

Geological Report  
on the  
Forster Creek - Starbird Ridge Property  
of  
Kodiak Mines Ltd.  
Golden Mining Division

Group Numbers 1 - 4

Situated on Forster Creek and Starbird Ridge,  
18 miles west-northwest of Invermere, B.C.

Co-ordinates at center of group:

50° 38' N                      116° 23' W

82 K/9W

Submitted by: R. H. D. Philp, P. Eng.

Owners: L. Hemmelgarn, W. Frocklage,  
F. Cameron, K. Calder, F. Holcapek

Work carried out for Kodiak Mines Ltd.  
during the period June 21 - September 12, 1967

1254

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<u>Maps</u>	Scale
Location Map #1	1 inch = 4 miles
Claims Plan Showing Generalized Geology	1 inch = $\frac{1}{2}$ mile #2
Copper Zone #3	1 inch = 40 feet
Molybdenum Showing - Gossan Creek #4	1 inch = 50 feet
Antimony Zone #5	1 inch = 20 feet

GEOLOGICAL REPORT ON THE  
STARBIRD RIDGE - FORSTER CREEK PROPERTY  
OF  
KODIAK MINES LTD.

INTRODUCTION:

Kodiak Mines Ltd. holds a total of 226 mineral claims in the Golden Mining Division, approximately 18 miles west-northwest of Invermere, British Columbia. The company first acquired claims in the area in late 1966 and added to its holdings during the summer of 1967 while conducting a preliminary exploration program.

During 1967 an exploration program consisting of a partial claims survey and staking of additional claims, prospecting, geological mapping, and trenching was carried out.

Copper, lead, antimony, and zinc mineralization had previously been reported in the area. During the 1967 season additional copper mineralization and molybdenum were found.

LOCATION AND ACCESS:

The claims lie along Starbird Ridge and Forster Creek in the Purcell Mountains approximately 18 miles west-northwest of Invermere, British Columbia. Invermere, located in the broad Rocky Mountain Trench lies one hundred miles northwest of Cranbrook, British Columbia.

Co-ordinates near the center of the claim group are  $50^{\circ} 38'$  north latitude,  $116^{\circ} 23'$  west longitude.

Access to the property is by a rough forestry road along Forster Creek, then on foot to the various parts of the claim group. During the past season camps on Ev Creek and Forster Creek were serviced by back-packing. Much of the property lies above timberline and could be reached by helicopter.

Invermere is reached by paved highway from Cranbrook which is served daily by commercial airline service.

PHYSIOGRAPHY:

The claims are situated along the eastern flank of the Purcell Mountains in an area of high and rugged relief. Elevations vary between 4600 and approximately 8500 feet above sea level. Lower slopes are brushy and heavily forested while slopes at higher elevations are bare and rocky.

Snowfall is heavy during the winter months, seriously hampering surface exploration. Summers are generally warm and dry.

CLAIMS:

The following 226 mineral claims located in the Golden Mining Division form the Starbird Ridge - Forster Creek Property described in this report.

<u>Claim</u>	<u>Record No.</u>	<u>Record Date</u>
Rocking Chair 1 - 4	11077 - 080	July 11/66
A 1 - 6	11516 - 521	Aug. 5/66
A 7 - 12	11522 - 527	Aug. 8/66
Q 1 - 6	11766 - 771	Sept. 26/66
F 1 - 5	12119 - 123	Oct. 26/66
K 1 - 18	13074 - 091	June 5/67
S 1 - 10	13092 - 101	June 5/67
R 1 - 6	13187 - 192	June 20/67
R 7 - 12	13193 - 198	June 20/67
F 6 - 10	13162 - 166	June 20/67
Cal 1 - 10	13167 - 176	June 20/67

<u>Claim</u>	<u>Record No.</u>	<u>Record Date</u>
V 1 - 10	13177 - 186	June 20/67
Pam 1 - 61	13368 - 428	Aug. 7/67
Pam 62 - 69	13463 - 470	Aug. 11/67
J 1 - 38	13330 - 367	Aug. 7/67
J 39 - 61	13471 - 493	Aug. 11/67
S 11 - 14	13906 - 909	Sept. 26/67

GEOLOGY:

General:

Regional mapping in the area has been carried out by the Geological Survey of Canada and published at a scale of 1 inch = 4 miles as map 12-1957.

The eastern flank of the Purcell Mountains, in which the Kodiak claims are located, consists of a northwest trending, folded and slightly metamorphosed series of sediments of mainly Proterozoic Age. These are bounded on the east by the broad Rocky Mountain Trench. In the Forster Creek area the sedimentary rocks belong to several Formations within the Upper Purcell and Windermere Systems.

Stratigraphy:

The following stratigraphic sequence, taken from Map 12-1957 is found in the Starbird Ridge - Forster Creek area.

Mesozoic

Quartz monzonite, granodiorite.

