through T are spaced at 50m intervals and will intersect the Rea Zone at the 1325m level. Of these, hole O is a re-drill of K86009, which was stopped short of the Rea Zone. Holes T and U are contingency holes designed to test the Rea zone at the 1275m level if results from the initial holes warrant it.

Drill holes V through Y are intended to explore the area around DDH K86010. A thin massive sulphide intersection within a section of fault gouge was encountered in this hole. This intersection has not been adequately followed up to date. Holes Z and AA will test the down-dip continuation of the mineralized chert unit which was intersected in holes K88037 and K88038. This chert is interpreted to occupy the same level in the stratigraphy as the massive sulphide and to be an indication of proximity to significant mineralization.

TABLE 9.1 PROPOSED COLLAR LOCATIONS - KAMAD 7 CLAIM

HOLE	EASTING	NORTHING	DIP	AZIMUTH	LENGTH
A	-90+50	0+50	-70	225°	225m
B	-90+00	0+25	-70	225°	225m
C	-89+50	0+15	-75	225°	250m
A	-89+00	-0+10	-75	225°	275m
E	-91+00	-0+70	-80	225°	300m
F	-90+50	0+50	-90	-	300m
G	-90+00	0+25	-90	-	300m
H	-89+50	-0+15	-90	-	300m
I	-89+00	0+10	-90	-	300m
J	-91+50	0+75	-75	225°	250m
K	-92+00	0+20	-90	-	225m
L	-90+50	-1+00	-45	225°	125m
M	-89+00	-0+10	-60	225°	225m
N	-89+50	-0+15	-50	225°	225m
O	-92+50	-0+25	-90	-	300m
P	-93+50	-0+25	-60	225°	200m
Q	-94+50	-0+50	-70	225°	200m
R	-93+00	-0+25	-60	225°	200m
S	-94+00	-0+50	-70	225°	200m
T	-93+00	-0+25	-90	-	250m
U	-83+50	-2+50	-50	225°	150m
V	-83+50	-2+50	-90	-	225m
W	-84+50	-2+50	-90	-	225m
X	-84+50	-2+50	-50	225°	150m
Y	-85+00	-2+50	-90	-	225m
Z	-86+50	-2+00	-90	-	225m
				TOTAL	6,075m

9.2 Kamad 8

Results of the exploration program on the Kamad 8 claim are encouraging. Geological mapping combined with a compilation of drilling and airborne geophysical data, has resulted in the location of the surface trace of the Rea Zone with a high degree of confidence. The known strike length of the Rea Zone has been increased by as much as 1.3km. Furthermore, soil geochemistry has produces three good quality multi-element anomalies that warrant drilling.

Recommendations:

A summary of the Kamad 8 targets is shown in Figure 8.7. The following follow-up program is recommended:

a) Detailed Fixed-Source GENIE coverage of the entire Kamad 8 grid at 50m line spacings (25m over anomalous areas).

b) Diamond drill testing of the three targets and systematic drilling of the zone at 100m section spacings. Proposed drill collars are summarized in Table 9.2 below and on Figure 8.7. These holes are approximate and are subject to change based on the results of the GENIE survey.

TABLE 9.2 PROPOSED COLLAR LOCATIONS - KAMAD 8 CLAIM

HOLE	EASTING	NORTHING	DIP	AZIMUTH	LENGTH
A	-68+00	-7+00	-50	250°	150m
B	-67+00	-7+50	-50	250°	125m
C	-66+00	-8+00	-50	250°	125m
D	-65+00	-8+75	-50	250°	125m
E	-64+00	-9+25	-50	250°	125m
F	-63+00	-10+25	-50	250°	125m
G	-62+00	-11+00	-50	250°	125m
H	-61+00	-11+50	-50	250°	125m
I	-60+00	-12+00	-50	250°	125m
J	-59+00	-13+25	-50	250°	150m
K	-58+00	-14+00	-50	250°	150m
L	-57+00	-14+00	-50	250°	150m
				TOTAL	1,600m

9.3 Homestake Mine Area

1988 work on the Homestake Mine area resulted in three significant developments that have a direct bearing on exploration. These are:

i) The mineralized horizon appears to be associated with a pyritic chert unit that can be followed for nearly 1km on the southeast side of Homestake Creek.

ii) The upper contact of the Homestake Schist is a thrust fault that cuts up and down the schist sequence. In places, the mineralized horizon lies beneath the thrust fault.

iii) The rocks within 5m (stratigraphically) of the massive barite mineralization, exhibit extremely anomalous Hg values.

