

014155

DIAMOND DRILLING ON

PAY MINERAL CLAIM GROUP

FORTIN LAKE AREA

Watson Lake Mining Division
Yukon Territory

Longitude: $130^{\circ} 30'$ W.

Latitude : $62^{\circ} 00'$ N.

N.T.S. 105-J-1,2,
105-G-15,16

By

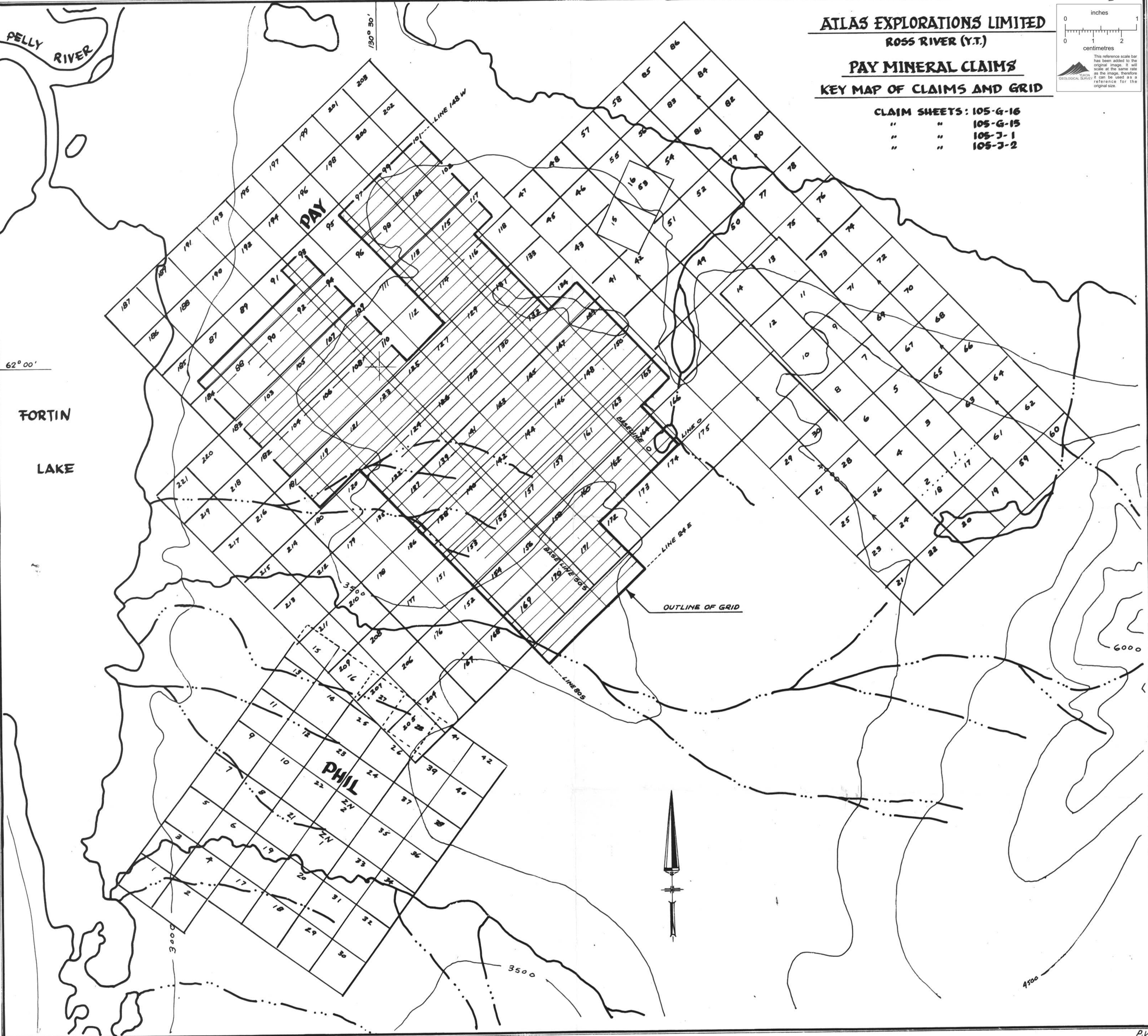
R. J. DARNEY

ATLAS EXPLORATIONS LIMITED

April 7 - October 10, 1968

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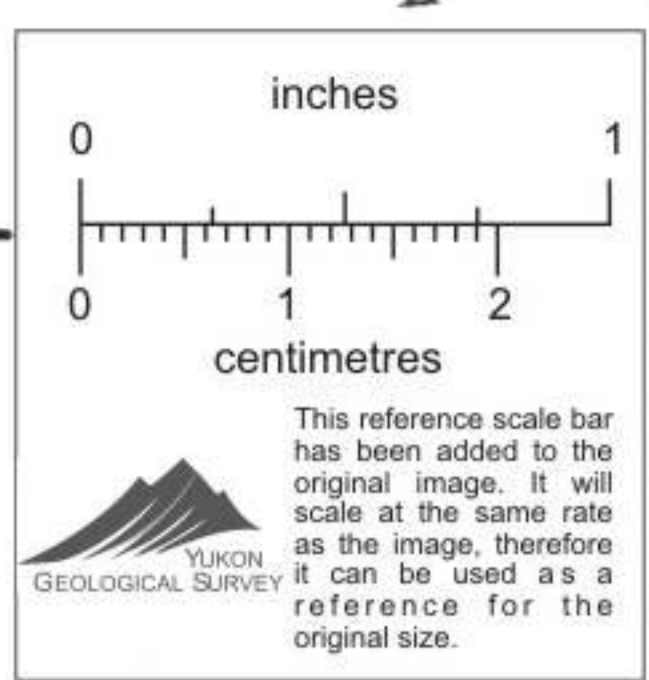


ATLAS EXPLORATIONS LIMITED

ROSS RIVER (Y.T.)

