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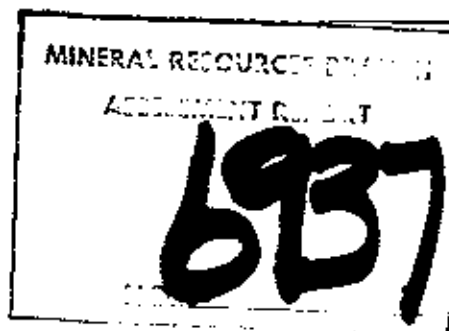
GEOLOGICAL, GEOPHYSICAL AND PROSPECTING REPORT

BYRON CLAIM (Rec. No. 698(8))

SMITHERS, B.C. - Omineca M.D.

MAPSHEET 93L15E, Lat. 54°47', Long. 126°43'

for:



PETRA GEM EXPLORATION OF CANADA LTD.

200-3540 W. 41st. Ave.  
Vancouver, B.C.

by:

B. J. Price, M.Sc., F.G.A.C.  
October 21, 1978

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GEOLOGICAL, PROSPECTING AND GEOPHYSICAL REPORT

BYRON M.C., OMINECA M.D.

SUMMARY

During July 23 to 28, 1978, the writer, accompanied by A. L'Orsa and C. Winter, geologists, completed a geological mapping, ground magnetometer survey, and prospecting program on the Byron Claim, 32 km east of Smithers, B.C. in the Omineca Mining District. Mapping outlined a complexly interbedded sequence of rhyolites, rhyolitic or dacitic lapilli tuffs and tuff breccias, and fine to shaly tuffs and black shales striking southeast to easterly and dipping moderately southward into a conspicuous hill. At the summit of the hill is a dioritic intrusive, partly fault-bounded, but apparently younger than the volcanics. Disseminated sphalerite and galena occur in outcrop in several different lapilli tuff units. No mineralization is present in the intrusion. The mineralized bands occur over a length of at least 1600 feet (488 meters) and one band mineralized throughout in drill core, is at least 48 feet (15 meters) thick. From prospecting and knowledge of other showings on nearby claims, volcanogenic mineralization is present over an impressive area and suggests massive mineralization could be present in the area. Further mapping, prospecting and electromagnetic surveying are recommended.



BYRON CLAIM

GEOLOGY, GEOPHYSICS AND PROSPECTING

INTRODUCTION

This report describes geological, geophysical and prospecting efforts in July, 1978 aimed at extending the limits of known mineralization in the Byron claim and clarifying geological concepts of volcanogenic mineralization in the Hazelton Group, as a continuation of the "Ascot Project" described in a previous report (Price, 1977).

LOCATION AND ACCESS

The claim is located 20 miles (32km) due east of Smithers at the headwaters of one branch of Canyon Creek, north of Dome Mtn. (see figure 1). The property is reached most easily by helicopter from Smithers, although a cat road extends from near "Burnt Cabin Junction" on the Babine Lake highway to within 1½ miles of the claim. This road could be improved easily by a small amount of cat work and corduroy road repair. In winter, access is by snowmobile. The trail is kept in good shape by Smithers Snowmobile Club and a small cabin can be used, at the east end of a chain of small lakes within 1/3 mile (500m) of the legal corner post for BYRON, M.C.

During the 1978 program, transportation was provided by Okanagan Helicopters 206B Jet Ranger.

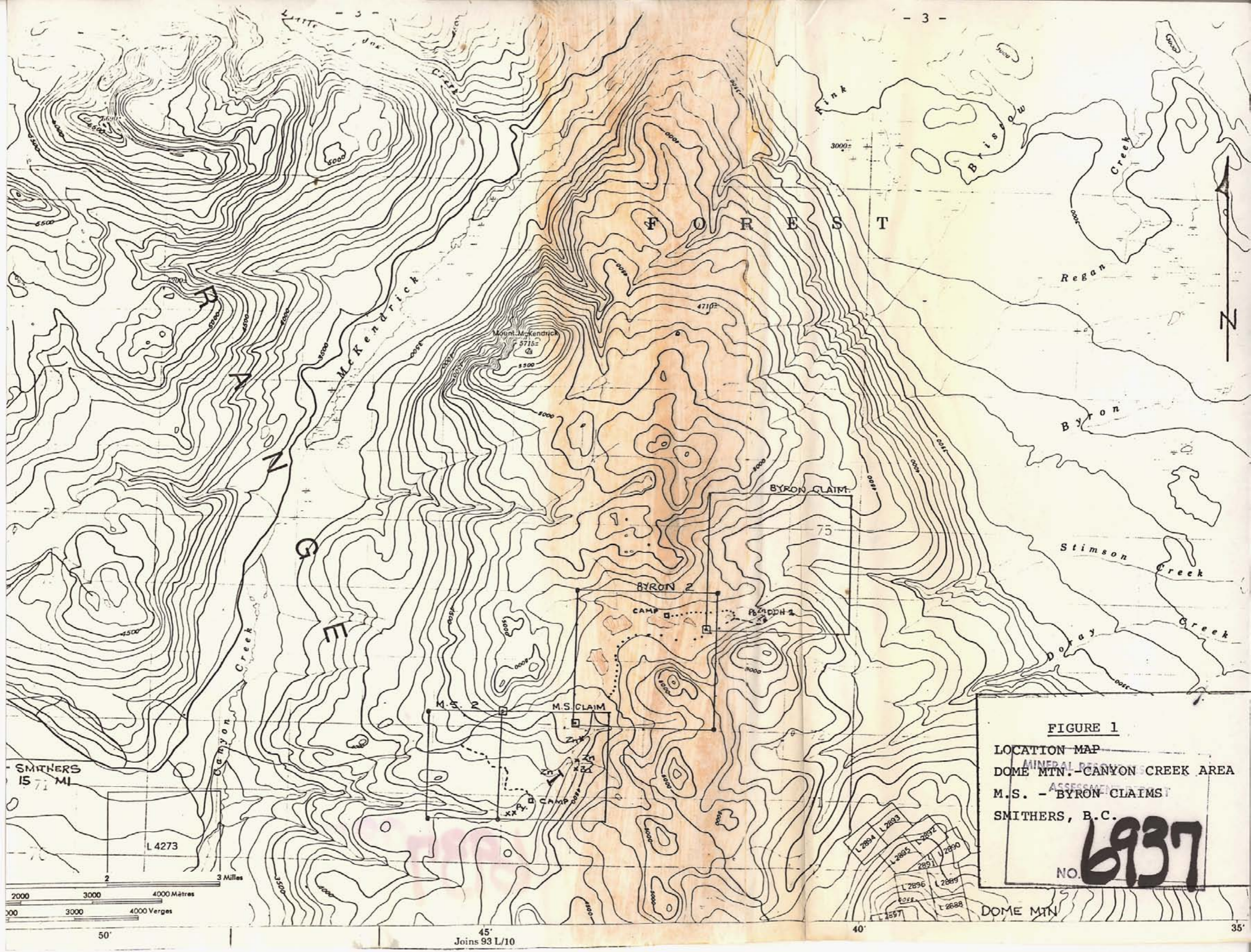
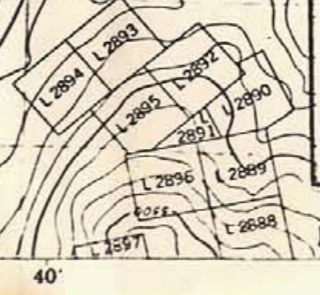
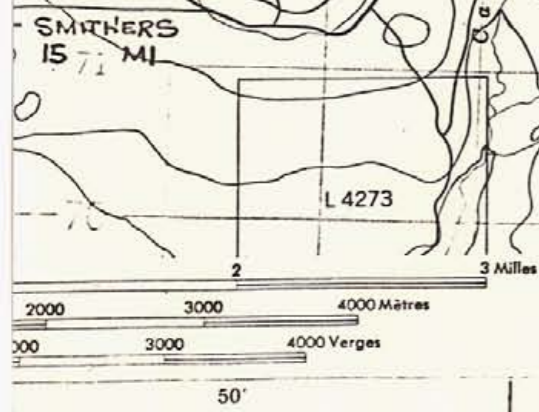


