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CONSULTING GEOLOGICAL & MINING ENGINEERS
808 BANK OF CANADA BUILDING
VANCOUVER I. B.C.

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Summary Report

CASSIAR MOLYBDENUM PROPERTY
Cassiar, B.C.

Aug. 19, 1969

Douglas D. Campbell Consultant Vancouver, Canada.

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INTRODUCTION

Since the discovery of the Cassiar Molybdenite deposit by Value Line Minerals Ltd. in October, 1966, the writer has examined the property frequently to record results of every stage of its development. This report represents a summary of all the work that has been done on the property since 1966 and makes recommendations for continued work.

PROPERTY: The Cassiar Molybdenum property owned by Value Line Minerals Ltd. consists of 205 located mineral claims and fractions as listed below:

Rusty 1,2,4-12	6 claims	5 fractions
Tail 1-16	14 "	2 "
Hazel 1-12,14-31,33,35	23 "	9 "
Daphne 5-7,9	4 "	
"X" 1-10,13,14,17-22,29-32	3 "	22 "
Lillian 1-8	6 "	2 "
Eloise 7-12	9 "	1 "
"V" 1-99	85 "	14 "
TOTALS:-	150 M.C.'s	55 Fractional claims

The configuration of the entire property is shown in Figure 69-2 of this report.

LOCATION: (59° 13' N, 129° 50' W)

The property is located 6 miles south of the town of Cassiar, B.C., in the Liard Mining Division. Access is by excellent dirt road to the adit portal, 2 miles from the Cassiar-Stewart Highway. The distance north along the Cassiar Highway is 100 miles to the town of Watson Lake on the Alaska Highway, (Fig. 69-1). Canadian Pacific Airlines services Watson Lake daily by jet aircraft from Vancouver and Edmonton.

HISTORY:

Prospecting and exploration have been active in the Cassiar district since World War II but the discovery of molybdenite on the Cassiar Molybdenum property in 1966 is an original discovery and no previous staking, prospecting or exploration have been done on the property.

In December, 1967, an exploratory adit was collared high on the mountain, (El. 6037 ft.), on which the molybdenite showings occur. It was intended to drive this adit through the winter to pass 500-700 ft. beneath the surface showings; however, the difficulty of obtaining water, in a particularly severe winter, caused mining to cease after a length of 451 feet had been driven. Tunnelling was recommenced in the summer of 1968 and was driven an additional 2100 feet, to the southern edge of the target area, before shut-down for the winter. A new access road was also constructed from the Cassiar Highway in 1968.

In 1969 a final 1000 feet of adit has been driven north along the centre of the target area, passing beneath the southern two thirds of the projection of the area of surface showings, (Fig. 69-3).

The decision to drive an adit to explore the deposit, rather than employ surface diamond drilling, was largely influenced by the extreme severity of the topography of the area of the showings that would make a drill program costly, slow and locally impossible.

451
2100
805
3356' feet

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SUMMARY AND RECOMMENDATIONS

The Cassiar Molybdenum property of Value Line Minerals Ltd., Calgary, Alberta, is comprised of 205 contiguous mineral claims and fractions located on a mountain lying 6 miles south of the town of Cassiar, B.C. The main showings of the property are located three miles from the Cassiar-Stewart Highway and an adit below the showings is presently reached by dirt road. The adit has been driven for a length of about 3,500 feet since 1968 to pass 500-700 feet beneath the area of the surface showings of molybdenite.

The geology of the property is dominated by an irregular body of finely crystalline monzonite, (latite), that is intrusive into the quartz monzonite that underlies most of the property. The quartz monzonite is part of a pluton which is intrusive along the eastern border of the Cassiar Batholith, the edge of which lies one mile east of the property. The latite body and the molybdenite mineralization associated with it are locallized along a regional fracture-fault zone that extends at least 6 miles north to Cassiar Asbestos.

The ore occurrences on the property consist of relatively rich surface molybdenite showings within the finely crystalline monzonite body (latite), and adjacent normal monzonite. Molybdenite, quartz and minor chalcopyrite occur as fracture-fillings and replacement disseminations. Outcrop samples of the showings range from 0.20% Mo across 12 feet to 3.6% across 5 feet. The area of intense mineralization, which encompasses the latite stock as well as the fringing quartz monzonite, is approximately the size of a mineral claim and would aggregate 13 million tons per 100 vertical feet.

The exploratory adit has been driven beneath the southern portion of the surface showings to expose a tunnel length of 1000 feet of relatively intensely fractured and faulted monzonite and latite that is generally lightly and locally heavily mineralized by molybdenite, with and without quartz, as fracture fillings and disseminated flakes. Muck samples from this interval assayed from trace to 0.50% MoS_2, with molybdenite being concentrated in local fracture zones.

The indication in the adit of extensive molybdenite mineralization warrants the further exploration of the deposit by underground diamond drilling to determine the extent and grade of the mineralized zone at the adit level as well as between the adit level and the surface. It is possible that a potential of about 60 million tons may exist in the mineralized zone that would be amenable to block caving. The grade of this material must be determined by diamond drilling.

RECOMMENDATIONS:

A minimal diamond drill program, (10,000 ft.), to be drilled from the adit is recommended in this report. The results of this program will indicate whether the deposit warrants a complete diamond drill assessment preparatory to a feasibility study.

The estimated total cost of the recommended program, with all attendant services etc. is $187,000.