PAY MINERAL CLAIMS

KEY MAP OF CLAIMS AND GRID



- CLAIM SHEETS: 105-G-16
 " " 105-G-15
 " " 105-J-1
 " " 105-J-2

PELLY RIVER

62° 00'

FORTIN LAKE

130° 30'

LINE 148 W

OUTLINE OF GRID



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ATLAS EXPLORATIONS LIMITED

(N.P.L.)

330 MARINE BUILDING
355 BURRARD STREET
VANCOUVER 1, B.C.

PAY MINERAL CLAIMS

INTRODUCTION

The Pay Mineral Claims 1-16 were optioned from R. McBean of Vancouver, B.C. on August 13, 1966. During October, 1966, Pay 17-86 were added for protective measures. As a result of reconnaissance prospecting and geochemical soil sampling during September and October of 1966, Pay 87-166 were staked in November of the same year. Further claims, Pay 167-203 were added in June, 1967, when geologic, geochemical and geophysical surveys proved encouraging.

In August, 1967, Pay 204-221 were staked for protective measures. Pay 222-225 were staked in May, 1968, for the protection of proposed access routes from Fortin Lake to the property.

LOCATION AND ACCESS

The Pay Group is located directly east of Fortin Lake, approximately 62 miles east of Ross River, Y.T. The main base camp was located on the east shore of Fortin Lake, which is suitable for float-equipped aircraft from mid-May to mid-October. Aircraft equipped with skis can be used during winter months.

During April, 1967, Atlas Explorations constructed a winter tote-trail from the Ross River - Watson Lake Highway at a point northwest of Finlayson Lake to Pelly Lakes via the Pay Group. This 40 mile tote-trail is suitable for winter travel

but requires further construction for all season use.

DEVELOPMENT PRIOR TO 1968 DRILL PROGRAM

During the 1967 field season, a grid was cut on the Pay Mineral Claims. This grid consists of 496,900 feet of cut line with a 14,800 ft. base line, bearing 312 degrees. Cross lines at 400 ft. spacing with 100 ft. station intervals have been cut. A second base line at 50+00S was cut. Using grid stakes for location, geologic, geochemical and geophysical surveys were carried out over the entire grid area. As a result of these surveys, broad areas of anomalous geochemistry and electromagnetics were discovered. An outcrop at Line 48+00W, 51+00S, disclosed veined and disseminated zinc mineralization in a silicified dolomite. It was in this area that hand trenching and Winkie Drilling was initiated.

In early August, 1967, a D-7E cat was employed in an attempt to expose 3 locations along the mineralized horizon. Due to deep overburden and rubble, only 1 trench, adjacent to the main showing, reached bedrock.*

REVIEW OF REPRESENTATION WORK

Of the original 221 Pay mineral claims, 28 have been dropped and 192 remain in good standing. Pay 222-224 staked on June 21, 1968, will have assessment filed in the spring of 1969.

The following is a list of claims in good standing showing recording dates and due dates:

<u>Claim</u>	<u>Recording Date</u>	<u>Due Date</u>
Pay 1-16	Sept. 2, 1966	March 1, 1972
Pay 17-32	October 11, 1966	March 1, 1972
Pay 33-40	November 14, 1966	March 1, 1972
Pay 41-58	October 11, 1966	March 1, 1972
Pay 87-166	November 7, 1966	March 1, 1972
Pay 167-221	June 23, 1967	March 1, 1973
Pay 222-224	June 21, 1968	June 21, 1969

* Report on Hand Trenching, Bulldozer Trenching, Engineering Evaluation and Diamond Drilling on Pay Mineral Claims by R. J. Darney, November 8, 1967, Atlas Explorations Limited.

<u>Claim</u>	<u>Recording Date</u>	<u>Due Date</u>
Pay Fraction 1-11	September 15, 1967	March 1, 1973
Pay Fraction 16-24	September 15, 1967	March 1, 1973
Pay Fraction 25-32	September 25, 1967	March 1, 1973
Pay Fraction 34	September 15, 1967	March 1, 1973.

DIAMOND DRILLING

During January of 1968 a contract was let with A. Arsenault Diamond Drilling of Whitehorse, Y.T. for a minimum of 2000 lineal feet of drilling.

On April 7, 1968, the drill crew arrived at Fortin Lake, Y.T. and a BBS-1 wire line diamond drill was moved to the property. Drilling began on April 11, 1968. Due to the heavy overburden cover and inconclusive geophysical data, the drilling program was based mainly upon knowledge of geochemical targets. The 3 mile long anomaly was divided into two zones: Zone 1 and Zone 2 (Green Hill) anomalies. On each zone, profile lines were laid out across the anomaly perpendicular to the regional geologic strike. The line location was selected to penetrate the highest order geochemical areas (Fig.1). Holes were drilled on 4 lines bearing 208° in Zone 1 and 3 lines bearing 189° in Zone 2.

Initially, the holes were to be drilled at -45° dip so that maximum coverage of the stratigraphic section could be obtained. This dip was changed to -60° due to recovery difficulties encountered during the drilling of holes PDDH 68-1, 2 and 2a.

By October 10, 1968, 6,231 ft. was drilled from 25 set-ups. Of the 25 set-ups, only 22 holes were successful reaching ultimate depth.