FIGURE 1

LOCATION MAP  
 DOME MTN. - CANYON CREEK AREA  
 M.S. - BYRON CLAIMS  
 SMITHERS, B.C.

NO. **6937**





CLAIM (see figure 2)

Byron M.C., record number 698(8)., record date was staked July 28, 1977 by the writer. It is covered by perimeter clause of an option agreement with K. Coswan, Smithers, B.C.

HISTORY

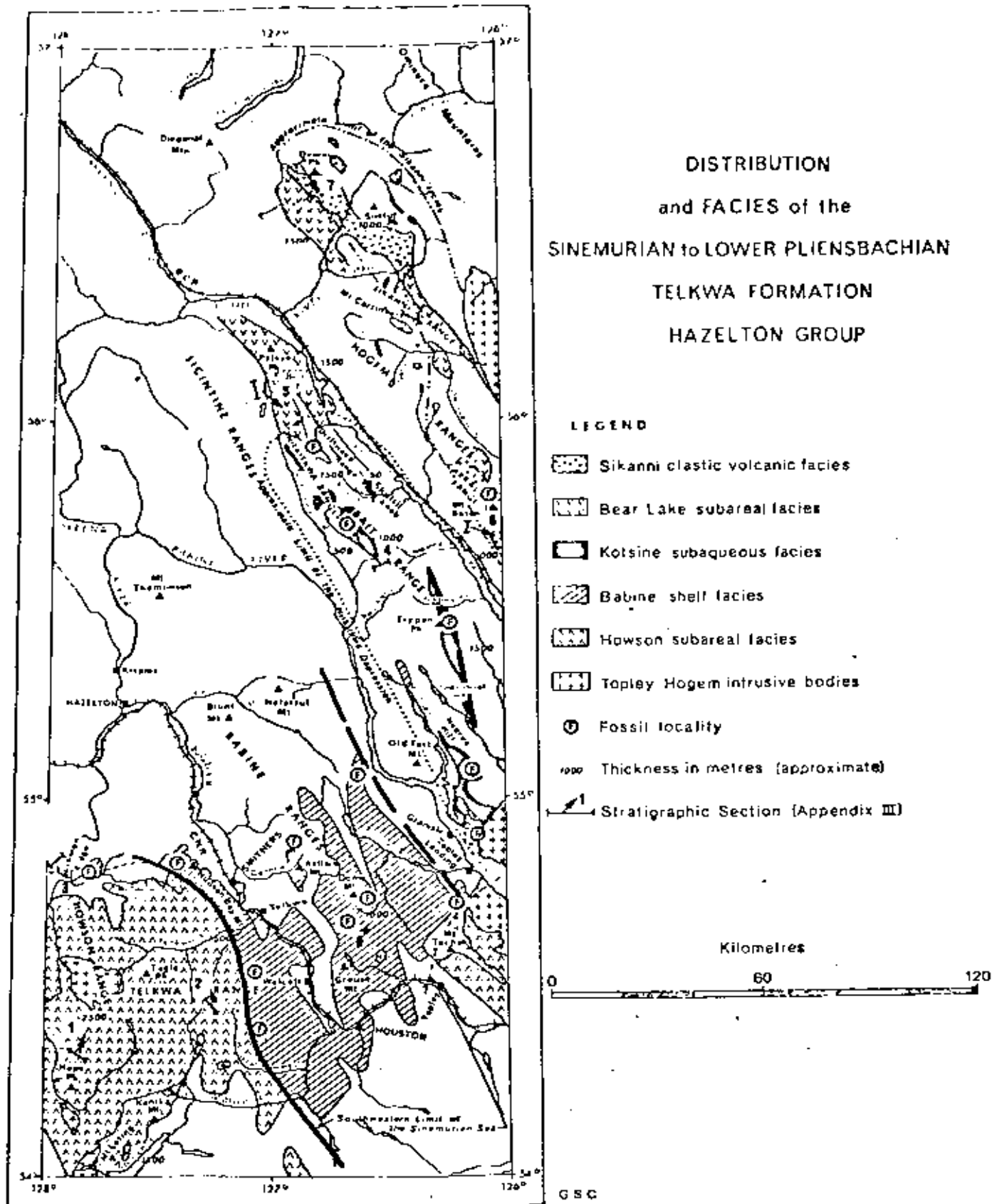
The claim area was originally held by Texasgulf Ltd. as part of a large block of claims known as the "Ascot" property. The property was explored during 1968-1969 by soil sampling, geological mapping and limited ground magnetometer and electromagnetic surveys on cut grid lines spaced 400 feet apart (122m). In addition, airborne magnetic and EM surveys cover part of the area.