Proterozoic

Horsethief Creek Series: slate and argillite, Quartz pebble conglomerate, quartzite, feldspathic quartzite and grit, minor limestone.

Toby Formation: pebble, cobble and boulder conglomerate and breccia (matrix of quartzite, argillite, and limestone).

Mt. Nelson Formation: dolomitic limestone, argillite and slate, white and green quartzite.

Dutch Creek Formation: argillite and slate, buff dolomitic slate, thin bedded dolomite, green, argillaceous quartzite.

The strata occupy a broad, north plunging geanticline, with numerous minor folds generally overturned to the east.

Two small acid intrusive stocks occur in the area. One, approximately 7 miles in diameter occurs on Starbird Ridge and in the upper Forster Creek valley, while the other lies approximately 9 miles to the northwest.

The majority of the known mineral occurrences in the surrounding area occur in dolomitic limestones of the Mt. Nelson Formation. These are generally in the form of fissure and bed-vein type deposits containing lead-silver or lead-silver-zinc. Gangue minerals normally consist of calcite, barite, quartz and siderite.

#### Geology of the Claim Group:

From east to west the claims are underlain by north-northwest sediments, either vertical or dipping to the west, apparently forming an overturned anticlinal structure. Considerable minor folding has taken place within this overall structure, and along the western boundary of the claims the sediments have been intruded by a small acid stock.

Most of the work carried out by Kodiak has been concentrated in the Mt. Nelson and Dutch Creek Formations and the eastern edge of the intrusive stock.

Copper mineralization occurs in quartz-calcite stringers and along fractures near the heads of Lake and Ev Creeks south of Forster Creek. To the north, in the area of the "V" claims several narrow north to northwest trending gossan zones varying up to approximately 3 feet in width are found in sediments of both the Dutch Creek and Mt. Nelson Formations. Weathering is deep and no

Mark  
of  
Fault

sulphides were seen in these. In the same area chalcop-  
pyrite was noted in a 20 foot wide dolomite horizon, a  
grab sample of which assayed 0.25% copper. Molybdenum  
and copper mineralization occur in the intrusives and  
adjacent sediments of the Dutch Creek Formation in a  
pyritized zone along the intrusive contact. Antimony  
mineralization is found in a limestone conglomerate on  
the "A" and Rocking Chair claims east of Ev Creek.

V new?

South of Forster Creek work has been concen-  
trated in the area of J #2 and J #13 on what is referred  
to as the Copper Zone. North of Forster Creek work has  
been concentrated on the "S" claims along the contact  
between the Dutch Creek Formation and the granitic stock,  
in what is referred to as the Gossan Creek zone.

S ?

Copper Zone: J 2 + 13      082K003

Copper mineralization has been explored on  
claims J #2 and J #13 on the ridge between Ev and Lake  
Creeks. Six trenches with an aggregate length of  
approximately 300 feet were excavated in bedrock and  
geological mapping at a scale of 1 inch = 40 feet  
carried out. This work has outlined copper mineral-  
ization over a length of 470 feet and a vertical range  
of approximately 250 feet which is shown on an accompa-  
nying map.

Copper mineralization occurs in quartz veins  
and stringers along a shale-andesite contact. West of  
the ridge two sub-parallel quartz veins, each varying  
up to 3 feet in width, strike easterly and may occupy  
two limbs of a tight syncline. Chalcopyrite, malachite,  
and azurite are found in the two quartz veins and in  
quartz stringers and along fractures in the adjoining  
shales and andesites. Assays vary up to 2.37% copper  
across  $2\frac{1}{2}$  feet with the best composite section averag-  
ing 0.56% copper over 22.5 feet.

Near the top of the ridge and down the eastern  
slope the zone breaks up into a number of mineralized  
quartz veins and stringers in andesite and amygdaloidal  
andesite. In places, malachite is found throughout the  
volcanics but is mainly derived from chalcopyrite and  
minor chalcocite in the quartz. Chalcopyrite was also  
found at a few points disseminated in the andesites.  
To the east the mineralized stringers become widely

spaced. To the west the veins pass under overburden and the limits have not been determined in this direction.

Copper Zone - Sample Index

Sample No.	Width	Cu%	Sample No.	Width	Cu%
6768	2.0'	0.07	6771	6.0'	0.55
6769	3.0'	0.42	6772	4.0'	0.20
6770	2.5'	2.37	6773	10.0'	0.25
6774	7.0'	0.65	6786	20'	tr
6775	22'	0.10	6787	20'	0.05
6776	18'	0.25	6788	20'	0.02
6777	4'	0.90	6789	14'	tr
6778	25'	0.15	6790	2'	0.80
6779	13'	0.05	6791	5'	0.12
6784	2'	1.60	6792	5'	0.60
6785	27'	0.13	6793	2'	0.50

Averages:

6769, 70, 71                      11.5' of 0.91% Cu.  
 6770, 71, 72, 73                22.5' of 0.56% Cu.

