



32D05SE0001 2.14427 PONTIAC

010

**REPORT ON EXPLORATION ACTIVITIES**

**1990**

**PROJECT 623**

**PONTIAC TOWNSHIP**

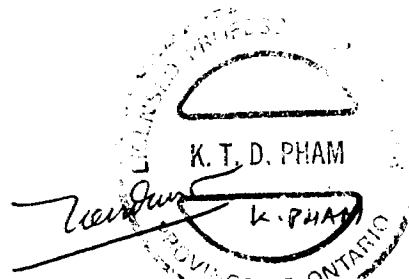
**KIRKLAND LAKE - LARDER LAKE REGION**

**COCHRANE - TIMISKAMING DISTRICT,  
NORTHEASTERN ONTARIO**

**NTS 32 D-5**

2.14427

**OROFINO RESOURCES LIMITED**  
Toronto, Ontario  
December 27, 1990



**Kim T. Pham, P. Eng.**  
**Consulting Geologist**

Qual-2.10639



32D055E0001 2.14427 PONTIAC

010C

TABLE OF CONTENTS

		<u>PAGE NO.</u>
1.0	SUMMARY AND RECOMMENDATIONS .....	1
1.1	Recommendations .....	2
2.0	INTRODUCTION .....	3
3.0	PROPERTY, LOCATION AND ACCESS .....	5
4.0	TOPOGRAPHY AND VEGETATION .....	5
5.0	PREVIOUS WORK .....	7
6.0	THE SUMMER 1990 SURVEYS .....	9
7.0	GENERAL GEOLOGY .....	11
8.0	LOCAL GEOLOGY .....	12
8.1	Intermediate to Felsic Volcanics .....	13
8.1.1	High Level Intrusive Rhyolites .....	13
8.1.2	Extrusive Felsic Volcanics .....	13
8.2	Intermediate to Mafic Volcanics .....	15
8.3	Mafic to Intermediate Intrusives .....	16
9.0	1990 GEOCHEMICAL SURVEY .....	17
9.1	Alteration .....	17
9.2	Interpretation of Whole Rock Data .....	17
10.0	UTEM SURVEY .....	32
11.0	MINERALIZATION .....	32
12.0	STAFF .....	33
	REFERENCES AND BIBLIOGRAPHY .....	34

APPENDICES

APPENDIX A ANALYTICAL RESULTS

APPENDIX B GEOPHYSICAL CONTRACTOR REPORTS

- I) "AEROMAGNETIC REVIEW; PONTIAC/BEN NEVIS TOWNSHIPS,  
ONTARIO"
- II) "LOGISTICS REPORT ON UTEM SURVEY AT PONTIAC  
TOWNSHIP, ONTARIO"  
LAMONTANGE GEOPHYSICS LTD, October 1990
- III) "UTEM SURVEY RESULTS - PONTIAC TWP.,  
EXCALIBUR INTERNATIONAL CONSULTANTS  
December 1990

LIST OF FIGURES

PAGE NO.

FIGURE 1	LOCATION MAP .....	4
FIGURE 2	CLAIM MAP .....	6
TABLE 1	CHEMICAL CLASSIFICATION .....	19
TABLE 2	ALTERATION INDICES .....	26

NOTE: TWO MAPS IN BACK POCKET - GEOLOGY AND GEOCHEMISTRY  
(NORTH AND SOUTH SHEET)



## 1.0 SUMMARY AND RECOMMENDATIONS

Pontiac Township is located to the northeast of Kirkland Lake adjacent to the Quebec border in Ontario (Fig. 1). It lies between the Porcupine-Destor Fault and the Kirkland Lake-Larder Lake Fault. Both of these regional structures are interpreted to have been conduits for mineralizing fluids transferred through the volcanic rocks of the Abitibi belt. The Noranda massive sulphides camp and the Canagau Mine (a gold-silver-base metal prospect) are about 40 km ESE and 7 km west, respectively, of Pontiac Township.

Because of its ideal location, the area between the two fault systems has been an active zone of exploration for gold and massive sulphides for decades. The porous nature of volcanic rocks in this region makes it especially amenable to trapping base metal sulphides. Rhyolite, including pyroclastic flows and breccia phases, comprises 30-50% of the outcrop in Pontiac Township, making this township a favourable location for base metal exploration.

A variety of volcanic lithologies intruded by granitic stocks, sills, dykes and by diabase dykes were observed during the 1990 field season. Detailed geological mapping enabled further classification of the felsic volcanics into separate components and therefore resulted in a facies analysis. In Pontiac township proximal vent to near-vent facies is interpreted to have been associated with high level intrusive rhyolites, fragmental rhyolites, and rhyolitic flows. In addition, of sulphide fragments observed at the "Gilamn Outcrop" have implied a resurgent style hydrothermal vent.

Significant surface mineralization has not been observed in Pontiac claims and for the most part mineralization seems unrelated to hydrothermal activity. An exception to this is the surface mineralization observed in the vicinity of "Gilman outcrop" (L 8+00 N, BL 0+00).

The 1990 geochemical survey did not yield any significant base metal anomalies except for two single high-valued zinc anomalies in soil samples MH-016 (112 ppm Zn) and T1-1 (213 ppm Zn). The latter sample occurred within an alteration zone below the Pontiac Creek Fault and close to an interpreted volcanic vent. "Gilman outcrop" also occurs in this alteration zone.

Results from the UTEM geophysical survey was mildly encouraging with a few very weak to weak conductors distributing over two main areas: the vicinity of Gilman outcrop and south southwest of the Death Lake showing. These conductors trend north-south. The Death Lake area conductor

is probably formational. One conductor occurs approximately 900 m east of "Gilman Outcrop" is probably related to the alteration zone.

### 1.1 Recommendations

Based on the field results of the summer-fall 1990 programme it was concluded that further exploration efforts are warranted within a 1-2 km radius of Gilman outcrop where an alteration zone and a UTEM conductor have been outlined.

A secondary target area within the Orofino claim block is the claims covering Death Lake and its shore. These claims are tied on a four-claim group to the east owned by four independent prospectors in Kirkland Lake. The Canagau Mine showing is approximately 6 km to the west of Death Lake. The four-claim group hosts a showing that has been the target of three diamond drilling programmes in the past. Mineralized drill sections occurred at the contact between tuffaceous rhyolite and a porphyritic andesite to dacites as blebs and stringers of pyrite with or without minor chalcopyrite or pyrrhotite. In both showings there is a peculiar association of a gabbro unit.

The followings are recommended for future work in the Pontiac property:

1. Reduce claim holdings to a manageable size. A list provided below for claims that should be dropped:

L 1129622 to - 623 inclusive	- 2 claims
L 1129627 to - 628 inclusive	- 2 claims
L 1129635	- 1 claims
L 1129638 to - 646 inclusive	- 9 claims
L 1129656 to - 679 inclusive	- 24 claims
L 1137929 to - 940 inclusive	- 12 claims
L 1152568 to - 570 inclusive	- 3 claims
L 1152575 to - 576 inclusive	- 2 claims
L 1152593 to - 599 inclusive	- 7 claims
L 1152600 to - 603 inclusive	- 4 claims
L 1155459 to - 472 inclusive	- 11 claims
	-----
	77 claims

2. Test the UTEM targets as recommended by Excalibur International Consultants. Two recommended holes are:

\* Hole 1 is to be collared at 10+00 S, 9+00 E and drilled at -50<sub>0</sub> grid east for 230.0 m

\* Hole 2 is to be collared at 10+00 N, 8+50 E and drilled at -50<sub>0</sub> grid east for 230.0 m

## 2.0 INTRODUCTION

This report covers work performed by Orofino Resources Limited over the period of late-May to mid-November, 1990 in the Pontiac property.

The principal objective of the 1990 exploration programme was to carry out recommendations established from the 1989 regional reconnaissance survey and from the 1990 winter drilling programme. In general, this year's activities were similar to those of 1989 but work was done at detailed scale.

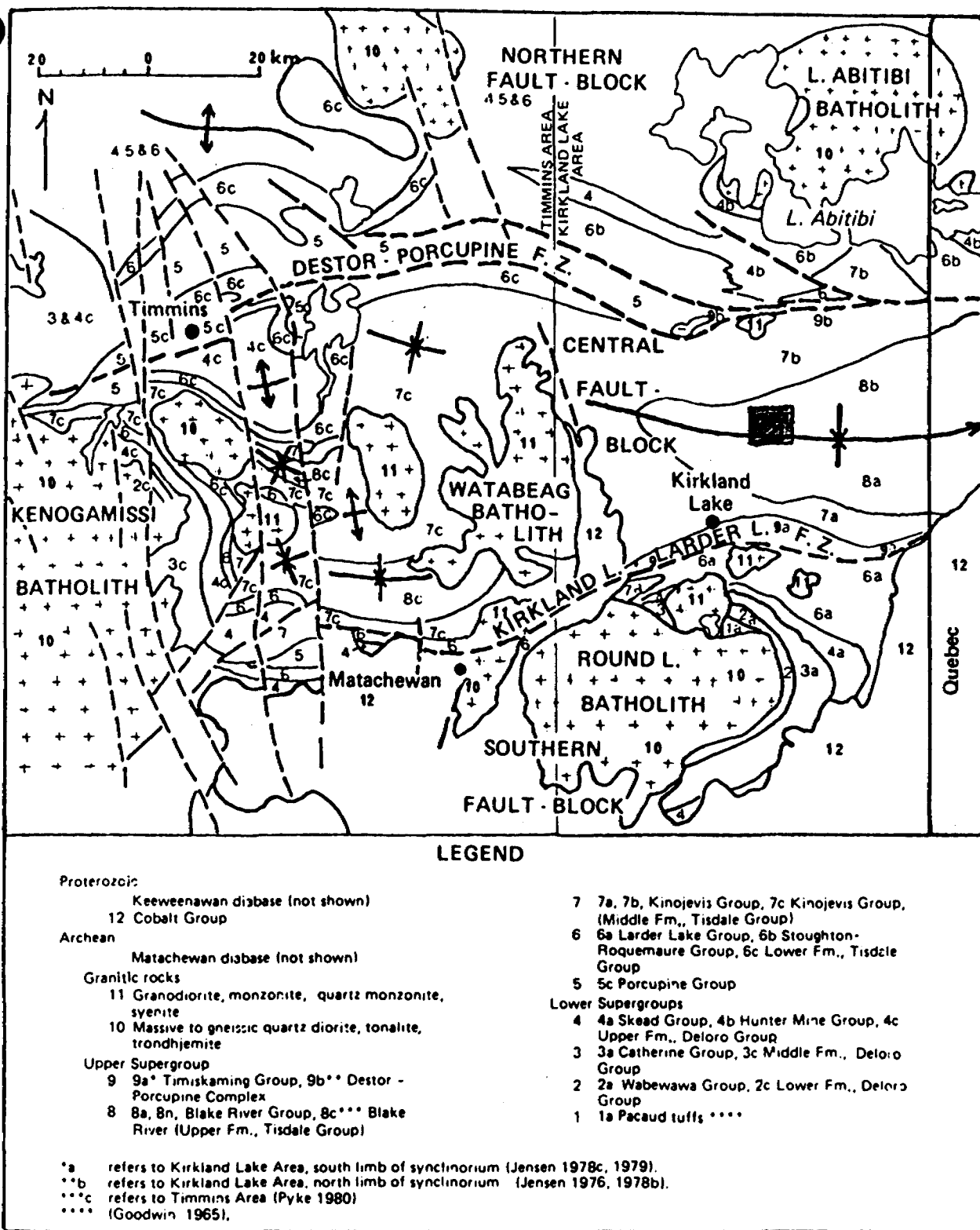


Fig. 1 Geological map of the Timmins-Kirkland Lake area (modified from Jensen and Langford, 1985, p.11).

### 3.0 PROPERTY, LOCATION AND ACCESS

The Orofino's Pontiac property is located in the central portion of Pontiac Township, Ontario. In total there are one hundred and fifty-one unpatented mining claims as listed below:

L 1115983 to -988 inclusive	- 6 claims
L 1129000 to -018 inclusive	- 19 claims
L 1129620 to -649 inclusive	- 30 claims
L 1129650 to -670 inclusive	- 30 claims
L 1137912 to -927 inclusive	- 16 claims
L 1137929 to -944 inclusive	- 16 claims
L 1152568 to -576 inclusive	- 9 claims
L 1152593 to -603 inclusive	- 11 claims
L 1155459 to -472 inclusive	- 14 claims

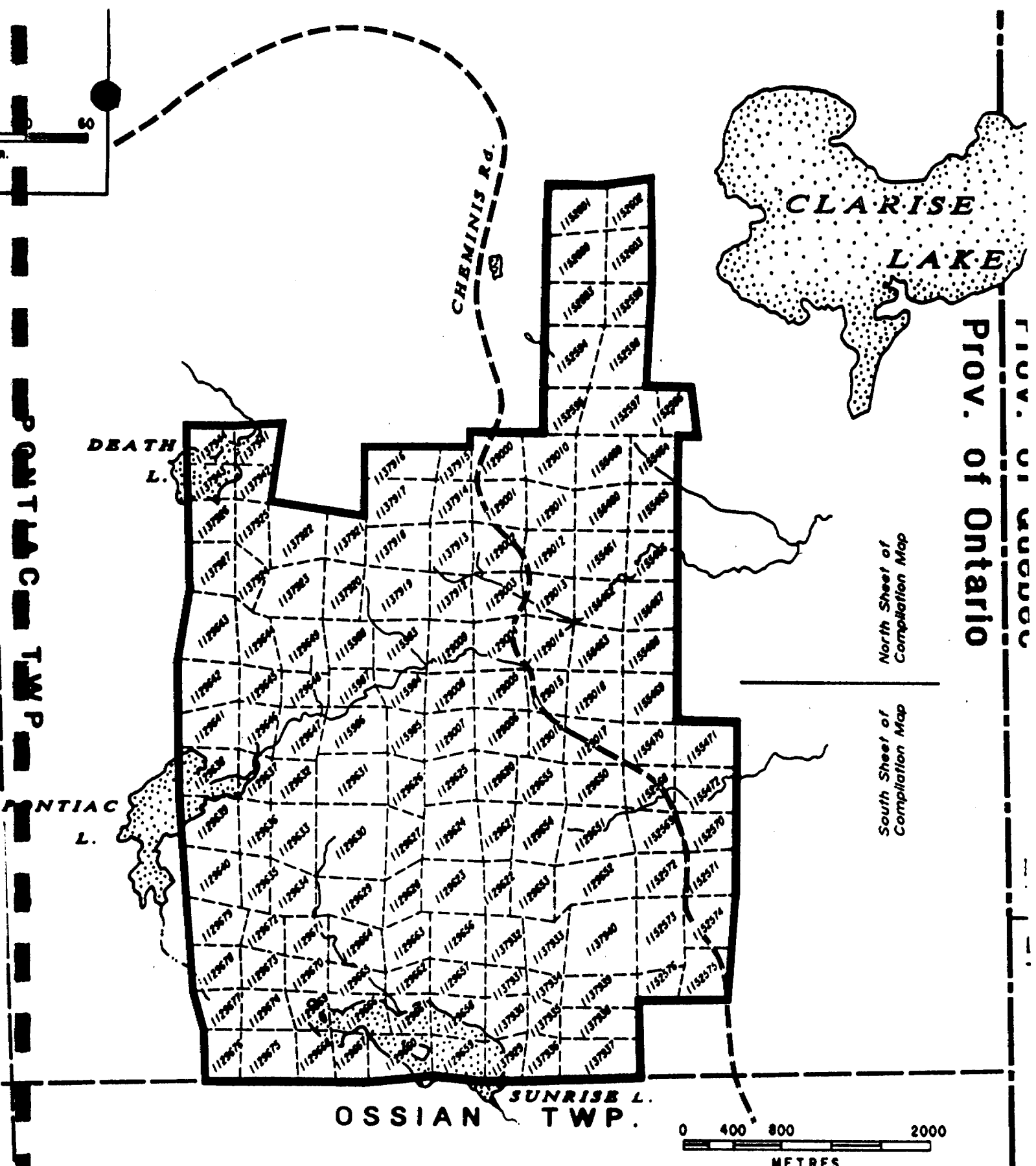
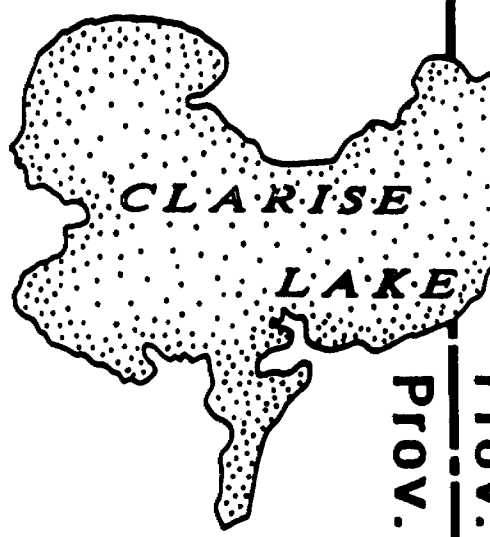
-----  
Total 151 claims

Access to these claims is relatively easy. The Cheminis Road starts from Highway 66 immediately east of Kearns and leads to the southern boundary after a drive approximately 30 km.

A net work of trails on both sides of the Cheminis Road provides access to many claims in the property.

### 4.0 TOPOGRAPHY AND VEGETATION

The topography is considerably rugged in the area with sudden change of up to 100 m in relief. Overburden varies from muskeg, boggy swamp to clay or well-drained gravel and sand. Most of the township has been logged off and presently Cheminis Lumber Ltd. is active in the central part of the township. Approximately 30 % of the Orofino claims have been logged-off with sparse patches of spruce and/or birch left untouched.



PONTIAC TWP

PONTIAC L.

OSSIAN TWP. SUNRISE L.



North Sheet of  
Compilation Map

South Sheet of  
Compilation Map

## 5.0 PREVIOUS WORK

Exploration work in Pontiac Township to date has been comprehensive in terms of geophysical surveys and geological mapping, but inadequate in terms of geochemical sampling. This is mainly due to the fact that most of the previous work in the township was completed in the 1960's and 1970's when geophysical methods predominated in the exploration of massive sulphides.

Mineralization was first detected in the area soon after the discovery of gold in Larder Lake in 1906. However, assessment reports submitted to the Ontario Geological Survey did not report any activity before 1956. In 1956, P. Roche drilled three holes in the mineralized area east of Death Lake. Although surface mineralization was observed, the drill results did not indicate economic concentration at depth.

In 1965 Jayco Mines Ltd. completed geological, MAG and EM surveys on a small set of claims northwest of Sunrise Lake. Outcrop ridges composed mainly of fine-grained massive unaltered volcanic rocks were found, while swampy areas and valleys were observed to be underlain by altered and schistose rocks. The MAG and EM surveys were performed by Sulmac Exploration Services Ltd. The EM survey failed to indicate the presence of any conductors and the MAG survey only confirmed the overall low magnetic relief revealed by the previous government airborne survey. There was no further work carried out.

G. Paquette and J. Essberger held claims in 1969, approximately 1 km east of Sunrise Lake. They contracted Shield Geophysics Ltd. to carry out an EM survey which detected a topographic low but no anomalies.

In 1970 to 1972 Amax Exploration Inc. undertook a thorough geological, base metal geochemical and geophysical programme designed to locate drill targets for massive sulphide mineralization. A geological map was produced for the group of 226 claims covering most of the western half of the township. The map was detailed and concentrated on chloritic and sericitic alteration, but it neglected silicification, carbonatization and the presence of epidote alteration. Rock geochemistry revealed a few zinc anomalies. It was discovered that the majority of these anomalies straddle the felsic-intermediate metavolcanic or felsic volcanic-mafic intrusive contacts.

In 1970 Amax conducted an IP survey which outlined three anomalous zones in a 600 m x 200 m area located just east of Death Lake, adjacent to the present Orofino's claims. These

anomalies coincided with the zinc anomalies found along the geological contacts described above. Two airborne Mag and EM surveys were flown in 1971 and 1972 covering Pontiac and Ben Nevis townships, first with E-W flight lines and then N-S. Results reflected the regional weak magnetics consistent with the geology of felsic and intermediate rocks. Weak anomalies outlined geological features such as dioritic plugs at Verna Lake (in Ben Nevis Township) and Clarice Lake (in Pontiac Township). Three holes, totalling 884 feet (269.0 m), were drilled in 1973 to test the IP anomalies east of Death Lake. Drill logs described disseminated pyrite and minor chalcopyrite in rhyolitic to dacitic tuff host rocks over short intervals.

Kerr Addison Mines Ltd. also performed ground MAG and EM geophysical surveys in 1972 on claims covering a N-S central strip of the township. The only anomalous readings were typical of Keweenaw diabase dykes. There was no further work recorded.

In 1976 Noranda Exploration carried out a geological survey over nine claims east of Pontiac Lake where an airborne EM conductor is located. Mineralization was detected as pyrite replacement around quartz phenocrysts near Pontiac River (according to the geological map, this is located close to a major NE-striking fault), and also as pods of massive and fine-grained pyrite along the sides of a valley (near a felsic-intermediate volcanic contact). A deep penetrating EM survey was recommended to investigate the possible presence of a conductor under the valley hosting the latter type of mineralization. However, Noranda soon dropped the claims and no further work was planned.

In 1976, Conwest Exploration conducted geological and ground EM surveys on claims outlining the felsic volcanic-intermediate volcanic contact east of the western township boundary. This also included the previously explored Death Lake showing. Minor mineralization was discovered at several localities along this contact. In addition, proximal vent-type volcanism and possible vent locations were noted on the 1977 report. The northern vent was interpreted to occur in an area where zinc anomalies were discovered by Amax during 1970-73. The southern occurrence was previously drilled by P. Roche (1956) and Amax Exploration (1973). Conwest drilled five short holes eastward along the rhyolite-andesite contact at the previous Death Lake showing. An 800-ft strike length was tested and the three northernmost holes intersected anomalous but non-economic zinc and silver values over short intervals at the contact or very close to it.

In 1978 Ram Petroleums Ltd. performed Mag and EM surveys over most of Pontiac Lake and its shores. There were indications



of conductivity on the lake with some weak magnetic correlation. The principal anomaly was traced for 2,200 feet. It is west-dipping and may be continuous to the south. Although explained as a possible deep zone of weakly conductive sulphides, the location of the anomaly coincides with a major NE-striking fault outlined by Jensen (1975).

Falconbridge Nickel Mines Ltd. carried out a geophysical survey in 1981 on three claim groups in the centre of Pontiac Township. Mag and EM surveys on a small block in the township centre south of Pontiac River revealed little besides diabase dykes. It was recommended that lines be recut E-W and the survey repeated due to the lack of continuity in Vertical Loop EM readings. On a larger block NE of Death Lake an unexplained broad weak magnetic high covers the property and a weak broad conductive zone was outlined.

In 1989 Orofino Resources Limited undertook a regional geological mapping and lithological sampling predominantly over the felsic stratigraphy in the central portion of Pontiac Township. In December 1989, compilation of previous work and statistical study of the whole rock results led to the decision of staking twenty-five claims, straddling Cheminis Road, and subsequently added ninety-two claims to the holdings.

In early 1990, horizontal loop EM was performed over a metric grids (A and AB). Five diamond drill holes, totalling 3,342 feet (1,019.0 m), were completed in attempt to understand the stratigraphy of the area. Based on results and recommendations from these work the 1990 summer exploration programme was instigated and, at the same time, more claims were acquired. The results of the summer 1990 work is the subject of this report.

## 6.0 THE SUMMER 1990 SURVEYS

During the last week of May 1990 a four-person crew mobilized to the south shore of Clarice Lake, Pontiac Township, where a base camp was established. The team utilized two vans and a boat to travel from and to the base camp.

There were two phases in the 1990 exploration programme. Phase 1 spanned from late May to early July 1990. Phase 2 lasted from early August to mid-November 1990.

Work completed during phase 1 included soil sampling and rock sampling. Traverses were carried out along north-south trending claim lines and samples were collected at every 200

m. For rock sampling, samples were collected when outcrops were convenient therefore the sampling intervals were not consistently at 200 m. Preliminary geological mapping at 1:5,000 scale was also completed. Soil samples and few rock samples were submitted for geochemical trace level analysis for Cu, Pb, and Zn. All rocks samples were analyzed for major oxides (whole rock analysis). One hundred and ninety-six soil samples and 83 rock samples were collected during this phase of the programme.

Phase 2 of the 1990 exploration programme in Pontiac Township started with the staking of an additional thirty-four claims to the east and to the north of the existing 117-claim property. This staking was undertaken upon recommendations from J. Boniwell (August 1990, Excalibur International Consultants) who compiled and reinterpreted past geophysical survey results. In this study, Mr. Boniwell also recommended a UTEM survey over certain parts of the property as well as detailed geological mapping.

Subsequent to the staking of new claims, a metric grid was cut by a contractor from Timmins. This new grid also overlapped the winter grids A and AB. The old baseline was refurbished and extended in both directions (north and south). Where the old winter lines were locatable they were refurbished, otherwise new lines were cut. A total of 16.2 km of old lines were re-furbished and approximately 128.5 km of new lines were cut. East-west trending lines were spaced at 100 m from L 0+00 to line 22+00 N, the remaining lines were spaced at 200 m. Along each line pickets were installed at 25 m intervals.

The period between August 13, 1990 to September 27, 1990 were spent on geological mapping (1:5,000) and litho-geochemical sampling. A 1:20,000 topographical map was enlarged to 1:5,000 for use as a control base map. This was done to ensure the accuracy of the survey. Approximately 128.5 km of lines were traversed and 102 rock samples were collected (this brought the total number of rock samples collected to date to 185). Whole rock analysis and base metal geochemical trace level were carried out for the samples by Technical Service Laboratories of Timmins, Ontario. Work from phase 1 was also incorporated in those of phase 2.

The UTEM survey was subsequently executed by Lamontagne Geophysical Consultant under the supervision of Excalibur International Consultants during the period of October 15, 1990 and November 15, 1990. 72 km of lines were surveyed. The results of the survey are described in a separate report included in Appendix B of this report. This survey is the final activity in the property for 1990.

## 7.0 GENERAL GEOLOGY

Lithologies exposed in Pontiac Township belong to the upper calc-alkalic portion of the Blake River Group (2705 Ma) which form part of the Abitibi greenstone belt that extends from the Chibougamau area in Quebec to west of Timmins in Ontario. The layered rocks of the upper Blake River Group consist of mafic, intermediate, felsic flows and pyroclastics that are thought to have been deposited around the flanks of a massive rhyolitic dome, seen directly west of Clarice Lake (Jensen and Langford, 1985). Numerous stocks of gabbro, diorite, and quartz diorite also intrude the host Blake River Group. A few northeast-trending diabase dikes of Proterozoic age intrude the Early Precambrian rocks. Pleistocene deposits consist of sand gravel, clay, and boulder till deposited on the Precambrian surface during the retreat of the Wisconsin glacier. Recent deposits consist of alluvium and peat (Jensen, 1975).

The rocks that underlie the study area have undergone low-grade metamorphism of the pumpellyite-prehnite-quartz facies (equivalent to approximately 1 kbar). The characteristic metamorphic assemblage consists of prehnite-pumpellyite, hydrogarnet, quartz, talc, chlorite, albite, actinolite, epidote, primary olivine-pyroxene and feldspar (Jensen, 1975).

Much of the alteration which occurs in the volcanic and intrusive rocks is ascribed to the action of deuteric solutions during their emplacement. Near larger intrusions of felsic rocks, the volcanic rocks have been recrystallized to the albite-epidote hornfels facies metamorphism (Winkler, 1967 via Jensen, 1975).

Regionally the Blake River Group is situated on the north limb of an east-west trending synclinorium bound to the north by Destor-Porcupine Fault zone and to the south by Kirkland-Larder Lake Fault zone (Fig. 1). Pontiac Township is, in turn, located in the south-central part of this regional synclinorium. There are three recognized sets of faults transecting the area. They strike northeast, north and northwest. Northeast faults truncate the north- and northwest-striking faults. Shearing is found in places along the faults (Jensen, 1975).

## 8.0 LOCAL GEOLOGY

Upper Blake River Group lithologies observed in the Pontiac property during the 1990 summer geological and lithogeochemical survey were predominantly intermediate to felsic volcanics. The intermediate to felsic volcanic rocks were subdivided into five lithological classifications and their corresponding volcanic facies:

- 1) massive to porphyritic high level intrusive rhyolites - near vent facies (mapping unit 2a)
- 2) felsic flows and flow breccias - near vent to proximal facies (mapping units 2h and 2i)
- 3) felsic pyroclastic flows - proximal to distal facies (mapping unit 2p)
- 4) felsic lapilli tuff/tuff breccias - vent to proximal facies (mapping units 2c and 2d)
- 5) felsic ash/crystal tuffs - proximate to distal facies (mapping unit 2b).

In general, the felsic volcanic flows outcrop to the west of Cheminis road while the intrusive rhyolites outcrop east of Cheminis road. Felsic pyroclastics outcrop both to the west and east of Cheminis road, with a greater percentage occurring west of the road.

Mafic to intermediate volcanics were subdivided into massive volcanic flows, pillowed flows and pillow breccia flows. These rocks outcrop to the west and east of Cheminis road, predominantly around the flanks of the felsic volcanic pile. The exception is a wedge of intermediate pillow flows immediately east of Sunrise Lake which extends northward up into the felsic volcanic pile.

Other lithologies observed within or close to the Pontiac property were mafic to intermediate and intermediate to felsic intrusives. The latter, consisting of granodiorite-quartz diorite and microdiorite, occurs within the vicinity of Clarice Lake. The former, consisting of gabbro, quartz gabbro -diorite and hornblende gabbro.

## **8.1 Intermediate to Felsic Volcanics**

### **8.1.1 High Level Intrusive Rhyolites**

The high level intrusive rhyolites of the Upper Blake River Group outcrop within the Pontiac property in three areas:

- 1) in the north-central portion of the township along a north-south trending topographic high extending 770 m north, 1725 m south and 1575 m east of the Cheminis-Clarice Lake cut off
- 2) in the south central portion of the township along a NW-SE trending topographic high which is 770 m west of Cheminis road and 1340 m north of Sunrise Lake
- 3) in the east central portion of Pontiac Township, approximately 2.3 km S-SW of Clarice Lake.

The high level intrusive rhyolites are typically aphanitic to fine-grained (<1mm) and display massive aphyric to porphyritic textures. The average phenocryst content is 10-20%, with euhedral to anhedral feldspar phenocrysts comprising 1-30% of the rock while quartz phenocrysts comprise 1-10% of the rock. The abundance of large (1-4 mm) euhedral to subhedral feldspar crystals aid in distinguishing the high level rhyolites from felsic ash/crystal tuffs, which commonly exhibit small (<2 mm) anhedral felsic fragments and crystals. This lithology commonly exhibits a distinct lack of local regional foliation. The rhyolites in the north central portion of the township exhibit moderate to intense silicification and sericitization whereas rhyolites in the south exhibit moderate to intense carbonatization and silicification. Of note is the large domal body of intrusive rhyolites immediately west of Clarice Lake. This felsic body was thought to represent the centre of early precambrian volcanism (Jensen, 1975).

#### 8.1.2 Extrusive Felsic Volcanics

Felsic flows and flow breccias predominate in a north-south strip of land that roughly parallels the west side of Cheminis road. In addition to the above, this lithology also outcrops approximately 1500 m north of Sunrise Lake.

Felsic flows commonly associated with felsic flow breccias in outcrop, exhibit an aphanitic to fine-grained matrix that is aphyric or phyrlic. Phenocryst contents are commonly less than 5%. The felsic flow breccia is typified by 6-15 cm size fragments surrounded by a thin (1-2 mm) veneer of highly sheared, sericitized and chloritized matrix. A distinctive characteristic of the flow breccias is their

flow bands. Flow bandings observed are approximately 1-3 cm in width and exhibit numerous folds of colour variations (i.e. light and dark bands).

The "Gilman Outcrop" (L 8+00 N, BL 0+00) was identified and named as such in the 1989 regional work by Orofino's summer field crew is composed of flow breccia. This lithology is distinguished by a significant content of pyroclastically produced rounded clasts situated in a feldspar-quartz porphyritic rhyolite flow. Technically the rock should be classified as massive to porphyritic felsic flows since 75-90% of the rock is composed of flow material, but the presence of clasts comprising 3-25% of the rock make this lithology unique. Fragments (2-25 cm) thought to be of a pyroclastic origin include felsic aphyric fragments, felsic feldspar-quartz phyrlic fragments and minor amounts of sulphide fragments. The sulphide clasts are significant because they indicate:

- 1) a phreatic brecciation (i.e. by intrusive material) of a pre-existing VMS body
- 2) a resurgent hydrothermal vent: meaning that more than one pulse of mineralized fluids is accounted for the orebody, thereby increasing the probability of an economical deposit
- 3) a close proximity to the site of discharge and potential orebody, since studies have indicated that these fragments usually occur within 200-400 m of a vent (Lydon, 1988b).

In general, the flow breccia does not exhibit any foliations. The exception is a ridge approximately 800 m south of "Gilman outcrop" which displays a foliation with an E-W strike and a 72° northerly dip to vertical dip. The same lithology is also present in an area extending 1.5 km north of the NW end of Sunrise Lake.

Felsic lapilli tuff/tuff breccia outcrops predominantly to the west of Cheminis road and the intrusive rhyolite with the greatest proportion occurring in the area north of Pontiac Creek and Gilman outcrop and in the area immediately east of Death Lake. Minor amounts of felsic lapilli tuff/tuff breccia also occur up to 1 km west of Clarice Lake within the intrusive rhyolites.

The felsic lapilli tuff/tuff breccia rocks are composed of 30-45% subrounded to angular lapilli and breccia size fragmentals, with lapilli fragments representing the greater

portion. Fragmentals include aphyric and phyric felsic fragments with minor amounts of mafic pumice. The matrix is aphanitic to fine-grained, felsic in composition, commonly exhibits a porphyritic texture and comprises 55-70% of the rock. A distinctive characteristic of this lithology is the flow-like structures observed in the matrix and the clasts. These structures indicate a period of mobility after deposition within this subaqueous pyroclastic unit. Furthermore, these structures may represent mass flow and/or slump-slide-flows occurring within the vicinity of the central and/or proximal vent facies. Regional foliations in these rocks vary from an E-W strike with subvertical dips, along Larder Lake Station road in the Joutel Option, to a N-NW strike with subvertical to moderate dips to the SW, in the southern portion of the Pontiac property.

In addition to the above pyroclastics, felsic ash/crystal tuffs were also observed in Pontiac Township. The greatest proportion of these rocks can be found N-NW of Sunrise Lake and east of Death Lake. Typically, this lithology is fine-grained (<2 mm) with feldspar, quartz crystals, felsic fragments and chloritic clots. Regional or local foliations commonly strike WNW with near vertical dips. These rocks are commonly observed in the proximal to distal vent facies, 2-15 km from the vent (Easton and Johns, 1986).

## 8.2 Intermediate to Mafic Volcanics

Intermediate to mafic massive volcanic flows are exposed both west and east of Cheminis road, on the periphery of the felsic volcanic pile. Typically this rock is fine-grained, aphyric to porphyritic (phenocrysts include feldspar crystals, quartz augens and chloritic clots) with 1-5% feldspar/quartz infilled amygdules and vugs.

Intermediate pillowed flows and pillow breccias form the largest percentage by volume of the intermediate to mafic volcanic lithologies. These rocks can be observed within Pontiac Township to outcrop in two areas:

- 1) immediately SSW of Clarice Lake
- 2) in a wedge that extends eastward along Sunrise Lake trail to Cheminis road, and northward up into the felsic volcanics in the vicinity of Pontiac Creek.

Pillowed flows and pillow breccia are commonly fine-

grained, rarely porphyritic, amygdaloidal, with pillows ranging from 10 cm to 3 m in size. These rocks commonly exhibit pillow selvages 1-8 cm in thickness and quartz-carbonate infilled 1-6 mm size amygdules and vugs. The poorly- to well-formed pillows indicate tops to the southwest. In the southern portion of the property these rocks exhibit intense sericitization and carbonatization while in the northeastern portion of the township these rocks commonly exhibit intense sericite and silica alteration. The lack of massive volcanic flows, abundance of pillowed flows and pillow breccia, high percentage by volume of amygdules, vesicles and vugs in addition to the large size of both pillows (up to 3 m in size) and selvages (up to 8 cm) indicate a shallow water subaqueous environment. Other volcanic products that help substantiate this claim are: a discontinuous unit of greywackes east of Clarice Lake (Jensen, 1975) and an abundance of eruptive material (indicating a lack of hydrostatic pressure) (Spence and De Rosen-Spence, 1975).

### 8.3 Mafic to Intermediate Intrusives

Mafic to intermediate intrusive rocks from gabbro to diorite in composition intrude the volcanic rocks.

The gabbro is coarse- to medium-grained, massive, and dark green to black weathering to a rusty green colour. Mineralogically, the rock is composed of 40-60% amphiboles (mostly hornblende) 20-30% plagioclase, 10% quartz and other accessories. The diorite and quartz diorite are medium grained, homogenous, light green and weather to a pinkish white.

The quartz diorite is a medium to fine-grained rock with a salt and pepper texture. It consists of 20-25% hornblende, 50-55% feldspar, 15-20% quartz, 5% magnetite and minor chlorite, epidote and pyrite. Feldspars commonly exhibit sericite alteration.

## 9.0 1990 GEOCHEMICAL SURVEY

### 9.1 Alteration

Alteration observed during the 1990 field season in Pontiac Township includes chlorite, sericite, silica, carbonate, epidote and ankerite alteration. Several mechanisms are postulated to be responsible for these alteration



assemblages. They are:

- 1) metasomatism related hydrothermal solutions of eruptive vents
- 2) normal groundwater circulation in close proximity to eruptive vents
- 3) metasomatism related to the emplacement of intrusive bodies
- 4) metasomatism related deformation zones (fracture/fault/shear zones).

Outcrops containing alteration possibly associated with hydrothermal solutions from eruptive vents and/or normal groundwater circulation in close proximity to hydrothermal vents are: the NW-SE trending topographic high east of Sunrise Lake; "Gilman outcrop"; the outcrops along Pontiac Creek, west of "Gilman outcrop"; the outcrop to the west side of Cheminis road, 800 m south of "Gilman outcrop". Most of these field observations are substantiated by statistical analysis of the whole rock data (section 10.2).

## 9.2 Interpretation of Whole Rock Data

The whole rock analysis data was entered into a spreadsheet for statistical study purposes. All data were corrected for LOI (Loss On Ignition) and classified using the method suggested by Irvine-Baragar (1971). There are two major trends : calc-alkaline volcanics and tholeiitic volcanics. Subdivisions from each trend was also made.

The calc-alkaline trend includes (high alumina) basalt, (high alumina) andesite, dacite and rhyolite divisions while the tholeiitic trend includes basalt, andesite, dacite and rhyolite.

Whole rock analysis indicates that chemical (i.e. cation) changes in the alteration pipe parallel the mineralogical zonations. As a result, an increase of MgO and FeO can be expected in the core while an increase in K<sub>2</sub>O and SiO<sub>2</sub> can be expected in the periphery (i.e. enrichment and depletion of K<sub>2</sub>O will distort the alteration index). A loss of Na<sub>2</sub>O and CaO can occur in both the core and outer regions.

In attempt to quantify the alteration, different parameters were calculated and compared. Alteration index was computed

using two different methods. The first index (AI-1) was calculated as:

$$AI-1 = [(MgO+K_2O)/(MgO+MnO+CaO+K_2O+Na_2O)] * 100$$

If AI-1 is greater than 45 the sample is considered to be altered. This index was used by Cambior Resources Inc. geologists to determine samples that show signs of chlorite, sericite, and carbonate alteration. A typical alteration pipe occurring beneath a massive sulphide body would have patchy sericitized margins in contrast to a chloritic core. sericite envelope is more common. Chlorite/sericite alteration results in de-silicification in the core and silicification in the peripheral of the pipe.

The second index (AI-2) was calculated as:

$$AI-2 = [K_2O/(K_2O+Na_2O)] * 100$$

The interpretation of this index is the lower the value of the index the more altered the sample.

Table 1 summarizes the results of the alteration index study. As shown in this table the altered samples are reasonably identified by both indices. When the values of AI-1 is contoured, an alteration zone whose AI-1 > 45 resulted below Pontiac Creek, to the west of Cheminis Road. This altered area lies just west of one of the two drill targets identified by UTEM survey. Other altered samples occur outside of this alteration zone are isolated points and do not offer further interpretation.

