ROVER AND KEYSTONE PROJECTS

GEOLOGICAL GEOCHEMICAL REPORT

on the

ROVER, BURN, COVER, RIDGE, FALLS,
BLUE GOLD, RED BOG, KEYSTONE,
BONANZA LODE, MIDNITE,
RIVER QUEEN #1#2#3
CLAIMS

NICOLA MINING DIVISION
92H/11E
(120°,00', 49° 45')

by

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for

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INTRODUCTION

The ROVER and KEYSTONE projects are porphyry molybdenum prospects in the Coquihalla Pass area in southern British Columbia. The project areas comprise twelve contiguous claims totalling 84 units. A good gravel road services the area from Merritt and Hope, B.C., during the snow free months, generally May to December.

Both project areas have been staked and worked by many mining companies in the past but only recently did the claim situation simplify to allow one operator to evaluate the area as a whole. The significance of the Pb-Zn-manganese mineralization in the KEYSTONE project area in terms of peripheral mineralization in a porphyry molybdenun system does not appear to have been recognized previously. A programme of detailed outcrop mapping and sampling was completed on the ROVER project area in July and August and on the KEYSTONE project area in October. In December new road cuts made by loggers on the ROVER claim were examined and a drill core from the KEYSTONE project area was examined and partly assayed. Prospecting and mapping in the area between the KEYSTONE and ROVER during this programme lead to the discovery of a previously unknown zone of molybdenum mineralization.

Three base maps were prepared at 400 feet/inch scale, Rover map 1, the Blue Gold-Red Bog map 2, and Keystone-Bonanza Lode map 3. (The latter two are the KEYSTONE Project).

Outcrop geology, alteration, soil and silt geochemistry, and rock geochemistry maps for each at molybdenum, manganese, flourine, lead, and zinc have been prepared for each map area. Rock and alteration units are field map units. No thin-section petrography has been attempted.

Three areas of interest have been defined by alteration mapping and rock geochemistry; the ROVER prospect centered on a multi-stage breccia system within the Eagle batholith and two centers in the KEYSTONE project area, the Blue Gold-Red Bog system and the KEYSTONE system.

The Blue Gold-Red Bog is a zone of quartz veins with minor molybdenum and chalcopyrite in altered Eagle granodiorite.

The KEYSTONE center is an area of Pebble Breccia containing silicified molybdenite-pyrite mineralized fragments. The breccia cuts pervasively sericitized biotite quartz monzonite mineralized with manganese.

Each of these map areas is described below.

ROVER PROJECT

Geology

The ROVER prospect is centered on an area of breccias which intrude Eagle granodiorite. The Eagle grandiorite is part of a larger batholithic intrusive complex which extends from Lytton to south of Princeton. In this prospect area it is weakly foliated biotite-hornblende granodiorite with local zones up to 10 feet of paragneiss. Pods and irregular lenticular zones of quartz-feldspar pegmatite crosscut foliation. These are small and narrow.

The ROVER prospect has three distinctive breccias although the relationship between them is not completely understood because of insufficient exposure.

The earliest breccia (Breccia C) is an annealed "rock" breccia composed of fragments of Eagle granodiorite cemented with comminuted rock. Fragments are variable in size from a few inches to several feet. There is minor disseminated pyrite (1%) in the matrix. This breccia type is found as fragments in a later breccia (Breccia B).

Breccia B is a polymictic breccia composed dominantly of Eagle granodiorite (90%) Breccia C, (5%) and quartz porphyry (5%). The matrix is coarse quartz, pyrite, and minor molybdenite and comprises 5 - 10% of the rock. The fragments display various types of alteration and mineralization. Some quartz porphyry and Eagle granodiorite fragments have reticulate quartz veins and fractures with molybdenite and pyrite.

Breccia A is of unknown age with 10 - 30% matrix quartz and calcite. It is composed mainly of Eagle granodiorite fragments with minor quartz porphyry.

Quartz porphyry is present as narrow dykes from a few feet to 20 feet wide in the Eagle granodiorite adjacent to the zone of breccias. It is also found as fragments in Breccia A and Breccia B, more commonly in Breccia A. Although it is difficult to be certain because of the weathered and moss covered nature of the outcrops and poor outcrop distribution, it appears that most of the quartz porphyry fragments in Breccia B are confined to a zone about 400 feet wide trending northeast (c.f. Alteration map).

One dyke of quartz monzonite was noted in Eagle granodiorite. The relationship with other rock types is unknown.

A few dykes of biotite-feldspar porphyry appear to cut Breccia A, and one piece of float containing a fragment of quartz porphyry suggests that it postdates quartz porphyry.

Two small stocksof a biotite-hornblende quartz diorite intrude the Eagle granodiorite and the Breccias. The extent of a small road-cut exposure quartz diorite in the recent December logging is unknown.

Andesite dykes are noted in Eagle granodiorite and in Breccia B. One occurrence has sheared contacts with breccia and may be a large fragment in the breccia. Elsewhere it cuts the breccia sharply. There may be two ages of andesite dykes (c.f. Keystone - Bonanza Code Area)

- an early dyke related in some way to the Eagle granodiorite, and a later one associated with the late stages of the breccia-sulphide system.

ALTERATION

The area of breccias is generally surrounded by an area of quartz veins, fracture pyrite and fracture and envelope sericite in Eagle granodiorite. This zone of alteration is not defined northwest of the breccia because of lack of outcrop. An outer limit of fracture chlorite and abundant fracture hematite with rare quartz veins can also be mapped.

Alteration within the breccia is variable from fragment to fragment.

Breccia A locally contains pervasive chloritized fragments and matrix chlorite but most often is biotite stable. Breccia B displays most variation in alteration. The Eagle granodiorite fragments range from unaltered biotite-hornblende granodiorite, to some with fracture chlorite-pyrite, or pervasively chloritized Eagle with fracture pyrite and quartz veins or pervasively sericitized Eagle. There is a zone in which fragments of well altered Eagle are more common which roughly coincides with the zone in which quartz porphyry fragments are found (c.f. above and Alteration map).

The quartz porphyry fragments are mainly altered to pervasive chlorite and sericite in the southwest end of Breccia B and K-spar altered fragments are found on the edge of overburden cover to the northeast. Often the quartz porphyry fragments display reticulate quartz veins. One small exposure of quartz porphyry with leached mineralized fractures with K-spar envelopes is present in an overburden covered area between Breccia A and Breccia C.

Alteration of Eagle fragments in Breccia C is also variable but mainly less altered than those in Breccia B. There are a few pervasively sericitized Eagle fragments in the most northerly exposures of Breccia B.

Several small zones (up to 70 feet diameter) of intense pervasive sericitized Eagle granodiorite are present in Breccia B and the unbrecciated Eagle granodiorite.

This alteration event is post-Breccia B and is a mineralizing event. These sericite zones may represent alteration caused by an intrusive event not recognized at surface.

The biotite-hornblende quartz diorite stocks are mainly pervasively chloritized but unmineralized. The southern outcrop of the southernmost stock is locally unaltered. The small road cut exposure in the recent logging contains minor quartz veins with anomalous Pb and Mo. These stocks are late-mineral in age.

Several stages of alteration and mineralization are evident in the Eagle granodiorite adjacent to the breccias. Veins and fractures have been sampled to distinguish mineralizing events. The earliest alteration lies along unmineralized fractures with envelope sericite grading to chlorite and then fresh biotite. The alteration envelopes are up to several inches wide. There are two later stages of quartz veining which are difficult to distinguish because each may have K-feldspar, sericite or chlorite and the selvages and envelopes may be sericite or chlorite. The age relations between quartz veins are only locally evident. The earliest quartz vein is quartz-pyrite and the latter is quartz-molybdenite. The latest event is fracture chlorite-pyrite.

MINERALIZATION

Molybdenum

Molybdenum is present in mineralized fragments of quartz porphyry and Eagle granodiorite in Breccia B. Breccia B also has minor disseminated molybdenite in the matrix. In addition there are scattered quartz veins in the Eagle granodiorite adjacent to the breccias with minor molybdenite.

The best mineralization is exposed in a creek bed between samples 161 to 165, where Breccia B contains mainly pervasive sericitized Eagle fragments. At sample 157, fourteen samples of breccia fragments were assayed and averaged 160 ppm Mo. Samples 185 and 189 are also pervasively sericitized breccia which assay 92 ppm and 130 ppm Mo.

respectively. These samples appeared to be completly leached.

The average assay for Breccia B is 77 ppm Mo. (34 samples).

The quartz vein material in the Eagle granodiorite locally ranges to 750 ppm Mo but veining is not abundant enough to have a significant total rock assay. The best M_oS_2 mineralized quartz veins are associated with high Pb and quartz-chlorite mineral assemblage.

The molybdenite in the quartz veins tends to be medium grained but is generally very fine grained in Breccia B.

Breccia C is weakly mineralized, 9 - 74 ppm Mo. Breccia A is poorly mineralized compared to Breccia B and Breccia C.

Manganese

Manganese is not present in any significant amounts on the ROVER prospect. One sample of pervasive sericitized Breccia B (sample 185) assays 1120 ppm Mn.

Flourine

Flourine geochemical assays do not display any significant pattern. Samples 189 and 192 are pervasively sericitized Eagle Breccia B and Eagle granodiorite (c.f. Alteration map) and contain anomalous flourine assaying 900 ppm F and 935 ppm F.

Lead and Zinc

No anomalous zinc is present. There are scattered anomalous values for lead ranging from 100 to 690 ppm Pb in quartz veins in Eagle granodiorite, adjacent to the Breccias.

STRUCTURE

The Eagle granodiorite has a regional northwest trending foliation, usually striking about 130° with 60 NE to vertical dips. These attitudes in adjacent unbrecciated granodiorite do not appear to have been affected by the brecciation.

Quartz veins and dominant fractures on the west side of the breccia zone trend north-south and dip gently 20° - 30° east. On the south side of Breccia B the quartz veins are 110° - 120° and 60° - 70° NE. On the east side they are mainly northerly with steep east dips.

Quartz porphyry dykes trend northeast at the southwest end of the system and northwest at the southeast end of the system.

Breccia B and Breccia C may be elongate bodies similar in orientation to the quartz porphyry dykes. Breccia B contains a northeast trending zone of quartz porphyry and altered Eagle granodiorite fragments.

The combination of these structures, the distribution of rock types and alteration of the quartz porphyry fragments suggests a center to the system at approximately 40N 15E.

SUMMARY AND RECOMMENDATIONS

On the ROVER property, three breccia bodies lie within an alteration halo containing fracture pyrite, quartz veins with minor MoS_2, and fracture and envelope sericite in Eagle granodiorite.

Within Breccia B, the best mineralized of the three breccias present, is a zone containing quartz porphyry fragments with veinlet MoS_2 and altered Eagle granodiorite fragments. This comprises the main area of interest. Average grade of Breccia B is 77 ppm Mo based on 34 surface samples with varying amounts of leaching. Alteration of the quartz porphyry fragments changes from chlorite-sericite to K-feldspar from southwest to northeast at the edge of overburden cover. This mineralized trend under cover defines a target area within the system where significant tonnage of ore grade mineralization could be present near surface. This area roughly coincides with the center of the system defined by alteration mapping and generalized structural orientation.

Although initial work should be concentrated to find surface or near surface ore, consideration should be given to a deep target as well. Other intrusives are known in the area (c.f. Blue Gold-Red Bog and Keystone-Bonanza Lode) and Breccia B is locally altered to intense pervasive sericite suggesting a younger hydrothermal event. The breccias, in particular Breccia B, may roof a mineralized intrusive.

Quite fortuitously, proposed immediate logging by Nicola Valley Sawmills is located in an area roughly corresponding to the "limit of quartz veins and fracture pyrite". Therefore, it is proposed to wait until summer 1978 in order to examine the logged area for new bedrock exposures. If no further geological data is available, then trenching should be attempted in the overburden covered area, in the proximity of the K-feldspar altered quartz porphyry (sample 197), and in a northwest trending direction from existing trenches towards sample 161. This should adequately test the potential for any surface ore, assuming that the degree of surface leaching can be determined.

Diamond drill recommendation should be based on examination of the new geological data. If no significant change in geology is found by trenching, then four NQ diamond drill holes should be spaced within the breccia system and drilled to 500 - 700 feet. Casing should be left in each hole. If no ore is encountered in this drilling, one or two of the holes should be deepened to 1500 feet. Hole selection for deepening should be based on alteration, geology, and rock geochemistry.

KEYSTONE PROJECT

BLUE-GOLD - RED BOG MAP AREA

GEOLOGY

The Blue-Gold - Red Bog system is centered on a zone of quartz veins in Eagle granodiorite. This area of interest is defined by alteration mapping and rock geochemistry. Immediately southeast of the zone of quartz veins is a stock of medium grained biotite Quartz monzonite. Adjacent to the area of interest the stock is unmineralized, unaltered, and devoid of quartz veins and at first glance would appear to be post-mineral. However, the south end of the stock on the Keystone Claim is altered and mineralized.

The system is intruded by narrow late-mineral biotite (chlorite)-feldspar porphyry dykes and post-mineral andesite dykes. One occurrence of quartz porphyry dyke was noted although there is further evidence of quartz porphyry in float on the east side of the ridge.

ALTERATION

An alteration pattern consisting of three zones has been mapped. The outer limit of the sulphide system is defined by pervasive chloritization of the mafics in Eagle granodiorite. This roughly coincides with 1% - 2% pyrite. Alteration outward from this line is decreasing partial chloritization and decreasing fracture pyrite. There may be local narrow zones with pyrite, fracture chlorite, hematite and manganese and rare quartz veins.

Internal to the pervasive chlorite is a zone of alternating pervasive chlorite and biotite stable Eagle granodiorite with quartz veins. These zones may be several tens of feet wide. Quartz veins tend to be thin and reticulate. Some megascopic sericite is present with the chlorite in local zones.

The central alteration zone is biotite stable Eagle granodiorite with abundant quartz veins. The biotite in the foliated granodiorite is randomly oriented in foliated clots. This suggests that this biotite is re-crystallized from the original planar oriented biotite of the Eagle granodiorite. Two explanations are possible. The random biotite could be a pervasive hydrothermal alteration caused by the mineralization or a product of pre-mineral contact metamorphism caused by the adjacent Quartz monzonite stock, which is unaltered and unmineralized.

It should be emphasized that the alteration system is not closed off by surface bedrock mapping. It potentially could open to the south along the ridge on unstaked ground.

MINERALIZATION

Molybdenum

The best molybdenum exposed in either project area is present along the banks of a north flowing creek of the Blue Gold claim. Complete leaching is quite deep (6 inches to 1 foot) for proper surface sampling. Selected grab samples from small pits range from 62 to 980 ppm Mo.

To examine the effect of leaching, the variation in rock geochemistry in similar alteration zones is examined in the table below:

Alteration Zone	Sample No.	PPM Mo	PPM Mn
Pervasive Chlorite	628, 746	80-136	165-180
" "	626, 627	6	185-260
" "	709, 710	4- 19	340-190
" "	730, 731	1- 3	250-310
" "	C-509	62	145
Mixed Zone	716, 717A, B	2	320-360
" "	727, 718	29- 40	290-350

It is apparent that wide variation in rock geochemistry exists within similarly altered rocks in close proximity and in the same structural setting. This is believed to be due to variable leaching. If consideration is to be given to the rock geochemistry pattern as a guide to diamond drilling then unweathered rock samples must be acquired. It is recommended that several short percussion holes (50 feet of unweathered rock) be drilled to establish the relationship between alteration and rock assay.

Leaching is less of a problem in the biotite stable alteration zone on the ridge. Samples 721 - 725, 735 - 740 are mainly quartz vein material from backhoe trenches. There is a general increase in Mo content towards the northwest end of the trenches. No attempt was made to distinguish between different stages of quartz veins because of active snowfall. This should be done as an aid to interpreting diamond drill core. It should be noted, however, that at least three stages of quartz veins are present.

OTHER ELEMENTS

Rock geochemistry assays for manganese, flourine, lead and zinc are uniformly low. Copper was not assayed but malachite and minor chalcopyrite was noted occasionally. A soil survey of the ridge area of the Blue-Gold - Red Bog claims by El Paso Mining and Milling Company in 1973 indicates local anomalous zones for copper and a broad anomalous zone for molybdenum.

STRUCTURE

The regional foliation of Eagle granodiorite is 130° - 150° with 75° NE to vertical dips. Quartz veins are present in the plane of foliation. On the ridge, quartz vein orientation is quite variable in strike and dip although the dominant direction is parallel to foliation. Dykes crosscut foliation at small angles, 10° - 15°, in a more westerly direction.

A late structural element is hematite (specularite)-carbonate veining which form the locus of minor fault, typically a few inches. This trend is 050 - 060 70° SE to vertical dips. It is quite abundant in those exposures in the creek on the Blue-Gold claim. Elsewhere it is a dominant fracture and may have manganese.

SUMMARY AND RECOMMENDATIONS

The Blue-Gold - Red Bog prospect is centered on an alteration system in Eagle granodiorite defined by pervasive chlorite and quartz veins. The area of alteration is about 3000 feet by 2500 feet. Best MoS_2 mineralization observed to date is in pervasive chlorite altered rocks in the northwest end of the alteration system. Some doubt exists about the validity of surface rock geochemistry reflecting true grade because of the effects of leaching. It is unknown if the broad zone of pervasive chlorite would be more likely to lead to ore closer to surface than the biotite stable granodiorite with quartz veins, in the center of the alteration system. There is no doubt that the biotite stable alteration zone is the best area for deeper targets. It is recommended that several short percussion drill holes (50 feet of unweathered rock) be drilled to establish the relationship between alteration and rock assay with some certainty.

