ARIS SUMMARY SHEET

District Geologist, Kamloops Off Confidential: 89.02.04

ASSESSMENT REPORT 16989 MINING DIVISION: Kamloops

PROPERTY: Twin
LOCATION: LAT 51 07 50 LONG 119 47 25
UTM 11 5667827 304767
NTS 082M04W
CLAIM(S): Twin 2-3
OPERATOR(S): Esso Res. Can.
AUTHOR(S): Heberlein, D.R.
REPORT YEAR: 1988, 53 Pages
COMMODITIES
SEARCHED FOR: Silver,Zinc,Lead,Gold
GEOLOGICAL
SUMMARY: The property is underlain by Devono-Mississippian rocks of the Eagle Bay Formation. Lithologies consist of mafic volcanics overlain by graphitic argillites and wackes. Cherts are abundant at the contact. Weak sulphide mineralization at this horizon is interpreted to be equivalent to that at the Rea Gold deposit 3 kilometres to the northwest. The stratigraphy is folded into southwesterly overturned folds that are thrusted along axial planes.

WORK
DONE: Drilling
DIAD 558.7 m 4 hole(s);NQ
Map(s) - 5; Scale(s) - 1:5000,1:250
SAMP 48 sample(s) ;CU,PB,ZN,AG,AU,BA,AS
MINFILE: 082M 020

ASSESSMENT REPORT

ON THE

1987 TWIN PROPERTY DIAMOND DRILL PROGRAM

Kamloops Mining Division, British Columbia

NTS: 82M/4W
Lat: 51° 08'N Long: 119° 47'W

Owners:

Apex Energy Corp.
407 - 750 W. Pender Street
Vancouver, B.C. V6C 1T7
and
Lincoln Resources Inc.
1440 - 625 Howe Street
Vancouver, B.C. V6C 2T6

Operator:

Esso Minerals Canada
A Division of Esso Resources Canada Limited
1600 - 409 Granville Street
Vancouver, B.C. V6C 1T2

Report By:
D.R. Heberlein

January 25, 1988

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Ministry - 2
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1.0 INTRODUCTION

1.1 General Statement

The Twin Property, jointly owned by Lincoln Resources Inc. and Apex Energy Corp. is currently under option to Esso Minerals Canada (the operator). It consists of three MGS mineral claims, the Twin 1-3 claims, that cover a total area of 975 hectares. They were staked in 1980 by Mr C. Graf to cover the Twin Mountain showing; a silver-lead-zinc vein occurrence. Since 1983, following the discovery of the Rea Gold massive sulphide mineralization 2.5km northwest, the focus for exploration has concentrated on the strike extension of the Rea Zone that crosses the southern portion of the claims.

A second zone referred to as the Silver Zone is interpreted to parallel the Rea Zone approximately 400m to the north and hosts the recently discovered Samatosum silver-lead-zinc orebody that is currently being developed by Minnova Inc. on their adjoining HN and Rea claims. The Silver Zone has not been conclusively identified on the Twin Property.

This report presents the results of a 1080m diamond drilling program that was carried out on the Twin 2 and 3 claims between June 20 and July 19, 1987. This work is submitted as part of the requirements of the B.C. Government FAME program.

1.2 Location and Access

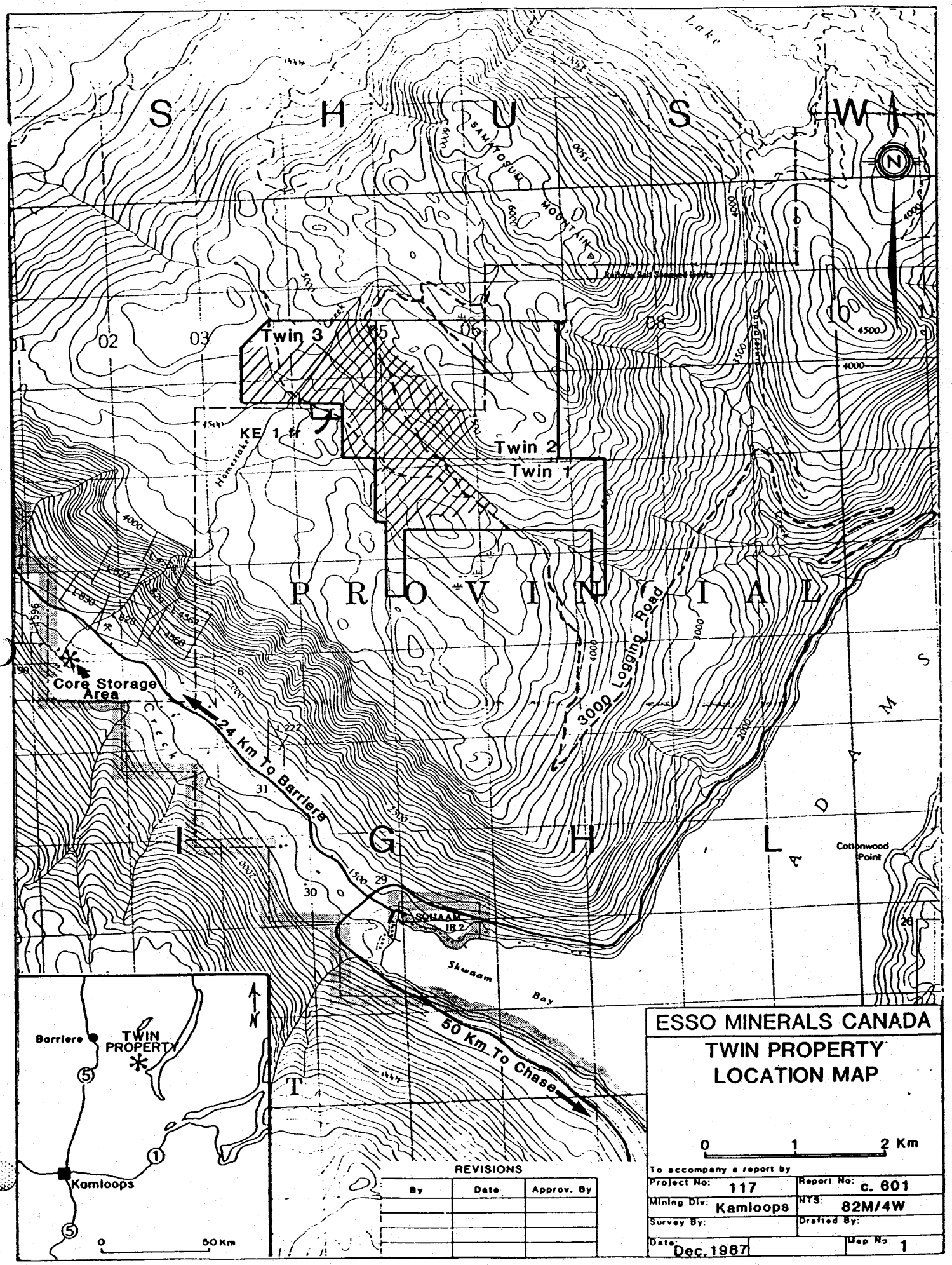
The Twin Property is located in the Kamloops Mining Division of South-Central British Columbia. The claims are situated approximately 25km east-southeast of the town of Barriere and 60km northeast of Kamloops (Fig. 1).

Access to the property can be gained by logging road from Squaam Bay on Adams Lake. There are two routes to Squaam Bay; the most direct is from the North Thompson River valley via the Louis Creek (or Agate Bay) Road that leaves Highway 5 2km south of Barriere. A second route is a well-maintained gravel logging road that follows the west shore of Adams Lake and joins up with the Scotch Creek Road to the South. This road in turn joins the Trans-Canada Highway at Squilax, 4km east of Chase.

A system of well-maintained logging roads provides access to the property. From Squaam Bay, one must take the Adams West logging road north for a distance of 8.5km to the Samatosum turn-off. From there the Samatosum or 3000 road leads generally northward through a series of switchbacks to join with the 3200 logging road that crosses the claim boundary.

1.3 Topography, Vegetation and Climate

The Claims are situated on the southwestern slopes of Samatosum Mountain and span an elevation range from 1340m to 1675m. The surrounding area is essentially table-land that forms part of the interior plateau.



ESSO MINERALS CANADA

TWIN PROPERTY
LOCATION MAP

0 1 2 Km

REVISIONS

By	Date	Approv. By

To accompany a report by

Project No: 117	Report No: c. 601
Mining Div: Kamloops	NTS: 82M/4W
Survey By:	Drafted By:
Date: Dec. 1987	Map No 1

Vegetation on the plateau consists primarily of pine and spruce forest with lesser stands of poplar and balsam. Much of the claim area has been clear-cut by recent logging operations.

Climate is semi-arid and typical of the southern interior of British Columbia. Summers are hot and dry with mean temperatures in the high 20's°C. Winters are cold with variable snowfall.

2.0 PROPERTY HISTORY

The area has received attention since the early 1920's. Early exploration efforts concentrated on several small massive sulphide and vein occurrences known throughout the region. One of these, the Twin Mountain occurrence, is located within the Twin Property boundaries.

First reported work on the property was in 1936 when Henry Height and Associates from Barriere put in twelve hand trenches across a 3m wide dolomite vein enclosed by quartz sericite altered volcanic rocks. They found abundant sulphides in the dolomite zone that contained Pb, Zn, Ag and traces of Au. Assay results of 6 samples were reported. Values ranged from trace to 0.5oz/t Au, trace to 5.0 oz/t Ag, 0 to 36.5% Pb and 0 to 3.7% Zn (BCMMAR., 1936, p. D39).

The properety was optioned to Camoose Mines Limited by C.C. Keller of Louis Creek in 1952. During that year two exploration adits were driven into the Twin Mountain vein and 7.5km of access road from Squaam Bay was constructed. A mineralized dolomite vein was encountered in the western adit. This was followed 100' to the northwest and 110' to the southeast by underground drifting.

The property was restaked by C.C. Keller in 1966 and optioned to Sinmax Mines Ltd. They conducted a surface exploration program consisting of a cut grid, soil geochemistry, geophysics and underground mapping and sampling. In 1969 Sinmax Mines Ltd. actively prospected the claims, and excavated 15 trenches. They identified the Twin Mountain vein for a distance of 4 miles, but found that metal values were highly variable and erratically distributed.

The Twin 1 to 3 claims were staked in 1980 by Mr C. Graf to cover the Twin Mountain occurrence. This was followed by extensive geological mapping, soil geochemical and geophysical surveys over the showings in 1981 and 1982.

In 1983, following discovery of the Rea Gold massive sulphide lens, Lincoln Resources entered into an option agreement with Apex Energy Corp. to work on the Twin Property. A grid was established over the property and a soil geochemical survey carried out.

Corporation Falconbridge Copper (CFC) acquired the property from Lincoln Resources in 1984 and conducted a 1:2500 geological mapping program in conjunction with rock geochemistry, Max-Min II and VLF-EM. This program was completed with two diamond drillholes. CFC terminated their option in April 1985. Lincoln Resources Inc. conducted a limited fill-in soil geochemical survey that year.

In 1986 Lincoln Resources Inc. and Apex Energy Corp. hired J.D. Blanchflower to conduct an extensive exploration program on the Twin Claims. The program included re-establishment of the grid, addition of 15.5km

of new grid, 1:5000 scale geological mapping, litho-geochemical sampling, soil sampling, Genie EM (fixed source) and trenching on the Rea Zone. In December 1986, Esso Minerals Canada optioned the property from Lincoln Resources Inc. and Apex Energy Corp.

Early in 1987, Esso Minerals conducted a geophysical (VLF EM) and a limited trenching program over target areas identified by Blanchflower the previous summer. This was followed by a 2269m diamond drilling program focussing mainly on the Rea Zone. A small massive sulphide lens with features similar to the Rea Gold mineralization was discovered on the Twin 3 claim.

3.0 CLAIMS

The Twin Property consists of the Twin 1 to 3 claims that total 39 units (Fig. 1). Details of the claims are summarized below:

CLAIM	RECORD NO.	UNITS	EXPIRY DATE
Twin 1	2403	18	02-13-1990
Twin 2	2404	12	02-13-1990
Twin 3	2405	9	02-13-1990

TOTAL 39 UNITS

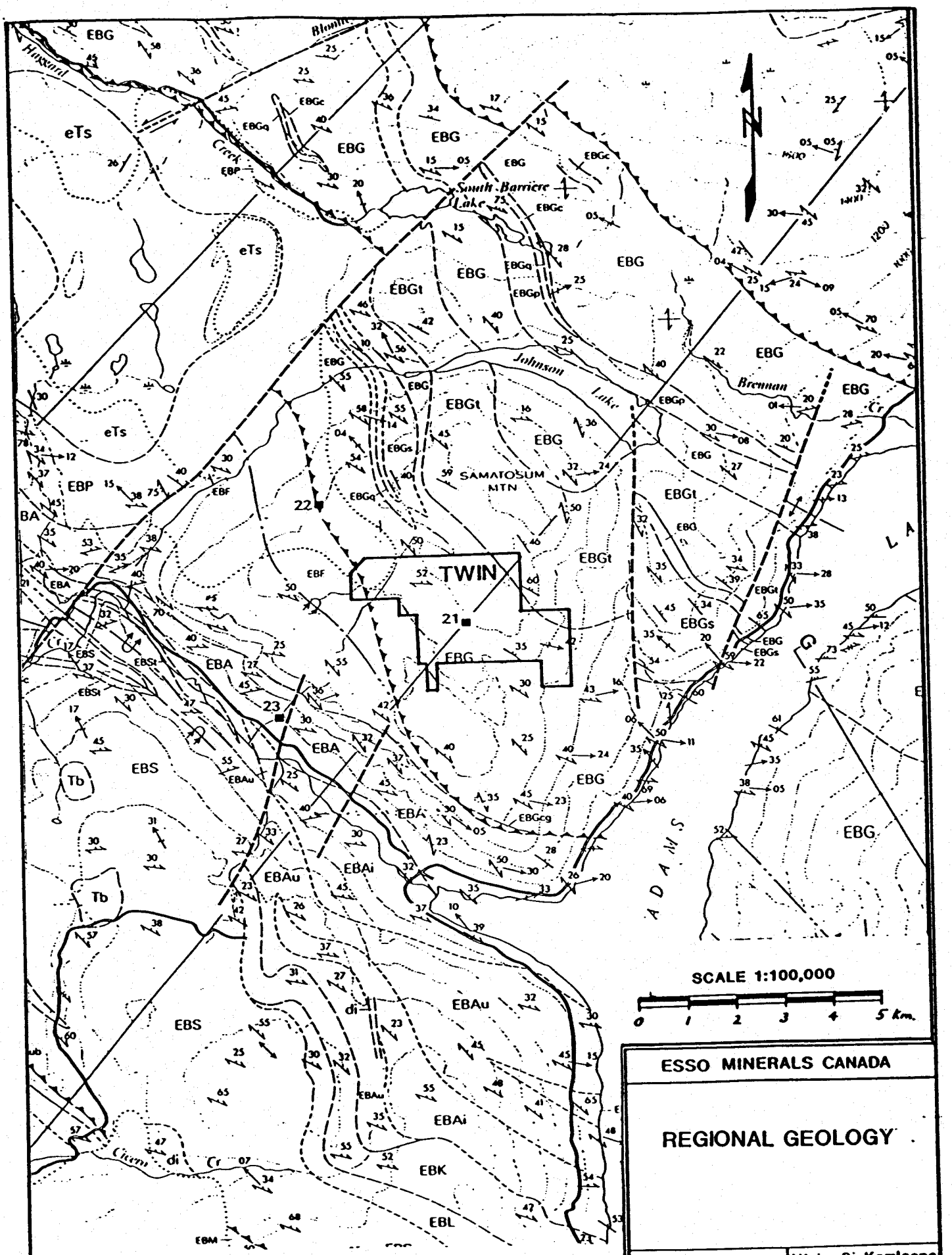
4.0 GEOLOGY

4.1 Geological Setting

The Barriere Lakes-Adams Plateau area has been extensively mapped in the last few years. Geological reports by Hoy and Goutier (1986), Schiarizza and Preto (1984), Preto and Schiarizza (1985) and White (1985) provide an excellent regional geological base for the area.