Bombardier transport was provided for drillers to and from camp-site located on the east shore of Fortin Lake. All drill moves were completed by Bombardier.

The core was hauled from the individual drill locations to the base camp, where it was logged, split when necessary and stored in a core rack constructed at the camp site. Sludges were also collected in 10 ft. sections and bagged for storage in the core racks.

Pertinent information, such as hole locations, depths, drilling problems, etc. on each hole is given below.

For detailed information on geology and mineralization refer to drill logs (Appendices 2, 3, 4 and 5).

- PPDH 68-1 April 11-16. Ground very broken and hole made water in several places. Cementing and use of mud impossible because of artesian condition of the hole.
- PDDH 68-2 April 17-24. Ground similar to PDDH 68-1. Tried cement but encountered further caving at 183 ft. Hole abandoned. Location: 550 ft. from PDDH 68-1 on bearing 208 degrees.
- PDDH 68-2a April 25-27. Ground was highly fractured and the hole caved every few feet. An attempt was made to push casing beyond the fractured zone, but the casing became too tight to turn in the hole. Hole abandoned at 83 ft.
Location: 1100 ft. from PDDH 68-1 on bearing 208°.
- PDDH 68-2b April 28-May 4. AQ and BQ wireline. 1100 ft. SW on bearing 208 degrees from PDDH 68-1. Dip minus 60 degrees SW. Proposed depth 300 ft. ultimate depth 119 ft. Rock units were very broken and core recovery was difficult. During the drilling of this hole, M. Smith of Arsenault visited the drill site and several attempts were made to improve the core recovery. These included various speeds and pressures on the bit with and without the use of drilling mud. Due to variations in the competency of the rock types and their core angles, no one method was proved to be the most efficient.

The hole was terminated at 119 ft. when the casing became too tight to turn in the hole. Attempts

were made at reaming ahead, but this was found impossible.

PDDH 68-3 May 4 - May 12. BQ wireline. 900 ft. SW on bearing 208 degrees from PDDH 68-1. Dip minus 60 degrees SW. Proposed depth 300 ft., ultimate depth 416 ft. The drilling was found to be much easier in this hole. The hole did not make water and few caving problems were encountered. Drilling mud was used.

The rock types were generally dolomitic shales, sandy dolomites and chloritic to graphitic phyllites. Minor amounts of sphalerite were found intermittently through most of the section down to 310 ft. Core angles average 60 degrees.

PDDH 68-4 May 11 - May 20. BQ wireline. 735 ft. SW on bearing 208 degrees from PDDH 68-1. Dip minus 60 degrees SW. Proposed depth 350 ft., ultimate depth 348 ft. Hole was abandoned in wide shear zone. The rods were too tight to turn and the hole was caving badly.

As in PDDH 68-3, the section consisted of dolomitic shales and sandy dolomites with minor amounts of sphalerite occurring in quartz-carbonate veinlets.

PDDH 68-5 May 21 - May 27. BQ wireline. 1075 ft. SW on bearing 208 degrees from PDDH 68-1. Vertical. Ultimate depth 250 ft.

From 0-58 ft. the ground was very broken making the core recovery impossible. However, after casing to this depth, the ground conditions became much

better and core recovery increased. The hole was abandoned in a shear zone at 250 ft. No drilling mud was used in the hole.

- PDDH 68-6 May 28 - May 31. Located 10 ft. southeast of station 48+28 on base line 50S. Hole drilled bearing 208° , at angle -60° southwest. Proposed depth 250-300 ft., ultimate depth 87 ft. Intersected broken zone at 87 ft. and broke off bit and reaming shell. Attempted to case down to bit for recovery, EX casing broke off in hole so 68-6 abandoned.
- PDDH 68-7 June 1 - June 8. Located 63 ft. from PDDH 68-6 on bearing 208° . Hole drilled bearing 208° , at angle -60° southwest. Proposed depth 300 ft., ultimate depth 305 ft. Few drilling problems encountered. Intermittent broken zones to 90 ft. Hole terminated at 305 ft., casing blasted out as too tight to turn.
- PDDH 68-8 June 9 - June 13. Located Line 40W, station 45+84 South, drilled bearing 208° at angle -60° southwest. Proposed depth, ultimate depth 282 ft. No drilling problems.
- PDDH 68-9 June 15 - June 16. Location 350 ft. southwest of PDDH 68-1 on bearing 208° , at angle -60° southwest. Proposed depth 300 ft., ultimate depth 36 ft. Casing broke off in hole, hole angle changed.
- PDDH 68-9A June 16 - June 21. Location, same as PDDH 68-9, bearing 208° . Dip -63° southwest. Proposed depth 300 ft., ultimate depth 87 ft. Alternate hole to 68-9. Ground very abrasive and casing broke off in hole.
- PDDH 68-10 Location 425 ft. southwest of PDDH 68-1 on bearing 208° . Drilled 208° angle -60° southwest. Ground badly broken, reasonable core recovery. Dolomitic