The pervasive chlorite alteration in the southeast part of the map area diverges significantly away from the Quartz monzonite stock in an area of poor exposure. A few percussion tests in the overburden covered area is recommended.

The Blue-Gold and Falls claims are not completely mapped. Several local zones of sericite-pyrite pegmatite were noted in reconnaissance work but not evaluated. The geological relationship of these zones with the other mineralized areas should be understood. Also Pebble Breccia float in the creek on the north end of the Falls claim was not found in place. The alteration on the Blue-Gold is open to the south and anomalous soil geochemistry for Mo extends south of the present claim boundary. This mapping should be completed before any further physical work is attempted.

If no significant changes in the extent of the alteration system area found and no surface ore is encountered by percussion drilling, then four 500 - 700 foot holes NQ diamond drill holes are recommended at sample site 725, 740, 717 and part way between 729 and 730. One or more of these holes may be deeped to 1500 feet based on geology, alteration and rock geochemistry.

KEYSTONE PROJECT

KEYSTONE - BONANZA LODE MAP AREA

GEOLOGY

The Keystone and Bonanza Lode claim areas have been actively explored in the past. Much of the data presented here is based on mapping existing trenches and examination of drill core.

The Eagle granodiorite in this map area is intruded by a quartz monzonite stock. The quartz monzonite away from the altered zone contains 2% - 5% magnetite. Intruding both the Eagle and the quartz monzonite is an elliptical-shaped Pebble Breccia body about 7000 feet by 4000 feet.

The Pebble Breccia is composed of round to subangular fragments of Eagle granodiorite and quartz monzonite, with minor quartz porphyry and feldspar porphyry. Fragments typically range in size from a few millimeters to a few inches. In the south part of the breccia body, large blocks up to ten feet of Eagle granodiorite breccia are present. Similar Eagle breccia is present intermittently along the west boundary of the Pebble Breccia with the Eagle granodiorite and in drill holes 73-3, NC-73-6, NC-73-2 and NC-73-7.

Past diamond drilling in the Keystone claim area has been concentrated in and around the Pebble Breccia and is the main source of information about the breccia. Noranda Mines drilled six holes in the south part of the breccia. There is limited assay information on these holes and the Noranda logs are attached. The core was found in the field shortly before snowfall and was not logged. These cores are in a poor state at present and should be re-marked, re-logged and assayed where necessary to determine the relationship between the Pebble Breccia and the country rock. The next significant drilling was done in 1973 by Denison Mines (DDH-1 to 4). Three of these holes were drilled adjacent to one breccia; the fourth, DDH-2 is the deepest penetration in the Pebble Breccia (500 feet) located roughly in the central part of the breccia. In 1973, Noranda Mines drilled seven short diamond drill holes in the Pebble Breccia and adjacent rocks. These penetrations provide information about the breccia in the overburden covered area in the main valley. The Noranda 1973 and the Denison drill holes have been logged and partly assayed by Western. The summary assays are discussed below.

The Pebble Breccia often is well layered by the lamination of sand-size fragments and more rarely by pebble-size fragments. This layering is believed to be fluidization at the time of breccia formation. This means that fragment transport has taken place and fragment rock-type have been mixed. However, some broad generalizations are evident from logging and assaying. More mineralized fragments are present in the north part of the Pebble Breccia. Drill hole NC-73-6 displays the most chaotic Pebble Breccia with most angular and abundant mineralized fragments than any other. Drill hole NC-73-6 and to a lesser degree NC-73-5 contain more quartz-eye (feldspar) porphyry fragments than any other. Drill holes NC-73-5 and NC-73-6 contain the most Mo in the Keystone part of the system. On the basis of the presence of mineralized and altered rock fragments, the north part of the Pebble Breccia is believed to be an important lead to ore mineralization.

Eagle Pebble Breccia dykes cut Eagle granodiorite and foliated andesite dykes. Other dykes in the Eagle granodiorite are biotite (chlorite)-feldspar porphyry, rhyolite, hornblende diorite and andesite. Two occurrences of quartz-feldspar porphyry were noted in the area of Pebble Breccia but contacts were not observed.

ALTERATION

Pervasive chloritization of the mafic minerals in Eagle granodiorite and the Quartz monzonite forms an ellipsoidal-shaped outline peripheral to the Pebble Breccia body. Eagle breccia and some Eagle breccia blocks in the Pebble Breccia are pervasively chloritized. The Pebble Breccia is only pervasively chloritized on the south and eastern contact areas. At the north end of the Pebble Breccia, the breccia and the biotite in the adjacent Quartz monzonite is pervasively altered to sericite. Elsewhere sericite alteration of the Pebble Breccia is within pervasively chloritized Pebble Breccia.

The interesting thing to note is that the pervasive sericite zone crosses the Pebble Breccia contact on the north end. It appears that the Pebble Breccia on its western and southern boundary has a rim of pervasive chlorite but is absent on its northern contact. Consideration should be given to a possible superimposed alteration event in the northern area of the Pebble Breccia which created pervasive sericite in Pebble Breccia and adjacent Quartz monzonite.

MINERALIZATION

Molybdenum

There is no significant surface molybdenum mineralization in the Eagle granodiorite and Quartz monzonite. However the top part of DDH-3 contains brecciated felsic dyke and brecciated intrusive (possible Eagle granodiorite) with anomalous Mo up to 200 ppm. In addition, well MoS_2 mineralized fragments are evident in the north part of the Pebble Breccia. The Pebble Breccia drill core and the core from adjacent pre-mineral rocks have been partly geochemically assayed and summarized below.

AVERAGED ASSAYS

FROM KEYSTONE AREA DRILLING

PRE-MINERAL ROCKS

DRILL HOLE			Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm
73-1	(6)*	(489)**	61	540	1	4675	760
73-4	(9)	(486)	98	456	2	3005	745
NC-73-1	(2)	(200)	22	240	1	3200	480
NC-73-2	(3)	(197)	7	66	1	330	345
NC-73-7	(2)	(200)	25	132	1	1395	425
73-3	17-107		87	508	24	2510	555
	107-197		58	197	3	3480	530
	222-307		77	1480	1	3900	600
	307-407		94	1542	1	11490	945
	407-(497)		104	857	1	6890	880

( )* denotes number of samples assayed, average sample length 10 feet

( )** total depth drilled

PEBBLE BRECCIA

73-2	(7)	(500)	136	325	10	2760	505
NC-73-3	(2)	(201)	25	215	14	1230	500
NC-73-4	(1)	(230)	26	187	12	1120	520
NC-73-5	(1)	(242)	24	97	30	1310	480
NC-73-6	(2)	(200)	18	340	20	1675	488

It is apparent that the Pebble Breccia contains the most Mo in the Keystone part of the system and the breccia past-Mo mineral in age. It is, however, mineralized with Pb and Zn.

Manganese

Highly anomalous manganese is present in the Quartz monzonite close to the contact with the Pebble Breccia, especially at the north end in the pervasive sericite alteration zone. All of drill hole 73-3 is highly anomalous and at depth is extremely anomalous with many 10 foot intervals assaying greater than 1% Mn. This is also associated with an increase in flourine content and an increase in the sercite alteration intensity. The managese content of the Pebble Breccia is variable but moderately anomalous especially in the deeper drill penetration in the central part of the breccia body. Elsewhere in the Eagle granodorite, and Quartz monzonite, manganese is restricted to narrow zones and structures.

Flourine

Flourine is moderately anomalous in the high manganese zone in Quartz monzonite adjacent to the Pebble Breccia and in the bottom of drill hole 73-3. This is the only area of anomalous flourine evident on all map sheets.

Lead and Zinc

All rock types within the pervasive chlorite zone are moderate to highly anomalous for lead and zinc. Two mineralized vein systems are noteworthy. The Keystone vein is galena, sphalerite, pyrite rhodochrosite and quartz and appears to mineralize Quartz monzonite. No orientation of the vein has been mapped but underground workings have a northeast trend. It has been suggested that the high manganese in the quartz monzonite at the north end of the Pebble Breccia is related to the Keystone vein. This is unlikely because the distribution of high manganese does not parallel the apparent structure of the vein but more closely is associated with the outline of pervasive alteration. Samples 570 and 556 indicate the northern limit of anomalous manganese. The western limit is defined by unmineralized and unaltered quartz monzonite which was not assayed. These outcrops are approximately on strike with the apparent strike extension of the Keystone vein. This point is belaboured because it is important to the interpretation of the manganese mineralization and the alteration of the north end of the Pebble Breccia and adjacent quartz monzonite and how it might relate to mineralization covered by the late-mineral Pebble Breccia.

Adjacent to the western boundary of the Pebble Breccia is a zone of Pb-Zn veins and mineralized fractures. This area is reported to have 1 - 2 million tons of low grade Pb-Zn, referred to as the Julie Zone. The old trenches have been sloughed in by recent logging and geologic information is limited. It appears that mineralization in the Eagle granodiorite is composed of several narrow veins with some fracture-controlled mineralization. The zone apparently crosses the Pebble Breccia contact and mineralization in the Pebble Breccia is primarily vein stockwork. The general zone of mineralization trends northeast as exposed in early trenches and logging slash.

STRUCTURE

The foliation of the Eagle granodiorite is similar to the other map areas and is unaffected by the quartz monzonite stock or the Pebble Breccia. The dominant mineralized structural trend is northeast, as indicated in the Keystone and Julie Zones. This direction is also the orientation of Eagle breccia dykes and other smaller Pb-Zn veins in the Eagle granodiorite west of the Pebble Breccia.

Rhyolite and biotite (chlorite) feldspar porphyry dykes west of the Pebble Breccia trend north-south. East and north of the breccia, biotite-feldspar porphyry dykes trend northwest. Rhyolite dykes north of the Pebble Breccia trend north and northeast.

There does not appear to be a dominant structural trend in this area. This may be because the Pebble Breccia dominates the map area. A more regional geologic view may be useful with particular emphasis on orientation of dykes and mineralized structures.

The Pebble Breccia locally is layered by sorting of fragments by size. Fragments may change from sand size to pebble size from layer to layer. This is interpreted as a result of fluidization. It is best displayed near the northwest contact and in drill holes. At the northwest contact the layering is parallel to the contact and dips eastwards (inwards) 40° - 45°.

This may reflect the attitude of the contact of the Pebble Breccia in this area. Thus the Pebble Breccia may have gentle inward quaquaversal dipping contacts to a central breccia core. Dip angles in vertical drill holes vary from 20° - 45°.

SUMMARY AND RECOMMENDATIONS

The Keystone-Bonanza Lode map area is dominated by a late-mineral Pebble Breccia. The breccia contains well-mineralized fragments with fracture pyrite and MoS_2 and Quartz-MoS_2 veinlets. The geochemistry and distribution of these mineralized fragments suggests that the north part of the Pebble Breccia is the best MoS_2 mineralized portion of the Keystone sulphide system.

It is important to note that the pervasive sericite alteration zone is present in the contact rock only at the north end of the breccia. This area is also coincidentally mineralized with highly anomalous manganese and moderately anomalous flourine. It is interesting to note that the Keystone-Bonanza Lode area displays the poorest molybdenum mineralization of all three systems, but contains the most sericite alteration, pyrite, manganese, flourine, lead and zinc mineralization of all of the systems. This is not incompatible with a molybdenum porphyry system.

It is recommended to drill two diamond holes in the north end of the Pebble Breccia to penetrate to pre-breccia rock. Hole 1 should be located 400 feet north of NC-73-5. Hole 2 should be 800 feet west from hole 1. Drilling should be NQ with casing left in hole for future deepening.

RESPECTFULLY SUBMITTED

K. W. LIVINGSTONE, M.Sc.,
Geologist

APPENDIX

ROVER AND KEYSTONE PROJECT
CLAIMS

CLAIM NAME	NO. OF UNITS	RECORD NUMBER	RECORD DATE
ROVER	6	301	July 29, 1977
COVER	8	302	July 29, 1977
BURN	6	303	July 29, 1977
RED BOG	6	310	August 5, 1977
RIVER QUEEN #1	8	311	August 5, 1977
RIVER QUEEN #2	6	312	August 5, 1977
RIVER QUEEN #3	6	313	August 5, 1977
BONANZA LODE	8	314	August 5, 1977
BLUE GOLD	9	337	September 26, 1977
FALLS	9	338	September 26, 1977
COMSTOCK	1	339	September 26, 1977
RIDGE	6	340	September 26, 1977
KEYSTONE	6	341	September 26, 1977
MIDNITE	2	342	September 26, 1977

CERTIFICATE OF QUALIFICATIONS

I, K. W. Livingstone, M.Sc., Geology, of 4317 West 12^{th} Avenue, Vancouver B.C., V6P 2R9, state as follows:

That I graduated from Carelton University in 1966 with a Bachelor of Science in Honors Geology and, with Masters of Geology from University Of British Columbia in 1968.

That I have prospected and actively persued geology prior to my graduation and have practiced my profession since 1966.

That I am a member of the Canadian Institute Of Mining and Metallurgy and the Geological Association of Canada.

That I am presently employed as a businessman and geologist with JMT Services Corp. 8827 Hudson Street, Vancouver B.C., V6P 4N1.

Dated at Vancouver, British Columbia this 13^{th} day of June, 1978.

K.W. Livingstone

STATEMET OF EXPENDITURES

ROVER PROJECT
August 1, 1977 to June 1, 1978

PERSONNEL	Dates Worked		
K.W. Livingstone Geologist	August 12, to November 30, 16 days @ 175	$2730	
J.S. Christie Geologist	August 26, 27, 2 days @ $175	350	
G. Lauzon Assistant	August 12, to August 28, 4 days @ $70	280	
L.W. Saleken Geologist	November 14, to November 30, 5 days @ $125	625	
			3985
Food and Accommodations 30 man days @ $15 per day			450
Transportation Four Wheel drive Camper 20 days @ $40.00 pd			800
Assay and Geochemical 200 rock & soil samples, Cu, Pb, Zn, Mo, Ma, F, @ $7.55			1510
Supplies Field Supplies,air photo etc,			150
Report Preparation K.W. Livingstone, 4 days @ $175 pd		700	
T. Kovacevic, draftsperson, 20 hrs. @ $8.50 ph		170	
Printing & Reproduction		200	
			1070
		TOTAL EXPENDITURE	$7965

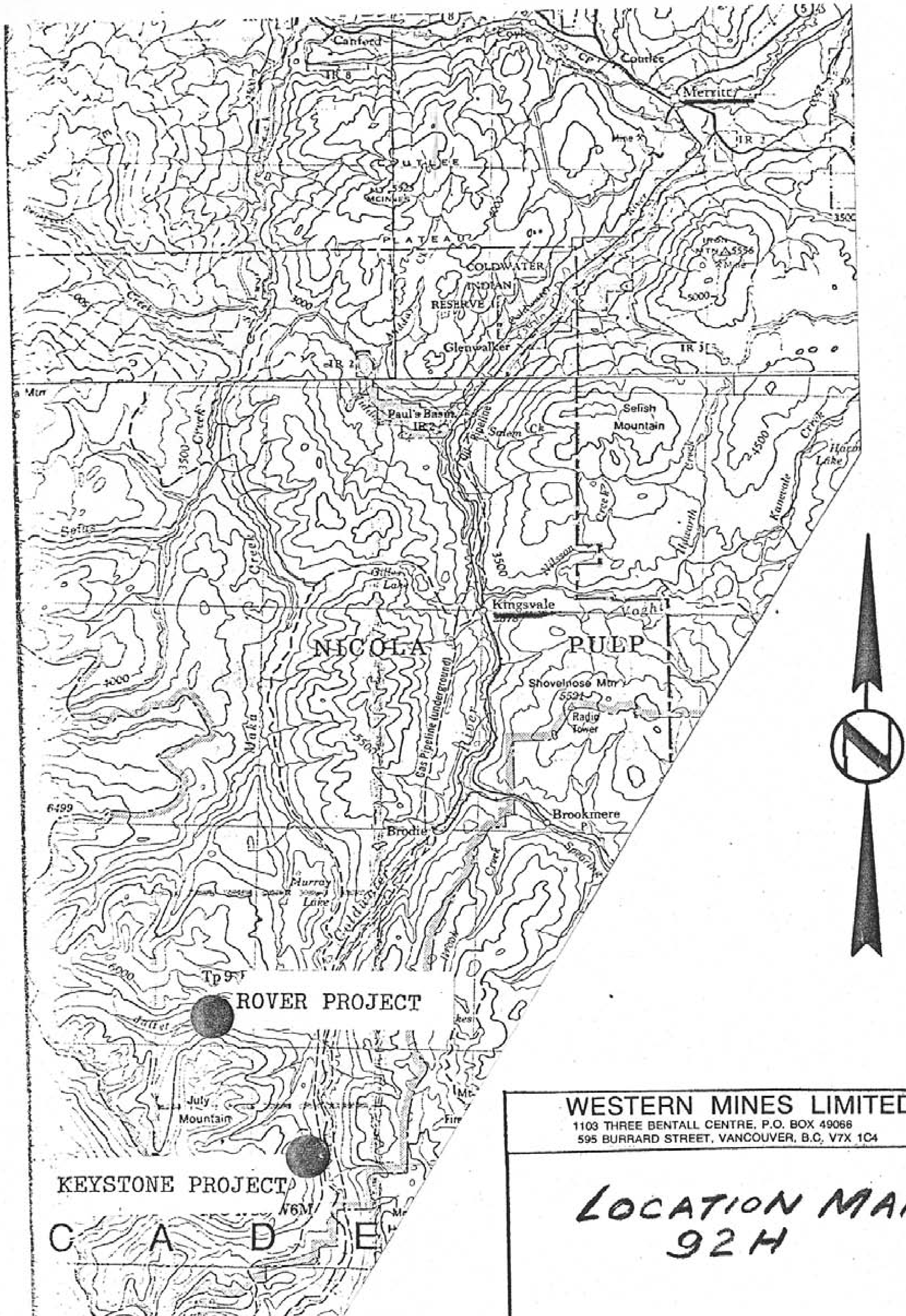
STATEMENT OF EXPENDITURES

KEYSTONE -BLUE GOLD PROJECTS
Sept 28, 1977 to June 1, 1978

PERSONNEL	Dates Worked		
K.W. Livingstone Geologist	Sept 28, to Nov 30, 22 days @ $175 Per Day	$3850	
G. Lauzon Assistant	Oct 4 to Oct 10, 5 days @ $70	350	
L.W. Saleken Geologist	Oct 18, to Nov 30, 15 days @ $125	1875	
G. Crooker Geologist	Oct 18 to Oct 28, 8 days @ $100	800	
B.E. Spencer Senior Geologist	Oct 18 to Oct 28, 2 days @ 200	400	
			$7275