Gossan Creek area:

Molybdenum was first recognized in this area during the summer of 1967. The area is very rugged and only a small portion of the mineralized zone was investigated in detail. Five rock trenches were excavated and sampled and geological mapping at a scale of 1 inch = 50 feet carried out for a distance of 900 feet along an intrusive contact in Gossan Creek.

Argillaceous quartzites are in contact with a coarse grained granodiorite to the west, the contact between the two trending northwesterly. Along the immediate contact the intrusive is fine-grained aplitic in nature with aplite dikes also cutting the sediments.

Pyrite is abundant in all the rocks along the contact, forming a prominent oxidized zone up to approximately 1000 feet in width. Molybdenite, with minor chalcopyrite, occurs along fracture planes, occasionally disseminated, and in quartz stringers in both the sedimentary and intrusive rocks. In the in-

S (v?)



trusives it is most common in the aplitic phase but was also noted in coarse-grained granodiorite near the south limit of the mapped area.

The contact is exposed for approximately 800 feet along Gossan Creek. Downstream to the south it is covered by overburden. To the north, upstream, bedrock is concealed by a layer of limonite cemented till. Much of the area above this to the ridge is covered by overburden and talus. However, reconnaissance prospecting has located traces of molybdenite in talus, etc. for a total distance of approximately 6000 feet.

The limited trenching was carried out in a small area and trenches were shallow, remaining in the oxidized material. Sampling within oxidized material along these trenches and on surface returned low molybdenum values, varying from trace to 0.013% molybdenite. Two grab samples returned values of 0.16% and 0.54% molybdenite.

#### Antimony Zone:

This zone was mapped and sampled after being located with assistance of J. Ball and W. Frocklage. A

Antimony-copper-lead mineralization is erratically distributed in a flat lying white limestone conglomerate bed near the top of a very steep rocky ridge. Mineralization is exposed for a distance of 130 feet in a north-south direction and approximately 170 feet in a southwest direction on the opposite side of the ridge. In the first section the white conglomerate varies up to approximately 20 feet thick but grades along strike into a brown, unmineralized conglomerate to the south. Traces of antimony also occur in an overlying brown conglomerate for approximately 20 feet above the main band. To the southwest the mineralized conglomerate varies up to approximately 8 feet in thickness.

Although much of the surrounding area is inaccessible, except for at one point very little mineralization was noted in the surrounding talus indicating the mineralization does not continue far beyond the known limits. The strong mineralization found in talus at one point appears to be an isolated occurrence and may come from a different horizon.

CONCLUSIONS:

The Starbird Ridge - Forster Creek Property of Kodiak Mines Ltd. is underlain by slightly metamorphosed sediments of Proterozoic Age in contact to the west with an acid intrusive body of Mesozoic Age. Complex folding occurs within the sedimentary units which trend northwesterly and in general, dip steeply to the west.