To summarize, the region (Fig. 2) is underlain by a Devono-Mississippian volcanic and sedimentary assemblage collectively referred to as the Eagle Bay Formation. This overlies the late Devonian Fennell Formation, a sequence of mafic to felsic volcanics and sedimentary rocks. These formations have been intruded by quartz monzonite and granodiorite of Late Devonian to Cretaceous age. Tertiary olivine-basalts locally bury the Paleozoic stratigraphy. These outliers once formed an extensive Tertiary cover over much of the area.

Structurally, the area has undergone at least two periods of folding and faulting. The earliest and most intense phase is seen as a series of tight, upright to southerly overturned folds that have shallow northwesterly plunging axes. These folds appear to be related to a episode of thrust faulting that is manifested as a series of sub-parallel thrust faults which juxtapose older rocks against younger rocks in many places. Associated with this deformation is a strongly developed axial planar cleavage. Later folds are manifest as a gentle warping of the earlier structures by open folds with northerly trending axes.



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

ESSO MINERALS CANADA

REGIONAL GEOLOGY

Project No. 117	Mining Div. Kamloops
NTS. 82M/4W	Drawn by:
Date: DEC 87	Fig. No. 2

LEGEND

UPPER TRIASSIC AND LOWER JURASSIC NICOLA GROUP (?)

UPPER TRIASSIC OR LOWER JURASSIC

TrJv — AUGITE 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 lFc, lFg, 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; EBFq—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 BALOY BATHOLITH; EBAf—FELDSPAR PORPHYRY, FELDSPATHIC PHYLLITE, PYRITIC SERICITE–FELDSPAR–QUARTZ PHYLLITE, METAVOLCANIC BRECCIA; EBAl—SERICITIC QUARTZO–FELDSPATHIC SCHIST AND GNEISS DERIVED FROM FELSIC INTRUSIVE ROCKS; EBAu—UNDIVIDED EBA and EBAl

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

EBU — 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

EBK — BANDED LIGHT GREY AND GREEN ACTINOLITE–QUARTZ SCHIST AND EPIDOTE–ACTINOLITE–QUARTZ ROCK; LESSER AMOUNTS OF GARNET–EPIDOTE SKARN, CHLORITIC SCHIST, AND SERICITE–QUARTZ SCHIST

DEVONIAN (?) AND/OR OLDER (?) (UNITS EBU 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; EBSb—GREENSTONE, PILLOWED METABASALT, CHLORITIC PHYLLITE; EBScg—CONGLOMERATE; EBSp—GREY PHYLLITE AND SILTSTONE; EBSi—SIDERITE–SERICITE–QUARTZ PHYLLITE AND FELDSPATHIC PHYLLITE (METATUFF); EBSs—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 ?); EBGcg—POLYMICTIC CONGLOMERATE

SPAHLEM 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 FOLIATED DIORITE, QUARTZ DIORITE, AND GABBRO

ub SERPENTINITE

LATE DEVONIAN

Dgn GRANITE AND GRANODIORITE ORTHOGNEISS; Dgnp INCLUDES SILLIMANITE-BEARING PARAGNEISS

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 (PRE 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 (Pb/U 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 E E'

TOPOGRAPHICAL CONTOUR (200-METRE INTERVAL)

MINERAL OCCURRENCES

			Minfile
1	REXSPAR	U, F	82M-21
2	FOGHORN (CHIOGRINI)	Ag, Pb, Zn, Cu	82M-40
3	LYDIA	Pb, Ag, Cu	82M-8
4	JUDY	Mo, Cu	92P-36
5	WINDPASS	Au, Cu, Bi, Ag	92P-39
6	SWEET HOME	Au, Cu, Bi	92P-40
7	GOLD HILL	Au, Pb, Cu, Zn, Ag	92P-41
8	QUEEN BESS	Pb, Zn, Ag	92P-42
9	CC (CHU CHUA)	Cu, Zn	92P-140
10	ENARGITE	Pb, Zn	82M-65
11	FORTUNA 1	Pb	82M-72
12	FORTUNA 2	Pb	82M-70
13	COPPER CLIFF	Pb, Zn, Cu	82M-67
14	RAINBOW	Cu, Pb, Zn	82M-67
15	C-C	Cu, Pb, Zn	82M-67
17	BROKEN RIDGE	Pb, Zn, Cu	82M-130
18	HARPER	Cu, Pb, Zn	82M-60
19	EBL	Cu	82M-51
20	KAJUN (JUNE)	Ag, Pb, Zn, Cu	82M-58
21	TWIN MOUNTAIN	Pb, Zn, Cu, Ag, Au, barite	82M-20
22	REA	Au, Ag, Pb, Zn, Cu	82M-191
23	HOMESTAKE	Ag, Pb, Zn, Au, Cu, barite	82M-25
24	BECA (TOM)	Cu, Pb, Zn, Au, Ag	82M-55
25	JOE (GLEN)	Cu, Pb, Zn	82M-54
26	ELSIE	Pb, Zn, Ag, Au	82M-12
27	LUCKY COON	Pb, Zn, Ag, Au, As	82M-12
28	KING TUT	Ag, Pb, Zn, Au	82M-13
29	SPAR	Pb, Au, Ag, Cu	82M-17
30	PET	Pb, Zn	82M-143
31	MOSQUITO KING	Pb, Zn, Ag	82M-16
32	BC (CUSI)	Cu, Pb, Zn	82M-139

Regional metamorphism is in the lower to middle greenschist facies.

4.2 Mineralization

The Eagle Bay Formation contains numerous strata-bound base metal occurrences. Mineralization of this type is known in the Birk Creek area near North Barriere Lake, in the Johnson Creek/Sinmax Valley area and on the Adams Plateau east of Adams Lake.

In the vicinity of the Twin Property there are three significant polymetallic deposits; the Homestake Mine (250,000 tonnes, 197 g/T Ag, 0.51 g/T Au, 31.9% Ba, 9.3% Zn and 1.5% Pb) the Rea Gold ' Discovery Zone' (267,000 tonnes, 73.37g/T Ag, 6.51 g/T Au, 2.25% Zn, 2.14% Pb, 0.57% Cu) and the recently discovered Samatosum orebody (660,000 tonnes, 1337g/T Ag, 2.04 g/T Au, 3.50% Zn 1.70% Pb, 1.20% Cu).

The geological setting and style of mineralization is generally similar in all three deposits. Each is stratabound and hosted in sericite schist, close to a mafic volcanic/sedimentary contact. The Discovery and Homestake lenses contain large quantities of barite that host massive and disseminated galena, sphalerite and tetrahedrite with lesser chalcopyrite. At the Samatosum deposit, mineralization is associated with a zone of massive sulphide and a cross-cutting series of quartz-dolomite-tetrahedrite veins. Stratigraphy hosting the mineralized horizons is laterally persistent for several kilometres along strike.

5.0 DRILLING PROGRAM

5.1 Logistics

The diamond drillholes (Fig. 3) reported here were drilled by Atlas Drilling Ltd. of Kamloops B.C. using a skid-mounted, Longyear Super 38 diamond drill. All holes were drilled using NQ diameter drill rods.

Drillcore was logged by J.C. Oliver and M. Reed on site. Core boxes were labelled with aluminum tags and removed to a storage location in Sinmax Valley (Fig 3). Assays on split drillcore were done at Eco-Tech Laboratories Ltd. in Kamloops.

Tabulated data for the drillholes are as follows:

1987 TWIN DRILLING

DDH #	NORTHING	EASTING	ELEV. (m)	DIP	AZM.	DEPTH (m)
TWIN 5	4+90S	76+00E	1360	-45	225°	153.9
TWIN 6	4+25S	78+75E	1395	-45	225°	160.3
TWIN 7	0+69S	69+27E	1412	-45	225°	132.9
TWIN 8	3+73S	66+96E	1382	-45	225°	111.6
TOTAL						558.7

Drill hole locations are shown in Figure 3.

5.2 Results

The purpose of the drill program was to test a series of geochemical and geophysical anomalies that approximately correspond with the interpreted strike extension of the Rea and Silver zones. Two of the holes (Twin 5 and 6) intersected a strongly sericitized zone at a mafic volcanic/clastic sediment contact that contained mineralized chert. This zone is interpreted to be the Rea Zone.

One hole (Twin 7) was drilled into soil Pb-Zn-Ag geochemical anomalies with coincident EM conductors that were interpreted to be the trace of the Silver Zone. Twin 8 intersected a dioritic intrusion and a zone of carbonate-fuchsite alteration.

Key results of each drillhole are summarized below and in cross sections (map pocket):

Twin 5: (Fig. 4)

This hole was drilled to test the lateral continuity of the Rea Horizon. A strongly developed Rea zone was present (90.9 to 124.1m); however, no significant mineralization was found. One unusual feature found in this hole was the presence of intermediate volcanics structurally below the Rea Zone. The clastic sediment package is absent.

Twin 6: (Fig. 5)

This hole was drilled to test the contact between the Rea sedimentary rocks and the mineralized horizon. In this hole, the Rea Zone (114.2 to

150.8m) is moderately well-developed. The sericitic tuff and pyritic tuff units are diluted by interbeds of black clastic material. The zone is truncated by a sharp fault at 150.8m. Hanging wall sediments were not intersected.

Twin 7: (Fig. 6)

A linear Pb-Zn-Ag geochemical anomaly over the predicted trace of the Silver Zone was the target for this hole. The hole intersected 87.2m of weakly sericitized and carbonatized mafic fragmentals and 45.7m of diorite. Country rocks at the intrusive contact are highly silicified and moderately pyritized. No significant base or precious metal values were obtained.

Twin 8: (Fig. 7)

This hole was drilled into a moderate-strength GENIE EM and strong VLF conductor associated with a zone of silica-fuchsite alteration exposed in a trench at 67+10E, 3+73S. Moderately carbonatized mafic volcanic rocks with up to 10% pyrite are present in the top 56.3m. Between 56.3 and 72.7m, rocks consist of fuchsite-bearing mafic breccia (64.0 to 72.7m) and a 10m zone of chert and heterolithic chert breccia. The remainder of the hole is in weakly sericitized mafic volcanic rocks. No anomalous values were obtained.

APPENDIX 1

DRILL LOGS

J.C. Oliver - Geologist B.Sc. 1982
M.Sc. 1985
University of British Columbia

M. Reed - Geologist - B.Sc. 1986
University of British Columbia

ML 85-6A

ESSO MINERALS CANADA
DRILL LOG

HOLE NO. Twin 5
PAGE 1 OF 11
PROJECT Twin
LOGGED BY: J. Oliver

COLLAR COORDINATES L 16E
4+90 S'
COLLAR ELEVATION 1360 m
AZIMUTH 225 DIP -45
TOTAL LENGTH 153.9 m
HORIZONTAL PROJECTION 108.8 m
VERTICAL PROJECTION 108.8 m

CONTRACTOR Atlas Drilling
CORE SIZE NQ
DATE STARTED June 30 DATE COMPLETED July 2-87
AVERAGE CORE RECOVERY 95%
PURPOSE Test of Extension (SE) of Twin 3 intersection
COMMENTS: Zone penetrated, no M.S. unusual Fold and structur

ALTERATION SCALE

absent
slight
moderate
intense

TOTAL SULPHIDE SCALE

traces only
< 1%
1% - 3%
3% - 10%
> 10%

DIP TESTS

DEPTH	DIP	AZIMUTH	DEPTH	DIP	AZIMUTH
153.9	38°				

LEGEND

SUMMARY LOG

0 - 7.9 - CASING
7.9 - 21.9 MAFIC LAPILLI PYROCLH
21.9 - 30.3 SERICITIC MAFIC ASH FL
30.3 - 44.5 PORPHYRITIC MAFIC FLOW
44.5 - 48.5 SERICITIC SILICA INJEC FAULT ZONE
48.5 - 62.2 MAFIC ASH FLOW WI LESSER LAPILLI FRAG
62.2 - 90.9 QTZ-CARB. INJECTED MAFIC VOLCANIC FLO
90.9 - 124.1 SERICITIC TUFFACEOUS C PYRITIC CHERT BRECCIAS LESSER INTERBEDDED E CLASTICS
124.1 - 126.9 PYRITIC TUFF
126.9 - 131.7 PYRITIC SILTITE
131.7 - 132.9 QUARTZ WACKES
132.9 - 138.1 PYRITIC CHERTS AND G CHERT BRECCIAS.
138.1 - 140.6 PYRITIC TUFF
140.6 - 142.6 GREY PYRITIC CHERTS
142.6 - 147.5 PYRITIC TUFF
147.5 - 147.8 FAULT
147.8 - 153.9 INTERMEDIATE LAP
153.9 E.O.H.