Soil sampling in 1968 and 1969 showed scattered but strongly anomalous values of cold extractable zinc in soil, in an area first outlined by regional silt sampling. After geophysical surveys which outlined magnetically anomalous areas with coincident EM conductors, a diamond drill hole 333 feet (102m) was drilled in 1969. The hole, the position of which is shown in figure 3, encountered altered dacitic or rhyolitic lapilli tuff with disseminated sphalerite and galena. The "Ascot" claims lapsed in 1977 and the ground was restaked by the writer in July, 1977.

REGIONAL GEOLOGY

The property is underlain by volcanic and sedimentary rocks of the Hazelton Group described by Tipper and Richards (1976). The various units trend roughly eastward to north eastward in the southern part of the Babine range (i.e. Mt. McKendrick-Dome Mtn. area) and are locally disturbed from this trend by strong northwesterly trending





**FIGURE 3**

Facies Map - Telkwa Formation, showing 'Babine Shelf' area.



fold axes and probable thrust faults in shaly members (Richards 1977-personal communication). Dioritic stocks and gabbro or diabase sills intrude the layered rocks throughout the range. More acidic intrusions are known northwest and southeast of the claims.

#### GEOLOGY OF THE PROPERTY

Geological mapping was done on a scale of 1" = 1000 ft. (305m) by Peatfield and Loudon (1968) for the entire Ascot area, although the Byron claim lies at the eastern extremity of their most detailed mapping. Peatfield divides the Hazelton rocks in this area into 3 divisions, with the Lower Division (to the north) composed of predominantly purple sub-aerial volcanoclastics and tuffs. The Upper Division (to the south) consists of andesitic flows and tuffs. The Middle Division, underlying the Ascot area contains mixed subaqueous tuffs, greywackes, shales and limestones with occasional rhyolitic to andesitic flows.

These same rocks are described by Tipper and Richards (1977) as being the "Babine Shelf Facies" of the lower to mid-Jurassic Telkwa Formation. The property may lie on the trend of the transition between the "Howson sub-aerial facies" and the shelf facies which, according to Tipper and Richards, is "a broad arcuate belt with limestone reef and reefoid bodies, marine sediments with shell coquinas and minor aquagene tuff inter-fingered with the prominent reddish colored volcanics typical of the subaerial facies".

#### 1978 MAPPING

Geological mapping was done by the writer, A. L'Orsa and C. Winter, geologists, during the period July 23 to 28, 1978, on the grid on

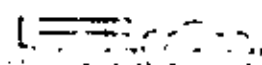
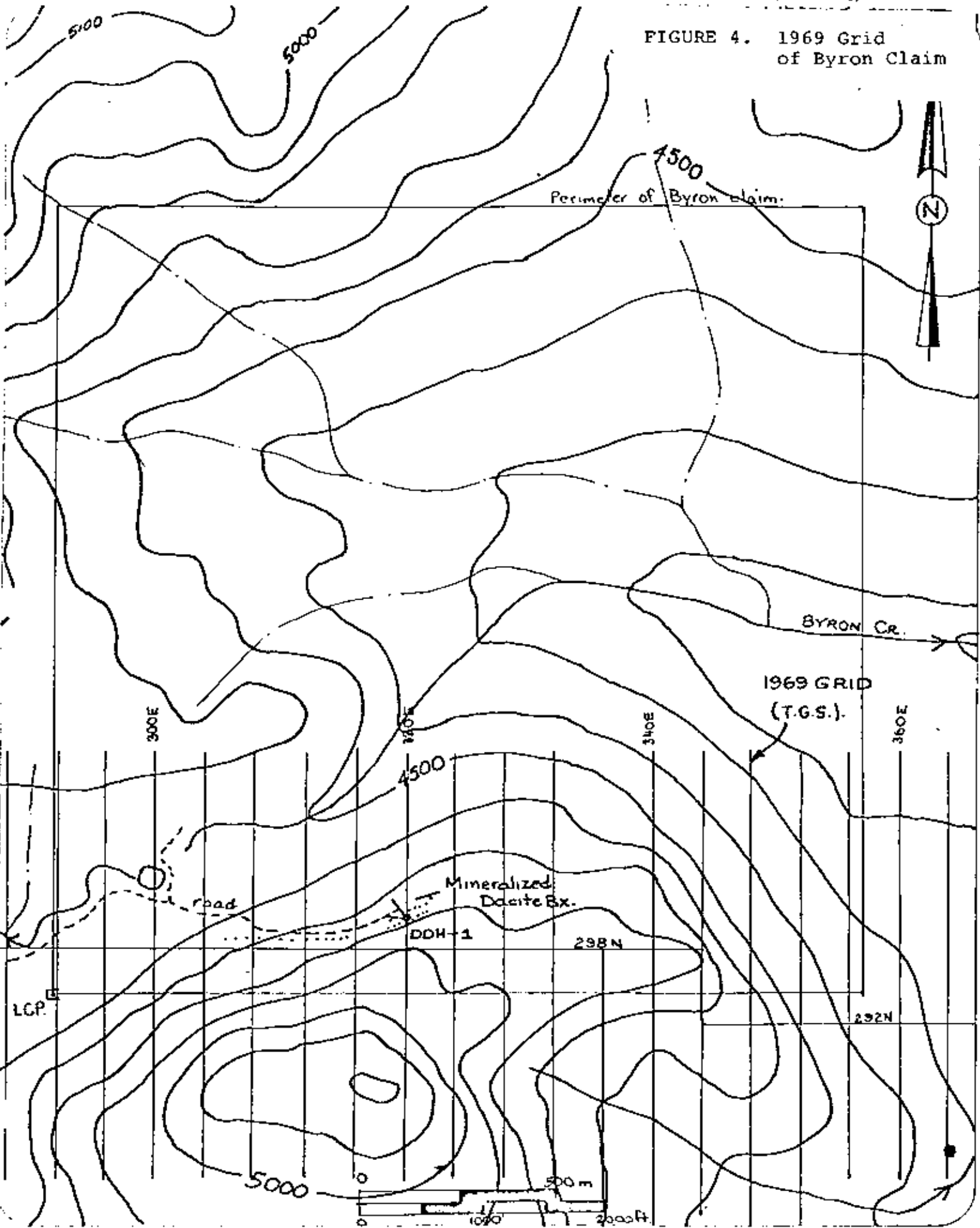
ASCOT PROJECT "BYRON" CLAIM - 16 units. 