GEOLOGICAL SETTING

REGIONAL: The Cassiar Molybdenum property lies within the Cassiar Batholith near its eastern contact, (Fig. 69-1). The outcrop contact of the batholith with the intruded Paleozoic sedimentary rocks is one mile east of the property. The age of the intrusives is considered to be Jurassic or Cretaceous with local segments as young as Late Cretaceous or Tertiary. The Cassiar Batholith rocks are predominantly acidic in composition, ranging from granite to granodiorite. The regional structural trend of the batholith and the sediments to the east, is northwesterly. Several major longitudinal faults, along which some movement has taken place in Tertiary time or later, have been recognized along the flank of the batholith.

The equivalent continuations of the Cassiar Batholith northwest to Ross River in the Yukon and southeast to the Omineca in B.C. are spatially associated with proven silver-lead-zinc and mercury deposits, and the Cassiar Batholith itself is spatially related to the Cassiar Asbestos deposit. The region between Cassiar and the Omineca was very lightly explored up to 1968 when activity increased considerably.

PROPERTY:

All of the principal known molybdenite occurrences on the property appear to be spatially related to a regional fault or fracture zone that dips vertically to steeply westward and that strikes slightly east of north. This zone is most discernable from the air as a wide (200-400 ft.) band of fractured and rusty rock that can be readily traced northward to the edge of the Cassiar Molybdenum mountain, to reappear across an intermontane valley on the next mountain range north where New Jersey Zinc Co. Ltd. have been exploring a mineral deposit in an extensive gossan. Several gouge-filled faults have been exposed on the Cassiar Molybdenum adit, all within a zone of fractured and sheared rock at least 500 feet in width that probably represents the fault-fracture zone seen on surface. The best molybdenite mineralization, exposed in the adit occurs within this zone of fractured rock.

QUARTZ MONZONITE: The principal country rock on the property is a medium-coarse crystalline intrusive that has been designated earlier as a quartz monzonite but which, as it has been exposed in the adit, appears to be more alaskitic, at least locally. As revealed by megascopic and microscopic, (10 thin sections), examinations the quartz-monzonite, or alaskite, has the following petrological characteristics:

> Medium to coarsely crystalline, massive, light pinkish gray colour, holocrystalline, fresh granitoid. White feldspar crystals up to ½ inch mottle the rock, as do watery gray quartz clusters (¼ inch). Large honey-coloured orthoclase phenocrysts up to 1" in length are very common in the rock and are not uncommonly surrounded by white albite reaction rims. The rock is characteristically very low in content of mafic minerals.

Compositionally the rock generally averages:

Orthoclase	35-55%	(Replaces matrix)
Oligoclase	40-50%	
Quartz	5-20%	
Biotite (hornblende)	Less than 3%.	

Technically, in view of the high quartz and silicic-intermediate feldspar contents, the rock is a quartz-monzonite; however, the very small content of mafics together with local increases in silicic (potash) feldspar at the expense of intermediate feldspar converts the rock locally to an alaskite.

LATITE: Sited along the regional north-south fault-fracture zone described above are several very irregularly shaped bodies of finely crystalline phases of the quartz monzonite that have been termed "latite". The best molybdenite surface showings are confined to one such latite body which appears to be both gradational and intrusive into the surrounding quartz monzonite. This latite body measures approximately 2000 feet (N-S) by 200-800 feet (E-W) on the surface but is locally interrupted by areas of monzonite. The adit-drift passed directly under this body at an elevation of about 600 feet below the surface and exposed only a few, relatively small bodies of the latite, indicating that the body is either a discontinuous patch or it dips sharply away from the adit. The latite occurs both as small, irregular dikes cutting the monzonite and as diffuse patches gradational within the monzonite. Petrographically the latite is revealed as:

> Uniformly pale grayish pink-white, [illegible], fresh, finely crystalline, almost aplitic, rock. It is finely speckled with black biotite. Compositionally it is nothing but a finer crystalline version of the quartz monzonite but with somewhat less quartz. Since the term latite, strictly speaking, should be applied to aphanitic rocks of volcanic origin, the rock at Cassiar Moly is mis-named; however, it is a reasonable field usage to call it latite.

HYBRID ROCK: In the surface exposures the latite stock is fringed on the east and west by rims of latite that has been replaced up to 40% by randomly oriented crystals of hornblende, up to ½" in length, which have in turn been replaced almost entirely by pseudomorphous magnetite, which is generally accompanied by replacement molybdenite.

ORE OCCURRENCES

GENERAL:

In the surface exposures the principal molybdenite occurrences are concentrated within the latite stock, particularly in the wider (north) end, in the area of the mapped faults. However, molybdenite mineralization is also common, though sparse, within the fringing quartz monzonite, particularly along the eastern side of the stock and within the monzonite to the south. The best surface showings cover a total area of 1000 feet by 600 feet. The molybdenite occurs as large blebs and rosettes disseminated in all rock types, but mostly in latite, and is generally spatially related to quartz veinlets which are parallel to the two mapped faults. This feature indicates that the latite stock and adjacent rocks were not only faulted but also considerably fractured at the time of faulting and these fractures have provided sites for the later quartz-molybdenite mineralization and access for replacement of the adjacent rock. The occurrence of molybdenite both as fracture-fillings as well as replacement disseminations and clusters throughout the wallrocks suggests a most encouragingly pervasive mineralization. Disseminated molybdenite has been found in quartz latite, quartz monzonite and hybrid latite, replacing all minerals except magnetite.