- shale grading in colour from grey to black and varying graphitic content. Much of section is broken by gouge zones. Hole terminated at 309 ft.
- PPDH 68-11 BQ wireline - June 27 - July 3. Located 300 ft. from PDDH 68-1 on bearing 208° , dip 60° NE. Proposed depth 300 ft., ultimate depth 289 ft. No drilling problems and core recovery approximately 65%. Several broken or shear zones in the order of 20 ft. thick gave no problems. Rocks mainly dolomitic shales changing to grey chloritic phyllite in the bottom of the holes. Minor associated sphalerite.
- PDDH 68-12 BQ wireline - July 3 - July 14. Located 76 ft. from L60, 62+00 south on bearing 55 degrees. Dip 60° SW. Proposed depth 350 ft., ultimate depth 361 ft. The period July 12-14 was spent in moving the drill and equipment to Zone 2 on the 'Green Hill'. No drilling problems - recovery approximately 70%.
- PDDH 68-13 BQ wireline - July 14-July 21. Located 150 ft. NE of station 58+40 south line 96 west. Proposed depth 350-400 ft., ultimate depth 379 ft. Rocks more phyllitic than in previous zone and core recovery slightly lower at 50-55%.
- PDDH 68-14 BQ wireline - July 21 - Located 420 ft. from PDDH 68-13 on bearing 189 degrees. Dip 60 degrees SW. No drilling problems down to 242 ft. where the rods stuck in the hole. An attempt to drive BX casing to this depth resulted in the casing sticking at 200 ft.
- PDDH 68-15 BQ wireline - August 6 - August 11. Located 800 ft. from PDDH 68-13 on bearing 189° . Bearing 009° . Dip 60° NE. Ultimate depth 319 ft. Overburden depth 40 ft. No drilling problems with approximately 70% core recovery.

Mainly medium-dark grey dolomitic shales with varying percentages of quartz-carbonate veinlets. Approximately .5% sphalerite from 47'-65'.

PDDH 68-16 BQ wireline. August 12 - August 19. Located 1200 ft. from PDDH 68-13 on bearing 189°. Bearing 009°. Dip 60° NE. Ultimate depth 377 ft. Overburden depth 43 ft. Approximately 60% core recovery. Dolomitic shales. Some zones were coarser grained with some silicification. 58'-80' and 85'-110' approximately .5% sphalerite.

PDDH 68-17 BQ wireline. August 20 - August 23. Located 1500 ft. from PDDH 68-13 on bearing 189°. Bearing 009°. Dip 60° NE. Ultimate depth 62 ft. No core recovery from hole. Ground was extremely broken and the hole caved badly. Terminated at 62 ft.

PDDH 68-18 BQ wireline. August 24 - August 27. Located 1510 ft. from PDDH 68-13 on bearing 189°. Bearing 009°. Dip 60° NE. Ultimate depth 80 ft. Overburden depth 43 ft.

Light-dark grey chloritic phyllite. Ground broken, core recovery approximately 35%. No mineralization, hole terminated and drill moved to location PDDH 68-19 to begin new profile line.

PDDH 68-19 BQ wireline. August 28 - September 9. Located 250 ft. from Station 59, Line 112 on bearing 009°. Bearing 189°. Dip 60° SW. Ultimate depth 408 ft. Overburden depth 90 ft. A wide shear zone between 124-205 ft. caused caving problems. Cementing of this zone was necessary before the hole could be continued.

Rock mainly dolomitic shales becoming highly graphitic and grading to phyllite at the bottom of the hole. Approximately 3% sphalerite from 108'-124'.

PDDH 68-20 BQ wireline. September 10 - September 20. Located 300 ft. from PDDH 68-19 on bearing 189° . Bearing 189° . Dip -60° SW. Ultimate depth 443 ft. Overburden depth 82 ft.

Drilling time lost because of frozen hose lines. Coil heaters were used, but the length of hose was approximately 2700 ft. uphill, and freezing could not be prevented.

The rocks were mainly dolomitic shales with minor silicification in localized bands. Some interbedding with graphitic rich phyllites. Approximately 2% sphalerite from 322'-337', occurring mainly in quartz-carbonate stringers.

PDDH 68-21 BQ wireline. September 21 - October 1. Located at station 66 south line 128 west. Bearing 189° . Dip -60° SW. Ultimate depth 410 ft. Overburden depth 103 ft.

Two coil stoves were used on the 2200 ft. hose line to prevent freezing. No drilling problems encountered.

Rocks ranged from dolomitic shales and schistose dolomite to black shales or argillites. Extremely minor sphalerite.

PDDH 68-22 BQ wireline. October 1 - October 10. Located 500 ft. from PDDH 68-21 on bearing 189° . Bearing 189° . Dip -60° SW. Ultimate depth 255 ft. Overburden depth 154 ft.

Drilling very slow as a result of deep overburden. Casing became tight making progress slow. Hose lines froze due to extremely cold weather with no snow for insulation. Several mechanical problems with drill and pump. Hole terminated in section of highly broken ground where the rods became tight.

GENERAL GEOLOGY

The Pay Mineral Claims are situated in the Sheldon Region which is underlain by a succession of northwesterly trending folded and faulted metasedimentary rocks. These rocks range in age from Proterozoic to Mississippian in age and are intruded by Cretaceous granitic stocks.

The structure consists largely of isoclinal to moderately-tight folds which trend northwest and plunge approximately 20° - 30° . Faulting is generally of high angle normal or reverse types.

Within the boundaries of the Pay Claims (See Geologic Map Pay Mineral Claims, Fig.2), the succession is limited to the Middle-Upper Cambrian to Upper Devonian. The structure consists of three structural blocks separated by two southwesterly dipping normal faults.

The oldest rock, Middle-Upper Cambrian grey, well foliated phyllites, comprise the centre block which has an isoclinal syncline structure plunging to the northwest. This syncline is cored by a unit of dark brown, massive, cryptocrystalline, Silurian-Devonian dolomite. The major portion of the Silurian-Devonian (Devonian-Mississippian?)^{*1} rock outcrops in the southwest block, south of the Boundary fault. This southwest block, probably an upward extension of the centre block, is composed of dolomitic shales and sandy silicified dolomites.