FIGURE 4. 1969 Grid of Byron Claim





the southernmost part of the claim. This area is situated on the north facing slope of a hill with elevation to 5,000 ft. (1524m). Texas Gulf's 1969 DDH-1 is situated in the center of the mapped area (320E-301N) and is reached by a bulldozed road which extends from the camp on BYRON 2 claim. Rock exposure on the slope is sufficient to trace continuity of some horizons from line to line, but in lower swamp areas overburden cover is deep and little outcrop exists.

Most rocks on the area mapped are tuffaceous, ranging from coarse rhyolitic lapilli and tuff breccias to extremely shaly black tuffs, some of which could probably be called true shales. Sandy varieties are gradational to true greywackes. These tuffaceous rocks are in contact with a uniformly medium crystalline fresh augite diorite body which is sill-like from lines 312 to 320E, but which widens to a stock-like body east of this. The diorite is suspected to also occur near the top of the hill (south of the Byron claim boundary) on lines 300 to 308E, judging from hornfelsing and contorted bedding altitudes seen in this area. Extent of the diorite body to the south is unknown, but overall width of the intrusion is probably no more than 500-600 meters (1500-2000 ft.) Contacts may be partly fault controlled, because lineaments exist at suspected contacts. The faulting, however, is likely post intrusion in age. The diorite is unaltered and unmineralized and is not suspected to be related to mineralization.

The most significant units present are the coarse lapilli tuffs and tuff breccias. The rocks are in at least three separate bands, although fault displacement or repetition could occur. The rocks are greyish to light green in color, and have fragments of dacitic and rhyolitic appearance, light green to white in a finely divided matrix of the same color. One variety, seen as float on the road near ln. 300E, and also in outcrop near a rhyolite band at 327E/307+50N is reddish with a high proportion of hematite. The normal greenish lapilli tuff and some of the dense siliceous black fine lapilli tuffs also have hematitic fragments.



Black tuffs are hard and siliceous. The outcrops on the drill hole access road are very flinty and contain pelecypods, and small, slightly deformed ammonites, some of which could probably be identified to date the horizon.

All the tuff units appear to grade laterally into finer, more shaly units, with some locally sandy or greywacke beds. In addition, the coarser tuffs, judging from outcrop patterns, may grade laterally (eastward) into rhyolitic flows. Black tuffaceous shales contain much pyrite and marcasite and have iron oxide stain on weathered surfaces.

Alteration. The soft greyish green lapilli tuffs have a pronounced clayey odor and likely have suffered argillic and chloritic alteration. Near the drill hole, the fine variety seen in outcrop is hard, possibly silicified to some extent and is criss-crossed by a network of fine black healed fractures of unknown origin.

Structure. At the western end of the mapped area, beds trend  $120^{\circ}$  and dip southwestward, varying from  $40^{\circ}$  near the road to  $75^{\circ}$  higher on the slope. Strikes change to east west near the eastern contact with the diorite intrusions, possibly as a result of forceful emplacement of the diorite. One minor fold seen near Ln 320E/305N has an axis plunging  $30^{\circ}$  toward  $120^{\circ}$ , consistent with those measured by Peatfield - ( $120^{\circ}/25^{\circ}$ ). Faulting with both normal and strike-slip components are likely; offsets occur along the tuff-diorite contact, and strong lineaments marked by pronounced topographic depressions are present. Known and postulated faults trend approximately  $045^{\circ}$ , and  $135^{\circ}$ , with other lineaments trending  $120^{\circ}$ , parallel with strike of the bedded units.