Recommendations:

The following work on the Homestake Mine area is recommended for 1989.

a) A detailed rock Hg survey to the east and west of the Homestake Creek area to identify prospective drill targets within the schist sequence.

b) A seven hole, 2,500m diamond drill program designed to test the Homestake Mine horizon at approximately 150m intervals over a strike length of 1,200m. The drill holes are positioned (Fig. 6.1) to intersect the target horizon at approximately the 650m level (assuming a constant 45° dip); 250m down-dip from the surface trace.

Due to the precipitous nature of the proposed collar locations and the difficulties with road construction on the bluffs, a helicopter is recommended as the safest and quickest means of mobilizing and supporting a drill.

9.4 Homestake NW Area

Preliminary work on the Homestake NW grid has revealed a mineralized horizon that closely resembles the Homestake Mine horizon. The zone, termed the Inferno Zone, consists of a massive to brecciated chert unit, containing massive barite mineralization identical to that at the Homestake Mine. Samples of the 50cm thick barite lens returned values of 1068 ppm Cu, 4175 ppm Zn, 334 ppm Pb and 211.0 ppm Ag.

The mineralization lies at the top of the Homestake schist sequence at a contact with less altered, porphyritic felsic volcanic rocks. It can be traced on surface for a strike length for 250m. To the east and west it is obscured by bouldery talus deposits.

Soil geochemistry over the Inferno Zone has defined three good quality, multi-element targets (A, B and C, Fig. 6.17). These features lie on and directly down slope from the interpreted trace of the mineralized horizon. In the vicinity of anomaly A, highly gossanous soils, ferricretes and a kill zone suggest the presence of an oxidizing sulphide concentration in the uphill direction.

Recommendations:

Four diamond drill holes are recommended to test the geochemical anomalies. These are summarized in Table 9.3 below:

TABLE 9.3 RECOMMENDED COLLAR LOCATIONS - HOMESTAKE NW GRID

HOLE	EASTING	NORTHING	DIP	AZIMUTH	LENGTH
A	33+00W	2+00	-90°	-	200m
B	29+00W	2+00	-90°	-	200m
C	28+00W	2+50	-90°	-	200m
D	27+00W	3+00	-90°	-	200m
				TOTAL	800m

Drill hole A is designed to test the Inferno horizon in the vicinity of geochemical anomaly C. Holes B, C and D test soil anomalies A and B, uphill from the gossan and kill zones.

In addition to the above drill program, the geology of the area east of Fraser's Gulch are should be reevaluated to determine if the Inferno horizon extends to the Homestake Mine.

9.5 Acacia Area

Preliminary evaluation of the Acacia area in 1988 did not result in any good quality targets for follow-up. The dip-slope and the relatively thick till layer effectively masks any surface expression from the mineralized horizon.

Recommendations:

A small follow-up program on the Acacia grid is recommended. This should be delayed until the logging access road that is currently under construction by a local logging contractor is completed. It is hoped that the road may produce additional exposures that will contribute to the geological interpretation.

Reevaluation of the geology and a moving source GENIE EM survey is recommended over the area between Acacia and Delores creeks.

TRANSPORTATION SERVICES

AIRLINE	FREQUENCY	FROM – TO
Alaska Air		Juneau/Ketchikan/Seattle
(907) 225-6608	Daily	– Wrangell
Trans Provincial Air		
(604) 279-9082 Vancouver	Weekly	Vancouver – Bronson
(604) 635-6616 Terrace	Daily?	Terrace – Bronson
(907) 874-2433 Wrangell	Daily?	Wrangell – Bronson
Central Mountain Air		
(604) 847-4780	Daily?	Smithers/Terrace – Bronson/Bob Quinn
	Daily?	Wrangell – Bronson
Sunrise Aviation		
(907) 874-2319	Charter	Wrangell – Bronson
Ketchikan Air Service		
(907) 874-2319	Charter	Wrangell – Bronson
HELICOPTER		
Northern Mtn.		
(604) 638-7955	Charter	
Trans North Air		
(403) 668-2177	Charter	
HOVERCRAFT		
Cominco		
(604) 264-5500	Daily	Wrangell – Bronson Strip
SHIPPING		
White Pass Transportation		
(604) 984-9561	Weekly	Vancouver – Wrangell
BARGE		
Alaska Marine Lines		
(206) 763-1244	Twice Weekly	Seattle – Wrangell
Boxer Alaska Marine Lines		
(206) 763-8575	Weekly	Seattle – Wrangell
Northland Services		
(206) 763-3000	Weekly	Seattle – Wrangell