FILE:TOTSTAT

CALC-ALKALINE HIGH ALUMINA BASALT

Sample No.	FIELD DESCRIPTION	k-content	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	Ba	Sr	Zr	Y	Sc
135200366254-4	29 PILW BASALT, CPY IN SELV	k-avg A	60.31	16.51	2.26	4.14	7.89	4.08	3.23	0.54	0.76	0.14	0.14	120.00	210.00	130.00	28.00	15.00
2001801129644-1	51 INT-FEL, PX FLOW OR LAP TF BX, SER 3, CHL 2	k-avg A	55.98	18.72	2.37	5.59	7.13	4.52	3.29	1.26	0.87	0.14	0.15	340.00	170.00	130.00	16.00	19.00
1137927-3	57 INT, FEL CLASTS (1-3 X 2 CM), PY	k-avg A	54.65	16.85	2.42	6.30	9.74	5.43	2.79	0.56	0.92	0.18	0.17	240.00	380.00	110.00	22.00	26.00
22506	96 plwd ande fl, less por greener, tr py	k-avg A	57.08	17.39	2.31	4.64	7.72	5.54	3.41	0.81	0.81	0.11	0.15	350.00	160.00	110.00	26.00	14.00
22514	130 mas ande minor plwd fls	k-avg A	58.28	16.68	2.21	6.12	5.23	6.33	3.31	0.82	0.71	0.17	0.15	278.00	141.00	115.00	25.00	16.00
0750001129627-1	18 FX BX, SIL CLASTS E-W	k-avg A	58.27	17.30	2.32	5.98	6.36	4.29	3.37	0.94	0.82	0.21	0.15	290.00	100.00	120.00	32.00	20.00
22341	124 anyg plwd int fl	k-avg A	55.28	16.49	2.85	6.69	7.11	5.92	3.32	0.70	1.35	0.16	0.12	166.00	145.00	85.00	21.00	25.00
22502	92 plwd, sil porp ande fl, tr py assoc chl	k-avg A	58.19	18.24	2.22	3.78	8.91	4.15	2.98	0.61	0.72	0.09	0.11	100.00	200.00	100.00	16.00	13.00
0570001129673-1	45 INT MAS FLOW, CARB + SIL	k-avg A	56.37	18.04	2.38	5.28	8.49	5.31	2.60	0.38	0.88	0.10	0.19	110.00	270.00	100.00	18.00	19.00
4000001129679-1	26 INT FLOW	k-avg B	52.40	19.18	2.35	5.97	9.88	6.31	2.34	0.39	0.85	0.16	0.17	110.00	80.00	90.00	16.00	19.00
0150001137941-2	13 GABBRD	k-avg B	53.85	20.80	2.03	3.92	10.47	5.50	2.38	0.33	0.53	0.10	0.08	110.00	200.00	80.00	10.00	14.00
0960001137927-1	62 TF, SX PY, AMYG, SIL, CARB.	k-poor A	58.47	16.74	2.49	5.25	5.90	5.84	3.54	0.44	0.99	0.15	0.19	380.00	150.00	120.00	24.00	21.00
22507	97 fg mas carb, sil ande fl, tr py, hor int	k-poor A	58.37	16.61	2.28	4.72	8.80	5.31	2.75	0.15	0.78	0.11	0.12	70.00	200.00	110.00	30.00	15.00
0351801129677-1	24 ANDE FLOW, UNALTERED	k-poor A	54.65	17.71	2.79	6.42	7.81	4.47	4.36	0.88	1.29	0.20	0.21	100.00	170.00	100.00	22.00	32.00
22509	99 epi-sil wk chl m-cg int fl, hb phenos, dk ?	k-poor A	55.75	16.42	2.79	6.46	7.85	4.52	3.90	0.73	1.29	0.16	0.17	260.00	170.00	100.00	22.00	23.00
0050901129640-4	39 INT FLOW PURP	k-poor A	56.36	19.05	2.03	4.65	7.72	4.52	4.11	0.25	0.80	0.12	0.12	80.00	80.00	90.00	18.00	18.00
1129677-4	33 INT FLOW, PORP	k-poor A	57.14	17.22	2.31	5.39	7.24	5.27	4.17	0.13	0.81	0.13	0.19	100.00	180.00	110.00	22.00	18.00
22485	86 mas anyg int - maf volc fl	k-poor A	54.87	17.21	2.67	6.25	7.10	5.78	4.11	0.40	1.17	0.19	0.25	200.00	220.00	110.00	24.00	21.00
0300901129656-1	72 INT FLOW, AMYG	k-poor A	59.48	16.46	2.21	5.01	7.04	5.08	3.46	0.31	0.71	0.13	0.10	130.00	150.00	110.00	26.00	17.00
4000001129644-1	3 INT FLOW	k-poor A	56.62	17.71	2.46	5.72	6.36	5.50	4.20	0.23	0.96	0.11	0.15	110.00	200.00	130.00	18.00	20.00
1301801137920-1	69 QFP, SER, ANDE?	k-poor A	58.85	17.04	2.33	4.47	9.02	4.03	3.06	0.10	0.83	0.11	0.17	50.00	170.00	130.00	22.00	17.00
22484	85 mas anyg int volc fl	k-poor B	53.45	16.56	2.84	8.68	7.95	5.37	3.12	0.33	1.34	0.19	0.19	130.00	210.00	100.00	30.00	25.00
1000901129673-4	40 INT FLOW	k-poor B	51.83	18.09	2.49	6.95	10.45	5.97	2.84	0.10	0.99	0.16	0.12	50.00	210.00	50.00	18.00	32.00
0300001129678-1	25 GABBRD	k-poor B	53.92	16.51	2.83	8.25	8.36	4.66	3.58	0.19	1.33	0.18	0.17	130.00	140.00	70.00	22.00	33.00
0200001129642-3	2 INT PORP FLOW	k-poor B	53.47	18.32	2.65	5.77	10.54	4.59	3.14	0.08	1.15	0.16	0.13	50.00	130.00	80.00	16.00	29.00
1621801137926-4	5 INT FLOW, BEDDING	k-rich A	57.28	19.37	2.41	4.67	6.56	2.88	1.92	3.70	0.91	0.12	0.17	580.00	60.00	160.00	28.00	16.00
2250001129640-1	22 RHYD - DAC, CHL 1	k-rich A	54.07	19.28	2.31	5.53	8.29	6.03	2.68	0.73	0.81	0.10	0.17	160.00	220.00	90.00	16.00	18.00
2001801129002-3	50 INT FLOW, QV, PY+PU (30%)	k-rich A	61.79	17.21	2.29	4.66	3.49	4.38	1.74	3.36	0.79	0.10	0.22	660.00	50.00	130.00	24.00	17.00
22487	88 mas int-maf, anyg volc fl	k-rich A	56.17	17.68	2.34	5.33	9.01	5.03	2.05	1.24	0.84	0.12	0.19	320.00	210.00	120.00	28.00	16.00
3120001129643-1	59 FLDAT, PILW BX, 15 % PY IN SELV, SIL	k-rich A	56.70	18.38	2.45	5.27	10.06	2.83	2.39	0.61	0.95	0.18	0.19	160.00	120.00	170.00	32.00	18.00
22338	121 QFP dyke ?, py + cpy 1%, chl3 sil2	k-rich B	53.83	20.06	2.17	4.44	9.63	6.20	2.23	0.61	0.67	0.11	0.06	186.00	175.00	75.00	12.00	13.00
		mean:	56.25	17.74	2.41	5.56	8.00	5.02	3.11	0.68	0.92	0.14	0.16					
		std:	2.33	1.15	0.22	1.11	1.61	0.89	0.69	0.81	0.21	0.03	0.04					
		min:	51.83	16.42	2.03	3.78	3.49	2.83	1.74	0.08	0.53	0.09	0.06					
		max:	61.79	20.80	2.85	8.68	10.54	6.33	4.36	3.70	1.35	0.21	0.25					



FILE:TUTSTAT

CALC-ALKALINE RHYOLITE

Sample No.	FIELD DESCRIPTION	k-content	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	Ba	Sr	Zr	Y	Sc
22518	134 por ande + lam cx tf	k-avg	R 77.55	11.36	1.99	0.10	1.66	0.31	3.68	2.73	0.49	0.04	0.10	725.00	80.00	241.00	54.00	7.00
0150001129008-1	28 RHYD - RHYD DAC FLOW, MINOR LAP CLASTS	k-avg	R 78.55	11.05	1.79	0.08	1.07	0.24	3.26	3.56	0.29	0.03	0.06	800.00	70.00	190.00	58.00	5.00
1650001129665-1	79 INT FLOW, SIL 2-3	k-poor	D 71.09	14.30	2.11	2.57	1.33	1.20	5.76	0.87	0.61	0.08	0.08	290.00	60.00	260.00	70.00	10.00
22131	109 int-fel lp tf, tp phyr, chl3	k-poor	R 73.10	13.37	2.01	1.87	1.25	1.02	5.57	1.14	0.51	0.07	0.08	300.00	108.00	214.00	49.00	8.00
22331	114 HLI rhyo, sil3	k-poor	R 73.48	13.66	2.04	0.50	1.44	0.86	5.83	1.51	0.54	0.04	0.08	356.00	75.00	226.00	50.00	8.00
1129636-1	42 INT CHL SER SCHIST (203/090, MOD 279/090)	k-poor	R 79.73	11.75	1.94	0.19	0.51	0.34	4.17	1.17	0.44	0.06	0.06	250.00	60.00	200.00	50.00	6.00
22511	157 rhdac bx	k-poor	R 75.86	12.70	1.80	1.66	0.65	0.79	4.91	1.22	0.30	0.04	0.06	261.00	56.00	219.00	75.00	8.00
22301	160 GFP - HLI rhyo	k-poor	R 78.43	11.83	1.84	0.40	0.80	0.46	4.43	1.37	0.34	0.03	0.06	313.00	69.00	223.00	60.00	7.00
22515	131 rusty ser sch (fm rhdac tf bx), sh 2 dir	k-poor	R 74.64	13.04	1.99	0.00	1.81	0.68	6.53	0.57	0.55	0.04	0.14	244.00	65.00	240.00	54.00	8.00
3600001129633-1	48 INT FLOW, SIL 3, N-S FOLIATION	k-poor	R 75.61	13.37	1.88	0.00	0.93	0.22	7.14	0.20	0.53	0.04	0.08	80.00	90.00	240.00	56.00	8.00
22109	144 mas por ande-dac fl, tr py, chl2-3	k-poor	R 72.99	13.74	1.98	1.99	1.23	1.12	5.64	0.73	0.48	0.04	0.06	164.00	84.00	240.00	69.00	9.00
22320	179 HLI rhyo, sil3	k-poor	R 75.32	12.85	1.79	1.26	1.77	0.53	5.50	0.61	0.29	0.05	0.04	88.00	114.00	234.00	70.00	7.00
22322	181 HLI rhyo, sil3	k-poor	R 73.81	13.00	1.96	1.72	1.38	0.73	4.96	1.87	0.46	0.06	0.06	403.00	77.00	235.00	58.00	8.00
1751801129631-1	49 GABBRO/BASALT	k-poor	K 73.65	13.14	1.98	1.73	1.43	0.80	5.63	0.99	0.48	0.08	0.08	180.00	50.00	240.00	68.00	9.00
22129	108 very hard tp phyr rhyo fl	k-poor	K 73.36	13.54	1.91	1.04	1.04	0.57	5.12	2.91	0.41	0.06	0.04	690.00	86.00	256.00	55.00	7.00
22306	165 fel fl/fel px fl ? 1% py, sil-carb3 ser-chl2	k-poor	R 74.42	13.50	1.87	1.78	1.18	0.88	4.74	1.16	0.37	0.06	0.04	257.00	93.00	258.00	75.00	7.00
22516	132 chl-ser sch (fm ande-dac fl ?)	k-poor	K 72.88	15.10	2.00	0.91	0.87	0.81	5.07	1.70	0.50	0.03	0.12	359.00	52.00	291.00	60.00	9.00
1820001129652-3	32 GFP FLOW ?	k-poor	R 74.86	13.57	1.82	1.54	0.77	0.51	4.93	1.55	0.32	0.07	0.04	350.00	90.00	240.00	76.00	8.00
0201801129671-1	46 INT FLOW, SIL 3, CHL 0-1	k-poor	R 72.76	14.77	1.98	1.06	1.17	0.74	6.03	0.89	0.48	0.04	0.08	340.00	80.00	250.00	60.00	11.00
22323	182	k-poor	R 74.14	13.07	1.85	1.39	0.93	0.63	5.05	2.49	0.35	0.05	0.04	443.00	80.00	251.00	64.00	7.00
22483	84 tel lp tf, sil-chl3	k-poor	K 73.47	13.41	1.83	2.26	0.88	0.94	4.91	1.83	0.33	0.07	0.06	370.00	60.00	230.00	80.00	9.00
		mean:	74.75	13.15	1.92	1.15	1.15	0.68	5.18	1.48	0.43	0.05	0.07					
		std:	2.15	0.99	0.09	0.78	0.35	0.27	0.87	0.83	0.10	0.02	0.03					
		min:	71.09	11.05	1.79	0.00	0.51	0.22	3.26	0.20	0.29	0.03	0.04					
		max:	79.73	15.10	2.11	2.57	1.81	1.20	7.14	3.56	0.61	0.08	0.14					

FILE:TOTSTAT

CALC-ALKALINE DACITE

Sample No.	FIELD DESCRIPTION	k-content	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	Ba	Sr	Zr	Y	Sc	
22326	185 HLI rhyo, up to 10% py																		
22302	161 fel lp tf, sil-ser3, 20-30% py & some coy	k-avg	D	71.15	13.87	2.49	2.98	1.29	1.71	3.15	2.24	0.99	0.04	0.08	488.00	50.00	174.00	36.00	13.00
22342	126 HLI - GFP	k-avg	R	72.84	12.89	1.89	1.71	2.94	1.29	3.77	2.13	0.39	0.04	0.10	460.00	89.00	203.00	58.00	8.00
22512	158 sh, ser (anas vns) rhdac fl	k-avg	R	76.10	12.21	1.72	1.14	3.17	0.64	2.93	1.75	0.22	0.06	0.06	255.00	55.00	218.00	72.00	7.00
22305	164 tel px fl ? HLI rhyo, 10% py	k-avg	R	76.72	11.90	1.81	1.05	1.54	0.46	2.86	3.28	0.31	0.04	0.04	686.00	50.00	220.00	65.00	7.00
1431801129007-1	27 ANDE FLOW	k-avg	R	77.45	12.06	1.73	0.99	1.74	0.53	3.19	2.01	0.23	0.04	0.02	390.00	70.00	240.00	60.00	7.00
22325	184 HLI rhyo, sil3, GFP	k-avg	R	75.55	12.10	1.81	1.29	1.71	0.45	4.04	2.64	0.31	0.05	0.04	450.00	93.00	219.00	66.00	7.00
22324	183 HLI rhyo, sil3	k-avg	R	74.17	12.87	1.82	0.99	2.45	0.70	3.37	3.19	0.32	0.06	0.06	365.00	119.00	227.00	71.00	7.00
22309	168 HLI rhyo, sil3	k-avg	R	74.39	12.82	1.83	1.52	2.54	0.91	3.19	2.57	0.33	0.05	0.04	551.00	113.00	240.00	71.00	8.00
22124	103 mod sh lp tf, 5-10% ank blotches	k-avg	R	73.17	13.47	2.07	1.72	2.59	0.83	3.52	1.84	0.57	0.08	0.13	361.00	64.00	221.00	52.00	8.00
1881801129622-1	80 GFP, HI LEVL INTRU RHYO***	k-avg	R	76.74	11.53	1.80	0.35	2.40	0.29	3.32	3.18	0.30	0.05	0.02	680.00	120.00	200.00	62.00	4.00
22118	153 GFP rhyo intru, 1-2% py, sil-ser1 chl3+	k-poor	D	71.24	12.80	2.17	2.96	3.94	1.25	4.18	0.58	0.67	0.09	0.12	110.00	148.00	204.00	53.00	10.00
22303	162 tel lp tf, carb3	k-poor	D	71.12	14.04	1.99	2.22	2.11	1.78	5.60	0.54	0.49	0.06	0.06	119.00	98.00	216.00	56.00	10.00
0101781129647-1	61 FF PORP RHYO, XTAL (3 MM)	k-poor	D	65.47	14.85	1.98	2.62	3.15	3.01	7.25	0.93	0.48	0.08	0.18	740.00	870.00	150.00	32.00	10.00
0650001129627-2	20 PILM INT FLOW, SER 1-2	k-poor	D	71.26	13.66	1.99	2.27	3.05	0.95	5.09	1.05	0.49	0.10	0.08	210.00	70.00	230.00	68.00	9.00
22115	150 tel lp tf, sil2-3 chl3+	k-poor	D	69.94	14.11	2.24	2.90	2.11	1.53	5.22	1.01	0.74	0.07	0.12	405.00	94.00	221.00	60.00	12.00
22108	143 int lp tf + tp phenos, ser2 sil2-3	k-poor	D	71.82	12.97	1.90	1.85	4.02	1.37	4.08	1.44	0.40	0.07	0.06	472.00	122.00	197.00	53.00	8.00
22112	147 ff bx, 10% diss py, sil3	k-poor	D	71.79	14.55	2.06	1.94	1.38	1.08	5.08	1.46	0.56	0.03	0.06	466.00	69.00	195.00	44.00	12.00
0103571137916-4	1	k-poor	R	75.76	11.97	1.83	1.51	1.69	0.55	4.70	1.54	0.33	0.08	0.04	350.00	80.00	220.00	64.00	7.00
2341801115988-1	64 ANDE FLOW, CHL 1, SIL 1	k-poor	R	73.63	13.34	2.07	1.45	2.13	1.16	3.73	1.74	0.57	0.07	0.12	330.00	70.00	240.00	56.00	9.00
22117	152 rhyo por subvolc sill	k-poor	R	75.82	12.08	1.82	1.28	2.33	0.79	4.41	1.05	0.32	0.04	0.04	365.00	115.00	224.00	64.00	8.00
1129015-1	43 POMP, INT HI LEVL INTRU, K-ALTN 2-3	k-poor	R	72.58	13.79	1.99	2.02	1.94	0.97	4.63	1.44	0.49	0.06	0.08	280.00	80.00	230.00	68.00	9.00
22517	133 ser-chl sch (ta ande-dac fl ?), str sh	k-poor	R	76.22	12.84	1.53	0.00	2.36	0.43	4.33	1.54	0.58	0.05	0.12	259.00	65.00	219.00	50.00	8.00
22313	1/2 tel-int volc fl ? chl3-sil3	k-poor	R	73.93	13.09	1.96	1.78	2.02	0.91	4.58	1.33	0.46	0.05	0.06	194.00	45.00	236.00	61.00	9.00
22317	176 HLI rhyo, sil3	k-poor	R	73.63	13.26	1.86	1.95	1.88	1.00	4.09	1.85	0.36	0.07	0.04	529.00	132.00	235.00	70.00	8.00
2601801129622-1	81 GFP, HI LEVL INTRU RHYO	k-poor	R	74.49	16.61	1.86	2.55	1.43	0.99	3.93	1.62	0.36	0.10	0.04	340.00	80.00	240.00	74.00	7.00
22304	163 fel fl + tp phenos, sil3 ser2	k-poor	R	76.13	12.04	1.71	1.20	2.11	0.50	4.45	1.55	0.21	0.06	0.02	272.00	80.00	220.00	67.00	6.00
2000001129677-1	34 GABBRD	k-poor	R	73.43	12.95	2.08	1.74	2.72	0.85	4.95	0.53	0.58	0.07	0.10	110.00	130.00	210.00	54.00	9.00
2001801137916-1	54 FEL-INT LAP TF BX (3-SCH), QTZ+FP IN MATRIX	k-poor	R	72.35	14.00	1.89	1.33	2.93	1.68	4.56	0.75	0.39	0.03	0.08	200.00	90.00	250.00	76.00	9.00
22126	105 GFP HLI, chl 2-3, 1-2% diss py	k-poor	R	76.19	11.86	1.78	1.55	1.73	1.23	4.05	1.24	0.28	0.06	0.04	158.00	70.00	195.00	55.00	6.00
0700001129629-2	83 INT FLOW, AMYG	k-poor	R	74.32	13.07	2.04	0.99	2.43	0.83	4.44	1.19	0.54	0.07	0.06	260.00	130.00	250.00	64.00	9.00
1001801129603-3	63 INT-FEL, GFP	k-poor	R	75.78	12.24	1.83	1.34	2.18	0.75	3.99	1.45	0.33	0.06	0.06	250.00	80.00	200.00	64.00	7.00
2050001129661-1	75 FEL FLOW, SIL PORP	k-poor	R	76.31	11.04	1.96	1.93	1.99	0.83	3.98	1.33	0.46	0.10	0.06	200.00	60.00	190.00	54.00	7.00
28855	141	k-poor	R	72.70	13.58	2.11	2.22	1.55	1.22	4.13	1.70	0.61	0.06	0.13	273.00	49.00	278.00	65.00	10.00
28852	138	k-poor	R	74.02	12.12	2.05	0.61	3.81	0.69	5.27	0.70	0.55	0.08	0.10	152.00	77.00	191.00	48.00	7.00
22111	146 very tg mas rhyo, sil-ser3 chl2	k-poor	R	75.68	13.08	1.91	1.87	1.72	0.59	5.28	1.33	0.41	0.06	0.06	288.00	98.00	260.00	54.00	8.00
29101	142 tel tp phyr fl	k-poor	R	73.57	13.23	2.00	1.43	1.91	0.75	4.80	1.65	0.50	0.06	0.10	294.00	64.00	262.00	71.00	9.00
22110	145 mas GFP - mas fl to sub volc sill	k-poor	R	73.28	13.40	1.98	2.01	1.64	0.90	5.02	1.17	0.48	0.05	0.06	253.00	82.00	247.00	68.00	9.00
1251801129001-1	65 RHYO DAC FLOW, PGAP	k-poor	R	72.42	14.40	1.85	1.61	4.00	0.72	3.76	0.75	0.35	0.08	0.06	110.00	170.00	240.00	72.00	8.00
22328	111 fel-int por/px fl/lp tf ? sil-chl2 ser-carb2-3	k-poor	R	75.03	12.68	2.01	1.39	1.77	0.92	3.88	1.66	0.51	0.08	0.08	288.00	58.00	206.00	51.00	7.00
1830001129659-1	74 INT-FEL FLOW, 113/U90 FOLIATION, GV, SER 2-3	k-rich	D	71.05	13.64	2.02	2.23	1.72	1.10	2.85	4.73	0.52	0.08	0.06	780.00	110.00	240.00	70.00	9.00
22120	155 mg int-fel intru - grnt por/HLI rhyo ?, 2 & py	k-rich	R	74.03	12.70	1.83	1.75	2.00	0.63	2.91	3.69	0.33	0.08	0.04	776.00	116.00	259.00	68.00	7.00
22327	110 fel por fl ? GFP HLI rhyo, sil-ser3	k-rich	R	72.86	13.89	2.06	0.01	3.32	0.92	3.28	2.98	0.56	0.04	0.08	475.00	50.00	230.00	50.00	7.00
22318	177 HLI rhyo, sil3	k-rich	R	74.31	12.78	1.80	1.28	2.01	0.63	2.76	4.03	0.30	0.06	0.04	888.00	135.00	243.00	70.00	7.00
22321	180 tel px fl/ HLI rhyo ?	k-rich	R	75.17	12.48	1.82	1.66	1.45	1.06	2.17	3.75	0.32	0.06	0.04	930.00	99.00	248.00	70.00	7.00
		mean:		73.72	13.06	1.93	1.62	2.29	0.96	4.10	1.82	0.44	0.06	0.07					
		std:		2.21	1.00	0.16	0.67	0.73	0.47	0.93	0.99	0.15	0.02	0.03					
		min:		65.47	11.04	1.53	0.00	1.29	0.29	2.17	0.53	0.21	0.03	0.02					
		max:		77.45	16.61	2.49	2.98	4.02	3.01	7.25	4.73	0.99	0.10	0.18					

FILE: TOTS1AT

THOLEIITIC BASALT

Sample No.	FIELD DESCRIPTION	k-content	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	Ba	Sr	Zr	Y	Sc
22488	89 amyg plwd int-maf fl	k-avg	A 60.29	16.05	2.24	4.75	7.62	4.49	2.96	0.63	0.74	0.11	0.13	170.00	60.00	100.00	24.00	14.00
22122	101 fg ande-dac lp tt, ser-sil2-3	k-avg	A 61.14	16.94	2.37	3.32	10.25	2.27	2.19	0.43	0.87	0.10	0.10	83.00	237.00	148.00	30.00	15.00
22335	118 mas to phyr, amyg int-maf volc fl	k-avg	A 56.26	16.21	2.48	5.27	9.74	5.71	2.79	0.33	0.98	0.12	0.10	96.00	124.00	91.00	19.00	20.00
22333	116 mas-amyg int fl, sil3	k-avg	A 55.15	13.33	3.80	13.72	4.65	4.55	1.93	0.19	2.30	0.17	0.19	47.00	70.00	113.00	27.00	35.00
3550001129628-2	70 INT FLOW, MAS - FORP	k-avg	A 61.39	14.86	2.14	4.12	9.88	4.31	2.25	0.21	0.64	0.10	0.08	60.00	90.00	100.00	26.00	15.00
2200001129636-1	41 RUSTY INT FLOW, PY, CHL+SER+SIL+CARB	k-avg	A 60.25	15.70	2.48	5.61	6.17	5.66	2.26	0.60	0.98	0.12	0.17	190.00	200.00	100.00	18.00	19.00
22508	98 cg ande fl, abu epi subrd grns (5-10%)	k-avg	A 54.70	14.99	2.25	6.37	7.59	9.95	2.74	0.38	0.75	0.14	0.15	120.00	150.00	70.00	16.00	18.00
4000001129634-3	35 INT FLOW BX (3MM-4CM X 5MM-15CM), SIL, CHL	k-avg	A 59.67	15.53	2.75	5.76	7.81	3.85	2.53	0.50	1.25	0.14	0.21	110.00	210.00	130.00	30.00	21.00
0501801137942-2	14 GABBRO/DIORITE	k-avg	A 59.16	15.65	2.63	6.29	9.67	2.99	1.95	0.21	1.13	0.15	0.19	60.00	280.00	140.00	22.00	21.00
22486	87 amyg pill int-maf fl	k-avg	D 62.16	15.67	2.20	4.02	9.98	3.26	1.71	0.10	0.70	0.10	0.10	210.00	250.00	100.00	26.00	14.00
22128	107 fel lp tt - tt bx, 2% py, chl3+ sil-ser2+	k-poor	A 61.06	15.24	2.48	4.74	8.27	3.94	2.94	0.10	0.98	0.11	0.13	61.00	202.00	104.00	22.00	17.00
2003501129677-1	23 MAFIC INTRUSIVE/FLOW	k-poor	B 54.00	15.71	2.78	8.47	9.88	4.86	2.49	0.17	1.28	0.18	0.19	70.00	160.00	80.00	22.00	35.00
1129644-1	56 VES PIL INT FLOW	k-rich	A 56.43	18.24	2.28	3.20	15.37	2.85	0.49	0.08	0.78	0.13	0.15	30.00	120.00	90.00	16.00	16.00
2000001129643-3	53 INT PUMP FLOW, PY, SIL	k-rich	A 55.69	18.29	2.51	4.20	13.96	3.28	0.68	0.08	1.01	0.15	0.15	40.00	30.00	80.00	18.00	27.00
2050201137923-1	4 INTRUSIVE MAS FLOW	k-rich	A 56.03	16.40	2.49	5.98	9.01	5.99	2.04	0.72	0.99	0.17	0.17	220.00	550.00	120.00	24.00	23.00
1000001129643-3	58 INT PUMP FLOW, SIL	k-rich	A 54.32	18.29	2.46	7.10	9.89	5.07	1.14	0.44	0.96	0.19	0.15	130.00	310.00	130.00	24.00	27.00
1129635-1	37 INT TF FLOW, QTZ-CARB	k-rich	A 56.59	16.97	2.83	6.01	10.42	4.20	1.14	0.13	1.33	0.14	0.23	50.00	40.00	140.00	32.00	22.00
22501	91 int-fel por fl/sil ande fl ?	k-rich	A 58.33	17.15	2.14	3.37	13.17	3.38	1.45	0.21	0.64	0.10	0.06	30.00	90.00	90.00	16.00	12.00
2000001129669-1	58 INT FLOW, SER 2	k-rich	A 56.21	17.03	2.67	6.39	10.36	4.39	0.99	0.44	1.17	0.14	0.19	90.00	290.00	130.00	30.00	22.00
22536	119 melanocratic t-mg maf intru (gabbro)	k-rich	A 56.85	15.49	2.83	6.45	11.74	3.56	1.25	0.23	1.33	0.14	0.13	73.00	194.00	121.00	21.00	23.00
0970001137927-1	6 TF, 5% PY, AMYG., SIL, CARB.	k-rich	B 53.00	17.17	2.45	4.02	19.03	2.48	0.51	0.13	0.95	0.15	0.13	40.00	170.00	100.00	22.00	19.00
22130	125 plwd ande. 2-3% py cubes	k-rich	D 62.09	15.50	2.22	5.28	5.62	3.74	2.88	1.67	0.72	0.11	0.17	460.00	156.00	122.00	24.00	17.00
22123	102 mas-amyg maf-int fl, sil-chld	k-rich	D 62.74	14.50	2.52	3.50	13.12	2.21	0.17	0.04	1.02	0.07	0.11	21.00	25.00	132.00	24.00	15.00
2803571129673-1	36 INT PX FLOW, SIZE INCR, NUKYH, 310 SHEAR, CHL2-3	k-rich	D 63.74	14.14	2.66	4.28	7.29	2.46	1.43	2.49	1.16	0.14	0.20	490.00	40.00	130.00	32.00	15.00
2000001129674-1	44 INT FLOW BX, SIL + CARB	k-rich	D 64.59	15.00	2.77	4.43	5.78	2.38	1.90	1.56	1.27	0.12	0.20	500.00	230.00	160.00	38.00	16.00
		mean:	58.47	16.00	2.54	5.47	9.85	4.07	1.79	0.48	1.04	0.13	0.15					
		std:	3.27	1.25	0.33	2.13	3.20	1.62	0.82	0.58	0.33	0.03	0.04					
		min:	53.00	13.33	2.14	3.20	4.65	2.21	0.17	0.04	0.64	0.07	0.06					
		max:	64.59	18.29	3.80	13.72	19.03	9.95	2.96	2.49	2.30	0.19	0.23					

FILE:TDTS1A1

TROLEITIC ANDESITE

Sample No.	FIELD DESCRIPTION	k-content	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	Ba	Sr	Zr	Y	Sc
0103141115987-4	9 RHYO - RHYO DAC FLOW	k-avg D	63.78	15.82	2.64	3.96	5.26	1.60	4.08	1.38	1.14	0.14	0.19	350.00	170.00	190.00	38.00	16.00
22315	174 HLI rhyo, <1% py, sil-ser3	k-avg R	72.78	12.65	1.97	2.93	3.77	0.88	2.86	1.55	0.47	0.08	0.06	563.00	99.00	246.00	69.00	9.00
22510	156 int-fel px bx, sil3 chl0-1, < 5% diss py	k-poor D	70.83	13.68	2.07	2.68	4.48	0.80	3.80	0.94	0.57	0.07	0.08	176.00	110.00	215.00	59.00	10.00
22521	137 chl-ser sch (fm ande fl)	k-rich D	71.92	12.60	2.07	2.41	4.82	1.01	2.31	2.10	0.57	0.08	0.11	382.00	84.00	227.00	63.00	9.00
22311	170 WFP + maf, sil3 ser2-3	k-rich R	72.09	13.44	1.95	1.70	5.29	1.45	2.32	1.20	0.45	0.07	0.04	213.00	102.00	249.00	68.00	9.00
22345	129 DF phyr-int fl, str sh, ser2-3 sil-chl-carb3	k-rich R	72.51	13.27	2.08	1.92	3.80	1.29	2.20	2.15	0.58	0.08	0.12	329.00	83.00	210.00	56.00	8.00
22310	169 HLI rhyo, sil-ser3	k-rich R	75.11	12.57	1.81	1.22	3.82	0.69	1.94	2.42	0.31	0.06	0.04	540.00	132.00	228.00	69.00	7.00
0201801129661-1	76 RHYO DAC FLOW, SIL	k-rich R	72.47	13.09	2.04	2.08	3.49	0.62	2.64	2.88	0.54	0.10	0.06	330.00	60.00	250.00	66.00	9.00
1350001137939-1	71 WFP, HI LEVL INTRU RHYO, SER 2-3	k-rich R	74.11	13.16	1.84	1.68	3.71	0.90	1.57	2.56	0.34	0.09	0.04	240.00	140.00	240.00	74.00	7.00
22519	135 chl-ser sch (rhyo bx - fm lp tt ?), wk toln	k-rich R	75.24	12.42	2.03	1.91	2.83	0.97	0.93	2.93	0.53	0.07	0.13	353.00	48.00	222.00	63.00	8.00
22334	117 int volc, str sh, chl sch, carb3 chl2-3	k-rich R	74.29	12.60	1.90	2.26	2.25	1.28	1.31	3.55	0.40	0.05	0.10	445.00	45.00	228.00	62.00	8.00
22307	166 tel lp tt, ang frgs, sil3 ser2-3 chl2 carb2	k-rich R	72.25	13.72	1.96	2.49	4.10	0.75	2.21	1.94	0.46	0.09	0.04	240.00	212.00	266.00	63.00	9.00
1870101137934-1	31 WFP DOME	k-rich R	74.46	13.09	1.81	1.42	3.76	0.55	1.79	2.66	0.31	0.09	0.06	270.00	50.00	220.00	72.00	7.00
		mean:	72.45	13.24	2.01	2.20	3.95	0.98	2.30	2.17	0.51	0.08	0.08					
		std:	2.82	0.85	0.20	0.69	0.84	0.32	0.86	0.73	0.20	0.02	0.04					
		min:	63.78	12.42	1.81	1.22	2.25	0.55	0.93	0.94	0.31	0.05	0.04					
		max:	75.24	15.82	2.64	3.96	5.29	1.60	4.08	3.55	1.14	0.14	0.19					



## LITHOGEOCHEMISTRY - PONTIAC SUMMER 1990, PHASE 1 &amp; 2

Table 1 (con't)

(7 of 7)

## THOLEIITIC DACITE

FIELD DESCRIPTION	k-content	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	Ba	Sr	Zr	Y	Sc
106 int lp tt. ch13 ser2	k-poor	D 71.38	14.30	1.94	2.35	2.13	0.74	5.56	1.05	0.44	0.06	0.04	165.00	75.00	258.00	55.00	8.00
149 fel bx tt bx to lp tt	k-poor	D 69.27	14.31	2.22	2.86	2.28	0.86	4.64	2.56	0.72	0.10	0.12	578.00	101.00	240.00	65.00	12.00
127 cy por fel-int intru. ser-s113	k-poor	D 70.25	14.36	2.00	1.91	4.50	0.57	4.96	0.72	0.50	0.07	0.12	118.00	294.00	250.00	68.00	8.00
77 INT FLOW, PORP MAS, QTZ NODULES	k-poor	R 74.09	12.10	1.99	2.40	2.56	0.75	4.70	0.75	0.49	0.11	0.06	210.00	50.00	220.00	62.00	8.00
? DAC - RHYD DAC, SER, FLOW?	k-poor	R 77.30	11.89	1.91	1.30	1.75	0.37	3.74	1.26	0.41	0.04	0.04	210.00	50.00	230.00	50.00	8.00
154 int-fel very fg tt, por, 2% py, po stg	k-poor	R 72.03	13.04	2.03	2.12	2.91	0.47	5.19	1.52	0.53	0.08	0.06	270.00	71.00	280.00	60.00	9.00
170 HLI rhyo - OFF, s113	k-rich	R 75.87	12.99	1.80	1.17	2.73	0.48	2.04	2.48	0.30	0.06	0.06	315.00	101.00	249.00	64.00	6.00
	mean:	72.87	13.29	1.98	2.02	2.69	0.61	4.41	1.48	0.48	0.07	0.07					
	std:	2.75	0.98	0.12	0.57	0.82	0.17	1.10	0.71	0.12	0.02	0.03					
	min:	69.27	11.89	1.80	1.17	1.75	0.37	2.04	0.72	0.30	0.04	0.04					
	max:	77.30	14.36	2.22	2.88	4.50	0.88	5.56	2.56	0.72	0.11	0.12					

## LITHOGEOCHEMISTRY - PONTIAC SUMMER 1990, PHASE 1 &amp; 2

## THOLEIITIC RHYOLITE

FIELD DESCRIPTION	k-content	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	Ba	Sr	Zr	Y	Sc
148 same as 22112 (Calc-Alkaline dacite)	k-avg	R 76.54	12.85	1.90	1.71	0.67	0.46	2.94	2.47	0.40	0.01	0.04	714.00	35.00	201.00	55.00	8.00

Table 2 - Alteration Indices (1 of 6)

LITHOGEOCHEMISTRY - MONTANA SUMMER 1990, PHASE 1 &amp; 2

AI-1 = (MgO+FeO)/(K<sub>2</sub>O+Na<sub>2</sub>O+MgO+CaO)\*100AI-2 = Na<sub>2</sub>O/(Na<sub>2</sub>O+K<sub>2</sub>O)\*100

AI &lt; 45 means fresh rock

FILE:alter620

CALCO-ALKALINE DACITE

Sample No.	FIELD DESCRIPTION	K-content	AI-1	AI-2	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	FeO	CaO	MgO	Na <sub>2</sub> O	K <sub>2</sub> O	TiO <sub>2</sub>	MnO	P <sub>2</sub> O <sub>5</sub>
22321	105 HLI rhyo. up to 10% py	k-rich R	57 altered	37	75.17	12.48	1.82	1.66	1.45	1.06	2.17	3.75	0.22	0.06	0.04
22326	160 tel up to 17 HLI rhyo /	k-rich R	56 altered	38	71.05	13.64	2.02	2.25	1.72	1.10	2.85	4.73	0.32	0.08	0.06
22392	74 INT-FEL FLOW, 113/090 FULIATION, UV, SER 2-3	k-rich R	49 altered	41	74.31	12.78	1.80	1.23	2.01	0.83	2.76	4.03	0.30	0.06	0.04
22392	172 HLI rhyo, sill	k-rich R	49 altered	44	74.05	12.70	1.83	1.75	2.00	0.83	2.91	3.69	0.23	0.08	0.04
22395	152 ag int-rel intru - gent por/HLI rhyo / 2 & 3 py	k-avg R	46 altered	47	76.72	11.90	1.81	1.05	1.54	0.46	2.86	3.26	0.21	0.04	0.04
141501112907-1164	tel por / HLI rhyo, 10% py	k-avg R	46 altered	51	76.74	11.53	1.80	0.35	2.40	0.29	3.32	3.18	0.20	0.05	0.02
22324	89 OFF, HI LEVL INTRU RHYO***	k-avg R	30	51	76.74	11.53	1.80	0.35	2.40	0.29	3.32	3.18	0.20	0.05	0.02
22325	181 HLI rhyo, sill	k-avg R	40	51	74.17	12.87	1.82	0.99	2.43	0.70	3.37	3.17	0.21	0.06	0.06
22328	110 tel por / 1 OFF HLI rhyo, sill-ser2	k-rich R	37	52	72.86	13.89	2.06	0.01	3.32	0.92	3.28	2.98	0.26	0.04	0.06
22329	160 HLI rhyo, sill	k-avg R	36	57	74.39	12.62	1.85	1.52	2.54	0.91	3.19	2.37	0.21	0.05	0.04
22512	161 tel to tr, sill-ser3, 20-30% py & some clay	k-avg D	47 altered	58	71.15	13.87	2.49	2.98	1.29	1.71	3.15	2.24	0.39	0.04	0.06
1861801129622-1164	HLI rhyo, sill, OFF	k-avg R	35	60	75.55	12.10	1.81	1.29	1.71	0.45	4.04	2.64	0.31	0.05	0.04
22110	27 ANDE FLOW	k-avg R	34	61	77.45	12.06	1.73	0.99	1.74	0.53	3.19	2.01	0.23	0.04	0.02
1127015-1	158 sh, ser (andes vnt) rhdac fi	k-avg R	28	63	76.10	12.21	1.72	1.14	3.17	0.64	2.93	1.75	0.22	0.06	0.06
0101781129647-1126	HLI - OFF	k-avg K	34	64	72.64	12.89	1.89	1.71	2.94	1.29	3.77	2.13	0.39	0.04	0.10
0103571127916-4103	mod sh ip tr, 5-10% ank blotches	k-avg K	30	66	73.17	13.47	2.07	1.72	2.59	0.83	3.52	1.84	0.57	0.08	0.13
0650001129627-2 64	ANDE FLOW, DML 1, SIL 1	k-poor R	33	68	73.63	13.34	2.07	1.45	2.13	1.16	3.73	1.74	0.57	0.07	0.12
22106	176 HLI rhyo, sill	k-poor R	32	69	73.63	13.26	1.86	1.95	1.88	1.00	4.09	1.85	0.36	0.07	0.04
22112	111 tel-int por/px fi/tr 1/2 ? sill-ch12 ser-carb2-3	k-poor R	31	70	75.03	12.68	2.01	1.39	1.77	0.92	3.88	1.66	0.51	0.08	0.06
22115	91 OFF, HI LEVL INTRU RHYO	k-poor R	33	71	74.49	16.61	1.86	2.55	1.43	0.99	3.93	1.62	0.36	0.10	0.04
22305	141	k-poor R	34	71	72.70	13.58	2.11	2.22	1.55	1.22	4.13	1.70	0.61	0.06	0.13
22304	63 INT-FEL, OFF	k-poor K	26	73	75.78	12.24	1.83	1.34	2.18	0.75	3.99	1.45	0.33	0.06	0.06
22111	113 ser-ch1 sch (fm ande-dac fi ?), str sh	k-poor R	23	74	76.22	12.84	1.53	0.00	2.36	0.43	4.33	1.54	0.58	0.05	0.12
2001801129916-1143	int ip tr + tp phenos, ser2 sill2-1	k-poor D	26	74	71.82	12.97	1.90	1.85	4.02	1.37	4.08	1.44	0.40	0.07	0.06
2050001129661-1163	tel tr + tp phenos, sill ser2	k-poor R	24	74	76.13	12.04	1.71	1.20	2.11	0.50	4.45	1.55	0.21	0.06	0.02
2601801129622-1142	tel to phyr fi	k-poor R	26	74	75.57	13.23	2.00	1.43	1.91	0.75	4.80	1.65	0.50	0.06	0.10
22617	75 FEL FLOW, SIL PORF	k-poor R	27	75	76.31	11.04	1.96	1.93	1.99	0.63	3.98	1.33	0.46	0.10	0.06
0700001129629-2 1		k-poor R	25	75	75.76	11.97	1.83	1.51	1.69	0.55	4.70	1.54	0.33	0.08	0.04
22313	43 PORF, INT HI LEVL INTRU, K-ALIN 2-3	k-poor R	27	76	72.58	13.79	1.99	2.02	1.94	0.97	4.63	1.44	0.49	0.06	0.06
1391801110968-1105	OFF HLI, chl 2-3, 1-2% diss py	k-poor R	30	77	76.19	11.86	1.76	1.55	1.73	1.23	4.05	1.24	0.26	0.06	0.04
2000001129677-1172	tel-int void fi / chl3-sill	k-poor R	26	77	73.93	13.09	1.96	1.78	2.02	0.91	4.38	1.33	0.46	0.05	0.06
22117	147 tr bx, 10% diss py, sill	k-poor D	26	78	71.79	14.55	2.06	1.94	1.38	1.08	5.08	1.46	0.36	0.03	0.06
27101	63 INT FLOW, AMYB	k-poor R	25	79	74.32	13.07	2.04	0.99	2.43	0.83	4.44	1.19	0.54	0.07	0.06
22110	146 very to mes rhyo, sill-ser1 chl2	k-poor R	22	80	73.68	13.08	1.91	1.67	1.72	0.59	5.28	1.33	0.41	0.06	0.06
1251801129001-1152	rhyo por subvolc sill	k-poor R	21	81	75.82	12.06	1.82	1.28	2.33	0.79	4.41	1.05	0.32	0.04	0.04
23805	145 mas OFF - mas fi to sub volc sill	k-poor A	24	81	73.28	13.40	1.98	2.01	1.64	0.90	5.02	1.17	0.46	0.05	0.06
22328	20 FILW INT FLOW, SER 1-2	k-poor D	20	83	71.26	13.66	1.99	2.27	3.05	0.95	5.09	1.05	0.49	0.10	0.06
22120	65 RHYO DAC FLOW, PORF	k-poor K	16	83	72.42	14.46	1.85	1.61	4.00	0.72	3.76	0.75	0.35	0.06	0.06
22126	150 tel ip tr, sill-3 chl3+	k-poor D	26	84	69.94	14.11	2.24	2.90	2.11	1.53	5.22	1.01	0.74	0.07	0.12
1001801129003-3 54	FEL-INT LAP TR BX (3-SEM), QTZ+FP IN MATRIX	k-poor R	24	86	72.35	14.00	1.89	1.33	2.93	1.68	4.56	0.75	0.39	0.03	0.08
1850001129639-1153	OFF rhyo intru, 1-2% py, sill-ser1 chl3+	k-poor D	18	88	71.24	12.80	2.17	2.96	3.94	1.25	4.18	0.58	0.67	0.09	0.12
22318	136	k-poor R	13	88	74.02	12.12	2.05	0.61	3.81	0.69	5.27	0.70	0.55	0.08	0.10
22517	61 FP PORF RHYO, XTAL (3 MM)	k-poor D	27	89	65.47	14.85	1.98	2.62	3.15	3.01	7.25	0.93	0.48	0.08	0.18
22327	34 BARBAD	k-poor R	15	90	73.43	12.95	2.08	1.74	2.72	0.85	4.95	0.53	0.58	0.07	0.10
28652	162 tel ip tr, carb3	k-poor D	23	91	71.12	14.04	1.99	2.22	2.11	1.78	5.60	0.54	0.49	0.06	0.06
mean:					73.72	13.06	1.93	1.62	2.29	0.96	4.10	1.62	0.44	0.06	0.07
std:					2.21	1.00	0.16	0.67	0.73	0.47	0.93	0.99	0.15	0.02	0.03
min:					65.47	11.04	1.53	0.00	1.29	0.29	2.17	0.53	0.21	0.03	0.02
max:					77.45	16.61	2.49	2.98	4.02	3.01	7.25	4.73	0.99	0.10	0.18

## LITHOGEOCHEMISTRY - FONTIAC SUMMER 1990, PHASE 1 &amp; 2

Table 2 (Con't)

(2 of 6)

FILE:alter623

CALC-ALKALINE RHYOLITE

Sample No.	FIELD DESCRIPTION	k-content	Al	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5		
0150001129008-1	28 RHYD - RHYD DAC FLOW, MINOR LAF CLASTS	k-avg	R	47 altered	48	78.55	11.05	1.79	0.08	1.07	0.24	3.26	3.56	0.29	0.03	0.06
22518	134 por ande + lam cx fl	k-avg	R	36	57	77.55	11.36	1.99	0.10	1.66	0.31	3.68	2.73	0.49	0.04	0.10
22129	108 very hard tp phyr rhyo fl	k-poor	R	36	64	73.36	13.54	1.91	1.04	1.04	0.57	5.12	2.91	0.41	0.06	0.04
22323	182	k-poor	R	34	67	74.14	13.07	1.85	1.39	0.93	0.63	5.05	2.49	0.35	0.05	0.04
22322	101 HLI rhyo, sil3	k-poor	R	29	73	73.81	13.00	1.96	1.72	1.38	0.73	4.96	1.87	0.46	0.06	0.06
22483	84 tel to fl, sil-ch13	k-poor	R	32	73	73.47	13.41	1.83	2.26	0.86	0.94	4.91	1.63	0.33	0.07	0.06
22516	132 chl-ser sch (fm ande-dac fl ?)	k-poor	R	30	75	72.88	15.10	2.00	0.91	0.87	0.81	5.07	1.70	0.50	0.03	0.12
1E20001129652-3	32 OFF FLOW ?	k-poor	R	27	76	74.86	13.57	1.82	1.54	0.77	0.51	4.93	1.55	0.32	0.07	0.04
22301	160 off - HLI rhyo	k-poor	R	26	76	78.43	11.83	1.84	0.40	0.80	0.46	4.43	1.37	0.34	0.03	0.06
1129636-1	42 INT CHL SER SCHIST (2037050, MOD 2797090)	k-poor	R	24	78	79.73	11.75	1.94	0.19	0.51	0.34	4.17	1.17	0.44	0.06	0.06
22331	114 HLI rhyo, sil3	k-poor	R	25	79	73.48	13.66	2.04	0.50	1.44	0.86	5.83	1.51	0.54	0.04	0.08
22311	157 rhdac bx	k-poor	R	27	80	75.86	12.70	1.80	1.66	0.65	0.79	4.91	1.22	0.30	0.04	0.06
22306	163 tel fl/tel px fl / 1% py, sil-carb3 ser-ch12	k-poor	R	26	80	74.42	13.50	1.87	1.78	1.18	0.88	4.74	1.16	0.37	0.06	0.04
22131	109 int-tel to fl, tp phyr, chl3	k-poor	R	24	83	73.10	13.37	2.01	1.87	1.23	1.02	5.57	1.14	0.51	0.07	0.03
1751801129631-1	49 GABBRO/BASALT	k-poor	R	20	85	73.65	13.14	1.98	1.73	1.43	0.80	5.63	0.99	0.48	0.08	0.08
1650001129665-1	79 INT FLOW, SIL 2-3	k-poor	D	23	67	71.09	14.30	2.11	2.57	1.33	1.20	5.76	0.87	0.61	0.08	0.08
0201801129671-1	46 INT FLOW, SIL 3, CHL 0-1	k-poor	R	18	87	72.76	14.77	1.98	1.06	1.17	0.74	6.03	0.89	0.48	0.04	0.08
22109	144 mas por ande-dac fl, tp py, chl2-3	k-poor	R	21	89	72.99	13.74	1.98	1.99	1.23	1.12	5.64	0.73	0.48	0.04	0.06
22320	179 HLI rhyo, sil3	k-poor	R	14	90	75.32	12.85	1.79	1.26	1.77	0.53	5.50	0.61	0.29	0.05	0.04
22515	131 rusty ser sch (fm rhdac fl bx), sh 2 dir	k-poor	R	13	92	74.64	13.04	1.99	0.00	1.81	0.88	6.53	0.57	0.55	0.04	0.14
3600001129633-1	48 INT FLOW, SIL 3, N-S FOLIATION	k-poor	R	5	97	75.61	13.37	1.88	0.00	0.93	0.22	7.14	0.20	0.53	0.04	0.08
		mean:				74.75	13.15	1.92	1.15	1.15	0.68	5.18	1.48	0.43	0.05	0.07
		std:				2.15	0.99	0.09	0.78	0.35	0.27	0.87	0.83	0.10	0.02	0.03
		min:				71.09	11.05	1.79	0.00	0.51	0.22	3.26	0.20	0.29	0.03	0.04
		max:				79.73	15.10	2.11	2.57	1.81	1.20	7.14	3.56	0.61	0.08	0.14