In the adit there are infrequently scattered occurrences of molybdenite fracture fillings and disseminations up to the point where the adit passes under the surface boundaries of the latite body, (Figs. 69-4 and 5). Throughout the final 500 feet of the adit crosscut, and the full 800 feet (N-S) of the adit "drift", a zone of significant molybdenite mineralization has been exposed. This exposure has been mapped in detail by the writer and Mr. E. Meyers of Value Line Minerals Ltd., but is shown in Figure 69-5 of this report only as a general zone of mineralization.

In detail the mineralization in the adit consists predominantly of molybdenite along fine fractures, occurring either as vein-filling with quartz or as black gougey smears. Pockets or isolated flakes of disseminated molybdenite are not uncommon in the rock between the mineralized fractures but they do not attain the profusion or richness in the adit that are exposed in the surface showings. The predominant fracturing and faulting in the adit are sets that strike NNE to NE and dip steeply east and/or west. These fractures are also the most common hosts for quartz and molybdenite mineralization, with less hosts being discontinuous flat fractures and tight, vertical north-trending joints. Invariably the richest clusters of disseminated molybdenite, ranging from 1/8" to 1" in rosette size, occur in the vicinity of mineralized fractures, thus making locally very high grade concentrations in the adit for lengths of from 10 to 100 feet.

ALTERATION:

Two types of host rock alteration are widespread in the Cassiar Moly adit. The first, potash feldspathization, affects all rock types and occurs well beyond the area of molybdenite mineralization. This alteration occurs in two forms: (1) as isolated euhedral crystals or clusters of crystals up to several inches in length, and (2) as disseminated fine grains scattered uniformly throughout the host rock. Commonly these two types of occurrences grade into one another. All minerals of all rock types are replaced without preference by the K-feldspar. In all exposures of molybdenite mineralization the K-feldspar is more or less present in the host.

The second alteration is argillization, the conversion of the feldspars to clay. This is most commonly and intensely developed in the vicinity of faults and fractures zones and is first evidenced as a bleaching of the K-feldspar, and eventually develops into a conversion of all feldspars to soft, white clay.

It is evident that the molybdenite replaces the K-feldspars, therefore it followed that alteration, but its age relation with the argillic alteration remains to be determined.

GRADE:

Molybdenite assays obtained from the channel sampling of scattered surface bedrock exposures in the cirque, along the top of the talus, range as high as 3.6% MoS_2 across 12 feet; however, because of lack of accessibility and deeply weathered fractures, it is essentially impossible to obtain a truly representative sample from the surface cliff exposures. It is established that the surface area of such rich molybdenite occurrences is about 600 x 1000 feet in size and covers a vertical interval of at least 500 feet.

The only sampling done in the drift adit was muck (car) sampling. All of the results of this sampling are not yet available but those that are available indicate a very wide range in grades from sparsely mineralized sections to obviously highly mineralized sections. In the north-trending "drift" section of the adit, that traverses the centre of the mineralized zone projected down from the surface, the following assays were obtained from muck sampling:

x-cut plus (100-200 ft.) - 2 mapped moly fractures 0.02% MoS_2

x-cut plus (692-722 ft.) - intense moly minzn. in latite 0.33 "

It is difficult to assess the dependability of the muck samples; the sample methods, witnessed by the writer, were the usual practices acceptable in most mines, however, the obvious tendency of molybdenite to disintegrate and disperse during blasting introduces to the sampling of the muck more variable parameters than are generally encountered in most ore deposits.

It is the writer's opinion that the grade of the Cassiar Moly molybdenite rock can be more dependably determined by the sampling of diamond drill core, provided the core recovery is sufficiently high.

TONNAGE POTENTIAL:

At this stage, of course, the possible tonnage of the Cassiar Moly deposit is unknown because the grade of any part of it has yet to be determined; however, several possibilities exist in this type of deposit for commercial ore-bodies. Such possibilities are listed below, with accompanying general tonnage figures that could pertain in each such deposit at this location:

1. Large low grade, encompassing entire mineralized zone provided it attains about 0.20% MoS_2.

   (800' x 1500') Surface area x (600') Adit depth = 60 million.

2. Medium sized zone from high grade portion of adit to surface, provided a grade in excess of about 0.30% MoS_2 is attained. approx. = 3 million.

3. Relatively restricted, high grade fracture zones.

   Grade? Tonnage = 1 million (?)

From the results to date it seems that the first alternative listed above, a large low grade zone, is the most likely target for the next stage of exploration; however, attention should be paid to the other possibilities as well.

It is emphasized that nothing is known yet about the trend, continuity or nature of the molybdenite mineralization between the relatively rich surface showings and the relatively lean exposures in the adit 600-700 feet below. It is necessary that this should be determined by diamond drilling.

CONCLUSIONS

It is evident from the results obtained on the surface and underground to date that the Cassiar Molybdenum deposit is a large one with a depth extension of at least 700 feet. The grade of this mineralized fracture zone is locally very high and locally nearly barren; it remains to determine now what the average grade is and/or what tonnage of higher grade material is amenable to mining if the overall grade is too low. The quickest and cheapest way to determine this is by drilling a pattern of diamond drill holes from the adit drift to:

1. Ascertain the extent and grade of the molybdenite zone on the level.

2. The continuity of the mineralization below the level and up to the surface.

A drill program should be laid out in the above framework primarily to determine whether any of the possible occurrences of ore may exist at Cassiar Moly. The results of such a first phase of drilling will then determine whether a more intense and definitive drill exploration and development program is warranted. With this as a guide the writer recommends that a pattern of flat holes be drilled from the adit drift as shown in Figure 69-5. In addition to these flat holes at least one up hole and one down hole should be drilled as shown to probe the vertical continuity of the mineralization.