Food and Accommodations		
Food, 50 man days @ $15 pd	750	
Lodging, 23 days @ $20 pd	460	1210
Transportation		
Four Wheel drive Camper 22 days @ $40 pd	880	
Four Wheel drive pick up, 15 days @ $30 pd	450	
		1330
Assay and Geochemical		
205, rock & soil samples Cu, Pb, Zn, Mo, Mn, F, A $7.55		1547
Supplies		
Field Supplies, topofil, Flagging etc.		150
Rentals		
H.E. Sanders Ltd. T.D. 25C Tractor from Oct 18, to Oct 24 33 hrs. @ $66 PHR	2178	
Hauling Charge	125	
		2,303
Report Preparation		
K.W. Livingstone, 4 days $175	700	
T. Kovacevic, draftsperson, 20 hrs. @ $8.50	170	
Printing And Reproduction	200	
		1070
TOTAL EXPENDITURE		14,885

ILLUSTRATIONS

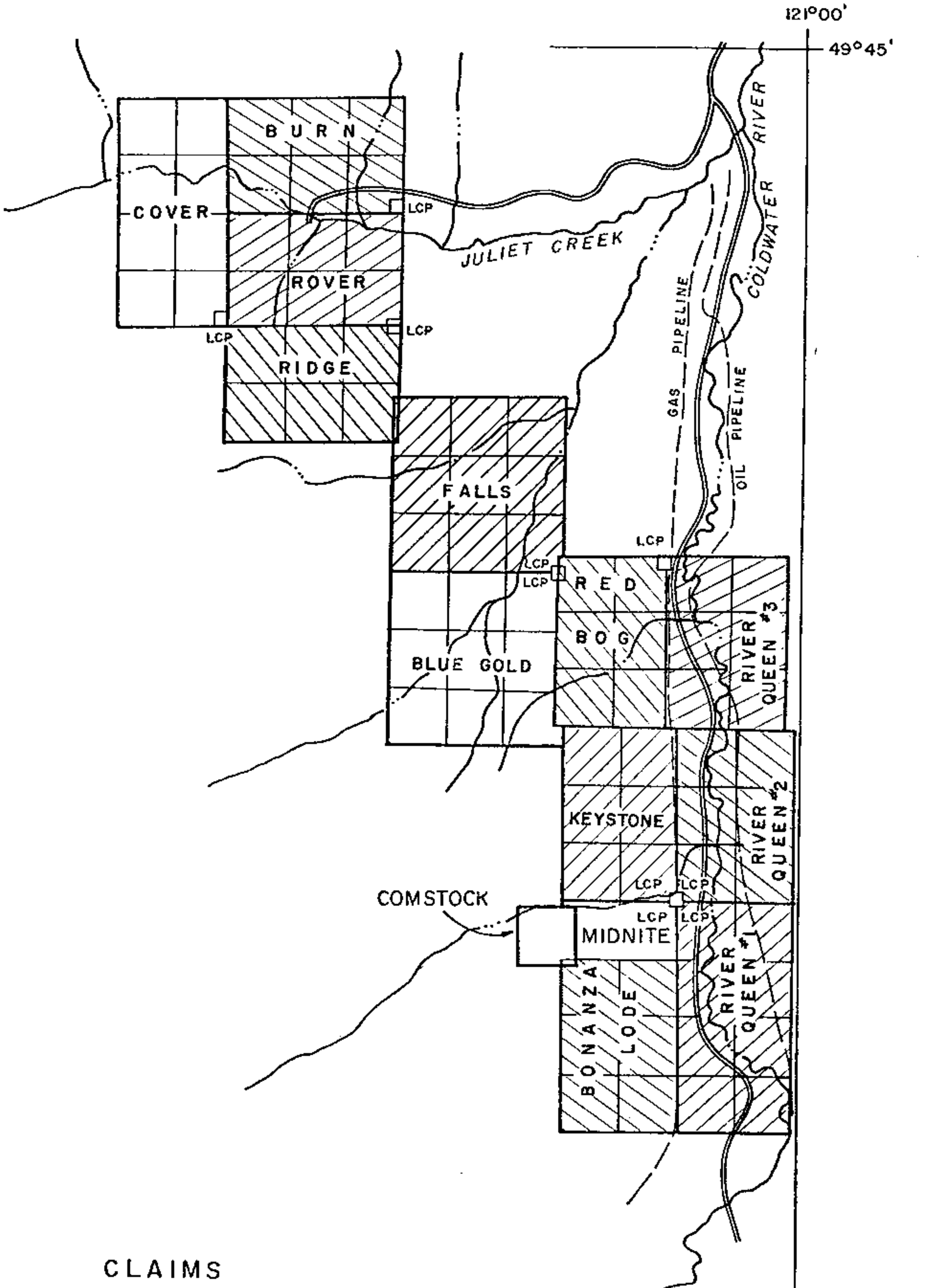


WESTERN MINES LIMITED
1103 THREE BENTALL CENTRE, P.O. BOX 49066
595 BURRARD STREET, VANCOUVER, B.C. V7X 1C4

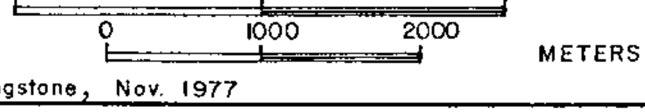
LOCATION MAP
92H

Drawn By:
Drafted By:
Date: 6/78 Revised:

Scale: 1:250,000
Contour Interval:
Drawing No. RWS



CLAIMS
ROVER AND KEYSTONE PROJECTS
92 H / 11 E



K. W. Livingstone, Nov. 1977

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST

Hole No. 73-1 Page No. 1

Property
District
Commenced
Completed

Length
Bearing
Dip

Lat.
Dip
Elev.

~~Drill~~ Type VERTICAL
Hole Size BQ
Contractor DENISON

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	Au	Ag	Cu	Pb	Zn	Mo	Oxide Cu	Oxide Mo			ROCK DESCRIPTION AND NOTES	GRAPHIC LOG FOOTAGE	ROCK TYPE
BOX 1	10	25													Med. grained qtz monz. with minor dissem. MoS_2 and pyrite <1% mainly perv. ser. mafics Structures: 45° vuggy qtz-sphal. 20° qtz-Mo-py 45° qtz-gypsum 70° qtz-Mo-py		
~~Box 9~~	~~203~~	~~233~~															
Box 9	203	223													Crowded f-spar porphyritic quartz monzonite dissem. py 1½% structures: qtz-py 20° 10° fract. pyrite		
Box 13	319	344													sim. to Box-9 perv. ser. mafics abundant qtz-gypsum 20°		
Box 15	368	—													368-418 dominantly pervasive sericite		
16															418 — to 489 local zone of perv. sericite but mainly biotite qtz monz.		
17															dissem. py up to 1½% in sericite zone fracture pyrite < ½%		
18															qtz-gypsum-py 10°-20°		
19	—	489 EOH															

383' structures
(1) 30° qtz veins cut by
(2) 80° " " " "
(3) 20° qtz-gypsum

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST

Hole No. 73-2 Page No. 1

Property ______ Length ______ Lat. ______ ~~Drill Type~~ VERTICAL

District ______ Bearing ______ Dip ______ Hole Size BQ

Commenced ______ Dip ______ Elev. ______ Contractor DENISON Logged by ______

Completed ______ Approved by ______ Date ______

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES	GRAPHIC LOG FOOTAGE	ROCK TYPE
Box 1	81	—													Pebble Breccia		

Core angles to 150': 10°, 10°, 7°; 5°, 8°, 15°

local layers to 5' with course subrounded fragments but mainly fine grained (< 1/4") fragments with scattered pebble size

towards bottom of hole the breccia is unlayered and mainly fine sand-size breccia with scattered pebble-size fragments.

350-370 feldspar porphyritic andesite similar to top of NC-73-6 - chilled contacts with core angles 17° and 35°

weak layering 15° at 385'

Q.M.C-2

DRILL SAMPLE RECORD

- [ ] GRANITE
- [ ] VOLCANIC
- [ ] SEDIMENT
- [ ] SCHIST

Hole No. 73-2 Page No. 2
Property KEYSTONE
District
Commenced
Completed

Length
Bearing
Dip

Lat.
Dip
Elev.

~~Drill Type~~ VERTICAL
Hole Size BQ
Contractor DENISON

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES	GRAPHIC LOG	FOOTAGE	ROCK TYPE
															layering 479' 15°, 20°			
															~~408-413~~ dark grey andesite			
															413-437.5 dyke.			
Box 18	—	500													below 400' fragments			
		EOH													become coarser and			
															more angular with			
															several high ~~sulphide~~ pyrite			
															siliceous quartz monzonite			
															fragments. A few			
															fragments of pervasively			
															sericitized feldspar			
															porphyritic quartz monz.			
															and a few rhyolite			
															dyke fragments			

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST
☐

Hole No. 73-3 Page No. 1
Property KEYSTONE
District
Commenced
Completed

Length
Bearing
Dip

Lat.
Dip
Elev.

Drill Type
~~Hole Size~~ BQ
Contractor DENISON

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES		GRAPHIC LOG FOOTAGE	ROCK TYPE
Box 1	6	30																
															6′ - 217′ mainly pervasively sericitized Eagle breccia.			
															41-43 - fine grained pebble breccia			
															≈70-81 mainly fragments of pyritic 3-4% MoS_2 mineralized rhyolitic banded dyke rock. This appears to be a brecciated dyke.			
															100-108 sim. to above with 4% fract. py.			
															150′ 6″ siliceous dyke with banding			
															203-210′ locally well mineralized py-sphal. veinlets			

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST

Hole No. 73-3 Page No. 2
Property KEYSTONE
District
Commenced
Completed

Length
Bearing
Dip

Lat.
Dip
Elev.

~~Drill Type~~
Hole Size BQ
Contractor DENISON

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES		GRAPHIC LOG FOOTAGE	ROCK TYPE
															217-307 mainly brecciated quartz monzonite pervasive clay-sericite 1-2% dissem. py			
Box 21	—	497 EOH																
															307-324 polymict pebble breccia with fract. sphalerite and up to 5% fract. pyrite loc. chalcopyrite in ½" qtz vein			
															324-~~497~~ mainly fine grained quartz monzonite locally brecciated and local brecciated rhyolitic dykes.			

Comments: The alteration appears to change ~~in the~~ across the zone 300' to 325' from perv. ser. of the mafic minerals in the qtz monz. and clay altered feldspar to a dominant perv. sericitization of both mafics and feldspars. In the intense alteration zone the quartz monz. is grey qtz-ser. cores of clay-qtz-ser with buff with easily distinguishable feldspars. Late Pb-Zn mineralization cuts this alteration.

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE ☐ VOLCANIC ☐ SEDIMENT ☐ SCHIST ☐

Hole No. 73-4 Page No. ____
Property KEYSTONE
District ____
Commenced ____
Completed ____

Length ____
Bearing ____
Dip ____

Lat. ____
Dip ____
Elev. ____

~~Drill Type~~ VERTICAL
Hole Size BQ
Contractor DENISON

Logged by ____
Approved by ____ Date ____

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES	GRAPHIC LOG	FOOTAGE	ROCK TYPE
Box3	59	83													Biotite qtz monzonite with sericite-chlorite envelopes on fractures.	qtz veins		45°
															Dominently perv. ser. to 110' then dominent perv. chl. of mafics	qtz veins		40-45
																dominant fract		30-4
															179-208 dom. perv. Sericite			
															208-~~[illegible]~~366' " " chlorite with local sericite	286' vuggy qtz		80
																252' " "		60
															329-342 feldspar porphyry dyke			
				378' qtz veins 10° cut by chl-py 70°											qtz vein 26° ser. envelope			
			390-400' abund. qtz veins 30°												qtz-py-sphal. 30°			
															326' vuggy qtz-galena-sphal.			40°
			443' qtz-py and qtz-gypsum 30°												366-408 dominently pervasive sericite with			
			480 gypsum 30°												vuggy qtz-k-spar-sphalerite			50-60°
Box 20	—	486																
															408—486 EOH dominently perv chl.			

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST

Hole No. NC-73-1 Page No. 1
Property KEYSTONE
District
Commenced
Completed

Length
Bearing
Dip

Lat.
Dip
Elev.

~~Drill Type~~ VERTICAL
Hole Size BQ
Contractor NORANDA

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES	GRAPHIC LOG	FOOTAGE	ROCK TYPE
Box 1	112	—													Eagle granodiorite breccia dominantly pervasive chlorite of mafic with minor sericite at bottom.			
	—	200 EOH.																
															143-183' andesite dyke brecciated abundant calcite veinlets and local Eagle breccia			
															183-200 brecciated Eagle pervasive sericite and minor chlorite			

Q.M.C-2

DRILL SAMPLE RECORD

- [ ] GRANITE
- [ ] VOLCANIC
- [ ] SEDIMENT
- [ ] SCHIST

Hole No. NK-73-2 Page No. 1

Property KEYSTONE

District

Commenced

Completed

Length

Bearing

Dip

Lat.

Dip

Elev.

~~Drill Type~~ VERTICAL

Hole Size BQ

Contractor NORANDA

Logged by

Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES	GRAPHIC LOG	FOOTAGE	ROCK TYPE
Box 1	125	—													Mainly brecciated Eagle granodiorite with	1-2%	fract. py	
															perv. sericitization of the			
		202 EOH													mafics – loc. perv. chl.			
															125-132' brecciated quartz porphyry dyke with broken feldspars			
															minor dissem. py < ½%			
															150-155 quartz porphyry			
															155-202 EOH Eagle breccia			
															fragments ¼"-1" but mainly 1-2"			

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE ☐ ☐
☐ VOLCANIC ☐ ☐
☐ SEDIMENT ☐ ☐
☐ SCHIST ☐ ☐
☐ ☐ ☐

Hole No. NC-73-3 Page No. 1
Property KEYSTONE
District
Commenced
Completed

Length
Bearing
Dip

Lat.
Dip
Elev.

~~Drill Type~~ VERTICAL
Hole Size BQ
Contractor NORANDA

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES		GRAPHIC LOG FOOTAGE	ROCK TYPE
Box 1	114	—																
2																		
3															Pebble breccia			
4	—	200.9																

Rock description and notes:

Pebble breccia

layering prominent in top 10-15' but present througout

Core angles measured 10°, 29°, 31°, 30°, 36

Pebbles up to 2"

Fragment types:

(1) perv. ser. Eagle granodiorite
(2) leucocratic granitoid (qtz monz.)
silicified and mineralized fragments up to 3/4"

Eagle fragments tend to be larger.
Minor scattered pink aplite fragments

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST
☐

Hole No. NC-73-4 Page No. 1
Property KEYSTONE
District
Commenced
Completed

Length
Bearing
Dip

Lat.
Dip.
Elev.

~~Drill Type~~ VERTICAL
Hole Size BQ
Contractor NORANDA

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo**	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES	GRAPHIC LOG	FOOTAGE	ROCK TYPE
Box-1	161	-																
-3	-	230													mainly fine grained (up to 1cm) pebble breccia with local scattered fragments up to 3/4"			
															fragments ~~a~~ 50% Cogle g.d. 50% siliceous granitoid with dissem. py and ~~[illegible]~~ qtz-py-MoS2 veinlets.			
															local zone much coarser breccia 175-210.			
															Layering core angles measured 30°, 40°, 31°, 32°			

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST

Hole No. NC-73-5 Page No. 1

Property KEYSTONE

District

Commenced

Completed

Length

Bearing

Dip

Lat.

Dip

Elev.