## LITHOGEOCHEMISTRY - FONTIAC SUMMER 1990, PHASE 1 &amp; 2

FILE:alter623

CALC-ALKALINE HIGH ALUMINA ANDESITE

Sample No.	FIELD DESCRIPTION	k-content	Al	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5		
22312	60 MASS-PORF ANDE FLOW	k-rich	D	49 altered	39	70.69	14.48	2.16	2.60	2.79	1.37	1.93	3.08	0.66	0.09	0.14
22504	115 tel-int fl, sil-ser3	k-rich	D	37	50	68.95	16.04	1.97	2.43	3.57	0.90	2.74	2.74	0.47	0.08	0.12
1001801129642-2128	tel to fl/bx andit or ser dist sw, chl-ser3 sil2	k-rich	R	39	52	72.03	13.02	2.08	1.99	3.39	1.37	2.76	2.56	0.58	0.09	0.12
22340	173 tel to fl, sil3	k-rich	D	35	52	69.51	14.01	2.20	2.84	4.02	1.19	2.78	2.52	0.70	0.10	0.14
22513	151 int-tel intra/rhyo intra ?	k-avg	A	45	64	59.16	16.36	2.36	5.10	4.89	4.97	3.84	2.20	0.86	0.17	0.10
1330001129627-2159	chry, mas rhdac fl, to fl B, 150 fl hill	k-poor	A	37	64	59.51	17.61	2.42	3.64	5.88	3.63	3.99	2.26	0.92	0.08	0.06
0261281107926-4113	tel-int to phyr fl, ser-sil3	k-poor	D	37	76	62.55	17.10	2.42	4.53	3.38	3.22	4.30	1.36	0.92	0.11	0.12
1230001129657-1175	HLI rhyo, sil3	k-poor	A	44	77	54.09	18.37	2.40	7.24	4.40	5.88	4.92	1.45	0.90	0.25	0.10
0261281107926-1171	mas int-mar void fl	k-avg	A	32	78	56.74	16.77	2.30	5.63	7.75	4.46	4.14	1.14	0.80	0.17	0.08
2251801107941-2167	tel fl / boulder ? 20-35 py	k-avg	A	38	78	60.37	16.56	2.37	4.08	5.67	4.80	4.01	1.10	0.87	0.07	0.10

Table 2 (Con't)

(3 of 6)

0852701137926-1125	mes-amyg int fl	k-poor A	36	79	56.86	15.98	2.78	5.46	6.92	5.23	4.14	1.10	1.28	0.13	0.12
1129667-1	47 INT-FEL FLOW, 118 FOLIATION	k-poor D	32	79	67.95	14.35	2.00	5.00	5.86	2.63	4.24	1.10	0.56	0.07	0.14
22306	95 fg to plwd ande fl, intense MnO2	k-poor A	42	80	59.89	16.70	2.29	5.06	4.22	5.23	4.47	1.09	0.79	0.13	0.15
22121	73 INT FLOW, AMYG, GV, SER 2	k-avg A	35	81	59.63	16.32	2.25	4.65	6.26	5.38	3.68	0.89	0.75	0.10	0.08
22520	112 mes amyg int void fl	k-poor A	35	83	57.53	18.25	2.39	3.69	6.51	4.98	4.59	0.92	0.69	0.11	0.12
0950001137927-1120	mg mes amyg int void fl	k-poor A	33	84	59.86	17.12	2.31	3.99	6.69	4.40	4.02	0.78	0.61	0.11	0.11
1129640-1	139	k-poor A	35	84	57.81	18.51	2.37	4.21	5.36	4.58	5.06	0.97	0.87	0.13	0.13
22116	16 BASALT/SIL,CARB/RHY-RHY DAC PORPH	k-poor A	39	84	57.85	17.39	2.53	5.17	5.03	5.33	4.55	0.84	1.03	0.14	0.15
1372701137942-1	30 INT FX FLOW, LAP CLASIS IN ANDE MATRIX	k-avg D	36	84	62.11	16.40	2.18	3.97	5.63	4.52	3.63	0.67	0.68	0.10	0.13
22344	66 INT-FEL FLOW, 2% FY	k-poor D	20	85	62.71	16.45	2.37	3.11	7.21	2.05	4.22	0.74	0.87	0.10	0.16
0182341137941-1100	mat-int amyg fl	k-poor A	36	86	61.69	16.59	2.26	4.11	4.72	4.46	4.48	0.72	0.76	0.10	0.10
22329	94 sil, carb ande fl, chl mod to loc intense	k-poor A	29	88	58.72	17.97	2.24	3.73	7.96	4.19	3.79	0.50	0.74	0.10	0.06
2400001129643-1	93 sil plwd ande fl	k-poor A	27	89	59.58	17.64	2.16	3.43	8.17	4.00	3.70	0.47	0.66	0.10	0.11
0502701129642-1	8 DAC - RHYD FLOW	k-poor A	31	89	58.81	16.84	2.44	5.37	6.59	4.33	3.90	0.45	0.94	0.13	0.16
1610001129647-1	21 ANDE PORPH FLOW	k-poor A	31	89	56.40	18.61	2.31	4.76	7.13	4.59	4.57	0.56	0.81	0.14	0.10
1510001129654-1	10 GABBRD	k-poor A	28	90	59.65	15.51	2.55	5.56	6.81	5.76	4.27	0.49	1.05	0.13	0.16
22330	68 GABBRD	k-poor A	28	92	61.24	15.07	2.71	5.88	5.39	3.45	4.31	0.39	1.21	0.13	0.21
22503	82 INT FLOW, AMYG	k-poor A	35	92	61.76	16.20	2.22	4.39	4.24	4.68	5.14	0.44	0.72	0.10	0.10
28854	19 FILM INT FLOW/SX?, GV	k-poor A	38	92	56.83	19.47	2.44	5.36	4.37	5.12	4.79	0.40	0.94	0.12	0.17
22505	78 INT FLOW	k-poor A	36	93	58.60	17.10	2.26	4.84	6.06	5.49	4.32	0.34	0.76	0.12	0.13
1129663-1	122 mes wty int fl	k-poor A	33	93	57.88	16.79	2.38	5.03	7.09	5.16	4.20	0.33	0.88	0.12	0.12
28853	11 AMY INT FLOW	k-poor H	34	94	60.34	16.71	2.46	4.85	4.69	4.62	4.75	0.33	0.96	0.13	0.17
22327	12 FEL LAF LUFT, LWAB-2	k-poor A	34	94	60.67	16.82	2.45	4.63	4.55	4.57	4.75	0.31	0.95	0.12	0.17
22125	104 ande amyg fl, 1-2% diss py	k-poor A	29	94	60.92	16.36	2.31	3.80	6.11	4.16	5.00	0.31	0.81	0.10	0.10
0053601110966-1	32 FX BX (10UM), 3% SIL	k-poor A	25	94	61.92	17.24	2.27	3.70	6.21	5.28	4.49	0.27	0.77	0.10	0.15
22339	90 amyg int-mat fl	k-poor A	32	94	61.46	15.86	2.21	4.18	5.70	4.60	4.74	0.26	0.71	0.12	0.13
22332	67 FX BX (10UM), FUL. 170/0455	k-poor A	26	95	58.65	18.22	2.33	4.23	6.69	5.78	4.62	0.23	0.85	0.10	0.12
22469	136 int to fl	k-poor A	31	97	58.25	16.19	2.82	6.73	4.93	4.26	4.97	0.13	1.32	0.14	0.26
22316	17 INT FLOW, SIL 2	k-poor A	35	98	61.02	15.98	2.42	4.00	6.36	5.38	3.58	0.08	0.92	0.09	0.17
1137432-1	15 AMY INT FLOW SIL-2, URL-2	k-poor A	34	98	60.46	15.17	2.35	4.54	6.47	5.49	4.30	0.08	0.65	0.13	0.15
22314	140	k-poor A	23	98	61.16	15.83	2.23	3.99	5.79	5.60	6.33	0.11	0.73	0.12	0.11
0360001137935-1	35 fl, 3% FY, AMYG., SIL, CARB.	k-poor A	39	99	55.58	18.04	2.50	5.87	5.01	6.39	5.02	0.04	1.08	0.16	0.21
	mean:			60.64	16.62	2.35									
	std:			3.90	1.29	0.17									
	mint:			54.09	13.02	1.97									
	max:			72.03	19.47	2.82									

## LITHOGEOCHEMISTRY - PONTIAC SUMMER 1990, PHASE 1 &amp; 2

FILE:alter623

CALC-ALKALINE HIGH ALUMINA BASALT

Sample No.	FIELD DESCRIPTION	k-content	Al-1	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	
2091801129002-3	50 INT FLOW, GV, FY+FO (30%)	k-rich A	60 altered	34	61.79	17.21	2.29	4.66	3.49	4.38	1.74	3.36	0.79	0.10	0.22
1621001137926-4	3 INT FLOW, BEDDING	k-rich A	44	34	57.26	19.37	2.41	4.67	6.56	2.88	1.92	3.70	0.91	0.12	0.17
22467	88 mes intmat, amyg void fl	k-rich A	36	62	56.17	17.68	2.34	5.30	9.01	5.03	2.05	1.24	0.84	0.12	0.19
2905801129644-1	31 INT-FEL, FX FLOW D- LAP OF 2%, SER 3, CHE 2	k-avg A	36	72	55.98	18.72	2.37	5.57	7.13	4.52	3.25	1.26	0.87	0.14	0.15
0750001129627-1	18 FX BX, SIL CLASIS E-W	k-avg A	30	76	58.27	17.30	2.32	5.48	6.36	4.29	3.37	0.94	0.82	0.21	0.15
22336	121 DPP dyke fl, py + cpy ls, chis silic	k-rich B	36	79	52.83	20.06	2.17	4.44	9.63	6.20	2.23	0.61	0.67	0.11	0.66
2250001129649-1	22 RHYD - DAC, CHE 1	k-rich A	36	79	54.07	19.28	2.31	5.53	6.29	6.93	2.68	0.73	0.81	0.10	0.17

Table 2 (Con't)

(4 of 6)

3120001129643-1	59 FLOW, FILM Bt. 15 % FY IN SELV6. SIL	k-rich	A	22	89	56.70	18.36	2.45	5.27	10.06	2.83	2.39	0.61	0.95	0.18	0.19
22514	130 mas ande minor plwd fls	k-avg	A	46 altered	80	58.28	16.68	2.21	6.12	5.23	6.33	3.31	0.82	0.71	0.17	0.15
22506	96 plwd ande fl. less pur greener, tr py	k-avg	A	36	81	57.09	17.39	2.31	4.64	7.72	5.54	3.41	0.81	0.61	0.11	0.15
22541	124 anyy plwd int fl	k-avg	A	39	83	55.28	16.49	2.65	6.69	7.11	5.92	3.32	0.70	1.35	0.16	0.12
22502	92 plwd, sil wupr ande fl, tr py assoc chi	k-avg	A	29	83	58.19	18.24	2.22	3.78	8.91	4.15	2.98	0.61	0.72	0.09	0.11
1137927-3	57 INT, FEL CLAGTS 11-3 x 2 CM, FY	k-avg	A	82	83	54.65	16.65	2.42	6.30	9.74	5.43	2.79	0.56	0.92	0.18	0.17
22509	79 epi-sil wr chi m-cg int fl. no phenos, dk ?	k-poor	A	31	84	55.75	16.42	2.79	6.46	7.60	4.52	3.90	0.73	1.29	0.16	0.17
133200366234-4	29 FILM BASALT, CHY IN SELV6	k-avg	A	29	86	60.31	16.51	2.26	4.14	7.89	4.08	3.23	0.54	0.76	0.14	0.14
4000001129679-1	26 INT FLOW	k-avg	B	35	86	52.40	19.13	2.35	5.97	9.68	6.31	2.34	0.39	0.85	0.16	0.17
0570001129675-1	45 INT MAG FLOW, CHRS + SIL	k-avg	A	24	87	56.07	16.04	2.38	5.26	8.49	5.01	2.60	0.38	0.68	0.10	0.19
0150001137941-2	13 GABBRD	k-avg	B	31	88	53.85	20.80	2.03	3.92	10.47	5.50	2.38	0.33	0.53	0.10	0.08
0960001107927-1	62 F, SA PY, AMYS, SIL, CHRS.	k-poor	A	40	89	58.47	16.74	2.49	5.25	5.90	5.84	3.54	0.44	0.99	0.15	0.19
22484	85 mas anyy int void fl	k-poor	B	34	90	53.45	16.56	2.84	8.68	7.95	5.37	3.12	0.33	1.34	0.19	0.19
22495	66 mas anyy int - det void fl	k-poor	A	36	91	54.87	17.21	2.67	6.25	7.10	5.78	4.11	0.40	1.17	0.19	0.25
0500901129656-1	72 INT FLOW, AMYS	k-poor	A	34	92	59.48	16.46	2.21	5.01	7.04	5.08	3.46	0.31	0.71	0.13	0.10
0050901129640-4	39 INT FLOW FOPF	k-poor	A	29	94	56.36	19.05	2.03	4.65	7.72	4.52	4.11	0.25	0.60	0.12	0.12
22507	97 fy mas carb. sil ande fl, tr py, hor jnt	k-poor	A	32	95	58.37	16.61	2.28	4.72	8.80	5.31	2.75	0.15	0.76	0.11	0.12
4000001129644-1	3 INT FLOW	k-poor	A	35	95	56.62	17.71	2.46	5.72	6.36	5.50	4.20	0.23	0.96	0.11	0.15
0300001129678-1	25 GABBRD	k-poor	B	29	95	53.92	16.51	2.83	8.25	8.36	4.66	3.58	0.19	1.33	0.18	0.17
1000901129673-4	40 INT FLOW	k-poor	B	31	96	51.83	18.09	2.49	6.95	10.45	5.97	2.84	0.10	0.99	0.16	0.12
1301801137920-1	69 QFP, SER, ANDE?	k-poor	A	25	97	58.85	17.04	2.33	4.47	9.02	4.03	3.06	0.10	0.83	0.11	0.17
1129677-4	33 INT FLOW, FOPF	k-poor	A	32	97	57.14	17.22	2.31	5.39	7.24	5.27	4.17	0.13	0.81	0.13	0.19
0200001129642-3	2 INT FLOW FLOW	k-poor	B	29	98	53.47	18.32	2.65	5.77	10.54	4.59	3.14	0.08	1.15	0.16	0.13
0351801129677-1	24 ANDE FLOW, UNALTERED	k-poor	A	27	98	54.65	17.71	2.79	6.42	7.81	4.47	4.36	0.08	1.29	0.20	0.21
		mean:				56.25	17.74	2.41	5.56	8.00	5.02	3.11	0.68	0.92	0.14	0.16
		std:				2.33	1.15	0.22	1.11	1.61	0.89	0.69	0.81	0.21	0.03	0.04
		min:				51.83	16.42	2.03	3.78	3.49	2.83	1.74	0.08	0.53	0.09	0.06
		max:				61.79	20.80	2.85	8.68	10.54	6.33	4.36	3.70	1.35	0.21	0.25

## LITHOGEOCHEMISTRY - PONTIAC SUMMER 1990, PHASE 1 &amp; 2

FILE:alter623

PHOLEPTIC ANDESITE

Sample No.	FIELD DESCRIPTION	k-content	A	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5		
22517	135 chi-ser sch (hvy bx - w 10 14 17) wr voln	k-rich	R	51 altered	24	75.24	12.42	2.03	1.91	2.83	0.97	0.93	2.93	0.53	0.07	0.13
22514	117 int void, str sh, chi sch, carb3 chi2-3	k-rich	R	58 altered	27	74.29	12.60	1.90	2.26	2.25	1.28	1.31	3.55	0.40	0.05	0.10
1350001137939-1	71 QFP, HI LEVEL INTRO AMYS, SER 2-3	k-rich	R	49	38	74.11	13.16	1.94	1.68	3.71	0.90	1.57	2.56	0.34	0.09	0.04
1870101137934-1	31 QFP DOME	k-rich	R	37	40	74.46	13.09	1.61	1.42	3.76	0.55	1.79	2.66	0.31	0.09	0.06
22510	169 HLI rhyo, sil-ser3	k-rich	R	35	44	75.11	12.57	1.81	1.22	3.82	0.69	1.94	2.42	0.31	0.06	0.04
0201801129661-1	76 RHYO DAC FLOW, SIL	k-rich	R	36	48	72.47	13.09	2.04	2.08	3.49	0.82	2.64	2.88	0.54	0.10	0.06
22545	129 QF rhy-int fl, str sh, ser2-3 sil-chi-carb3	k-rich	R	36	51	72.51	13.27	2.08	1.92	3.80	1.29	2.20	2.15	0.58	0.08	0.12
22521	137 chi-ser sch (hvy ande fl)	k-rich	D	30	52	71.92	12.60	2.07	2.41	4.82	1.01	2.31	2.10	0.57	0.06	0.11
22307	166 tel tr, ang frags, sil3 ser2-3 chi2 carb2	k-rich	R	30	53	72.25	13.72	1.96	2.49	4.10	0.75	2.21	1.94	0.46	0.09	0.04
22315	174 HLI rhyo, <1% py, sil-ser3	k-avg	R	27	65	72.78	12.65	1.97	2.93	3.77	0.86	2.86	1.55	0.47	0.08	0.06
22311	170 QFP + mat, sil3 ser2-3	k-rich	R	26	66	72.09	13.44	1.95	1.70	5.29	1.45	2.02	1.20	0.45	0.07	0.04
0103141115787-4	9 RHYO - RHYO DAC FLOW	k-avg	D	24	75	63.78	15.82	2.64	3.96	5.26	1.60	4.08	1.36	1.14	0.14	0.19
22510	166 int-tel px bx, sil3 chi2-1, < 5% glass py	k-poor	D	17	80	70.65	13.68	2.07	2.68	4.48	0.80	3.80	0.94	0.57	0.07	0.08
		mean:				72.45	13.24	2.01	2.20	3.95	0.98	2.30	2.17	0.51	0.06	0.06

Table 2 (Con't)

(5 of 6)

std:	2.82	0.85	0.20	0.67	0.84	0.32	0.86	0.73	0.20	0.02	0.04
min:	63.78	12.42	1.81	1.22	2.25	0.53	0.93	0.94	0.31	0.05	0.04
max:	75.24	15.82	2.64	3.96	5.29	1.60	4.08	3.55	1.14	0.14	0.19

## LITHOGEOCHEMISTRY - PONTIAC SUMMER 1990, PHASE 1 &amp; 2

FILE:alter623

## THOLEIITIC BASALT

Sample No.	FIELD DESCRIPTION	K-content	Al	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5		
2803571129673-1	56 INT FX FLOW, SIZE INCR, NGRM, DIO BREAK, CHLZ-3	k-rich	D	56	63.74	14.14	2.66	4.28	7.29	2.46	1.43	2.49	1.16	0.14	0.20	
2000001129674-1	44 INT FLOW BK, SIL + CHAB	k-rich	D	34	55	64.59	15.00	2.77	4.43	5.78	2.38	1.90	1.56	1.27	0.12	0.29
22100	125 plwd ande, 2-3% py cubes	k-rich	D	39	63	62.09	15.50	2.22	5.26	5.62	3.74	2.68	1.67	0.72	0.11	0.17
2000001129689-1	38 INT FLOW, SER 2	k-rich	A	36	67	56.21	17.03	2.67	6.39	10.36	4.39	0.99	0.44	1.17	0.14	0.19
1000001129643-3	58 INT FLOW FLOW, SIL	k-rich	A	30	72	54.32	18.29	2.46	7.10	9.89	5.07	1.14	0.44	0.96	0.19	0.15
2050201137923-1	4 INTRUSIVE MAS FLOW	k-rich	A	38	74	56.03	16.40	2.49	5.98	9.01	5.99	2.04	0.72	0.53	0.17	0.17
2200001129636-1	41 RUSTY INT FLOW, PY, CHL+SER+SIL+CHAB	k-avg	A	40	79	60.25	15.70	2.48	5.61	6.17	5.66	2.26	0.60	0.98	0.12	0.17
0770001137927-1	8 (F, 5% PY, AMG., SIL, CHAB)	k-rich	B	12	80	53.00	17.17	2.45	4.02	19.03	2.48	0.51	0.13	0.95	0.15	0.13
22120	102 mas-avg mar-int fl. sil-chl3	k-rich	D	14	81	62.74	14.30	2.52	3.50	13.12	2.21	0.17	0.04	1.02	0.07	0.11
22488	89 amyg plwd int-met fl	k-avg	A	33	82	60.29	16.05	2.24	4.75	7.62	4.49	2.96	0.63	0.74	0.11	0.13
4000001129634-3	35 INT FLOW BK (CHL+ALM) CHL-15CM, SIL, CHL	k-avg	A	30	83	59.67	15.53	2.75	5.76	7.81	3.65	2.53	0.50	1.25	0.14	0.21
22122	101 fq ande-dac lp fl. ser-sil2-3	k-avg	A	18	84	61.14	16.94	2.37	3.32	10.25	2.27	2.19	0.43	0.87	0.10	0.10
22336	119 melanocratic frag mar intru (gabbro)	k-rich	A	20	84	56.85	15.49	2.83	6.45	11.74	3.56	1.25	0.23	1.33	0.14	0.13
1129644-1	36 VED PIL INT FLOW	k-rich	A	16	85	56.43	16.24	2.28	3.20	15.37	2.85	0.49	0.08	0.78	0.13	0.15
22501	91 int-fel por fl/sil ande fl 7	k-rich	A	20	87	58.33	17.15	2.14	3.37	13.17	3.38	1.45	0.21	0.64	0.10	0.06
22500	98 cg ande fl. abu ep1 subrd gms (5-10%)	k-avg	A	50 altered	88	54.70	14.99	2.25	6.37	7.59	9.95	2.74	0.38	0.75	0.14	0.15
2000001129643-3	53 INT FLOW FLOW, PY, SIL	k-rich	A	19	89	55.69	16.29	2.51	4.20	13.96	3.28	0.68	0.08	1.01	0.15	0.15
22335	118 mas tp phyr, amyg int-met volc fl	k-avg	A	33	89	56.26	16.21	2.48	5.27	9.74	5.71	2.79	0.33	0.98	0.12	0.10
1129635-1	37 INT FLOW, QTZ-CHAB	k-rich	A	27	90	56.59	16.97	2.83	6.01	10.42	4.20	1.14	0.13	1.33	0.14	0.23
0501801137942-2	14 GABBRO/DIORITE	k-avg	A	22	90	59.16	15.65	2.63	6.29	9.67	2.99	1.95	0.21	1.13	0.15	0.19
22333	116 mas-avg int fl, sil3	k-avg	A	42	91	55.15	13.33	3.80	13.72	4.65	4.55	1.93	0.19	2.30	0.17	0.19
0500001129628-2	70 INT FLOW, MAS - FOKP	k-avg	A	27	91	61.39	14.86	2.14	4.12	9.88	4.31	2.25	0.21	0.64	0.10	0.08
2003501129677-1	23 MAFIC INTRUSIVE/FLOW	k-poor	B	29	94	54.00	15.71	2.78	8.47	9.68	4.86	2.49	0.17	1.28	0.18	0.19
22486	87 amyg pill int-met fl	k-avg	D	22	94	62.16	15.67	2.20	4.02	9.93	3.26	1.71	0.10	0.70	0.10	0.10
22120	107 fel lp fl - fl bk. 2% py. chl3 sil-ser2+	k-poor	A	26	97	61.06	15.24	2.48	4.74	8.27	3.94	2.94	0.10	0.98	0.11	0.13
		mean:			58.47	16.00	2.54	5.47	9.65	4.07	1.77	0.40	1.04	0.13	0.15	
		std:			3.27	1.25	0.33	2.13	3.20	1.62	0.82	0.58	0.33	0.05	0.04	
		min:			53.00	13.33	2.14	3.29	4.63	2.21	0.17	0.04	0.64	0.07	0.06	
		max:			64.59	18.29	3.60	13.72	19.03	9.95	2.96	2.49	2.30	0.19	0.25	

## LITHOGEOCHEMISTRY - PONTIAC SUMMER 1990, PHASE 1 &amp; 2

FILE:alter623

## THOLEIITIC DIORITE

Sample No.	FIELD DESCRIPTION	K-content	Al	SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5		
22319	178 HLI rhyo - GPP, sil3	k-rich	B	38	45	75.89	12.99	1.80	1.17	2.73	0.48	2.04	2.46	0.30	0.06	0.06
22114	149 fel pl. fl bk. to lp fl	k-poor	D	33	64	69.27	14.31	2.22	2.88	2.28	0.88	4.64	2.56	0.72	0.10	0.11

Table 2 (Con't)

(6 of 6)

2001801137/17-4	7 DAC - RHYO DAC, SER. FLOW?	k-poor	R	23	75	77.30	11.89	1.91	1.30	1.75	0.37	3.74	1.26	0.41	0.04	0.04
22119	154 int-tel very lg tl, por. 2% py, po stg	k-poor	R	20	77	72.03	15.04	2.03	2.12	2.91	0.47	5.19	1.52	0.53	0.08	0.08
22127	106 int lp tr, ch13 ser2	k-poor	D	19	84	71.38	14.30	1.94	2.35	2.13	0.74	5.56	1.05	0.44	0.06	0.04
0152481129662-1	77 INT FLOW. PURP MAS, GTI NODULES	k-poor	R	17	86	74.09	12.10	1.99	2.40	2.56	0.75	4.70	0.75	0.49	0.11	0.06
22340	127 cg por rel-int intru, ser=113	k-poor	D	12	87	70.25	14.38	2.00	1.91	4.50	0.57	4.98	0.72	0.50	0.07	0.12
		mean:			72.89	13.29	1.98	2.02	2.69	0.61	4.41	1.48	0.48	0.07	0.07	
		std:			2.75	0.98	0.12	0.57	0.82	0.17	1.10	0.71	0.12	0.02	0.03	
		min:			69.27	11.89	1.80	1.17	1.75	0.37	2.04	0.72	0.30	0.04	0.04	
		max:			77.30	14.38	2.22	2.88	4.50	0.88	5.56	2.56	0.72	0.11	0.12	

## LITHOGEOCHEMISTRY - PONTIAC SUMMER 1990, PHASE 1 &amp; 2

FILE:alter623

THOLEIITIC RHYOLITE

Sample No.	FIELD DESCRIPTION	k-content		SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5		
22113	148 same as 22112 (Calc-Alkaline Dacite)	k-avg	R	45	54	76.54	12.85	1.90	1.71	0.67	0.46	2.94	2.47	0.40	0.01	0.04

## 10.0 UTEM SURVEY

Seventy-two kilometres of lines were surveyed by La Montagne Geophysical Consulting Ltd. under the supervision of Excalibur International Consultants Inc. The method employed was UTEM. The operation report for this surveyed is included in Appendix B of this report.

In brief, the survey outlined two anomalies in the eastern portion of the Pontiac property. The first one extends from L 10+00 S, 8+50 E to L 4+00 S, 5+00 E while the second conductor extends from L 6+00 N, 10+00 E to L 12+00 N, 9+50 E. Recommendations to drill these two were submitted by Excalibur and are included in the beginning of this report.

## 11.0 MINERALIZATION

Mineralization consists predominantly of disseminated and massive pyrite with minor amounts of disseminated and massive chalcopyrite and pyrrhotite. Sulphides occur within pillows, pillow selvages and within the matrix of lapilli tuffs/tuff breccias and pyroclastic flows.

To date there has been no significant surface mineralization observed in the Pontiac property. Analytical results for soil and rock samples did not show any encouraging signals. For these reasons, it has been decided that a statistical analysis for base metal abundances was not necessary.

However, among the soil sample collected during the phase 1 of the programme there are two single high zinc values: sample MH-016 returned 112 ppm Zn and sample T1-1 reported 213 ppm Zn. Sample MH-016 is located at post #1 of claim 1115987, north of Pontiac Creek whereas sample T1-1 is located approximately 25 m north and 20 m east of post #1 of claim 1129908 (south sheet). Geographically, the two soil anomalies form an imaginary east-west trend. Structurally, they occur along Pontiac Creek Fault and geophysically they coincide with an interpreted volcanic vent (Boniwell, 1990). Furthermore, sample T1-1 is enclosed within the alteration zone defined by statistical study of whole rock data.

Nevertheless, a follow-up soil survey was undertaken with 22 samples taken between MH-016 and T1-1 did not prove that the two anomalies are related to each other. For the time being MH-016 is considered spot anomaly.



## 12.0 STAFF

Name	Position	Date
J. Bryce	Junior Assistant	May 26 - Aug. 20, 1990
K. Cook	Senior Assistant	May 26 - Sept.27, 1990
M. Houle	Senior Assistant	May 26 - Sept.27, 1990
J. Moors	Senior Assistant	Sept.19- Sept.27, 1990
K. Pham	Project Geologist	May 26 - Sept.16, 1990
P. Tschipper	Senior Assistant	Sept.19- Sept.27, 1990

## REFERENCES &amp; BIBLIOGRAPHY

Colvine, A.C.

- 1988: Archean Lode Gold Deposits in Ontario, O.G.S.misc. paper 139, p. 31-51.

Descarreaux, Jean

- 1975: A Petrochemical Study of the Abitibi Volcanic Belt and its Bearing on the Occurrences of Massive Sulphide Ores; Can. Mining and Metallurgical Bull., Feb., 1973, p. 1-9.

Easton, R.M. and Johns, G.W.

- 1986: Volcanology and Mineral Exploration: The Application of Physical Volcanology and Facies Studies, in Volcanology and Mineral Deposits, ed. by J. Wood and H. Wallace, O.G.S. misc. report 129, p. 1-40.

Franklin, J.M., et al

- 1981: Volcanic - Associated Massive Sulphide Deposits, Ec. Geol., 75th anniversary volume, p. 485-627.

Grunsky, E.C.

- 1986: Recognition of Alteration in Volcanic Rocks using Statistical Analysis of Lithogeochemical Data; in Volcanology and Mineral Deposits, ed. J. Wood and H. Wallace; O.G.S., Misc. Paper 129.

Jensen, L.S.

- 1975: Geology of Pontiac and Ossian Townships, Districts of Cochrane and Timiskaming; O.D.M., Geol. Rep. 125, 40 p.

Jensen, L.S.

- 1975: Geology of Clifford and Ben Nevis Townships, District of Cochrane; O.D.M., Geoscience Report 132, 55 p. with map 2283, scale 1 inch to 1/2 mile.

Jensen, L.S. and Langford, F.F.

- 1985: Geology and Petrogenesis of the Archean Abitibi belt in the Kirkland Lake area, Ontario; O.G.S., Misc. paper 123, 130p.
- Lydon, J.W.
- 1988a: Volcanogenic Massive Sulphide Deposits, Part 1: A Descriptive Model, in Ore Deposit Models, ed. by R.G. Roberts and P.A. Sheahan, Geoscience Canada reprints series 3, p.145-153.
- Lydon, J.W.
- 1988b: Volcanogenic Massive Sulphide Deposits, Part 2: Genetic Models, in Ore Deposit Models, ed. by R.G. Roberts and P.A. Sheahan, Geoscience Canada reprint series 3, p. 155-181.
- O.G.S.
- 1979: Airborne Electromagnetic and Total Intensity Magnetic Survey, Kirkland Lake area, Pontiac township, district of Cochrane; by Questor Surveys Limited for the O.G.S., Prelim. Map p. 2255 Geophys. Ser., scale 1:20,000. Survey and compilation, Feb. and Mar. 1979.
- Ploeger, F. and Grabowski, G.
- 1979: Pontiac Township, District of Cochrane; Ontario Geological Survey Prelim. Map P.2284, Kirkland Lake Data Series. Scale 1:15840 or 1 inch to 1/4 mile. Data compiled 1978.
- Spence, C.D. and DeRosen - Spence, A.F.
- 1975: The Place of Sulphide Mineralization in the Volcanic Sequence at Noranda, Quebec, Ec. Geol., Vol. 70, P. 90-101.
- Tilsley, J.E. and Mueller, R.P.
- 1988: Regal Goldfields Ltd., Exploration Program - 1988, Ben Nevis Property, Larder Lake Division, Ontario, pp1-22.
- Thurston, P.C.
- 1986: Volcanic Cyclicity in Mineral Exploration: The Caldera

Cycle and Zoned Magma Chambers, in Volcanology and Mineral Deposits, ed. by J. Wood and H. Wallace, O.G.S. Misc. Paper 129, p. 104-123.

Wolfe, W.J.

1977: Chemical Exploration of Early Precambrian Volcanogenic Sulphide Mineralization in Ben Nevis Township, district of Cochrane; O.G.S., study 19, 39p.

CERTIFICATE OF QUALIFICATIONS

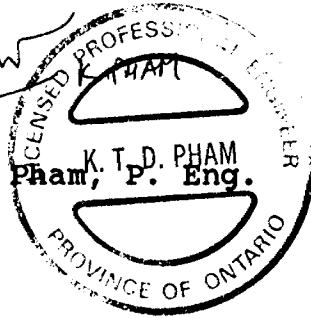
CERTIFICATE OF QUALIFICATIONS

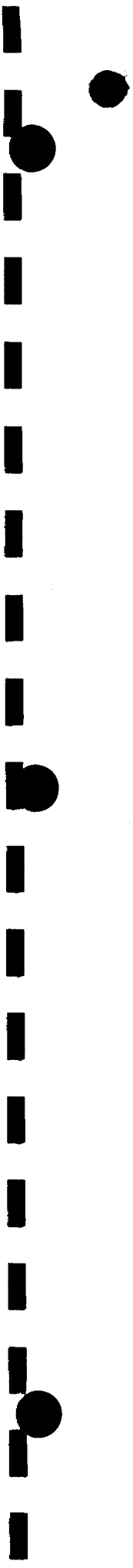
I, Kim T. Pham, of 1-938 Bathurst St., Toronto, Ontario declare that:

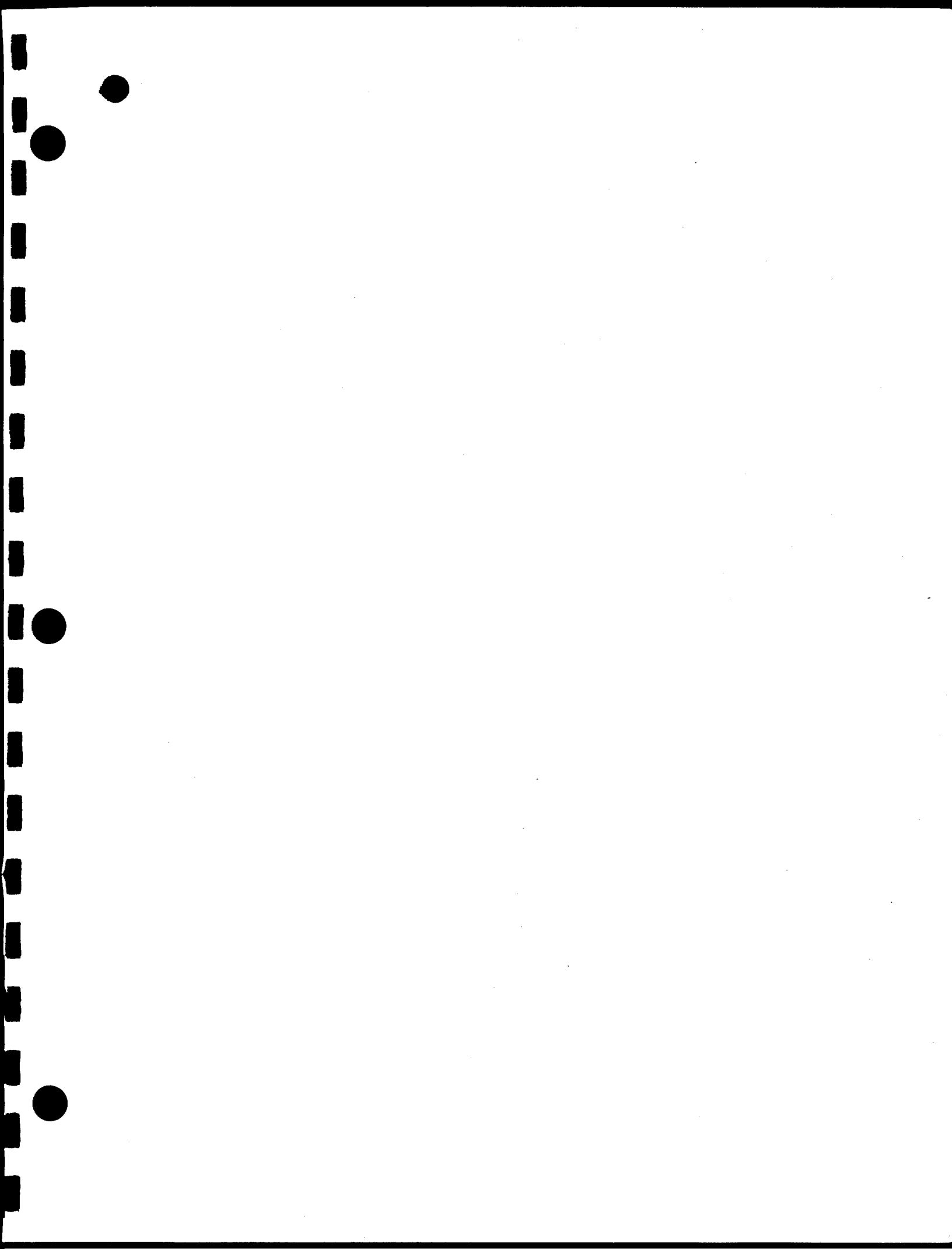
1. I received a Bachelor of Applied Science in Mineral Exploration Geological Engineering from the University of Toronto, Toronto, Ontario in 1987.
2. I have practiced my profession continuously since graduation.
3. I am a registered member in good standing with the Association of Professional Engineers of Ontario.
4. I was employed as a consultant by Orofino Resources Limited of Toronto during the course of this work (Project 623, Pontiac property) in Pontiac Township, Ontario.
5. All the data presented in this report are factual and precise to the best of my knowledge.
6. I do not and will not receive any benefit nor interest from any parties involved in the property except for my consulting fee which was paid for by Orofino.

Toronto, December 27, 1990

*Kim T. Pham*  
Kim T. Pham, P. Eng.









APPENDIX A  
ANALYTICAL RESULTS



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE NO.  
4240

0-026

CHARGE TO  Orofino Resources Ltd. P.O. Box 143 Suite 2701 1 First Canadian Place Toronto, Ontario M5X 1C7	DATE July 18/90	REFERENCE NO. W4205	YOUR ORDER NO.
	SHIP TO		TERMS: NET 30 DAYS

QTY	DESCRIPTION	UNIT PRICE	TOTAL
3	40 Det. of Whole Rock  <i>623-C-4</i> <i>[Signature]</i>	25.00	1,000.00

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT

2031 RIVERSIDE DRIVE, UNIT 2  
 TIMMINS, ONTARIO  
 P4N 7C3  
 TEL: (705) 268-4441 FAX: (705) 268-4420

4600

0-026

CHARGE TO

Orofino Resources  
 P.O. Box 143  
 Suite 2701, 1 First Canadian Place  
 Toronto, Ontario  
 M5X 1C7

DATE: Sept. 11/90 REFERENCE NO.: W4659 YOUR ORDER NO.: 623-C4

SHIP TO: M. Houle

TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
2	46 Det. of Cu Pb Zn	4.60	\$211.60
5	42 Sample Prep.	3.75	\$157.50
			\$369.10

RECEIVED  
 SEP 17 1990

CHECKED BY: [Signature]  
 APPROVED BY: [Signature]  
 623 C4  
 623-C-4

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



**TSL LABORATORIES**

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
 TIMMINS, ONTARIO  
 P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE NO.

4580

0-026

CHARGE TO

Orofino Resources Ltd.  
 Suite 2701, P.O. Box 143  
 1 First Canadian Place  
 Toronto, Ontario M5X 1C7

DATE: Sept 10/90 REFERENCE NO. YOUR ORDER NO.

SHIP TO

TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	Bus Charges from Kirkland Lake to Timmins		
	Bill # 315-399503		22.40
	" 504		26.15
			\$48.55

RECEIVED  
 SEP 17 1990

CHECKED BY: [Signature]  
 APPROVED BY: [Signature]  
 623-C-6

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE NO.
4667

*Jan*

O-026

CHARGE TO  Orofino Resources P.O. Box 143 Toronto, Ontario M5X 1C7	DATE Sept 24/90	REFERENCE NO.	YOUR ORDER NO.
	SHIP TO		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	Bus Charges from Larder Lake to Timmins Bill #315-399566  CHECKED BY _____ APPROVED BY _____ <i>623 E-6</i> <i>[Signature]</i>		\$22.35

INVOICE--PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

KHP

RECEIVED  
JUL 20 1990


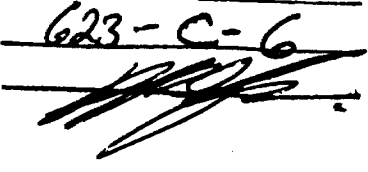
INVOICE NO.  
4122

CHARGE TO

Orofino Resources  
P.O. Box 143  
Toronto, Ontario

0-026

DATE July 5/90	REFERENCE NO.	YOUR ORDER NO.
SHIP TO		

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	Bus Charges from Kirkland Lake to Timmins Bus Bill #315-392004  CHECKED BY  APPROVED BY  623-C-6		\$14.00

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT

TERMS: NET 30 DAYS

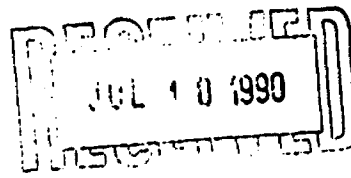


# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420



4105 *in*

O-026

CHARGE TO  Orofino Resources P.O. Box 143 Toronto, Ontario	DATE <b>June 26/90</b>	REFERENCE NO.	YOUR ORDER NO.
	SHIP TO		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	600 Sample Bags	.15	\$90.00

CHECKED BY \_\_\_\_\_  
 APPROVED BY \_\_\_\_\_  
*McKeller*  
 623-C5

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

4008

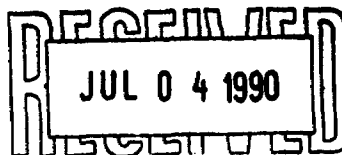
0-026

CHARGE TO <b>Orofino Resources</b>	DATE <b>June 15/90</b>	REFERENCE NO.	YOUR ORDER NO.
	SHIP TO		
			TERMS: NET 30 DAYS

3

Bus Charges from Kirkland Lake

Bill #315-391919  
315-391918



15.20  
15.20  
\$30.40

CHECKED BY

APPROVED BY

623-C-6

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

4052

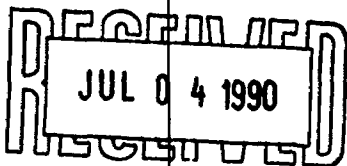
0-026

CHARGE TO <b>Orofino Resources Suite 2701 P.O. Box 143 1 First Canadian Place Toronto, Ontario M5X 1C7</b>	DATE <b>June 21/90</b>	REFERENCE NO.	YOUR ORDER NO.
	SHIP TO		
			TERMS: NET 30 DAYS

3

Shipping from Toronto to Timmins  
Bus Bill # 315-391961  
315-391962

19.75  
16.40  
\$36.15



CHECKED BY

APPROVED BY

623-C-6



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420


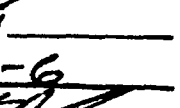
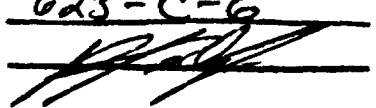
RECEIVED  
JUL 20 1990

INVOICE NO. 4123

0-026

CHARGE TO Orofino Resources P.O. box 143 Toronto, Ontario	DATE July 6/90	REFERENCE NO.	YOUR ORDER NO.
	SHIP TO		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	Bus Charges from Kirkland Lake to Timmins Bus Bill #315-392012		\$7.15

CHECKED BY   
 APPROVED BY   
623-C-6  


INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT





# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

4065

0-026

CHARGE TO Orofino Resources P.O. Box 143 Suite 2701, 1 First Canadian Place Toronto, Ontario M5X 1C7	DATE June 26/90	REFERENCE NO. W4138	YOUR ORDER NO. 623-C4
	SHIP TO T. McKillen		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
2	5 Det. of Cu	2.30	11.50
2	5 Det. of Pb	1.15	5.75
2	5 Det. of Zn	1.15	5.75
5	4 Sample Prep.	3.75	15.00
			<b>\$38.00</b>

**RECEIVED**  
JUL 04 1990  
**REGISTERED**

CHECKED BY   
APPROVED BY   
623-C-4

INVOICE-PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

4058

0-026

CHARGE TO Orofino Resources Suite 2701, 1 First Canadian Place P.O. Box 143 Toronto, Ontario M5X 1C7	DATE June 22/90	REFERENCE NO. W4101	YOUR ORDER NO. 623-C4
	SHIP TO T. McKillen		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	16 Det. of Whole Rock	31.00	496.00
5	16 S.P.	3.75	60.00
			<b>\$556.00</b>

**RECEIVED**  
JUL 04 1990  
**REGISTERED**

CHECKED BY   
APPROVED BY   
623-C-4



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE NO.  
4029

0-026

CHARGE TO Orfino Resources P.O. Box 143 Suite 2701, 1 First Canadian Place Toronto, Ontario MSX 1C7	DATE June 20/90	REFERENCE NO. W4102	YOUR ORDER NO. 623-C4
	SHIP TO K. Pham		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
2	82 Det. of Cu, Pb and Zn	4.60	377.20
5	74 Sample Prep. Soils	.90	66.60
			\$443.80

RECEIVED  
JUL 0 4 1990

CHECKED BY   
APPROVED BY   
623-C-4

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE NO.  
4028

0-026

CHARGE TO Orfino Resources P.O. Box 143 Suite 2701, 1 First Canadian Place Toronto, Ontario MSX 1C7	DATE June 20/90	REFERENCE NO. W4100	YOUR ORDER NO. 623-C4
	SHIP TO K. Cook		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
2	1 Det. of Cu, Pb, and Zn	4.60	4.60
			\$4.60

RECEIVED  
JUL 0 4 1990

CHECKED BY   
APPROVED BY   
623-C-4



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

3907

O-026

CHARGE TO  Orofino Resources P.O. Box 143 Suite 2701 1 First Canadian Place Toronto, Ontario	DATE May 30/90	REFERENCE NO.	YOUR ORDER NO.
	SHIP TO  Maurice Houle		TERMS: NET 30 DAYS

3

500 plastic sample bags

.15

\$75.00

RECEIVED  
JUN 13 1990  
RECEIVED

CHECKED BY 

APPROVED BY

623-C-5

INVOICE-PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2

TIMMINS, ONTARIO

P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

RECEIVED  
JUL 10 1990  
REGISTERED

4081

0-026

CHARGE TO

Orofino Resources  
P.O. Box 143  
Toronto, Ontario

DATE

June 28/90

REFERENCE NO.