ML 85-6B

PAGE 2 OF 10 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
				0	7.9	CASING
						7.9 - 8.4 Lost core - overburden
				7.9	21.9	MaFic Lapilli Pyroclastic Well defined light cream oval Fragments, occupy 20% rock volume and clearly define the Fragmental origin of this unit. Carbonate and iron carbonate are the principle alteration minerals within this lightly altered mafic unit. The principle alteration assemblage is: CaC 02 - FeC 01.5, Ser < 01 Py < 01. This interval is moderately oxidized approximately 2.0 meters down from the collar. 8.4 - 13.0 Blocky core, numerous Fragments visible. Fragment elongation and primary Foliation 11.6 076° to CA. 15.8 - 19.8 Blocky broken core. 19.9 - 20.6 Minor sericitized ash fall.
						21.9
				21.9	30.3	Sericitic MAFic Ash Flow This interval is characterized by a yellow green, very fine grained mafic volcanics. The ash flows origin is suggested based on textural evidence especially prominant in the interval 21.9 - 23.1. Gently convoluted ash sized particles are noted within this interval. Carbonate (both CaC and FeC) are slightly lower within this interval and silica - sericite elevated in broad, although discontinuous zones. Pyrite remains < 1% vein. 26.2 - 26.4 Broken core. 27.3 - 28.1 Brittle Failure; Fault zone.
						30.3
				30.3	44.5	Fine to Medium Grained Porphyritic MaFic Flows. Residual chloritized amphiboles are visible within this interval. At least two Flow series are present within this section as is evidenced by the Fg to mg. contact at 34.4 These volcanics are typically very lightly altered, with alteration represented

ML 85-6C

PAGE 3 OF 10	PROJECT: Twin	HOLE NO. Twin 5

ALTERATION							TOTAL SULPHIDE	SAMPLES				ASSAYS				
Fe C	Fe C	Si	SiO_2	Chl	Tourm			FROM	TO	WIDTH	SAMPLE NUMBER	Au g/T	Ag g/T	Cu %	Pb %	Zn %
								13.2	14.7	1.5	T5-13.2			Lithos		
								13.5	15.0	1.5	T5-13.5					
								22.7	24.2		T5-22.7			Lithos		
								27.3	28.1	0.8	T5-273	0.45	0.20	0.01	0.01	0.01

ML 85-6B

PAGE 4 OF 10 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						by CaC 02, and FeC 01. Ser < 01, Py < 2%. The unit tends to be highly homogeneous with very limited late SiO_2 addition.
						34.4 Volcanic bedding to CA: 085°
						← 36.3 - 37.9 Sericitic Fault zone. Silica increased to 20% rock volume, pyrite 12-14%
						39.7 Foliation to CA 073°
						40.9 - 44.5 General increase in grain size, e.g., possible subvolcanic intrusion, especially probable in light of fault zone which flank both contacts.
						44.5
				44.5	48.5	Sericitic Silica Injected Fault Zone. Strong strain induced compositional layering, two phases of quartz injection and foliation parallel pyrite to 20% characterize this Fault zone.
						Alter: Ser 03 = FeC, Py 02.5, SiO_2 02, FeCh 01
						48.5
				48.5	62.2	Mafic Ash Flows and Lesser Lapilli Fragmentals Texturally this medium green, very lightly altered mafic unit is of interest.
						Discrete grain size stratification and ash sized fragments, typically chloritized, are common. Lapilli sized fragments, quite vaguely defined are located at the top of this interval.
						48.5 - 51.9 Stratification within this interval common, poorly defined 2.0 - 4.0cm oval Fragments noted.
						51.9 - 62.2 Stratified, light, ash flows
						54.5 Preserved ash sized fragments
						58.7 Ash Flow contact 076°
						59.6 - 60.5 Quartz injection, late, Py increases to 8%
						Addendum: Alteration within this section is very light dominated by CaC (02) and FeC 01, Py is less than 2%
						62.2

ML 85-6C

PAGE 5 OF 10 | PROJECT: Twin | HOLE NO. Twin 5

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Ca C	Mg C	Ser	SiO_2	Cal	Fuch			FROM	TO	WIDTH		Au g/T	Ag g/T	Cu %	Pb %	Zn %
								36.3	37.7	1.4	TS-36.3	0.10	0.40	0.01	0.01	0.01
								40.7	42.2		TS-40.7			LITHO		
								44.8	46.2	1.4	TS-44.8	0.30	0.30	0.01	0.01	0.01
								56.0	57.1	1.1	TS-56.0/1.1			LITHO		

ML 85-6B

PAGE 6 OF 10 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
				62.2	90.9	Quartz - Carbonate Injected MaFic Volcanic Flow(?)
						The last modifier on this rock name is some what tentative, based primarily on an increase in phenocryst size, and a decrease in stratification. The major difference, relative to the preceeding section, lies in the volume of quartz carbonate vein and amygdale material, 15-20 % rock volume. This alteration is typically NOT accompanied by sericite or pyrite and generally appears quite dry.
						The primary alteration sequence is:
						CaC 02.5 Py < 01 SiO_2 01
						FeC 01 Ser < 01
						62.2 - 64.6 Moderate sericite and Foliation parallel pyrite microveinlets near the principle contact.
						71.3 Foliation to CA 075°
						75.8 - 90.9 Gradual increase in quartz carbonate veining and sericitization.
						CaC 02.5 SiO_2 01.5, Ser 01.
						Pyrite present in reticulating microveinlets, 4-5 %.
						85.3 Foliation to CA 068°
						87.6 - 90.9 Primary fabric and overall appearance becoming increasingly chaotic CaC 03.5, SiO_2 0%, Py increases to 10% disem.
					90.9	
				90.9	124.1	Sericitic Tuffaceous Cherts, Pyritic Chert Breccias and Lesser Interbedded Black Clastics.
						The marked increase in pyrite, sericite and silica define this interval. Two principle sericitic lithologies are again noted, a pale yellow green compositionally layered sericitic tuffaceous chert and a more homogeneous pale cream grey weakly brecciated pyritic chert. Black clastics and graphitic cherts form less than 10% of this section.
						90.9 - 93.0 Black and cream chert, low sulphides QV at 92.4 - 92.7
						90.9 : Contact to CA: 081°
						93.0 - 102.0 Yellow green tuffaceous sericitic chert. Within this interval the chert component, SiO_2 laminations are subordinate 20% by volume to sericitic tuff input

ML 85-6C

PAGE 7 OF 13 | PROJECT: Twin | HOLE NO. Twin 5

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
CaC	Fld	Ser	SiO_2	CW	Fuch			FROM	TO	WIDTH		Au g/T	Ag g/T	Cu %	Pb %	Zn %
								62.2	63.4	1.2	TS 62.2	0.15	0.70	0.01	0.06	0.01
								71.0	72.5	1.5	TS-71.0			Litho		
								83.6	85.1	1.5	TS-83.6			Litho		
								89.3	90.8		TS-89.3			Litho		
								92.1	93.6	1.5	TS-92.1	1.5				

ML 85-68

PAGE 8 OF 13 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						The principle alteration sequence is Ser : 02.5, Chl<01, CaC <01, Si02 01.5, Py 01.5. Pyrite averages 10-12% disseminated and within foliation parallel microveinlets
						97.6 Well developed bx textures, depositional. Compositional layering to
						99.9 CA: 074°.
						102.0 - 104.5 Black and grey chert interbed. Sericite decreases to < 01.5,
						Pyrite slightly suppressed 6-8%
						104.5 - 114.3 Sericitic TuFFaceous chert. An identical series to 93.0 - 102.0. Core very well presented, no evidence of significant faulting
						Pyrite levels appear slightly stronger, as compared to the first interval 14-17%
						114.3 - 124.1 Pale cream homogeneous, Pyritic cherts and chert breccias.
						Sericite significantly decreases to 02, Py averages 10%. Few other alteration products.
						114.3 - 115.0 Dark grey weakly pyritic chert interbed. Broken core at 114.9.
						Note this unit has a strong sericite content which surpasses silica.
						124.1
				124.1	126.9	Pyritic TuFF.
						This intensely pyritic unit, defines the onset of what appears to be a complex structural interval, with several structural repitions and rapid changes in bedding attitude, Py uniform diss.; 20-25%
						Foliation to CA: 065°
						126.9
				126.9	131.7	Pyritic Silite
						This unit appears to be a deciviation or variation of the pyritic TuFF member. It is distinguished by the presence of well defined clasts to 1.5 cm's, eg at 127.8 and 130.3. In addition small pale cream quartz rich grains are commonly present, as are black clastic interbeds, 15% rock volume.

ML 85-6C

PAGE 9 OF 13	PROJECT: Twin	HOLE NO. Twin 5

ALTERATION							TOTAL SULPHIDE	SAMPLES				ASSAYS				
Ca C	Mg C	Ser	Si O_2	Cal	Tour			FROM	TO	WIDTH	SAMPLE NUMBER	Au gpt	Ag gpt	Cu %	Pb %	Zn %
											TS-95.0			Litho.		
								97.8	99.3	1.5	TS-97.8	0.04	<0.10	0.01	<0.01	<0.01
								100.7	102.2	1.5	TS-100.7	0.06	<0.10	0.01	<0.01	0.03
								103.5	105.0	1.5	TS-103.5	0.06	<0.10	0.01	0.01	<0.01
								106.5	108.0	1.5	TS-106.5			Litho		
								110.6	113.1		TS-110.6			Litho		
								113.5	115.0	1.5	TS-113.5					
								114.5	116.0		TS-114.5			Litho		
								118.7	120.2		TS-118.7	0.04	<0.10	<0.01	0.01	<0.01
								121.5	123.0		TS-121.5			Litho		
								124.3	125.8		TS-124.3			Litho		
								126.3	130.1	1.5	TS-126.8	0.36	<0.10	0.01	<0.01	0.01

ML 85-6B

PAGE 10 OF 13 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						131.7
				131.7	132.9	Fine Grained Quartz Wackes Although youngging directions are not available, severe changes in bedding attitudes within this unaltered sulphide deficient unit are noted: 131.8 Bed. to CA: 045° Fol. " " 070°. 132.4 Bed to CA: 010° → defines minor Fold axis Fol. to CA 068° 132.7 Bed to CA 065° Fol. to CA. 045°. 132.9 Bedding to CA: 065°
						132.9
				132.9	138.1	Pyritic Cherts and Homogeneous Grey Chert Bx's This unit is identical to the interval defined by 114.3 - 124.1. Isoclinal Fold surfaces are developed near the structural upper contact. Py averages 8-10%, sericite ↑. The structurally lower contact with the pyritic siltite appears conformable, at 030° to CA, although moderately sheared.
						138.1
				138.1	140.6	Pyritic TuFF At this location the structurally lower contact, near perpendicular to CA, implies that the section is upright Foliation to CA = 060°
						140.6
				140.6	142.6	Grey Pyritic Cherts Pyrite slightly lower within this interval, 6-8% Contact appears conformable at 065° to CA
						142.6
				143.6	147.5	Pyritic TuFF. Representative pyritic tuFF, minor Fold axis at 142.3. Trace sphalerite at 147.1 146.3 Bedding to CA: 076°
						146.3
				147.5	147.8	Contact Fault clay gouge and breccia. Pyrite to 15%, bedding contorted subparallel to CA
						147.8
						(Cont.)

ML 85-6C

PAGE 11 OF 13	PROJECT: Twin	HOLE NO. Twin 5

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Ca C	Fe C	Ser	SiO_2	Chl	Fuchs			FROM	TO	WIDTH						
											TS-126.6			Litho		
								134.1	135.6		TS-135.6			Litho		
								145.0	146.5		TS-145.0			Litho		

ML 85-6B

PAGE 12 OF 13 | PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
				147.8	153.9	Pale Grey Blue Intermediate Lapilli Volcanics. This rock is defined by: 1.) A distinctive blue grey color. 2.) A fine grained locally phenocrystic, although blurred, appearance to the matrix. The protolith may be suggested to be an intermediate ash flow with lesser lapilli sized fragments. 3. Fine quartz is not noted but Ferromag. alteration by products eg. FeC are weak. 4.) Sericite is the principle alteration mineral, OZ, followed by CaC O1. ; Ch1C01. Late stage quartz veining is rare. Pyrite occurs in relatively uniform disseminations 6-8%. 151.0 Foliation to CA: 078° 151.0 - 153.9 White carbonitized 0.75 ovals common, 5% rock volume.
					153.9	E.O.H

ML 85-6C

PAGE 13 OF 13 | PROJECT: TWIN | HOLE NO. Twin 5

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
CaCO	FeC	Ser	SiO2	Cal.	Fuch			FROM	TO	WIDTH						
								151.0	152.5		75-151.0	Litho				

ML 85-68

PAGE 12 OF 12 | PROJECT:

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION

ML 85-6A

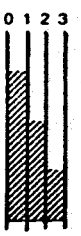
ESSO MINERALS CANADA
DRILL LOG

HOLE NO. Twin b
PAGE 1 OF 12
PROJECT Twin
LOGGED BY: J. Oliver

COLLAR COORDINATES L 78+75 E
4+25 S
COLLAR ELEVATION
AZIMUTH 225° DIP -45
TOTAL LENGTH 160.3
HORIZONTAL PROJECTION 113.3 m
VERTICAL PROJECTION 113.3 m

CONTRACTOR Atlas Drilling
CORE SIZE NQ
DATE STARTED July 2 DATE COMPLETED July 4- 87
AVERAGE CORE RECOVERY
PURPOSE On strike extension of massive Barite DDH Twin J.
COMMENTS:

ALTERATION SCALE



absent
slight
moderate
intense

TOTAL SULPHIDE SCALE

traces only
< 1%
1% - 3%
3% - 10%
> 10%

DIP TESTS

DEPTH	DIP	AZIMUTH	DEPTH	DIP	AZIMUTH
160.3	43.5°	225°			

LEGEND

SUMMARY LOG

0 - 4.9 CASING.
4.9 - 38.3 CARBONITIZED MAFIC FLOW
38.3 - 53.0 QTZ-CARB. INJECTED SERICITIZED MAFIC FLOW
53.0 - 60.2 PORPHYRITIC MAFIC FLOW
60.2 - 64.8 CARBONATE INJECTED MA FLOW.
64.8 - 102.2 PORPHYRITIC - VESICULAR MAFIC FLOWS
102.2 - 106.5 BLACK CHERT - TUFFACE SERICITIC CHERT.
106.5 - 114.2 SERICITIC PYRITIZED MAFIC FLOW
114.2 - 149.9 SERICITIC TUFFACEOUS CHERT - PYRITIC CHERT BRECCIAS LESSER BLACK CLASTICS
149.9 - 150.2 PYRITIC TUFF
150.2 - 150.6 GREY PYRITIC CHERTS
150.6 - 150.8 PYRITIC TUFF.
150.8 - 160.3 TURBIDITES, WACKES AND CONGLOMERATE

160.3 E.O.H.

ML 85-6B

PAGE 2 OF 12 | PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
				0	4.9	Casing
5				4.9	38.3	Carbonitized MaFic Flow.
		80				A very lightly altered maFic volcanic. Flow textures are poorly developed, pyroclastic features are absent. Texturally and compositionally, the rock is fine grained, with light to moderate quartz injection. CaC is disseminated
10						uniformly throughout the matrix in moderate levels. Some development of discrete rhombohedral carbonate occurs in the initial 5.0 m interval. Pseudo fragments, vague foliation parallel ovals to 5.0 cm, appear related to quartz carbonate alteration.
		100				Pyrite is exceedingly thin over this interval, < 1%.
						The principle alteration sequence is CaC 01-5, Ser <01, FeC 01,
20						SiO_2 01, Py < 01.
						4.9 - 9.3 Surface oxidation, finely disseminated rhombs of CaC. Fine grained uniform medium grained matrix not believed to be a dyke.
		100				4.9 - 5.7 lost core
						5.7 - 9.3 Pseudo Fragmental texture particularly obvious due to selective oxidation of vein selvedges.
						10.4 Foliation to CA: 076°
						17.8 - 18.1 CaC filled vesicles, possible scoriaous flow.
						Crenulation, plane 075° to CA
						38.0 Foliation to CA: 080°
40						38.3
				38.3	53.0	Carbonate-Quartz Injected Sericitized MaFic Volcanic.
						This interval is distinguished from the preceding, largely on the strength of increased carbonate compositional layering, stronger sericite, iron carbonate parting, and elevated pyrite (6-8%) content. The intensity of alteration appears to increase toward the structural lower contact, a minor deformation zone.
						Primary textures are typically obliterated by the 2.0-5.0 cm carbonate compositional layers