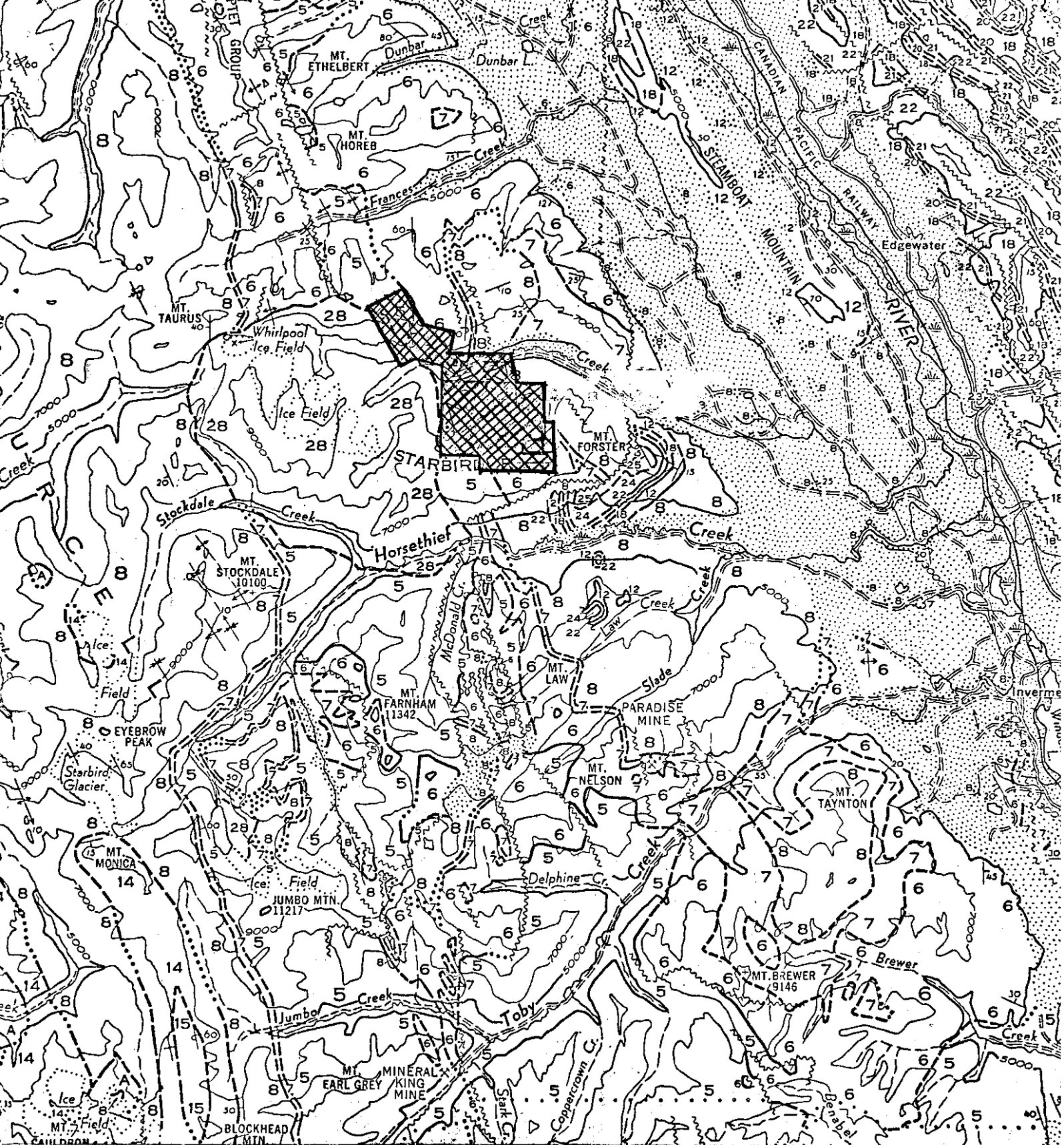
Copper, molybdenum, and antimony mineralization has been exposed on the property. Work has been concentrated in three relatively small areas and additional exploration is required to further explore the molybdenum and copper zones.

Work should be concentrated along the intrusive contact for possible extensions of the molybdenum mineralization. On the copper zone work should be concentrated to the northwest, towards Forster Creek.