Mineralization. Mineralization seen in outcrop and core is confined to the coarser lapilli tuff and tuff breccia units. In these, very

SOUTH

NORTH

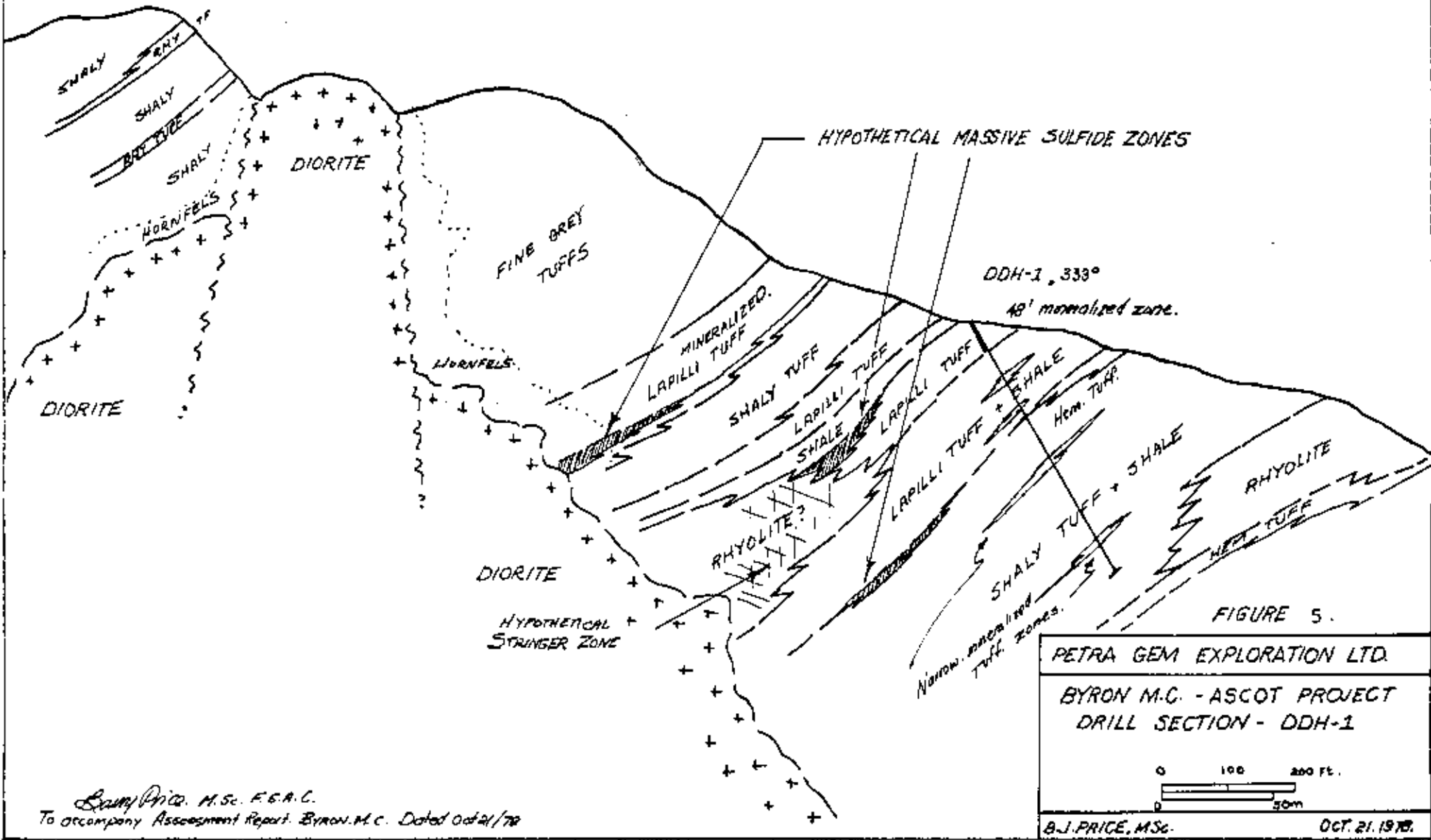
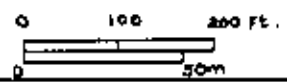


FIGURE 5.

PETRA GEM EXPLORATION LTD.  
 BYRON M.C. - ASCOT PROJECT  
 DRILL SECTION - DDH-1



B.J. PRICE, M.Sc. OCT. 21, 1970.

Byron Price, M.Sc. F.G.A.C.  
 To accompany Assessment Report, Byron M.C. Dated Oct 21/70



fine dispersed pyrite, sphalerite and galena are present. The mineralization is difficult to see without hand-lens, but as seen in the uppermost 48 feet of DDH 1, mineralization is present throughout the unit. A composite sample taken by the writer in 1977 (1 inch every foot), assayed 0.67% Zn (6700ppm) and 0.115% Pb (1150 ppm). This mineralization is identical to that seen in a band of tuff parallel with and above the road at Ln 312-316E, and in road exposures near Ln304/299N. Grade at these two latter occurrences will be low, probably less than 1% Pb and Zn yet it is significant that 3 mineralized bands with identical mineralization are present over a possible strike length of 1600 feet, with possible 40 ft. width in each band. These bands thus could represent approximately 1 million tons of rock in which Lead and Zinc are well above 10x background concentration.

In a large piece of rhyolite float found by the baseline at Line 316E, Sphalerite and galena are present as coarse grains in quartz veinlets. Although quartz veinlets are present in most rhyolite outcrops seen on the claims, no in-situ stockwork mineralization was seen. However, the float occurrence is significant, as it indicates that "stringer zone" mineralization could exist in a rhyolitic volcanic center adjacent to the mineralized tuff horizons, and supports a volcanogenic origin for the lead-zinc mineralization.

#### MAGNETOMETER SURVEY

During the period July 23 to July 28, 1978, 3.14 line miles (5.06km) of ground magnetometer survey were run on grid lines centered about DDH-1 on the Byron claim. Readings were taken by the writer after stations were re-marked (and in some cases re-surveyed by A. L'Orsa and C. Winter). The instrument used was a M-700 vertical flux-gate magnetometer manufactured by McPhar Geophysics and rented from Bema Industries Ltd., Langley, B.C. Base station L298N/316E was arbitrarily set at 1500 gammas.

Readings taken on the survey range from low 925 gammas to a high of 2050 gammas.