~~Drill Type~~ VERTICAL

Hole Size BQ

Contractor NORANDA

Logged by

Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	MoS2	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES	GRAPHIC LOG FOOTAGE	ROCK TYPE
Box 1	174														Pebble breccia		
2																	
3	—	242															

Pebble breccia

fragments – 30% high sulphide siliceous frag. with many MoS_2 mineralized fragments – minor qtz-porphyry fragments – minor pure sulphide fragments (up to 1 cm.) – one fragment of qtz monzonite with two stages of qtz-pyrite veinlets

layering with core angles: 18½°, 20°, 20°

Comments:

The layering present in the core is believed to be caused by fluidization of the pebble breccia at the time of formation.

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST

Hole No. NC-73-6 Page No. 1
Property KEYSTONE
District
Commenced
Completed

Length 200.6'
Bearing
Dip

Lat.
Dip
Elev.

VERTICAL
Drill Type
Hole Size BQ
Contractor NORANDA

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	Au	Ag	Cu	Pb	Zn	Mo	Cu	Mo			ROCK DESCRIPTION AND NOTES		GRAPHIC LOG FOOTAGE	ROCK TYPE
Box 1	98	—													98-103 dyke or flow with round inclusions of unaltered Eagle g.d. -sim. to dykes in other holes. probably post-Mineral.			
Box 4		200.6																
															103-183 pebble breccia with subang. fragments 70% Eagle 20% silicified granodiorite mineralized fragments 5-10% feldspar-bio (sericite) porphyry and minor quartz porphyry fragments	local steep MnO2 fractures		
															Layering is inconspicuous compared with other holes in pebble breccia and fragments more angular and caotic than other holes			

Comments: This hole has the largest percentage of mineralized fragments than any other. To date. Also the presence of qtz porphyry as a new rock-type fragment should be noted. Fragment size is generally coarser 1-2" than other areas of the pebble breccia.

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST

Hole No. NC-73-6 Page No. 2
Property KEYSTONE
District
Commenced
Completed

Length
Bearing
Dip

Lat.
Dip
Elev.

Drill Type
Hole Size
Contractor

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	SULPHIDE ANALYSIS Au	Ag	Cu	Pb	Zn	Mo	OXIDE ANALYSIS Cu	Mo			ROCK DESCRIPTION AND NOTES		GRAPHIC LOG FOOTAGE	ROCK TYPE
															183-199 mainly Eagle q.d. breccia with pervasive sericite and minor perv. chl.			
															199-200 pebble breccia			
															The presence of Eagle breccia may signify approaching the base of the breccia body in this area. Compare with Noranda logs of holes in the south part of the pebble breccia body.			

Q.M.C-2

DRILL SAMPLE RECORD

☐ GRANITE
☐ VOLCANIC
☐ SEDIMENT
☐ SCHIST

Hole No. NC-73-7 Page No. 1
Property KEYSTONE
District
Commenced
Completed

Length
Bearing
Dip

Lat.
Dip
Elev.

~~Drill type~~ VERTICAL
Hole Size BQ
Contractor NORANDA

Logged by
Approved by Date

SAMPLE No.	FOOTAGE FROM	FOOTAGE TO	SAMPLE LENGTH	% Recovery	Au	Ag	Cu	Pb	Zn	Mo	Cu	Mo			ROCK DESCRIPTION AND NOTES		GRAPHIC LOG FOOTAGE	ROCK TYPE
Box 2	137	–													Eagle granodiorite			
3															breccia with prev.			
4	–	200													sericitized mafics			
															1-2% py dissem.			

ROVER AND KEYSTONE

GEOCHEMICAL RESULTS

BONDAR-CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1574

SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm			REMARKS
K 31	160	340	1	4000	580			73-3 167
32	15	85	< 1	770	-			-177
33	13	143	< 1	790	-			-187
34	18	180	< 1	1820	450			-197
35	61	139	1	1830	-			222-227
36	87	330	< 1	2600	-			-235.5
37	86	860	< 1	3450	520			247-257
38	73	640	< 1	3400	-			-267
39	79	6400	< 1	4500	-			-277
40	65	770	< 1	5800	680			-287
41	88	1200	< 1	5700	-			297-307
42	126	8100	1	5800	-			-317
43	188	5550	2	16400	850			-327
44	44	245	< 1	11200	-			-337
45	22	55	< 1	10000	-			-347
46	45	245	< 1	11800	1025			-357
47	39	28	< 1	7400	-			-367
48	43	99	< 1	10600	-			-377
49	250	315	< 1	11100	950			-387
50	100	350	< 1	25000	-			-397
51	78	430	< 1	5600	950			-407
52	63	330	< 1	4950	-			-417
53	72	1350	< 1	6200	-			-427
54	82	525	< 1	6400	910			-437
55	60	890	< 1	6400	-			-447
56	92	850	< 1	4850	-			-457
57	81	720	< 1	6000	910			-467
58	163	1200	2	9900	-			-477
59	250	1150	< 1	11000	-			-487
60	80	695	< 1	6300	820			-497
61	16	164	< 1	2200	540			NC-73-1 128-138
62	28	315	< 1	4200	420			182-192
63	25	200	12	1250	500			NC-73-3 128-138
64	24	230	15	1210	500			168-178
65	6	100	< 1	270	330			NC-73-2 125-128

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Geochemical Lab Report

6758

Extraction: F; Basic Fusion / Pb,Zn,Mo,Mn; Hot Aqua Regia

Report No. 27 - 1574

Method: F; Specific Ion / Pb,Zn,Mo,Mn; Atomic Absorption

From: JMT Services

Fraction Used:

Date: December 22, 1977

SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm			REMARKS	
KC 1	50	445	2	3900	755		—	73-1	22-32'
2	17	65	1	325	680			73-1	203-213'
3	60	1000	< 1	6450	755		—	73-1	328-338'
4	200	1550	< 1	16000	910			73-1	378-388'
5	7	64	< 1	390	770		—	73-1	428-438'
6	31	108	< 1	1000	690		—	73-1	478-488
7	7	184	< 1	1460	730		—	73-4	468-478
8	6	170	< 1	2000	755			73-4	418-428
9	22	223	< 1	3000	730			73-4	368-378
10	460	620	< 1	2000	730		—	73-4	318-328
11	12	700	8	4350	755			73-4	273-283
12	123	1160	1	8900	820			73-4	218-228
13	8	360	5	1290	750			73-4	168-178
14	63	85	< 1	1660	750			73-4	118-128
15	178	605	< 1	2400	700			73-4	68-78
16	44	310	1	1230	580	—		73-3	7-17
17	19	124	5	810	-				17-27
18	152	525	< 1	2100	-				-37
19	400	2400	2	11400	580				-47
20	29	210	< 1	1620	-				-57
21	79	870	19	2000	-				-67
22	54	300	200	1230	540				-77
23	28	112	4	1420	-				-87
24	42	89	1	1880	-				-97
25	18	142	< 1	1430	520				-107
26	66	190	< 1	3550	-	—			-117
27	97	310	< 1	5900	-				-127
28	115	300	5	8800	560				-137
29	28	125	7	3700	-				-147
30	10	97	7	2000	-				-157
									[illegible]

BONDAR CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1574

SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm			REMARKS
K 66	10	57	< 1	370	370			NC 73-2 153-163
67	6	40	< 1	340	330			188-196
68	26	187	12	1120	520			NC 73-4 178-188
69	27	120	1	1700	400			NC 73-7 160-170
70	23	145	< 1	1090	450			181-191
71	24	97	30	1310	480			NC 73-5 218-228
72	24	400	22	1750	495			NC-73-6 128-138
73	12	280	17	1600	480			148-158
74	6	250	16	1920	480			73-2 ~~NC 73-2~~ 88-98
75	28	60	22	2900	480			138-148
76	400	540	8	5200	450			208-218
77	170	380	5	2900	535			258-268
78	260	425	11	2850	575			308-318
79	26	380	16	2100	495			388-398
80	62	240	11	1460	515			478-488
WC77 - 900	10	42	3	340	800	[illegible]		Rovel
901	235	48	32	140	355	[illegible]		
903A	12	50	13	250	515			road cuts
903B	9	5	1	110	400	[illegible]		
903C	4	69	4	260	460			on
904	16	12	2	100	350	[illegible]		new
905	4	74	4	400	495	[illegible]		
906	88	87	28	620	495	[illegible]		logging
907	6	94	15	310	670	[illegible]		
908	7	91	9	240	750			access
909	5	108	17	390	600	"		road
910	34	184	< 1	370	360		←	[illegible]
K 68A	-	-	21	440	880		}	
71A	-	-	12	420	880			mineralized
72A	-	-	49	620	755			pebbles
73A	-	-	16	720	820			
								cc Mr. W. Livingstone

BONDAR-CLEGG & COMPANY LTD.
1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Rover

Geochemical Lab Report

Extraction: Hot Aqua Regia — Report No. 27 - 949

Method: Atomic Absorption — From: JMT Services

Fraction Used: — Date: August 22, 1977

SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm	Mn ppm				REMARKS
GL-77 1	2	24	< 1	225				↑
3	3	40	< 1	540				
4	4	60	< 1	780				
5	4	54	< 1	740				
5B	8	63	< 1	925				
6	2	60	< 1	625				ROVER
7	3	30	< 1	1600				
8	10	100	2	765				
9	21	110	4	980				
10	35	140	2	2400				SAMPLES
11	16	88	2	625				
12	44	75	1	565				
13	16	60	< 1	760				SILT
14	13	36	1	630				
15	2	30	2	210				&
15B	2	10	< 1	195				SOIL
16	3	66	< 1	85				
16C	11	28	1	885				RECONN.
16B	3	28	< 1	400				
17	< 2	36	< 1	225				
18	3	36	< 1	290				
19	2	44	< 1	560				
19B	NS	NS	NS	NS				
20	2	38	< 1	170				
21	5	64	2	295				
22	3	48	< 1	440				↓
WL-77 149	16	120	25	680				SILT
								cc Mr. J. Christie

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Geochemical Lab Report

Extraction: Hot Aqua Regia — Report No. 27 - 1083

Method: Atomic Absorption — From: JMT Services

Fraction Used: — Date: Aug. 31, 1977

SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm	Mn ppm				REMARKS
77C 501	6	70	6	440				
506	6	56	2	570				
512	146	80	4	750				
513	32	49	1	580				
515	5	41	1	510				

Lovel & Keystone (Blue Gold) silts

cc Mr. K. W. Livingst

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Geochemical Lab Report

Extraction: F, Basic Fusion; Cu,Pb,Zn,Mo,Mn, Hot Aqua Regia:

Method: F, Specific Ion; Cu,Pb,Zn,Mo,Mn, Atomic Absorption:

Fraction Used

Report No. 27 - 1137 PROJECT: 'H'

From JMT Services

Date September 9, 19 77

SAMPLE NO.		Cu ppm	Pb ppm	Zn ppm	Mo ppm	Mn ppm			REMARKS
77C	513	164	9	-	36	760			SILT BLUE GOLD
	519	60	4	-	16	395			" "
	520	68	10	-	10	710			" "
	521	20	5	-	1	510			" "
77B	509	15	8	-	1	565			" "
	510	13	6	-	1	495			" "
	511	22	12	-	3	600			" "
	512	74	7	-	15	1100			" "
WL77	235	93	18	-	4	1000			SILTS & SOILS ROVER & COVER CLAIMS
	237	24	8	-	3	910			
	240	23	13	-	1	700			
	241	17	10	-	2	1200			
	242	42	6	-	3	665			
	243	23	7	-	3	515			
	244	15	7	-	2	215			
	245	24	10	-	2	260			
	246	31	10	-	2	615			
	247	15	8	-	2	505			
	248	23	10	-	2	760			
	249	20	9	-	2	720			
	250	30	9	-	3	2550			
	251	18	6	-	1	340			
	252	20	5	-	1	300			
	253	16	6	-	2	335			
	254	4	3	-	2	435			
	255	22	6	-	1	495			RECON. SOILS ON BLUE GOLD
	256	18	5	-	2	312			
	257	17	4	-	3	230			
	258	20	8	-	3	285			
	259	35	10	-	2	280			

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Geochemical Lab Report

Extraction F, Basic Fusion; Cu,Pb,Zn,Mo,Mn, Hot Aqua Regia:
Report No. 27 - 1137 PROJECT: 'B'

Method F, Specific Ion; Cu,Pb,Zn,Mo,Mn, Atomic Absorption:
From JMT Services

Fraction Used
Date September 9, 19 77

SAMPLE NO.		Cu ppm	Pb ppm	Zn ppm	Mo ppm	Mn ppm			REMARKS
77C	518	164	9	-	36	760			SILT BLUE GOLD
	519	60	4	-	16	395			" "
	520	68	10	-	10	710			" "
	521	20	5	-	1	510			" "
77B	509	15	8	-	1	565			" "
	510	13	6	-	1	495			" "
	511	22	12	-	3	600			" "
	512	74	7	-	15	1100			" "
WL77	235	93	18	-	4	1000			SILTS & SOILS ROVER & COVER CLAIMS
	237	24	8	-	3	910			
	240	23	13	-	1	700			
	241	17	10	-	2	1200			
	242	42	6	-	3	665			
	243	28	7	-	3	515			
	244	15	7	-	2	215			
	245	24	10	-	2	260			
	246	31	10	-	2	615			
	247	15	8	-	2	505			
	248	23	10	-	2	760			
	249	20	9	-	2	720			
	250	30	9	-	3	2550			
	251	18	6	-	1	340			
	252	20	5	-	1	300			
	253	16	6	-	2	335			
	254	4	3	-	2	435			
	255	22	6	-	1	495			RECON. SOIL ON BLUE GOLD
	256	18	5	-	2	312			
	257	17	4	-	3	230			
	258	20	8	-	3	285			
	259	35	10	-	2	280			

BONDAR-CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1137

SAMPLE NO.	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm		REMARKS
WL77 260	65	10	-	15	920	-		BROWN SOIL SAMPLES BLUE GOLD
261	18	5	-	5	120	-		
262	24	5	-	4	120	-		
263	29	4	-	8	150	-		
264	102	6	-	25	320	-		
265	20	6	-	7	590	-		
266	11	6	-	3	225	-		
267	25	10	-	3	750	-		
268	44	8	-	2	1300	-		
269	17	6	-	1	760	-		
270	16	7	-	2	1100	-		
271	10	7	-	1	210	-		
272	16	7	-	1	450	-		
273	12	7	-	1	1100	-		
274	14	6	-	1	170	-		
275	16	6	-	1	650	-		
276	9	5	-	1	170	-		
277	12	7	-	2	220	-		
278	12	7	-	1	720	-		
54 Rocks	-	6	46	108	110	530		BRECCIA B
55	-	36	11	22	15	590		"
56	-	16	16	8	190	630		qtz vein
57	-	5	41	166	135	570		BRECCIA B
58	-	10	74	34	245	810		"
183 A	-	20	100	14	360	550		fract py & qtz ϕ frags.
183B	-	10	8	4	100	290		pink qtz ϕ fract py leac
183C	-	4	2	8	35	180		qtz vein ser. in vugs
184A	-	5	56	39	470	510	ROCKS	qtz vein in ser. q.d. frag.
184B	-	6	8	102	50	300		oxidized qtz ϕ frag.
184C	-	9	35	27	590	550		oxided qtz vein
184D	-	6	72	15	512	570		Breccia C fragment
185	-	13	57	92	1120	550		leached per. ser. Breccia B
187	-	6	58	20	215	530		Breccia B matrix
188A	-	9	45	21	195	680		Breccia C frag in Breccia
188B	-	3	64	4	301	470		fract. oxides

BONDAR-CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1137

SAMPLE NO.		Cu ppm	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm		REMARKS
WL77	189	-	100	137	130	11	900		perv. ser. dissem py 5%
	223	-	40	50	76	205	970		mineralized fragment Breccia
	225	-	10	64	124	175	680		" "
	226	-	6	68	59	175	590		" "
	227	-	7	15	7	340	530		BRECCIA A
	229	-	3	14	7	215	460		"
	230	-	4	32	30	240	470	ROVER	"
	232	-	7	63	6	415	760		perv. chl bio-hb qtz dior.
	238	-	4	13	17	390	510		BRECCIA A
77C	500	-	11	66	7	450	530		qtz diorite perv. chl.
	502	-	7	56	1	590	470		"
	503	-	5	50	1	535	530		"
	505	-	7	62	1	580	430		Eagle g.d.
	507	-	6	10	39	175	290		reconn. Falls claim
	508A	-	6	40	250	175	320		
	508B	-	5	32	280	170	320		selected rocks.
	509	-	6	26	62	145	310	BLUE GOLD	in creek showing.
	510	-	4	32	980	265	320		in area Blue Gold.
	511	-	3	46	75	300	360		
	514	-	3	52	5	310	370		
	516	-	4	52	3	470	340		reconn. Falls claim
	517	-	2	20	3	180	220		cc W. Livingstone

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Geochemical Lab Report

Lovett

Extraction: F; Basic Fusion / Cu,Pb,Zn,Mo,Mn; Hot Aqua Regia — Report No. 27 - 1001