Respectfully Submitted,



R. H. D. Philp, P. Eng.

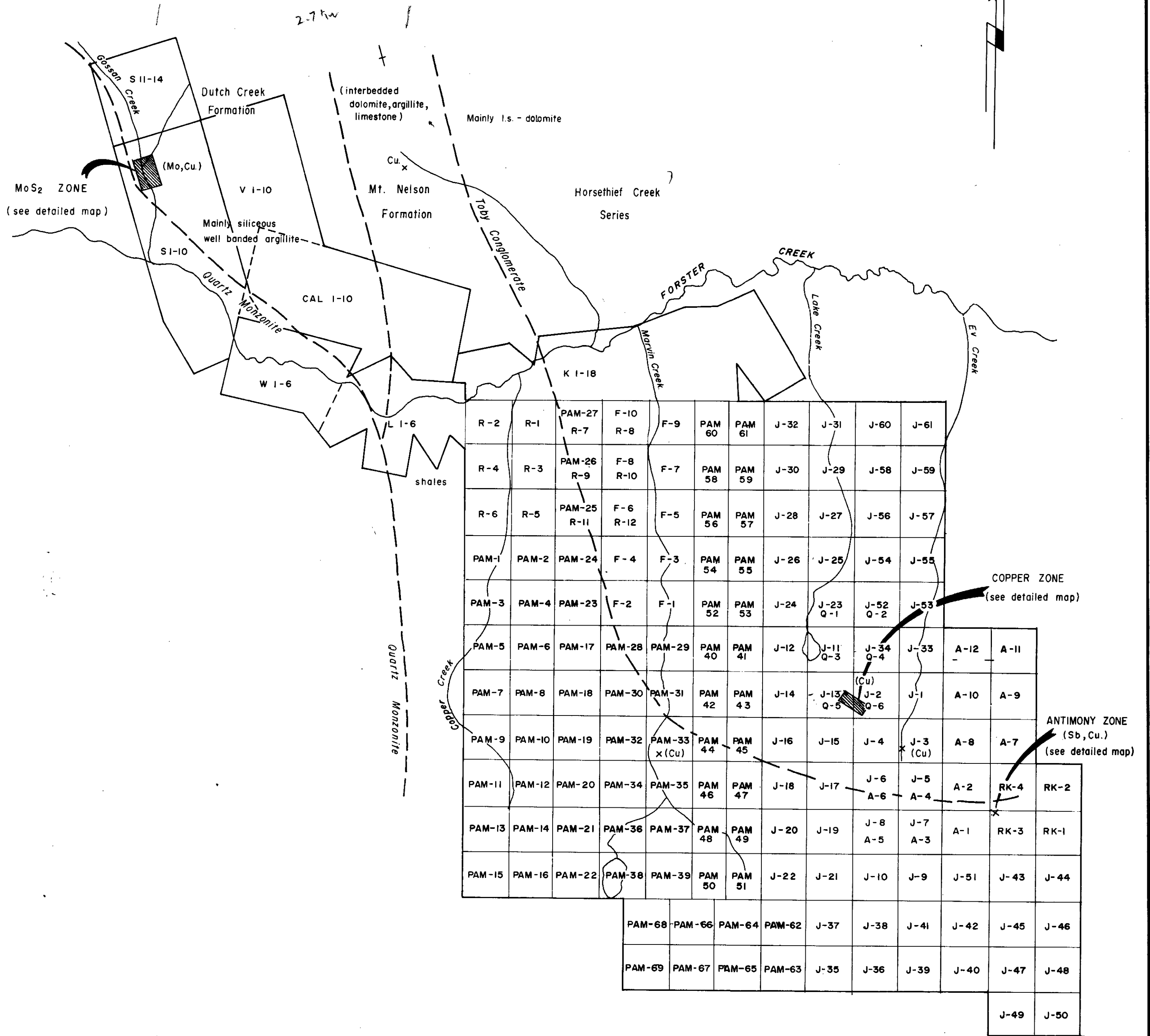


**LEGEND**

- 28** Quartz monzonite, granodiorite
- 8** Horsethief Creek Series - slate, conglomerate, quartzite
- 7** Toby Formation - conglomerate, breccia
- 6** Mt. Nelson Formation - limestone, slate, argillite, quartzite
- 5** Dutch Creek Formations - argillite, slate, quartzite, dolomite

**KODIAK MINES LTD**  
**Location Map**  
**&**  
**Regional Geology**

*[Handwritten signature]*  
*[Handwritten date]*



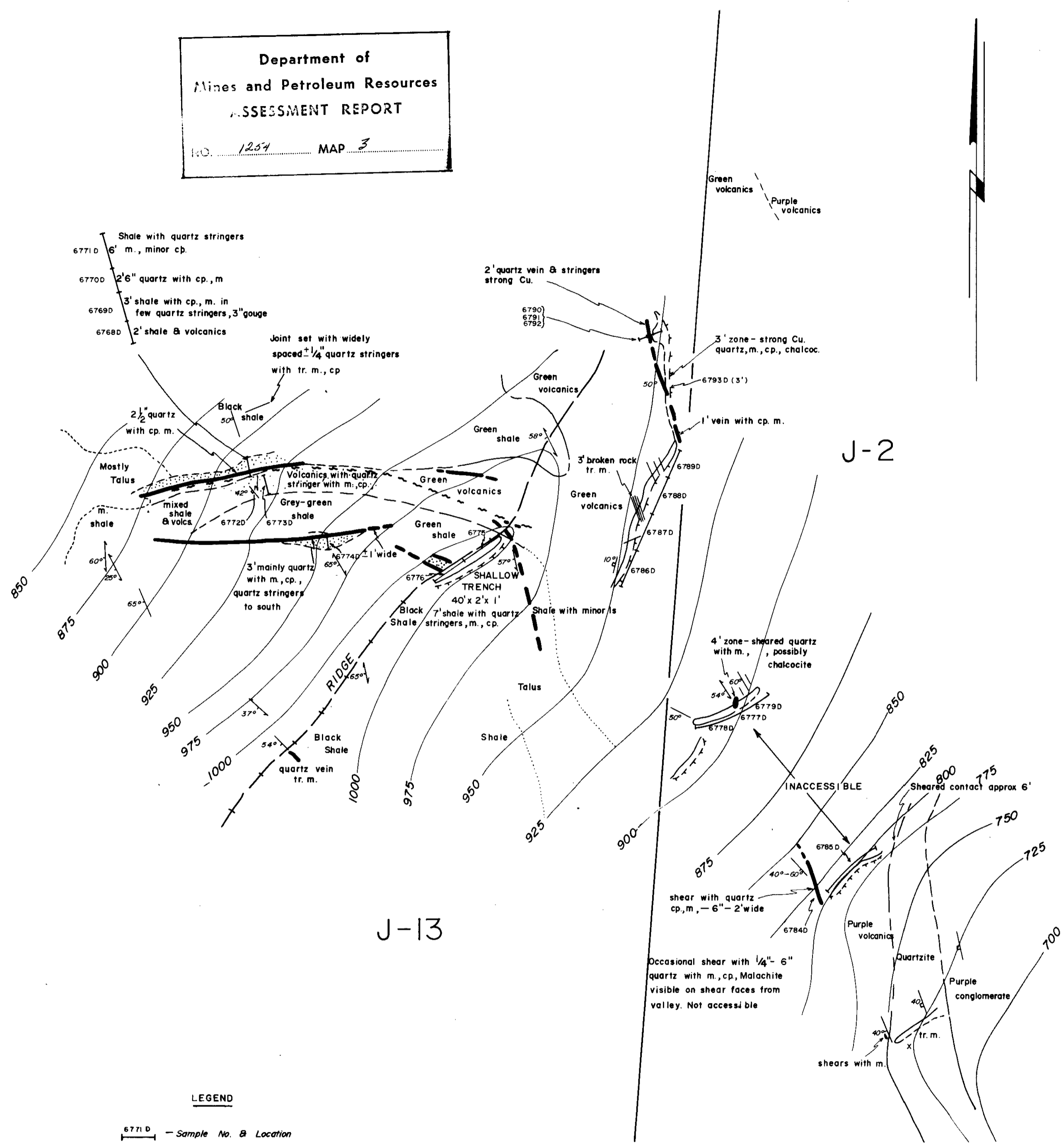
Department of  
Mines and Petroleum Resources  
STATEMENT REPORT  
NO. 1254 MAP 2