TRUCKING

(To Bob Quinn Transfer Point from Vancouver, Prince George, Smithers, Terrace)

Motorways	Vancouver –
(604) 525-7611	Terrace/Bob Quinn

EXPEDITERS

Black Expediters – Jean Black – Terrace B.C.
(604) 638-8354 Fax (604) 638-0898

North Arm Expediting – Bob Prunella – Wrangell B.C.
(907) 874-2433 Fax (907) 874-3911

Jaycox Industries Ltd. – Sandy Jaycox – Smithers B.C.
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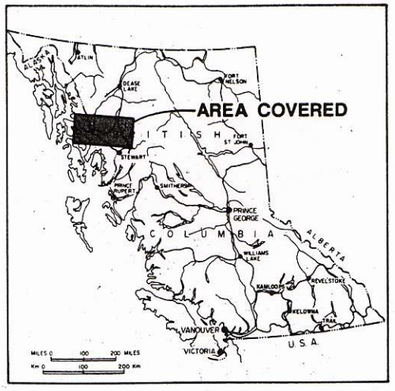

This map has been compiled from information believed reliable, actual claim locations/ownership are not guaranteed.

Galore Creek Deposit
A 125 million tons of 1.06% Cu, and 0.012 oz/ton Au (Drill Indicated)

Paydirt Deposit
B 200,000 tons of 0.12 oz/ton Au (Drill Indicated)

Snip Deposits
C 1.57 million tons of 0.64 oz/ton Au (Proven and Probable)

Johnny Mountain Gold Mine
D 686,000 tons of 0.57 oz/ton Au (Proven, Probable, Possible)

E & L Deposit
E 3.2 million tons of 0.08% Ni and 0.6% Cu (Drill Indicated)

21 Zone Discovery
F 3-5 million ounces of Au (Indicated Potential)

Sulphurets Gold Zone
G 20 million tons of 0.08 oz/ton Au (Indicated Potential)

Snowfield Gold Zone
H 25 million tons 0.08 oz/ton Au (Indicated Potential)

Brucejack Gold Deposit
J 854,072 tons of 0.354 oz/ton Au & 22.94 oz/ton Ag (Drill indic. & infer.)

Gold Wedge Deposit
K 375,000 tons of 0.75 oz/ton Au and 1.0 oz/ton Ag (Proven and Probable)

Kerr Deposit
L 66 million tons of 0.86% Cu and 0.01 oz/ton Au (Drill Indicated)

Q22/17 Gold Zone
M 470,000 tons of 0.27 oz/ton Au and 1.31 oz/ton Ag (Probable)

57° 00'

131° 00'

NELLY

MCLYMONT

GIM

INEL

JOSH

BRONSON STRIP
Marshalling area for Helicopters, Drilling Contractors, Camp Construction Contractors, Sawmill, etc.

STIKINE RIVER

ISKUT

BRONSON

Bob Quinn Lake

Proposed Road

STEWART
125 mi. 240 km

TERRACE
250 mi. 400 km

VANCOUVER
875 mi. 1300 km

T.P. Air
C.M. Air

Hovercraft
75 mi. 120 km
2.5 hr

T.P. Air
C.M. Air
Sunrise Aviation
Ketchikan Air
65 mi.105 km
0.5 hr

Alaska Air

WRANGELL
3500 Population
All Services

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from Seattle
Alaska Marine Lines
Boxer Alaska Marine Lines
Northland Services

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WRANGELL
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ALASKAN
PANHANDLE

Proposed Power Line

Proposed Road

T.P.Air

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765 mi. 1225 km
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Terrace
Smithers
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1.75 hr

TYEE POWER PLANT
Generates 18–20mw
Current use 9–11mw
Can expand to 30mw

0 5 10 15 20 25 30
KILOMETRES
0 5 10 15 20
MILES

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3. Johnny Mtn.	Hercules
4. Bob Quinn	Under Construction
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6. Snippaker	Twin Otter
7. Porcupine	Twin Otter

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