Results. Over most of the survey area, values do not differ appreciably from the base station value of 1500 gammas. In a general manner, large areas of shale or shaly tuffs are slightly lower than average, which is to be expected. Areas of known mineralization have no discernible regular correlation with areas of anomalously high or low readings. However, at L316E/298+90N a narrow but distinct high occurs at the contact of shales with overlying weakly mineralized tuffs. Two hundred feet (61m) north of DDH-1, a series of narrow highs and lows can be correlated tenuously between lines. The origin of these anomalies is unknown but could originate from:

1. Hematite (+magnetite?) concentrations in red lapilli tuffs
2. Pyrrhotite concentrations at shale-tuff contacts or within shaly units.

Because E.M. conductors were noted by Texasgulf personnel at this location, the possibility of pyrrhotite-rich massive sulphide concentrations associated with the shale-lapilli tuff contacts should not be ruled out and should be investigated, particularly in view of the presence of acid lapilli tuffs, silicified rhyolites, disseminated lead-zinc mineralization and hematitic tuffs (which could represent the oxide component often associated with massive sulphide bodies).

#### PROSPECTING

Prospecting traverses adjacent to the BYRON claim were done by the writer, A. L'Orsa and C. Winter. Portions of the dioritic intrusive which lies south of the Byron claim boundary were examined. In all areas the diorite, which from contact relations appears to be much younger than the adjacent mineralized tuffs, is unaltered and unmineralized and is not judged worthy of further prospecting efforts.





The rounded hill 500 meters south west of the LCP for Byron M.C. was prospected and mapped to determine if the synclinal feature mapped here by Peatfield is valid. This feature would have an effect on interpretation of stratigraphy of the mineralized tuffs within the Byron claim. Conflicting evidence was found by the writer. Although bedding attitudes in dark shaly units west of the hill dip steeply eastward, and limy coarse lapilli tuff on the top of the hill everywhere dip westward, a synclinal axis, if present, must lie near the western base of the hill and is likely offset by faulting.

Prospecting further south confirmed the widespread occurrence of dioritic sills or dykes with strike NNE and eastward steep dip. The prospecting program also resulted in the discovery of several localities with well preserved fossils: (1) Ammonites occur in excellent exposures of limy and siliceous tuffaceous shales on the cat road through Byron claim to the drillsite. Some of these were sufficiently preserved to be identifiable. On the northern flank of the hill above the lake on which the upper cabin is built, several pelecypods, tentatively identified as Weyla sp. (L'Orsa personal communication) were found; and in shaly rocks stratigraphically above this, and 4500 feet southeast (1372m), a well preserved specimen of Inoceramus was found.

In the coarse, limy, lapilli tuff which contained Weyla, no mineralization was seen, and the tuffs appear fresher and coarser. This unit may be stratigraphically higher than that which contains the mineralization on the Byron claim.

Very rusty spring seeps were noted along the creek which drains the southwestern corner of the Byron claim, adjacent to the LCP., and also on the south side of the middle lake, 3000 feet (915m) west of the LCP. These rusty springs could result from oxidization of pyritic or pyrrhotitic shales or mineralized tuffs, or from massive sulfide horizons, as is seen at the pyrite occurrence 12,250 ft. (3735m) southwest of Byron LCP, near the south Ascot camp.



CONCLUSIONS AND RECOMMENDATIONS

From the summer's exploration work on Byron and adjacent claims, it is apparent that stratigraphically controlled volcanogenic mineralization is present in more than one horizon in the claim area, and potential exists for more massive mineralization in or associated with the same units. Magnetometer surveying may not be the best tool to locate blind massive sulphide bodies in the area, although unexplained narrow anomalies do occur on the claim. From all known occurrences on and near the Byron claim, volcanogenic mineralization occurring at intervals over a strike length of over 3½ miles (5 km) consists of:

- (1) Massive, thinly bedded pyrite
- (2) Beds of disseminated to massive lead-zinc in limestone
- (3) Disseminated sphalerite, galena, arsenopyrite, pyrite and chalcopyrite in rhyolitic to dacitic lapilli tuffs and tuff breccias
- (4) Float of "stringer zone" sphalerite and galena in silicified rhyolites
- (5) Veins and bedded replacements of barite with sphalerite, galena and chalcopyrite in volcanic horizons.

These mineralization types encourage the search for massive sulphide mineralization on the claims.

Further work should be done on the claim including geological mapping, prospecting and electromagnetic surveying.

*Barry Price .*

BARRY PRICE, M.Sc., F.G.A.C.

October 21, 1978



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Petra Gem Exploration Ltd.



BYRON CLAIM - ITEMIZED COST STATEMENT

Wages:

A. L'Orsa	July 23-28	6 days @ \$100/day	\$ 600.00
C. Winter	July 23-28	6 days @ 75/day	450.00
B. Price	July 23-28	6 days @ 150/day	900.00
B. Price (report)	Sept.-Oct., 1978	3 days @ 150/day	450.00

Transportation:

Okanagan Helicopters	July 23	358.90
	July 28	251.13

Rental:

Magnetometer	1/2 mo. @ \$150/mo.	75.00
GMC Vandura	2 wks. @ 158.50/mo.	79.25
	425 mi. @ \$ 0.25/mi.	106.25

Disbursements:

Groceries	63.28
Propane	4.90
Gas	47.34
Motel	July 9, 20-24, 100.60
Meals	July 10-13, 20-29 61.15
Airfare	Vanc.-Quesnel (PWA) 57.25
Printing	(Van Cal) Sepias 12.35
	(Van Cal) Prints 11.29
Xeroxing	(Jorgensen) 12.00