The youngest rocks, Upper Devonian in age, lie northeast of base line 0. This block is composed of banded chert, phyllite and dolomite in an open anticlinal structure plunging 20° to the northwest

*1 Personal Communication

The calcareous section mapped as Silurian-Devonian during Atlas Explorations' 1967 field season is thought, by D. Templeman-Kluit, G.S.C., to be of probable Devonian-Mississippian age as indicated by a characteristic Mississippian black clastic lithogy.

DRILL HOLE GEOLOGY

All drilling was done within the limits of the geochemical anomaly thought to be underlain by Silurian-Devonian dolomitic shales, siliceous dolomites and platy dolomites.

The general rock-types intersected in drilling are generally all of the same type and no evident marker horizons exist. (Some characteristic sandy sections were used in Zone 2). However, in an attempt to arrive at some meaningful geologic structure, the various units have been categorized using three main generalizations.

1. Silicification: Although silicification is normally very partial, it appeared in some cases to obliterate the original rock. Rocks which fall in this category include all silicified rocks plus all siliceous sandy dolomites of some appreciable thickness.
2. Platy nature: Includes all rocks, independent of colour, which have well developed fine laminations giving rise to a very platy appearance.
3. Colour: Colour of the rock is used when silicification or platyness are not significant factors. It generally indicates the percentage of graphite present.

These three generalizations have made possible the division of the geologic section into units. It is important to note the finely interbedded nature of the sediments has restricted the complete isolation of each.

Correlation of Holes on Profile Line 1, Zone 1

In Zone 1, holes PDDH 68-1, 2, 2a, 2b, 3, 4, 5, 9, 9A, 10 and 11 were drilled along one profile line, Fig.3, so that enough information could be obtained to provide a geologic structure.

PDDH 68-3 and 4

Correlating PDDH 68-3 59'-69' with PDDH 68-4 168'-178'. A narrow member of light to medium grey dolomitic shale (slightly platy) having characteristic fine, irregular laminations of lighter grey more calcareous material. This member is bounded above and below by dark grey platy dolomitic shale.

PDDH 68-3, 4 and 5

Correlating PDDH 68-3 294'-317' with PDDH 68-4 215'-235' with PDDH 68-5 58'-81'.

The three intersections given above are thought to be the same member, as they are all dark grey to black in colour, fine grained and have a characteristic platy appearance. In each case, the platy member is bounded above and below by black graphitic shales or phyllites. The platy member is not present in PDDH 68-2b, therefore, it is believed that an anticlinal axis lies between holes PDDH 68-5 and PDDH 68-2b, eliminating the platy member from hole PDDH 68-2b (Fig.1). Ease of drilling adds further support to such an anticlinal structure. Holes PDDH 68-2a and 2b, collared at the same location and drilled in opposite directions at -60° were both abandoned due to caving while drilling down dip. Hole PDDH 68-5 was drilled vertically with few problems. It is suspected that hole PDDH 68-5 was drilled parallel to the axial plane of the fold, while holes PDDH 68-2a and 2b were drilled down dip on opposite limbs.

PDDH 68-9A and 10

Correlating PDDH 68-9A (?)'-45' with PDDH 68-10 (?)'-50'. Medium to dark grey silicified dolomite underlain by graphitic phyllite. The silicified unit is not present in hole PDDH 68-2. However, the graphitic phyllite is overlain by a schistose dolomite which could be the unsilicified equivalent of the silicified unit.

PDDH 68-10 and 11

Correlating PDDH 68-11 160'-197' with PDDH 68-10 263'-293'.

Light to dark grey dolomitic shales with characteristic light coloured banding. Overlain by medium to dark grey dolomitic shales.

TABLE I
LEGEND (Zone 1)

8	Dark grey dolomitic shales, mainly platy, but locally graphitic or brecciated.
7	Light-dark grey fine grained dolomitic shales with much higher graphitic content than unit 1. The light colour is a result of more calcareous banding present at the top of the unit.
6	Sandy silicified dolomite changing laterally to light grey sandy dolomitic shales and argillaceous dolomite.
5	Dark grey-black graphitic shale or phyllite, locally platy.
4	Dark grey-black dolomitic shale with interbedded light-dark grey more calcareous shales.
3	Light-dark grey dolomitic shale with light-medium grey bands of sandy material. This sandy material is not predominant throughout the entire unit.
2	Dark grey-black graphitic dolomitic shale.
1	Chloritic phyllite.

Structure Zone 1

The stratigraphic interpretation of units on profile line 1 indicates that the structure consists of two open anticlines enclosing a broad flat syncline (Fig.4). Although no direct correlation was apparent between holes PDDH 68-1, 11, 9, 10 and 2 and holes PDDH 68-4, 3, 2a, 2b and 5, a high angle reverse fault between holes PDDH 68-2 and 4, with approximately 100 ft. vertical movement, allowed units on the NE side of the fault to be brought to the same stratigraphic level as those on the SW side of the fault.

For this correlation, units 5 and 6 were used. On either side of the fault, unit 5 consists of dark grey to black, fine grained dolomitic shale enclosing a narrow member of medium to dark grey platy dolomite. The overlying unit 6 is composed of sandy silicified dolomite which grades laterally into light to medium grey schistose dolomite or argillaceous dolomite towards the fault.