W4140

YOUR ORDER NO.

623-C4

SHIP TO

T. McKillen

TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
2	69 Det. of Cu	2.30	158.70
2	69 Det. of Pb	1.15	79.35
2	69 Det. of Zn	1.15	79.35
5	61 Sample Prep Soils	.95	57.95
			<b>\$375.35</b>

CHECKED BY \_\_\_\_\_  
APPROVED BY \_\_\_\_\_  
*T. McKillen*  
623-C4

INVOICE-PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT

# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

RECEIVED  
JUL 20 1990

4150

0-025

CHARGE TO  Orfino Resources P.O. Box 143 Toronto, Ontario	DATE July 9/90	REFERENCE NO. W4137	YOUR ORDER NO. 623-C4
	SHIP TO K. Cook, K. Pham		
	TERMS: NET 30 DAYS		

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	13 Det. of Whole Rock	25.00	325.00
5	13 Sample Prep	3.75	48.75
			<u>373.75</u>

CHECKED BY \_\_\_\_\_  
APPROVED BY \_\_\_\_\_  
623-C-4

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

3974

O-026

CHARGE TO

Orofino Resources  
P.O. Box 143  
Toronto, Ontario  
M5X 1C7

DATE

June 13/90

REFERENCE NO.

W4056

YOUR ORDER NO.

623-C4

SHIP TO

TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
1	5 Det. of Au FA AA	7.75	38.75
2	5 Det. of Cu, Pb, Zn	4.60	23.00
5	5 Sample Prep Soils	.95	4.75
			<b>\$66.50</b>

CHECKED BY \_\_\_\_\_

APPROVED BY \_\_\_\_\_

*[Signature]*  
623-C4

RECEIVED  
JUN 19 1990  
REGISTERED

INVOICE-PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

0-026

4765

*Handwritten initials*

CHARGE TO  Orofino Resources P.O. Box 143 Toronto, Ontario	DATE Oct 11/90	REFERENCE NO. W4792	YOUR ORDER NO. project 623
	SHIP TO K. Pham		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	QUANTITY	TOTAL
2	20 Det. of cu, Pb, zn	4.60	92.00
5	18 Sample Prep	3.75	67.50
			\$159.50

*Handwritten signature*  
623 C4

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

0-026

4770

CHARGE TO  Orofino Resources P.O. Box 143 Toronto, Ontario M5X 1C7	DATE Oct 12/90	REFERENCE NO. W4734	YOUR ORDER NO. 623-C4
	SHIP TO		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	QUANTITY	TOTAL
3	25 Det. of Whole Rock	25.00	\$625.00

CHECKED BY \_\_\_\_\_  
APPROVED BY \_\_\_\_\_  
*Handwritten signature*  
623 C4



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

4241

0-026

**CHARGE TO**

Drofino Resources Ltd.  
P.O. Box 143  
Suite 2701  
1 First Canadian Place  
Toronto, Ontario M5X 1C7

**DATE**

July 18/90

SHIP TO

**REFERENCE NO.**

W4257

**YOUR ORDER NO.**

623

TERMS: NET 30 DAYS

**DESCRIPTION**

3  
5

4 Det. of Whole Rock  
4 Sample Prep.

25.00  
3.75

100.00  
15.00

\$115.00

*623-C-4*  
*[Signature]*

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT

ENCLOSE COPY OF INVOICE WITH PAYMENT

158





# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE  
4675

O-026

CHARGE TO  Orfino Resources P.O. Box 143 Toronto, Ontario	DATE Sept 26/90	REFERENCE NO. W4733	YOUR ORDER NO. 623-C4
	SHIP TO K. Paam		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
2	28 Det. of cu, Pb, Zn	4.60	128.80
5	25 Sample Prep	3.75	<u>93.75</u>
			\$222.55

CHECKED BY \_\_\_\_\_  
 APPROVED BY \_\_\_\_\_  
*623-C4*  
*[Signature]*

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

147

INVOICE NO.
4685

O-026

CHARGE TO  Orofino Resources P.O. Box 143 Toronto, Ontario	DATE	REFERENCE NO.	YOUR ORDER NO.
	Sept 26/90	W4660	project 623
	SHIP TO M. Houle		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	42 Det. of Whole Rock	25.00	\$1,050.00

CHECKED BY \_\_\_\_\_  
 APPROVED BY \_\_\_\_\_  
 623-B4  
*[Signature]*

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

XHP

INVOICE NO.

4466

O-026

CHARGE TO Orofino Resources P.O. Box 143 Toronto, Ontario	DATE Aug. 22/90	REFERENCE NO. W4319	YOUR ORDER NO.
	SHIP TO Project 623		TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	16 Det. of Whole Rock	25.00	400.00
5	16 Sample Prep.	3.75	60.00
TOTAL AMOUNT DUE:-----			460.00
CHECKED BY _____			
APPROVED BY _____			
623-C-4 <i>[Signature]</i>			

INVOICE-PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2

TIMMINS, ONTARIO

P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE NO. 4140

RECEIVED  
JUL 20 1990

0-026

CHARGE TO Orofino Resources P.O. Box 143 Toronto, Ontario	DATE July 6/90	REFERENCE NO. W4206	YOUR ORDER NO. 632-C4
	SHIP TO		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
1	11 Det. of Au FA AA	7.75	85.25
2	11 Det. of Cu,Pb,Zn	4.60	50.60
5	11 Sample Prep	3.75	41.25
			\$177.10

CHECKED BY \_\_\_\_\_  
APPROVED BY \_\_\_\_\_  
023-C-4

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2

TIMMINS, ONTARIO

P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

4249

O-026

CHARGE TO

Orofino Resources  
P.O. Box 143  
Toronto, Ontario

DATE

July 24/90

REFERENCE NO.

W4317

YOUR ORDER NO.

623

SHIP TO

TERMS: NET 30 DAYS

2

1 Det. of cu, Pb, Zn

4.60

\$4.60

623-C-4

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420



RECEIVED  
JUL 20 1990

4151

0-026

CHARGE TO Orofino Resources P.O. Box 143 Toronto, Ontario	DATE July 9/90	REFERENCE NO. W4139	YOUR ORDER NO. 623-C4
	SHIP TO K. Cook, K. Pham		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	20 Det. of Whole Rock	25.00	500.00
5	20 Sample Prep	3.75	75.00
			<u>575.00</u>

CHECKED BY   
 APPROVED BY 623-C-4  


INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE NO.
4191

45

0-026

CHARGE TO Orofine Resources P.O. Box 143 Suite 2701 1 First Canadian Place Totonto, Ontario M5X 1C7	DATE July 16/90	REFERENCE NO. W4256	YOUR ORDER NO. 623-C4
	SHIP TO J. Bryce		
	TERMS: NET 30 DAYS		

CODE	DESCRIPTION	UNIT PRICE	TOTAL
2	37 Det. of Cu, Pb & Zn	4.60	170.20
5	34 Sample Prep.. Soils	.95	32.30
<i>623 C4</i>			
Total Amount Due-			202.50

INVOICE-PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE NO.
4195

0-026

CHARGE TO Orfino Resources Ltd. Suite 2701 P.O. Box 143 1 First Canadian Place toronto, Ontario M5X 1C7	DATE July 13/90	REFERENCE NO. W4213	YOUR ORDER NO. 623
	SHIP TO		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	10 Det. of Whole rock	25.00	250.00
5	10 Sample Prep.	3.75	37.50
<i>Umbell</i> 623 C4			
Total Amount Due			287.50

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT





# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

RECEIVED  
JUL 20 1990

INVOICE NO.  
4143


CHARGE TO

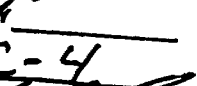
Orofino Resources  
P.O. Box 143  
Toronto, Ontario

0-026


DATE July 6/90	REFERENCE NO. W4214	YOUR ORDER NO. 623-C4
SHIP TO		

CODE	DESCRIPTION	UNIT PRICE	TERMS: NET 30 DAYS	
			TOTAL	
2	26 Det. of cu, Pb, Zn	4.60	119.60	
5	26 Sample Prep	.95	24.70	
			<u>144.30</u>	\$144.30

CHECKED BY 

APPROVED BY 

623-C-4



INVOICE-PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



**TSL LABORATORIES**  
 DIV. BURGNER TECHNICAL ENTERPRISES LIMITED  
 2031 RIVERSIDE DRIVE, UNIT 2  
 TIMMINS, ONTARIO  
 P4N 7C3  
 TEL: (705) 268-4441 FAX: (705) 268-4420

4994

N-005

CHARGE TO  Northgate Exploration P.O. Box 143 Toronto, Ontario <i>Orfino</i>	DATE Nov 29/90	REFERENCE NO. W4989	YOUR ORDER NO. 623 C4
	SHIP TO Ken Cook		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
5	10 Det. of Whole Rock  ENTERED DEC 28 1990  CHECKED BY _____ APPROVED BY _____ <i>623 C4</i>	25.00	\$250.00

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



**TSL LABORATORIES**  
 DIV. BURGNER TECHNICAL ENTERPRISES LIMITED  
 2031 RIVERSIDE DRIVE, UNIT 2  
 TIMMINS, ONTARIO  
 P4N 7C3  
 TEL: (705) 268-4441 FAX: (705) 268-4420

INVOICE NO.  
4995

N-005

CHARGE TO  Northgate Exploration P.O. Box 143 Toronto, Ontario <i>Orfino</i>	DATE Nov 29/90	REFERENCE NO. W4987	YOUR ORDER NO. 623 C4
	SHIP TO Ken Cook		
			TERMS: NET 30 DAYS

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	20 Det. of Whole Rock  ENTERED DEC 28 1990  CHECKED BY _____ APPROVED BY _____ <i>623 C4</i>  RECEIVED DEC 28 1990	25.00	\$500.00

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT

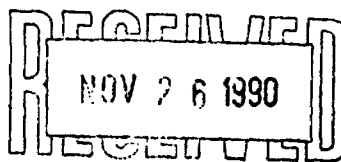


# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420



INVOICE NO.
4970

*Input*

N-005

CHARGE TO Northgate Exploration Ltd. Suite 2701, P.O. Box 143 1 First Canadian Place Toronto, Ontario M5X 1C7	DATE	REFERENCE NO.	YOUR ORDER NO.
	Nov 20/90	W4988	623C4
SHIP TO			TERMS: NET 30 DAYS
Ken Cook			

CODE	DESCRIPTION	UNIT PRICE	TOTAL
2	10 Det of Cu, Pb, Zn.	\$4.60	\$ 46.00
5	10 Sample Prep.	3.75	37.50
Total Amount			\$ 83.50

623-C-4

*[Signature]*

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT

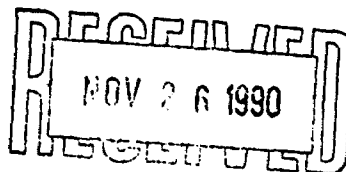


# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420



INVOICE NO.
4969

N-005

CHARGE TO Northgate Exploration Ltd. Suite 2701, P.O. Box 143 1 First Canadian Place Toronto, Ontario M5X 1C7	DATE	REFERENCE NO.	YOUR ORDER NO.
	Nov 20/90	W4986	623C4
SHIP TO			TERMS: NET 30 DAYS
Ken Cook			

CODE	DESCRIPTION	UNIT PRICE	TOTAL
2	20 Det. of Cu, Pb, Zn.	\$4.60	\$ 92.00
5	20 Sample Prep.	3.75	75.00
Total Amount			\$ 167.00

623-C-4

*[Signature]*

INVOICE—PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT



# TSL LABORATORIES

DIV. BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT 2  
TIMMINS, ONTARIO  
P4N 7C3

TEL: (705) 268-4441 FAX: (705) 268-4420

4541

0-026

CHARGE TO	DATE	REFERENCE NO.	YOUR ORDER NO.
Orofino Resources Ltd. Suite 2701 P.O. Box 143 1 First Canadian Place Toronto, Ontario M5X 1C7	Aug 31/90	W4593	623
	SHIP TO Kim Pham		
	TERMS: NET 30 DAYS		

CODE	DESCRIPTION	UNIT PRICE	TOTAL
3	2 Det. of Whole Rock	25.00	\$50.00

RECEIVED  
SEP 17 1990

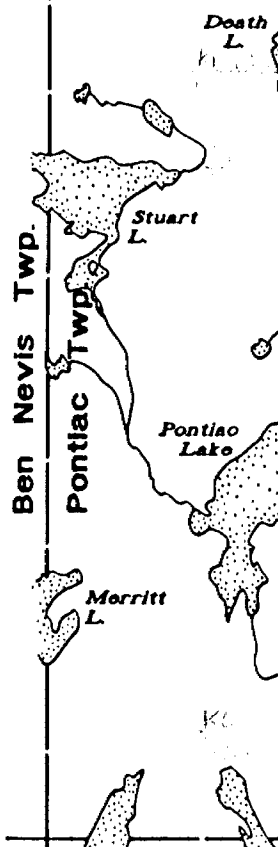
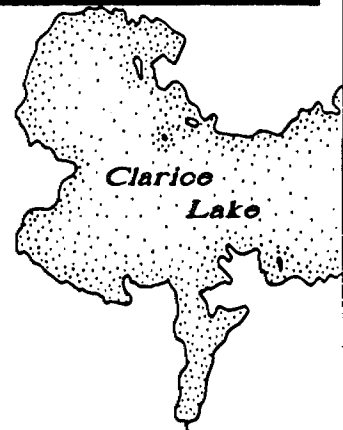
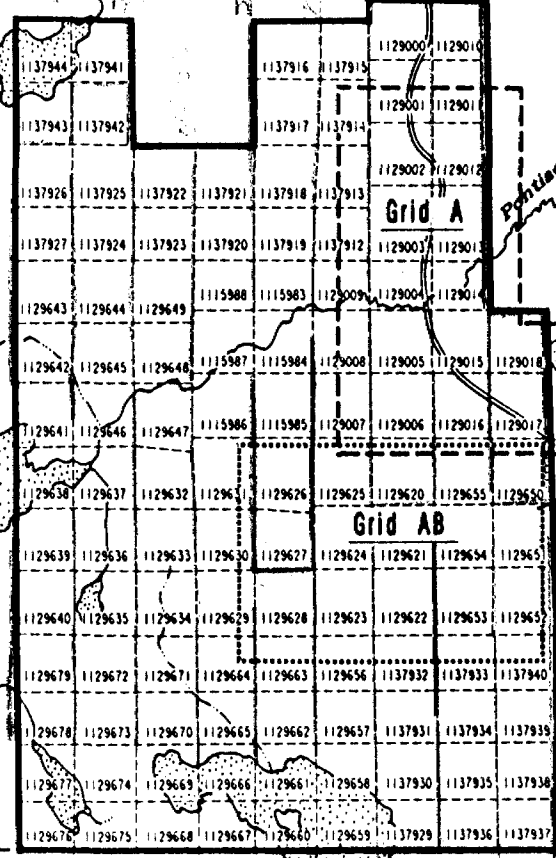
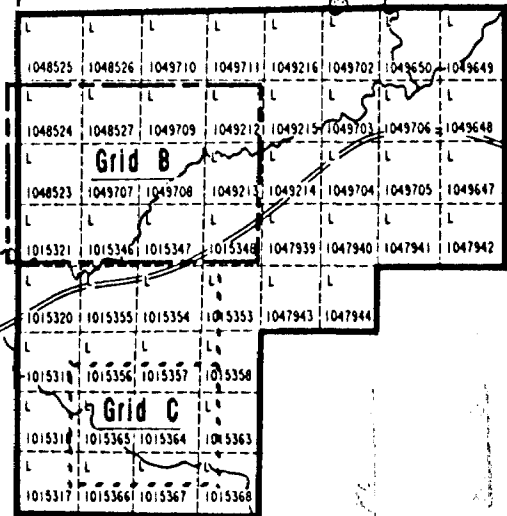
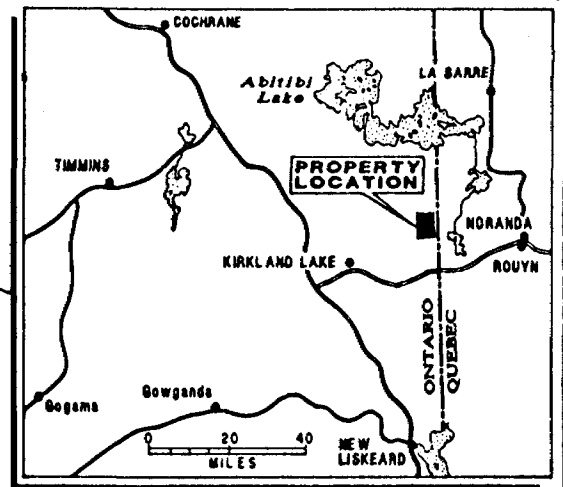
CHECKED BY  
APPROVED BY  
623-C-4

INVOICE - PLEASE ENCLOSE COPY OF INVOICE WITH PAYMENT

1649

**APPENDIX A**  
**ANALYTICAL RESULTS**

Dokis Twp.



Ben Nevis Twp.

Pontiac Twp.

Ossian Twp.

Sunrise L.

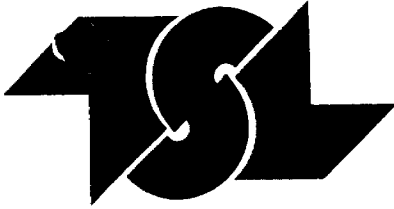


**OROFINO RESOURCES LTD.**  
**PONTIAC TWP. PROJECT - No. 623**  
 Pontiac Twp., Cochrane Dist., Larder Lake Mining Div., Ont. N.T.S. 32 D 5  
**CLAIM & GRID LOCATION MAP**



Drawn by RODEL E. ORTIZ March 90

Figure No. 1



# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

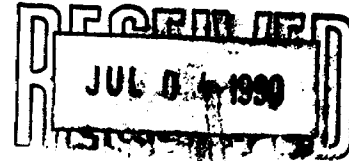
SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4102

INVOICE #: 4029  
P.O.: 623-C4

SAMPLE(S) OF Soil

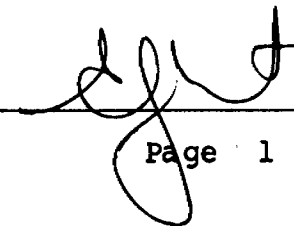
K. Pham  
623



	Cu ppm	Pb ppm	Zn ppm
KC-001	20	14	21
KC-002	18	4	23
KC-003	12	9	41
KC-004	14	4	46
KC-005	8	3	21
KC-006	12	3	24
KC-007	11	6	18
KC-008	12,11	8,5	30,31
KC-009	36	6	38
KC-010	6	7	19
KC-011	10	6	22
KC-012	16	8	22
KC-013	6	6	26
KC-014	7	8	21
KC-015	4	3	21
KC-016	6,5	3,3	22,20
KC-017	4	3	18
KC-018	5	7	28
KC-019	7	6	24
KC-020	6	3	33

COPIES TO: Kirkland Lake, Toronto  
INVOICE TO: Toronto

Jun 20/90

SIGNED 



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4102

SAMPLE(S) OF Soil

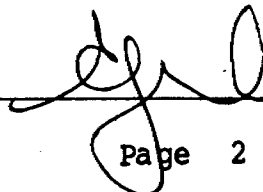
INVOICE #: 4029  
P.O.: 623-C4

K. Pham  
623

	Cu ppm	Pb ppm	Zn ppm
KC-021	6	5	9
JS-001	5	6	15
JS-002	21	14	43
JS-003	15	6	27
JS-004	14	7	26
JS-005	14,14	2,4	22,22
JS-006	10	12	23
JS-007	8	8	17
JS-008	9	5	19
JS-009	5	3	23
JS-010	6	5	22
JS-011	7	3	18
JS-012	6	3	13
JS-013	4	5	10
JS-014	4	3	11
JS-015	10	6	27
JS-016	8,6	3,3	10,8
JS-017	5	4	13
JS-018	6	8	12
JS-019	6	5	12

COPIES TO: Kirkland Lake, Toronto  
INVOICE TO: Toronto

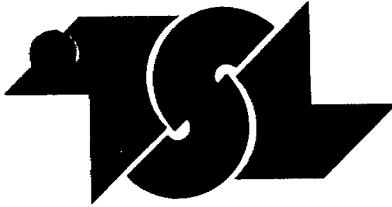
Jun 20/90

SIGNED 



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4102

INVOICE #: 4029

P.O. : 623-C4

SAMPLE(S) OF Soil

K. Pham  
623

	Cu ppm	Pb ppm	Zn ppm
JS-020	13	13	29
JS-021	9	4	21
JS-022	7	5	19
JS-023	7	2	14
KP-001	7,7	5,6	11,13
KP-002	8	4	17
KP-003	9	5	22
KP-004	8	5	11
KP-005	4	1	10
KP-006	9	3	30
KP-007	19	5	46
KP-008	11	7	21
KP-009	9	4	25
KP-010	6	2	17
KP-011	9	7	24
KP-012	6	2	10
KP-013	3	2	8
MH-001	9,9	5,5	19,17
MH-002	12	5	15
MH-003	8	4	25

COPIES TO: Kirkland Lake, Toronto

INVOICE TO: Toronto

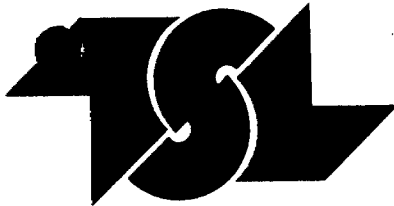
Jun 20/90

SIGNED \_\_\_\_\_

Page 3 of 4



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Profino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4102

INVOICE #: 4029  
P.O.: 623-C4

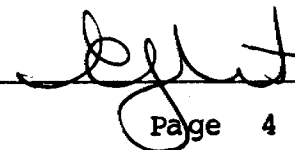
SAMPLE(S) OF Soil

K. Pham  
623

	Cu ppm	Pb ppm	Zn ppm
MH-004	9	4	15
MH-005	6	5	17
MH-006	5	11	16
MH-007	8	7	24
MH-008	4,4	7,8	5,7
MH-009	4	3	14
MH-010	5	4	23
MH-011	6	6	23
MH-012	3	7	3
MH-013	5	4	12
MH-014	12	5	18
MH-015	4	7	6
MH-016	52	17	112
MH-017	7,7	9,9	8,10
MH-018	Did Not Receive		

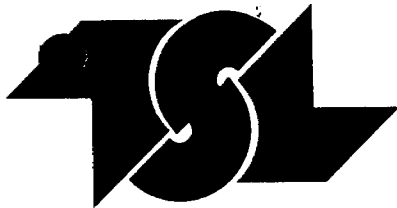
COPIES TO: Kirkland Lake, Toronto  
INVOICE TO: Toronto

Jun 20/90

SIGNED 

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4214

INVOICE #: 4143  
P.O.: 623-C4

SAMPLE(S) OF ~~SOIL~~

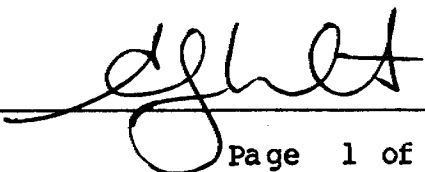
K. Cook, J. Bryce  
project 623

623 1990  
GEOCHEMISTRY  
SOILS

	Cu ppm	Pb ppm	Zn ppm
JS-45	6	6	14
JS-46	5	3	14
JS-47	9, 8	4, 3	26, 24
JS-48	7	5	19
JS-49	5	3	14
JS-50	10	10	24
JS-51	12	7	25
KC-34	10	4	21
KC-35	7	3	16
KC-36	3	<2	10
KC-37	17	3	16
KC-38	7	3	28
KC-39	11	2	13
KC-40	10	4	21
KC-41	4	3	26
KC-42	4	3	30
KC-43	4	4	16
KC-44	4	5	17
KC-45	5, 5	2, 2	29, 29
KC-46	7	3	14

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jul 06/90

SIGNED 



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4214

INVOICE #: 4143

P.O.: 623-C4

SAMPLE(S) OF soils

K. Cook, J. Bryce  
project 623

	Cu ppm	Pb ppm	Zn ppm
KP-30	6	2	15
KP-31	8	9	21
KP-32	11	9	26
KP-33	3, 2	2, 3	13, 11
KP-34	4	6	19
KP-35	6	<2	14

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jul 06/90

SIGNED \_\_\_\_\_

Page 2 of 2



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.

*To sil*



# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO  
P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4140

INVOICE #: 4081  
P.O. : 623-C4

SAMPLE(S) OF soils

K. Cook & K. Pham  
project 623

	Cu ppm	Pb ppm	Zn ppm
KC-022	8	6	56
KC-023	3	6	34
KC-024	6	6	22
KC-025	4	2	12
KC-026	7	4	14
KC-027	11,11	2,1	35,35
KC-028	5	<1	14
KC-029	11	1	34
KC-030	14	4	35
KC-031	5	2	17
KC-032	6	3	23
KC-033	4	2	19
KP-014	6,6	8,9	24,24
KP-015	7	8	33
KP-016	7	6	33
KP-017	10	7	26
KP-018	4	7	19
KP-019	6	8	23
KP-020	9	3	23
KP-021	4	8	19

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jun 28/90

SIGNED *[Signature]*



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4140

INVOICE #: 4081  
P. O. : 623-C4

SAMPLE(S) OF soils

K. Cook & K. Pham  
project 623

	Cu ppm	Pb ppm	Zn ppm
KP-022	8,9	6,8	24,25
KP-023	6	3	21
KP-024	7	3	20
KP-025	5	6	14
KP-026	3	6	19
KP-027	6	12	20
KP-028	12	5	24
KP-029	8	5	25
MH_018	4	8	21
MH_019	6,9	7	36,39
MH_020	6	5	19
MH_021	7	7	29
MH_022	4	9	21
MH_023	7	7	29
MH_024	4	2	16
MH_025	11	4	29
MH_026	7,7	12,12	18,19
MH_027	4	9	14
MH_028	8	8	36
MH_029	6	7	27

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jun 28/90

SIGNED 

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4140

INVOICE #: 4081  
P.O.: 623-C4

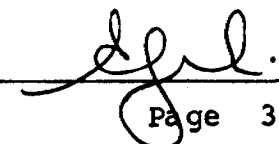
SAMPLE(S) OF soils

K. Cook & K. Pham  
project 623

	Cu ppm	Pb ppm	Zn ppm
MH_030	2	7	15
JS-024	3	7	19
JS-025	5	6	16
JS-026	7	3	16
JS-027	7	7	27
JS-028	9	5	29
JS-029	5,5	8,6	19,17
JS-030	11	4	18
JS-031	10	5	17
JS-033	10	3	15
JS-034	9	5	18
JS-035	6	10	13
JS-036	11	5	30
JS-037	11	10	23
JS-038	8,9	10,10	28,32
JS-039	11	5	31
JS-040	6	5	22
JS-041	5	5	20
JS-042	5	4	19
JS-043	11,11	27,26	27,26

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jun 28/90

SIGNED 

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Profino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4140

INVOICE #: 4081  
P.O.: 623-C4

SAMPLE(S) OF soils

K. Cook & K. Pham  
project 623

	Cu ppm	Pb ppm	Zn ppm
JS-044	7	5	16

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jun 28/90

SIGNED \_\_\_\_\_

Page 4 of 4



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4256

SAMPLE(S) OF soils

INVOICE #: 4191  
P.O.: 623-C4

J. Bryce  
project 623

	Cu ppm	Pb ppm	Zn ppm
A-1	7	9	20
A-2	9,8	19,18	23,27
A-3	6	3	10
A-4	4	3	3
A-5	5	4	17
A-6	5	3	6
A-7	11	6	25
A-8	4	8	8
A-9	4	4	12
A-10	6	5	11
A-11	7	3	12
B-1	6	3	4
B-2	10	3	14
B-3	4	8	4
B-4	5	4	7
B-5	9	2	8
B-6	4	3	3
B-7	4,5	4,4	7,9
B-8	4	3	4
B-9	4	<2	25

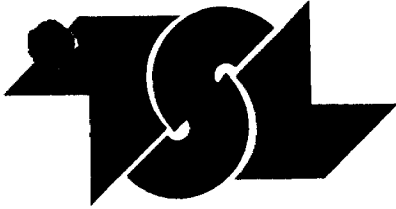
COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jul 16/90

SIGNED *J. Bryce*



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4256

INVOICE #: 4191  
P.O.: 623-C4

SAMPLE(S) OF soils

J. Bryce  
project 623

	Cu ppm	Pb ppm	Zn ppm
B-10	4	3	27
B-11	7	3	12
B-12	4	4	2
B-13	6	5	6
B-14	4	3	4
B-15	6	4	8
B-16	7	4	8
KC-47	8,8	6,7	14,14
KC-48	12	7	25
KC-49	11	6	17
JS-52	3	6	12
JS-53	11	4	29
JS-54	16	4	40
JS-55	24	8	55

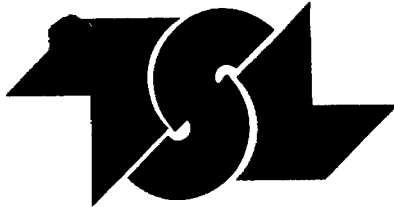
COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jul 16/90

SIGNED *A.G. Bryce*



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

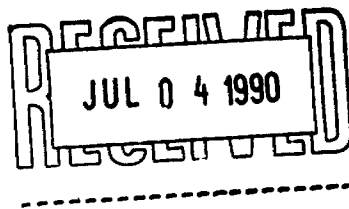
REPORT No.  
W4100

SAMPLE(S) OF pulp from W4099

INVOICE #: 4028  
P.O.: 623-C4

K. Cook  
project 623

	Cu ppm	Pb ppm	Zn ppm
2001801129002-3	39	5	65



COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jun 20/90

SIGNED



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

(DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED)

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO  
P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4212

SAMPLE(S) OF

INVOICE # 4142  
P.O. : 623-C4

K. Cook, J. Bryce  
project 623

	Cu ppm	Pb ppm	Zn ppm
0040001129661-1	8, 7	2, 2	17, 16

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jul 06/90

SIGNED \_\_\_\_\_



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



RECEIVED  
OCT - 4 1990

# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO  
P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4733

SAMPLE(S) OF rocks

INVOICE #: 4675  
P.O.: 623-C4

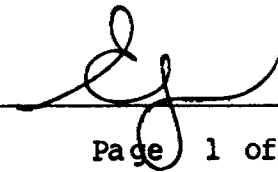
K. Pham  
623-C4

	Cu ppm	Pb ppm	Zn ppm
22121	52	3	61
22122	39	3	39
22123	24	2	36
22124	12	2	77
22125	54, 56	4, 4	59, 62
22126	7	5	43
22127	18	3	59
22128	54	<2	56
22129	15	2	43
22131	19	<2	67
22327	6	2	33
22328	16	4	56
22329	62	4	73
22330	36	2	110
22331	5	4	39
22332	2, 5	8, 10	62, 71
22333	42	3	81
22334	9	12	85
22335	11	3	36
22336	40	7	57

RECEIVED  
OCT - 4 1990

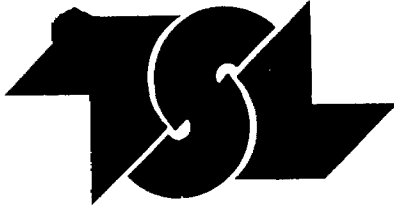
COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Sep 26/90

SIGNED 



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4733

INVOICE #: 4675  
P.O.: 623-C4

SAMPLE(S) OF Rocks

K. Pham  
623-C4

	Cu ppm	Pb ppm	Zn ppm
22337	49	5	73
22338	150	3	44
22339	54, 58	7, 9	52, 59
22340	41	3	43
22341	75	14	115

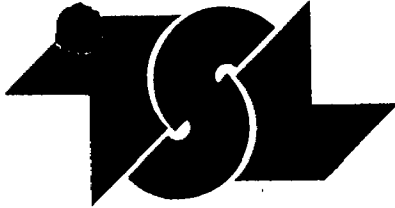
COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Sep 26/90

SIGNED \_\_\_\_\_  
Page 2 of 2

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

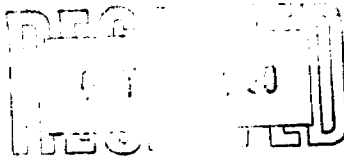
TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Toronto, Ontario  
M5X 1C7  
T. McKillen



REPORT No.  
W4792

SAMPLE(S) OF rock

INVOICE #: 4765  
P.O.: 623-C4

K. Pham  
project 623

	Cu ppm	Pb ppm	Zn ppm
22130	55	67	355
22342	17	50	47
22343	10	51	32
22344	8	30	53
22345	15, 13	39, 34	50, 45
22514	43	14	61
22515	10	15	43
22516	3	19	88
22517	12	10	41
22518	11	14	46
22519	26	13	67
22520	36	3	70
22521	31	8	69
28852	25	6	35
28853	54	7	62
28854	48, 52	15, 13	78, 69
28855	11	13	52
29101	9	19	40

COPIES TO: Toronto, Timmins  
INVOICE TO: Toronto

Oct 11/90

SIGNED \_\_\_\_\_



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4138

INVOICE #: 4065  
P.O.: 623-C4

SAMPLE(S) OF Pulp-W4137 & Rocks

K. Cook & K. Pham  
project 623

REMARKS: Assay - >5000 ppm Cu & Pb. Sample shipment notice not complete.

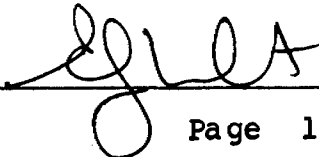
	Cu ppm	Pb ppm	Zn ppm
135200366254-4	31	11	16
140200366254-4	460	4	38
145207366254-4	75	3	40
3680001129635-1	8	19	5
3683581129635-1	13	6	47

RECEIVED  
JUL 04 1990

RECEIVED  
JUL 04 1990

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jun 26/90

SIGNED 

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.







**T S L LABORATORIES**

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

**CERTIFICATE OF ANALYSIS**

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4212

INVOICE #: 4142  
P.O.: 623-C4

SAMPLE(S) OF ~~rock~~

K. Cook, J. Bryce  
project #23

	Cu ppm	Pb ppm	Zn ppm
0040001129661-1	8, 7	2, 2	17, 16

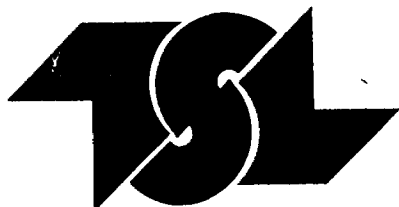
COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jul 06/90

SIGNED \_\_\_\_\_



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO  
P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4317

SAMPLE(S) OF pulp from W4319

INVOICE #: 4249  
P.O. : 623-C4

J. Bryce  
project 623

	Cu ppm	Pb ppm	Zn ppm
22483	5	<2	66

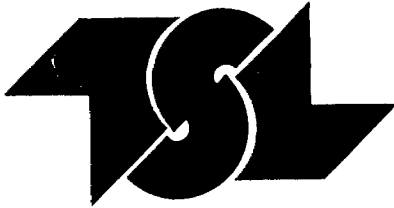
COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jul 24/90

SIGNED 

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4659

INVOICE #: 4600  
P.O.: 623-C4

SAMPLE(S) OF rock

M. Houle  
project 623

	Cu ppm	Pb ppm	Zn ppm
22108 FE	74	4	59
22109 FE	9	2	38
22110 FE	8	<2	37
22111	4	<2	46
22112	11, 11	2, 2	22, 23
22113	13	4	4
22114	19	5	110
22115	61	<2	48
22116	33	<2	55
22117 FE	24	7	53
22118 FE	140	<2	80
22119 FE	24	<2	50
22120 FE	9	3	52
22510 FE	23	6	73
22511 FE	9, 10	<2, <2	59, 62
22512	13	7	79
22513	63	2	68
22301	16	2	30
22302 FE	9	2	57
22303 FE	19	3	60

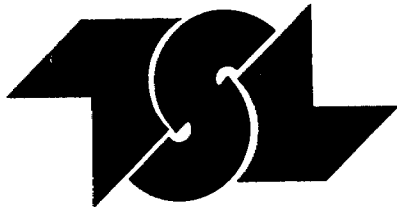
COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Sep 11/90

SIGNED \_\_\_\_\_

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO  
P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4659

INVOICE #: 4600  
P.O. : 623-C4

SAMPLE(S) OF rock

M. Houle  
project 623

	Cu ppm	Pb ppm	Zn ppm
22304	22	13	145
22305	20	9	43
22306 V1	7	2	68
22307 V1	11	5	57
22308	15, 14	<2, <2	24, 25
22309 FE	5	<2	43
22310 FE	12	5	49
22311 FE	16	3	57
22312 FE	9	<2	43
22313 FE	5	<2	52
22314 FE	8	<2	53
22315 FE	36	<2	32
22316 FE	19	<2	88
22317 FE	34	<2	38
22318 FE	8, 9	3, 2	42, 45
22319 FE	5	2	32
22320 FE	11	3	37
22321 FE	5	<2	48
22322 FE	3	<2	38
22324	16	<2	47

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

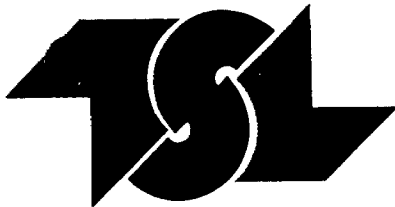
Sep 11/90

SIGNED \_\_\_\_\_



Page 2 of 3

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO  
P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4659

INVOICE #: 4600  
P.O.: 623-C4

SAMPLE(S) OF rock

M. Houle  
project 623

	Cu ppm	Pb ppm	Zn ppm
22325	9	8	69
22326 FE	12	7	29

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Sep 11/90

SIGNED \_\_\_\_\_ 

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





**T S L LABORATORIES**

DIVISION OF RUPGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO  
P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

**CERTIFICATE OF ANALYSIS**

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4733

INVOICE #: 4675  
P.O. : 623-C4

SAMPLE(S) OF Rocks

K. Pham  
623-C4

	Cu ppm	Pb ppm	Zn ppm
22121	52	3	61
22122	39	3	39
22123	24	2	36
22124	12	2	77
22125	54, 56	4, 4	59, 62
22126	7	5	43
22127	18	3	59
22128	54	<2	56
22129	15	2	43
22131	19	<2	67
22327	6	2	33
22328	16	4	56
22329	62	4	73
22330	36	2	110
22331	5	4	39
22332	2, 5	8, 10	62, 71
22333	42	3	81
22334	9	12	85
22335	11	3	36
22336	40	7	57

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Sep 26/90

SIGNED \_\_\_\_\_ 



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF DURGENEA TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4733

INVOICE #: 4675  
P.O. : 623-C4

SAMPLE(S) OF rocks

K. Pham  
623-C4

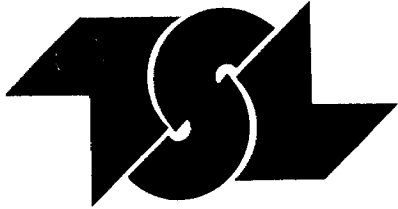
	Cu ppm	Pb ppm	Zn ppm
22337	49	5	73
22338	150	3	44
22339	54, 58	7, 9	52, 59
22340	41	3	43
22341	75	14	115

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Sep 26/90

SIGNED \_\_\_\_\_





# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Toronto, Ontario  
M5X 1C7  
T. McKillen

REPORT No.  
W4792

INVOICE #: 4765

P. O. : 623-C4

SAMPLE(S) OF rock

K. Pham  
project 623

	Cu ppm	Pb ppm	Zn ppm
22130	55	67	355
22342	17	50	47
22343	10	51	32
22344	8	30	53
22345	15, 13	39, 34	50, 45
22514	43	14	61
22515	10	15	43
22516	3	19	88
22517	12	10	41
22518	11	14	46
22519	26	13	67
22520	36	3	70
22521	31	8	69
28852	25	6	35
28853	54	7	62
28854	48, 52	15, 13	78, 69
28855	11	13	52
29101	9	19	40

COPIES TO: Toronto, Timmins  
INVOICE TO: Toronto

Oct 11/90

SIGNED \_\_\_\_\_

Page 1 of 1



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



MW166

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7G3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW166

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium MetaBorate Fusion

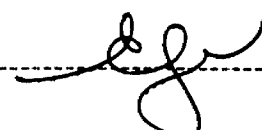
Drafting Resources  
 Suite 2701, 1 First Canadian Place  
 P.O. Box 140  
 Toronto, Ontario M5X 1G7  
 \*DUP REFERENCE - project 623

T.S.L. REPORT No. : W4101  
 T.S.L. File No. : M7070  
 T.S.L. Invoice No. : 4058

SAMPLE #	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI	TOTAL
	%	%	%	%	%	%	%	%	%	%	%	%
010357113791-4	73.76	11.69	3.42	1.65	9.54	4.59	1.50	0.72	0.08	0.04	1.35	99.65
0100001129642-1	50.34	17.25	6.52	9.92	4.32	2.96	0.08	1.08	0.15	0.12	5.41	100.17
4000001129644-1	54.49	17.04	8.48	6.12	5.29	4.04	0.22	0.92	0.11	0.14	3.44	100.30
2050201137927-1	52.67	15.42	8.59	6.47	5.63	1.92	0.68	0.93	0.16	0.16	5.06	99.69
1621801137926-4	52.21	17.99	7.06	6.09	2.69	1.78	3.44	0.85	0.11	0.16	7.18	100.55
0970001137927-1	50.74	16.35	6.58	18.12	2.36	10.49	0.12	0.90	0.14	0.12	4.28	100.21
2001901137917-4	75.76	11.68	3.29	1.72	0.36	3.68	1.24	0.40	0.04	0.04	2.11	100.54
1610001129642-1	57.03	16.33	8.15	6.39	4.20	3.78	0.48	0.91	0.13	0.16	3.02	100.60
0103141115987-4	61.88	15.35	6.94	5.10	1.55	3.96	1.34	1.11	0.14	0.18	2.77	100.23
2251801137941-2	58.30	15.16	8.54	6.66	3.69	4.17	0.48	1.03	0.13	0.18	2.52	100.87
0261281137926-4	57.81	16.01	7.52	4.49	4.43	4.55	0.32	0.92	0.12	0.16	2.75	99.06
1137926-1	56.63	16.26	7.34	4.40	4.42	4.59	0.30	0.92	0.12	0.16	3.70	100.86
0150001137941-2	52.29	20.20	6.20	10.17	5.34	2.31	0.32	0.51	0.10	0.08	3.28	100.80
0501801137942-2	57.03	15.09	9.27	9.32	2.88	1.88	0.20	1.09	0.14	0.18	2.67	99.74
0152041137941-1	57.99	14.55	7.10	6.21	5.27	4.12	0.08	0.82	0.12	0.14	2.94	99.34
0852701137926-1	55.15	16.58	7.89	4.80	5.08	4.34	0.80	0.98	0.13	0.14	3.23	99.12