ML 85-6C

PAGE 3 OF 12	PROJECT: Twin	HOLE NO. Twin 6

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
CC	Fe	Si	SiO2	Ca	Fe			FROM	TO	WIDTH						
↓	↓	↓	↓	↓	↓		↓									
								18.5	20.0		T6 - 18.5			Lith		

ML 85-6B

PAGE 4 OF 12 | PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						Extensional quartz microveinlets are commonly emplaced within carbonate compositional layers. Pyrite is typically formed within selvedges which parallel the principle FeC - Sericite Foliation surface.
						Alteration CaC 03, FeC 01.5 = Ser, Py 6-8% 01.5, SiO_2 01
						48.3 - 53.0 Yellow sericite increases, residual maFic cast no longer present. Carbonitization now complete
						Trace Fuchsite, pyrite approximately consistent with preceeding interval
						50.9 Compositional layering to CA 080°.
						52.0 - 53.0 Quartz veins and bx's, Py increases to 14%, Fault zone.
						53.0
				53.0	60.2	Tectonized Porphyritic MaFic Flow - Carbonitized. The unit is characterized by its blue-green grey color, absence of carbonate compositional layers, frequent brittle Failures, without significant quartz injection, numerous highly strained 0.5-3.0 mm carbonate ovoids. Pyrite averages less than 3%
						55.8 Slightly elevated pyrite within, silicified breccia zone.
						60.2
				60.2	64.8	Carbonate Injected MaFic Flow. A similar maFic volcanic unit to that identified From 4.9 - 38.3. Late carbonate veins, Frequently discordant to Foliation, and without significant py or sericite, occupy 15% rock volume and are the principle distinguishing Feature of this unit.
						62.8 A remanent pillow rim possible.
						64.8
				64.8	102.2	Porphyritic - Vesicular MaFic Flows. This broad interval contains a highly homogeneous, Fine to medium grained maFic Flow series. Carbonate continues to dominate the alteration sequence within this borehole: CaC 03 - pervasive., FeC 01.5, Ser <01, Py <01 < 3%. Within the exception of quartz vein and minor shear zones, compositional layering is absent from

ML 85-6C

 PROJECT: Twin HOLE NO. Twin 6

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Cac	Fec	Ser	SiO_2	Chl	Fuch			FROM	TO	WIDTH		Au g/T	Ag g/T	Cu %	Pb %	Zn %
								49.0	50.5		T6-49.0			Litho		
								52.0	53.0	1.0	T6-52.0	0.09	0.60	0.02	0.05	0.03
								54.8	55.6		T6-54.8	/.8		Litho		
								55.6	57.1		T6-55.6			Litho		
as stringers																

ML 85-6B

PAGE 6 OF 12 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						this interval. The characteristic blue grey green color of the unit reflects pervasive carbonatization of the matrix. Carbonate knots and ovals may be perceived as fragments, but these structures lack any of the internal heterogeneity which characterize most of the previously identified pyroclastics in this area.
						68.4 - 73.5 Increase in quartz veining, sericitization. Trace GI noted with Q.V.'s.
						Carbonate knots to 1.5 cm, oval, common within this interval.
						74.2 Foliation to CA: 075°
						77.1 - 77.9 Quartz Vein, trace GI-Zn.
						80.4 Late dry failure, 10° to CA.
						80.9 - 82.2 Fault zone.
						81.6 - 82.0 Quartz veins carry tetrahedrite, gl, lemon sphalerite, and py. GI 2%, Tota S. 5% Sph. 3%
						83.6 - 89.1 Density of CaC amygdales increase, 60% rock volume.
						98.1 - 102.2 Disseminated Py slightly increases, 6-8%. Carbonate very pervasive at 03.5. Amygdale
						size decreases, possible fragments at 98.5
						101.0 Foliation to CA: 074°.
						102.2
				102.2	106.5	Black Chert - TuFFaceous Sericitic Chert
						A Fault chert - and sericitic chert horizon. The unit is texturally quite similar to the main Rea Horizon, and may be a Failed precursor to the main zone.
						102.2 - 104.5: Sericitic tuFFaceous chert, and grey black compositionally layered chert. Py to 15%
						104.5 - 105.5 Black chert, heavily Faulted From 104.9 - 105.5.
105						105.5 - 106.5 TuFFaceous sericitic chert.
						106.5
				106.5	114.2	Sericitic Pyritized Mafic Flow.
						Elevated pyrite, and silica characterize the immediate Footwall volcanics to the Rea Zone. Carbonate remains the principle alteration product.

ML 85-6C

PAGE 7 OF 12 | PROJECT: Twin | HOLE NO. Twin 6

ALTERATION							SAMPLES				ASSAYS				
Cac	Fe c	Ser	SiO_2	Chl	Fuch	TOTAL SULPHIDE	FROM	TO	WIDTH	SAMPLE NUMBER	Au g/t	Ag g/t	Cu %	Pb %	Zn %
							71.0	71.5	0.5	TG-71.0	0.13	1.00	0.02	0.09	0.14
							72.5	73.4	0.9	TG-72.5	0.13	1.10	0.02	0.11	0.18
							75.3	76.8		TG-75.3			Litho		
							77.1	77.9	0.8	TG-77.1	0.09	0.30	0.02	0.07	0.08
							81.6	82.2	0.6	TG-81.6	0.40	2.20	0.02	0.23	0.27
							102.5	104.0	1.5	TG-102.5			Litho		
							105.6	107.1	1.5	TG-105.6	0.06	<0.10	0.06	0.05	0.19

ML 85-68

PAGE 8 OF 12 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						Moderate (01.5) chlorite alteration is noted over the last 1.0 m interval of this hole. Pyrite averages 12-13%, usually as selvedges to reticular quartz carbonate veinlets.
						110.1 Foliation to CA: 075°
						113.7 Bedding to CA: 077° minor 5.0 cm chert band, ribbons to 1.0 cm, Py selvedges.
115						114.2
				114.2	149.9	Sericitic Tuffaceous Chert - Pyritic Chert Breccias Lesser Black Clastics.
						Over this interval the Rea Horizon is exceptionally well developed. The characteristic depositional sulphide rich chert breccias are again noted. The three stratigraphic components identified in Twin Three are again present:
						1.) Sericitic Tuffaceous Cherts.
						2.) Failed Sediment - Quartz Wacke.
						3.) Pyritic - Grey Homogeneous cherts and Breccias.
						In detail:
						114.2 - 132.2 Tuffaceous Sericitic Cherts.
						Striking yellow cream laminations, strong sericite (03) and foliation parallel and discordant pyritic microveinlets.
						114.5 - 114.9 Minor Fault.
						115.9 - 116.2 " "
						114.2 - 118.0 Significant Fine grained clastic input, including lithic fragments, 10% or volume.
						122.0 - 122.7 Minor Fault.
						122.8 - 127.8 Classy depositional chert breccias, pyrite rich matrix to 20. Breccia is heterolithic, lithic clastic fragments, chert pebbles, and sericitized volcanic chips.
						128.0 - 128.8 Minor Fault.
						128.8 Superb sulphide sericite bedding features 050° to CA.
						130.2 - 131.0 Partial failure minor gouge.
						131.0 - 132.2 Interbedded sericitic cherts (30%) and pyritic black clastics.

ML 85-6C

PAGE 9 OF 12 | PROJECT: Twin | HOLE NO. Twin 6

ALTERATION							TOTAL SULPHIDE	SAMPLES				ASSAYS				
c.c	Fac	Ser	Sil	Chl	Fuch			FROM	TO	WIDTH	SAMPLE NUMBER	Au g/t	Ag g/t	Cu %	Pb %	Zn %
								110.5	112.0	1.5	T6-110.5			Litho		
								114.2	115.6		T6-114.2			Litho		
								118.1	119.6		T6-119.6			Litho		
								121.1	122.6		T6-121.1			Litho		
								123.6	125.1	1.5	T6-123.6	0.17	0.50	0.01	0.01	<0.01
								125.1	126.6	1.5	T6-125.1	0.09	0.50	0.01	0.01	<0.01
								128.0	129.3	1.3	T6-128.0	0.15	0.30	0.01	0.01	<0.01

ML 85-6B

PAGE 10 OF 12 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
				132.		132.0 - 134.7 Tuffaceous Fine Grained wackes and Pyritic Siltites. This short interval represents a volcanic hiatus. Sulphide content, decreases to < 3% within extremely Fine grained wackes or tuffs to more than 30% in the pyritic siltite member.
						134.7 - 135.0 Minor Fault.
						135.0 - 138.5 Pyritic chlorite Altered Che Well defined washes of blue black chlorite is the principle alteration component in this area. Chlorite (02.5 Py 15%, generally coarser grained than noted in sericitic members. Silica low, secondary to sericite.
						138.5 - 142.2 Sericitic Tuffaceous Cherts and Lesser Interbedded Black Clastics (Si - Pyrite averages 15-18% Ser(03), Silica (02) Py (02) Cac < 01
						140.8 Foliation to CA: 065°
						142.2 - 149.9 Pale Grey - green homogeneous Pyritic Cherts and Chert Breccias Py averages 10%, disseminated, occassionally rimmed by by a dark low reflectance sulphide possibley teto.
						149.9
				149.9	150.2	Pyritic Tuff. This component of the stratigraphy is exceedingly thin. Traces of GI are noted at the structural upper contact.
						150.2
150				150.2	150.6	Grey - Pyritic Homogeneous Cherts. Py has reduced to less than 5%. Significant secondary silica may be in placed. Upper and lower contacts appear conformable.
						150.
				150.6	150.8	Pyritic Tuff. This short tuff interval is truncated by a knife edge Fault at 150.8. Fragment rotation r orientation across this Fault implies movement
						150.8 Fault to CA: 055°

ML 85-6C

PAGE 10 OF 12	PROJECT: Twins	HOLE NO. Twin 6

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Ca C	Fe C	Ser	Silica	Chl	Fuch			FROM	TO	WIDTH		Au g/t	Ag g/t	Cu %	Pb %	Zn %
								132.4	133.9	1.5	T6-132.4	0.53	<0.10	0.01	0.01	0.03
								135.1	136.5	1.4	T6-135.1	0.04	<0.10	0.01	0.02	0.02
								136.5	138.0		T6-136.5			Litho		
								140.7	142.2	1.5	T6-140.7			Litho		
								143.8	149.5	1.5	T6 143.8	0.12	0.20	0.01	0.01	0.04
								146.60	148.1	1.5	T6-146.6			LITHO		
								149.5	150.2	0.7	T6 149.5	0.54	10.90	0.03	0.16	0.21

ML 85-6B

PAGE 11 OF 12 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						150.8
				150.8	160.3	Rea Sediments Interbedded Turbidites, Quartz Wackes and Heterolithic Conglomerates. The Fine grained clastics and well bedded turbidites define the hanging wall stratigraphy. Coarse grained conglomerates are also noted within this interval. Sediments are typically quartz rich.
						150.9 Sulphide lamination to CA 030°, parallels bedding.
						150.9 - 153.6 Fine grained turbidites and black clastics.
						153.7 Beautiful graded bed, down hole younging. Bedding to CA: 058°
						153.7 - 160.0 Turbidites.
						160.4 - 160.3 Heterolithic conglomerate.
						160.3
				160.3	EOH	

ML 85-6C

PAGE 12 OF 12 | PROJECT: Twin | HOLE NO. Twin b

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Calc	Fe C	Sil	Silica	Chl	Feld			FROM	TO	WIDTH						
								155.1	156.6		T6-155.1			Litho	V	

ML 85-6B

PAGE	OF	PROJECT:

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION

ML 85-6A

ESSO MINERALS CANADA
DRILL LOG

HOLE NO. Twin 7
PAGE 1 OF 2
PROJECT Twin
LOGGED BY: J. Oliver

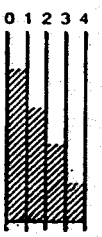
COLLAR COORDINATES L 69+27 E
0+69 S
COLLAR ELEVATION
AZIMUTH 225 DIP -45°
TOTAL LENGTH 132.9 m
HORIZONTAL PROJECTION 94 m
VERTICAL PROJECTION 94 m

CONTRACTOR
CORE SIZE NQ
DATE STARTED July 10 DATE COMPLETED July 12
AVERAGE CORE RECOVERY 95%
PURPOSE Test of an strike geochemistry Ag zone
COMMENTS:

ALTERATION SCALE

absent
slight
moderate
intense

TOTAL SULPHIDE SCALE



traces only
< 1%
1% - 3%
3% - 10%
> 10%

DIP TESTS

DEPTH	DIP	AZIMUTH	DEPTH	DIP	AZIMUTH

LEGEND

SUMMARY LOG

0 - 3.7 Casing
3.7 - 25.9 Carbonitized Mafic Flow + Pillowed Series.
25.9 - 73.4 Mafic Lapilli Pyroclastics.
73.4 - 87.2 Sericitized Mafic Lapilli Pyroclastics.
87.2 - 117.5 Dioritic Intrusion, Internal Contact Aureole.
117.5 - 132.9 Diorite.
132.9 EOH.

ML 85-6B

PAGE 2 OF 12 | PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
				0	3.7	CASING
				3.7	25.9	Carbonitized MaFic Flow and Pillowed Series The medium to dark green color, highly homogeneous matrix and well preserved chloritic pillow rims define this unit. Alteration within this Flow is extremely limited. Pervasive regional carbonitizatio and discordant carbonate veins are the principle alteration Forms within this unit. Sericite is virtually non existant and Py is present in trace quantities only. The principle assemblage becomes: Py <01, SiO_2 <01, CaC 03, FeC <01 Ser <01 12.4 Foliation to CA: 072° 21.3-21.5 Exception pillow margin and neck structure. Rim to CA: 080° 25.5-25.9 Flow top breccia, weak sericitization, Silica oz 25.9
				25.9	42.5	MaFic Lapilli Pyroclastics Widespread pale green cream medium grained oval pyroclastic Fragments characterize this interval. Fragment boundaries are well defined, and Frequently irregular, the pyroclastic peralite of this unit is obvious and clearcut. No change in the alteration assemblage is noted From the First unit, pervasive carbonitization, vigorous HCl responses, and discordant carbonate veinlets domina te the assemblage. Sulphides, including pyrite, are conspicous only by their absence. 27.5-28.5 Elevated Ser (al) Silica (oz) and Py 5-6%, possible autobreccia 33.3-34.4 Interbedded Flow sequence 38.7 Foliation to CA: 088° 40.0-42.5 Quartz Cal veining, (oz), sericite development 01.5, Py 7-8%, assymetric alteration extending From upper contact.