1254  
*[Signature]*

AGILIS EXPLORATION SERVICES LTD.  
KODIAK MINES LTD.  
STARBIRD RIDGE PROPERTY  
Claims Plan  
SHOWING GENERALIZED GEOLOGY  
DRAWN: K.K. SCALE: 1" = 1/2 Mile  
CHECKED: R.P. DATE: June, 1968

2.04 km = 1.25 km  
1:50,000 = 317"

**Department of  
 Mines and Petroleum Resources**  
**ASSESSMENT REPORT**  
 No. 1254 MAP 3



J-2

J-13

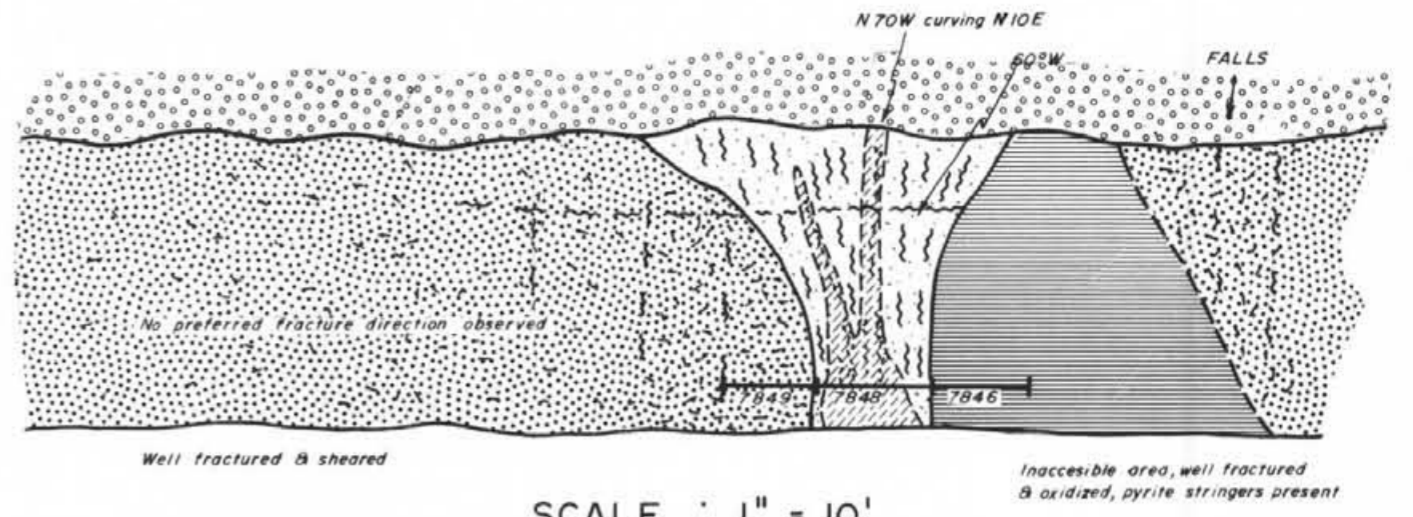
- LEGEND**
- 6771D — Sample No. & Location
  - m — Malachite
  - cp — Chalcopyrite
  - f — Foliation
  - bedding
  - — trench
  - — scattered copper mineralization

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AGILIS EXPLORATION SERVICES LTD	
KODIAK MINES LTD	
STARBIRD RIDGE PROPERTY	
Copper Zone	
DRAWN : H.W.C.	SCALE : 1" = 40'
CHECKED :	DATE : SEPTEMBER, 1967