DATE : JUN-22-1990

SIGNED :



1 of 2

MW165

B.L. LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMING, ONTARIO RAN 703

TELEPHONE #: (705) 269 - 4441

FAX #: (705) 269 - 4400

MW165

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METASCORATE FUSION

Drifting Resources

T.S.L. REPORT No. : 44101

T.S.L. File No. : M7070

T.S.L. Invoice No. : 4055

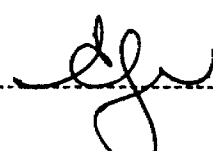
YOUR REFERENCE - project b22

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
0103571137916-4	350	90	200	64	7
0200001129642-3	50	130	80	16	29
4000001129644-1	110	200	130	18	20
2050201137923-1	220	550	120	24	23
1621801137924-4	580	60	160	26	16
0970001137927-1	40	170	100	22	19
2001801137917-4	210	50	230	50	8
1610001129647-1	190	260	140	26	23
0103141115987-4	350	170	150	38	16
2251801137941-2	260	160	160	22	23
0261281137925-4	140	110	160	24	18
0261291137926-1	120	100	140	26	18
0150001137941-2	110	200	90	10	14
0501801137942-2	60	280	140	22	21
0192341137941-1	70	190	110	22	18
1852701137926-1	570	200	120	20	19

DATE : JUN-22-1990

SIGNED :



2 of 2

MWJEG

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWJEG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium MetaBorate Fusion

Drofino Resources  
P.O. Box 143  
Toronto, Ontario

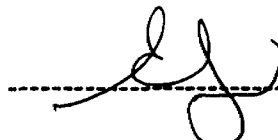
T.S.L. REPORT No. : M4139  
T.S.L. File No. : M7097  
T.S.L. Invoice No. : 4151

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
0360001187935-1	57.88	15.28	6.14	5.25	4.21	3.38	0.62	0.63	0.09	0.12	4.26	97.87
1870101137934-1	68.97	12.12	3.14	3.48	0.51	1.66	2.46	0.29	0.08	0.06	4.77	97.53
1820001129652-3	71.55	12.97	3.38	0.74	0.49	4.71	1.48	0.31	0.07	0.04	2.26	98.00
1129677-4	54.52	16.43	7.92	6.91	5.03	3.98	0.12	0.77	0.12	0.18	4.19	100.18
2000001129677-1	71.98	12.69	3.94	2.67	0.83	4.85	0.52	0.57	0.07	0.10	1.91	100.14
4000001129634-3	56.78	14.78	8.71	7.43	3.66	2.41	0.48	1.19	0.13	0.20	4.98	100.72
2803571129673-1	58.81	13.05	6.84	6.73	2.27	1.32	2.30	1.07	0.13	0.18	7.72	100.42
1129635-1	53.44	16.02	8.98	9.84	3.97	1.08	0.12	1.26	0.13	0.22	4.50	99.56
2000001129669-1	53.23	16.13	9.26	9.81	4.16	0.94	0.42	1.11	0.13	0.18	4.17	99.54
0050901129640-4	54.56	18.44	7.23	7.47	4.38	3.98	0.24	0.77	0.12	0.12	3.31	100.61
1000901129673-4	49.93	17.43	9.83	10.07	5.75	2.74	0.10	0.95	0.15	0.12	3.41	100.47
2200001129636-1	58.15	15.15	8.41	5.95	5.46	2.18	0.58	0.95	0.12	0.16	3.40	100.52
1129636-1	78.99	11.69	2.14	0.51	0.34	4.15	1.16	0.44	0.06	0.06	0.94	100.48
1129015-1	68.40	13.00	3.99	1.83	0.91	4.36	1.36	0.46	0.06	0.08	5.87	100.33
2000001129674-1	63.06	14.65	7.51	5.64	2.32	1.86	1.52	1.24	0.12	0.20	2.61	100.74
0570001129673-1	53.97	17.27	7.89	8.13	5.08	2.49	0.36	0.84	0.10	0.18	3.42	99.71
0201801129671-1	71.87	14.59	3.12	1.16	0.73	5.96	0.88	0.47	0.04	0.08	1.06	99.95
1510001129654-1	66.69	14.08	5.32	3.79	2.58	4.16	1.08	0.57	0.07	0.14	1.82	100.31
360000112963-1	75.59	13.37	1.88	0.93	0.22	7.14	0.20	0.53	0.04	0.08	0.75	100.73
1751801129631-1	73.08	13.04	3.88	1.42	0.79	5.59	0.98	0.48	0.08	0.08	0.78	100.19

DATE : JUL-04-1990

SIGNED :



1 of 2

MWIEG

T S L

LABORATORIES

WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWIEG

I.C.A.P. WHOLE ROCKWOFHP

LITHIUM METABORATE FUSION

Drofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : M4139  
T.S.L. File No. : M7097  
T.S.L. Invoice No. : 4151

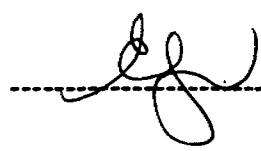
YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
0360001137935-1	180	260	120	24	17
1870101137934-1	270	50	220	72	7
1820001129652-3	350	90	240	76	8
1129677-4	100	180	110	22	18
2000001129677-1	110	130	210	54	9
4000001129634-3	110	210	130	30	21
2803571129673-1	490	40	130	32	15
1129635-1	50	40	140	32	22
2000001129669-1	90	290	130	30	22
0050901129640-4	80	80	90	18	18
1000901129673-4	50	210	50	18	32
2200001129636-1	190	200	100	18	19
1129636-1	250	60	200	50	6
1129015-1	280	80	230	68	9
2000001129674-1	500	230	160	38	16
0570001129673-1	110	270	100	18	19
0201801129671-1	340	80	250	60	11
1510001129654-1	300	100	160	36	12
3600001129663-1	80	90	240	56	8
1751801129631-1	180	50	240	68	9

DATE : JUL-04-1990

SIGNED :



2 of 2

MWIEG

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

MWIEG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP  
Lithium MetaBorate Fusion

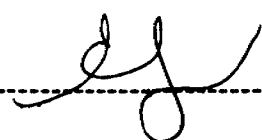
Orofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4137  
T.S.L. File No. : M7098  
T.S.L. Invoice No. : 4150

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
1129669-1	59.02	15.46	6.64	6.15	5.20	3.46	0.08	0.89	0.09	0.16	3.28	100.44
0750001129627-1	55.55	16.49	8.54	6.06	4.09	3.21	0.90	0.78	0.20	0.14	3.76	99.73
1330001129627-2	54.06	18.52	7.98	4.16	4.87	5.56	0.38	0.89	0.11	0.16	3.26	99.95
0650001129627-2	69.13	13.25	4.38	2.96	0.92	4.94	1.02	0.48	0.10	0.08	3.41	100.66
1129640-1	54.04	17.83	7.29	6.83	4.40	4.38	0.54	0.78	0.13	0.10	3.53	99.83
2250001129640-1	51.70	18.43	8.08	7.93	5.77	2.56	0.70	0.77	0.10	0.16	3.56	99.77
2003501129677-1	51.65	15.03	11.66	9.45	4.65	2.38	0.16	1.22	0.17	0.18	2.95	99.48
0351801129677-1	51.91	16.82	9.43	7.42	4.25	4.14	0.08	1.23	0.19	0.20	3.00	98.67
0300001129678-1	52.23	15.99	11.63	8.10	4.54	3.47	0.18	1.29	0.17	0.16	2.68	100.44
4000001129679-1	48.77	17.85	8.36	9.20	5.87	2.18	0.36	0.79	0.15	0.16	5.02	98.73
1431801129007-1	76.24	11.87	2.79	1.71	0.52	3.14	1.98	0.23	0.04	0.02	1.82	100.35
0150001129008-1	78.45	11.04	1.88	1.07	0.24	3.26	3.56	0.29	0.03	0.06	0.39	100.25
135200366254-4	59.83	16.38	6.80	7.83	4.05	3.20	0.54	0.75	0.14	0.14	0.63	100.31

DATE : JUL-04-1990

SIGNED :  1 of 2

MW1EG

T S L

LABORATORIES

WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCKWOFHP

LITHIUM METABORATE FUSION

Drofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : M4137  
T.S.L. File No. : M7098  
T.S.L. Invoice No. : 4150

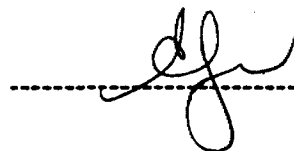
YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
1129669-1	60	200	120	26	18
0750001129627-1	290	100	120	32	20
1330001129627-2	160	110	160	38	22
0650001129627-2	210	70	230	68	9
1129640-1	260	300	100	18	18
2250001129640-1	160	220	90	16	18
2003501129677-1	70	160	80	22	35
0351801129677-1	100	170	100	22	32
0300001129678-1	130	140	70	22	33
4000001129679-1	110	80	90	16	19
1431801129007-1	390	70	240	60	7
0150001129008-1	800	70	190	58	5
135200366254-4	120	210	130	28	16

DATE : JUL-04-1990

SIGNED :



2 of 2

NW1EG

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4W 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

NW1EG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium MetaBorate Fusion

Drofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4099  
T.S.L. File No. : W7069  
T.S.L. Invoice No. : 4124

YOUR REFERENCE - 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
2001801129002-3	57.44	16.00	6.94	3.24	4.07	1.62	3.12	0.73	0.09	0.20	4.81	98.25
2001801129644-1	53.42	17.86	8.19	6.80	4.31	3.14	1.20	0.83	0.13	0.14	3.88	99.91
1001801129642-2	59.22	16.59	6.14	5.98	3.16	4.32	0.26	0.74	0.10	0.14	3.31	99.97
2000001129643-3	52.94	17.39	6.82	13.27	3.12	0.65	0.08	0.96	0.14	0.14	4.59	100.09
2001801137916-1	71.86	13.91	3.35	2.91	1.67	4.53	0.74	0.39	0.03	0.08	1.42	100.89
095000137927 -1	52.90	17.17	8.69	4.77	6.08	4.78	0.04	1.03	0.15	0.20	4.00	99.81
000001129644-1	53.63	17.33	5.54	14.61	2.71	0.47	0.08	0.74	0.12	0.14	4.25	99.61
000001137927-3	52.68	16.24	9.08	9.39	5.23	2.69	0.54	0.89	0.17	0.16	3.06	100.12
1000001129643-3	52.06	17.53	9.92	9.48	4.86	1.09	0.42	0.92	0.18	0.14	3.56	100.17
3120001129643-1	54.13	17.55	7.93	9.60	2.70	2.28	0.58	0.91	0.17	0.18	3.91	99.94
0053601115986-1	68.34	14.00	4.88	2.70	1.32	1.87	2.98	0.64	0.09	0.14	3.66	100.63
0101781129647-1	64.58	14.65	4.82	3.11	2.97	7.15	0.92	0.47	0.08	0.18	0.81	99.74
0960001137927-1	55.98	16.03	7.97	5.65	5.59	3.39	0.42	0.95	0.14	0.18	4.21	100.50
1001801129003-3	74.12	11.97	3.24	2.13	0.73	3.90	1.42	0.32	0.06	0.06	2.80	100.75
2391801115988-1	71.29	12.92	3.56	2.06	1.12	3.61	1.68	0.55	0.07	0.12	3.25	100.24
1251801129001-1	71.57	14.23	3.60	3.95	0.71	3.72	0.74	0.35	0.08	0.06	1.47	100.49
2400001129643-1	61.16	16.04	5.68	7.03	2.00	4.12	0.72	0.85	0.10	0.16	2.89	100.75
0502701129642-1	56.79	17.64	6.80	6.48	3.66	4.67	0.22	0.80	0.10	0.12	3.44	100.72
1372701137942-1	59.09	14.54	8.92	5.20	3.33	4.16	0.38	1.17	0.13	0.20	2.77	99.87
1801801137920-1	56.71	16.42	7.03	8.69	3.88	2.95	0.10	0.80	0.11	0.16	3.68	100.53

DATE : JUL-06-1990

SIGNED :  1 of 2

NWIEB  
 T S L LABORATORIES WOFHP  
 2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
 TELEPHONE #: (705) 268 - 4441  
 FAX #: (705) 268 - 4420

NWIEB  
 I.C.A.P. WHOLE ROCK WOFHP  
 LITHIUM METABORATE FUSION

Orofino Resources  
 P.O. Box 143  
 Toronto, Ontario

T.S.L. REPORT No. : #4099  
 T.S.L. File No. : M7069  
 T.S.L. Invoice No. : 4124

YOUR REFERENCE - 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
2001801129002-3	660	50	130	24	17
2001801129644-1	340	170	130	16	19
1001801129642-2	90	180	90	14	16
2000001129643-3	40	30	80	18	27
2001801137916-1	200	90	250	76	9
095000137927 -1	70	140	130	28	25
0950001129644-1	30	120	90	16	16
0950001137927-3	240	380	110	22	26
1000001129643-3	130	310	130	24	27
3120001129643-1	160	120	170	32	18
0053601115986-1	430	80	230	58	11
0101781129647-1	740	870	150	32	10
0960001137927-1	380	150	120	24	21
1001801129003-3	250	80	200	64	7
2391801115988-1	330	70	240	56	9
1251801129001-1	110	170	240	72	8
2400001129643-1	230	180	170	32	15
0502701129642-1	70	90	100	18	18
1372701137942-1	200	150	180	24	22
1301801137920-1	50	170	130	22	17

DATE : JUL-06-1990

SIGNED :



2 of 2



5  
NW1E6

T S L LABORATORIES  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

NW1E6

I.C.A.P. WHOLE ROCK ANALYSIS  
Lithium MetaBorate Fusion

Drofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4213  
T.S.L. File No. : N7189  
T.S.L. Invoice No. : 4195

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
355000112962B-2	59.15	14.32	6.48	9.52	4.15	2.17	0.20	0.62	0.10	0.08	2.30	99.09
1350001137939-1	72.27	12.83	3.61	3.62	0.88	1.53	2.50	0.33	0.09	0.04	1.26	98.95
0300901129656-1	56.80	15.72	7.43	6.72	4.85	3.30	0.30	0.68	0.12	0.10	3.15	99.18
1230001129657-1	57.80	15.82	7.19	6.07	5.22	3.57	0.86	0.73	0.10	0.08	2.64	100.09
1830001129659-1	69.96	13.43	4.43	1.69	1.08	2.81	4.66	0.51	0.08	0.06	1.11	99.81
2050001129661-1	73.22	10.59	3.94	1.91	0.80	3.82	1.28	0.44	0.10	0.06	2.54	98.70
0201801129661-1	71.38	12.89	4.28	3.44	0.61	2.60	2.84	0.53	0.10	0.06	1.15	99.89
0152481129662-1	72.93	11.91	4.58	2.52	0.74	4.63	0.74	0.48	0.11	0.06	1.43	100.11
1129663-1	55.75	16.27	7.26	5.77	5.22	4.11	0.32	0.72	0.11	0.12	3.09	98.75
1650001129665-1	70.27	14.14	4.91	1.31	1.19	5.69	0.86	0.60	0.08	0.08	1.35	100.49

DATE : JUL-13-1990

SIGNED :

1 of 2

NW1EG

T S L LABORATORIES  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

NW1EG

I.C.A.P. WHOLE ROCK  
LITHIUM METABORATE FUSION

Orofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4213  
T.S.L. File No. : M7189  
T.S.L. Invoice No. : 4195

YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
3550001129628-2	60	90	100	26	15
1350001137939-1	240	140	240	74	7
0300901129656-1	130	150	110	26	17
1230001129657-1	320	120	120	28	18
1830001129659-1	780	110	240	70	9
2050001129661-1	200	60	190	54	7
0201801129661-1	330	60	250	66	9
0152481129662-1	210	50	220	62	8
1129663-1	160	100	130	34	17
1650001129665-1	290	60	260	70	10

DATE : JUL-13-1990

SIGNED :

*L. J. Ryan*

2 of 2

MW1E6

S L

LABORATORIES

WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW1E6

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium MetaBorate Fusion

Drofino Resources

P.O. Box 143

Toronto, Ontario

T.S.L. REPORT No. : W4257

T.S.L. File No. : M7225

T.S.L. Invoice No. : 4241

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
1881801129622-1	48.36	13.88	15.14	6.80	5.99	4.08	0.94	2.90	0.32	0.36	0.54	99.29
2601801129622-1	73.49	12.44	4.64	1.41	0.98	3.88	1.60	0.36	0.10	0.04	1.53	100.45
1137932-1	58.99	15.47	6.78	4.05	4.47	4.91	0.42	0.69	0.10	0.10	3.14	99.13
0700001129629-2	72.32	12.71	3.06	2.36	0.81	4.32	1.16	0.53	0.07	0.06	0.84	98.23

DATE : JUL-18-1990

SIGNED



1 of 2

MWIES

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWIES

I.C.A.P. WHOLE ROCKWOFHP

LITHIUM METABORATE FUSION

Orofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4257  
T.S.L. File No. : M7225  
T.S.L. Invoice No. : 4241

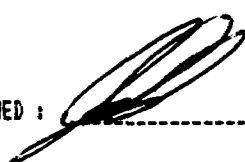
YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
1881801129622-1	410	160	160	30	30
2601801129622-1	340	80	240	74	7
1137932-1	120	100	130	30	17
0700001129629-2	260	130	250	64	9

DATE : JUL-18-1990

SIGNED :



2 of 2

MWIEG  
 S L LABORATORIES WOFHP  
 2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
 TELEPHONE #: (705) 268 - 4441  
 FAX #: (705) 268 - 4420

MWIEG  
 I.C.A.P. WHOLE ROCK ANALYSIS WOFHP  
 Lithium MetaBorate Fusion

Drafting Resources  
 P.O. Box 143  
 Toronto, Ontario

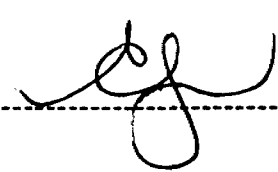
T.S.L. REPORT No. : W4319  
 T.S.L. File No. : M7334  
 T.S.L. Invoice No. : 4466

YOUR REFERENCE - 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
22483	72.41	13.22	4.28	0.87	0.93	4.84	1.80	0.33	0.07	0.06	2.00	100.81
22484	51.23	15.87	11.96	7.62	5.15	2.99	0.32	1.28	0.18	0.18	3.25	100.03
22485	51.78	16.24	9.07	6.70	5.45	3.88	0.38	1.10	0.18	0.24	4.39	99.41
22486	60.43	15.23	6.48	9.70	3.17	1.66	0.10	0.68	0.10	0.10	2.78	100.41
22487	53.48	16.83	7.87	8.58	4.79	1.95	1.18	0.80	0.11	0.18	3.65	99.43
22488	57.11	15.20	7.12	7.22	4.25	2.80	0.60	0.70	0.10	0.12	3.50	98.73
22489	58.09	15.01	6.48	5.39	4.35	4.48	0.26	0.67	0.11	0.12	2.92	97.88
22501	55.21	16.23	5.57	12.47	3.20	1.37	0.20	0.61	0.09	0.06	4.24	99.24
22502	55.25	17.32	6.09	8.46	3.94	2.83	0.58	0.68	0.09	0.10	3.80	99.14
22503	56.36	16.69	5.64	7.73	3.78	3.50	0.44	0.62	0.09	0.10	3.67	98.60
22504	56.64	17.33	6.15	7.68	4.04	3.66	0.48	0.71	0.10	0.06	3.60	100.44
22505	57.20	15.95	7.55	4.03	5.00	4.27	1.04	0.75	0.12	0.14	3.34	99.41
22506	54.67	16.66	7.16	7.39	5.31	3.27	0.78	0.78	0.11	0.14	3.73	100.00
22507	56.13	15.97	7.24	8.46	5.11	2.64	0.14	0.75	0.11	0.12	3.71	100.37
22508	52.37	14.35	8.93	7.27	9.53	2.62	0.36	0.72	0.13	0.14	3.74	100.14
22509	53.79	15.84	9.61	7.57	4.36	3.76	0.70	1.24	0.15	0.16	2.76	99.93

DATE : AUG-22-1990

SIGNED : \_\_\_\_\_ 1 of 2



MW1EG

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCKWOFHP

LITHIUM METABORATE FUSION

Orofino Resources

T.S.L. REPORT No. : W4319

T.S.L. File No. : M7334

T.S.L. Invoice No. : 4466

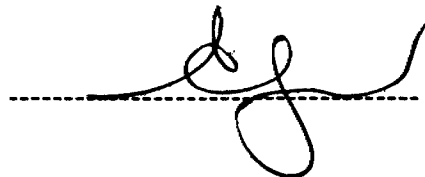
YOUR REFERENCE - 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
22483	370	60	230	80	9
22484	130	210	100	30	25
22485	200	220	110	24	21
22486	210	250	100	26	14
22487	320	210	120	28	16
22488	170	60	100	24	14
22489	70	90	110	26	14
22501	30	90	90	16	12
22502	100	200	100	16	13
22503	120	120	90	16	12
22504	110	110	90	16	14
22505	320	100	120	24	15
22506	350	160	110	26	14
22507	70	200	110	30	15
22508	120	150	70	16	18
22509	260	170	100	22	23

DATE : AUG-22-1990

SIGNED :



2 of 2

MWIEG

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWIEG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium MetaBorate Fusion

Profino Resources  
P.O. Box 143  
Toronto, Ontario

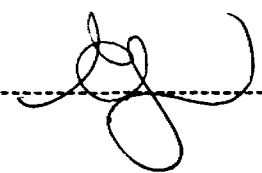
T.S.L. REPORT No. : W4593  
T.S.L. File No. : M7763  
T.S.L. Invoice No. : 4541

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
1881801129622-1	75.80	11.39	2.17	2.37	0.29	3.28	3.14	0.30	0.05	0.02	0.64	99.46
2601801129622-1	73.93	12.39	4.61	1.35	0.92	3.91	1.62	0.35	0.10	0.04	1.52	100.73

DATE : SEP-06-1990

SIGNED :



1 of 2

MWIEG

S L

LABORATORIES

WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWIEG

I.C.A.P. WHOLE ROCKWOFHP

LITHIUM METABORATE FUSION

Orofino Resources

T.S.L. REPORT No. : W4593

T.S.L. File No. : M7763

T.S.L. Invoice No. : 4541

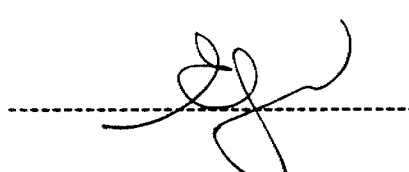
YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
1881801129622-1	680	120	200	62	4
2601801129622-1	330	80	230	74	6

DATE : SEP-06-1990

SIGNED :



2 of 2



MWIEG

T S L LABORATORIES WGFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

*Handwritten initials/signature*

MWIEG

I.C.A.P. WHOLE ROCK ANALYSIS WGFHP

Lithium MetaBorate Fusion

Grading Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4660  
T.S.L. File No. : M7991  
T.S.L. Invoice No. : 4685

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
22108 FE	69.60	12.57	3.84	3.90	1.33	3.95	1.40	0.39	0.07	0.06	2.08	99.19
22109 FE	70.09	13.19	4.02	1.18	1.08	5.42	0.70	0.46	0.04	0.06	1.60	97.84
22110 FE	71.22	13.02	4.10	1.59	0.87	4.88	1.14	0.47	0.05	0.06	2.14	99.53
22111	72.88	12.94	3.95	1.70	0.58	5.22	1.32	0.41	0.06	0.06	0.93	100.06
22112	69.91	14.17	4.11	1.34	1.05	4.95	1.42	0.55	0.03	0.06	2.28	99.87
22113	72.63	12.19	3.61	0.64	0.44	2.79	2.34	0.38	0.01	0.04	2.77	97.84
22114	67.05	13.85	5.25	2.21	0.85	4.49	2.48	0.70	0.10	0.12	1.92	99.00
22115	67.74	13.67	5.29	2.04	1.48	5.06	0.98	0.72	0.07	0.12	1.64	98.79
22116	56.59	15.65	7.68	4.68	4.75	3.67	2.10	0.82	0.16	0.10	2.88	99.08
22117 FE	75.42	12.02	3.23	2.32	0.79	4.39	1.04	0.32	0.04	0.04	0.92	100.52
22118 FE	70.67	12.70	5.41	3.91	1.24	4.15	0.58	0.66	0.09	0.12	1.32	100.64
22119 FE	72.03	13.04	4.39	2.91	0.47	5.19	1.52	0.53	0.08	0.08	0.70	100.96
22120 FE	73.51	12.61	3.75	1.99	0.63	2.89	3.66	0.33	0.08	0.04	1.11	100.61
22510 FE	69.63	13.45	4.96	4.40	0.79	3.74	0.92	0.56	0.07	0.09	1.75	100.35
22511 FE	74.79	12.52	3.60	0.64	0.78	4.84	1.20	0.30	0.04	0.06	1.43	100.20
22512	73.95	11.87	2.90	3.08	0.62	2.85	1.70	0.21	0.06	0.06	3.39	100.69
22513	57.86	17.12	6.28	5.72	3.53	3.88	2.20	0.89	0.08	0.06	2.64	100.28
22301	77.95	11.76	2.27	0.80	0.46	4.40	1.36	0.34	0.03	0.06	1.00	100.42
22302 FE	67.99	13.25	5.55	1.23	1.63	3.01	2.14	0.95	0.04	0.08	3.40	99.27
22303 FE	68.45	13.51	4.29	2.03	1.71	5.39	0.52	0.47	0.06	0.06	2.12	98.60
22304	74.59	11.60	2.99	2.07	0.49	4.36	1.52	0.21	0.06	0.02	1.66	99.97
22305	75.21	11.67	2.91	1.51	0.45	2.80	3.22	0.30	0.04	0.04	1.42	99.56
22306 V1	73.13	13.27	3.78	1.16	0.86	4.66	1.14	0.36	0.06	0.04	1.57	100.03
22307 V1	70.66	13.42	4.62	4.01	0.73	2.16	1.90	0.45	0.09	0.04	1.62	99.72
22308	58.28	15.99	6.66	5.47	4.63	3.87	1.06	0.84	0.07	0.10	3.44	100.40
22309 FE	74.04	12.76	3.50	2.53	0.91	3.18	2.36	0.33	0.05	0.04	1.12	100.82
22310 FE	72.59	12.15	3.06	3.69	0.67	1.87	2.34	0.30	0.06	0.04	1.41	98.18
22311 FE	70.68	13.18	3.76	5.19	1.42	2.27	1.18	0.44	0.07	0.04	2.15	100.39
22312 FE	55.73	16.47	8.41	7.61	4.38	4.07	1.12	0.79	0.17	0.08	1.25	100.07
22313 FE	72.01	12.75	3.84	1.97	0.89	4.27	1.30	0.45	0.05	0.06	2.08	99.68

DATE : SEP-24-1990

SIGNED :

*Handwritten signature*

1 of 4

MW.E6

T S L LABORATORIES WOFHP  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

MWIE6

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP  
Lithium MetaBorate Fusion

Drifind Resources

T.S.L. REPORT No. : W4660  
T.S.L. File No. : M7991  
T.S.L. Invoice No. : 4685

*WSP*

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
22314 FE	68.97	13.90	5.31	3.99	1.18	2.76	2.50	0.69	0.10	0.14	1.27	100.76
22315 FE	71.41	12.41	5.13	3.70	0.86	2.81	1.52	0.46	0.08	0.06	1.57	100.01
22316 FE	52.25	17.74	10.09	4.25	5.68	4.75	1.40	0.87	0.24	0.10	2.35	100.06
22317 FE	73.22	13.19	4.01	1.87	0.99	4.07	1.84	0.36	0.07	0.04	0.22	100.28
22318 FE	73.83	12.70	3.20	2.00	0.63	2.74	4.00	0.30	0.06	0.04	0.35	100.39
22319 FE	74.12	12.69	3.03	2.67	0.47	1.99	2.42	0.29	0.06	0.06	1.35	100.14
22320 FE	74.56	12.72	3.16	1.75	0.52	5.44	0.60	0.29	0.05	0.04	0.65	99.80
22321 FE	74.15	12.31	3.62	1.43	1.05	2.14	3.70	0.32	0.06	0.04	1.22	100.15
22322 FE	72.79	12.82	3.81	1.36	0.72	4.89	1.84	0.45	0.06	0.06	0.67	99.41
22324	73.18	12.90	3.36	0.92	0.62	4.98	2.46	0.35	0.05	0.04	0.75	99.62
22325	73.38	12.73	2.89	2.42	0.69	3.33	3.16	0.32	0.06	0.06	1.47	100.50
22326 FE	74.86	11.99	3.22	1.69	0.45	4.00	2.62	0.31	0.05	0.04	1.29	100.31

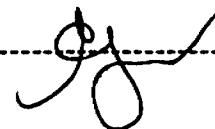
*2.35*

*0.67*

*1.08*

DATE : SEP-24-1990

SIGNED :



2 of 4

MWJES

T S L LABORATORIES

MOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWJES

I.C.A.P. WHOLE ROCK/MOFHP

LITHIUM METABORATE FUSION

Drofino Resources

T.S.L. REPORT No. : W4660

T.S.L. File No. : M7991

T.S.L. Invoice No. : 4685

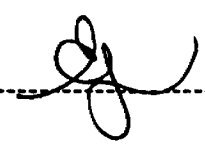
YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
22108 FE	472	122	197	53	8
22109 FE	164	84	240	69	9
22110 FE	253	62	247	68	9
22111	288	96	260	54	8
22112	466	69	195	44	12
22113	714	35	201	55	8
22114	578	101	240	63	12
22115	405	94	221	60	12
22116	720	179	125	23	17
22117 FE	365	115	224	64	8
22118 FE	110	148	204	53	10
22119 FE	270	71	260	65	9
22120 FE	776	116	259	68	7
22510 FE	176	110	215	59	10
22511 FE	261	56	219	75	8
22512	255	55	218	72	7
22513	818	98	103	24	17
22301	313	69	223	60	7
22302 FE	488	50	174	36	13
22303 FE	119	98	216	56	10
22304	272	80	220	67	6
22305	686	50	220	65	7
22306 V1	257	93	258	75	7
22307 V1	240	212	266	63	9
22308	182	156	142	32	20
22309 FE	551	113	240	71	8
22310 FE	540	132	228	69	7
22311 FE	213	102	249	68	9
22312 FE	229	152	114	27	20
22313 FE	194	45	236	61	9

DATE : SEP-24-1990

SIGNED :



3 of 4

MW1E6 .

T S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4M 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW1E6

I.C.A.P. WHOLE ROCKWOFHP

LITHIUM METABORATE FUSION

Orofino Resources

T.S.L. REPORT No. : W4660

T.S.L. File No. : M7991

T.S.L. Invoice No. : 4685

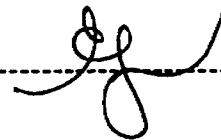
YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
22314 FE	229	116	258	62	11
22315 FE	563	99	246	69	9
22316 FE	367	134	90	18	20
22317 FE	529	132	235	70	8
22318 FE	888	135	243	70	7
22319 FE	315	101	249	64	6
22320 FE	88	114	234	70	7
22321 FE	930	99	248	70	7
22322 FE	403	77	235	58	8
22324	443	80	251	64	7
22325	565	119	227	71	7
22326 FE	450	93	219	66	7

DATE : SEP-24-1990

SIGNED : \_\_\_\_\_



4 of 4

MWIEB

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWIEB

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium MetaBorate Fusion

Gráfico Resources  
P.O. Box 143  
Toronto, Ontario

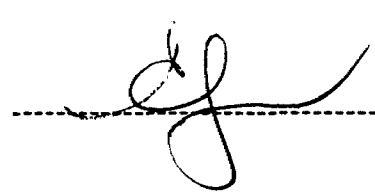
T.S.L. REPORT No. : W4734  
T.S.L. File No. : M8158  
T.S.L. Invoice No. : 4770

YOUR REFERENCE - 623-C4

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
22121	59.73	16.06	6.81	4.57	4.32	4.34	0.70	0.74	0.10	0.10	2.81	100.10
22122	59.69	16.54	5.92	10.01	2.22	2.14	0.42	0.85	0.10	0.10	2.32	100.32
22123	59.05	13.65	6.03	12.35	2.08	0.16	0.04	0.96	0.07	0.10	3.18	97.68
22124	70.01	12.89	3.81	2.46	0.79	3.37	1.76	0.55	0.08	0.12	3.00	98.87
22125	59.12	15.88	6.34	5.93	4.04	4.85	0.30	0.79	0.10	0.10	2.59	100.04
22126	73.63	11.46	3.38	1.67	1.19	3.91	1.20	0.27	0.06	0.04	1.62	98.44
22127	68.12	13.65	4.34	2.03	0.71	5.31	1.00	0.42	0.06	0.04	1.89	97.57
22128	58.44	14.59	7.42	7.91	3.77	2.81	0.10	0.94	0.11	0.12	2.65	98.85
22129	71.68	13.23	2.99	1.02	0.56	5.00	2.84	0.40	0.06	0.04	0.70	98.52
22131	71.69	13.11	4.01	1.23	1.00	5.46	1.12	0.50	0.07	0.08	1.74	100.01
22327	69.41	13.23	1.97	3.16	0.88	3.12	2.84	0.53	0.04	0.08	2.70	97.97
22328	74.10	12.52	3.51	1.75	0.91	3.83	1.64	0.50	0.08	0.08	1.80	100.72
22329	55.99	17.76	6.32	6.34	4.85	4.47	0.90	0.87	0.11	0.12	3.19	100.94
22330	60.81	16.62	7.24	3.29	3.13	4.18	1.32	0.89	0.11	0.12	2.77	100.49
22331	71.79	13.35	2.54	1.41	0.84	5.70	1.48	0.53	0.04	0.08	0.89	98.66
22332	66.47	15.46	4.50	3.44	0.87	2.64	2.64	0.45	0.08	0.12	1.92	98.57
22333	51.10	12.35	17.65	4.31	4.22	1.79	0.18	2.13	0.16	0.18	5.10	99.18
22334	72.39	12.28	4.30	2.19	1.25	1.28	3.46	0.39	0.05	0.10	2.56	100.25
22335	54.55	15.72	8.08	9.44	5.54	2.71	0.32	0.95	0.12	0.10	3.30	100.83
22336	54.24	14.78	9.54	11.20	3.40	1.19	0.22	1.27	0.13	0.12	3.13	99.22
22337	56.73	16.27	6.41	6.36	4.16	3.82	0.74	0.77	0.10	0.10	2.51	97.96
22338	50.89	18.96	6.71	9.10	5.86	2.11	0.58	0.63	0.10	0.06	3.21	98.21
22339	56.31	16.33	7.76	6.90	5.02	4.09	0.32	0.86	0.12	0.12	2.56	100.38
22340	55.69	15.65	8.66	6.78	5.12	4.95	1.08	1.25	0.13	0.12	1.94	100.48
22341	53.48	15.95	9.95	6.88	5.73	3.21	0.68	1.31	0.15	0.12	2.14	99.61

DATE : OCT-12-1990

SIGNED :



1 of 2

MWIEG

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWIEG

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METABORATE FUSION

Original Resources

T.S.L. REPORT No. : W4734

T.S.L. File No. : M8158

T.S.L. Invoice No. : 4770

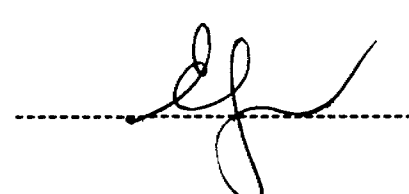
YOUR REFERENCE - 623-04

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
22121	257	129	120	21	14
22122	83	237	148	30	15
22123	21	25	132	24	15
22124	361	64	221	52	8
22125	141	123	119	21	15
22126	158	70	195	55	6
22127	165	75	258	55	8
22128	61	202	104	22	17
22129	690	86	256	55	7
22131	300	108	214	49	8
22327	475	50	230	50	7
22328	288	58	208	51	7
22329	396	168	140	24	16
22330	476	200	168	30	15
22331	356	75	226	50	8
22332	377	184	264	60	9
22333	47	70	113	27	35
22334	445	45	228	62	8
22335	96	124	91	19	20
22336	73	194	121	21	23
22337	308	197	139	23	14
22338	186	175	75	12	13
22339	103	183	113	20	16
22340	208	116	89	19	23
22341	166	145	85	21	25

DATE : OCT-12-1990

SIGNED :



2 of 2

MW1EG

S L

LABORATORIES

WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium MetaBorate Fusion

Griffin Resources  
P.O. Box 143  
Toronto, Ontario

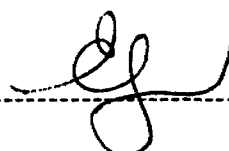
T.S.L. REPORT No. : W4793  
T.S.L. File No. : M8278  
T.S.L. Invoice No. : 4805

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
22130	59.47	14.85	7.75	5.38	3.58	2.76	1.60	0.69	0.11	0.16	3.16	99.51
22342	71.65	12.68	3.73	2.89	1.27	3.71	2.10	0.38	0.04	0.10	1.46	100.00
22343	68.01	13.92	3.99	4.36	0.55	4.82	0.70	0.48	0.07	0.12	1.06	98.07
22344	70.41	12.73	4.20	3.31	1.34	2.70	2.50	0.57	0.09	0.12	2.46	100.42
22345	70.22	12.85	4.08	3.68	1.25	2.13	2.08	0.56	0.08	0.12	2.28	99.35
22514	55.34	15.84	8.55	4.97	6.01	3.14	0.78	0.67	0.16	0.14	4.23	99.82
22515	73.08	12.77	1.95	1.77	0.67	6.39	0.56	0.54	0.04	0.14	2.65	100.59
22516	70.14	14.53	2.90	0.84	0.78	4.88	1.64	0.48	0.03	0.12	2.18	98.52
22517	73.34	12.35	1.47	2.27	0.41	4.17	1.48	0.56	0.05	0.12	3.08	99.31
22518	76.69	11.23	2.07	1.64	0.31	3.64	2.70	0.48	0.04	0.10	1.06	99.95
22519	71.98	11.88	3.98	2.71	0.93	0.89	2.80	0.51	0.07	0.12	4.02	99.90
22520	54.77	15.22	9.68	4.64	4.02	4.67	0.12	1.24	0.13	0.24	4.09	98.82
22521	67.88	11.89	4.48	4.55	0.95	2.18	1.98	0.54	0.08	0.10	5.27	99.91
28852	71.91	11.77	2.65	3.70	0.67	5.12	0.68	0.53	0.08	0.10	3.70	100.92
28853	54.88	17.57	6.69	5.09	4.35	4.80	0.92	0.83	0.12	0.12	3.20	98.58
28854	56.75	14.69	6.19	5.37	3.34	5.87	0.10	0.68	0.11	0.10	5.54	98.75
28855	69.48	12.98	4.37	1.48	1.17	3.95	1.62	0.58	0.06	0.12	2.69	98.47
29101	72.36	13.01	3.53	1.88	0.74	4.72	1.62	0.49	0.06	0.10	1.42	99.95

DATE : OCT-19-1990

SIGNED :



1 of 2

MW1EG

B L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 1, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METABORATE FUSION

Grading Resources

T.S.L. REPORT No. : W4793

T.S.L. File No. : M827B

T.S.L. Invoice No. : 4805

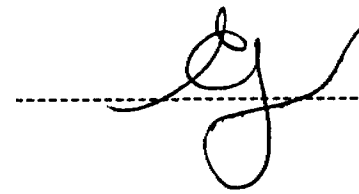
YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Gr ppm	Zr ppm	Y ppm	Sc ppm
22130	460	156	122	24	17
22342	460	89	203	58	8
22343	118	294	250	68	8
22344	533	94	227	55	9
22345	329	83	210	56	8
22514	278	141	115	25	16
22515	244	65	240	54	8
22516	359	52	291	60	9
22517	259	65	219	50	8
22518	725	80	214	54	7
22519	353	48	222	63	8
22520	65	168	131	31	20
22521	382	84	227	63	9
28852	152	77	191	48	7
28853	484	359	107	18	17
28854	93	119	91	14	15
28855	273	49	278	65	10
29101	294	64	262	71	9

DATE : OCT-19-1990

SIGNED :



2 of 2



MONTH	DAY	YR	PROJECT	CODE	SUPPLIER	CEIP	DESCRIPTION	INVOICE	AMOUNT
11	30	90	623	A2	Payroll distribution	Y	November 1990		\$4508.74
			623	A2					
07	30	90	623	B1	Payroll distribution	Y	July 1990		\$429.22
09	30	90	623	B1	Payroll distribution	Y	September 1990		\$882.32
11	30	90	623	B1	Payroll distribution	Y	November 1990		\$1427.79
12	31	90	623	B1	Payroll distribution	Y	December 1990		\$1134.94
			623	B1					
08	31	90	623	B2	Payroll distribution	Y	August 1990		\$9210.97
09	30	90	623	B2	Payroll distribution	Y	September 1990		\$7921.31
11	30	90	623	B2	Payroll distribution	Y	November 1990		\$978.39
11	30	90	623	B2	Payroll distribution	Y	November 1990		\$1805.59
12	31	90	623	B2	Payroll distribution	Y	December 1990		\$6481.84



# DEAKIN EQUIPMENT LTD.

1610 Powell Street, Vancouver, B.C. V5L 1H4  
TEL: (604) 253-2685 • FAX: (604) 253-4639 • 1-800-663-3735 (ACROSS CANADA)  
MINING EXPLORATION • FORESTRY • SURVEYING • DRAFTING SUPPLIES

## INVOICE 6276

S ACRILLATE EXPLORATION LIMITED  
D P.O. Box 143  
T 1 FIRST CANADIAN PLACE, SUITE 1101  
O TORONTO, ONTARIO M5X 1C7

S ACRILLATE EXPLORATION LTD.  
H 40 TILLAMOUNT RESOURCES LTD.  
I 1160 BRADLEY ROAD  
P ASBURN, ONTARIO (NEAR WATKIN)

SHIPPING AND INVOICE DATE		SHIPPED VIA	APP. COLL.	PPD. CHG.	TERMS:	YOUR ORDER NO.	DATE ORDERED
Sept 19/90		Kingston Freight	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1% 10 DAYS NET 30	701-B-5	SEPT 17/90
QTY. S.O.	QTY. ORDERED	DESCRIPTION	QTY. SHIPPED	UNIT PRICE	AMOUNT		
	9	9 each 11" x 12" x 31" ALUM. FIELD BOXES	9	203.50	1831.50		
	11	PHONE PATCH DEVICE 11 LEADS PROVIDED PHONE TO SITE DEVICES //		(416) - 762-6675 EXT 276 685-4646			
		<i>Munkhills</i>					
		704 B5 #3x66.30					
		707 B5 366.30					
		708 B5 366.30					
		709 B5 366.30					
		623 B5 366.30					
FEDERAL TAX		FEDERAL TAX NO.	PROVINCIAL TAX NO.		TOTAL	1831.50	
INCL. <input type="checkbox"/> EXCL. <input type="checkbox"/>			OUT OF PROV		PROV. TAX	-	
					FREIGHT/POST.	-	



a division of: **REPRODUCTION HOLDINGS LIMITED**  
 HEAD OFFICE: 71 Judson Street, Toronto, Ontario M8Z 1A4  
 Telephone: (416) 259-8292

**DOWNTOWN** 118 John Street, Toronto, Ontario M5V 2E3 Telephone: (416) 593-5701  
**DON MILLS** 900 Don Mills Road, Toronto, Ontario M3C 1T7 Telephone: (416) 449-7777

KFP

**ORIGINAL INVOICE**

Sold To **NORTHGATE EXPLORATION**  
**1 FIRST CANADIAN PLACE**  
**SUITE 2701 P.O. BOX 143**  
**TORONTO, ONTARIO**  
**M5X 1C7**

Ship To **FORM:64454**  
**ATT. RANDY SEDORE**

Please remit to 71 Judson Street  
 Return copy with payment

Refer to this number when remitting

										Invoice Number
Entered	Date Shipped	Customer PO No	Customer Job No	Customer Code	Entire File No	Dr. Memo No	Salesman Code			
10/90	11/10/90		N142	N142E	T01685		08			J0008681
QTY	DESCRIPTION	Back Order	Quantity Ordered	Quantity Shipped	No. of Copies	No. of Copies	Total Square Feet	Unit Price	Amount	
	MYLAR FILM .003 STA-CLEAR		99		1	3	27.00	1.700SF	45.90	
<p><i>Summerville</i>  <u>100</u> 623-B-5          Y</p>										