ML 85-6C

PAGE 3 OF 12 | PROJECT: Twin | HOLE NO. Twin 7

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Calc	Fe	Ser	SiO_2	Chl	Fuch			FROM	TO	WIDTH		Au g/T	Ag g/T	Cu %	Pb %	Zn %
								12.1	13.6	1.5	T7-12.1	1.5		Lithos		
								27.5	28.5	1.0	T7-27.5	0.04	<0.10	<0.01	<0.01	0.01
								40.0	40.9	0.9	T7-40.0	0.04	<0.10	0.01	<0.01	<0.01
								40.9	42.4	1.5	T7-40.9	0.08	<0.10	0.01	<0.01	0.01

ML 85-6B

PAGE 4 OF 12 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						42.5 Foliation to CA: 079°.
						43.5
				42.5	73.4	Mafic Lapilli Pyroclastics and Lesser Interbedded Flows.
						This sequence is virtually identical to the preceeding pyroclastic series. A qualitative judgment on the amount of Flow material, particularly in the central portions of this warrant the distinction. Abundant medium grained lapilli Fragmentals are Frequent, occupy 30 % rock volume and are only weakly altered. Carbonates continue as the dominant alteration mineral, 0.3 Pyrite has very slightly increased, to 1-2 %, disseminated only.
						43.9 Well defined 1.0 x 2.5 cm oval Fragments.
						46.8 - 47.5 Well sericite envelope embraces deformed quartz veins.
						47.5 - 56.0 Fragments poorly defined in this zone, chloritic rims common, pillow buds? Possible Flow component.
						56.2 Slightly blurred pyroclastic Fragments.
						56.3 - 64.7 Yellow green Fragments ubiquitous; representative crowded medium grained lapilli pyroclastic.
						62.9 Foliation to CA: 083°. Foliation parallels tectonic elongation of Fragments.
						64.7 - 66.3 Fine grained homogeneous Flow series. Flow contact to CA: 086°.
						66.3 - 73.4 Mafic pyroclastic, lesser Flow component.
						73.4
				73.4	87.2	Sericitized Mafic Lapilli Pyroclastic. The pronounced alteration of this unit appears to be directly related to a major intrusive contact. At the upper contact, 73.4 m's, yellow Fragments are preferentially altered and are outstanding displayed against a dark chlorite rich matrix. By 74.4 m's

ML 85-6C

PAGE 5 OF 12	PROJECT: Twin	HOLE NO. Twin 7

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Qtz	Fe c	ser	Si O2	Chl	Fe. h			FROM	TO	WIDTH						
								52.8	54.3	1.5	T7-52.8/1.5			Litho		
								71.4	72.9		T7-71.4/1.5			Litho		

ML 85-6B

PAGE 6 OF 12 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						both matrix and fragments are completely replaced by sericite, carbonate, and silica. This alteration and increase in net sulphides strengthens toward the bottom contact. This trend in alteration is one of the criteria used to delineate a generally poorly defined intrusive volcanic contact. The alteration assemblage within this interval is characterized by SiO_2 (oz.), Ser (01.5) CaC oz.5 Py (oz) - 8-10%, Fuch (01) Highest Py levels coincide directly with zones of elevated silica
						73.4 - 74.4 Distinctive preferentially altered pyroclastics.
						74.4 - 78.1 Very homogeneous carbonate, carbonate, > silica, no compositional layers.
						78.1 - 79.0 Carbonate decreases relative to silica and pyrite. Gl + Tetra associated with a 20 cm carbonate quartz vein, strongest at 78.3, Ag 20.25 oz/T, Gl < 2%. Au potential? Note stockwork development limited.
						79.0 - 80.8 Carbonate alteration, pervasive and uniform, 5.0 cm quartz vein at 79.7 carries clotted chalco, 0.5%
						80.8 - 81.9 Elevated diss Py, SiO_2 as an interstial matrix component, tetra identified at 80.9 - 81.2.
						81.9 - 82.8 Carbonate quartz veining may carry a barite salvage. Gl - Tetra trace levels.
						82.8 - 87.2 Well defined quartz carbonate compositional layering, carbonate 03, SiO_2 oz.5, Py 10% oz, Fuch 01 Ser 01.5. Density of discordant quartz carbonate veins low.
						87.2

ML 85-6C

PAGE 7 OF 12 | PROJECT: Twin | HOLE NO. 7

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Calc	Hem	Sol	Sil	Chl	Fuch			FROM	TO	WIDTH		Au g/t	Ag g/t	Cu %	Pb %	Zn %
								77.1	78.1	1.0	T7-77.1	0.29	<0.10	<0.01	<0.01	0.01
								78.1	79.0	0.2	T7-78.1	0.10	<0.10	0.02	0.14	0.21
								79.0	80.0	1.0	T7-79.0	0.23	<0.10	0.02	<0.01	0.01
								80.0	80.8	0.8	T7-80.0	0.23	<0.10	0.04	0.02	0.14
								80.8	81.9	1.1	T7-80.8	0.04	<0.10	<0.01	<0.01	0.01
								81.9	82.8	0.9	T7-81.9	0.03	<0.10	0.01	0.01	0.02
								82.8	84.1	1.3	T7-82.8	<0.03	<0.10	0.02	<0.01	0.01
								84.1	85.6	1.5	T7-84.1	0.15	<0.10	0.01	0.02	0.01
								85.6	87.0	1.4	T7-85.6	0.12	<0.10	0.01	<0.01	0.01

ML 85-6B

PAGE 8 OF 12 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
				87.2	117.5	Dioritic Intrusion - Internal Sericitic - Carbonate. Contact Aureole.
						This unit is discriminated from the enclosing volcanic rocks by its extremely fine grained texture, remnant phenocrysts, usually carbonitized, by local residual chlorite Sericite carbonate alteration diminishes gradually toward the less altered core of this significant intrusive body. Asymetric quartz veining and silicification may also be of use in localizing the structural upper contact of this unit. Relative to the external contact aureole, pyrite content is significantly reduced, averaging 5%. The principle assemblage is Cal 03, Ser 02 FeC 01 Fuch < 01 SiO_2 01.5
						Alteration is somewhat patchy and not uniformly diminishing toward the lower contact.
						87.2 - 93.0 Strong yellow cream pervasive carbonate, very fine grained matrix with limited Fuchsite.
						88.7 Foliation to CA 084°
						93.0 - 96.0 Pale yellows green, slightly less altered area, m.g. to c.g. carbonate porphyroblastic after Feldspar?.
						96.3 - 96.8 Discordant quartz carbonate vein, c.g. Py 3%, well developed crack and seal textures
						99.4 Minor fault
						100.7 - 101.3 Quartz vein, well developed bx and wall rock inclusions, Py 8%
						101.6 - 102.6 Dusy appearing, low net sulphide content < 1% quartz veins.
						103.2 - 105.8 Intrusive textures, c.g. matrix becoming more apparent. Matrix CE increases, carbonate slightly decreases.
						105.8 - 107.0 Large quartz vein and breccia zone. Chlorite as inclusions, no evidence of fetmhed.

ML 85-6C

PAGE 9 OF 12	PROJECT: Twin	HOLE NO. Twin 7

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Ca C	Fe C	Sil	SiO_2	Ca/	Fe-Ca			FROM	TO	WIDTH		Au gA	Ag gA	Cu %	Pb %	Zn %
								88.4	89.8		T7-88.4	1.4		Litho		
								89.8	91.3		T7-89.8	1.4		Litho		
								95.5	96.3	0.8	T7-95.5	0.53	<0.10	0.01	<0.01	<0.01
								96.3	96.8	0.5	T7-96.3	0.10	<0.10	0.01	<0.01	0.01
								96.8	98.4	1.6	T7-96.8	0.09	<0.10	0.01	<0.01	0.01
								99.8	100.7	.9	T7-99.8	<0.03	<0.10	0.01	<0.01	0.01
								100.7	101.3	.6	T7-100.7	<0.03	<0.10	<0.01	<0.01	0.01
								101.7	102.7	1.0	T7101.7	<0.03	<0.10	<0.01	<0.01	0.02
								104.3	105.8	1.5	T7-104.3	<0.03	<0.10	<0.01	<0.01	0.03
								105.8	107.0	1.2	T7-105.8	0.09	<0.10	<0.01	<0.01	0.01
								107.0	108.5	1.5	T7107.0	0.08	<0.10	<0.01	<0.01	0.01

ML 85-6B

PAGE 10 OF 12 PROJECT: Twin

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						107.0 – 117.5 Alteration becoming increasingly patchy, density of Quartz veining significantly decreases. 107.1 Foliation to CA: 081° Note within this interval Py decreases to less than 2 %.
					117.5	
				117.5	132.9	Diorite and Metasomatized Diorite. This intrusive unit with this interval displays exceptionally well defined textural features indicating bulk composition change towards the intrusive contact. The interval may be subdivided:
						117.5 – 123.7 Carbonitized Medium Grained Diorite. The unit is pale grey with pervasive carbonate (QZ) but low sulphides Py < 3% < 01, low sericitic and Fe Ox 01. The intrusive interpretation requires carbonate is pseudomorphic after primary phenocrysts.
						123.7 – 132.9 Striped Metasomatized Diorite. Well defined chloritic laminations are produced by a decrease in carbonate within these 2.0 – 4.0 cm layers. Texturally these laminations are inferred to reflect a change in composition and not primary features.
						Check litho series for this change. ← Note, striping, decreases down hole and grain size increases. The CI increases, color becomes more uniform and residual feldspars may be indentified eg: 130.0
						132.1 Foliation to CA: 085°
					132.9	
				132.9	EOH	

ML 85-6C

PAGE 11 OF 12 | PROJECT: Twin | HOLE NO. Twin 7

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
CaC	FeC	Ser	SiO_2	Chl	Fuch			FROM	TO	WIDTH						
								118.7	120.2	1.5	T7-118.7/1.5			Litho		
								126.3	127.8	1.5	T7-126.3/1.5			Litho		
								130.5	132.0	1.5	T7 130.5			Litho		

ML 85-68

PAGE	OF	PROJECT:

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION

ML 85-6A

ESSO MINERALS CANADA
DRILL LOG

HOLE NO. TWIN 8
PAGE 1 OF 12
PROJECT TWIN
LOGGED BY: M. REED

COLLAR COORDINATES L 66+96 E
3+73 S
COLLAR ELEVATION
AZIMUTH 225° DIP -45°
TOTAL LENGTH 111.6 m
HORIZONTAL PROJECTION 78.9
VERTICAL PROJECTION 78.9 m

CONTRACTOR ATLAS DRILLING CORE SIZE NQ
DATE STARTED JULY 15 DATE COMPLETED JULY 16, 1987
AVERAGE CORE RECOVERY

PURPOSE Test of strong alteration zone, VLF conductor and favorable strike extensions to the Ag zone Twin property.
COMMENTS:

ALTERATION SCALE

absent
slight
moderate
intense

TOTAL SULPHIDE SCALE

traces only
< 1%
1% - 3%
3% - 10%
> 10%

DIP TESTS

DEPTH	DIP	AZIMUTH	DEPTH	DIP	AZIMUTH
111.6	40°				

LEGEND

SUMMARY LOG

ML 85-6B

PAGE 2 OF 13 | PROJECT: TWIN

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
				0	4.3	CASING.
5				4.3	12.5	OXIDIZED, LEAN MAFIC LAPILLI PYROCLASTIC THIS INTERVAL IS DARK GREEN IN COLOR AND IS CHARACTERIZED BY STRONG OXIDIZING EFFECTS. PERVASIVE CaC (02.5) IS SEEN AS PORPHYROBLASTIC AMYGDULES THROUGHOUT THE SECTION - SOME DISCRETE RHOMBS NOTED. STRONG REGIONAL CHLORITE (03) IS NOTED (8.1 - 12.5). SILICIFICATION IS ALSO PRESENT IN THE FORM OF DISCORDANT QZ VEINS (02). FROM 4.3 - 12.5 THE ROCK HAS A BLEACHED APPEARANCE & IS SLIGHTL
10						SERICITIZED (0.5). ANKERITIC STAINING IS PERVASIVE AND IS FOUND IN CONJUNCTION W/ QZ VEINLETS VERY WEAK SULPHIDES (PY < 1 %) AS DISSEMINATIO LAPILLI ARE SEEN AS GHOSTS AND HAVE THE SAME ALTERATION AS THE REST OF THE ROCK.
						10.1 FOLIATION TO CA: 065°
				12.5	34.6	SILICIFIED MAFIC FLOW & LESSER LAPILLI PYROCLASTIC THIS INTERVAL IS A PALE GREEN TO CREAM GREEN COLOR - MARKEDLY DIFFERENT THAN
15						THE PRECEEDING INTERVAL. THE ROCK IS UNIFORMLY FINE GRAINED BUT SHOWS INCREASE IN GRAIN SIZE AS A FAULT IS APPROACHED ALTERATION IS DOMINATED BY FINE GRAINED SILICIFICATION (02.5) AND DISCORDANT, FAULT RELATED QUARTZ VEINING. CARBONITIZATION IS MUCH
						WEAKER (01) AND IS CONFINED TO FINE GRAINED PERVASIVE ALTERATION OF THE MATRIX. ANKERITIC ALTERATION SEEMS TO BE WHOLEY LACKING IN
20						THIS INTERVAL. SERICITE HAS INCREASED TO (01.5) BUT IS CONFINED TO FOLIATION SURFAC AND WISPS WITHIN THE LAPILLI. CHLORITE APPEARS TO BE ABSENT AND ONLY THE OCCASIONAL FUCHSITE (0.5) FLAKE IS NOTED. SULPHIDE DEVELOPMENT IS VERY POOR WITH PY >> 1 % AND OCCURRING AS DISSEMINATIO
						AND THIN VEINS 17.0 - 17.1 MINOR FAULT 21.6 - 22.8 FAULT - UPPER CONTACT IS MARKED BY INCREASE IN SERICITIZATION AND AN 2.5 cm WIDE QZ VEIN. PY↑ CaC↓
25						

ML 85-6C

PAGE 3 OF 13 | PROJECT: TWIN | HOLE NO. TWIN 8

ALTERATION							TOTAL SULPHIDE	SAMPLES				ASSAYS				
Cac	FeC	Ser	SiO_2	Chl	Fuch			FROM	TO	WIDTH	SAMPLE NUMBER					
								21.2	22.7	1.5	TD-21.2/1.5			LITHO		