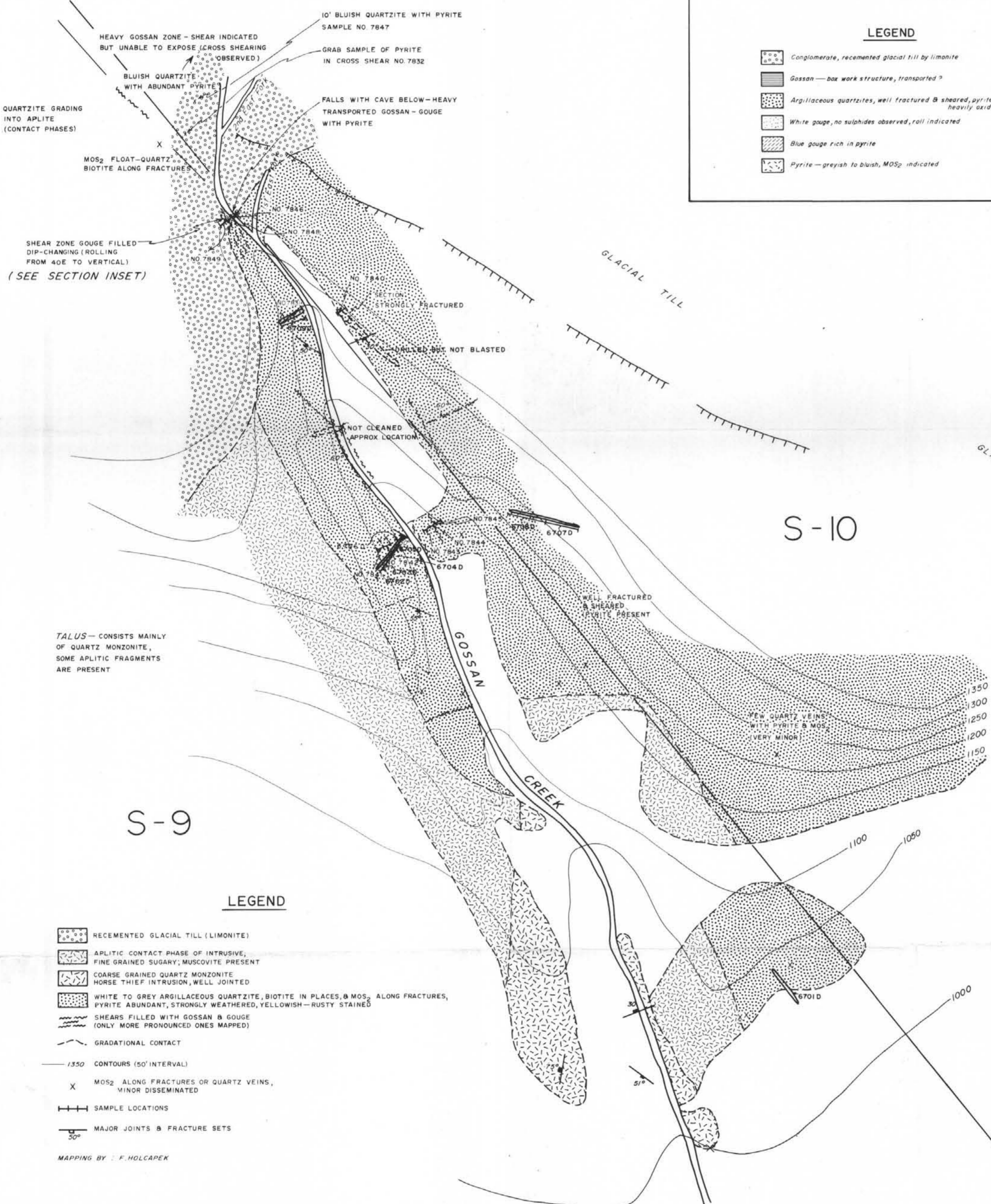
SECTION IN FACE OF CAVE LOOKING N 40° W



SCALE : 1" = 10'

LEGEND

- Conglomerate, recemented glacial till by limonite
- Gossan — box work structure, transported
- Argillaceous quartzites, well fractured & sheared, pyrite abundant, heavily oxidized
- White gouge, no sulphides observed, roll indicated
- Blue gouge rich in pyrite
- Pyrite — greyish to bluish,  $MOS_2$  indicated