Further evidence for such a fault is shown in the Ronka EM 16 data. Although no information is available for line 52W, a weak in-phase cross over on line 56W lies between holes PDDH 68-2 and 4 when projected to the SE.

From information obtained in holes PDDH 68-6, 7, 8 and 12 (Figs. 5, 6 and 7), the structure across profile line 1 has been projected laterally to the NW and SE (Figs. 8, 9 and 10).

Holes PDDH 68-6, 7 and 8 intersected units 4, 5, 6 and 7 on the NE limb of the anticline whose axis lies beneath holes PDDH 68-2a and 2b and which strikes approximately perpendicular to the profile lines. Plunges of minor folds observed in surface mapping were in the order of 15° - 20° to the NW. Assuming that these plunges indicate the plunge of the anticlinal structure in question, hole PDDH 68-12 would intersect rock at a higher

stratigraphic level than unit 8. Because no correlation was made, these units are referred to as a, b, c and d.

Correlation of Drill Hole Geology Zone 2 (Green Hill)

The Zone 2 geochemical anomaly is much larger than the Zone 1 anomaly. Consequently, drill profile lines were spaced further apart to give maximum coverage with a minimum number of holes. Therefore, the geological data is not as reliable for structural interpretation as that in Zone 1.

However, Profile line 1 Zone 2 consisting of five holes over a horizontal distance of 1500 ft. (Fig.11), provided adequate data to facilitate a geologic cross section (Fig.12).

Profile Line I

Holes PDDH 68-15 and 16

Correlating PDDH 68-15 47'-74' with PDDH 68-16 228'-250'

This member contained in the upper part of unit F, is composed of light to medium grey, fine grained dolomitic shale with fine irregular interbanding of more calcareous material. It is underlain by dark grey, finely laminated and slightly platy dolomitic shale. Only the top section of unit c is exposed in hole PDDH 68-16, therefore, it is expected that a wide shear zone intersected from 259'-278' in hole PDDH 68-16 has displaced unit F downward approximately 50 ft.

Correlating PDDH 68-15 161'-184' with PDDH 68-16 308'-325'

Due to a characteristic sandy appearance caused by medium subrounded grains of quartz, the above two intersections are thought to be the same member. The shale which is fine grained, laminated and medium to dark grey in colour is underlain by dark grey, laminated, (laminations 1 mm. - 1 cm) and platy dolomitic shale. Graphitic concentrations appear on slip surfaces parallel to bedding.

TABLE I
LEGEND ZONE 2 (Green Hill)

H	Light to medium grey, sandy dolomitic shale partial silicified.
G	Dark grey to black, fine grained dolomitic shale.
F	Light to medium grey dolomitic shale, sandy in appearance at the top of the unit and grading downwards to medium-dark grey platy dolomitic shale.
E	Mainly dark grey to black dolomitic shales. Locally platy and interbedded with light grey dolomitic shale.
D	Light to dark grey dolomitic shale with some siliceous dolomite members.
C	Medium to dark grey dolomitic shale, slightly platy.
B	Dark grey to black dolomitic phyllite interbedded with light-medium grey dolomitic shale.
A	Black graphitic phyllite.

Structure Profile Line I, Zone 2

The above correlations together with core angles obtained in holes PDDH 68-15 and 16 indicate the structure consisting of a broad open syncline terminated on each limb by faults intersected in holes PDDH 68-14 and 18 (Fig.12). Although the units of graphitic phyllites with some interbedded dolomitic shales in PDDH 68-14 and 18 are similar to one another, they are quite different from the calcareous section intersected in holes PDDH 68-15 and 16. Since the calcareous section was stratigraphically higher than the phyllites in Zone 1, it is probable that the calcareous section lying between the faults in Zone 2 is a downdropped block.

PDDH 68-13, which is composed of interbedded graphitic phyllites and dolomitic shales, cannot be directly correlated with any units in holes PDDH 68-14 or PDDH 68-15 and 16. Because of the interbedded nature of the rocks, it is possible that these rocks lie in a transitional zone between the units in hole PDDH 68-14 and those in the bottom of holes PDDH 68-15 and 16.

Due to the distances between Profile Line 1 and Lines 2 and 3 (Figs. 13 and 14), the structure postulated across Line 1 cannot be directly related to the moderately dipping section intersected on Lines 2 and 3 (Figs. 15 and 16). The rocks in holes PDDH 68-19, 20, 21 and 22 are dark grey to black, fine grained dolomitic shales with interbedded light grey siliceous dolomites very similar to those in holes PDDH 68-15 and 16. It is then expected that they lie somewhere in the stratigraphic column above the graphitic phyllites similar to Zone 1 and Line 1, Zone 2

STRUCTURAL RELATIONSHIP BETWEEN ZONES 1 & 2

It can be seen above, that the structure in both Zones 1 and 2 consists of a broad open syncline bordered by anticlines on each limb. Due to similar structure and general rock types, it is suspected that Zone 2 is simply a continuation of Zone 1. However, with the plunge postulated in Zone 1, some faulting activity is assumed to have taken place between Zones 1 and 2, resulting in uplift of Zone 2. Although no definite proof of such a fault exists, geophysical data indicates some irregularity between the zones. "At the western extremity of the Zone 1 conductor, a fault has been assumed through the location of a well-defined northeasterly topographic linear, displacement of magnetic anomalies, and a cut-off and apparent partial displacement of the conductor. It is probable that, in the vicinity of Line 72W, the topographic linear is so pronounced that heavy overburden cover within its confines has masked EM results. This area could represent the central portion of a doubly-folded syncline although, structurally, this is not likely."^I

The sub-parallel faults shown in Fig.1 have opposite vertical movements on the NW and SW sides of the cross-fault described above. The opposite vertical movements are probably a result of rotational movement about a point between Zones 1 and 2.