ML 85-6B

PAGE 4 OF 13 PROJECT: TWIN

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						26.0 - 27.3 FAULT - MARKED BY GOUGE & FAULT RELATED QZ VEINING PY, DISRUPTED FABRIC.
						27.35 FOLIATION TO CA: 063°
						27.5 - 28.4 QZ VEING ACCOMPANIED BY INCREASES IN BOTH PY TO 6-8% & SER (QZ)
						29.8 - 30.3 DISCORDANT QZ VEINING, PY 6-8%
						E.G PASSES QZ VEIN - VOLCANIC CONTACT 042° TO CA
						30.3 - 3: STRONG SERICITE
						32.9 - 33.05 HIGHLY SILICIFIED TECTONIC BRECCIA
				34.6	56.3	QUARTZ ALTERED - SULPHIDE RICH MAFIC (?) VOLCANIC FLO
						THE PROTOLITH OF THIS INTERVAL IS QUESTIONABLE. OVER MOST OF ITS LENTH THE ROCK IS A BLUE - GREY COLOR AND IS GENERALLY FINE GRAINED ALTHOUGH SOME COARSENING &/O BRECCIATION IS APPARENT. THE INTERVAL IS DISTINGUISHED BY THE NUMEROUS CROSS-CUTTING QZ VEINS & VEINLETS AND ABUNDANT SULPHIDES.
						PYRITE IS PRESENT IN ELEVATED AMOUNTS, (10-12% OVER THE INTERVAL) MASSIVE & SEMI-MASS IN SOME LOCATIONS. CHALCOPYRITE (1%), TETRAHED (1%) & GALENA (1%) OCCUR AS BLEBS & DISSEMINATIONS WITHIN QZ VEINS.
						ALTERATION IS DOMINATED BY SiO_2 (03 DUE TO QZ VEINING. FeC IS V. WEAK (0.5) & CaC VERY WEAK (0.5). SERICITE OCCURS IN MODERATE AMOUNTS (01.5) ALONG FOLIATION SURFACES. CHLORITE IS ABSENT & ONLY VERY WEAK FUCHSITE (0.5) IS NOTED.
						34.8 - 35.5 QZ VEIN
						38.4 - 38.8 FAULT - GOUGE, ROTATED FABRIC
						41.3 - 41.4 QZ VEIN
						42.2 - 42.4 STRINGER QZ VEINING PY → 15%
						44.0 - 44.1 QZ VEINING PY → 15%
						46.65 - 47.0 PY TO 20% SOME BRECCIATION
						52.25 - 54.0 STOCKWORK TYPE VEINING

ML 85-6C

PAGE 5 OF 13 | PROJECT: TWIN | HOLE NO. TWIN 8

ALTERATION							SAMPLES				ASSAYS				
CaC	FeC	Ser	Sic	Chl	Ricm	TOTAL SULPHIDE	FROM	TO	WIDTH	SAMPLE NUMBER	Au g/T	Ag g/T	Cu %	Pb %	Zn %
							30.2	31.7	1.5	TB 30.2/1.5			LITHO		
							39.4	40.9	1.5	TB 39.4/1.5			LITHO		
							42.2	43.7	1.5	TB 42.2/1.5			LITHO		
							46.45	47.9	1.45	TB 46.45/1.45			LITHO		
							53.3	53.7	0.4	TB 53.3/04	0.05	<0.10	0.01	<0.01	0.01

ML 85-6B

PAGE 6 OF 13 | PROJECT: TWIN

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
53						54.0 - 56.3 QUARTZ VEIN - THIS VEIN CONTAINS THE BULK OF THE SX'S
						54.5 MASSIVE Sx - PY, TT(?) (5 cm
55						54.8-55.1 SEMI-MASSIVE Sx (PY)
						554-56.3 SEMI MASSIVE SX'S INCLUDING GALENA
				56.3	64.0	MAFIC VOLCANIC LAPILLI PYROCLASTIC
						THIS IS A MODERATELY WELL ALTERED PALE CREAMY-GREEN ROCK. FRAGMENTS ARE
						ABOUT 1.0 IX 1-4 CM IN SIZE AND MAKE UP BETWEEN 30 - 40 % OF THE ROCK BY VOLUME.
						ALTERATION IS CaC (01), FeC (01.5), Ser (0.5), SiO_2 (01).
60						SULPHIDE DEVELOPMENT IS VERY POOR PY < 1% OCCURING AS FINE GRAINED (1 m
						EUHEDRAL DISSEMINATIONS ACROSS THE INTERVAL.
						58.3 MINOR FAILURE WITH GRAPHITIC PART
						59.0-59.2 MINOR FAULT - QZ VEIN + GRAPHITE
						59.7 FOLIATION TO CA : 075°
						61.0-62.8 PALE YELLOW-CREAM DISTINCT FRAGMENTS
						63.0 KNIFE EDGE MICROFAULT — NOTE FABRIC DISRUPTION!
65						
				64.0	72.7	SILICIFIED, FUCHSITIC BRECCIA
						THE MOST STRIKING ASPECT OF THIS INTERVAL IS THE SUDDEN, SPECTACULAR DEVELOPMENT OF FUCHSITE (03) WHICH MAKES UP ~5% OF THE ROCK BY VOLUME.
						THE FUCHSITE OCCURS IN FOLIATION PARALLEL AND BIFURCATING SURFACES ALONG WITH WEAK SERICITE (01). CaC OCCURS AS WEAK (01) FINE GRAINED PERVASIVE ALTERATION.
						SULPHIDE DEVELOPMENT IS SIGNIFICANTLY STRENGTHENED IN THIS INTERVAL (PY 8-10 %) ALSO OCCURING AS FINE GRAIN EUHEDRAL FOLIATION PARALLEL VEINLETS AND DISSEMINATIONS ACROSS THE INTERVA
						THE ROCK IS A DULL GREY COLOR, FINE GRAINED & BRECCIATED ACROSS ITS LE & IS STRONGLY SILICIFIED.
						64.0 - 64.2 QZ VEIN - BARREN
70						65.8 - 65.4 QZ VEIN - BARREN

ML 85-6C

PAGE 7 OF 13 | PROJECT: TWIN | HOLE NO. TWIN 8

ALTERATION							TOTAL SULPHIDE	SAMPLES				ASSAYS				
CaC	FeC	Ser	SiO_2	Chl	FeCh			FROM	TO	WIDTH	SAMPLE NUMBER	Au g/T	Ag g/T	Cu %	Pb %	Zn %
								53.7	55.2	1.5	TB 53.7/1.5	0.07	<0.10	0.03	0.03	0.02
								55.2	56.5	1.3	TB 55.2/1.3	0.17	20.2	0.28	2.23	1.61
								60.9	62.4	1.5	TB 60.9/1.5			LITHO		
								66.6	68.1	1.5	TB-66.6/1.5			LITHO		

ML 85-6B

PAGE 8 OF 13 | PROJECT: TWIN

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
70						66.7 - 68.0 QZ VEIN - ORIENTATION TO CA: 037°
						68.4 FOLIATION TO CA: 065°
						71.9 - 72.5 10 CM LOST CORE
72						NOTE: WHILE THIS UNIT IS PROXIMAL TO THE "HORIZON" ALTERATION IN THIS INTERVAL IS MOST LIKELY
73						DUE TO STOCKWORK LIKE QZ VEINING
				72.7	74.7	SERICITIC MAFIC VOLCANIC FLOW
						A THIN, WEAK TO MODERATELY WELL ALTERED UNIT. Ser (01.5), CaC (01.5), FeC (01) Py 2-3 %
75						MINOR FAULTS & GOUGE AT 74.3 & 74.7
						72.7 - 73.2 50 CM LOST CORE
				74.7	84.4	PYRITIC, TUFFACEOUS CHERT BRECCIA
						THIS INTERVAL REPRESENTS THE Ag-HORIZON. THE INTERVAL EXHIBITS THREE VARIATIONS AS FOLLOWS:
						① → 74.7 - 76.6 BOTH GREY AND BLACK CHERT BRECCIA FRAGMENTS OCCUR IN THIS INTERVAL. CREAM COLORED SERICITIC FRAGMENTS ARE ALSO NOTED. Ser (01.5), CaC (0.5), FeC (0.5) SULPHIDES MODERATE (Py 2-3 %)
						② → 76.6 - 79.0 SEMI MASSIVE Py (30 - 40 %) WITHIN THE INTERVAL. ALTERATION REMAINS THE SAME WITH THE ADDITION OF WEAK FUCH (0.5). SOME (1-2 %) FINE GRAINED BLACK CLASTICS ARE INTRODUCED.
						SERICITE DEVELOPMENT IN LAST 80 CM OF INTERVAL INCREASES WHILE SULPHIDES DECREASE
						③ → 79.0 - 83.9 GREY CHERT BRECCIA. SULPHIDE CONTENT DROPS SIGNIFICANTLY (Py 6-8 %) AND BECOMES BLOTCHY. BLACK CHERT FRAGMENTS ARE ALSO LOST.
80						82.0 - 82.2 MINOR FAULT
						83.0 - 83.8 30 CM LOST CORE
						84.0 - 84.4 MINOR FAULT + GRAPHITE
83						

ML 85-6C

PAGE 9 OF 13 | PROJECT: TWIN | HOLE NO. TWIN 8

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
Ca C	Fe C	Ser	SiO_2	Chl	Fuch			FROM	TO	WIDTH		Au g/t	Ag g/t	Cu %	Pb %	Zn %
								75.3	76.8	1.5	78 75.3/1.5			LITHO		
								76.8	78.3	1.5	78 76.8/1.5	0.37	2.00	0.01	0.03	0.02
								78.3	79.8	1.5	78 78.3/1.5	0.06	<0.10	0.01	0.01	0.03
								81.2	82.7	1.5	78 81.2/1.5			LITHO		

ML 85-6B

PAGE 10 OF 13 | PROJECT: TWIN

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
84				84.4	93.1	WEAKLY SERICITIZED MAFIC FLOW NOTE THE RETURN OF RELATIVELY UNALTERED STRATIGRAPHIC FOOTWALL VOLCANICS → NO H.W. SEDIMENTS! THE ROCK ACROSS THIS INTERVAL IS PALE YELLOW-CREAM, FINE GRAINED AND VERY HOMOGENEOUS. THE INTERVAL IS INTERUPTED BY SEVERAL DISCORDANT QZ-CARB VEINS SOME OF WHICH ARE VUGGY — NO SULPHIDES NOTED. ALTERATION CONSISTS OF WEAK TO MODERATE WISPY, FOLIATION PARALLEL FeC (01.5) & SER (01.5). FINE GRAINED PERVASIVE CaC IS WEAK (0.5). DISSEMINATED PY 2-3%. 84.4-84.7 MINOR FAULT 85.0 FOLIATION TO C/L: 070° 85.2-85.4 MINOR FAULT 86.4-86.8 SMALL (1×2mm) CaC AMYGDULES 90.1 PY 6-8% IN CONJUNCTION W/ QZ VEIN & MINOR FAILURE
85						
90						
93						
				93.1	105.8	QUARTZ-CA CARBONATE INJECTED MAFIC FLOW THIS INTERVAL IS DISTINGUISHED BY IT DEEP GREEN AND WHITE STRIPED APPEARANCE. THE FINE GRAINED FLOW SEQUENCE HAS BEEN CUT BY NUMEROUS QZ > CaC VEINS RANGING IN THICKNESS FROM MILLIMETERS TO 2-3 cm IN WIDTH. THE ROCK ALSO CONTAINS VERY STRONG CHLORITE AFTER AMPHIBOLE (02.5) FROM REGIONAL METAMORPHISM. SERICITE & FeC ARE INTIMATELY ASSOCIATED AS WISPY FOLIATION PARALLEL ALTERATION (01.5) SULPHIDES IN THIS INTERVAL ARE VERY WEAK (PY < 1%) OCCURRING AS UNIFORMLY DISTRIBUTED FINE GRAINED DISSEMINATIONS. 93.3-96.3 MISLATCH 2.4m LOST CORE 96.0 CHIP FROM MISLATCH CONTAINING ABUNDANT PY & GALENA → APPEARS VEIN RELATED
95						
100						
105						
				105.8	108.5	SERICITIC LEAN MAFIC LAPILLI PYROCLASTIC THIS INTERVAL HAS AN OVERALL PALE YELLOW-CREAM COLOR DUE TO SERICITIZA

ML 85-6C

PAGE 11 OF 13 | PROJECT: TWIN | HOLE NO. TWIN 8

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
CaC	FeC	Ser	SiO_2	Chl	Fuch			FROM	TO	WIDTH						
								89.0	90.5	1.5	TB 89.0/1.5			LITHO		
								99.6	101.1	1.5	TB 99.6/1.5			LITHO		

ML 85-6B

PAGE 12 OF 13 | PROJECT: TWIN

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION
						(02) & FeC (01). HOWEVER THE ROCK IS FAIRLY HARD & COMPETENT REFLECTING AN INCREASED SiO_2 CONTENT (02). CaC (0 IS LOW. LAPILLI ARE VERY FAINT (NOTE 106. CHLORITE APPEARS AS CLOTS AND FLAKES (01)
						THROUGHOUT. Py < 1%.
						107.0 - 107.3 Qz VEIN - BARREN
				108.5	111.6	SILICIFIED MAFIC FLOW
					GOH	PRIMARY TEXTURES IN THIS INTERVAL
110						HAVE BEEN WIPED OUT BY VERY FINE GRAINED CHERT-LIKE SILICIFICATION. THE INTERVAL HAS A BLUE-GREY APPEARANCE INTERUPTED BY WISPY SERICITE (01.5).
						108.5 - 108.7 MINOR FAULT
						109.0 FOLIATION TO CA: 074°
						110.8 FELTED CHLORITE (5 cm's)
						Pyrite WEAK 1-2%. F.G. DISEMINATIONS

ML 85-6C

PAGE 13 OF 13	PROJECT: Twin	HOLE NO. Twin 8

ALTERATION							TOTAL SULPHIDE	SAMPLES			SAMPLE NUMBER	ASSAYS				
CaC	FeC	Ser	SiO_2	Chl	Fuch			FROM	TO	WIDTH						
								109.9	111.4	1.5	TB 109.9/1.5			LITHO		

ML 85-6B

PAGE	OF	PROJECT:

DEPTH (m)	RQD	% CORE REC	GRAPHIC LOG	FROM	TO	GEOLOGICAL DESCRIPTION

APPENDIX 2

ASSAYS

APPENDIX 2

ASSAYS

Eco-Tech LABORATORIES LTD.