Net 30 days - 2% per month - 18% per annum on overdue accounts  
 No debts will be accepted for credit without proper authorization from this office

<b>FREE DELIVERY</b>	PPD Coll COD	Fed Tax No. or Amount	6.20	X	Pro Tax No. or Amount	4.17	X	Sub Total	45.90
								Total Tax	10.37
								Shipping Charges	.00
								<b>TOTAL AMOUNT</b>	<b>56.27</b>

*Complete reprographic services and supplies for the  
 Architectural, Engineering, Graphic Arts and related industries*





a division of: **REPRODUCTION HOLDINGS LIMITED**  
**HEAD OFFICE:** 71 Judson Street, Toronto, Ontario M8Z 1A4  
 Telephone: (416) 259-8292

**DOWNTOWN**  
 118 John Street  
 Toronto, Ontario M5V 2E3  
 Telephone: (416) 593-5701

**DON MILLS**  
 900 Don Mills Road  
 Toronto, Ontario M3C 1V8  
 Telephone: (416) 449-7172

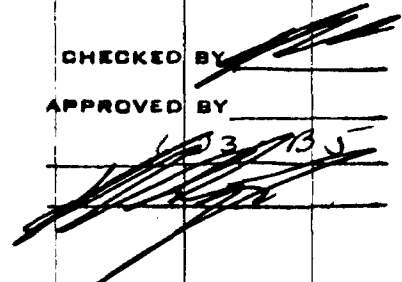
Sold To **NORTHGATE EXPLORATION**  
**1 FIRST CANADIAN PLACE**  
**SUITE 2701 P.O. BOX 143**  
**TORONTO, ONTARIO**  
**M5X 1C7**

Ship To **FORM:07607**  
**ATT.KIM PHAM**

Please remit to 71 Judson Street  
 Return copy with payment

Refer to this number  
 when remitting



										Invoice Number	
Date Ordered	Date Shipped	Customer PO No	Customer Job No	Customer Code	Entire File No	Del. Memo No	Salesman Code				
07/09/90	07/09/90	623 B5	N142	N142E	T00619		08				J0007373
Product Code No	DESCRIPTION		Back Order	Quantity Ordered	Quantity Shipped	No. of Original	No. of Copies	Total Square Feet / Unit	Unit Price	Amount	
27-01	HYLAR FILM .003 STA-CLEAR		99			2	2	56.00	1.700SF	95.20	
21-01	WHITEPRINTS, BLUE OR BLACKLINE		94			2	4	112.00	.100SF	11.20	
CHECKED BY _____ APPROVED BY _____ 											
<b>TERMS</b> Net 30 days - 2% per month - 18% per annum on overdue accounts No goods will be accepted for credit without proper authorization from this office								Sub Total	106.40		
Shipped via <b>CUSTOMER PICKUP</b>			PEP Charge Code	Fee for H. or for cart	Fee for H. or for cart		Fee for H. or for cart	Total Tax	24.02		
			14.36	X			9.66	X	Shipping Charges	.00	
								<b>TOTAL AMOUNT</b>	130.42		



Complete reprographic services and supplies for the  
 Architectural, Engineering, Graphic Arts and related industries

Kty



a division of: **REPRODUCTION HOLDINGS LIMITED**  
**HEAD OFFICE:** 71 Judson Street, Toronto, Ontario M8Z 1A4  
 Telephone: (416) 259-8292

**DOWNTOWN** 118 John Street Toronto, Ontario M5V 2E3 Telephone: (416) 593-5701  
**DON MILLS** 900 Don Mills Road Toronto, Ontario M3C 1V8 Telephone: (416) 449-7172

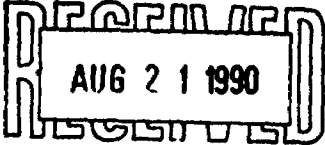
Sold To **NORTHGATE EXPLORATION**  
**1 FIRST CANADIAN PLACE**  
**SUITE 2701 P.O. BOX 143**  
**TORONTO, ONTARIO**  
**M5X 1C7**

Ship To

**FORM 113199**  
**ATT MAURICE HOULE**

Please remit to 71 Judson Street  
 Return copy with payment

Refer to this number  
 when remitting

										Invoice Number		
Date Ordered	Date Shipped	Customer PO No	Customer Job No	Customer Code	Order File No	Del Memo No	Salesman Code					
01/08/90	01/08/90		N142	N142E	E113199		08					E0018433
Product Code No	DESCRIPTION		Back Order	Quantity Ordered	Quantity Shipped	No. of Original	No. of Copies	Total Square Feet/Unit	Unit Price	Amount		
78-01	OFRS373		95			1	1		19.000LT	19.00		
												
CHECKED BY _____ APPROVED BY _____ 623-B-5 _____												
<b>TERMS</b> - Net 30 days, 2% per month, 18% per annum on overdue accounts No goods will be accepted for credit without proper authorization from this office								Sub Total		19.00		
Shipped via		PPD - Cash COD	Fed. Tax Inc. of Amount		Prov. Tax Inc. of Amount							
CUSTOMER PICKUP			2.57		1.73							
								Total Tax		4.30		
								Shipping Charges		.00		
								<b>TOTAL AMOUNT</b>		<b>23.30</b>		



Complete reprographic services and supplies for the *C.A.E.*  
 Architectural, Engineering, Graphic Arts and related industries



a division of: **REPRODUCTION HOLDINGS LIMITED**  
 HEAD OFFICE: 71 Judson Street, Toronto, Ontario M8Z 1A1  
 Telephone: (416) 259-8292 FAX: (416) 259-4236

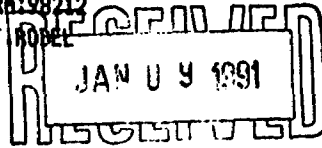
**ORIGINAL INVOICE**  
 DOWNTOWN 119 John Street Toronto, Ontario M5V 2E3 Telephone: (416) 593-5201  
 DON MILLS 300 Don Mills Road Toronto, Ontario M3C 1V8 Telephone: (416) 449-7172

Sold To

**NORTHGATE EXPLORATION**  
 1 FIRST CANADIAN PLACE  
 SUITE 2701 P.O. BOX 143  
 TORONTO, ONTARIO  
 M5X 1C7

Ship To


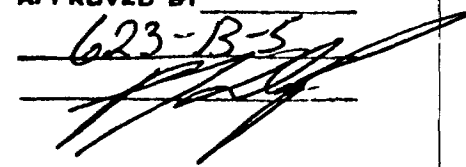
FORM: 98212  
 ATT: 6086E



Please remit to 71 Judson Street  
 Return copy with payment

Refer to this number  
 when remitting



										Invoice Number	
Date Ordered	Date Shipped	Customer PO No	Customer Job No	Customer Code	Entire File No	Det. Memo No	Salesman Code				
13/12/90	13/12/90	623	N142	N142E	T06407		08				J0011182
Product Code No	DESCRIPTION		Back Order	Quantity Ordered	Quantity Shipped	No. of Original	No. of Copies	Total Square Foot / Unit	Unit Price	Amount	
27-01	MYLAR FILM .003 STA-CLEAR		99			2	1	24.00	1.700SF	40.80	
21-01	WHITEPRINTS, BLUE OR BLACKLINE		94			2	1	24.00	.100SF	2.40	
CHECKED BY  APPROVED BY  623-B-5											
<b>TERMS</b> Net 30 days. 1% per month, 18% per annum on overdue accounts. No goods will be accepted for credit without proper authorization from this office.								Sub Total	43.20		
Shipped via		PPD Cost Code	Post. Exp. Div. or Amount		Prep. Exp. Div. or Amount				Total Tax	9.75	
ENTIRE DELIVERY			5.83		3.92				Shipping Charges	.00	
									<b>TOTAL AMOUNT</b>	52.95	



Complete reprographic services and supplies for the  
 Architectural Engineering, Graphic Arts and related industries.



a division of: **REPRODUCTION HOLDINGS LIMITED**  
**HEAD OFFICE:** 71 Judson Street, Toronto, Ontario M5J 1A1  
 Telephone: (416) 259-8292

**DOWNTOWN** 1150 Dundas Street West, Toronto, Ontario M5V 1T3  
 Telephone: (416) 591-5201  
**DON MILLS** 600 Denison Street, Toronto, Ontario M1B 1Y9  
 Telephone: (416) 449-2122

ORIGINAL INVOICE

Sold To

**NORTHGATE EXPLORATION**  
**1 FIRST CANADIAN PLACE**  
**SUITE 2701 P.O. BOX 143**  
**TORONTO, ONTARIO**  
**M5X 1C7**

Ship To

**FORM:98246**  
**ATT:RODEL**

Please remit to 71 Judson Street  
 Return copy with payment

Refer to this number  
 when remitting



										Invoice Number														
Date Ordered	Date Shipped	Customer PO No	Customer Job No	Customer Code	Entire File No	Del. Memo No	Salesman Code																	
10/12/90	10/12/90	623-B-5	N142	N142E	T06071		08			J0011060														
Product Code No	DESCRIPTION		Back Order	Quantity Ordered	Quantity Shipped	No. of Original	No. of Copies	Total Square Feet/Unit	Unit Price	Amount														
79-07	5080 BOND PAPER ENLG/REDUCTION		99			2	1	14.00	1.800SF	25.20														
<table border="1"> <tr> <td>VENDOR</td> <td>BATCH</td> </tr> <tr> <td colspan="2">INVOICE J0011040</td> </tr> <tr> <td>ACCOUNT</td> <td>AMOUNT</td> </tr> <tr> <td>623-B-5</td> <td>\$30.89</td> </tr> <tr> <td colspan="2">APPROVED BY <i>[Signature]</i></td> </tr> <tr> <td colspan="2">CHECKED BY <i>[Signature]</i></td> </tr> <tr> <td colspan="2">DATE ENTERED</td> </tr> </table>											VENDOR	BATCH	INVOICE J0011040		ACCOUNT	AMOUNT	623-B-5	\$30.89	APPROVED BY <i>[Signature]</i>		CHECKED BY <i>[Signature]</i>		DATE ENTERED	
VENDOR	BATCH																							
INVOICE J0011040																								
ACCOUNT	AMOUNT																							
623-B-5	\$30.89																							
APPROVED BY <i>[Signature]</i>																								
CHECKED BY <i>[Signature]</i>																								
DATE ENTERED																								
<b>TERMS</b> Net 30 days, 2% per month, 18% per annum on overdue accounts. No goods will be accepted for credit without proper authorization from this office.								Sub Total	25.20															
Shipped Via		DDT Col. Code	Est. Tax No. or Amount		Pay. By No. or Amount				Total Tax	5.69														
CUSTOMER PICKUP			3.40		2.29				Shipping Charges	.00														
									<b>TOTAL AMOUNT</b>	<b>30.89</b>														



Complete reprographic services and supplies for the  
 Architectural, Engineering, Graphic Arts and related industries

TOM 1990

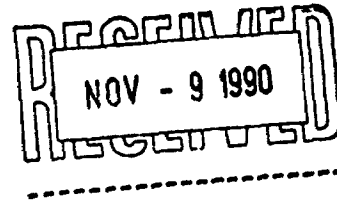


**EXCALIBUR  
INTERNATIONAL  
CONSULTANTS LTD.**

*Input and File Copy  
Original Sent For  
Payment.*

10 Hurontario Street,  
Mississauga, Ont., Canada L5G 3G7  
Telephone (416) 271-1043

November 7, 1990.



Orofino Resources Limited,  
First Canadian Place, 27th floor,  
TORONTO, Ontario.  
M5X 1C7.

ATTENTION: Mr. Terrence McKillen  
Mr. Peter Doyle

TO: Geophysical consulting, A. Ryder-Turner

RE: Pontiac Project, Ontario.

Oct. '90	Supervision and field appraisal of UTEM	
9,10,11,17,	survey and its results, including two on-	
18,19,20,	site inspections;	
21,22,30	total: 9 days	\$3,375.00

Expenses

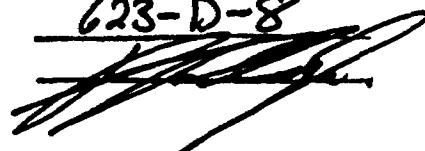
i)	Air fares (430.80 + 301.56 (share))	732.36
ii)	Taxis (40.00 + 20.00 (share))	60.00
iii)	Accommo. (126.00 + 476.00)	602.00
iv)	Incidental meals	64.39
v)	Car rentals (252.81 + 474.45 (share))	727.26
		<hr/>
		2,186.01
		<hr/>
		\$5,561.01
		*****

Invoice No.: 6582

CHECKED BY 

APPROVED BY

623-D-8







**EXCALIBUR  
INTERNATIONAL  
CONSULTANTS LTD.**

10 Hurontario Street,  
Mississauga, Ont., Canada L5G 3G7  
Telephone (416) 271-1043

December 31, 1990.

Orofino Resources Limited,  
First Canadian Place, Ste. 2701,  
Box 143,  
TORONTO, Ontario.  
M5X 1C7.

ATTENTION: Mr. Peter Doyle / Terrence McKillen  
TO: Geophysical consulting, A. Ryder-Turner  
RE: Pontiac Twp. project, Ontario

1990  
Dec. 10,11, Evaluation of UTEM survey; written report  
12,13,14, with map showing recommended lay-outs for  
drilling;  
total: 27 hrs. \$1,350.00

Expenses

i)	Professional back-up, J. B. Boniwell total: 3.5 hrs.	332.50
ii)	Drafting, R. T. Marcroft as per attached	187.79
iii)	Reproduction as per attached	12.25

\$1,882.54  
\*\*\*\*\*

623-D-8

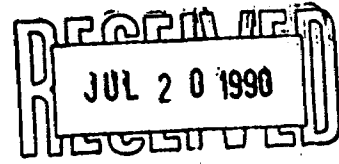
Invoice No.: 6611



**EXCALIBUR  
INTERNATIONAL  
CONSULTANTS LTD.**

10 Hurontario Street,  
Mississauga, Ont., Canada L5G 3G7  
Telephone (416) 271-1043

July 19, 1990.



Orofino Resources Limited,  
P.O. Box 143, Ste. 2701,  
First Canadian Place,  
TORONTO, Ontario.  
M5X 1C7.

ATTENTION: Mr. Terrence McKillen  
Mr. Peter Doyle



TO: Geophysical consulting, J. B. Boniwell

RE: Ben Nevis/Pontiac Twps., Ontario.

1990		
June 10,	Review of exploration potential based on	
21,23,24,	reprocessed aeromagnetics (KLIP data),	
25,28,29,	published geology (OGS) and assessment	
30	records; preparation of written report	
July 1,2,	with maps and recommendations;	
3,5,6,8,	submission of same;	
9,10	total: 62 hrs.	\$5,890.00

Expenses

i)	Drafting, R. T. Marcroft & Assoc. as per attached	385.00
ii)	Reproduction as per attached	8.59

CHECKED BY   
APPROVED BY   
623-D-8  
\$6,283.59  
=====

Invoice No.: 6551



**EXCALIBUR  
INTERNATIONAL  
CONSULTANTS LTD.**

141

10 Hurontario Street.  
Mississauga, Ont., Canada L5G 3G7  
Telephone (416) 271-1043

July 30, 1990.

Orofino Resources Ltd.,  
P.O. Box 143,  
First Canadian Place,  
TORONTO, Ontario.  
M5X 1C7.

ATTENTION: Mr. Peter Doyle

TO: Geophysical consulting, J. B. Boniwell

RE: Pontiac Twp. project, Ont.

1990 Initiation of next stage of exploration;  
July 18,  
20,23,24

- i) Appraisal of HLEM results from most recent coverage, written memorandum on findings;
- ii) grid design and lay-out for proposed large loop deep em. coverage, cost projection, written memorandum on details, forwarding of plan to Lamontagne Geophysics for quote; presentation to P. Doyle

total: 9.5 hrs.

\$902.50  
=====

Invoice No.: 6554

623-D-8



**EXCALIBUR  
INTERNATIONAL  
CONSULTANTS LTD.**

10 Hurontario Street,  
Mississauga, Ont., Canada L5G 3G7  
Telephone (416) 271-1043

December 19, 1990.

**RECEIVED JAN - 7 1991**

Orofino Resources Inc.,  
First Canadian Place, Suite 2701,  
Box 143,  
TORONTO, Ontario.  
M5X 1C7.

ATTENTION: Mr. Peter Doyle  
TO: Geophysical expenses  
RE: Pontiac Twp. project

Oct. '90 i) UTEM survey,  
Lamontagne Geophysics Ltd., subcontract;  
total charges as per attached listing:

	\$48,082.86
Less advance payment	5,600.00
	<hr/>
Balance now due	\$42,482.86
	=====

Invoice No.: 6600

EX003 #271  
ENTERED DEC 31 1990

CHECKED BY \_\_\_\_\_

APPROVED BY \_\_\_\_\_

*[Signature]*  
623 D8 *[Signature]*

**RECEIVED**  
DEC 28 1990  
**REGISTRY**

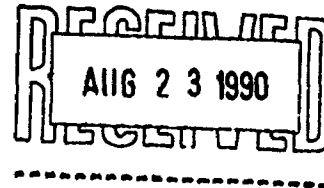


**EXCALIBUR  
INTERNATIONAL  
CONSULTANTS LTD.**

10 Hurontario Street,  
Mississauga, Ont., Canada L5G 3G7  
Telephone (416) 271-1043

August 21, 1990.

Orofino Resources,  
Box 143, Suite 2701,  
First Canadian Place,  
TORONTO, Ontario.  
M5X 1C7.



ATTENTION: Terrence McKillen, Peter Doyle  
TO: Geophysical consulting, J. B. Boniwell  
RE: Pontiac Twp. project, Ontario

1990  
Aug. 20,21 Search of assessment files for extra  
information on recorded AEM anomalies in  
Pontiac Twp.; written memo re findings;  
total: 4 1/2 hrs.

\$427.50  
=====

Invoice No.: 6563

*Araine  
Please Rush  
this one. Rob*

CHECKED BY \_\_\_\_\_  
APPROVED BY \_\_\_\_\_  
*623-C-8*  
\_\_\_\_\_



**EXGALIBUR  
INTERNATIONAL  
CONSULTANTS LTD.**

RECORDED  
NOV 1 - 1990  
REGISTERS

kt  
●

10 Hurontario Street,  
Mississauga, Ont., Canada L5G 3G7  
Telephone (416) 271-1043

October 29, 1990.

Orofino Resources Inc.,  
First Canadian Place, 27th floor,  
TORONTO, Ontario.  
M5X 1C7.

ATTENTION: Mr. Terrence McKillen  
Mr. Peter Doyle

TO: Geophysical charges

RE: Pontiac Twp. Survey, 1990

i) On mobilization,  
Lamontagne Geophysics Ltd.  
as per contract, first payment

(as per attached invoice)

\$5,600.00

=====

Invoice No.: 6578

CHECKED BY \_\_\_\_\_

APPROVED BY \_\_\_\_\_

*Terrence McKillen*

623 08

4

1479

NO. 269


**FORPRO**  
 Mining Exploration & Forestry  
**RESOURCES** LTD.

DATE July 31, 1990

DROFINO RESOURCES LIMITED

c/o Northgate Exploration Limited, Suite 2701

#1 First Canadian Place, Box 143, Toronto, M5X 1C7

DESCRIPTION	CREDIT	DEBIT	BALANCE
PONTIAC TWP.			
Linecutting contract:			
Total estimate:		\$38,000	
190 km @ \$240.63/km - - - -		<del>\$45,719.00</del>	✓
Camp move & servicing - - - -		\$ 400.00	✓
	total	<del>\$46,119.00</del>	
		\$38,400.00	
50% advance payment - - - -		<del>\$23,060.00</del>	
		\$19,200	
	Total Due	<del>\$23,060.00</del>	
		\$19,200	
CHECKED BY			
APPROVED			
<del>623-F-8</del>		\$19,200	

249

NO. 275

# FORPRO

Mining Exploration & Forestry



# RESOURCES

P.O. Box 1513 705-225-0474  
South Porcupine, Ontario E1N 1M0

DATE SEPT. 28 / 9 890

OROFIND RESOURCES LIMITED

SUITE 2701, #1 - FIRST CANADIAN PLACE  
BOX 143, TORONTO, 175X 1C7

DESCRIPTION	CREDIT	DEBIT	BALANCE
PONTIAC TWP.			
LINE CUTTING CONTRACT:			
128.456 KM			
NEW CUTTINGS @ \$240.83/KM		\$30910.37	
16.2 KM			
RE-CUTTING @ \$160.42/KM		\$2598.80	
CAMP MOVE + SERVICING		\$400.00	
<del>Delete</del>			
(CAMP CLEAN-UP)			203.00
(COMPLETED BY OROFINO STAFF)			\$74303.17
ADVANCE (INVOICE #267 - CHRT 1050)			
TOTAL OWING			\$74303.17

CHECKED BY

APPROVED BY

~~623-0-8~~





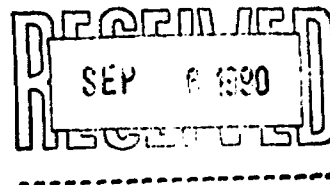
42 O'Leary Avenue, St. Johns, A1B 2C7. Phone: (709) 722-3132

Fax: (709) 722-3133

INVOICE

August 17, 1990

Orofino Resources  
1 First Canadian Place, Suite 2701  
Toronto, Ontario.  
M5X 1C7



Attention: Peter Doyle.

RE - Project 623, Pontiac Township.  
Topographic Mapping at 1:5000 and 1:10000 Scales \$2,900.00

CHECKED BY \_\_\_\_\_  
APPROVED BY \_\_\_\_\_

623-B-8

The undersigned confirm that they have requested that the present Agreement and Subscription Form, as well as letters and notices relating to the subject matter hereof, be drawn in the English language. Les soussignes confirment avoir requis que la presente contrat exploration la formule de souscription, de meme que les lettres et avis se rapportant a l'objet des presentes, soient rediges en langue anglais.

Short Term Contract Agreement  
(to be completed in duplicate)

Between: OROFINO RESOURCES LTD.  
- the "Company"  
and KIM T. PHAM  
- the "Temporary Field Worker"

For Services:

A e

B e

623 C3 = 10 days e\*200<sup>00</sup>/day = \$2,000<sup>00</sup>

Project: Supervisor:

Starting Date: June 21, 1990 Finishing Date: June 30, 1990

Other: N/A

ACKNOWLEDGMENT

It is understood that for the services rendered the Temporary Field Worker is responsible for submitting all regulatory government deductions. i.e. Canada Pension, Unemployment Insurance, Workmens Compensation, Income Tax, etc. and undertakes the services at his own risk and releases the Company from all claims of any kind which he, his heirs, executors, administrators and/or assigns might otherwise have as a result of any illness, accident, or death which he may suffer as a result of activities carried out by the Temporary Field Worker on behalf of the Company.

Signed (Company): 

Signed (Temporary Field Worker):  K PHAM

Date: July 4, 1990

KTP

The undersigned confirm that they have requested that the present Agreement and Subscription Form, as well as letters and notices relating to the subject matter hereof, be drawn in the English language. Les soussignes confirment avoir requis que la presente contrat exploration la formule de souscription, de meme que les lettres et avis se rapportant a l'objet des presentes, soient rediges en langue anglais.

**Short Term Contract Agreement  
(to be completed in duplicate)**

Between: ORFINO RESOURCES LTD.

- the "Company"

and Kim t - pham

- the "Temporary Field Worker"

For Services:

A

B

62303 = 20 days      \$200<sup>00</sup> / day = \$4,000<sup>00</sup>

Project: 623

Supervisor: T. McKillen

Starting Date: June 1<sup>st</sup>, 1990

Finishing Date: June 20, 1990

Other: N/A

**ACKNOWLEDGMENT**

It is understood that for the services rendered the Temporary Field Worker is responsible for submitting all regulatory government deductions. i.e. Canada Pension, Unemployment Insurance, Workmens Compensation, Income Tax, etc. and undertakes the services at his own risk and releases the Company from all claims of any kind which he, his heirs, executors, administrators and/or assigns might otherwise have as a result of any illness, accident, or death which he may suffer as a result of activities carried out by the Temporary Field Worker on behalf of the Company.

Signed (Company): [Signature]

Signed (Temporary Field Worker): [Signature] K. PHAM

Date: June 21<sup>st</sup>, 1990

FL P

M?

The undersigned confirm that they have requested that the present Agreement and Subscription Form, as well as letters and notices relating to the subject matter hereof, be drawn in the English language. Les soussignes confirment avoir requis que la presente contrat exploration la formule de souscription, de meme que les lettres et avis se rapportant a l'objet des presentes, soient rediges en langue anglais.

Short Term Contract Agreement  
(to be completed in duplicate)

Between: OROFINO RESOURCES LTD.

- the "Company"

and KIM T PHAM

- the "Temporary Field Worker"

For Services:

623	<del>A</del> <sup>B3</sup>	3 days	@ \$200. <sup>00</sup> /day	=	\$600. <sup>00</sup>	} Total: \$1,600. <sup>00</sup>
624	B3	2 days	@ \$200. <sup>00</sup> /day	=	400. <sup>00</sup>	
632	B3	3 days	@ \$200. <sup>00</sup> /day	=	600. <sup>00</sup>	

Project: 623, 624, and 632

Supervisor: T. N McKillen

Starting Date: May 22, 1990

Finishing Date: May 31, 1990

Other: N/A

**ACKNOWLEDGMENT**

It is understood that for the services rendered the Temporary Field Worker is responsible for submitting all regulatory government deductions. i.e. Canada Pension, Unemployment Insurance, Workmens Compensation, Income Tax, etc. and undertakes the services at his own risk and releases the Company from all claims of any kind which he, his heirs, executors, administrators and/or assigns might otherwise have as a result of any illness, accident, or death which he may suffer as a result of activities carried out by the Temporary Field Worker on behalf of the Company.

Signed (Company): 

Signed (Temporary Field Worker):  K. PHAM

Date: May 31, 1990

The undersigned confirm that they have requested that the present Agreement and Subscription Form, as well as letters and notices relating to the subject matter hereof, be drawn in the English language. Les soussignes confirment avoir requis que la presente contrat exploration la formule de souscription, de meme que les lettres et avis se rapportant a l'objet des presentes, soient rediges en langue anglais.

Short Term Contract Agreement  
(to be completed in duplicate)

PROFIL  
AUG 23 1990  
L.S.T.V.S

Between: ORFIND RESOURCES LTD.

- the "Company"

and KIM T. PHAM

- the "Temporary Field Worker"

For Services:

A e  
623 B 3 = 13 days. e \$200/day = \$2,600.00  
C e

Project: 623 - Pontiac Twp. Supervisor: T. N. McKillen.

Starting Date: Aug 1, 2, 7, 8, 9, 10  
13 to 19 Finishing Date: Aug 19, 1990

Other:

ACKNOWLEDGMENT

It is understood that for the services rendered the Temporary Field Worker is responsible for submitting all regulatory government deductions. i.e. Canada Pension, Unemployment Insurance, Workmens Compensation, Income Tax, etc. and undertakes the services at his own risk and releases the Company from all claims of any kind which he, his heirs, executors, administrators and/or assigns might otherwise have as a result of any illness, accident, or death which he may suffer as a result of activities carried out by the Temporary Field Worker on behalf of the Company.

Signed (Company):

Signed (Temporary Field Worker):

Date: Aug 22, 1990

Kim T. Pham K. PHAM  
CHECKED BY  
APPROVED BY  
623-B-3

449  
The undersigned confirm that they have requested that the present Agreement and Subscription Form, as well as letters and notices relating to the subject matter hereof, be drawn in the English language. Les soussignes confirment avoir requis que la presente contrat exploration la formule de souscription, de meme que les lettres et avis se rapportant a l'objet des presentes, soient rediges en langue anglais.

**Short Term Contract Agreement  
(to be completed in duplicate)**


**Between:** OROFINO RESOURCES LIMITED.  
- the "Company"  
and Kim T. Pham  
- the "Temporary Field Worker"

**For Services:**

A @  
623 B 3 = 7 days @ \$200/day = \$1,400  
Eastman = 5 days @ \$200/day = \$1,000 } TOTAL \$2,400.<sup>00</sup>  
**Project:** 623 and Eastman **Supervisor:** T. N. McKillen  
**Starting Date:** Aug 20 1990 **Finishing Date:** Aug 31 1990  
**Other:** N/A

**ACKNOWLEDGMENT**

It is understood that for the services rendered the Temporary Field Worker is responsible for submitting all regulatory government deductions. i.e. Canada Pension, Unemployment Insurance, Workmens Compensation, Income Tax, etc. and undertakes the services at his own risk and releases the Company from all claims of any kind which he, his heirs, executors, administrators and/or assigns might otherwise have as a result of any illness, accident, or death which he may suffer as a result of activities carried out by the Temporary Field Worker on behalf of the Company.

**Signed (Company):** 

**Signed (Temporary Field Worker):**  K. PHAM

**Date:** Aug. 31, 1990

The undersigned confirm that they have requested that the present Agreement and Subscription Form, as well as letters and notices relating to the subject matter hereof, be drawn in the English language. Les soussignes confirment avoir requis que la presente contrat exploration la formule de souscription, de meme que les lettres et avis se rapportant a l'objet des presentes, soient rediges en langue anglais.

Short Term Contract Agreement  
(to be completed in duplicate)

Between:

ORCFIND RESOURCES LIMITED

RECEIVED  
OCT - 4 1990

CHECKED BY [Signature]  
APPROVED BY 623-B-8 and [Signature]

- the "Company"

KIM T. PHAM

- the "Temporary Field Worker"

For Services:

A e  
623 B 3 for nine days e \$200<sup>00</sup>/day = \$1800<sup>00</sup>  
C e

Project: 623 Pontiac Tap

Supervisor: T.N McKillen

Starting Date: Sept. 19 1990

Finishing Date: Sept 27 1990

Other: N/A

ACKNOWLEDGMENT

It is understood that for the services rendered the Temporary Field Worker is responsible for submitting all regulatory government deductions. i.e. Canada Pension, Unemployment Insurance, Workmens Compensation, Income Tax, etc. and undertakes the services at his own risk and releases the Company from all claims of any kind which he, his heirs, executors, administrators and/or assigns might otherwise have as a result of any illness, accident, or death which he may suffer as a result of activities carried out by the Temporary Field Worker on behalf of the Company.

Signed (Company): [Signature]

Signed (Temporary Field Worker): [Signature] K PHAM

Date: Sept 30 1990

Input + File Cap

The undersigned confirm that they have requested that the present Agreement and Subscription Form, as well as letters and notices relating to the subject matter hereof, be drawn in the English language. Les soussignes confirment avoir requis que la presente contrat exploration la formule de souscription, de meme que les lettres et avis se rapportant a l'objet des presentes, soient rediges en langue anglais.

**Short Term Contract Agreement  
(to be completed in duplicate)**

**Between:**

OROFINO RESOURCES LTD.

- the "Company"

and KIM T. PHAM

- the "Temporary Field Worker"

**For Services:**

A e  
623 B3 = fifteen days e \$200<sup>00</sup>/day x 15 = \$3,000<sup>00</sup>  
C e

**Project:** 623. Pentline Twp.

**Supervisor:** T.N. McKillen / P. J. Doyle

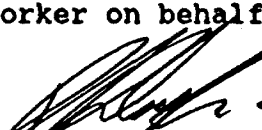
**Starting Date:** November 12, 1990

**Finishing Date:** November 30, 1990

**Other:** N/A

**ACKNOWLEDGMENT**

It is understood that for the services rendered the Temporary Field Worker is responsible for submitting all regulatory government deductions. i.e. Canada Pension, Unemployment Insurance, Workmens Compensation, Income Tax, etc. and undertakes the services at his own risk and releases the Company from all claims of any kind which he, his heirs, executors, administrators and/or assigns might otherwise have as a result of any illness, accident, or death which he may suffer as a result of activities carried out by the Temporary Field Worker on behalf of the Company.

**Signed (Company):** 

**Signed (Temporary Field Worker):**  K. PHAM

**Date:** December 3<sup>rd</sup>, 1990



KIM T. PHAM  
939 BATHURST ST. #1  
TORONTO, ONTARIO TEL. 537-3673  
MSR 3G5

INVESTMENT CHEQUING 407  
December 17 1990

PAY TO THE ORDER OF OROFINO RESOURCES LIMITED \$ 1,500.00  
Fifteen hundred / 100 DOLLARS

 Bank of Montreal  
COLLEGE & BEVERLEY  
205 COLLEGE STREET  
TORONTO, ONTARIO M5T 1P9

(Advanced Expense pay back)

K. PHAM

the present  
and notices  
the English  
la presente  
leme que les  
ites, soient

⑈407⑈ ⑆24912⑈001⑆ 8028⑈169⑈

BETWEEN:

OROFINO RESOURCES LTD.

- the "Company"

and KIM T. PHAM

- the "Temporary Field Worker"

For Services:

A  
623-B3 = 15 days

e  
e \$200<sup>00</sup> / day = \$3,000<sup>00</sup>

C  
Project: 623. Pontiac Twp.

e  
Supervisor: T.N. McKillen / P. J. Doyle

Starting Date: December 3<sup>rd</sup> 1990

Finishing Date: December 21<sup>st</sup> 1990

Other: N/A

**ACKNOWLEDGMENT**

It is understood that for the services rendered the Temporary Field Worker is responsible for submitting all regulatory government deductions. i.e. Canada Pension, Unemployment Insurance, Workmens Compensation, Income Tax, etc. and undertakes the services at his own risk and releases the Company from all claims of any kind which he, his heirs, executors, administrators and/or assigns might otherwise have as a result of any illness, accident, or death which he may suffer as a result of activities carried out by the Temporary Field Worker on behalf of the Company.

Signed (Company):

Signed (Temporary Field Worker):

K. PHAM

Date:







# Porcupine Canvas Inc.


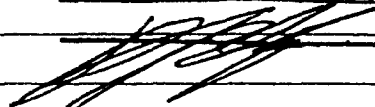
33 First Avenue, Box 700  
Schumacher, Ontario P0N 1G0  
Telephone (705) 268-7878

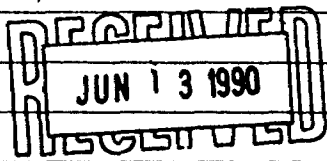
INVOICE # 2216



SOLD TO Orofino Resources  
Suite 2701, Box 143  
#1, 1st Canadian Place  
Toronto, Ontario. M5X 1C7

SHIP TO \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

DAY	MON	YR	FEDERAL LIC.	PROVINCIAL LIC.	PURCHASE ORDER	SHIP VIA	PACKING SLIP NO.
30	05	90				Picked Up	0959/0958
QUANTITY	PROD. #	DESCRIPTION			UNIT PRICE	AMOUNT	
3	#4047	Pico Field Books 298/360			\$ 6.50	\$ 19.50	
1 Box	#4104	(12) Hip Chain Thread				36.00	
3	#5400	Koh-INoor Double Sharpeners #981			2.40	7.20	
1	#4091	Acme 10" Scissors				18.98	
4	#4451	Acid Bottles			1.50	6.00	
1	#4057	Masking Tape			2.65	2.65	
3 Box	#4090	Orange Flagging Tape (12)-----			24.00	72.00	
5 LF	#5004	43.5" Drawing Board Cover			9.00/LF	45.00	
1	#4146	Komelon Steel Tape				6.00	
1	#4107	Hip Chain Thread				8.00	
			CHECKED BY 				
			APPROVED BY				
			623-B-5 8239 03				
							



Payment due upon receipt of invoice. No statements issued.  
TERMS: Net 30 days from date of billing on approved credit.  
2% interest/month on overdue accounts.

Sub-Total	\$221.33
F.S.T.	INCLUDED
P.S.T.	17.70
SHIPPING	
<b>TOTAL</b>	<b>\$239.03</b>







INVOICE  
**TESLA-10** Ltd

55A Port Street East, Mississauga, Ontario, Canada L5G 4P3

TEL: (416) 271-4399 • FAX: (416) 271-4414

TO

TI 1287

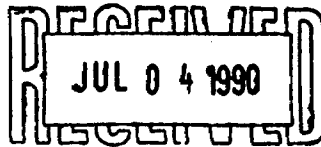
Orofino Resources Ltd.  
P.O. Box 143,  
2701 - 1st Canadian Place  
Toronto, Ontario. M5X 1C7

Job No. TC 1123

Attn : Terrence McKillen

Date June 29, 1990

ITEMS

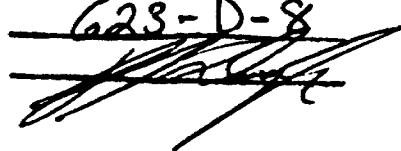


i) Data purchase	\$400.00
ii) Read In, Level and Correct Data	\$500.00
iii) Tesla Contours of Total Field Magnetics	\$1,000.00
<b>Total Owing</b>	<b>\$1,900.00</b>

Note: Maps forwarded to John Boniwell on June 25, 1990

CHECKED BY 

APPROVED BY

623-D-8  




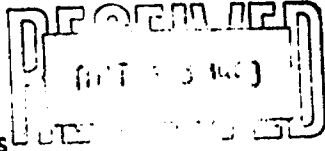
Randy Sedore  
R.R.#1 Pefferlaw, Ontario LOE 1N0

Sept 28 19 90

TO: Northgate Exploration Ltd.  
2701, 1 First Canadian Place  
Toronto, Ont.  
M5X 1C7

ATTN: RODEL QRTIZ

REF. NO.



*Randy Sedore*

Date                                      Details                                      Rate/Hr                                      Hrs                                      Cost

Sept. 13 -28	Project No. 638 Drafting base map for Pontiac Twp. Claim Group - Claim Map - Soil Geochem. Map - Rock Geochem. Map	\$ 20.00	36.0	\$ 720.00
		Total		\$ 720.00

Please pay upon receipt. Thank you.

*Wendell*  
623 B3

OROFINO RESOURCES LIMITED

SAMPLE ANALYSIS:

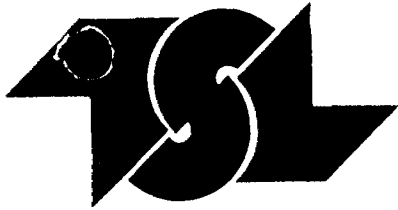
SUPPLIER	CEIP	DESCRIPTION	INVOICE	AMOUNT
TSL Laboratories	Y	10 Whole rock analyses	4994	8250.00
TSL Laboratories	Y	20 Whole rock analyses	4995	8600.00
TSL Laboratories	Y	11 Cu,Pb,Zn,Au analyses	4140	\$177.10
TSL Laboratories	Y	26 Cu,Pb,Zn analyses	4143	\$144.30
TSL Laboratories	Y	20 Whole rock analyses	4151	\$575.00
TSL Laboratories	Y	10 Whole rock analyses	4195	\$287.50
TSL Laboratories	Y	37 Cu,Pb,Zn analyses	4191	\$202.50
TSL Laboratories	Y	40 Whole rock analyses	4240	\$1000.00
TSL Laboratories	Y	4 Whole rock analyses	4241	\$115.00
TSL Laboratories	Y	1 Cu,Pb,Zn analyses	4249	\$4.60
TSL Laboratories	Y	16 Whole rock analyses	4466	\$460.00
TSL Laboratories	Y	2 whole rock analyses	4541	\$50.00
TSL Laboratories	Y	46 Cu,Pb,Zn analyses	4600	\$369.10
TSL Laboratories	Y	20 Cu,Pb,Zn analyses	4765	\$159.50
TSL Laboratories	Y	25 Whole rock analyses	4770	\$625.00
TSL Laboratories	Y	20 Cu,Pb,Zn analyses	4969	\$167.00
TSL Laboratories	Y	10 Cu,Pb,Zn analyses	4970	\$75.00
TSL Laboratories	Y	28 Cu,Pb,Zn analyses	4675	\$222.95
TSL Laboratories	Y	42 Whole rock analyses	4685	\$1050.00

9 4 May 30 90 APIN #237 TSL LABORATORI	3907	75.00
10 4 Jun 26 90 APIN #242 TSL LABORATORI	4105	90.00
9 4 Jun 13 90 APIN #240 TSL LABORATORI	3974	66.50
9 4 Jun 20 90 APIN #240 TSL LABORATORI	4028	4.60
9 4 Jun 20 90 APIN #240 TSL LABORATORI	4029	443.80
9 4 Jun 22 90 APIN #240 TSL LABORATORI	4058	556.00
9 4 Jun 26 90 APIN #240 TSL LABORATORI	4065	38.00
10 4 Jun 28 90 APIN #242 TSL LABORATORI	4081	375.35
10 4 Jul 09 90 APIN #244 TSL LABORATORI	4150	375.75

SAMPLE TRANSPORT:

TSL Laboratories	Y	Freight charges	4122	\$14.00
TSL Laboratories	Y	Freight charges	4123	\$7.15
TSL Laboratories	Y	Freight charges	4588	\$40.95
TSL Laboratories	Y	Freight charges	4467	\$22.35
9 4 Jun 15 90 APIN #240 TSL LABORATORI	4008	30.40		
9 4 Jun 21 90 APIN #240 TSL LABORATORI	4052	36.15		

2-10424



# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO  
P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Toronto, Ontario  
MSX 1C7  
T. McKillen

REPORT No.  
W4792

INVOICE #: 4765  
P.O.: 623-C4

SAMPLE(S) OF rock

K. Pham  
project 623

	Cu ppm	Pb ppm	Zn ppm
22130	55	67	355
22342	17	50	47
22343	10	51	32
22344	8	30	53
22345	15, 13	39, 34	50, 45
22514	43	14	61
22515	10	15	43
22516	3	19	88
22517	12	10	41
22518	11	14	46
22519	26	13	67
22520	36	3	70
22521	31	8	69
28852	25	6	35
28853	54	7	62
28854	48, 52	15, 13	78, 69
28855	11	13	52
29101	9	19	40

COPIES TO: Toronto, Timmins  
INVOICE TO: Toronto

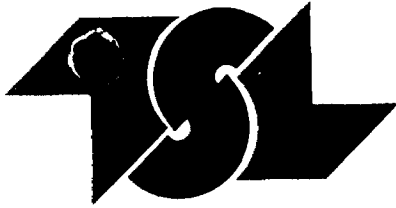
Oct 11/90

SIGNED \_\_\_\_\_

Page 1 of 1



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4659

SAMPLE(S) OF rock

INVOICE #: 4600  
P.O.: 623-C4

M. Houle  
project 623

	Cu ppm	Pb ppm	Zn ppm
22304	22	13	145
22305	20	9	43
22306 V1	7	2	68
22307 V1	11	5	57
22308	15, 14	<2, <2	24, 25
22309 FE	5	<2	43
22310 FE	12	5	49
22311 FE	16	3	57
22312 FE	9	<2	43
22313 FE	5	<2	52
22314 FE	8	<2	53
22315 FE	36	<2	32
22316 FE	19	<2	88
22317 FE	34	<2	38
22318 FE	8, 9	3, 2	42, 45
22319 FE	5	2	32
22320 FE	11	3	37
22321 FE	5	<2	48
22322 FE	3	<2	38
22324 ✓	16	<2	47

COPIES TO: Toronto, Kirkland Lake

INVOICE TO: Toronto

Sep 11/90

SIGNED \_\_\_\_\_

Page 2 of 3





# T S L LABORATORIES

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4659

INVOICE #: 4600  
P.O.: 623-C4

SAMPLE(S) OF ROCK

M. Houle  
project 623

		Cu ppm	Pb ppm	Zn ppm
22108	FE	74	4	59
22109	FE	9	2	38
22110	FE	8	<2	37
22111		4	<2	46
22112		11, 11	2, 2	22, 23
22113		13	4	4
22114		19	5	110
22115		61	<2	48
22116		33	<2	55
22117	FE	24	7	53
22118	FE	140	<2	80
22119	FE	24	<2	50
22120	FE	9	3	52
22510	FE	23	6	73
22511	FE	9, 10	<2, <2	59, 62
22512		13	7	79
22513		63	2	68
22301		16	2	30
22302	FE	9	2	57
22303	FE	19	3	60

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Sep 11/90

SIGNED \_\_\_\_\_ 



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources

P.O. Box 143

Suite 2701, 1 First Canadian Place

Toronto, Ontario M5X 1C7

Attention: T. McKillen

REPORT No.  
W4659

INVOICE #: 4600

P.O. : 623-C4

SAMPLE(S) OF rock

M. Houle  
project 623

	Cu ppm	Pb ppm	Zn ppm
22325	9	8	69
22326 FE	12	7	29

COPIES TO: Toronto, Kirkland Lake

INVOICE TO: Toronto

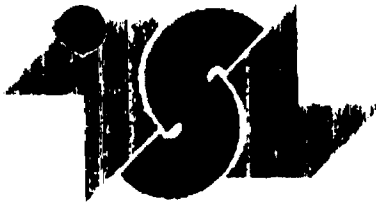
Sep 11/90

SIGNED \_\_\_\_\_

Page 3 of 3



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



**T S L LABORATORIES**

DIVISION OF RURGEMER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

**CERTIFICATE OF ANALYSIS**

SAMPLE(S) FROM Orofino Resources  
 P.O. Box 143  
 Suite 2701, 1 First Canadian Place  
 Toronto, Ontario M5X 1C7  
 Attention: T. McKillen

REPORT No.  
**W4733**

INVOICE #: 4675  
 P.O. : 623-C4

SAMPLE(S) OF rocks

K. Pham  
 623-C4

	Cu ppm	Pb ppm	Zn ppm
22121	52	3	61
22122	39	3	39
22123	24	2	36
22124	12	2	77
22125	54, 56	4, 4	59, 62
22126	7	5	43
22127	18	3	59
22128	54	<2	56
22129	15	2	43
22131	19	<2	67
22327	6	2	33
22328	16	4	56
22329	62	4	73
22330	36	2	110
22331	5	4	39
22332	2, 5	8, 10	62, 71
22333	42	3	81
22334	9	12	85
22335	11	3	36
22336	40	7	57

COPIES TO: Toronto, Kirkland Lake  
 INVOICE TO: Toronto

Sep 26/90

SIGNED \_\_\_\_\_ 



For enquiries on this report, please contact Customer Service Department.  
 Samples, Pulps and Rejects discarded two months from the date of this report.