RECOMMENDATIONS: PHASE 1:

1. 10,000 feet of underground diamond drilling (NQ) @ $10. (7000 shown in Fig. 69-5, location of remainder contingent on results of first holes.)	$100,000.
2. Camp costs, road and equipment maintenance, fuel, water supply. (4 months)	$ 40,000.
3. Assays, engineering, consulting.	$ 12,000.
4. Transportation, freight, communication.	$ 8,000.
5. Administration and overhead.	$ 10,000.
6. Contingencies (10%)	$ 17,000.
TOTAL:-	$187,000.

Any further exploration of the Cassiar Moly property should be contingent on the results of the above Phase 1 program. If the results are positive, indicating the possible existence of either a large low grade or smaller high grade deposit, then a more definitive program will be necessary, consisting of:

1. Additional underground drifting.
2. " " drilling.
3. Road and plant improvement.
4. Metallurgical tests and market studies.

Such a program, Phase 2, would cost at least $500,000. If it is to be comprehensive enough to provide data for a feasibility study.

Respectfully submitted,

DOLMAGE-CAMPBELL & ASSOCIATES LTD.

Douglas D. Campbell, P.Eng., Ph.D.

Vancouver, Canada.

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VANCOUVER I, B.C.

CERTIFICATE

Aug. 17, 1969.

I, Douglas D. Campbell, with business and residential addresses in Vancouver, British Columbia, do hereby certify that:

1. I am a consulting geological engineer.

2. I am a graduate of the University of British Columbia, (B.A. Sc., Geological Engineering, 1946), and of the California Institute of Technology, (Ph.D., Economic Geology and Geophysics, 1955).

3. I am a registered Professional Engineer of the Province of British Columbia and of the Yukon Territory.

4. From 1946 until 1957 I was engaged in mining and mineral exploration in Canada and the United States as geologist for a number of companies. In 1957 I retired as chief geologist for Eldorado Mining & Refining Co. Ltd. to begin private practice as a consulting engineer.

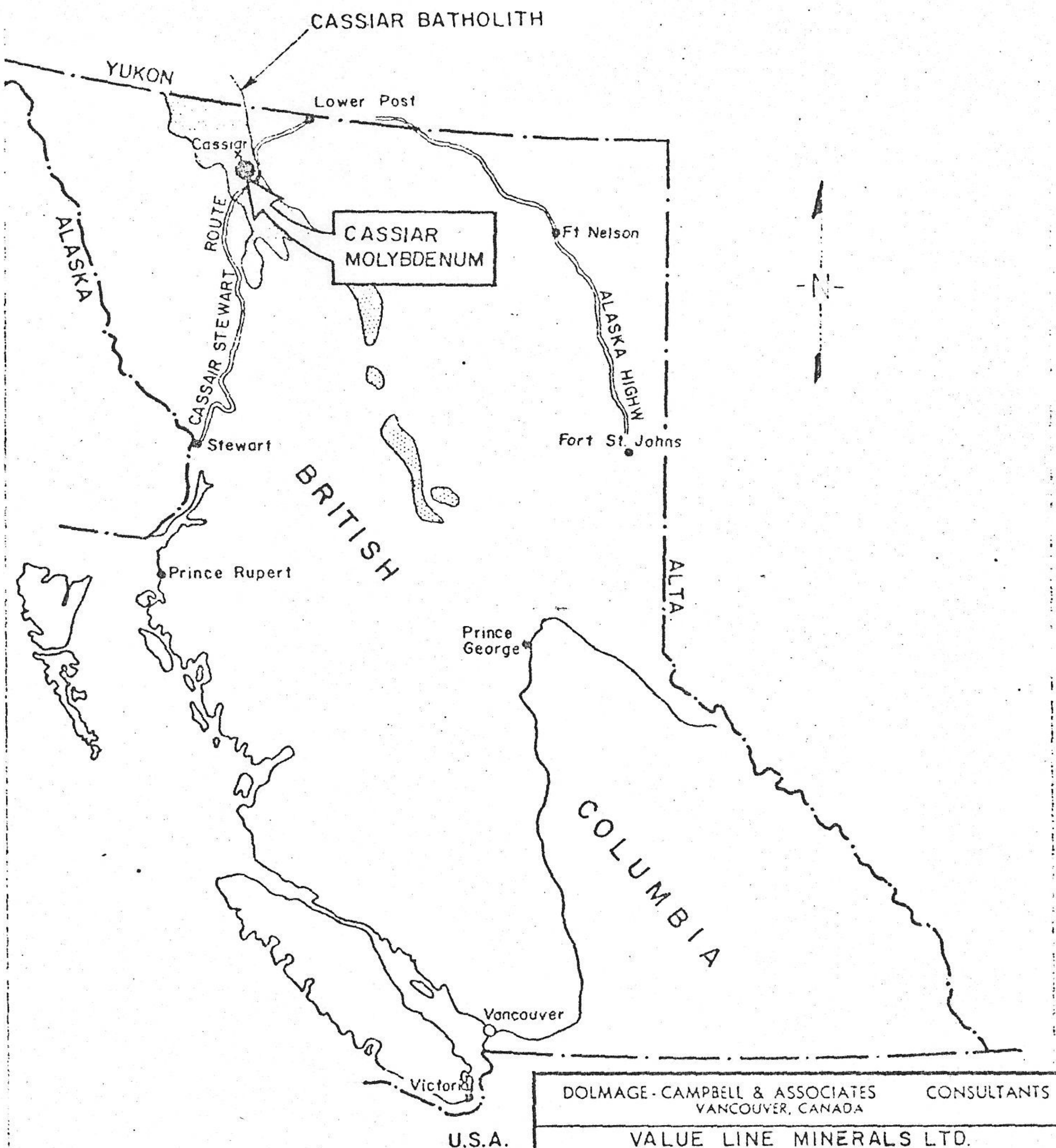
5. I have personally examined all but the most recent underground workings at the Cassiar property of Value Line Minerals Ltd. several times, and have also had access to all public and private reports on this property and area.