3640.69

*Barry Price*

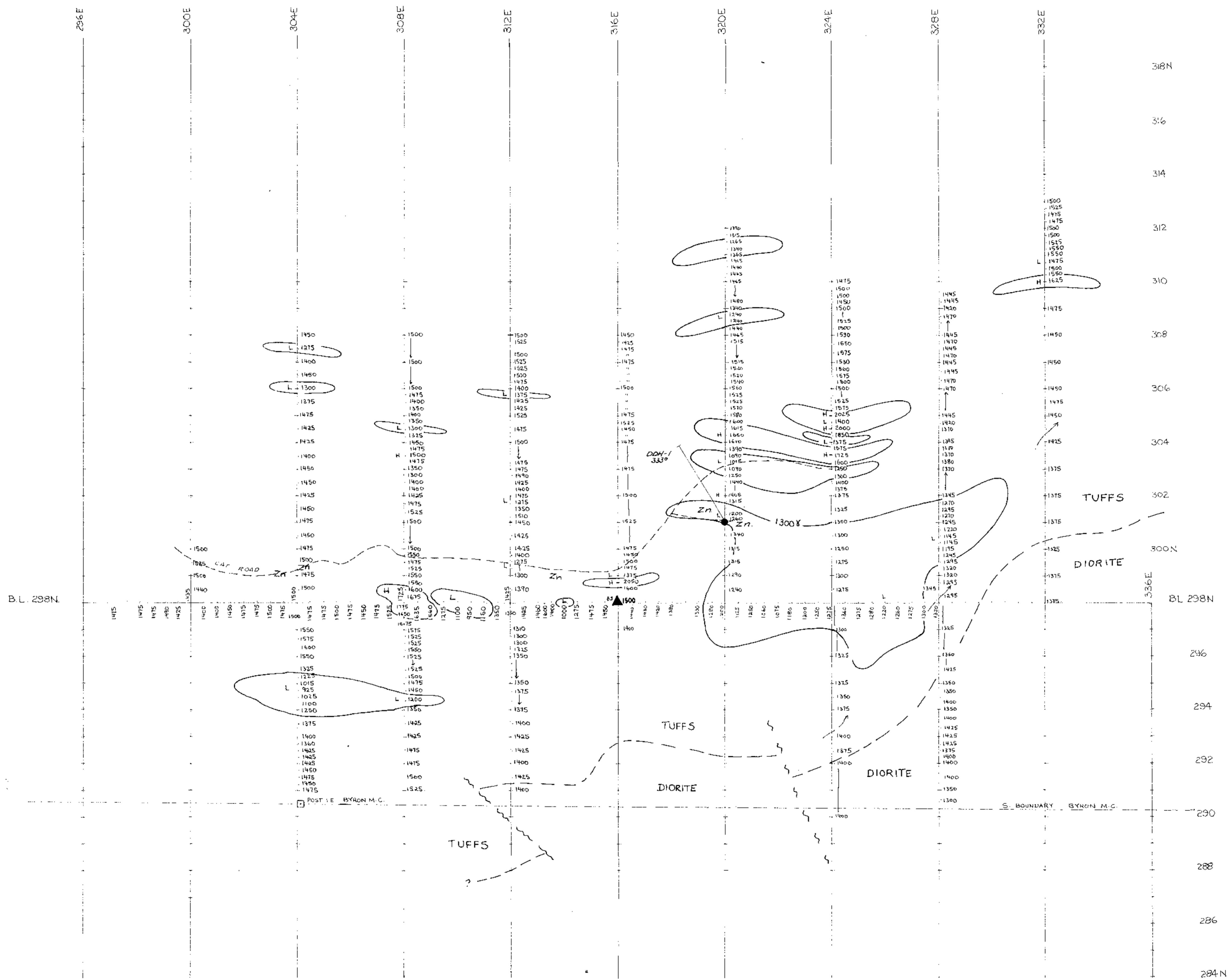
BARRY PRICE, M.Sc.

## DIAMOND DRILL CORE DESCRIPTIONS

P1/1

COMPANY:	TEXAS GULF (1969).	LOGGED BY:	B. PRICE	HOLE NO:	1
PROJECT	ASCOT	DATE:	June, 1977	LOC.:	BYRON CLAIM
LOCATION	CANYON CREEK	CORE SIZE	BQ?	LENGTH	289'
		ELEV:		AZIMUTH	333 DIP -60?

FROM	TO	LITHOLOGY	DESCRIPTION	RECOVERY
0	48	Lithic tuff.	Greenish grey altered dacite tuff, possibly solid dacite sections. Some darker shaly sections. Scattered fine brown sphalerite and specks of galena disseminated in matrix. Some reaction to Zn solution.	
48	289	shale.	Dark, phyllitic, some sections have a few specks of galena and sphalerite. e.g. @ 225'.	
			Assay: Composite sample. 1" pieces every foot. 0-48 ft. Zn: 0.67% Pb 0.115%	
			Core stored at Petra Gem Exploration Ltd. 800-3540 W. 41. Ave. Vancouver, B.C.	