MW158

L. LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO CAN 700

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

EG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium Metaborate Fusion

Profano Resources

P.O. Box 143

Toronto, Ontario

T.S.L. REPORT No. : W4774

T.S.L. File No. : M8158

T.S.L. Invoice No. : 4770

OUR REFERENCE - 623-04

SAMPLE #	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	CO2	TOTAL
	%	%	%	%	%	%	%	%	%	%	%	%
22121	59.73	16.36	6.61	4.57	4.32	4.54	0.70	0.74	0.10	0.10	2.81	100.10
22122	59.69	16.54	6.92	10.01	2.22	2.14	0.41	0.85	0.10	0.10	2.32	100.32
22123	59.05	13.65	6.03	12.35	2.08	0.16	0.04	0.96	0.07	0.10	3.18	97.68
22124	70.01	12.99	3.61	2.48	0.79	3.37	1.76	0.55	0.08	0.12	3.00	98.87
22125	59.12	15.98	6.34	5.93	4.04	4.85	0.30	0.79	0.10	0.10	2.59	100.04
22126	73.63	11.46	3.38	1.67	1.19	3.91	1.20	0.27	0.06	0.04	1.62	98.44
22127	58.12	13.65	4.34	2.03	0.71	5.31	1.00	0.42	0.06	0.04	1.89	97.57
22128	58.44	14.59	7.42	7.91	3.77	2.81	0.10	0.94	0.11	0.12	2.65	98.85
22129	71.68	13.33	2.39	1.02	0.56	5.00	2.84	0.40	0.06	0.04	0.70	98.52
22131	71.69	13.11	4.01	1.23	1.00	5.46	1.12	0.50	0.07	0.08	1.74	100.01
22327	69.41	13.23	1.97	3.16	0.88	3.12	2.84	0.53	0.04	0.08	2.70	97.97
22328	74.10	11.52	3.51	1.75	0.91	3.83	1.64	0.50	0.08	0.08	1.80	100.72
22329	55.99	17.76	6.32	6.34	4.85	4.47	0.90	0.67	0.11	0.12	3.19	100.94
22330	60.81	16.62	7.24	3.29	3.13	4.18	1.32	0.89	0.11	0.12	2.77	100.49
22331	71.79	13.35	2.54	1.41	0.84	5.70	1.48	0.53	0.04	0.06	0.89	98.66
22332	56.47	15.46	4.50	3.44	0.87	2.64	2.64	0.45	0.06	0.12	1.52	98.57
22333	51.10	12.35	17.65	4.31	4.22	1.79	0.18	2.13	0.16	0.18	5.10	99.18
22334	72.39	12.28	4.30	2.19	1.25	1.28	3.46	0.39	0.05	0.10	2.56	100.25
22335	54.55	15.72	6.08	9.44	5.54	2.71	0.32	0.95	0.12	0.10	3.30	100.63
22336	54.24	14.78	9.54	11.20	3.40	1.19	0.22	1.27	0.13	0.12	3.13	99.22
22337	56.73	16.27	6.41	6.36	4.16	3.82	0.74	0.77	0.10	0.10	2.51	97.96
22338	50.89	18.96	6.71	9.10	5.86	2.11	0.58	0.63	0.10	0.06	3.21	98.21
22339	56.31	16.33	7.76	8.90	5.02	4.09	0.32	0.86	0.12	0.12	2.56	100.38
22340	55.69	15.65	8.66	6.78	5.12	4.35	1.08	1.25	0.13	0.12	1.94	100.48
22341	53.48	15.95	9.95	6.88	5.73	3.21	0.68	1.31	0.15	0.12	3.14	99.61

DATE : OCT-12-1990

SIGNED :

1 of 2



WNEG

L LABORATORIES WOFHP  
2001 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4400

WNEG

I.D.A.P. WHOLE ROCK WOFHP  
LITHIUM METABORATE FUSION

Project Resources

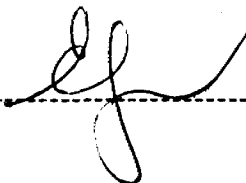
T.S.L. REPORT No. : W4734  
T.S.L. File No. : M3158  
T.S.L. Invoice No. : 4770

YOUR REFERENCE - 620-04

ALL RESULTS PPM

SAMPLE #	Ca	Sr	Ir	Zr	Ba
	ppm	ppm	ppm	ppm	ppm
22121	257	129	120	21	14
22122	83	237	148	30	15
22123	21	25	132	24	15
22124	363	64	221	52	8
22125	141	123	119	21	15
22126	158	70	195	55	6
22127	165	75	358	55	8
22128	61	202	104	22	17
22129	690	86	256	55	7
22131	300	108	214	49	8
22327	475	50	230	50	7
22328	288	58	208	51	7
22329	396	168	140	24	16
22330	476	200	168	30	15
22331	256	75	226	50	8
22332	377	184	264	60	9
22333	47	70	113	27	35
22334	445	45	228	62	8
22335	96	124	91	19	20
22336	72	194	121	21	23
22337	308	197	139	23	14
22338	166	175	75	12	13
22339	103	183	113	20	16
22340	208	116	89	19	23
22341	166	145	85	21	25

DATE : OCT-12-1996

SIGNED :  2 of 2

MW.EG

T S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWIEB

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium MetaBorate Fusion

Dorfind Resources

T.S.L. REPORT No. : W4660

T.S.L. File No. : M7991

T.S.L. Invoice No. : 4685

*WEP*

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
22314 FE	68.97	13.90	5.31	3.99	1.18	2.76	2.50	0.69	0.10	0.14	1.27	100.76
22315 FE	71.41	12.41	5.13	3.70	0.86	2.81	1.52	0.46	0.08	0.06	1.57	100.01
22316 FE	52.25	17.74	10.09	4.25	5.68	4.75	1.40	0.87	0.24	0.10	2.23	100.06
22317 FE	73.22	13.19	4.01	1.87	0.99	4.07	1.84	0.36	0.07	0.04	1.22	100.28
22318 FE	73.83	12.70	3.20	2.00	0.63	2.74	4.00	0.30	0.06	0.04	0.23	100.39
22319 FE	74.12	12.69	3.03	2.67	0.47	1.99	2.42	0.29	0.06	0.06	1.25	100.14
22320 FE	74.56	12.72	3.16	1.75	0.52	5.44	0.60	0.29	0.05	0.04	1.65	99.80
22321 FE	74.15	12.31	3.62	1.43	1.05	2.14	3.70	0.32	0.06	0.04	1.22	100.15
22322 FE	72.79	12.82	3.81	1.36	0.72	4.89	1.84	0.45	0.06	0.06	1.25	99.41
22324	73.18	12.90	3.36	0.92	0.62	4.98	2.46	0.35	0.05	0.04	1.25	99.62
22325	73.38	12.73	2.89	2.42	0.69	3.33	3.16	0.32	0.06	0.06	1.47	100.50
22326 FE	74.86	11.99	3.22	1.69	0.45	4.00	2.62	0.31	0.05	0.04	1.24	100.31

*2.25*

*1.25*

*1.08*

DATE : SEP-24-1990

SIGNED :

*[Signature]*

2 of 4

MW166

T S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW166

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METABORATE FUSION

Drofino Resources

T.S.L. REPORT No. : W4660

T.S.L. File No. : M7991

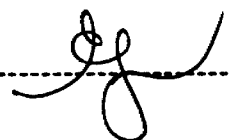
T.S.L. Invoice No. : 4685

YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
22314 FE	229	116	258	62	11
22315 FE	563	99	246	69	9
22316 FE	367	134	90	16	20
22317 FE	529	132	235	70	8
22318 FE	888	135	243	70	7
22319 FE	315	101	249	64	6
22320 FE	88	114	234	70	7
22321 FE	930	99	248	70	7
22322 FE	403	77	235	58	8
22324	443	80	251	64	7
22325	565	119	227	71	7
22326 FE	450	93	219	66	7

DATE : SEP-24-1990

SIGNED :  4 of 4

MWIEB

T.S.L. LABORATORIES WOFHP  
 2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
 TELEPHONE #: (705) 268 - 4441  
 FAX #: (705) 268 - 4420

*step*  
*step*

MWIEB

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP  
 Lithium MetaBorate Fusion

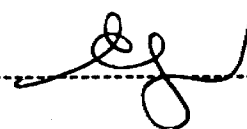
Oxford Resources  
 P.O. Box 143  
 Toronto, Ontario

T.S.L. REPORT No. : W4660  
 T.S.L. File No. : M7991  
 T.S.L. Invoice No. : 4685

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
22108 FE	69.60	13.57	3.84	3.90	1.33	3.95	1.40	0.39	0.07	0.06	2.08	99.19
22109 FE	70.09	13.19	4.02	1.18	1.08	5.42	0.70	0.46	0.04	0.06	1.60	97.84
22110 FE	71.22	13.02	4.10	1.59	0.87	4.88	1.14	0.47	0.05	0.06	2.14	99.53
22111	72.88	12.94	3.95	1.70	0.58	5.22	1.32	0.41	0.06	0.06	0.93	100.06
22112	69.91	14.17	4.11	1.34	1.05	4.95	1.42	0.55	0.03	0.06	2.28	99.87
22113	72.63	12.19	3.61	0.64	0.44	2.79	2.34	0.38	0.01	0.04	2.77	97.84
22114	67.05	13.85	5.25	2.21	0.85	4.49	2.48	0.70	0.10	0.12	1.92	99.00
22115	67.74	13.67	5.29	2.04	1.48	5.06	0.98	0.72	0.07	0.12	1.64	98.79
22116	56.59	15.65	7.68	4.68	4.75	3.67	2.10	0.82	0.16	0.10	2.88	99.08
22117 FE	75.42	12.02	3.23	2.32	0.79	4.39	1.04	0.32	0.04	0.04	0.92	100.52
22118 FE	70.67	12.70	5.41	3.91	1.24	4.15	0.58	0.66	0.09	0.12	1.32	100.84
22119 FE	72.03	13.04	4.39	2.91	0.47	5.19	1.52	0.53	0.08	0.08	0.70	100.96
22120 FE	73.51	12.61	3.75	1.99	0.63	2.89	3.66	0.33	0.08	0.04	1.11	100.61
22510 FE	69.63	13.45	4.96	4.40	0.79	3.74	0.92	0.56	0.07	0.06	1.75	100.35
22511 FE	74.79	12.52	3.60	0.64	0.78	4.84	1.20	0.30	0.04	0.06	1.43	100.20
22512	73.95	11.87	2.90	3.08	0.62	2.85	1.70	0.21	0.06	0.06	3.39	100.69
22513	57.86	17.12	6.28	5.72	3.53	3.88	2.20	0.89	0.08	0.06	2.64	100.28
22301	77.95	11.76	2.27	0.80	0.46	4.40	1.36	0.34	0.03	0.06	1.00	100.42
22302 FE	67.99	13.25	5.55	1.23	1.63	3.01	2.14	0.95	0.04	0.08	3.40	99.27
22303 FE	68.45	13.51	4.29	2.03	1.71	5.39	0.52	0.47	0.06	0.06	2.12	98.60
22304	74.59	11.60	2.99	2.07	0.49	4.36	1.52	0.21	0.06	0.02	1.86	99.97
22305	75.21	11.67	2.91	1.51	0.45	2.60	3.22	0.30	0.04	0.04	1.42	99.58
22306 V1	73.13	13.27	3.78	1.16	0.86	4.66	1.14	0.36	0.06	0.04	1.57	100.03
22307 V1	70.66	13.42	4.62	4.01	0.73	2.16	1.90	0.45	0.09	0.04	1.62	99.72
22308	58.28	15.99	6.66	5.47	4.63	3.87	1.06	0.84	0.07	0.10	3.44	100.40
22309 FE	74.04	12.76	3.50	2.53	0.91	3.18	2.36	0.33	0.05	0.04	1.12	100.82
22310 FE	72.59	12.15	3.06	3.69	0.67	1.67	2.34	0.30	0.06	0.04	1.41	98.18
22311 FE	70.66	13.18	3.76	5.19	1.42	2.27	1.18	0.44	0.07	0.04	2.15	100.39
22312 FE	55.73	16.47	6.41	7.61	4.36	4.07	1.12	0.79	0.17	0.08	1.25	100.07
22313 FE	72.01	12.75	3.84	1.97	0.89	4.27	1.30	0.45	0.05	0.06	2.68	99.68

DATE : SEP-24-1990

SIGNED :  1 of 4

MWIEG

T S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4M 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MWIEG

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METABORATE FUSION

Orfino Resources

T.S.L. REPORT No. : W4660

T.S.L. File No. : M7991

T.S.L. Invoice No. : 4685

YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
22108 FE	472	122	197	53	8
22109 FE	164	84	240	69	9
22110 FE	253	62	247	68	9
22111	288	96	260	54	8
22112	466	69	195	44	12
22113	714	35	201	55	8
22114	578	101	240	63	12
22115	405	94	221	60	12
22116	720	179	125	23	17
22117 FE	365	115	224	64	8
22118 FE	110	148	204	53	10
22119 FE	270	71	260	65	9
22120 FE	776	116	259	68	7
22510 FE	176	110	215	59	10
22511 FE	261	56	219	75	8
22512	255	55	218	72	7
22513	818	98	103	24	17
22301	313	69	223	60	7
22302 FE	488	50	174	36	13
22303 FE	119	98	216	56	10
22304	272	80	220	67	6
22305	686	50	220	65	7
22306 V1	257	93	258	75	7
22307 V1	240	212	266	63	9
22308	182	156	142	32	20
22309 FE	551	113	240	71	8
22310 FE	540	132	228	69	7
22311 FE	213	102	249	68	9
22312 FE	229	152	114	27	20
22313 FE	194	45	236	61	9

DATE : SEP-24-1990

SIGNED : \_\_\_\_\_



3 of 4

MWIEG

L LABORATORIES WOFHP  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

IEG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP  
Lithium MetaBorate Fusion

Prof. Resources  
P.O. Box 143  
Toronto, Ontario

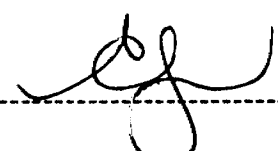
T.S.L. REPORT No. : #4319  
T.S.L. File No. : M7334  
T.S.L. Invoice No. : 4466

YOUR REFERENCE - 823

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
22483	72.41	13.22	4.26	0.87	0.93	4.84	1.80	0.33	0.07	0.06	2.00	100.81
22484	51.23	15.87	11.96	7.62	5.15	2.99	0.32	1.28	0.18	0.18	3.25	100.03
22485	51.78	16.24	9.07	6.70	5.45	3.88	0.38	1.10	0.18	0.24	4.39	99.41
22486	60.43	15.23	6.48	9.70	3.17	1.66	0.10	0.68	0.10	0.10	2.78	100.41
22487	53.48	16.83	7.87	8.58	4.79	1.95	1.18	0.80	0.11	0.18	3.65	99.43
22488	57.11	15.20	7.12	7.22	4.25	2.80	0.60	0.70	0.10	0.12	3.50	98.73
22489	58.09	15.01	6.48	5.39	4.35	4.48	0.26	0.67	0.11	0.12	2.92	97.88
22501	55.21	16.23	5.57	12.47	3.20	1.37	0.20	0.61	0.09	0.06	4.24	99.24
22502	55.25	17.32	6.09	8.46	3.94	2.83	0.58	0.68	0.09	0.10	3.80	99.14
22503	56.36	16.69	5.64	7.73	3.78	3.50	0.44	0.62	0.09	0.10	3.67	98.60
22504	56.64	17.33	6.15	7.68	4.04	3.66	0.48	0.71	0.10	0.06	3.60	100.44
22505	57.20	15.95	7.55	4.03	5.00	4.27	1.04	0.75	0.12	0.14	3.34	99.41
22506	54.67	16.66	7.16	7.39	5.31	3.27	0.78	0.78	0.11	0.14	3.73	100.00
22507	56.13	15.97	7.24	8.46	5.11	2.64	0.14	0.75	0.11	0.12	3.71	100.37
22508	52.37	14.35	8.93	7.27	9.53	2.62	0.36	0.72	0.13	0.14	3.74	100.14
22509	53.79	15.64	9.61	7.57	4.36	3.76	0.70	1.24	0.15	0.16	2.76	99.93

DATE : AUG-22-1990

SIGNED :



1 of 2

MW1EG



L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

1EG

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METABORATE FUSION

Drifino Resources

T.S.L. REPORT No. : W4319

T.S.L. File No. : M7334

T.S.L. Invoice No. : 4466

YOUR REFERENCE - 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
22483	370	60	230	80	9
22484	130	210	100	30	25
22485	200	220	110	24	21
22486	210	250	100	26	14
22487	320	210	120	28	16
22488	170	60	100	24	14
22489	70	90	110	26	14
22501	30	90	90	16	12
22502	100	200	100	16	13
22503	120	120	90	16	12
22504	110	110	90	16	14
22505	320	100	120	24	15
22506	350	160	110	26	14
22507	70	200	110	30	15
22508	120	150	70	16	18
22509	260	170	100	22	23

DATE : AUG-22-1990

SIGNED :

2 of 2



# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4317

SAMPLE(S) OF pulp from W4319

INVOICE #: 4249  
P.O.: 623-C4

J. Bryce  
project 623

	Cu ppm	Pb ppm	Zn ppm
22483	5	<2	66

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jul 24/90

SIGNED \_\_\_\_\_



For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF DURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4733

INVOICE #: 4675  
P.O. : 623-C4

SAMPLE(S) OF Rocks

K. Pham  
623-C4

	Cu ppm	Pb ppm	Zn ppm
22337	49	5	73
22338	150	3	44
22339	54, 58	7, 9	52, 59
22340	41	3	43
22341	75	14	115

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Sep 26/90

SIGNED \_\_\_\_\_





# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4138

INVOICE #: 4065  
P.O.: 623-C4

SAMPLE(S) OF Pulp-W4137 & Rocks

K. Cook & K. Pham  
project 623

REMARKS: Assay - >5000 ppm Cu & Pb. Sample shipment notice not complete.

	Cu ppm	Pb ppm	Zn ppm
135200366254-4	31	11	16
140200366254-4	460	4	38
145207366254-4	75	3	40
3680001129635-1	8	19	5
3683581129635-1	13	6	47

RECEIVED  
JUL 04 1990

RECEIVED  
JUL 04 1990

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

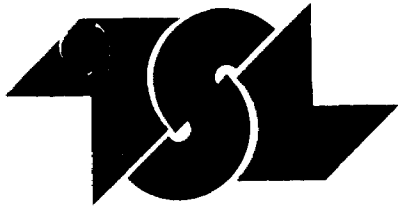
Jun 26/90

SIGNED \_\_\_\_\_

Page 1 of 1

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.





# T S L LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2

TIMMINS, ONTARIO

P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

## CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4100

SAMPLE(S) OF pulp from W4099

INVOICE #: 4028  
P. O. : 623-C4

K. Cook  
project 623

	Cu ppm	Pb ppm	Zn ppm
2001801129002-3	39	5	65

RECEIVED  
JUL 04 1990

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jun 20/90

SIGNED \_\_\_\_\_

Page 1 of 1

For enquiries on this report, please contact Customer Service Department.  
Samples, Pulps and Rejects discarded two months from the date of this report.



WALSB

L LABORATORIES XOFHP

2001 RIVERSIDE DRIVE, UNIT 2, TANNING, ONTARIO R4N 7G3

TELEPHONE #: (705) 268-4441

FAX #: (705) 268-4420

I.D.A.A. WHOLE ROCK ANALYSIS XOFHP

Lithium Metaborate Fusion

Labord Resouces

Suite 107, 111 River Canadian Place

P.O. Box 140

London, Ontario N6A 1G7

OUR REFERENCE - project 620

T.B.L. REPORT No.: W4101

T.B.L. File No.: 07170

T.B.L. Sample No.: 4058

SAMPLE #	SiO2	Al2O3	Fe2O3	CaO	MgO	MnO	K2O	TiO2	NaO	P2O5	LOI	TOTAL
	%	%	%	%	%	%	%	%	%	%	%	%
0001107916-4	77.96	11.97	7.40	1.66	1.84	4.59	1.50	0.72	0.08	0.04	1.35	99.59
0001107940-1	80.74	17.36	8.50	5.70	4.72	2.76	3.08	2.36	0.15	0.10	5.41	100.17
00000107944-1	84.49	17.74	8.48	5.10	5.29	4.14	3.22	0.92	0.11	0.04	3.44	100.00
00000107900-1	81.87	15.42	8.54	5.47	5.87	1.92	1.68	0.90	0.15	0.16	5.06	99.59
01801107916-4	87.21	17.99	7.06	5.09	2.89	1.73	3.44	0.95	0.11	0.15	7.19	100.55
00000107927-1	81.74	16.35	6.55	18.12	2.35	10.49	0.12	0.90	0.14	0.12	4.28	100.21
0001107917-4	81.95	11.66	3.29	1.72	0.36	3.88	1.24	0.40	0.04	0.04	2.11	100.54
0001107947-1	87.10	15.30	8.15	6.39	4.20	3.78	0.48	0.91	0.10	0.15	3.02	100.50
0103141105987-4	81.98	15.35	8.24	5.10	1.55	3.96	1.04	1.11	0.14	0.18	2.77	100.23
0051801107941-0	83.30	15.16	8.54	6.66	3.89	4.17	0.48	1.03	0.13	0.18	2.52	100.87
001281107925-4	87.91	16.01	7.31	4.45	4.43	4.55	0.32	0.92	0.12	0.16	1.75	99.01
0007926-1	83.80	16.26	7.34	4.40	4.42	4.59	0.30	0.92	0.12	0.16	3.70	100.86
00001107941-0	82.29	20.20	6.20	10.17	5.34	2.31	0.32	0.51	0.10	0.08	3.28	100.91
01801107942-2	87.03	15.09	9.27	9.32	2.88	1.89	0.20	1.05	0.14	0.18	2.87	99.74
0152041107941-1	87.99	14.55	7.10	6.21	5.27	4.12	0.08	0.62	0.12	0.14	2.44	99.74
00701107926-1	85.15	16.58	7.64	4.90	5.08	4.34	0.80	0.95	0.10	0.14	3.21	99.12

DATE : JUN-02-1996

SIGNED :

1 of 2

2000

LABORATORIES

209-44

2001 RIVERSIDE DRIVE, UNIT 2, BIRMING, ONTARIO CANADA

TELEPHONE #: (705) 269-4444

FAX #: (705) 269-4400

06

I.C.A.R. WHOLE ROOMWORK

LITHIUM METABOLITE PLESON

Project Reference

T.E.L. REPORT NO. : W4101

T.E.L. FILE NO. : M7070

T.E.L. INVOICE NO. : 4055

DUP REFERENCE - project 622

ALL RESULTS PPM

SAMPLE #	Se	Br	Ir	...	Sc
	ppm	ppm	ppm	ppm	ppm
1057107916-4	350	90	120	64	7
071129648-7	50	130	80	16	26
0001129644-1	110	200	130	18	20
2050000107907-1	120	350	120	24	27
1061107905-4	520	80	160	28	16
187001107907-1	40	170	100	20	19
11901107917-4	210	50	220	50	3
0001129647-1	190	260	140	26	23
2070141118987-4	250	170	190	38	18
1050801107941-1	260	160	160	22	23
1050801107905-4	140	110	160	24	13
1050801107906-1	120	100	140	26	12
0001107941-2	110	200	90	10	14
10501107940-1	60	280	140	21	21
10308401107941-1	70	190	110	22	18
10001107905-1	570	200	120	20	19

DATE : JUN-20-1991

SIGNED :

2 of 2

W1EG

L LABORATORIES WOFHP  
 2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
 TELEPHONE #: (705) 268 - 4441  
 FAX #: (705) 268 - 4420

W1EG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP  
 Lithium MetaBorate Fusion

Profino Resources  
 P.O. Box 143  
 Toronto, Ontario

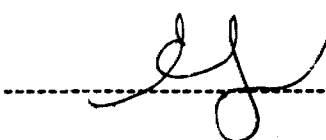
T.S.L. REPORT No. : W4137  
 T.S.L. File No. : M7098  
 T.S.L. Invoice No. : 4150

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
1129669-1	59.02	15.46	6.64	6.15	5.20	3.46	0.08	0.89	0.09	0.16	3.28	100.44
50001129627-1	55.55	16.49	8.54	6.06	4.09	3.21	0.90	0.78	0.20	0.14	3.76	99.73
50001129627-2	54.06	18.52	7.98	4.16	4.87	5.56	0.38	0.89	0.11	0.16	3.26	99.95
0650001129627-2	69.13	13.25	4.38	2.96	0.92	4.94	1.02	0.48	0.10	0.08	3.41	100.66
29640-1	54.04	17.83	7.29	6.83	4.40	4.38	0.54	0.78	0.13	0.10	3.53	99.83
2250001129640-1	51.70	18.43	8.08	7.93	5.77	2.56	0.70	0.77	0.10	0.16	3.56	99.77
2003501129677-1	51.65	15.03	11.66	9.45	4.65	2.38	0.16	1.22	0.17	0.18	2.95	99.48
51801129677-1	51.91	16.82	9.43	7.42	4.25	4.14	0.08	1.23	0.19	0.20	3.00	98.67
5000001129678-1	52.23	15.99	11.63	8.10	4.54	3.47	0.18	1.29	0.17	0.16	2.68	100.44
4000001129679-1	48.77	17.85	8.36	9.20	5.87	2.18	0.36	0.79	0.15	0.16	5.02	98.73
51801129007-1	76.24	11.87	2.79	1.71	0.52	3.14	1.98	0.23	0.04	0.02	1.82	100.35
0150001129008-1	78.45	11.04	1.88	1.07	0.24	3.26	3.56	0.29	0.03	0.06	0.39	100.25
5200366254-4	59.83	16.38	6.80	7.83	4.05	3.20	0.54	0.75	0.14	0.14	0.63	100.31

DATE : JUL-04-1990

SIGNED :



1 of 2

LEG

T S L

LABORATORIES

WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCKWOFHP

LITHIUM METABORATE FUSION

Drofino Resources

P.O. Box 143

Toronto, Ontario

T.S.L. REPORT No. : W4137

T.S.L. File No. : W7098

T.S.L. Invoice No. : 4150

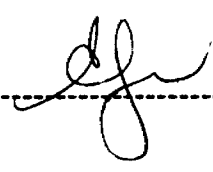
YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
1129669-1	60	200	120	26	18
0750001129627-1	290	100	120	32	20
50001129627-2	160	110	160	38	22
50001129627-2	210	70	230	68	9
1129640-1	260	300	100	18	18
50001129640-1	160	220	90	16	18
2003501129677-1	70	160	80	22	35
0351801129677-1	100	170	100	22	32
00001129678-1	130	140	70	22	33
000001129679-1	110	80	90	16	19
31801129007-1	390	70	240	60	7
50001129008-1	800	70	190	58	5
135200366254-4	120	210	130	28	16

DATE : JUL-04-1990

SIGNED :



2 of 2

HW1EG

S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

HW1EG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP

Lithium MetaBorate Fusion

Orfino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4257

T.S.L. File No. : M7225

T.S.L. Invoice No. : 4241

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
1881801129622-1	48.36	13.88	15.14	6.80	5.99	4.08	0.94	2.90	0.32	0.36	0.54	99.29
601801129622-1	73.49	12.44	4.64	1.41	0.98	3.88	1.60	0.36	0.10	0.04	1.53	100.45
1137932-1	58.99	15.47	6.78	4.05	4.47	4.91	0.42	0.69	0.10	0.10	3.14	99.13
0700001129629-2	72.32	12.71	3.06	2.36	0.81	4.32	1.16	0.53	0.07	0.06	0.84	98.23

DATE : JUL-18-1990

SIGNED :



1 of 2



WIES

S L LABORATORIES WOFHP  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

WIEG

I.C.A.P. WHOLE ROCK WOFHP  
LITHIUM METABORATE FUSION

Orofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4257  
T.S.L. File No. : M7225  
T.S.L. Invoice No. : 4241

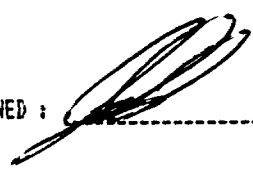
YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
1981801129622-1	410	160	160	30	30
01801129622-1	340	80	240	74	7
137932-1	120	100	130	30	17
0700001129629-2	260	130	250	64	9

DATE : JUL-18-1990

SIGNED :



2 of 2

WIEG

L LABORATORIES WOFHP  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

WIEG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP  
Lithium MetaBorate Fusion

Drofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4139  
T.S.L. File No. : M7097  
T.S.L. Invoice No. : 4151

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
0360001187935-1	57.88	15.28	6.14	5.25	4.21	3.38	0.62	0.63	0.09	0.12	4.26	97.87
70101137934-1	68.97	12.12	3.14	3.48	0.51	1.66	2.46	0.29	0.08	0.06	4.77	97.53
20001129652-3	71.55	12.97	3.38	0.74	0.49	4.71	1.48	0.31	0.07	0.04	2.26	98.00
1129677-4 ✓	54.52	16.43	7.92	6.91	5.03	3.98	0.12	0.77	0.12	0.18	4.19	100.18
00001129677-1	71.98	12.69	3.94	2.67	0.83	4.85	0.52	0.57	0.07	0.10	1.91	100.14
4000001129634-3	56.78	14.78	8.71	7.43	3.66	2.41	0.48	1.19	0.13	0.20	4.98	100.72
2003571129673-1	58.81	13.05	6.84	6.73	2.27	1.32	2.30	1.07	0.13	0.18	7.72	100.42
29635-1 ✓	53.44	16.02	8.98	9.84	3.97	1.08	0.12	1.26	0.13	0.22	4.50	99.56
2000001129669-1	53.23	16.13	9.26	9.81	4.16	0.94	0.42	1.11	0.13	0.18	4.17	99.54
0050901129640-4	54.56	18.44	7.23	7.47	4.38	3.98	0.24	0.77	0.12	0.12	3.31	100.61
00901129673-4	49.93	17.43	9.83	10.07	5.75	2.74	0.10	0.95	0.15	0.12	3.41	100.47
2200001129636-1	58.15	15.15	8.41	5.95	5.46	2.18	0.58	0.95	0.12	0.16	3.40	100.52
29636-1	78.99	11.69	2.14	0.51	0.34	4.15	1.16	0.44	0.06	0.06	0.94	100.48
29015-1	68.40	13.00	3.99	1.83	0.91	4.36	1.36	0.46	0.06	0.08	5.87	100.33
2000001129674-1	63.06	14.65	7.51	5.64	2.32	1.86	1.52	1.24	0.12	0.20	2.61	100.74
70001129673-1	53.97	17.27	7.89	8.13	5.08	2.49	0.36	0.84	0.10	0.18	3.42	99.71
201801129671-1	71.87	14.59	3.12	1.16	0.73	5.96	0.88	0.47	0.04	0.08	1.06	99.95
1510001129654-1	66.69	14.08	5.32	3.79	2.58	4.16	1.08	0.57	0.07	0.14	1.82	100.31
00001129633-1	75.59	13.37	1.88	0.93	0.22	7.14	0.20	0.53	0.04	0.08	0.75	100.73
51801129631-1	73.08	13.04	3.88	1.42	0.79	5.59	0.98	0.48	0.08	0.08	0.78	100.19

DATE : JUL-04-1990

SIGNED :  1 of 2

IEG

T S L LABORATORIES WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MNIEG

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METABORATE FUSION

Dofino Resources

P.O. Box 143

Toronto, Ontario

T.S.L. REPORT No. : #4139

T.S.L. File No. : M7097

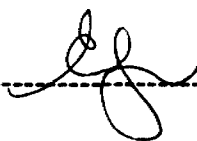
T.S.L. Invoice No. : 4151

YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
0560001137935-1	180	260	120	24	17
1870101137934-1	270	50	220	72	7
20001129652-3	350	90	240	76	8
29677-4	100	180	110	22	18
2000001129677-1	110	130	210	54	9
00001129634-3	110	210	130	30	21
2803571129673-1	490	40	130	32	13
1129635-1	50	40	140	32	22
00001129669-1	90	290	130	30	22
050901129640-4	80	80	90	18	18
00901129673-4	50	210	50	18	32
00001129636-1	190	200	100	18	19
1129636-1	250	60	200	50	6
1129015-1	280	80	230	68	9
00001129674-1	500	230	160	38	16
0570001129673-1	110	270	100	18	19
01801129671-1	340	80	250	60	11
010001129654-1	300	100	160	36	12
3600001129663-1	80	90	240	56	8
051801129631-1	180	50	240	68	9

DATE : JUL-04-1990

SIGNED :  2 of 2

5

T S L LABORATORIES  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

I.C.A.P. WHOLE ROCK ANALYSIS  
Lithium MetaBorate Fusion

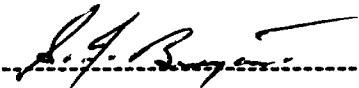
Drofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4213  
T.S.L. File No. : M7189  
T.S.L. Invoice No. : 4195

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
3550001129628-2	59.15	14.32	6.48	9.52	4.15	2.17	0.20	0.62	0.10	0.08	2.30	99.09
350001137939-1	72.27	12.83	3.61	3.62	0.88	1.53	2.50	0.33	0.09	0.04	1.26	98.95
3000901129656-1	56.80	15.72	7.43	6.72	4.85	3.30	0.30	0.68	0.12	0.10	3.15	99.18
1230001129657-1	57.80	15.82	7.19	6.07	5.22	3.57	0.86	0.73	0.10	0.08	2.64	100.09
330001129659-1	69.96	13.43	4.43	1.69	1.08	2.81	4.66	0.51	0.08	0.06	1.11	99.81
2050001129661-1	73.22	10.59	3.94	1.91	0.80	3.82	1.28	0.44	0.10	0.06	2.54	98.70
201801129661-1	71.38	12.89	4.28	3.44	0.61	2.60	2.84	0.53	0.10	0.06	1.15	99.89
52481129662-1	72.93	11.91	4.58	2.52	0.74	4.63	0.74	0.48	0.11	0.06	1.43	100.11
1129663-1	55.75	16.27	7.26	5.77	5.22	4.11	0.32	0.72	0.11	0.12	3.09	98.75
1650001129665-1	70.27	14.14	4.91	1.31	1.19	5.69	0.86	0.60	0.08	0.08	1.35	100.49

DATE : JUL-13-1990

SIGNED :  1 of 2

W1E6

T S L LABORATORIES  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

W1E6

I.C.A.P. WHOLE ROCK  
LITHIUM METABORATE FUSION

Orofino Resources  
P.O. Box 143  
Toronto, Ontario

T.S.L. REPORT No. : W4213  
T.S.L. File No. : M7189  
T.S.L. Invoice No. : 4195

YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
3550001129628-2	60	90	100	26	15
1350001137939-1	240	140	240	74	7
600901129656-1	130	150	110	26	17
1230001129657-1	320	120	120	28	18
1830001129659-1	780	110	240	70	9
050001129661-1	200	60	190	54	7
0201801129661-1	330	60	250	66	9
0152481129662-1	210	50	220	62	8
29663-1	160	100	130	34	17
1650001129665-1	290	60	260	70	10

DATE : JUL-13-1990

SIGNED : *L. J. Ryan* 2 of 2

HWIEG

LABORATORIES WOFHP  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

IEG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP  
Lithium MetaBorate Fusion

Drafting Resources  
P.O. Box 143  
Toronto, Ontario

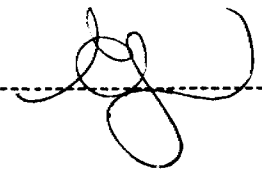
T.S.L. REPORT No. : W4593  
T.S.L. File No. : M7763  
T.S.L. Invoice No. : 4541

YOUR REFERENCE - project 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
81801129622-1	75.80	11.39	2.17	2.37	0.29	3.28	3.14	0.30	0.05	0.02	0.64	99.46
01801129622-1	73.93	12.39	4.61	1.35	0.92	3.91	1.62	0.35	0.10	0.04	1.52	100.73

DATE : SEP-06-1990

SIGNED : \_\_\_\_\_ 1 of 2



MW1EG

L LABORATORIES WOFHP  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

IE6

I.C.A.P. WHOLE ROCK WOFHP  
LITHIUM METABORATE FUSION

Grain Resources

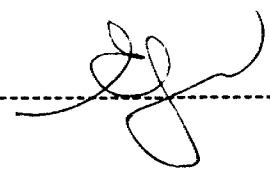
T.S.L. REPORT No. : W4593  
T.S.L. File No. : M7763  
T.S.L. Invoice No. : 4541

YOUR REFERENCE - project 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
81801129622-1	680	120	200	62	4
01801129622-1	330	80	230	74	6

DATE : SEP-06-1990

SIGNED :  2 of 2

11/18/88

S L LABORATORIES WOFAP  
 2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO CAN 703  
 TELEPHONE #: 705-268-4441  
 FAX #: (705) 268-4420

11/18/88

I.C.A.P. WHOLE ROCK ANALYSIS WOFAP  
 Lithium Metaborate Fusion

Profano Resources  
 P.O. Box 143  
 Toronto, Ontario

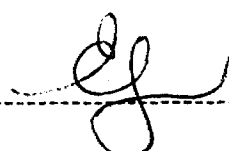
T.S.L. REPORT No. : W4793  
 T.S.L. File No. : M8278  
 T.S.L. Invoice No. : 4205

OUR REFERENCE - project 623

SAMPLE #	SiO2	Al2O3	Fe2O3	CaO	MgO	MnO	K2O	TiO2	MnO	P2O5	LOI	TOTAL
	%	%	%	%	%	%	%	%	%	%	%	%
340	59.47	14.85	3.75	5.38	3.56	2.76	1.80	0.69	0.11	0.16	2.16	99.51
342	71.65	12.68	3.73	2.89	1.27	3.71	2.10	0.38	0.04	0.10	1.46	100.00
343	68.01	13.92	3.99	4.36	0.55	4.82	0.70	0.48	0.07	0.12	1.06	98.07
22344	70.41	12.73	4.20	3.31	1.34	2.70	2.50	0.57	0.09	0.12	2.46	100.42
345	70.22	12.85	4.08	3.68	1.25	2.13	2.08	0.56	0.08	0.12	2.28	99.35
22514	55.34	15.84	2.55	4.97	6.01	3.14	0.78	0.67	0.16	0.14	4.23	99.82
22515	73.08	12.77	1.95	1.77	0.67	6.39	0.56	0.54	0.04	0.14	2.65	100.59
516	70.14	14.53	2.90	0.24	0.78	4.68	1.64	0.46	0.03	0.12	2.18	98.52
22517	73.34	12.35	1.47	2.27	0.41	4.17	1.48	0.56	0.05	0.12	3.08	99.31
22518 ✓	75.69	11.23	2.07	1.64	0.31	3.64	2.70	0.48	0.04	0.10	1.06	99.95
519	71.98	11.88	3.98	2.71	0.93	0.89	2.80	0.51	0.07	0.12	4.02	99.90
22520	54.77	15.22	9.68	4.64	4.02	4.67	0.12	1.24	0.13	0.24	4.09	98.82
521	67.88	11.89	4.46	4.55	0.95	2.18	1.98	0.54	0.08	0.10	5.27	99.91
852	71.91	11.77	2.65	3.70	0.67	5.12	0.68	0.53	0.08	0.10	3.70	100.92
28953	54.86	17.57	6.69	5.09	4.35	4.80	0.92	0.83	0.12	0.12	3.20	98.55
854	56.75	14.69	6.19	5.37	3.04	5.67	0.10	0.68	0.11	0.10	5.54	98.75
855	69.48	12.98	4.37	1.48	1.17	3.95	1.62	0.58	0.06	0.12	2.69	99.47
29101	70.26	13.01	3.53	1.88	0.74	4.72	1.62	0.45	0.06	0.10	1.42	99.95

DATE : OCT-15-1990

SIGNED :



1 of 2



W156

E.L. LABORATORIES WOFHP  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMING, ONTARIO CAN 703  
TELEPHONE #: (705) 269-4441  
FAX #: (705) 269-4420

W156

I.D.A.P. WHOLE ROCK WOFHP  
LITHIUM METABORATE FUSION

Doping Resources

T.S.L. REPORT No. : W4793  
T.S.L. File No. : M8278  
T.S.L. Invoice No. : 4905

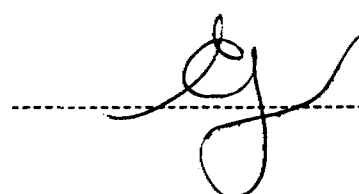
YOUR REFERENCE - project b23

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Ir ppm	Y ppm	Sc ppm
22130	460	156	122	24	17
22142	460	89	203	58	8
22143	118	294	250	68	8
22144	530	94	227	55	9
22145	329	83	210	56	8
22514	278	141	115	25	16
22515	244	65	240	54	8
22516	359	52	291	60	9
22517	259	65	219	50	8
22518	725	80	214	54	7
22519	353	48	222	63	8
22520	65	166	131	31	20
22521	382	84	227	63	9
22552	152	77	191	46	7
22553	484	359	107	16	17
22554	93	119	91	14	15
22555	273	49	278	65	10
29101	294	64	262	71	9

DATE : OCT-19-1999

SIGNED :



2 of 2



**T S L LABORATORIES**

DIVISION OF BURGNER TECHNICAL ENTERPRISES LIMITED

2031 RIVERSIDE DRIVE, UNIT #2  
TIMMINS, ONTARIO  
P4N 7C3

☎ (705) 268-4441 FAX: (705) 268-4420

**CERTIFICATE OF ANALYSIS**

SAMPLE(S) FROM Orofino Resources  
P.O. Box 143  
Suite 2701, 1 First Canadian Place  
Toronto, Ontario M5X 1C7  
Attention: T. McKillen

REPORT No.  
W4212

INVOICE #: 4142  
P.O.: 623-C4

SAMPLE(S) OF rock

K. Cook, J. Bryce  
project 623

	Cu ppm	Pb ppm	Zn ppm
0040001129661-1✓	8, 7	2, 2	17, 16

COPIES TO: Toronto, Kirkland Lake  
INVOICE TO: Toronto

Jul 06/90

SIGNED \_\_\_\_\_



11EG

L LABORATORIES WOFHP  
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4M 7C3  
TELEPHONE #: (705) 268 - 4441  
FAX #: (705) 268 - 4420

11EG

I.C.A.P. WHOLE ROCK ANALYSIS WOFHP  
Lithium MetaBorate Fusion

Drofino Resources  
P.O. Box 143  
Toronto, Ontario

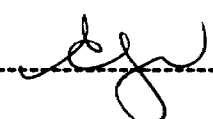
T.S.L. REPORT No. : W4099  
T.S.L. File No. : M7069  
T.S.L. Invoice No. : 4124

YOUR REFERENCE - 623

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
2001801129002-3✓	57.44	16.00	6.94	3.24	4.07	1.62	3.12	0.73	0.09	0.20	4.81	98.25
01801129644-1✓	53.42	17.86	8.19	6.80	4.31	3.14	1.20	0.83	0.13	0.14	3.88	99.91
001801129642-2✓	59.22	16.59	6.14	5.98	3.16	4.32	0.26	0.74	0.10	0.14	3.31	99.97
2000001129643-3	52.94	17.39	6.82	13.27	3.12	0.65	0.08	0.96	0.14	0.14	4.59	100.09
01801137916-1✓	71.86	13.91	3.35	2.91	1.67	4.53	0.74	0.39	0.03	0.08	1.42	100.89
095000137927 -1✓	52.90	17.17	8.69	4.77	6.08	4.78	0.04	1.03	0.15	0.20	4.00	99.81
01129644-1✓	53.63	17.33	5.54	14.61	2.71	0.47	0.08	0.74	0.12	0.14	4.25	99.61
01137927-3	52.68	16.24	9.08	9.39	5.23	2.69	0.54	0.89	0.17	0.16	3.06	100.12
1000001129643-3	52.06	17.53	9.92	9.48	4.86	1.09	0.42	0.92	0.18	0.14	3.56	100.17
3120001129643-1	54.13	17.55	7.93	9.60	2.70	2.28	0.58	0.91	0.17	0.18	3.91	99.94
03601115986-1	68.34	14.00	4.88	2.70	1.32	1.87	2.98	0.64	0.09	0.14	3.66	100.63
0101781129647-1✓	64.58	14.65	4.82	3.11	2.97	7.15	0.92	0.47	0.08	0.18	0.81	99.74
00001137927-1✓	55.98	16.03	7.97	5.65	5.59	3.39	0.42	0.95	0.14	0.18	4.21	100.50
01801129003-3	74.12	11.97	3.24	2.13	0.73	3.90	1.42	0.32	0.06	0.06	2.80	100.75
2391801115988-1	71.29	12.92	3.56	2.06	1.12	3.61	1.68	0.55	0.07	0.12	3.25	100.24
051801129001-1✓	71.57	14.23	3.60	3.95	0.71	3.72	0.74	0.35	0.08	0.06	1.47	100.49
000001129643-1	61.16	16.04	5.68	7.03	2.00	4.12	0.72	0.85	0.10	0.16	2.89	100.75
0502701129642-1✓	56.79	17.64	6.80	6.48	3.66	4.67	0.22	0.80	0.10	0.12	3.44	100.72
072701137942-1	59.09	14.54	8.92	5.20	3.33	4.16	0.38	1.17	0.13	0.20	2.77	99.87
01801137920-1✓	56.71	16.42	7.03	8.69	3.88	2.95	0.10	0.80	0.11	0.16	3.68	100.53

DATE : JUL-06-1990

SIGNED :



1 of 2

11EG

T S L

LABORATORIES

WOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METABORATE FUSION

Drofino Resources

P.O. Box 143

Toronto, Ontario

T.S.L. REPORT No. : M4099

T.S.L. File No. : M7069

T.S.L. Invoice No. : 4124

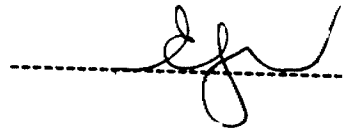
YOUR REFERENCE - 623

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
2001801129002-3	660	50	130	24	17
2001801129644-1	340	170	130	16	19
01801129642-2	90	180	90	14	16
000001129643-3	40	30	80	18	27
2001801137916-1	200	90	250	76	9
5000137927 -1	70	140	130	28	25
0950001129644-1	30	120	90	16	16
0950001137927-3	240	380	110	22	26
00001129643-3	130	310	130	24	27
5120001129643-1	160	120	170	32	18
53601115986-1	430	80	230	58	11
01781129647-1	740	870	150	32	10
0960001137927-1	380	150	120	24	21
01801129003-3	250	80	200	64	7
91801115988-1	330	70	240	56	9
1251801129001-1	110	170	240	72	8
00001129643-1	230	180	170	32	15
02701129642-1	70	90	100	18	18
1372701137942-1	200	150	180	24	22
01801137920-1	50	170	130	22	17

DATE : JUL-06-1990

SIGNED :



2 of 2



APPENDIX B

GEOPHYSICAL CONTRACTOR REPORTS



32D05SE0001 2.14427 PONTIAC

020

- (I) "AEROMAGNETIC REVIEW; PONTIAC/BEN NEVIS TOWNSHIPS, ONTARIO"  
By: J. B. Boniwell - July 1990
  
- (II) "LOGISTICS REPORT ON UTEM SURVEY AT PONTIAC TOWNSHIP"  
By: La Montagne Geophysics Ltd. - October 1990
  
- (III) "UTEM SURVEY RESULTS - PONTIAC TWP."  
By: Excalibur International Consultants  
- December 1990

APPENDIX B(I)

AEROMAGNETIC REVIEW; PONTIAC/BEN NEVIS TOWNSHIPS, ONTARIO

By: J. B. Boniwell - Excalibur International Consultants  
July 1990

AEROMAGNETIC REVIEW  
PONTIAC/BEN NEVIS TOWNSHIPS,  
ONTARIO

for

OROFINO RESOURCES LIMITED

by

J. B. Boniwell  
Exploration Geophysical Consultant

July 9, 1990



**EXCALIBUR  
INTERNATIONAL  
CONSULTANTS LTD.**



LIST OF CONTENTS

---

Introduction	Page 1
Data Base	2
Discussion - A. Lithologic Considerations	3
B. Structural Considerations	7
C. Stratigraphic Considerations	11
D. Mineral Considerations	12
Conclusions and Recommendations	18
Appendix	21

LIST OF DRAWINGS

---

DWG. NO.	TITLE	SCALE
EIC-2245	Total Field Aeromagnetic Contours	1:20,000
-2246	Plan of Interpretation	1:20,000
-2247	Hypothetical Longitudinal Section	N/A
-2248	Hypothetical Cross-Section	N/A

## INTRODUCTION

---

The resurgence in base metal interest has returned attention to the Pontiac/Ben Nevis region of northern Ontario. Located 50 kms due west of the Noranda camp in Quebec, it is noted for its geologic similarities including a felsic volcanic pile in the same Blake River volcanics, and sulphide showing with like mineral assemblages and habits of occurrence.