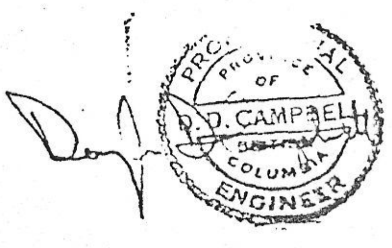
6. I have not received, nor do I expect to receive, any interest, directly or indirectly in the properties or securities of Value Line Minerals Ltd., or any associated company.

Respectfully submitted,

Douglas D. Campbell, P.Eng., Ph.D.

Vancouver, Canada.





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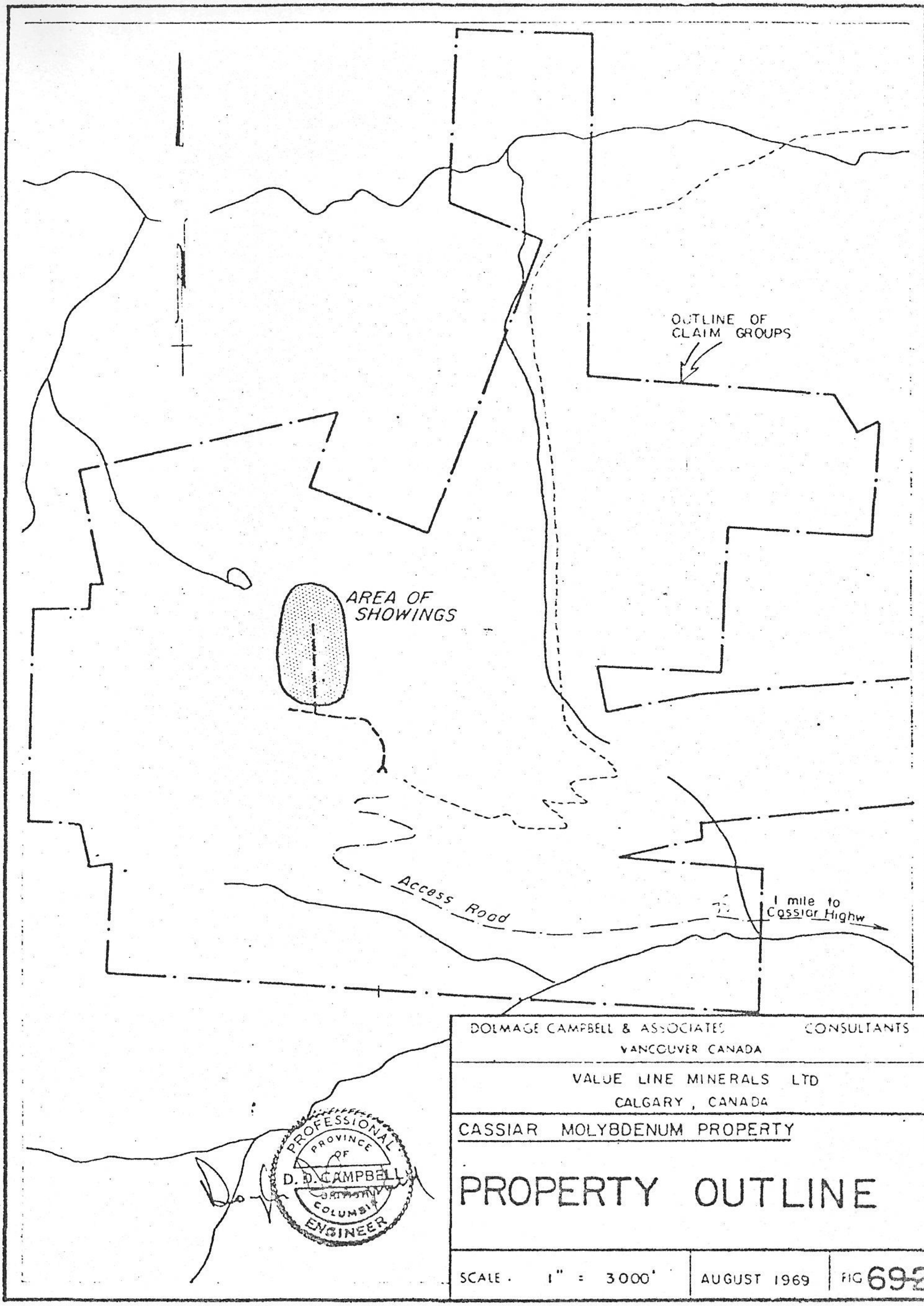
CASSIAR MOLYBDENUM PROPERTY