ENVIRONMENTAL TESTING
GEOCHEMISTRY
ANALYTICAL CHEMISTRY
ASSAYING

10041 E. Trans Canada Hwy., R.R. #2, Kamloops, B.C. V2C 2J3 Phone (604) 573-5700
Telex. 048-8393

July 28, 1987

CERTIFICATE OF ANALYSIS ETK 87-264

CLIENT: Esso Minerals Canada
1600 - 409 Granville St.
VANCOUVER, B. C.
V6C 1T2

ATTENTION: Mr. Jack Marr

RE: PROJECT TWIN 117

SAMPLE IDENTIFICATION: 10 rock samples received July 13, 1987

ETK #	Description	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Ba (%)	As (%)
264 - 1	T6 52.0/1	.09	.6	.02	.05	.03	.01	<.01
264 - 2	T6 71.0/.5	.13	1.0	.02	.09	.14	.01	.03
264 - 3	T6 72.5/.9	.13	1.1	.02	.11	.18	.03	.03
264 - 4	T6 77.1/.8	.09	.3	.02	.07	.08	.03	<.01
264 - 5	T6 81.6/.6	.40	2.2	.02	.23	.27	.03	.02
264 - 6	T6 128.6	.17	.5	.01	.01	<.01	.01	<.01
264 - 7	T6 125.1	.09	.5	.01	.01	<.01	<.01	<.01
264 - 8	T6 128.0	.15	.3	.01	.01	<.01	.01	<.01
264 - 9	T6 143.8	.12	.2	.01	.01	.04	.02	<.01
264 - 10	T6 149.5	.54	10.9	.03	.16	.21	<.01	.24

NOTE: < = less than

S. Benischek
ECO-TECH LABORATORIES LTD.
Sonja Benischek,
B. C. Certified Assayer

SPB/cpb
cc: Jim Oliver
Site #1, Box 40
R. R. #1
KAMLOOPS, B. C. V2C 1X1

Esso Minerals Canada

August 3, 1987

ETK #	Description	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Ba (%)
315 - 21	T7 89.8/1.4	.05	<0.1	.01	<0.01	.01	.03
315 - 22	T7 95.5/.8	.53	<0.1	.01	<0.01	<0.01	.08
315 - 23	T7 96.3/.5	.1	<0.1	.01	<0.01	.01	.09
315 - 24	T7 96.8/1.6	.09	<0.1	.01	<0.01	.01	.07
315 - 25	T7 99.8/.8	<0.03	<0.1	.01	<0.01	.01	.06
315 - 26	T7 100.7/.6	<0.03	<0.1	<0.01	<0.01	.01	.1
315 - 27	T7 101.7/1.0	<0.03	<0.1	<0.01	<0.01	.02	.02
315 - 28	T7 104.3/1.5	<0.03	<0.1	<0.01	<0.01	.03	<0.01
315 - 29	T7 105.8/1.2	.09	<0.1	<0.01	<0.01	.01	.02
315 - 30	T7 107.0/1.5	.08	<0.1	<0.01	<0.01	.01	.24
315 - 31	T7 118.7/1.5	.14	<0.1	<0.01	<0.01	.02	<0.01
315 - 32	T7 80.0/.8	.04	<0.1	<0.01	<0.01	.01	.09
315 - 33	T7 27.5/1.0	.04	<0.1	<0.01	<0.01	.01	.03

NOTE: < = less than
> = greater than

ECO-TECH LABORATORIES LTD.
Sonja P. Benischek
B.C. Certified Assayer

SPB/jk
c.c. Jim Oliver
4377 Karindale Road
Site 1, Box 40
R.R. #1
KAMLOOPS, B.C.
V2C 1Z3

Eco-Tech
LABORATORIES LTD.

ENVIRONMENTAL TESTING
GEOCHEMISTRY
ANALYTICAL CHEMISTRY
ASSAYING

[illegible] Phone (604) 573-5700
Fax: 046-8393

August 12, 1987

CERTIFICATE OF ANALYSIS ETK 87-345

CLIENT: Esso Minerals Canada
1600, 409 Granville Street
VANCOUVER, B.C.
V6C 1T2

ATTENTION: Mr. Jack Marr

RE: PROJECT TWIN 117

SAMPLE IDENTIFICATION: 5 rock samples received July 30, 1987

ETK #		Description	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Ba (%)
	T8							
345 -	1	75.8/1.5	.37	2.0	.01	.03	.02	<0.01
345 -	2	53.3/.4	.05	<.1	.01	<.01	.01	.25
345 -	3	78.3/1.5	.06	<.1	.01	.01	.03	.01
345 -	4	53.7/1.5	.07	<.1	.03	.03	.02	.11
345 -	5	55.2/1.3	.17	20.2	.28	2.23	1.61	.11

NOTE: < = less than

ECO-TECH LABORATORIES LTD.
Sonja P. Benischek
B.C. Certified Assayer

SPB/jk

APPENDIX 3

STATEMENT OF COSTS

STATEMENT OF COSTS

GEOLOGY:

Labour:

Project Geologist - 12 days @ $245.00/day	$ 2940.00
Geologist - 4 days @ $245.00/day	$ 600.00
Assistant - 12 days @ $92.75/day	$ 1113.00

LOGISTICS:

Accommodation	$ 757.25
Vehicle Rental	$ 388.87
Groceries	$ 491.19

DRILLING:

558.7m @ $46.47/metre	$25962.79
Core Removal and Storage	$ 826.07

ASSAYS:

48 (Cu, Pb, Zn, Ag, Au, Ba, As) @ $57.50	$ 2760.00
SUB-TOTAL	**$35839.17**
10% DSS	**$ 3583.92**
TOTAL	**$39423.09**

APPENDIX 4

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, David R. Heberlein, of 821 Pinemont Avenue, Port Coquitlam, B.C. V3B 5B7, do hereby certify that:

1. I am a Geologist in the employment of Esso Minerals Canada, a Division of Esso Resources Canada Limited at 1600 - 409 Granville Street, Vancouver, B.C. V6C 1T2.

2. I am a graduate of The University of Southampton, England with a Bachelor of Science (Honors) Degree in Geology (1980).

3. I am a graduate of the University of British Columbia with a Master of Science Degree in Geology (1985).

4. I am a Fellow of the Geological Association of Canada (F5050).

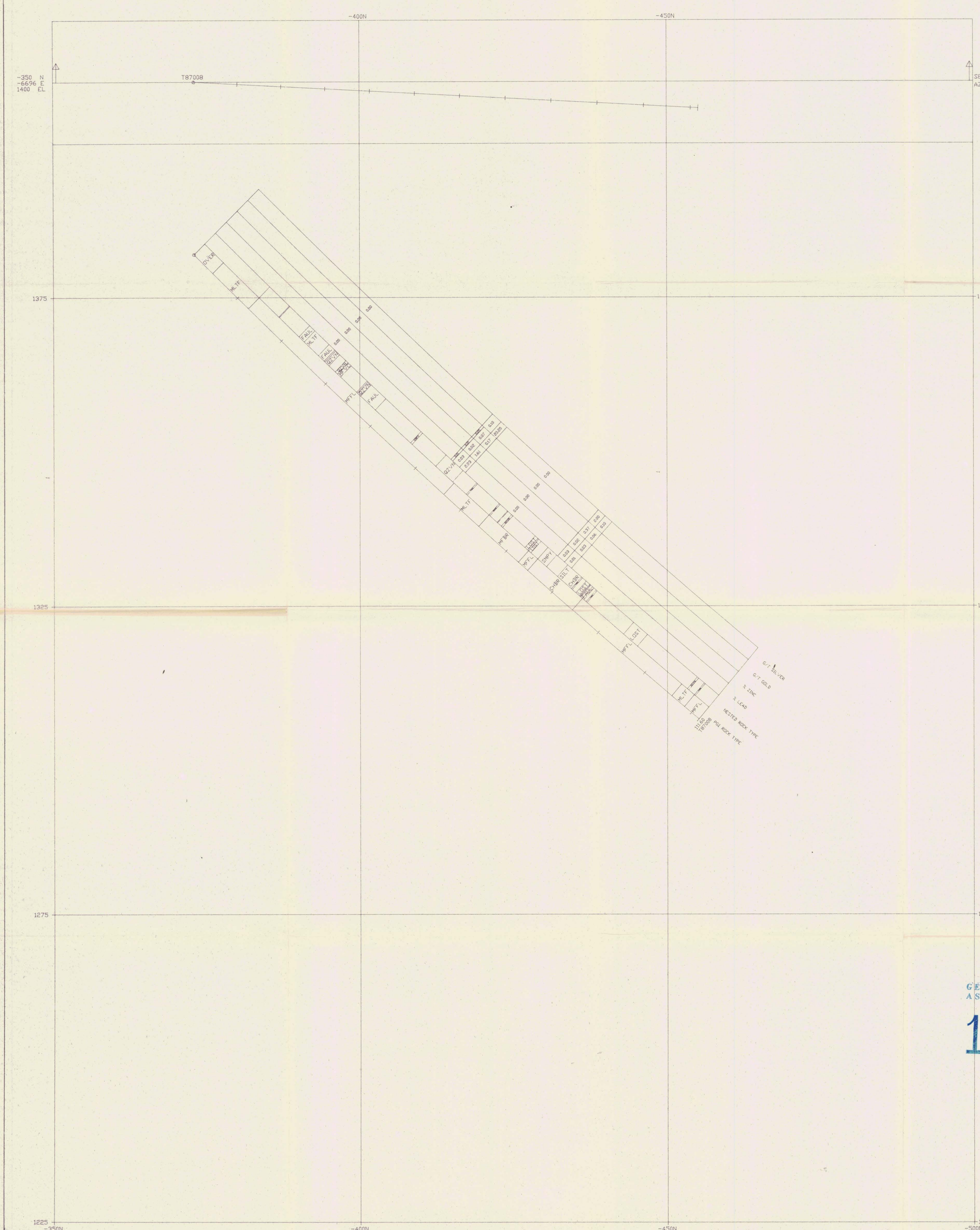
5. I have been employed as a contract and full-time geologist in mineral exploration since my graduation in 1980.

6. I personally supervised the field work summarized in this report.

7. I have no financial interest in the property described herein.

DATED THIS 26th DAY OF JANUARY, 1988 AT VANCOUVER, B.C..

David Heberlein, Project Geologist



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

- DIOR Diorite

HANGING WALL SEDIMENTS

- ARGR Graphitic argillite
- ARGL Argillite
- SILT Siltstone
- CHAR Cherty argillite
- CONG Conglomerate
- GWAC Graywacke
- LWAC Lithic wacke
- QZWK Quartz wacke
- QTZT Quartzite
- IBAW Interbedded argillite & wacke
- TFAR Tuffaceous argillite
- IBTA Interbedded tuff & argillite

REA ZONE: CHEMICAL SEDIMENTS

- MSBA Massive barite
- MSSX Massive sulphides
- SMPY Semi-massive pyrite
- SMSX Semi-massive sulphides - general
- PYST Pyritic siltite (muddy tuff)
- PYTF Pyritic tuff
- CHTF Cherty tuff
- PYCH Pyritic chert
- CHER Massive chert
- CARB Massive carbonate
- CDPH Chlorite dolomite phyllite
- RBCH Ribbon-banded chert

REA ZONE: ALTERED VOLCANIC ROCKS

- ASTF Ash tuff - alternate form
- ASHT Ash tuff
- AKSS Ankeritic sericite schist
- AKPH Ankeritic phyllite
- QSSH Quartz sericite schist
- SESH Sericite schist
- SETF Sericitic tuff
- LATF Lithic ash tuff
- LLAT Lapilli-bearing ash tuff
- LLTF Felsic lapilli tuff
- XATF Crystal ash tuff
- XLAT Crystal lithic ash tuff
- RHYL Rhyolite, massive

FOOTWALL VOLCANIC ROCKS

- BASL Basalt
- CLPH Chlorite phyllite
- CLSH Chlorite schist
- IATF Intermediate ash tuff
- IBCA Interbedded chert & argillite
- IFXT Intermediate feldspar crystal tuff
- ILTF Intermediate lapilli tuff
- INTF Intermediate tuff
- IXTF Intermediate crystal tuff
- MATF Mafic ash tuff
- MFBR Mafic (flow-top) breccia
- MFFL Mafic flow
- MAFV Mafic volcanic - general
- MFTF Mafic tuff
- MFVC Mafic volcanoclastic
- MLAT Mafic lapilli-bearing ash tuff
- MLTF Mafic lapilli tuff
- MXLT Mafic crystal lapilli tuff
- MXTF Mafic crystal tuff

- FAUL Fault (zone)
- FLBR Fault breccia
- GOUG Gouge zone (fault)
- QZVN Quartz vein
- DOVN Dolomite vein

REVISIONS

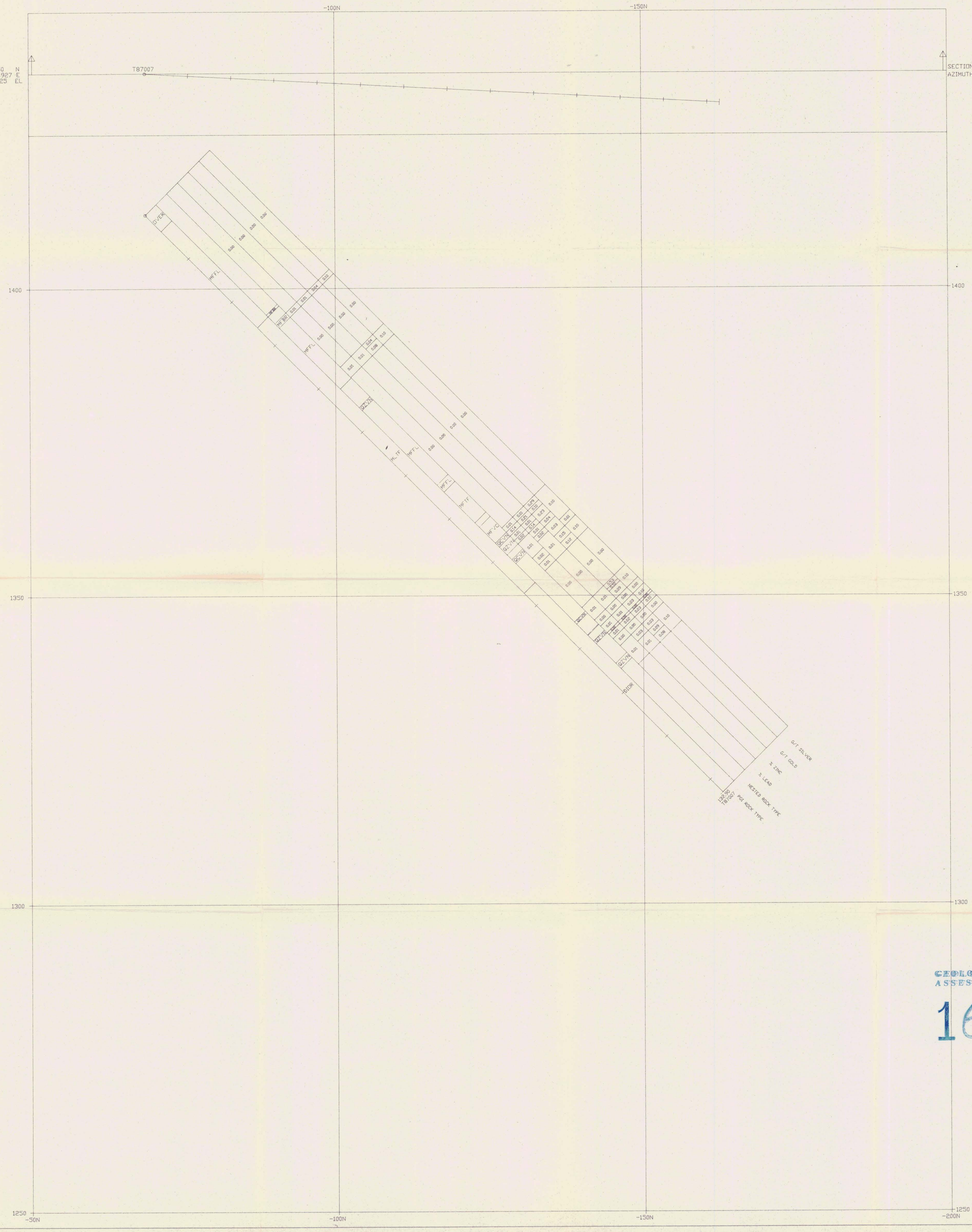
By	Date	Approv. By

ESSO MINERALS CANADA
TWIN PROJECT
GEOLOGICAL CROSS SECTION
LINE -67+96E

0 5 10 15 20 25 M

To accompany a report by D. Heberlein

Project No:	117	Report No:	c.602
Mining Div:	Kamloops	NTS:	82M/4W
Survey By:	D.H.	Drafted By:	D.H. & K.S.
Date:	Jan. 1988	Map No:	7