Method: W; Specific Ion / Cu,Pb,Zn,Mo,Mn; Atomic Absorption — From: JMT Services

Fraction Used — Date: August 31, 1977

SAMPLE NO.	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm		REMARKS
WL77 198	540	-	128	3	790	-		silt Lover
200	270	-	74	8	480	-		"
205	60	-	86	6	615	-		"
216	33	-	75	2	560	-		"
217	46	-	68	9	535	-		"
218	40	-	52	10	440	-		"
219	31	-	62	6	725	-		"
140 Rocks	-	380	540	3	530	133		fract py ox. py.
141A	-	300	316	385	360	370		Eagle fract chl-py
141B	-	690	760	210	500	115		8" qtz vein k-spar-ser.
141C	-	109	196	26	320	188		" " "
142	-	48	60	750	35	85		" 16" qtz vein qtz-ser. ser
143B	-	25	120	20	475	141		rock chip qtz veins fract
143C	-	29	80	610	145	178	→	float Breccia B
144C	-	16	84	20	210	213		fract chl-py
145A	-	9	73	13	270	168		qtz-py with ser. envel. a
145B	-	6	36	11	210	207		envel. alt. ser. → chl →
145C	-	16	39	120	125	77	Lovett	1-2" qtz vein no selvage al
146	-	13	33	150	70	104		qtz vein ser. envelope
147	-	8	64	10	300	77		fract py (ser. → chl env
148	-	8	85	12	275	89		qtz-py-chl (ser.)
150	-	7	76	15	500	81		~~qtz k-spar ser. ser. ...~~
151	-	16	30	2	380	171		rhyo. dyke
152	-	7	70	16	240	198		Breccia B perv. chl.
153	-	22	40	630	70	363	→	Breccia B float
154	-	14	96	5	405	352		Breccia B perv. ser. lea
155	-	9	52	33	170	338		Breccia B frag.
156	-	6	119	11	405	195		Breccia C frag. in Breccia
157-1	-	6	33	835	105	269		↑
157-2	-	10	40	95	90	430		

BONDAR-CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1001

SAMPLE NO.	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm		REMARKS
WL77 157-3	-	5	66	115	150	153		several fragments of ore exposure selected from Breccia B for diamond sawing - many were mineralized qtz porphyry (φ)
Sod Duplicate 157-3	-	10	62	110	150	145		
157-4	-	7	46	35	135	110		
157-5	-	11	32	130	90	124		
157-6	-	13	88	75	80	156		
157-7	-	10	280	140	40	123		
157-8	-	11	62	280	90	170		
157-9	-	10	94	140	45	110		
157-11	-	6	56	12	240	320		
157-13	-	13	86	170	75	180		
157-16	-	12	78	19	50	135		
157-18	-	11	30	91	85	215		
158	-	4	96	31	285	370		
159A	-	47	39	310	230	450		2" envel. ser→chl. qtz vei[n]
159B	-	5	136	130	305	260		qtz-py-chl
159C	-	29	51	21	110	210		pink qtz φ frag. in Brec[cia] flow
160A	-	32	15	470	15	75		6" qtz vein
160B	-	11	28	39	300	400		qtz veins
160C	-	10	31	22	410	420		perv. chl. Eagle q.d. qtz
161A	-	14	12	475	105	375		perv. ser. Breccia B
161B	-	18	20	22	370	550		" "
163B	-	7	69	76	205	570		10' chip sample "
163C	-	12	29	54	360	490		perv. ser. Eagle in Breccia
164	-	7	75	11	235	850		biotite feldspar φ dyke
165	-	6	28	81	100	295		Breccia B
Sod Duplicate 165	-	5	53	12	215	600		"
168A	-	13	35	21	100	665	Cover	Breccia B perv. ser. frag
168B	-	16	16	18	80	450		Breccia B qtz vein frag.
169A	-	2	2	5	15	105		qtz vein - k-spar ser.
169B	-	4	42	11	190	455		qtz veins leached
170	-	13	46	15	245	820		Breccia B
171	-	7	40	4	220	290		Eagle qtz-py-ser
173	-	2	64	4	290	420		" fract. chl-py
175	-	10	26	13	245	400		qtz veins
176	-	4	44	3	270	410		qtz-ser. thin ser. env.

BONDAR CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1001

SAMPLE NO.		Cu ppm	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm		REMARKS
WL77	177	-	4	55	1	300	240		fract chl-py
	178	-	5	54	1	275	200		qtz-chl-py
	179	-	2	76	2	235	235		fract py-chl
	180A	-	15	78	5	320	720		perv. ser. adj. to qtz Ø dy…
	180B	-	10	13	4	55	230		qtz Ø dyke
	181	-	< 2	54	2	320	270		qtz-chl vein
	182	-	22	72	4	165	260		qtz Ø dyke
	190	-	280	600	62	180	400		qtz veins
	191	-	8	60	5	250	255		fract py-chl.
	192	-	38	39	15	305	935		perv. ser. in Eagle
	193A	-	32	21	20	420	880		qtz vuggy leach chl o…
	193B	-	3	30	10	520	700		qtz with ser. envel.
	194	-	< 2	67	1	300	250		qtz with chl. selvag…
	196	-	11	20	7	950	430		BRECCIA A
	197	-	6	10	1	85	80		qtz-k-spar-ox. veins in q… *leached
	199	-	3	26	74	85	240		~~Loc~~ BRECCIA C
	201	-	2	63	5	215	290		"
	206	-	2	61	1	355	550		qtz veins post ser. envel.
	207	-	4	36	11	225	230		ser. envel., qtz veins fract py-chl.
	208	-	4	14	200	245	405		qtz-Mo-ser. cuts envel. ser.
	210A	-	10	36	39	385	165		qtz with ser. envel. 6"
	210B	-	7	131	3	1200	450		ser. envel.
	211	-	2	50	7	390	575		qtz vein ser. envel.
	212	-	< 2	168	1	405	440		qtz vein
	215	-	3	5	190	70	90		qtz-Mo-chl (ser) with chl. selv…
	220A	-	< 2	142	24	210	570		qtz vein ser. envel.
	220B	-	< 2	359	21	400	470		frac. py-ser-chl.
	221A	-	10	78	17	860	330		qtz-chl.
	221C	-	4	66	2	380	295		qtz-lim. ox.
	221B	-	4	78	12	450	190		pyritized Eagle.

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Cover

Geochemical Lab Report

Extraction: Hot Aqua Regia — Report No.: 27 - [illegible]

Method: Atomic Absorption — From: [illegible] Services

Fraction Used: — Date: August [illegible], 1977

SAMPLE NO.	[illegible]	[illegible]	[illegible]	ppm				REMARKS
CL-[illegible]	2	24	< [illegible]	225				
[illegible]	3	40	< 1	540				
	4	50	< 1	780				
[illegible]	4	54	< 1	740				
[illegible]	8	63	< 1	525				
	2	60	< 1	625				
[illegible]	3	30	< 1	1600				
	10	130	[illegible]	765				
	21	110		930				
[illegible]	35	140	2	2400				
[illegible]	16	68	2	625				
[illegible]	44	75	1	565				
	16	60	< 1	760				
[illegible]	13	36	1	630				
[illegible]	2	30	2	210				
[illegible]	2	10	< 1	195				
[illegible]	3	66	< 1	85				
[illegible]	11	23	1	885				
[illegible]	3	20	< 1	490				
[illegible]	< 2	36	< 1	225				
	3	35	< 1	290				
[illegible]	2	48	< 1	360				
[illegible]	NS	[illegible]	[illegible]	NS				
	2	23	< 1	170				
	5	64	[illegible]	295				
	3	[illegible]	< 1	440				
CL-7[illegible]	15	120	[illegible]	680				
								cc Mr. J. Christie

BONDAR-CLEGG & COMPANY LTD.
1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Geochemical Lab Report

Extraction [illegible] Report No. 7 - [illegible]

Method [illegible] Absorption From [illegible]

Fraction Used

Date October 31 1977

SAMPLE NO.	[illegible]	[illegible]	[illegible]	[illegible]	Mn	F ppm		REMARKS
7 630		[illegible]	[illegible]	[illegible]	[illegible]	260		
631	-	250	520	4	3000	400		
632	-	51	300	4	2100	480		
633		95	350	3	1420	420		
634	-	6	75	1	540	330		
635	-	4	62	1	530	370		
636	-	40	156	20	1410	720		
637		63	234	20	1060	580		
638		107	1600	3	1420	550		
639	-	16	240	2	900	420		
640A		209	580	5	5600	400		
640B	-	20	330	2	2100	320		
641	-	91	700	1	4300	430		
642	-	13	82	1	770	450		
643		56	314	1	1780	450		
644	-	54	196	12	700	460		
645A		54	490	2	1770	860		
645B	-	64	1750	1	17500	620		
646	-	24	120	1	1020	400		
647	-	44	220	2	1340	620		
648	-	11	212	1	990	640		
649	-	12	226	2	1170	550		
650A	-	39	880	4	2300	580		
650B		230	300	2	3600	400		
652		9	240	30	1220	540		
653		74	162	1	1150	420		
654	-	21	216	2	1050	370		
655		67	310	6	3400	460		
656	-	50	186	1	3100	400		
657		52	184	1	1390	580		

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Geochemical Lab Report

Report No. 7 - 1440 Page No. 2

SAMPLE NO.	[illegible]	[illegible]	Zn ppm	Mo ppm	Mn ppm	F ppm		REMARKS
77 651	-	2	46	1	240	580		
671		770	620	2	5900	750		
672	-	4	1300	1	5300	500		
673	-	4	420	1	2200	620		
674		500	340	7	2300	340		
675		94	830	1	1650	450		
676		34	168	2	770	400		
678	-	3[illegible]	4000	1	2300	370		
679		320	1400	3	3600	350		
680		165	2600	2	3800	590		
681	-	75	214	8	800	530		
682	-	17	154	13	950	580		
683	-	16	118	16	600	800		
684A	-	4	34	3	900	600		
684B	-	6	32	230	200	620		
685		2	114	9	600	480		
689	-	6	92	7	400	400		
690A	-	245	450	1	160	520		
690B	-	7[illegible]	690	1	1840	690		
691	-	49	430	2	390	600		
692	-	40	560	2	8000	500		
693	-	17	212	<1	900	520		
694	-	250	1750	3	4600	550		
695	-	34	236	6	720	580		
696		17	332	3	3100	1300		
698A		60	820	1	2400	770		
698B	-	550	1100	1	5100	750		
Rocks 699	-	10	77	18	360	480		
700	-	1[illegible]	46	13	240	370		
701		8	64	3	460	400		
702	-	6	66	2	500	400		
704	-	-	53	4	360	360		
707	-	[illegible]	[illegible]	2	560	430		
708	-	4	42	<1	590	360		
709	-	4	69	4	340	460		

BONDAR-CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. [illegible] Page No. 3

SAMPLE NO.	[illegible]	[illegible]	[illegible]	[illegible]	Mn ppm	F ppm		REMARKS
[illegible] 77 710		2	36	19	190	450		
711	-	<2	56	1	360	420		
712			34	[illegible]	340	390		
713		[illegible]	[illegible]	1	360	390		
714		5	32	2	324	500		
715		2	39	1	350	390		
716		5	34	2	320	370		
717A		4	56	2	360	430		
717B	-	2	30	2	360	460		
718	-	11	70	40	350	540		
719	-	2	50	6	270	620		
720	-	2	36	54	160	430		
721	-	2	36	29	150	450		
722	-	2	28	13	140	390		
723	-	3	13	3	50	220		
724	-	2	24	11	110	300		
725	-	2	38	49	160	370		
726A	-	2	48	188	260	520		
726B	-	3	14	3	60	280		
727	-	4	58	29	290	430		
728	-	2	56	205	280	430		
729	-	4	55	11	280	460		
730	-	4	40	3	250	360		
731	-	7	48	<1	310	370		
732	-	<2	50	2	250	420		
733	-	<2	42	2	390	400		
734	-	<2	52	2	230	370		
735	-	<2	22	23	120	300		
736	-	<2	46	4	250	400		
737	-	2	48	6	250	550		
738	-	2	53	4	280	640		
739	-	<2	64	37	340	580		
740	-	<2	54	34	200	460		
742	-	14	100	2	390	420		
743	-	2	50	3	290	370		

BONDAR-CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1449 Page No. 4

SAMPLE NO.		Cu ppm	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm		REMARKS
Rocks [illegible]-77	744	-	2	60	2	340	360		
	745	-	<2	56	2	240	360		
	746	-	[illegible]	34	[illegible]	130	350		
	747A	-	6	60	1	200	640		
	747B	-	4	60	16	320	330		
	748	260	5	37	7	240	450		
									cc: W. Livingstone

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Geochemical Lab Report

Extraction: F, Basic Fusion; Pb,Zn,MoMn, Hot Aqua Regia:

Report No. 27 - 1412

Method: F, Specific Ion; Pb,Zn,Mo,Mn, Atomic Absorption:

From: JMT Services

Fraction Used:

Date: October 20, 1977

SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm			REMARKS
WL77 518	6	70	1	365	-			
519	250	320	2	3700	-			
520	8	49	<1	395	-			
521	12	180	<1	1700	-			
522	3	31	<1	98	-			
523	7	116	<1	610	-			
525	6	30	<1	100	-			
526	6	70	2	110	-			
527	5	64	2	270	-			
528	12	84	21	1190	-			
529	10	88	17	615	-			
530	6	93	5	580	-			
531	6	52	4	590	-			
532	6	42	2	160	-			
533	5	36	<1	170	-			
534	7	38	<1	290	-			
535	5	28	1	85	-			
536	4	38	1	180	-			
537	8	600	1	560	-			
538	8	126	2	295	-			
539	9	160	2	370	-			
540	10	213	1	730	-			
542	7	385	<1	420	-			
544	16	240	1	1150	-			
545	8	168	1	155	-			
546	38	540	<1	2600	-			
547	210	545	<1	1320	-			
548	85	640	<1	2000	-			
588	30	195	2	2700	-			
591	11	90	3	1240	-			
[illegible]	15	112	[illegible]	[illegible]	[illegible]			

BONDAR-CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1412

Page No. 2

SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm			REMARKS
WL77 592	3	56	2	260	-			
593	5	40	2	80	-			
594	2	96	2	160	-			
595	12	138	6	670	-			
596	16	90	5	1540	-			
598	11	73	8	790	-			
599	31	128	2	280	-			
600	68	1250	5	1360	-			
601	87	580	4	1120	-			
602	116	1000	1	1400	-			
603	28	760	<1	585	-			
604	28	490	<1	480	-			
605	60	935	1	960	-			
606	62	625	1	870	-			
607	7	188	2	440	-			
608	5	67	1	205	-			
610	6	148	2	185	-			
611	10	218	3	390	-			
612	7	104	4	120	-			
613	7	87	4	120	-			
614	8	103	1	120	-			
615	11	150	1	175	-			
616	12	110	2	185	-			
617	4	95	2	120	-			
619	11	135	7	770	-			
620	8	82	28	1280	-			
621	4	64	9	170	-			
622	16	113	64	1165	-			
623	10	127	3	760	-			
624	8	72	1	320	-			
625	4	45	1	230	-			
625B Unidentified A	14	84	2	1240	-			
WL77 504 Rocks	52	315	2	425	370			
505	8	72	1	360	260			
506	4	54	1	265	280			

BONDAR-CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1412

SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm			REMARKS
WL77 507	2	24	2	250	280			
508	<2	42	1	295	280			
510	2	44	2	290	280			
511	2	46	1	250	260			
512	4	52	1	400	280			
513	4	44	1	270	260			
514	<2	54	1	300	300			
516	2	53	1	300	300			
524	5	61	<1	620	270			
549	200	390	1	2450	350			
551	170	385	2	3300	610			
552A	17	620	1	10200	900			
552B	12	1500	2	6000	610			
552C	64	210	1	395	740			
553	360	375	2	2950	680			
554	62	880	2	6100	590			
555	6	112	2	990	480			
556A	70	380	2	3300	770			
556B	240	450	3	225	610			
557	10	410	2	1300	590			
558	84	1100	1	4900	560			
559	122	830	2	3900	660			
560	128	315	2	1850	370			
561	5	300	4	1300	480			
562	16	435	1	2000	460			
563A	102	230	1	920	410			
563B	12	1250	1	6600	460			
564A	38	1250	1	6400	480			
564B	<2	56	3	345	200			
565A	132	285	2	275	610			
565B	33	2150	1	13200	590			
566	11	106	2	345	610			
567	14	900	1	4000	560			
568	72	315	1	3000	500			
569	3250	450	6	7900	500			

BONDAR-CLEGG & COMPANY LTD.