LOCATION PLAN

SCALE: 1 Inch = 120 Miles	AUGUST 1969	FIG. 69



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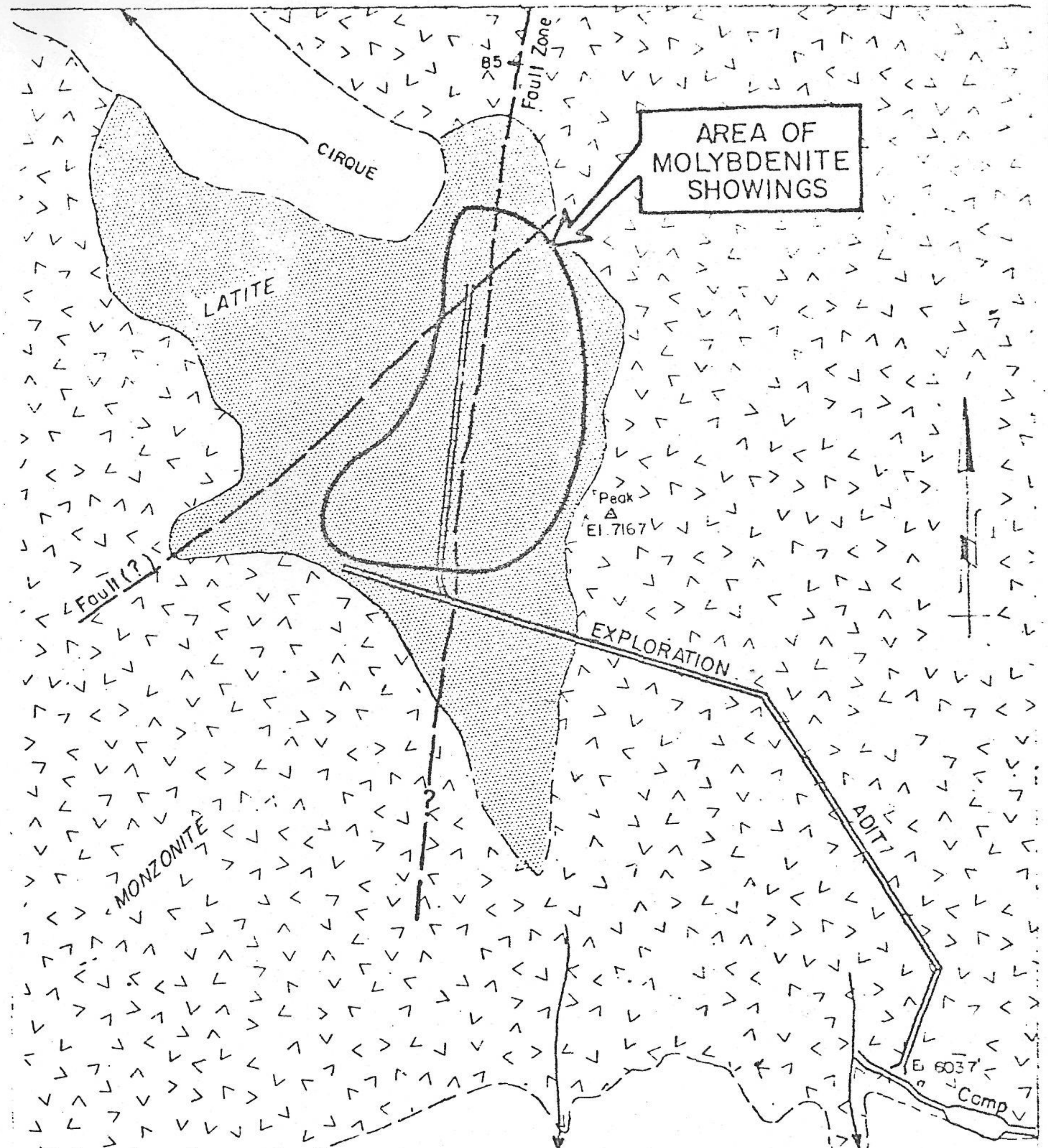
CASSIAR MOLYBDENUM PROPERTY