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

- DIOR Diorite

HANGING WALL SEDIMENTS

- ARGR Graphitic argillite
- ARGL Argillite
- SILT Siltstone
- CHAR Cherty argillite
- CONG Conglomerate
- GWAC Graywacke
- LWAC Lithic wacke
- QZWK Quartz wacke
- QTZT Quartzite
- IBAW Interbedded argillite & wacke
- TFAR Tuffaceous argillite
- IBTA Interbedded tuff & argillite

REA ZONE: CHEMICAL SEDIMENTS

- MSBA Massive barite
- MSSX Massive sulphides
- SMPY Semi-massive pyrite
- SMSX Semi-massive sulphides - general
- PYST Pyritic siltite (muddy tuff)
- PYTF Pyritic tuff
- CHTF Cherty tuff
- PYCH Pyritic chert
- CHER Massive chert
- CARB Massive carbonate
- CDPH Chlorite dolomite phyllite
- RBCH Ribbon-banded chert

REA ZONE: ALTERED VOLCANIC ROCKS

- ASTF Ash tuff - alternate form
- ASHT Ash tuff
- AKSS Ankeritic sericite schist
- AKPH Ankeritic phyllite
- QSSH Quartz sericite schist
- SESH Sericite schist
- SETF Sericitic tuff
- LATF Lithic ash tuff
- LLAT Lapilli-bearing ash tuff
- LLTF Felsic lapilli tuff
- XATF Crystal ash tuff
- XLAT Crystal lithic ash tuff
- RHYL Rhyolite, massive

FOOTWALL VOLCANIC ROCKS

- BASL Basalt
- CLPH Chlorite phyllite
- CLSH Chlorite schist
- IATF Intermediate ash tuff
- IBCA Interbedded chert & argillite
- IFXT Intermediate feldspar crystal tuff
- ILTF Intermediate lapilli tuff
- INTF Intermediate tuff
- IXTF Intermediate crystal tuff
- MATF Mafic ash tuff
- MFBR Mafic (flow-top) breccia
- MFFL Mafic flow
- MAFV Mafic volcanic - general
- MFTF Mafic tuff
- MFVC Mafic volcanoclastic
- MLAT Mafic lapilli-bearing ash tuff
- MLTF Mafic lapilli tuff
- MXLT Mafic crystal lapilli tuff
- MXTF Mafic crystal tuff

- FAUL Fault (zone)
- FLBR Fault breccia
- GOUG Gouge zone (fault)
- QZVN Quartz vein
- DOVN Dolomite vein

REVISIONS

By	Date	Approv. By

ESSO MINERALS CANADA

TWIN PROJECT

GEOLOGICAL CROSS SECTION

LINE -69+27E

0 5 10 15 20 25 M

To accompany a report by D. Heberlein

Project No:	117	Report No:	c.602
Mining Div:	Kamloops	NTS:	82M/4W
Survey By:	D.H.	Drafted By:	D.H. & K.S.
Date:	Jan. 1988	Map No:	6

303,500 ME | 304,000 ME | 304,500 ME | 305,000 ME | 305,500 ME | 306,000 ME

51° 08' 30"

119° 49' 00"

△NS(95043)

△PCP14 (1602)

N

5,668,500 MN

5,668,000 MN

5,667,500 MN

5,667,000 MN

5,666,500 MN

5,666,000 MN

5,665,500 MN

NS(9502)

KE1 Fr.

TWIN 1 | TWIN 2 | TWIN 3 | TWIN 4 | TWIN 5 | TWIN 6 | TWIN 7 | TWIN 8

L.C.P.

SRS3420

L80E | L79E | L78E | L77E | L76E | L75E | L74E | L73E | L72E | L71E | L70E | L69E | L68E | L67E | L66E | L65E | L64E | L63E | L62E | L61E | L60E | L59E | L58E | L57E | L56E | L55E | L54E | L53E

Diamond Drill Hole Collar

GEOLOGICAL BRANCH
ASSESSMENT REPORT

16,989

REVISIONS

By	Date	Approv. By

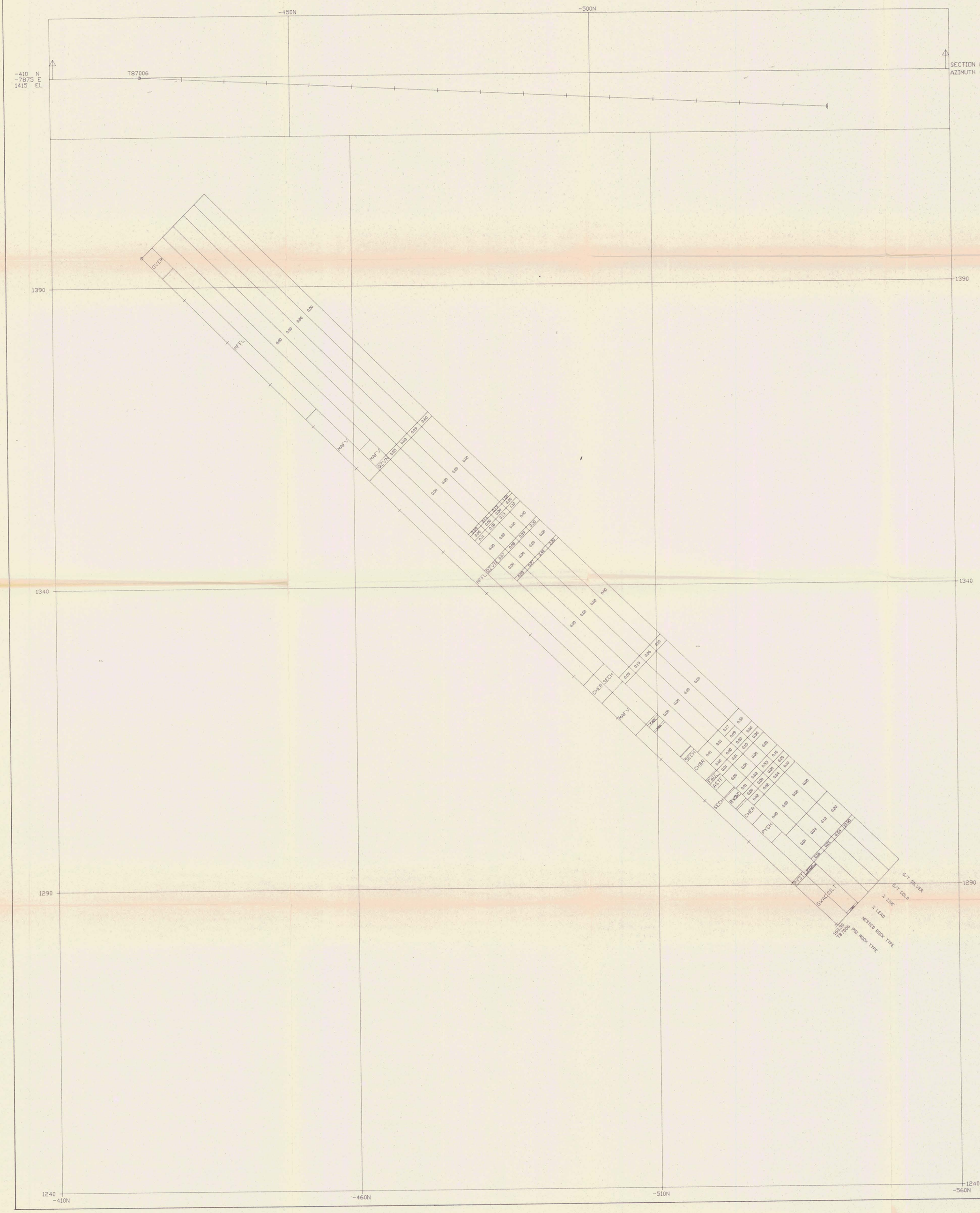
ESSO MINERALS CANADA

TWIN PROPERTY
DRILL HOLE LOCATION MAP

0 1 2 3 4 5 Km

To accompany a report by D. Heberlein.

Project No: 117	Report No: c.601
Mining Div: Kamloops	NTS: 82M/4W
Survey By:	Drafted By:
Date: Dec. 1987	Map No: 3



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

- DIOR — Diorite

HANGING WALL SEDIMENTS

- ARGR — Graphitic argillite
- ARGL — Argillite
- SILT — Siltone
- CHAR — Cherty argillite
- CONG — Conglomerate
- GWAC — Graywacke
- LWAC — Lithic wacke
- QZWK — Quartz wacke
- QTZT — Quartzite
- IBAW — Interbedded argillite & wacke
- TFAR — Tuffaceous argillite
- IBTA — Interbedded tuff & argillite

REA ZONE: CHEMICAL SEDIMENTS

- MSBA — Massive barite
- MSSX — Massive sulphides
- SMPY — Semi-massive pyrite
- SMSX — Semi-massive sulphides - general
- PYST — Pyritic siltite (muddy tuff)
- PYTF — Pyritic tuff
- CHTF — Cherty tuff
- PYCH — Pyritic chert
- CHER — Massive chert
- CARB — Massive carbonate
- CDPH — Chlorite dolomite phyllite
- RBCH — Ribbon-banded chert

REA ZONE: ALTERED VOLCANIC ROCKS

- ASTF — Ash tuff - alternate form
- ASHT — Ash tuff
- AKSS — Ankeritic sericite schist
- AKPH — Ankeritic phyllite
- QSSH — Quartz sericite schist
- SESH — Sericite schist
- SETF — Sericitic tuff
- LATF — Lithic ash tuff
- LLAT — Lapilli-bearing ash tuff
- LLTF — Felsic lapilli tuff
- XATF — Crystal ash tuff
- XLAT — Crystal lithic ash tuff
- RHYL — Rhyolite, massive

FOOTWALL VOLCANIC ROCKS

- BASL — Basalt
- CLPH — Chlorite phyllite
- CLSH — Chlorite schist
- IATF — Intermediate ash tuff
- IBCA — Interbedded chert & argillite
- IFXT — Intermediate feldspar crystal tuff
- ILTF — Intermediate lapilli tuff
- INTF — Intermediate tuff
- IXTF — Intermediate crystal tuff
- MATF — Mafic ash tuff
- MFBR — Mafic (flow-top) breccia
- MFFL — Mafic flow
- MAFV — Mafic volcanic - general
- MFTF — Mafic tuff
- MFVC — Mafic volcanoclastic
- MLAT — Mafic lapilli-bearing ash tuff
- MLTF — Mafic lapilli tuff
- MXLT — Mafic crystal lapilli tuff
- MXTF — Mafic crystal tuff

- FAUL — Fault (zone)
- FLBR — Fault breccia
- GOUG — Gouge zone (fault)
- QZVN — Quartz vein
- DOVN — Dolomite vein

REVISIONS

By	Date	Approved By

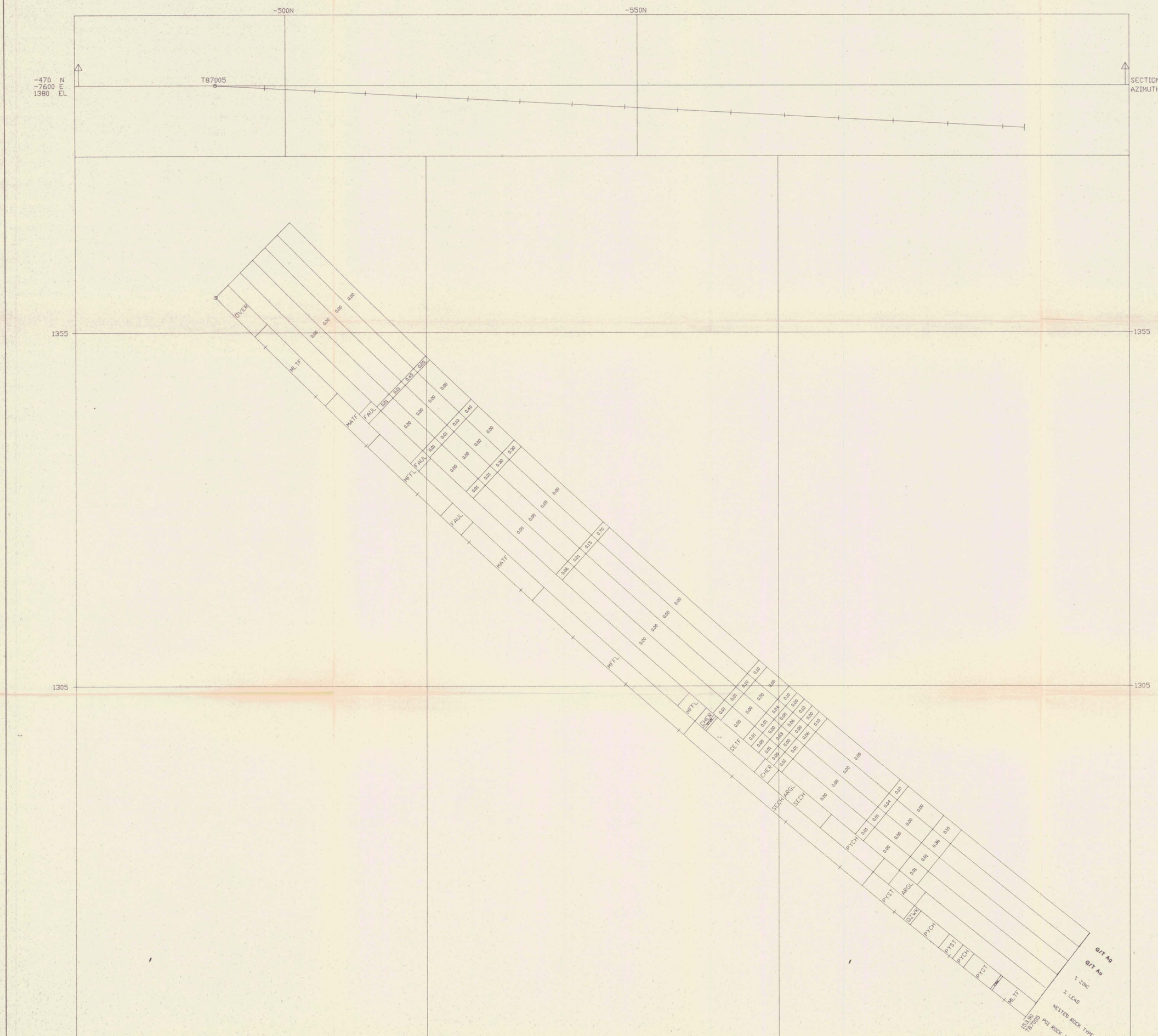
ESSO MINERALS CANADA

TWIN PROJECT
GEOLOGICAL CROSS SECTION
LINE -78+75E

0 5 10 15 20 25 M

To accompany a report by D. Heberlein

Project No:	117	Report No:	c.602
Mining Div:	Kamloops	NTS:	82M/4W
Survey By:	D.H.	Drafted By:	D.H. & K.S.
Date:	Jan. 1988	Map No:	5



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TWIN PROJECT

GEOLOGICAL CROSS SECTION

LINE -76+00E

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