Geochemical Lab Report

Report No. 27 - 1412

Page No. 4

SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm	Mn ppm	F ppm			REMARKS
L77 570	94	146	1	1000	520			
572A	114	490	1	3500	540			
572B	132	4300	<1	9100	630			
572C	42	200	<1	280	410			
574	10	96	<1	690	340			
575A	8	84	<1	235	220			
576A	1000	>20000	1	6000	250			
576B	73	7250	8	860	250			
576D	23	560	<1	910	260			
577	11	212	<1	365	290			
578A	33	695	<1	1040	330			
578B	8	157	2	810	330			
580	86	840	<1	3800	370			
583	6	128	<1	460	310			
584	6	186	<1	570	280			
585	151	460	1	1090	290			
586	18	160	1	810	260			
587	130	400	2	3100	290			
597	12	103	3	365	440			
626	6	59	6	260	350			
627	4	46	6	185	330			
628	5	49	136	165	330			
630A	2	34	17	60	210			
630B	<2	18	1	90	250			
630D	6	108	2	220	310			
Unidentified A	<2	48	1	210	270			
								cc W. Livingstone

BOND AR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

KEYSTONE

Geochemical Lab Report

Extraction: Hot Aqua Regia

Method: Atomic Absorption

Fraction Used:

Report No. 27 - 610

From: JMT Services

Date: July 21, 19 77

SAMPLE NO.	Mo ppm	Mn ppm			SAMPLE NO.				
[illegible] - 70	12	565							
71	27	750							
72	5	325							
73	9	940							

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1500 PEMBERTON AVE., NORTH VANCOUVER, B.C. PHONE: 985-0681 TELEX: 04-54554

Geochemical Lab Report

KEYSTONE

Extraction: Hot Aqua Regia

Method: Atomic Absorption

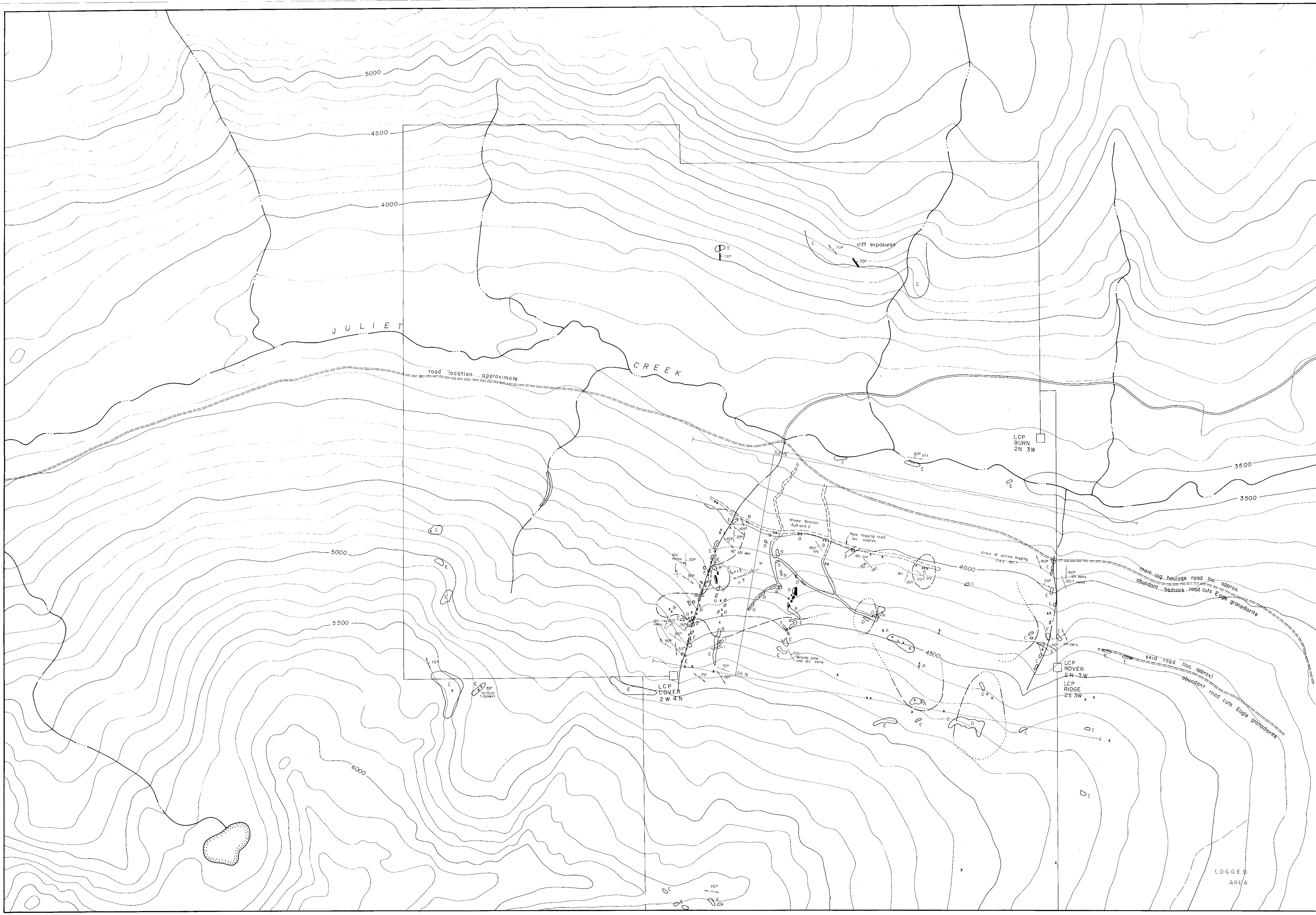
Fraction Used:

Report No.: 27 - 543

From: JMT Services

Date: July 21 19 77

SAMPLE NO.	Mo ppm	Mn ppm			SAMPLE NO.				
WL77 - 60	1	1610							
61	4	1200							
62	5	820							
63	4	1740							
64	5	2600							
64A	5	1730							
65	12	1860							
66	12	810							
68	3	550							
77R - 231	1	770							
232	1	600							
233	2	750							
234	1	950							
235	1	510							
236	1	400							
WL77 - 67 Rock	3	290							



L E G E N D

- Andesite dykes
- 1 Biotite — feldspar porphyry dyke
- 2 Quartz monzonite dyke
- 3 Quartz porphyry dyke
- A Breccia A
- B Breccia B
- C Breccia C
- D Biotite — hornblende quartz diorite
- E Eagle granodiorite
- Foliation of mafic minerals
- 55° Dominent fracture, quartz vein or mineralized structure
- Dyke — orientation of dyke in closest outcrop.
- x Small outcrop

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
6758
NO.

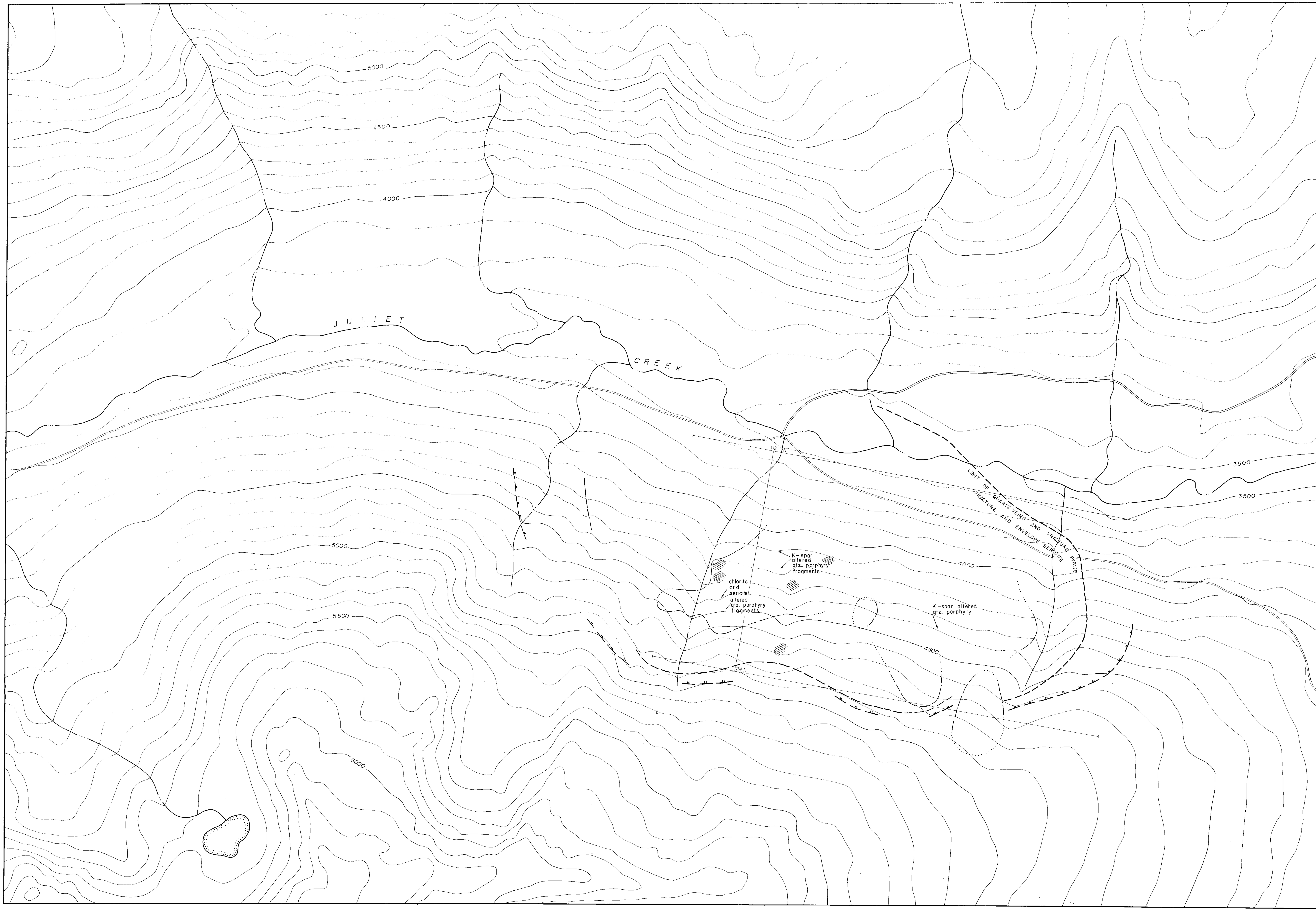
Geology by K.W. Livingstone
Nov. 1977. Rev. Dec. 1977

JMT SERVICES CORP.
FOR
WESTERN MINES LTD.
ROVER AND KEYSTONE
PROJECT

GEOLOGY

ROVER
MAP 1

SCALE
400 0 400 FEET
120 0 120 METERS



N

LEGEND

Limit fracture hematite and chlorite, rare quartz veins.

Limit of quartz veins, fracture pyrite

Local zone intense pervasive sericite

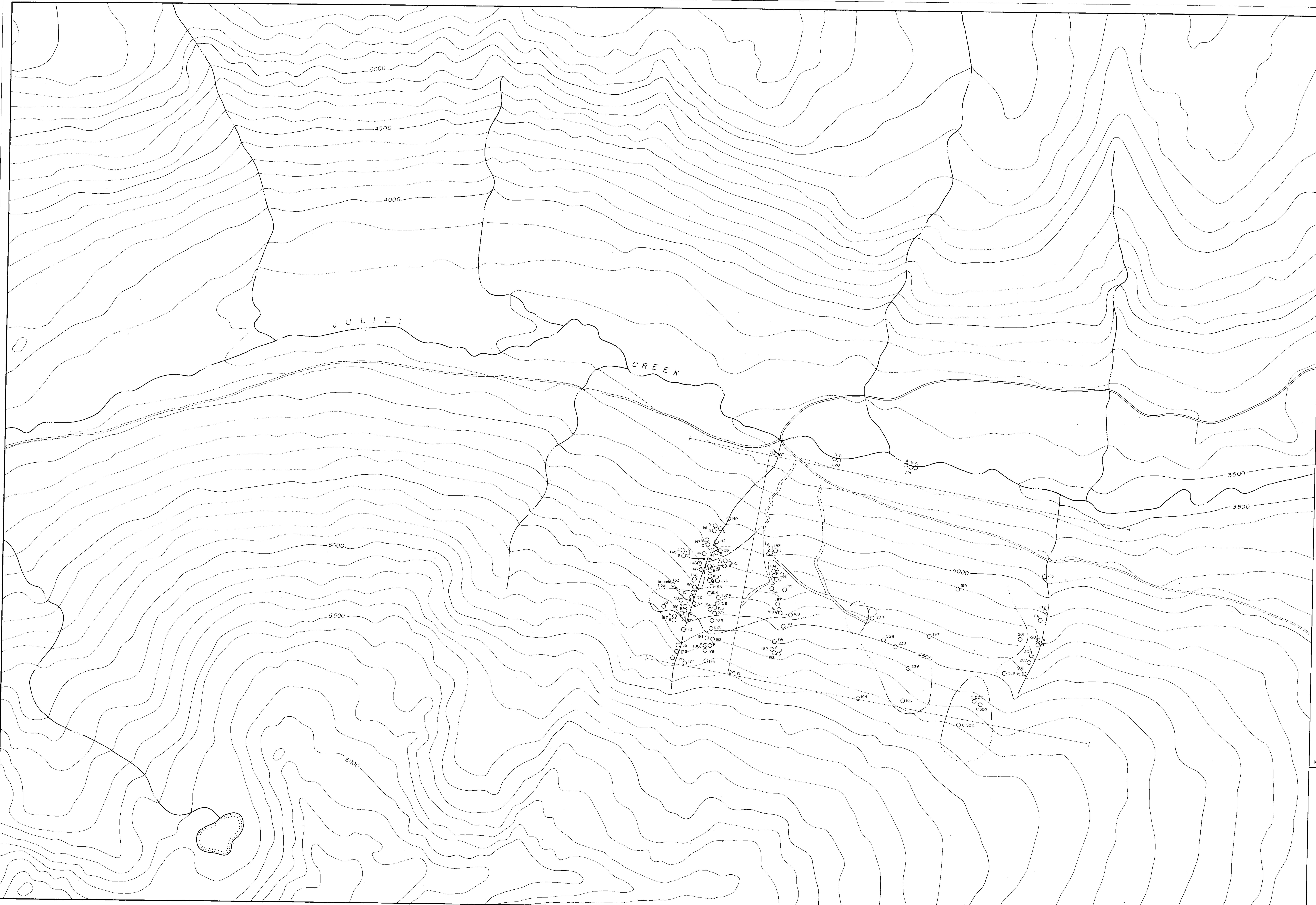
K. W. Livingstone, 1977

JMT SERVICES CORP.
FOR
WESTERN MINES LTD.
ROVER AND KEYSTONE
PROJECT

ALTERATION

ROVER
MAP 1

SCALE
400 0 400 FEET
120 0 120 METERS



N

MOLYBDENUM

- 0 – 5 ppm.
- 6 – 10 ppm.
- 11 – 20 ppm.
- 21 – 40 ppm.
- 41 – 80 ppm.
- >80 ppm.

MANGANESE

- 0 – 250 ppm.
- 251 – 500 ppm.
- 501 – 1000 ppm.
- 1001 – 2000 ppm.
- 2001 – 4000 ppm.
- >4000 ppm.

FLUORINE

- 0 – 300 ppm.
- 301 – 600 ppm.
- 601 – 900 ppm.
- 901 – 1200 ppm.
- 1201 – 1500 ppm.
- >1500 ppm.

LEAD

- 0 – 20 ppm.
- 21 – 40 ppm.
- 41 – 80 ppm.
- 81 – 160 ppm.
- 161 – 320 ppm.
- >320 ppm.

ZINC

- 0 – 200 ppm.
- 201 – 400 ppm.
- 401 – 800 ppm.
- 801 – 1600 ppm.
- 1601 – 3200 ppm.
- >3200 ppm.

206 ○ Sample locations

K. W. Livingstone, Nov. 1977

JMT SERVICES CORP.
FOR
WESTERN MINES LTD.
ROVER AND KEYSTONE
PROJECT

ROCK GEOCHEMISTRY

ROVER
MAP 1

SCALE
400 0 400 FEET
120 0 120 METERS

L E G E N D

○ 5054	1977 soil
⊗ 5046	1977 silt
├──┬──	1970 grid soil survey (molybdenum)
(14)	check sample by K. W. Livingstone or J. S. Cristie
1 | 760 / 6 | 60 / 24	molybdenum manganese / lead zinc/copper
GL-11/5054,241	sample location number

K. W. Livingstone, Nov. 1977

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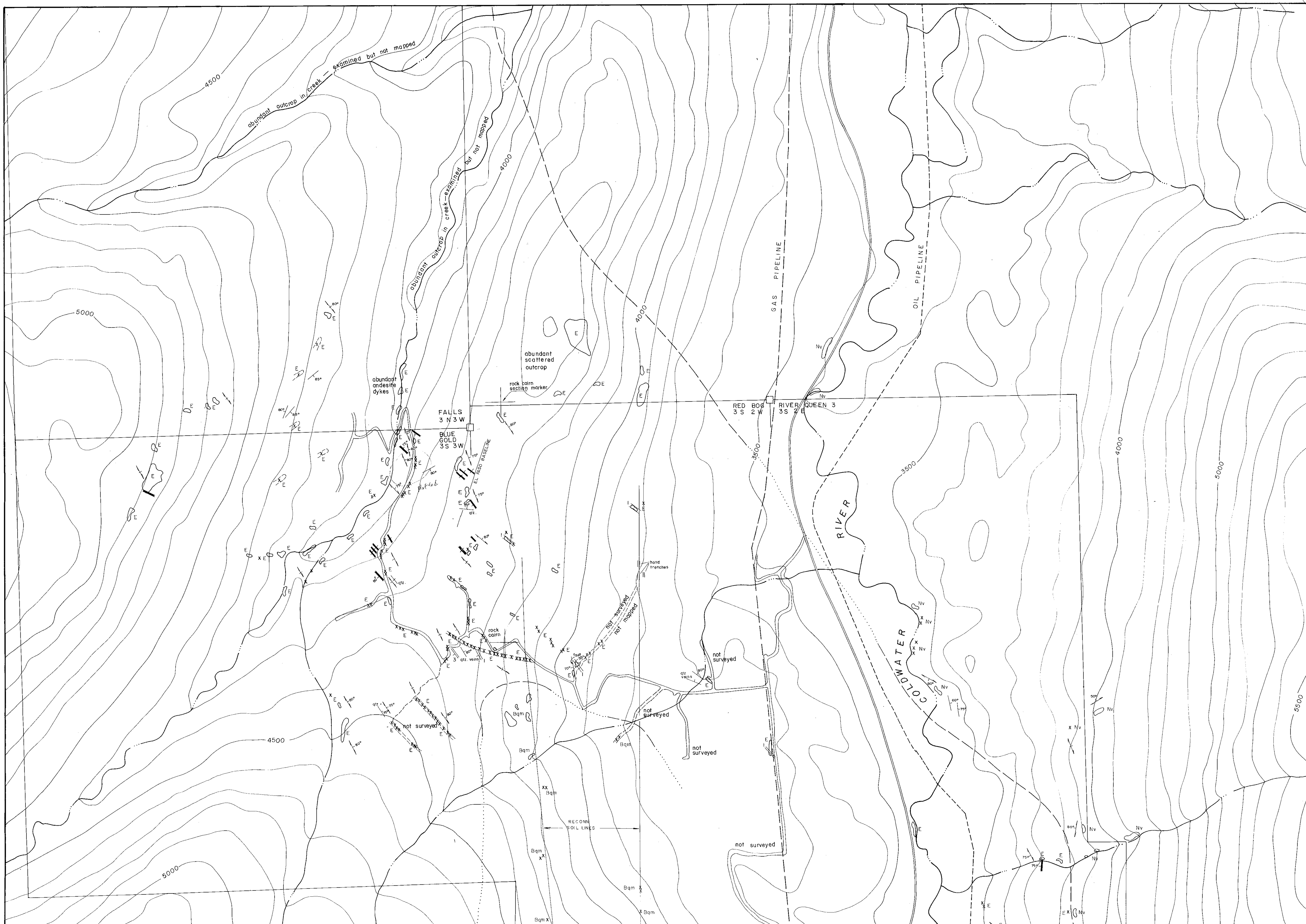
ROVER AND KEYSTONE
PROJECT