PROPERTY OUTLINE

SCALE: 1" = 3000' | AUGUST 1969 | FIG 69-2



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VANCOUVER CANADA

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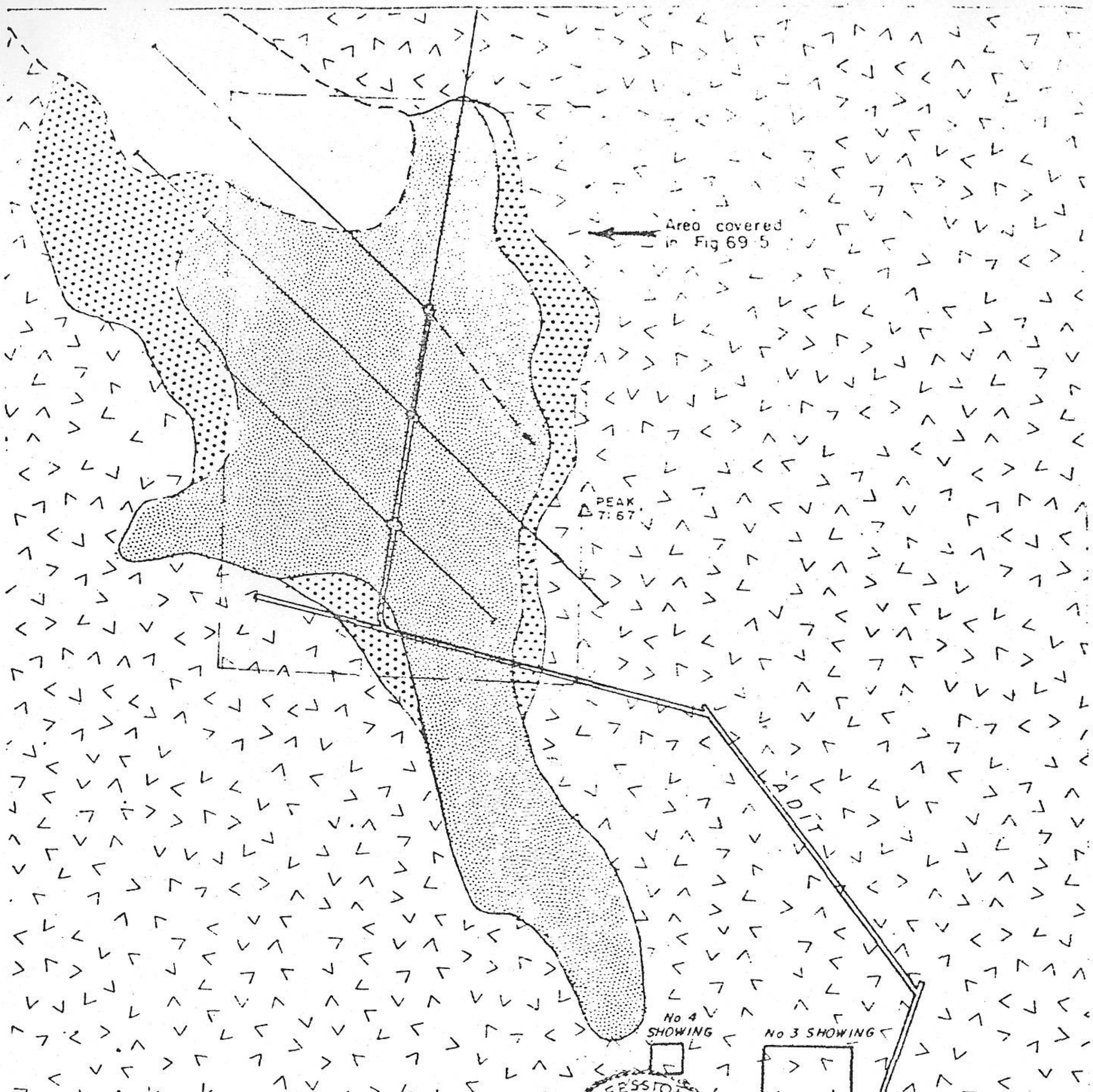
CALGARY, CANADA

CASSIAR MOLYBDENUM PROJECT

GENERAL GEOLOGY

SCALE, 1" = 400'	AUG. 1969	FIG. 69-3



PROFESSIONAL
PROVINCE OF
D. D. CAMPBELL
BRITISH COLUMBIA
ENGINEER

LEGEND

(symbol)	QUARTZ MONZONITE
(symbol)	QUARTZ LATITE
(symbol)	HYBRID LATITE
(symbol)	EDGE OF OUTCROP
(symbol)	DIAMOND DRILL HOLE (proposed) flat, dip

DO[illegible]BELL & ASSOCIATE CONSULTANTS
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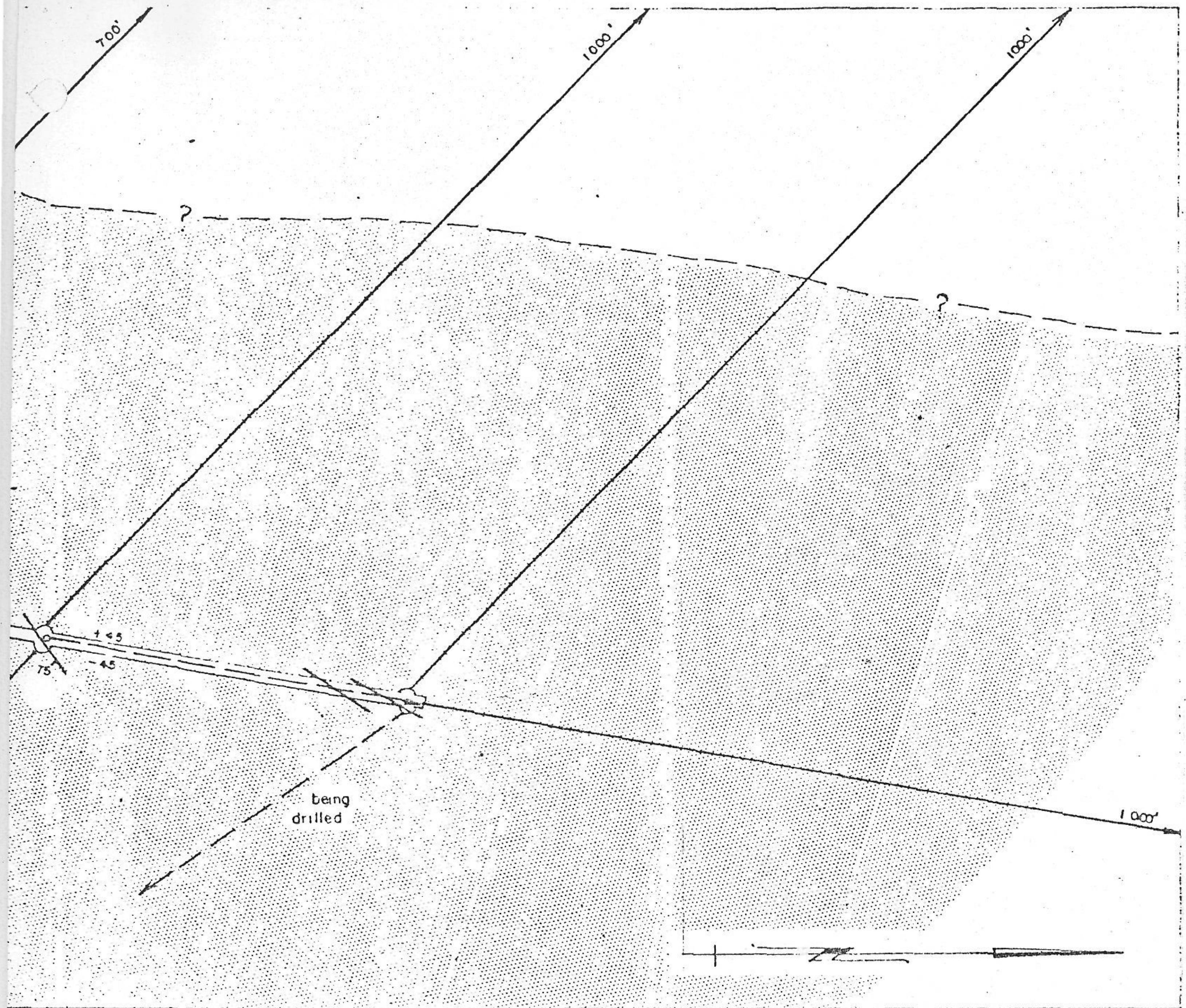
CASSIAR MOLYBDENUM PROPERTY