**6937** FIGURE 6

**PETRA GEM EXPLORATION**  
 ASCOT PROJECT - SMITHERS, B.C.  
 BYRON CLAIM BLOCK  
 GROUND MAGNETOMETER SURVEY

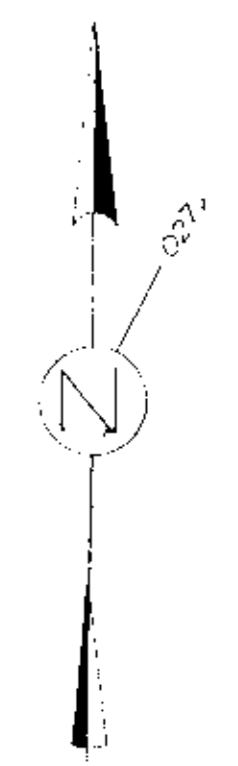
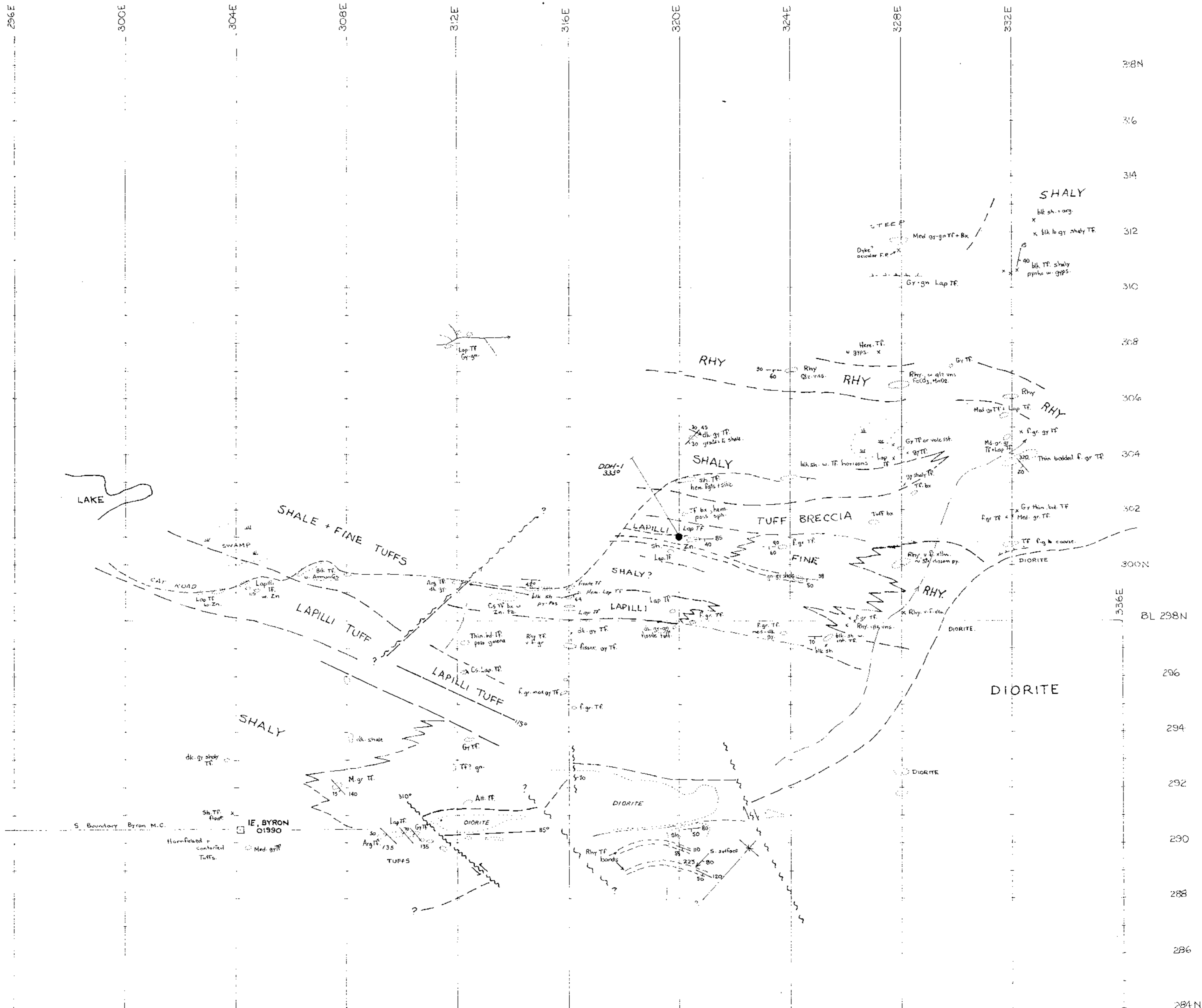
INSTRUMENT: McPhar M-100 Fluxgate Magnetometer.  
 Base Station set @ 1500 γ  
 Readings corrected for diurnal variations.  
 To accompany Assessment Report No. 6937.  
 Dated Oct 4, 1978.

Map drn. Sept. 1978  
 B. PRICE, M.Sc. 200-3540 W. 41 Ave. Vancouver, B.C.

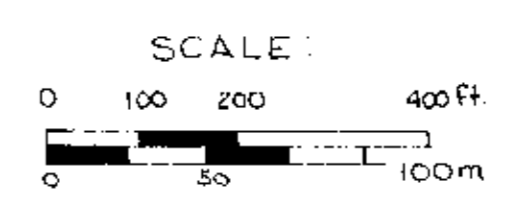
**LEGEND**

- (L) Relative magnetic low
- (H) Relative magnetic high
- Zn Mineralized tuff horizon
- - - Tuff / Diorite contact
- ▲ Base station
- 1500 Reading in gamma (γ)
- ↓ Zone of constant readings.

**SCALE:**  
 0 100 200 400 ft.  
 0 50 100 m



- LEGEND**
- DIAMOND DRILL HOLE
  - FAULT OR HYPERMETALIC FAULT
  - FACIES BOUNDARY
  - TF Tuff
  - Rhy Rhyolite
  - Lap. Lapilli size tuff
  - Bx Breccia
  - Sh. Shale or shaly
  - - - Geological Boundary
  - Outcrop
  - x Small outcrop
  - Zn, Pb Sphalerite, Galena occurrence in Tuff
  - Swamp
  - Creek



6937

FIGURE 7

**PETRA GEM EXPLORATION**  
 ASCOT PROJECT - SMITHERS, B.C.  
 BYRON CLAIM BLOCK  
**GEOLOGY**

Mapping by B. Price, A. L'Orsa, C. Hunter  
 To accompany Assessment Report No. 6937  
 Dated: Oct 4, 1978.  
 Map drn: Sept. 1978  
 B. PRICE, M.Sc. 200-3540 W 41 Ave. Vancouver, B.C.