SILT AND SOIL GEOCHEMISTRY

ROVER
MAP 1

SCALE
400 0 400 FEET
120 0 120 METERS



LEGEND

- Andesite dyke
- 1 Biotite (chlorite) — feldspar porphyry dyke
- 2 Rhyolite dyke
- 3 Quartz — eye — feldspar porphyry dyke
- Hornblende diorite dyke
- Pebble breccia dyke — related to main breccia body
- Pebble breccia
- Eagle granodiorite breccia
- Bqm Biotite quartz monzonite
- E Eagle granodiorite
- Nv Nicola volcanic rocks
- foliation of mafic minerals and local paragneiss
- 80° dominent fracture, quartz vein or mineralized structure
- dyke — orientation of dyke in closest outcrop dykes are too narrow to be mapped at 400' scale
- ⊗ diamond drill hole
- x small outcrop

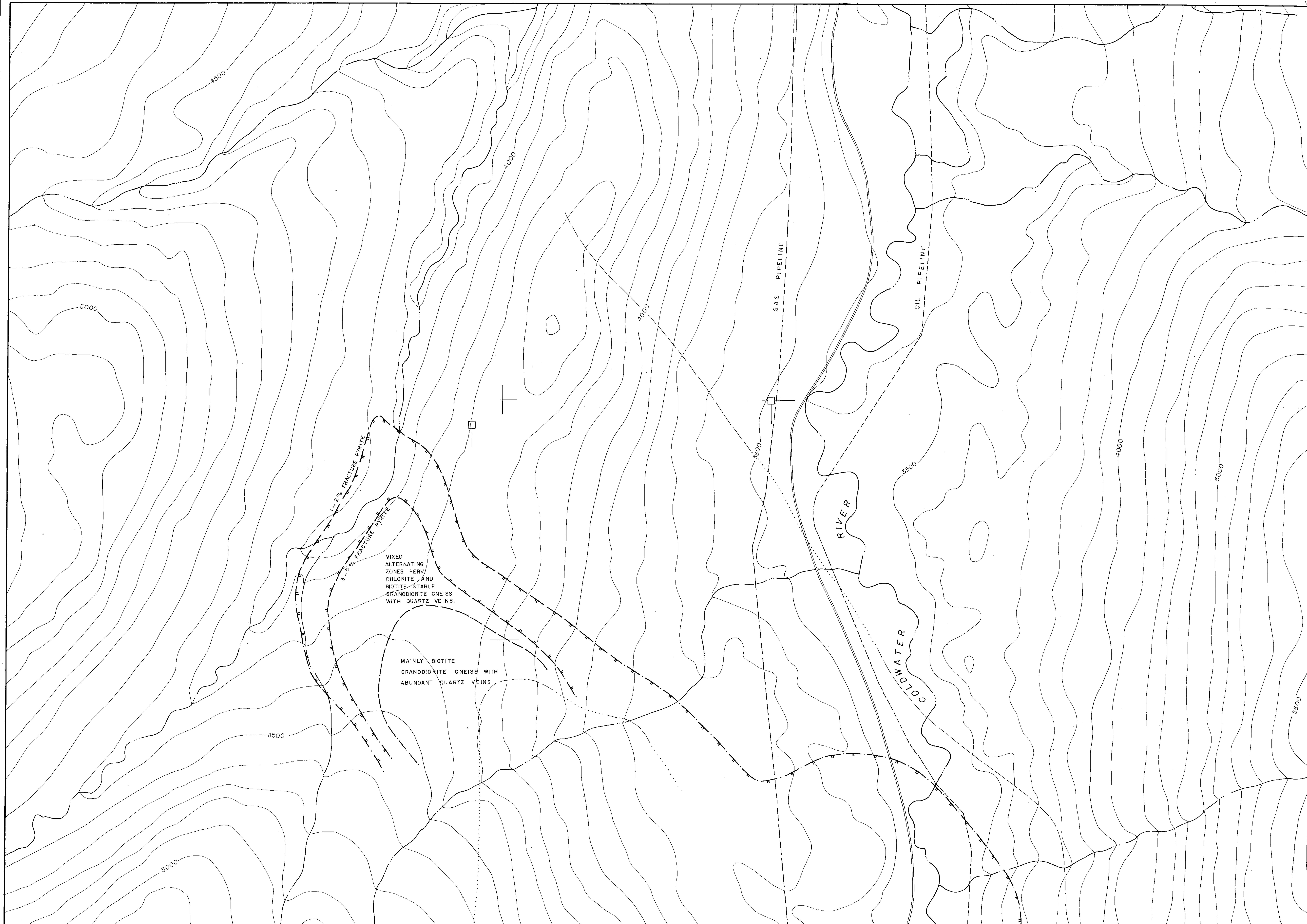
Geology by K. W. Livingstone
road and trench surveys on Blue — Gold and Red Bog by L. Saleken and G. Crooker — Nov. 1977.

JMT SERVICES CORP.
FOR
WESTERN MINES LTD.
ROVER AND KEYSTONE PROJECT

GEOLOGY

BLUE GOLD — RED BOG
MAP 2

SCALE
400 0 400 FEET
120 0 120 METERS



LEGEND

Outer limit of pervasive chlorite 1–2% fracture pyrite.

Inner limit of pervasive chlorite with minor sericite 3–5% fracture pyrite.

Outer limit of biotite, granodiorite gneiss (Eagle) with abundant quartz veins.

K. W. Livingstone, Nov. 1977

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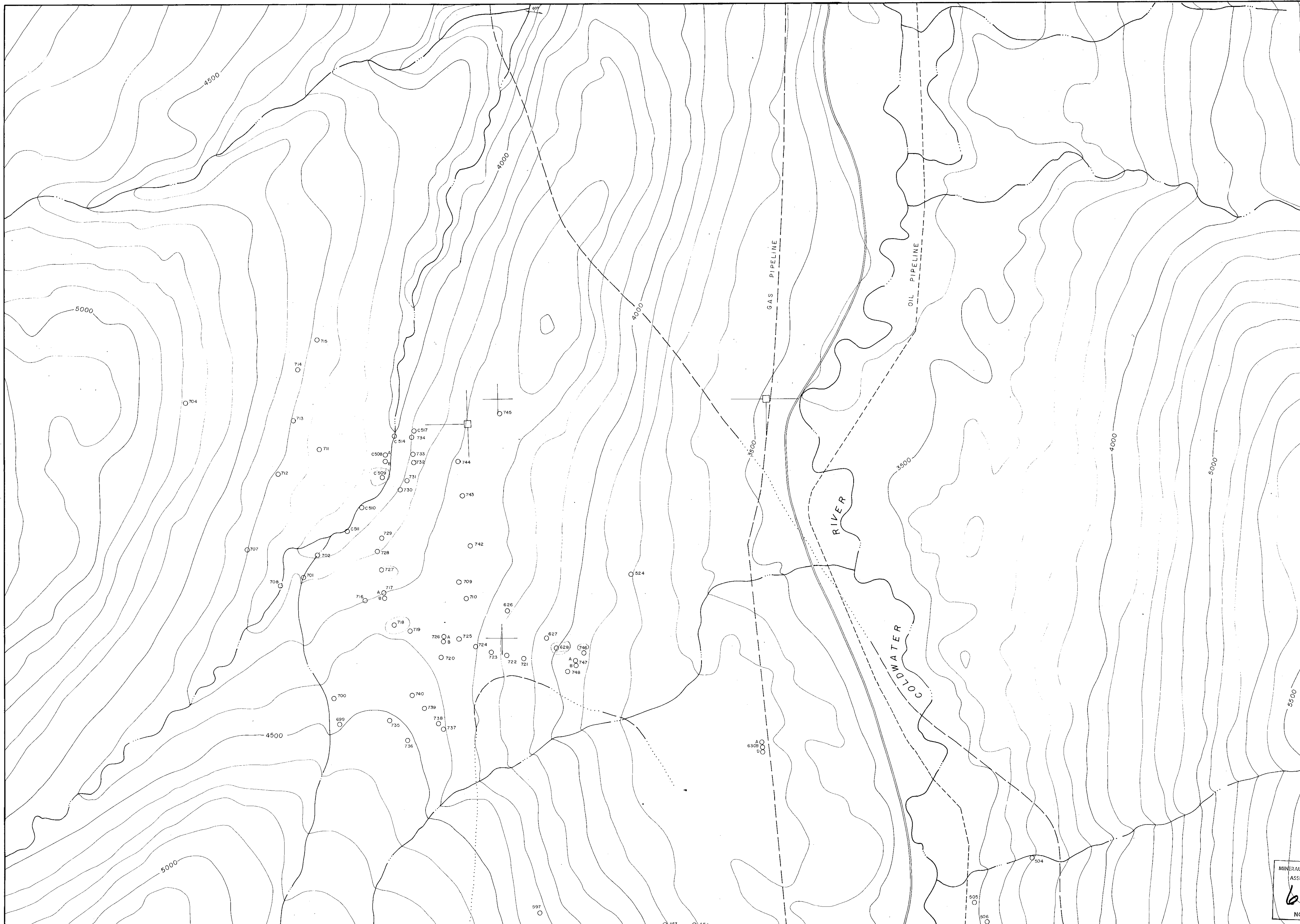
ROVER AND KEYSTONE PROJECT

ALTERATION

BLUE GOLD – RED BOG
MAP 2

SCALE
400 0 400 FEET
120 0 120 METERS



LEGEND

MOLYBDENUM
- 0 – 5 ppm.
- 6 – 10 ppm.
- 11 – 20 ppm.
- 21 – 40 ppm.
- 41 – 80 ppm.
- > 80 ppm.

MANGANESE
- 0 – 250 ppm.
- 251 – 500 ppm.
- 501 – 1000 ppm.
- 1001 – 2000 ppm.
- 2001 – 4000 ppm.
- > 4000 ppm.

FLUORINE
- 0 – 300 ppm.
- 301 – 600 ppm.
- 601 – 900 ppm.
- 901 – 1200 ppm.
- 1201 – 1500 ppm.
- > 1500 ppm.

LEAD
- 0 – 20 ppm.
- 21 – 40 ppm.
- 41 – 80 ppm.
- 81 – 160 ppm.
- 161 – 320 ppm.
- > 320 ppm.

ZINC
- 0 – 200 ppm.
- 201 – 400 ppm.
- 401 – 800 ppm.
- 801 – 1600 ppm.
- 1601 – 3200 ppm.
- > 3200 ppm.

206 ○ Sample locations

K. W. Livingstone, Nov. 1977

JMT SERVICES CORP.
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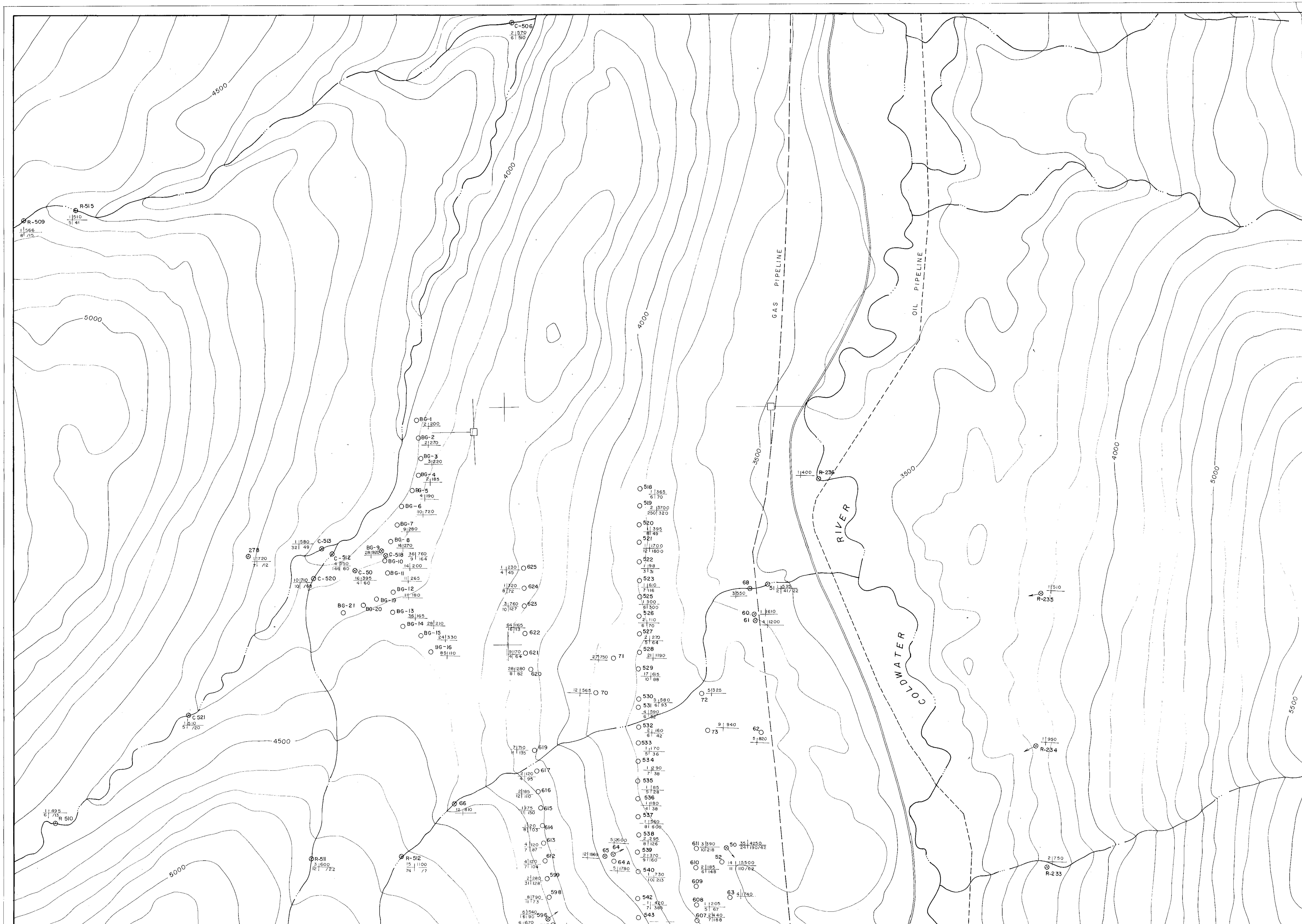
WESTERN MINES LTD.
ROVER AND KEYSTONE PROJECT