ADIT & PROPOSED DRILL HOLES

SCALE 1" = 400'	AUGUST 1969	FIG 69-4



LEGEND

Possible limits of molybdenite mineralization as evidenced by adit exposures

MOLY-BEARING FRACTURES

PROPOSED DIAMOND DRILL HOLES - flat

PROPOSED DIAMOND DRILL HOLES - dip

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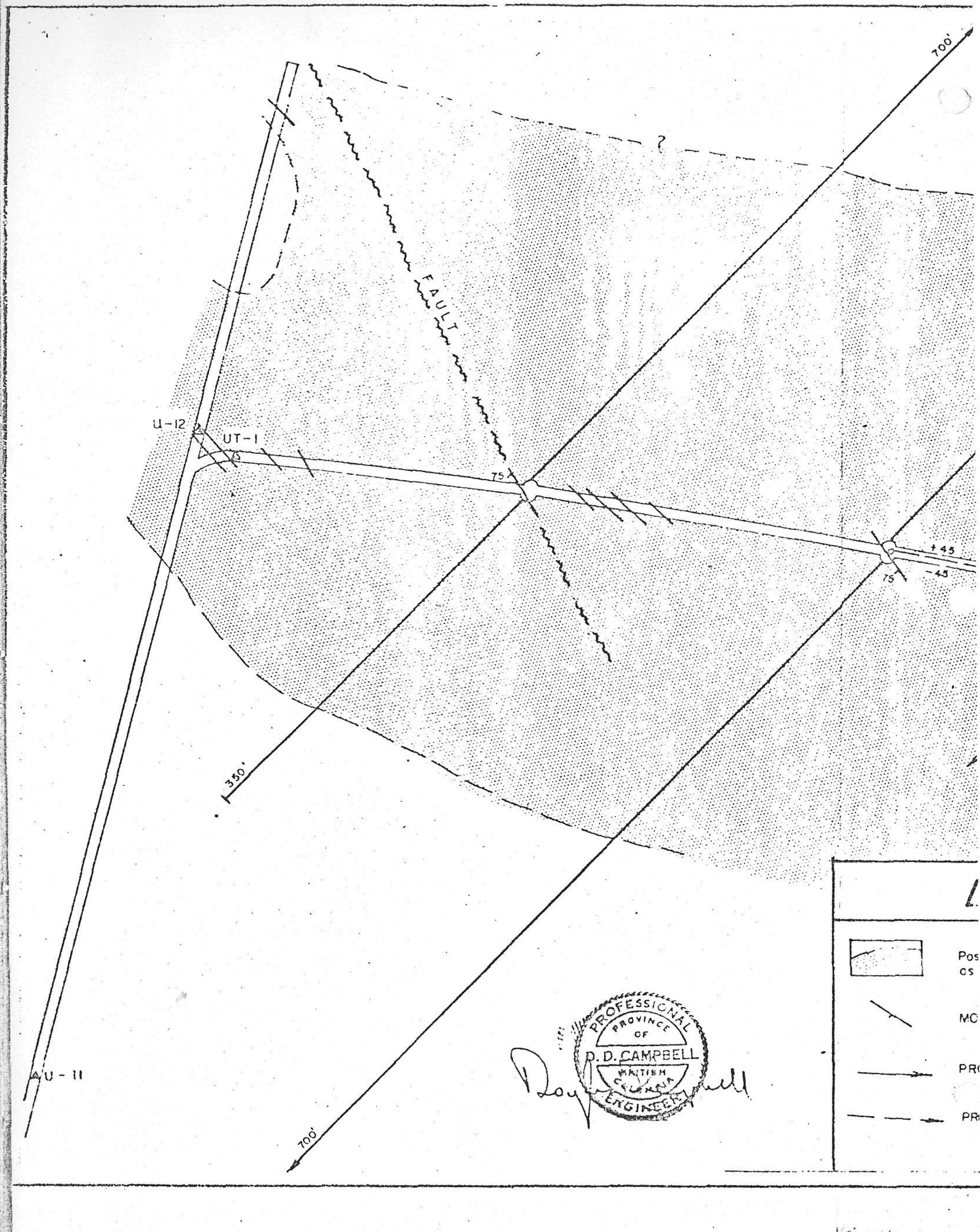
CASSIAR MOLYBDENUM PROPERTY

PROPOSED DRILLING OF MOLYBDENITE ZONE

SCALE 1" = 100'	AUGUST 1969	FIG. 69-5



700'
?
FAULT
U-12
UT-1
75
+45
-45
75
350'
AU-11
700'
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