LEGEND

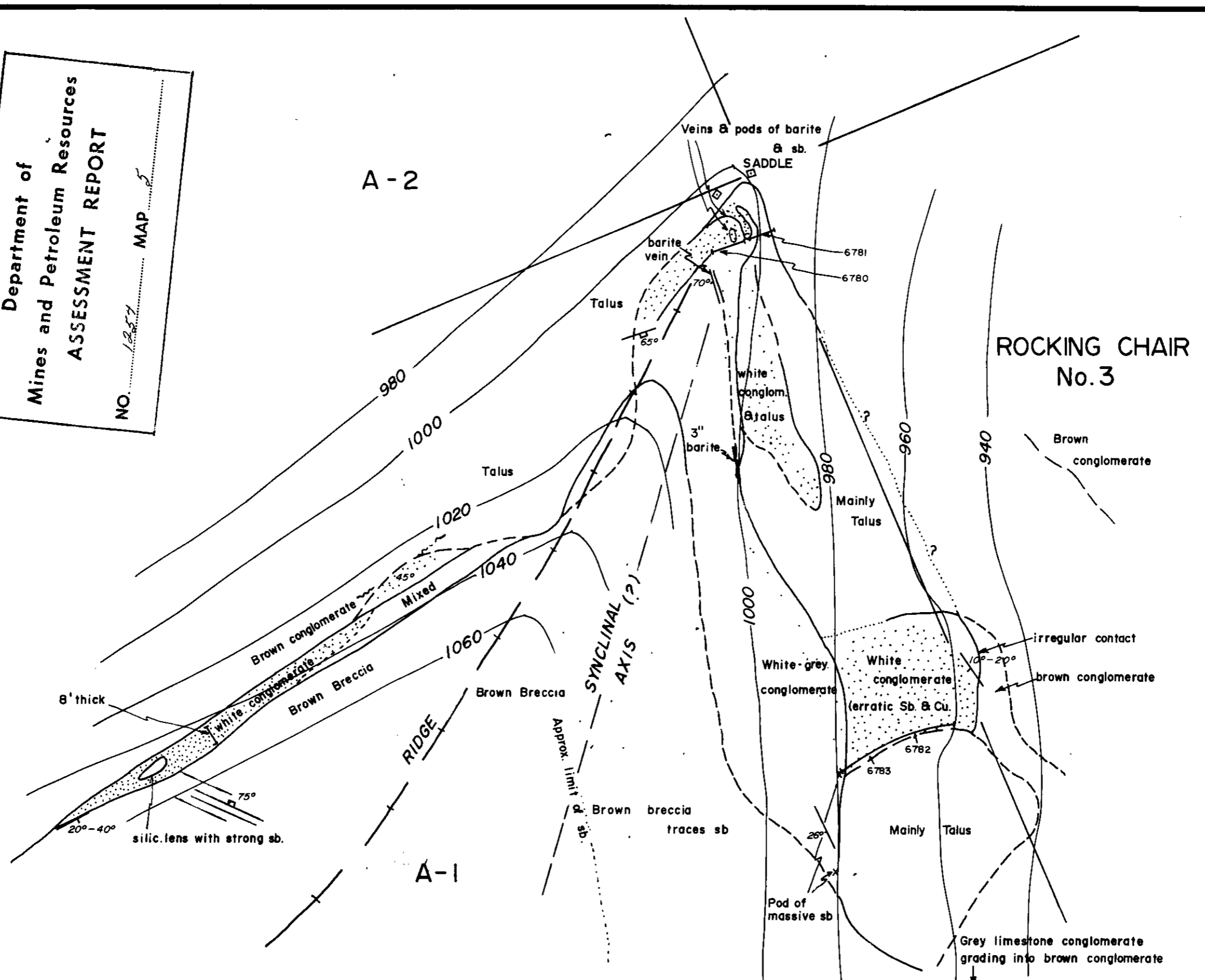
- RECEMENTED GLACIAL TILL (LIMONITE)
  - APLITIC CONTACT PHASE OF INTRUSIVE, FINE GRAINED SUGARY; MUSCOVITE PRESENT
  - COARSE GRAINED QUARTZ MONZONITE HORSE THIEF INTRUSION, WELL JOINTED
  - WHITE TO GREY ARGILLACEOUS QUARTZITE, BIOTITE IN PLACES, &  $MOS_2$  ALONG FRACTURES, PYRITE ABUNDANT, STRONGLY WEATHERED, YELLOWISH-RUSTY STAINED
  - SHEARS FILLED WITH GOSSAN & GOUGE (ONLY MORE PRONOUNCED ONES MAPPED)
  - GRADATIONAL CONTACT
  - 1/350 CONTOURS (50' INTERVAL)
  - X  $MOS_2$  ALONG FRACTURES OR QUARTZ VEINS, MINOR DISSEMINATED
  - SAMPLE LOCATIONS
  - MAJOR JOINTS & FRACTURE SETS
- MAPPING BY : F. HOLCAPEK

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 1254 MAP 4

AGILIS EXPLORATION SERVICES LTD  
KODIAK MINES LTD  
Geological Map  
MOLYBDENUM SHOWING  
GOSSAN CREEK  
SCALE : 1" = 50 ft DATE : JULY, 1967  
DRAWN : H.W.C. CHECKED : R.P.

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Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 1254 MAP 5



LEGEND

- 6783 — Sample No. & Location
- Antimony — sb
- Copper — cu
- Bedding — /30
- Jointing — /45
- Scattered antimony — [stippled pattern]

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AGILIS EXPLORATION SERVICES LTD	
KODIAK MINES LTD	
STARBIRD RIDGE PROPERTY	
Antimony Zone	
DRAWN : H.W.C.	SCALE : 1" = 20'
CHECKED :	DATE : SEPTEMBER, 1967