MINERALIZATION

Zinc mineralization occurs on the Pay Mineral Claims in varying amounts in a thick sequence of interbedded black shales, dolomitic shales and silicified dolomites. Lead mineralization does not appear in significant amounts.

The mineralogy is simple, consisting of sphalerite, pyrite, minor galena in a gangue of quartz, calcite, dolomite, siderite and minor gypsum.

^I Unpublished Report - Geophysical Survey, Pay Mineral Claims, Atlas Explorations Limited, by John S. Brock, August, 1967.

Sphalerite, the main mineral, appears light purplish-brown, fine to medium grained and has two distinct types of occurrence.

1. As narrow open space filling veinlets or tension gash fillings.

The entire section is fractured and brecciated to some extent. The fracture and breccia fillings are composed of quartz-carbonate (calcite and/or dolomite) carrying irregular amounts of fine-medium grained sphalerite. It is evident that this type of mineral occurrence is fracture controlled, but it appears that the density of filling material has no direct correlation with the grade. For example, drill core containing as much as 20%-25% free quartz-carbonate veinlets may contain only a trace of zinc, whereas, core with 10% quartz-carbonate veinlets may run as high as 4.0% zinc or vice versa.

The fracture patterns are very irregular and mineralization cannot be related to any one set of fractures.

2. As trace disseminated replacements.

These disseminations are fine to medium grained and occur primarily within moderately silicified zones or interbedded siliceous members. To a lesser extent, disseminated sphalerite occurs adjacent to some mineralized quartz-carbonate veinlets.

Pyrite, which is the most abundant sulphide mineral, is present as both a primary constituent within the sediments and as a hydrothermal alteration. The latter is very erratic and only extremely local in extent. Where pyritization does occur, sphalerite may or may not be associated. Therefore, no relationship between zinc mineralization and pyritization can be drawn.

The known mineralization is in sufficient quantity to explain the vast zinc geochemical anomalies. However, mineralization occurring off the main anomaly (PDDH 68-19) was not reflected in surface zinc geochemical expression. Hole PDDH 68-19 drilled to test a lead geochemical anomaly, intersected finely disseminated sphalerite at 108', just 18 ft. below the overburden. Unlike other disseminated mineralization on the property, it is extremely fine grained and in narrow sections replaces almost the entire host which is a fine grained slightly silicified dolomitic shale or argillite. The section which was approximately 14 ft. wide assayed 4.6% zinc.

ASSAY RESULTS (See Figs. 17-21 for Assay Profiles)

The core was prepared for assay by being split on a Heath & Sherwood splitter and bagged in convenient lengths (generally not greater than 5 ft. sections). Due to the laminated nature of much of the rock, a small diamond saw was employed in splitting the core in holes PDDH 68-15 to 22. This method proved to be slower but much more accurate.

The core was then shipped to Whitehorse via Ross River, where it was assayed for Pb-Zn by standard methods at a registered Assay Office.

The following are best sections taken from all holes assayed. The remaining assay results are shown in the drill logs (Appendices II, III, IV, V).

TABLE III

<u>Hole</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Assay</u>	<u>Length x Assay</u>	<u>Average Assay (Zn)</u>
PDDH 68-2a	19	23	4	2.1	8.4	
	23	26	3	4.0	12.0	
	26	49	23	2.0	46.0	
	49	57	8	.1	.8	
	57	59	<u>2</u>	Tr	<u>0</u>	19'-59' or 40 ft. @ 1.68%
		40		67.2	19'-49' or 30 ft. @ 2.20%	
PDDH 68-4	116	126	10	.65	6.5	
	126	136.5	10.5	.4	4.20	
	136.5	147	10.5	.66	6.93	
	147	157	10	.38	3.80	
	157	166.5	9.5	.33	3.13	
	166.5	176.5	10	.115	1.15	
	176.5	187	10.5	.25	2.62	
	187	197	<u>10</u>	.28	<u>2.8</u>	
		81		31.13	116'-197' or 81 ft. @ .38%	
PDDH 68-5	32	37	5	.44	2.20	
	37	43	<u>6</u>	.16	<u>.96</u>	
			11		3.16	32'-43' or 11 ft. @ .28%
	45.5	50	4.5	.58	2.61	
	62	67	5	.18	.90	
	67	72	5	.54	2.70	
	72	79	<u>7</u>	.28	<u>1.96</u>	62'-79' or 17 ft. @ .32%
			17		5.56	
	142	148	6	.46	2.76	
	148	154	6	.28	1.68	
154	159	5	.12	.6		
159	163	4	.16	.64		
163	168.2	5.2	.74	3.85		
168.2	174.8	6.6	1.50	9.90		
174.8	179.8	<u>5</u>	.84	<u>4.20</u>		
		37.8		23.63	142'-179.8' or 37.8 ft. @ .62%	