ROCK GEOCHEMISTRY

BLUE GOLD — RED BOG
MAP 2

SCALE
400 0 400 FEET
120 0 120 METERS



N

LEGEND

○ 522 1977 soil

⊗ C521 1977 silt

1 | 535 / 2 | 41 / 22 — molybdenum | manganese / lead | zinc copper

K. W. Livingstone, Nov 1977

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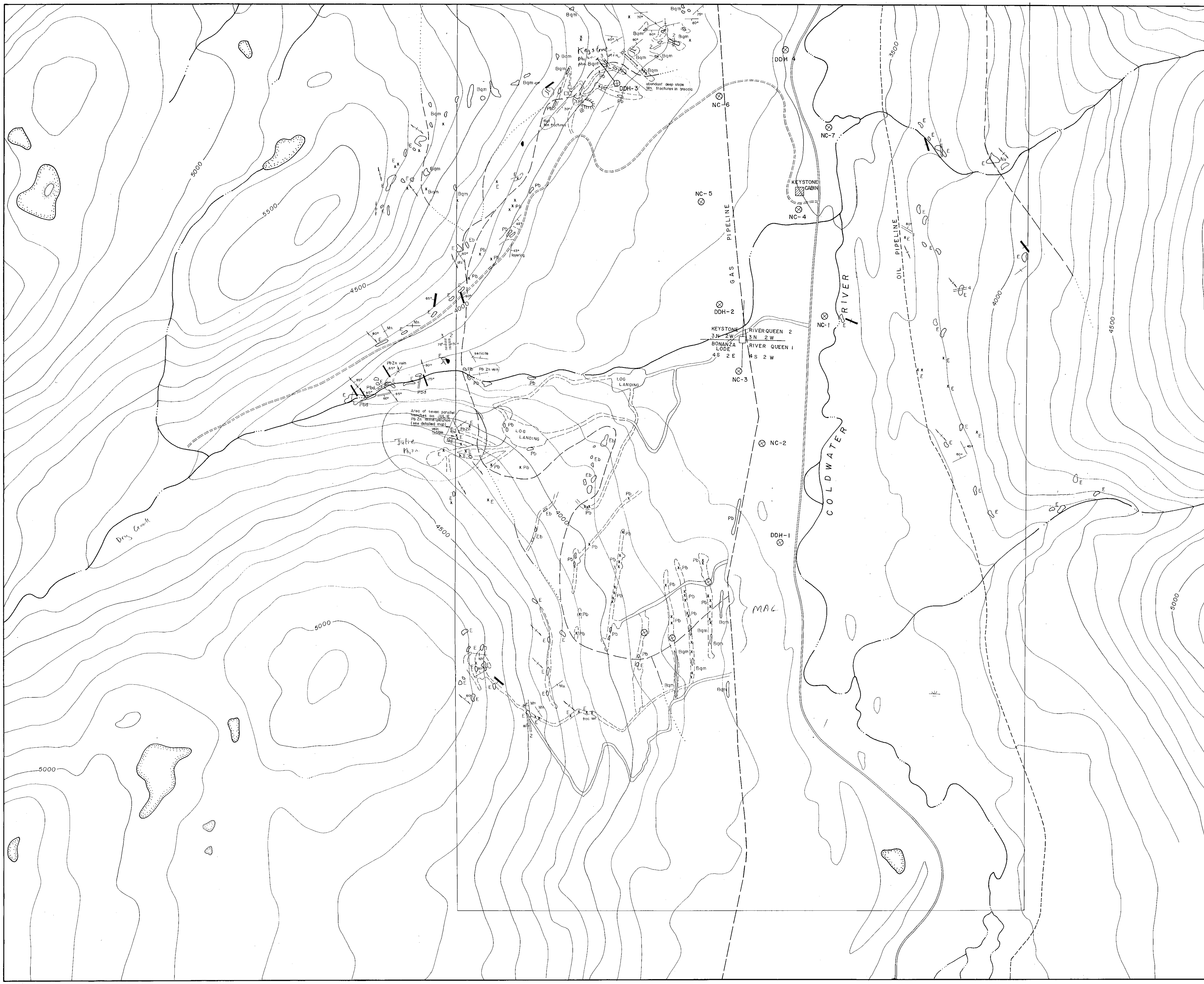
ROVER AND KEYSTONE PROJECT

SILT AND SOIL GEOCHEMISTRY

BLUE GOLD – RED BOG
MAP 2

SCALE
400 0 400 FEET
120 0 120 METERS



LEGEND

(heavy bar)	Andesite dyke
1	Biotite (chlorite) - feldspar porphyry dyke
2	Rhyolite dyke
3	Quartz - eye - feldspar porphyry dyke
4	Hornblende diorite dyke
Pbd	Pebble breccia dyke - related to main breccia body
Pb	Pebble breccia
Eb	Eagle granodiorite breccia
Bqm	Biotite quartz monzonite
E	Eagle granodiorite
Nv	Nicola volcanic rocks

foliation of mafic minerals and local paragneiss

80° dominent fracture, quartz vein or mineralized structure

dyke — orientation of dyke in closest outcrop dykes are too narrow to be mapped at 400' scale

diamond drill hole

x small outcrop

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
6758
NO.

Geology by K. W. Livingstone, Nov. 1977

JMT SERVICES CORP.
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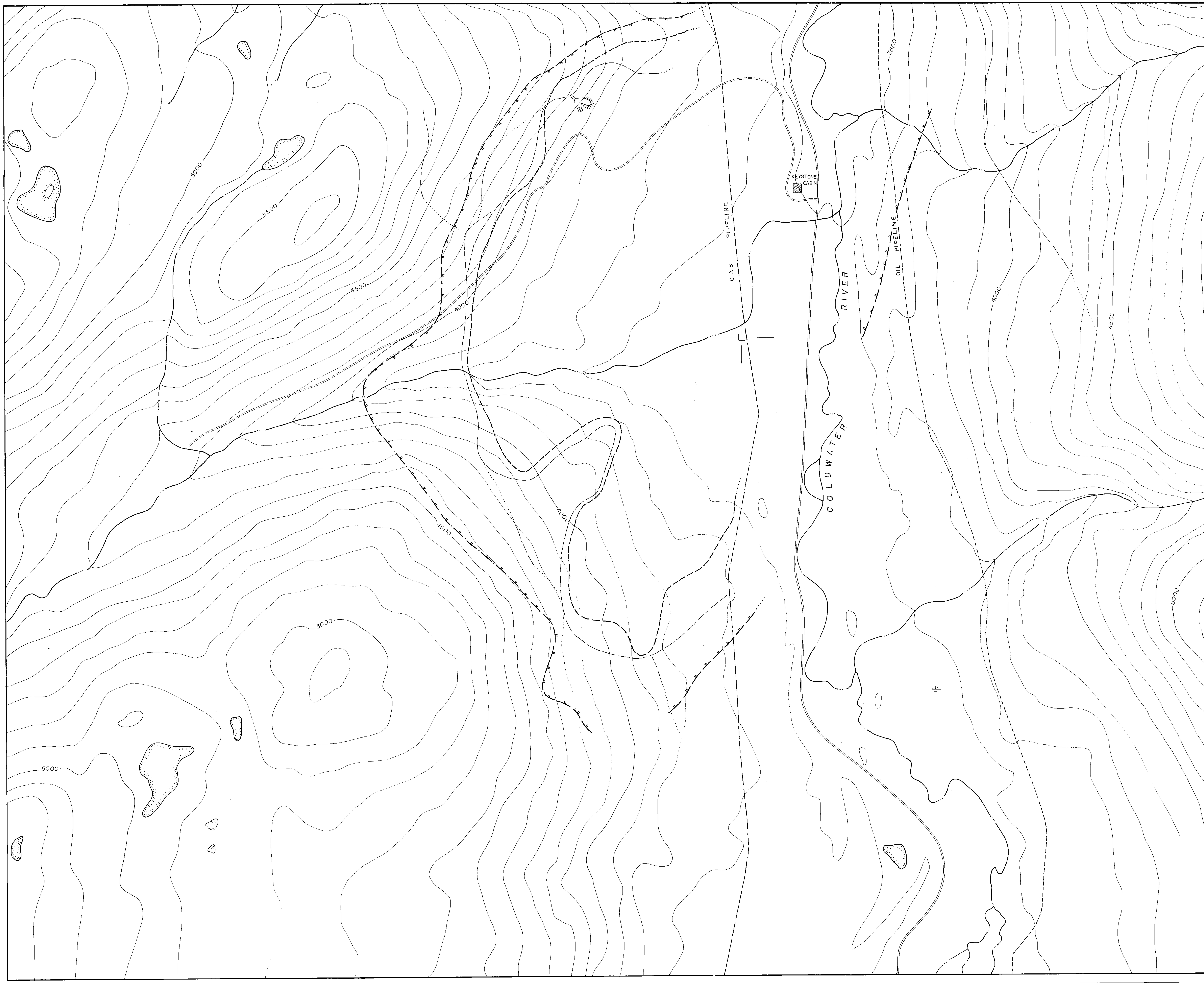
ROVER AND KEYSTONE PROJECT

GEOLOGY

KEYSTONE — BONANZA LODE

MAP 3

SCALE
400 0 400 FEET
120 0 120 METERS



LEGEND

Limit of pervasive sericite

Limit of pervasive chlorite

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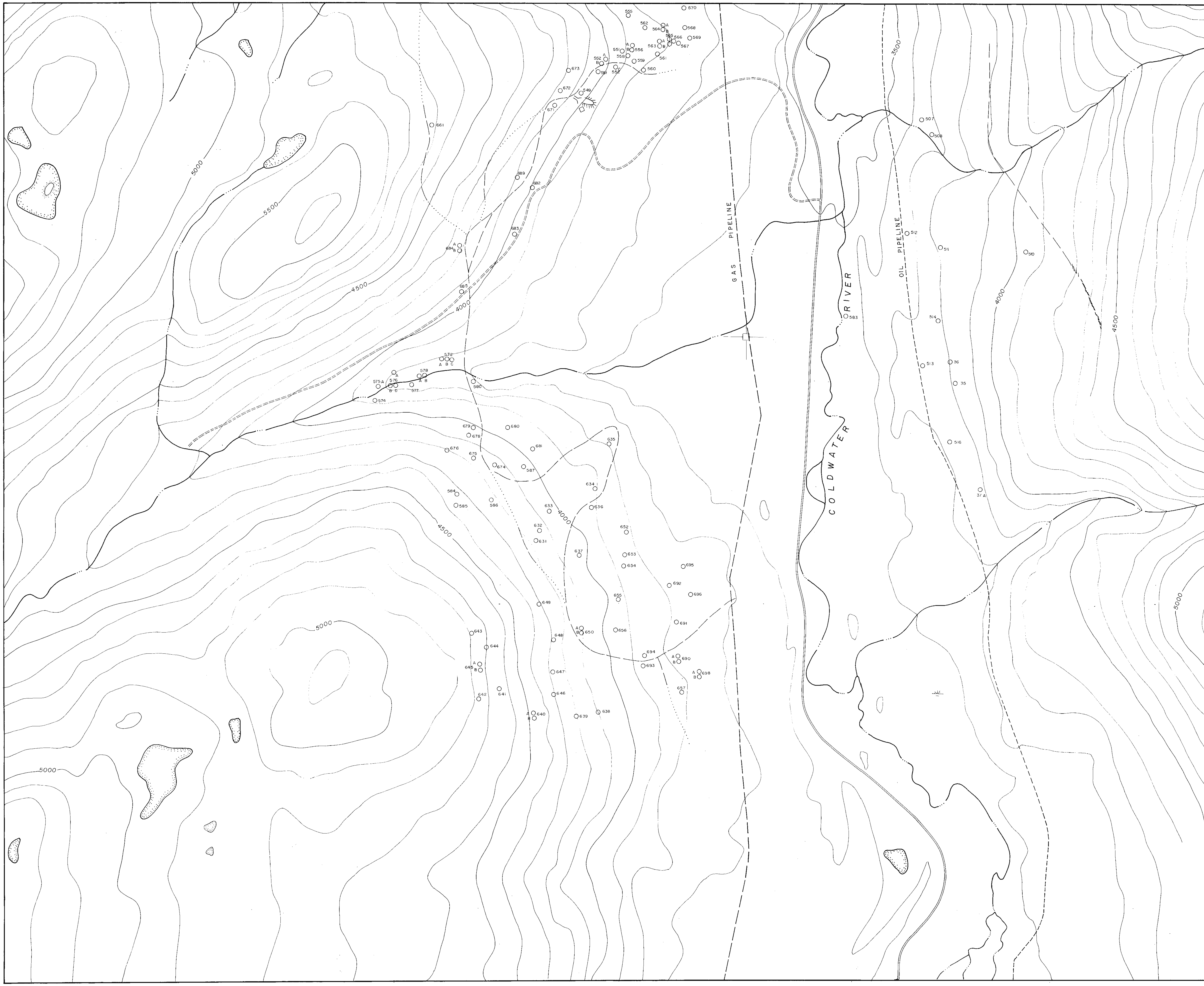
PROJECT

ALTERATION

KEYSTONE — BONANZA LODE
MAP 3

SCALE
400 0 400 FEET
120 0 120 METERS



LEGEND

MOLYBDENUM

	0 – 5 ppm.
	6 – 10 ppm.
	11 – 20 ppm.
	21 – 40 ppm.
	41 – 80 ppm.
	> 80 ppm.

MANGANESE

	0 – 250 ppm.
	251 – 500 ppm.
	501 – 1000 ppm.
	1001 – 2000 ppm.
	2001 – 4000 ppm.
	> 4000 ppm.

FLUORINE

	0 – 300 ppm.
	301 – 600 ppm.
	601 – 900 ppm.
	901 – 1200 ppm.
	1201 – 1500 ppm.
	> 1500 ppm.

LEAD

	0 – 20 ppm.
	21 – 40 ppm.
	41 – 80 ppm.
	81 – 160 ppm.
	161 – 320 ppm.
	> 320 ppm.

ZINC

	0 – 200 ppm.
	201 – 400 ppm.
	401 – 800 ppm.
	801 – 1600 ppm.
	1601 – 3200 ppm.
	> 3200 ppm.

206 ○ Sample locations

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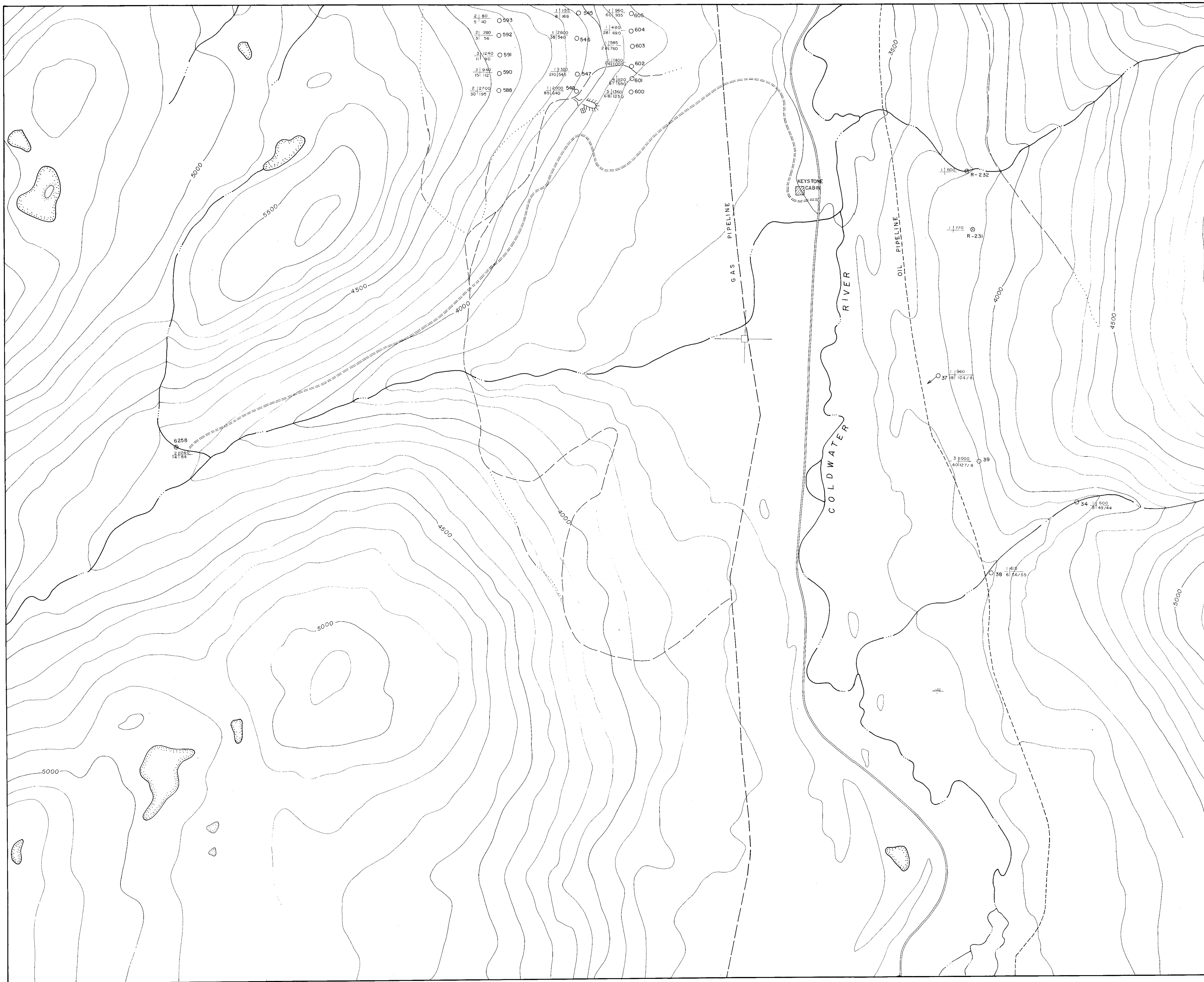
ROCK GEOCHEMISTRY

KEYSTONE — BONANZA LODE

MAP 3

SCALE
400 0 400 FEET
120 0 120 METERS



L E G E N D

○ 546 1977 soil

⊗ 601 1977 silt

3 | 1000 / 40 | 27/8	molybdenum | manganese / lead | zinc/copper

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6758

K. W. Livingstone, Nov. 1977

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SILT AND SOIL GEOCHEMISTRY

KEYSTONE — BONANZA LODE

MAP 3

SCALE

400 0 400 FEET

120 0 120 METERS