<u>Hole</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Assay</u>	<u>Length x Assay</u>	<u>Average Assay (Zn)</u>
PDDH 68-7	96	102	6	5.3	31.8	
	102	107	5	2.6	13.0	
	107	110	3	Tr	0	
	110	114	4	4.0	16.0	
	114	119	5	.6	3.0	
			<u>23</u>		63.8	96'-119' or 23 ft.@ 2.77%
PDDH 68-8	90	105	15	.27	4.05	
	105	110	5	.47	2.35	
	110	115	5	.165	.825	
	115	120	5	.36	1.80	
	120	125	5	.62	3.10	
	125	130	5	.78	3.90	
			<u>40</u>		16.025	90'-130' or 40 ft.@ .40%
PDDH 68-15	47	52	5	8.7	43.5	
	52	57	5	1.25	6.25	
	57	62	5	.30	1.50	
			<u>15</u>		51.25	47'-62' or 15 ft.@ 3.41%
	93	97	4	4.3	17.2	
97	104	7	2.7	18.9		
104	109	5	2.2	11.0		
		<u>16</u>		47.1	93'-109' or 16 ft.@ 2.9%	
	190	194	4	4.5		4 ft.@ 4.5%
PDDH 68-16	62	67	5	1.3	8.5	
	67	71.6	4.6	2.3	10.58	
	71.6	77.8	6.2	.65	4.03	
	77.8	81	3.2	.5	1.10	
	81	87	6	.27	1.62	
	87	92.6	5.6	3.6	20.16	
	92.6	98.6	6	.47	2.82	
		<u>36.6</u>		48.81	62'-98.6' or 36.6 Ft. @ 1.3%	

<u>Hole</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Assay</u>	<u>Length x Assay</u>	<u>Average Assay (Zn)</u>
PDDH 68-19	108	112	4	.27	10.80	
	112	117.6	5.6	4.0	22.40	
	117.6	121.8	<u>4.2</u>	7.4	<u>31.08</u>	
			13.8		64.28	108'-121.8' or 13.8 ft. @ 4.6%
PDDH 68-20	322	326.6	4.6	6.9	31.74	
	326.6	331	4.4	1.45	6.38	
	331	336	5.0	2.45	12.25	
	336	340	<u>4.0</u>	.80	<u>3.20</u>	
			18.0		53.57	322'-340' or 18 ft. @ 2.9%

CONCLUSIONS

General

1. The sequence is highly fractured and broken, making -45° holes impossible to drill. The most efficient angle is -60° dip. Core recovery is normally 60%-70%.
2. The use of drilling muds gave no apparent increase in core recovery.
3. The average overburden depth is 27 ft. in Zone 1 and 74 ft. in Zone 2, increasing in depth to the NW.

Technical

1. All mineralization intersected was of sub-economic grade.
2. The mineralization exists predominantly as hydrothermal sphalerite, quartz and carbonate fracture fillings in dolomitic shale hosts, and secondly as true disseminated replacements in silicified sandy dolomite units.

3. The vein-type mineralization is erratic and has not been proven to be the result of any regular fracture pattern.

The disseminated replacement type is almost entirely restricted to silicified zones which appear to occur at or near inflection points throughout the folded sequence.

4. The zinc mineralization intersected in drill holes is near surface in many cases and is in sufficient quantities to account for the existing surface geochemical expression. However, hole PDDH 68-19 was drilled upslope from the geochemical anomaly and intersected interesting mineralization (Page 21).
5. No galena was seen to account for the lead geochemical anomalies. Especially in holes PDDH 68-19, 20, 21 and 22 which were drilled on the lead anomalies.
6. The structure, similar in Zones 1 and 2, has been interpreted as a broad open syncline bordered by an anticline on either side. Subsequent faulting has offset the units in both zones. Although both zones are composed of similar rock types, have similar structures and have been structurally related by a cross-fault, no direct stratigraphic relationship can be drawn.

RECOMMENDATIONS

All known mineralization encountered through diamond drilling is of sub-economic grade. Testing of most zinc geochemical targets has been done by drilling and the relationships between known mineralization and geochemical anomalies has been verified in most cases. However, sphalerite mineralization in PDDH 68-19 was not represented by anomalous geochemistry. Further discrepancies in correlation of results are found between lead geochemical

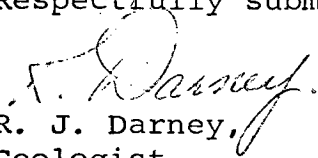
anomalies and lack of known lead sulphides on the northwest side of the "Green Hill" area.

Prior to further drilling, thorough research using present drilling data and geophysics should be completed. If a definite relationship between geochemical anomalies, geophysics and known drilling results cannot be determined, then several test holes should be drilled off the geochemical anomaly on targets defined by structural interpretations.

As investigations of all possible targets through drilling are not yet completed, it is recommended that:

1. Option payments for 1969 be made.
2. Assessment work be filed on key claims for 5 years total time.
3. Drilling and testing of all targets be completed when finances permit budgeting of further 'second-priority' follow-up.

Respectfully submitted,


R. J. Darney,
Geologist

SUMMARY OF EXPENDITURES
Jan. 1 - Dec. 31, 1968

Property Examinations	\$ 13.65
Prospecting	342.23
Claim Staking	519.27
Airborne Surveys	6,136.13
Line Cutting	37.25
Geochemical Surveys	1,496.28
Geophysical Surveys	569.61
Geological Surveys/Mapping	3,120.33
Access Roads	265.04
Diamond Drilling	139,651.37
Field Supervision	5,135.71
Administration Costs	17,481.20
Expediting	<u>17,522.21</u>
	\$192,290.28

LIST OF PERSONNEL

R. Darney	Geologist	New Westminster, B.C.
C. Fleming	Geological Asst.	Vancouver, B.C.
L. Sumner	Bombardier Driver- Mechanic	Calgary, Alberta.
G. Gray	Cook	Edmonton, Alberta
T. Skonseng	Prospector	Ross River, Y.T.
C. Marcoux	Relief Cook	Quebec, P.Q.