However this parallel has not yet provided the deposits such a favoured area might be expected to produce. It warrants therefore a re-examination of available, government-filed data for fresh leads to hidden occurrence, especially in depth. The present study seeks to discern such possibilities from aeromagnetics chiefly, and mapped geology.



DATA BASE

---

The following published sources of information have been drawn upon:

- i) OGS Maps P.2254, 2255, Airborne Electromagnetic Survey, Total Intensity Magnetic Survey, Ben Nevis, Pontiac Township(s), 1:20,000, 1979;
- ii) OGS Report 132, Clifford and Ben Nevis Townships, District of Cochrane, by L. S. Jensen, 1975, with map 2283, 1:31,680 scale;
- iii) OGS Report 125, Pontiac and Ossian Townships, Timiskaming, Cochrane District, by L. S. Jensen, 1975, with map 2296, 1:31,680 scale;
- iv) OGS Map 2205, Timmins-Kirkland Lake, Cochrane, Sudbury and Timiskaming Districts, geological compilation series, 1:253,440, 1971;
- v) assorted property reports from OMNR assessment files.



DISCUSSION

---

A. Lithologic Considerations

---

The volcanic suite underlying much of the area, provides very little definitive magnetic relief. There is a broad change which can be recognized denoting increasing background levels to the north. This is considered symptomatic of the more mafic volcanics lying in this direction relative to the more felsic units to the south. Other than this, no reliable differentiation is possible.

All the more pronounced magnetic features stem from intrusions. Even within this category however not everything is plain to see. An appreciable number of gabbroic and dioritic bodies have been mapped in outcrop which can not be distinguished magnetically. The magnetics on the other hand have defined several stocks, plugs and dykes which dominate the sectors in which they reside.

The most notable of these latter is a near-circular centre of anomaly at Clarice Lake in northeast Pontiac Twp. It



manifestly represents a zoned intrusion containing a felsic core and a surrounding border phase of magnetite-enriched rocks. Mapping in the environment places granodiorite at the hub grading outwards into a quartz diorite containing a consistent 1-2% magnetite. Mapping also reveals a microdiorite on the outer edges of the stock which was found to contain 5-7% magnetite, and which appeared to be older. This then is a centre which has almost certainly experienced multi-phase intrusion over time.

To its west, about 3.5 kms distant, a satellite magnetic feature is evident. It does not outcrop, but lies buried some 150 m under unconsolidated esker material. The source body is presumed dioritic also in composition, containing magnetite in similar amounts to the previous border phase. In this instance, there is no felsic core observable.

A further 5 kms west in Ben Nevis Twp. yet another centre of intrusion exists. No larger than the previous one in area, it however is more complicated in magnetic terms; it is also more shallow, in places less than 50 m from surface. Outcrop in the vicinity provides a mixture of granodiorite and diorite. Nevertheless there is a fairly widespread cover extant in this sector, and it is not difficult in consequence to postulate a felsic intrusive core grading into a magnetite enriched diorite as before, if completeness of encirclement is not a requirement.



The magnetic aureole clearly is not complete in this case, the proposed border phase being present only on the south side (strongly) and to the north and west (weakly). It is totally absent to the east. A second magnetic high neighbouring to the south can be attributed directly to the diorite outcroppings it falls over. These particular exposures however form a relatively isolated cluster, and while geology has discerned no difference in them, in magnetic terms they obviously are not the same as all the other diorites and gabbros mapped in the region. They are therefore taken to be younger, and specifically related to the felsic centres they are close to.

The same is said for the incipient magnetic highs in the area extreme southwest. Again diorite and gabbros outcrop at these sites but they show no overt difference from other like outcrops in the vicinity. However they do neighbour the Keith Lake felsic stock which is no more than 800 m away to the west in adjacent Clifford Twp.; thus it is assumed that it is to this centre they owe their magnetic distinctiveness.

At the centre north sheet edge, an area of quartz diorite has been mapped. This intrusion is classified felsic, and so is distinguished from the other diorites in the region. It is slightly magnetic. Importantly, it seems probable that this kind



of intrusion is far more widespread in the area than mapping has recognized. A certain amount of magnetic relief reaching south from the Clarice Lake intrusion in a long irregular tongue suggests that similarly magnetic quartz diorite extends right through here. Disturbingly, the OGS compilation at 1:253,440 makes this possibility a 1.25 km wide N-S belt of felsic intrusion. However, since there is a lot of masking cover through this whole sector, it is considered a projection of this nature is open to interpretation. The present magnetics therefore are taken to be more definitive, and that a more realistic disposition of such quartz diorite is as shown (Dwg. No. EIC-2246).

The remaining type-intrusion to be expressed magnetically is the diabase dyke. There are several of them, at least four. Strangely, only one of them has been picked up in the mapping, a NW-bearing dyke which cuts across the far southwest corner of the study area. All the others bear N-S. As this heading approximates the flight direction for the recorded magnetics, there is always the haunting question as to whether these features have been introduced (as level busts) by the survey operation itself. However of the three possibilities, two rule themselves out immediately. They are undeniably real, that is to say, they are true dykes and they strike N-S.



Such dykes are an addition to the geology of the area. They occur in the west half of Ben Nevis Twp. only. Because of their disposition, they are seen to be outlying members of the Matachewan dyke swarm which in numbers congregates well to the west. One of the present dykes is quite substantial in size and continuity. That it should not have been seen in outcrop suggests that not much of it reaches surface, and this circumstance would fit the magnetic response which indicates the dyke becomes increasingly buried to the south.

#### B. Structural Considerations

---

The presence of dykes and intrusive centres in the region implies the existence of considerable structure, that is, these injected bodies occur where they do by reason of pre-existing faults and other lines and points of weakness. Certainly there exists N-S faulting, since it is projected by geology in several places; thus it becomes notable that not only has it facilitated the N-S dyking prior-described, but that it also appears to have controlled in part the location of the intrusive stocks. This is judged to be important since these same felsic stocks could well represent earlier volcanic centres.





The stock in Clifford Twp. is particularly suggestive of this possibility. Not only are there interlayered volcanics encircling it, albeit in elliptical fashion, there is a tongue of felsic volcanics extending ENE from its granitic centre which cuts across the older formations of the pile. This feature is singular and occurs only to this E side of the centre. As a result, it can be prognosticated it signifies the primary central feeder to the ancient Clifford volcano. If this latter has been tilted up on its side by subsequent tectonics -- a high probability -- and with the feeder neck pointing the way it does, then firstly, formational dips should be much steeper on the west side of the centre than to the east, and secondly the formations themselves should be broader and far more extensive in the easterly direction. Both these conditions are fairly met, it seems: a dip of  $85^{\circ}$  W has been measured in volcanics on the stock's west side, and although no counterpart bedding determination has been noted to the east, there is no question the apparently derived volcanics extend way out to this side, in fact, it is judged, right across Ben Nevis and Pontiac Twps., that is, for over 20 kms. Nothing so grand exists to the west that is as patently related.

Geology from flow top observation has prescribed an E-W anticlinal axis through the Clifford volcanic-cum-intrusive



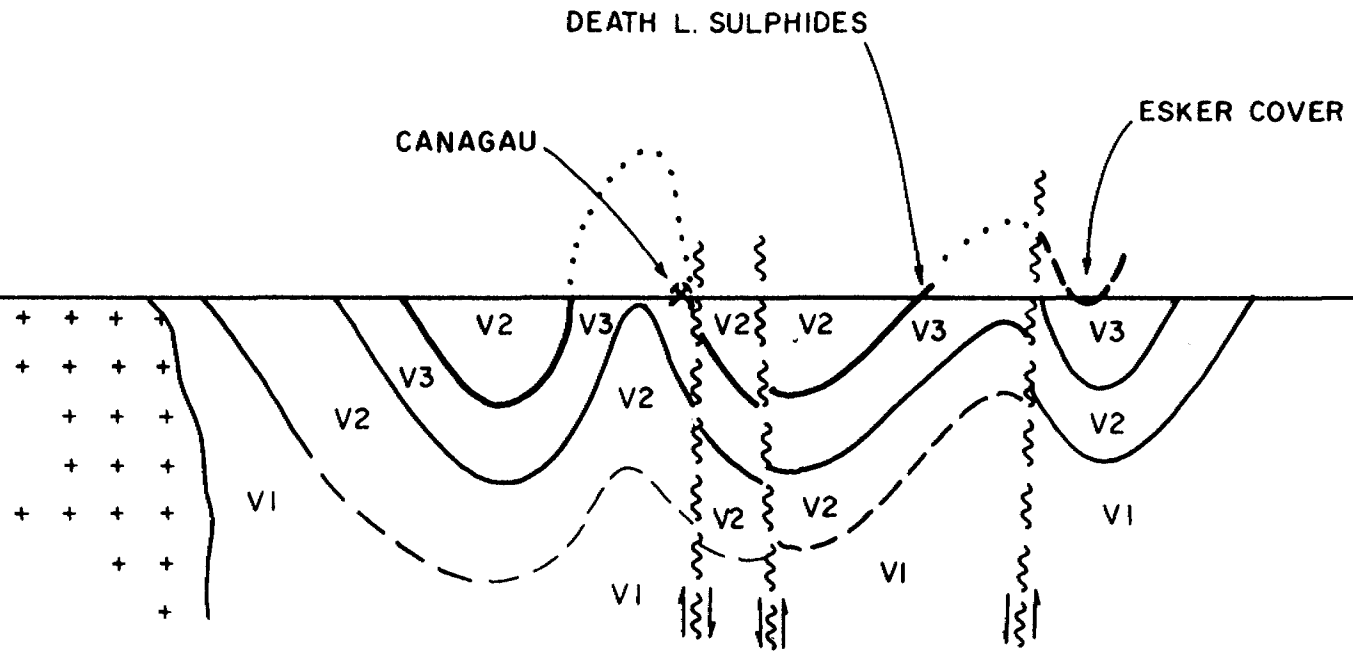
centre. It is now believed this structure is a major one for the area, and that it carries on into Pontiac Twp. where it swings markedly to the NE (Dwg. No. EIC-2246). It is flanked by sub-parallel synclinal and anticlinal subsidiary fold axes in its initial stages before each successively cuts across the main ridge as the latter rakes to the E and NE. The effect is an anticline which bobs up and down as it continues its extenuated course in the overall easterly direction (Dwg. No. EIC-2247).

The other dominant fault direction for the area is broadly NE-SW. There are several such fault axes perceived, some of them so well established they come with identifying names. The Murdock Creek-Kennedy Lake Fault for instance, which transects all of Ben Nevis and part of Pontiac Twps., is actually a NE-bearing splay from the Larder Lake-Cadillac break, some 20 kms down-structural axis to the SW. It is accompanied by sub-parallel satellite faults, including those which pass through Death Lake and Pontiac Lake. The Misema Lake-Mist Lake Fault in the SE corner of Pontiac Twp. is also a member of this structural family; it in fact converges upon the Murdock Creek Fault in the vicinity of Kirkland Lake. All these faults within this grouping are regarded younger than the N-S axes certainly, and likely younger than any other faulting in the area.



West

East



Not to scale, schematic only

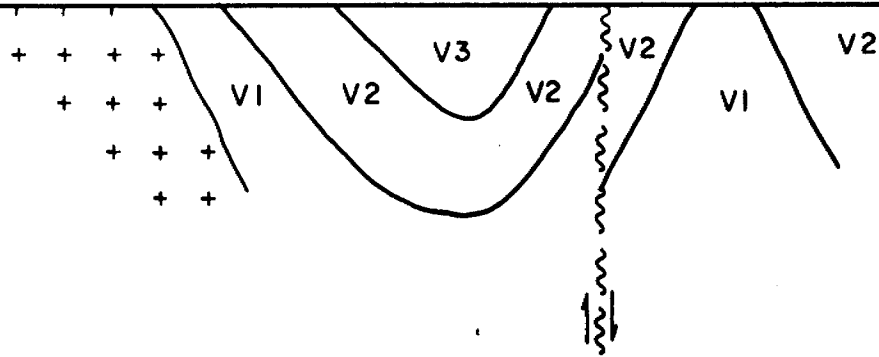
OROFINO RESOURCES LIMITED

Ben Nevis & Pontiac Twps., Ontario

### Hypothetical Longitudinal Section

South

North



Not to scale, schematic only

**OROFINO RESOURCES LIMITED**  
**Ben Nevis & Pontiac Twps., Ontario**  
**Hypothetical Cross-section**

Some E-W faulted off-sets are indicated by the dykes, and geology gives support to such a structural set in a couple of other places. Furthermore, the array of felsic intrusions across the north half of the area is aligned E-W, and intimates an underlying E-W control. By such token, it is seen possible that the Clifford stock location is similarly controlled, and it is noted here that a mapped E-W fault at Pontiac Lake would be on structural strike. This manner of evidence provokes the idea that the felsic (and magnetic) intrusive centres are all located at points of structural interaction between systems of N-S faulting and E-W faulting. Of these several intrusions however, only one was manifestly a volcano of size, viz. the Clifford stock.

The one remaining fault direction of note bears approximately NW. A group of such faults traverse the centre of the area. While elsewhere in the district faults with this heading tend to have major regional connotations, it is not easy to make such a case here. On the contrary, most of them appear local structures causing small displacements only. However, a fault running SE from Pontiac Lake could hold greater significance since it is well placed to have wrought the substantial change in strike direction of the Clifford anticlinal axis. So is another parallel fault 2.5 kms to the NE. As a



consequence, this pair of lineaments have been extrapolated magnetically to cross most of the area. Between them they bracket the flexure in the anticline as it swings from E to NE.

### C. Stratigraphic Considerations

---

On the mapped evidence, the volcanics extending outwards from the Clifford igneous centre are predominantly felsic to intermediate; there are very few mafic flows. Since the felsic rhyolites and the intermediate dacites repeatedly interlayer across most of Ben Nevis and Pontiac Twps., it is inferred that what is involved is essentially one volcanic cycle only. The shifts in stratigraphic level evident are not great, and are given by interceding structure as already described or inferred.

What stands out as an exception to this fairly orderly progression is the ostensible thickening of the rhyolite unit in Pontiac Twp. well down-plunge from its origin in Clifford. If this is the one and the same unit at the same stratigraphic level in the same cycle, then either it has flattened dramatically -- for which there is no evidence -- or it has been successively upthrown by faulting -- which is possible but difficult to prescribe adequately -- or it has been supplemented in some way



volumetrically in this sub-region. Of these alternatives, the latter offers the most promise.

Giving substance to the concept is a circular outline in topography immediately north of Pontiac Creek near the township geographic centre. This feature precisely fits a closure of distinctive magnetic low. There is little doubt in consequence that what is being described here is rooted in bedrock and geologic in cause. Exciting as it is plausible, an old fumarole is projected to have existed at this point. At the overall scale, it would sit on the flank of the main volcanic cone. As a once active feeder at an effusive stage of the volcanism, it could well have extruded extra rhyolitic lava into this local region. There may well be other vents in this general stratigraphic vicinity but recognizing these requires rather more conjecture, as is given in the next section.

#### D. Mineral Considerations

---

On the basis of the foregoing, it emerges that what might exist in Pontiac Twp. is a rhyolite dome, or domes. If so, both flanks of it, or them, would be highly prospective for banded massive sulphide deposits of the Noranda type.



There is some interesting mineralization through the region at various locations on the rhyolite contact. This is heartening inasmuch as it furnishes proof that the host volcanic cycle in its later fumarolic stages emitted geothermal fluids which contained significant minerals. Copper, zinc, lead have all been reported, along with substantial silver and some gold, in these occurrence. While some mining has been carried out in the past, viz. at Ranger Lake (Canagau Mines Ltd.) -- where the mineralization, incidentally, was vein-like, evidently remobilized by a local gabbroic intrusion, -- there has never been found the massive sulphide concentration that the environment suggests ought to exist. The Death Lake sulphide zone is a definite encouragement but it has yet to be proven of size.

To discover this hypothetical mineral body, several factors need to be considered. If it is accepted that the rhyolite unit mapped in outcrop is in essence the one flow, then the favourable upper contact has to be discriminated. On the longitudinal section (Dwg. No. EIC-2247) this contact is supposed to occur at Death Lake (where it manifestly dips  $45^{\circ}$  to the west), and to reappear 3 kms to the east in locations south and west from Clarice Lake. In this realm, a considerable glaciofluvial outwash forming a large esker is prevalent, and the





contact becomes hidden to some fair extent. Because of these circumstances, and the lack of any recent (INPUT) airborne em. anomaly to provide a target focus, it is likely no intense modern exploration of this buried contact environment has ever been mounted. Certainly there is no public record of one, although past prospecting forays must be assumed.

A further perceived importance of the Death Lake sulphides is that they lie at the rhyolite contact some 14 kms from the Clifford Twp. volcano. By this measure, it is a distal deposit, more likely to be associated with local fumaroles as a result, and more likely in consequence to typify the larger coherent depositions which are laid down under the relatively quiet marine conditions therewith prevailing. Whether these particular sulphides are actually banded as called for is not here known. They are evidently non-conducting at conventional frequencies.

The probability of fumaroles having once been extant in this sub-region is obviously high. However, beyond the already noted circular structure on Pontiac Creek, any additional occurrences can only be guessed at. Still, vents and necks are regarded possible in several places. The buried intrusive centre NE from Death Lake might be one, so could any part of the



so-called intrusive rhyolite mapped (by L. S. Jensen et al) at the west end of Clarice Lake. Another more concrete possibility is the small outcrop of rhyolite mapped along Pontiac Creek to the east of the flow boundary. This latter has no real support in geophysics, but a small coinciding ring structure and concentric layering to the south of it are seen to be relic imprints of its erstwhile feeder role. Due east 1.2 kms, a further ring structure can be perceived. It is in-filled with gabbro. All these circular structures, it is to be noted, lie on an E-W fault which passes through Stuart Lake into the Canagau mine vicinity.

All these various signs suggest that the search for massive sulphide deposits in the region ought to concentrate on the enlarged rhyolite flow unit in Pontiac Twp. However, while the west contact with its Death Lake sulphides is an obvious target, the equivalent east contact is not so certainly established. The exposed one is not necessarily the right one. In fact on weighing the evidence including adjacent flow top information, it seems likely the counterpart contact to the east exists under the esker, -- should it exist at all any longer, -- in the nose of a synclinal fold (Dwg. No. EIC-2247). It is here that the sought-after new hidden possibilities of sulphide occurrence fulfilling the requirements of the volcanogenic model



are best satisfied. It is also in this domain that past investigations appear to have been minimal.

Notwithstanding, three old airborne em. anomalies registered by Scintrex should have attracted attention. All three are isolated, and intriguingly rather well located, or at least two of them are. However, none has been confirmed by INPUT in the OGS flying. Patently, it follows that whatever exists in the way of sulphide mineralization is either broken up, disseminated or deeply buried, or in any combination thereof.

Future exploration will have to take consideration of this fact. However it is to be additionally noted that the INPUT flying would have paralleled any conformable sulphide deposition at any of the Scintrex positions. If a weak conducting response is all that can be expected anyway on the odds, the non-success of this coverage (as well as the Aerodat Joutel Resources survey) becomes understandable. Just the same, since massive sulphide deposits of size remain the ultimate goal of this review, the deep-seated body is the option to be catered to. At the Death Lake prospect for example, an appropriate future exploration will not content itself with defining what is there in the near-surface but will attempt to discover its in-depth mineral



connections, if any. By the same token, deep penetrating investigations under the esker suddenly become the vital mandatory component for any serious exploration of the sector's possibilities.



## CONCLUSIONS AND RECOMMENDATIONS

---

An area of exploration potential has been outlined. It is based on volcanogenic considerations for massive sulphide deposition in the region, and although far from complete in its details, it provides the scope and the chances to promote and finance a programme of major investigation.

This conclusion is rather sweeping in its implications. It suggests that future work should be directed to Pontiac Twp. and a broad band of rhyolite volcanics where little past exploration has been concentrated or proven effective. It postulates that a more deeply discerning, more focussed set of investigations could be rewarding. By inference, it down-grades all other sectors, including all of Ben Nevis Twp., and substantial portions of Pontiac Twp.

The most favoured sections contain the upper rhyolite contact. They also contain a fair amount of sand and gravel cover, and for the region, less outcrop than usual. Perforce, geophysics has a big part to play in any future exploration here. It is from this standpoint that the following recommendations are made. Specifically it is recommended that:

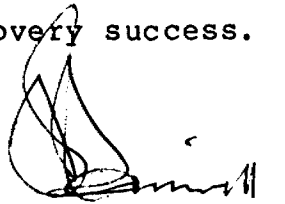


- i) a programme of deep searching, large loop em. be designed to screen the contact environment at Death Lake. As a minimum, the coverage should extend 3.5 kms along strike in both directions, traverses 200 m apart maximum, each approximately 800 m long apportioned 550 m west, 250 m east from the contact position;
- ii) a similar em. survey be conducted along the presumed central rhyolite contact(s) for a distance of 11.5 strike kms, from the intruding gabbro in the south to the Murdock Creek Fault in the north;
- iii) detailed VLF and total field magnetic measurements be collected on all lines of any grid prepared for the purpose of i) and ii) above;
- iv) diamond drilling be initiated on any target forthcoming. If no deep em. anomalies are encountered for testing, then consideration deserves to be given to the drilling of two or three deep stratigraphic holes carefully chosen to significantly improve geologic knowledge in depth;



- v) all holes completed in the previous stage be logged electromagnetically with time domain em.

By these steps, it is forecast, a new generation of exploration possibility will have been encompassed with above-average chances of discovery success.



JBB:sb

J. B. Boniwell

July 9, 1990

Exploration Geophysical Consultant



APPENDIX

---

COMMENTS ON DATA QUALITY

---

The air data used for this study were collected under the auspices of the Kirkland Lake Initiative Programme (KLIP) in the late 1970's. By modern standards, this is a dated survey. Its results contain inherent flaws due to the more lax specifications of the day. Two of them affect the quality of the data as they have been presented:

- 1) Levelling Errors For an area providing very modest change in magnetic background, it becomes plain there are several steps in response level which are oriented along the flight line direction. While not large in themselves, they are enough to give a biased grain to the data set hewing to the flight path headings, that is either approximately  $12^{\circ}$  E of N or  $12^{\circ}$  W of S. It is to be noted only one orthogonal tie line has been flown for control here, and it is central to the area.





- 2) Positioning Errors The published maps are based on a \_\_\_\_\_ semi-controlled photomosaic, and provide no geographic or UTM co-ordinates. In short, the data are not referenced, except to hand-picked recognition points. To bring them on to an international grid requires the fixing of several topographic points in the appropriate co-ordinates and smoothing out the distance differences between them. The outcome inevitably is not perfect. It is estimated that errors of up to 100 m in location will still exist in the contoured data as herewithin submitted (Dwg. No. EIC-2245).



MEMO TO : Terrence McKillen / Peter Doyle  
MEMO FROM: J. B. Boniwell  
SUBJECT : AEM Anomalies in Pontiac Twp.  
DATE : August 21, 1990

---

As requested, I've researched the assessment files for more information on the airborne em. anomalies recorded in our broad area of interest in Pontiac Township. Findings are:

- i) the surveying was carried out with a Scintrex HEM 701 helicopter system providing a single frequency (1600 Hz), one coil configuration (vertical co-axial), and measuring in-phase and out-of-phase components at the Rx coil. Although not specified, the coil separation would be about 22'.
- ii) there are no analogue records in the files.
- iii) the survey was flown in 1970,71. Results would not have been digitally recorded then.
- iv) positioning was per visual means from photo-mosaic.
- v) data quality, particularly in the in-phase, has been affected by interference from a microwave TV tower at Virginiatown.



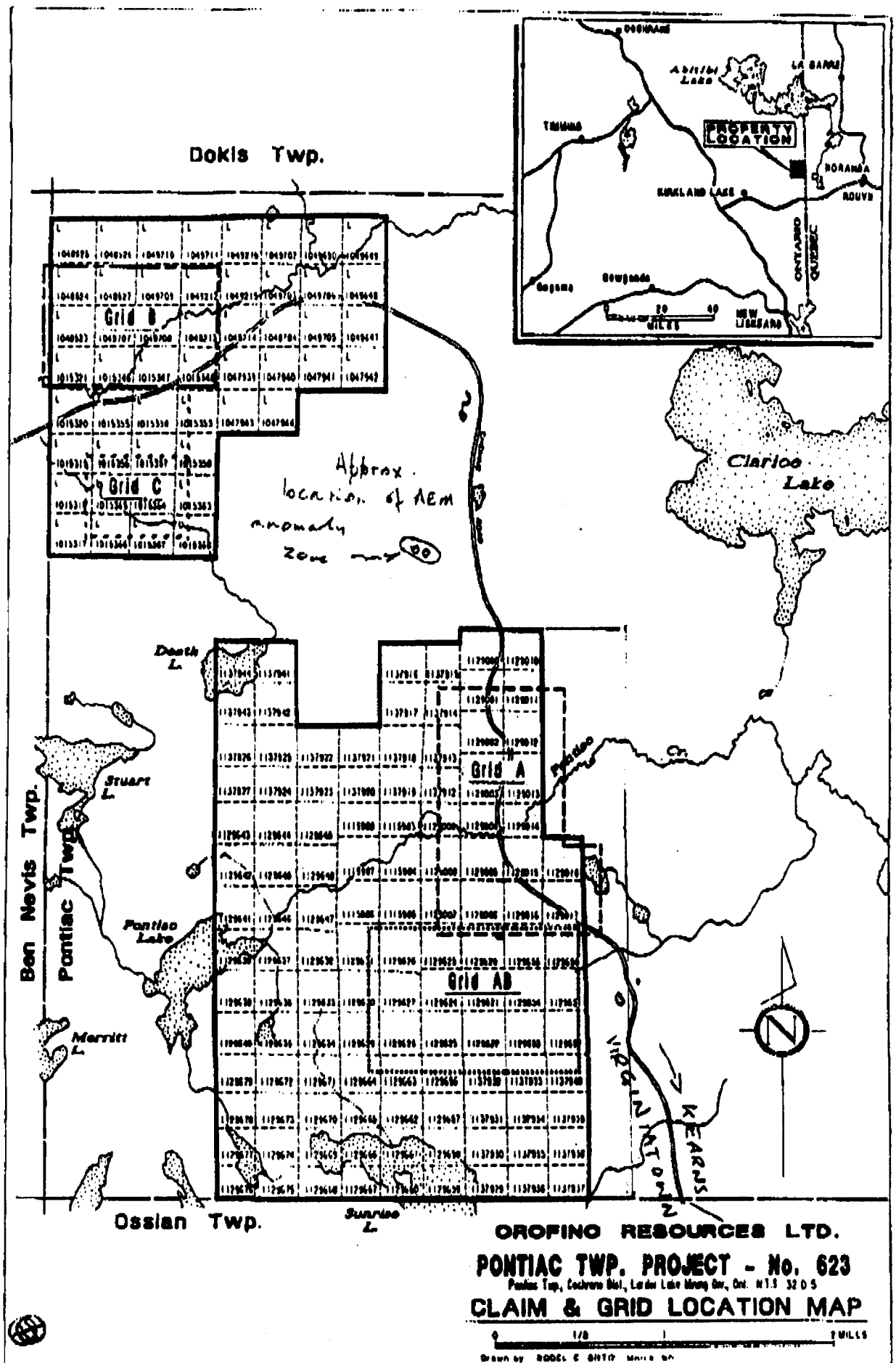
- vi) two blocks, A & B, were flown, Block B inside A. Block A embraces the whole of Ben Nevis and Pontiac Twps., plus a thin strip of the northern part of Katrine Twp. Herein, lines 1320' apart were flown E-W. Block B, also rectangular and parallel-sided with A, is smaller, extending from about halfway across Pontiac Twp. westwards to within one-third of the Ben Nevis Twp. west boundary. Herein, lines 660' apart were flown N-S.
- vii) these surveys were performed by Scintrex on behalf of AMAX. Interpretation and reporting were submitted by Jerry Roth, AMAX geophysicist of the day.
- viii) Roth saw very few overburden effects. His conclusion: overburden was thin. This is not the case of course, rather overburden is resistive, made up of sand and coarser detritus.
- ix) as a result, such AEM responses that were obtained, all confined to one line, were considered weak, isolated, and dubious. There is however an exception: a two-line anomaly zone on the SE



shoulder of the magnetic high closure NE from Death Lake, W from Clarice Lake. This feature, while still weak, has a definite magnetic correlation. Roth called it "fortuitous" since obviously he held little confidence in the underlying em. expression in the first place.

- x) this anomaly zone is well located with respect to the postulated stratigraphy of present concepts. The interesting thing is the zone does not appear on the OGS compilation, viz. plan #P2284. Thus it does not appear on the Excalibur interpretation overlay. (It has been missed, it seems, because the original compiler did not recognize that what is manifestly an aeromagnetic map is actually a magnetic and em. presentation combined.)
  
- xi) the existing Orofino claims do not incorporate this new anomaly feature. They ought if possible.
  
- xii) given a successful acquisition, the proposed follow-up programme for the area should be extended to cover it.





Dokis Twp.

Ossian Twp.

Ben Nevis Twp.  
Pontiac Twp.

**OROFINO RESOURCES LTD.**  
**PONTIAC TWP. PROJECT - No. 623**  
 Pontiac Twp., Cochrane Dist., Lake of the Mountains Div., Ont. N.T.S. 32 D 5  
**CLAIM & GRID LOCATION MAP**

0 1/2 1 2 MILES  
 Drawn by ROSE C. SMITH, M.Sc. Ph.D.

Approx.  
 location of AEM  
 anomaly  
 zone →



more mafic  
less mafic

MURDOCK  
CREEK

Vi

Vf

ii

ii

ii, i

ii

AEM

Anomalous Zone

ii

ii

ii

PC

Death Lake

Cu

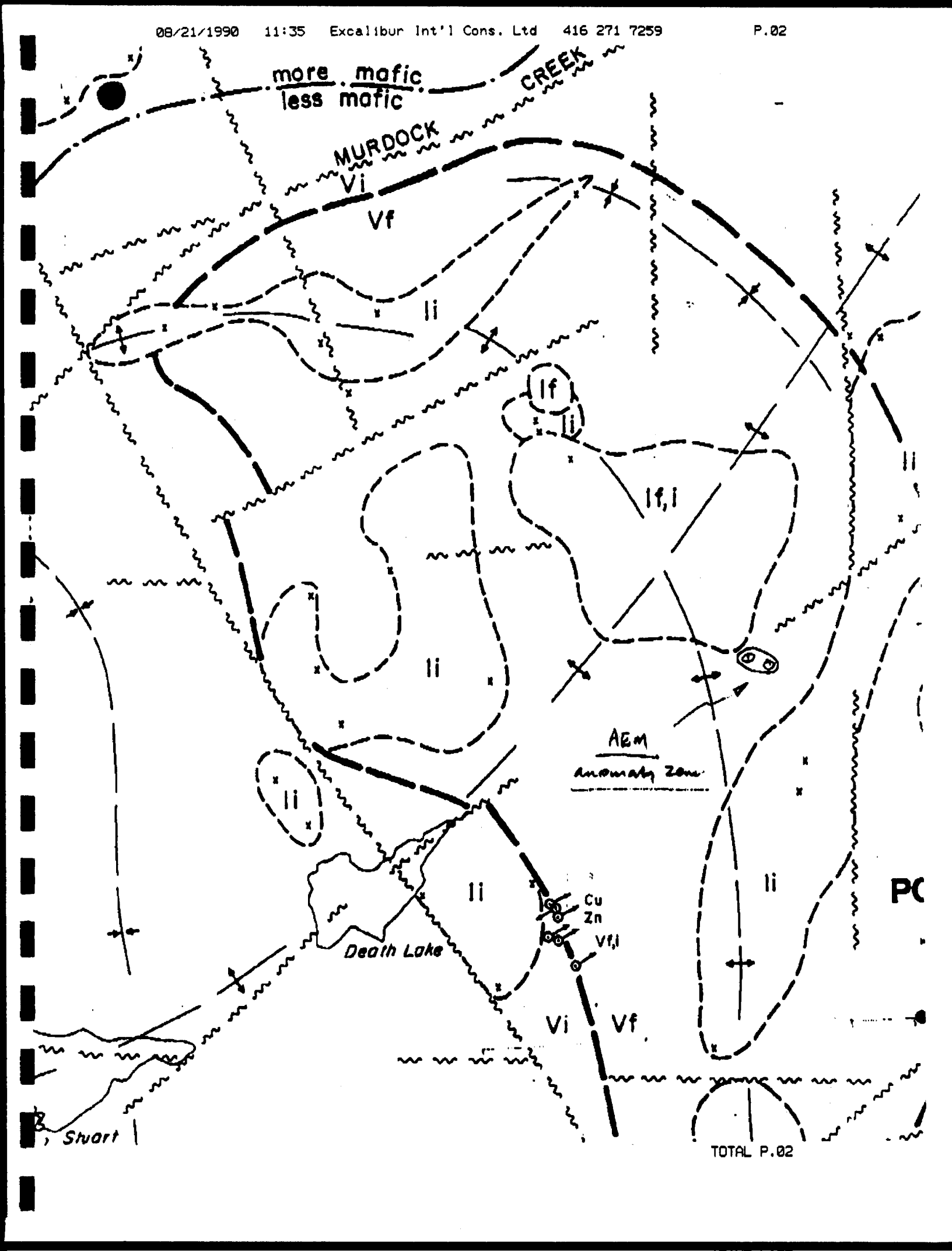
Zn

Vi, i

Vi

Vf

Shart





APPENDIX B(II)

LOGISTICS REPORT ON UTEM SURVEY AT PONTIAC TOWNSHIP

By: LaMontagne Geophysics Ltd.

October 1990



Logistics Report on a UTEM Survey at  
Pontiac Township, Larder Lake  
for  
Excalibur Geoscience Int. Ltd.  
October 1990

---

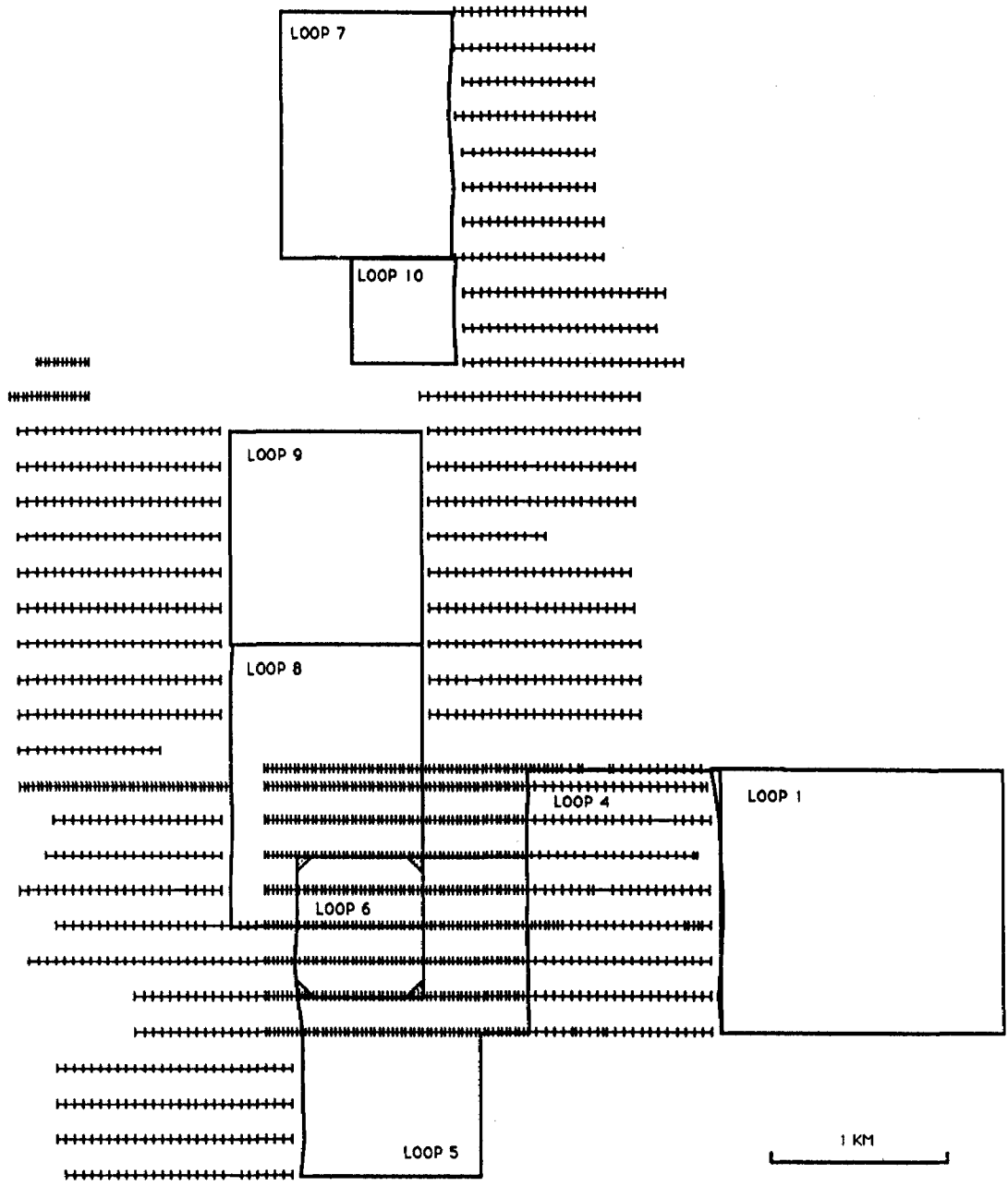


FIGURE 11 : UTEM LOOP LAYOUT

## INTRODUCTION

A UTEM III survey was carried out by Lamontagne Geophysics personnel on the Pontiac Township property on behalf of Excalibur Geoscience Int. Ltd. during October of 1990. The project area is located approximately 25 kilometres northeast of Larder Lake, Ontario (Figure 1).

## FIELD WORK

The crew mobilized from Val D'Or, Quebec on October 7. The crew consisted of Scott Toolin (geophysicist-in-charge), Gerry Lafortune (operator) and four assistants. The survey was carried out with the use of two receiver crews, Rc#4 and RC#15 and Tx#4.

A total of 47 kilometres of vertical component coverage (Hz) were surveyed from eight loops. The first loop was laid out on October 9 and surveying commenced the next morning. The work progress was continually interrupted by loop breaks from moose and forestry activities.

Loops 2 and 3 had to be abandoned due to active heavy logging machinery. However the lines were read off a different loop configuration. Surveying concluded on October 29 and the crew demobilized to Val d'Or the following morning. A project location map is shown on figure 1.

Pontiac Township UTEM Survey  
Logistics Report

<u>Date</u>	<u>First Rx*</u>		<u>Second Rx*</u>		<u>Loopers</u>	<u>Comments</u>
	<u>P</u>	<u>S</u>	<u>P</u>	<u>S</u>		
Oct 7						Mob from Val d'Or
8						Waiting for grid maps
9		1				Laid out loop 1
10	.5	.5				Loop 1 read line 6S 2 loop breaks by moose
11	.25	.75				Loop 1 read line 4S,10S 2 loop breaks by moose
12	1			1	1	Loop1 read lines 2S,6S Loop breaks by moose
13	1		1		2	Loop 1 read lines 0N,2N,4N,8S
14	.5				2	Loop 1 read lines 4N contd,5N Laid loop 2 and Loop 4
15	.5	.5	.5	.5	2	Loop 4 read lines 5N,10S Loop break due to moose
16	1		1		2	Loop 4 read lines 10S,8S,6S,4N,2N,0N Laid loop 5
17	.5	.5	.5	.5	2	Loop 4 read lines

						2S,4S and loop break when switching to loop 5.
18	.5	.5	.5	.5	2	Loop5 read lines 6S,8S,10S Loop break by moose
19	.75				2	Loop 5 read lines 4S,10S
20	1		.5		2	Loop 5 read lines 12S,14S,18S Laid loop 6
21	1		.25		2	Loop 5 read line 16S Loop 6 read lines 4S,6S Layout loop 7
22	1		1		2	Loop 7 read lines 34N,36N,38N,40N 42N,44N,46N,48N Laid out loop 8
23	1		1		2	Loop 8 read lines 2S,0N 2N,4N,6N,8N,10N
24	1				1	Loop8a read lines 6N,8N,10N,12N Laid loop 9
25	.75	.25	.75	.25	1	Loop 9 read lines 14N,16N,18N,20N, 22N,24N,26N,28N Loop break tree over wire
26	1				1	Loop 9a read lines 18N,20N,22N,24N,26N Laid loop 10
27	1				1	Loop 9a read lines 14N,16N

Loop10 read lines  
28N,30N,32N

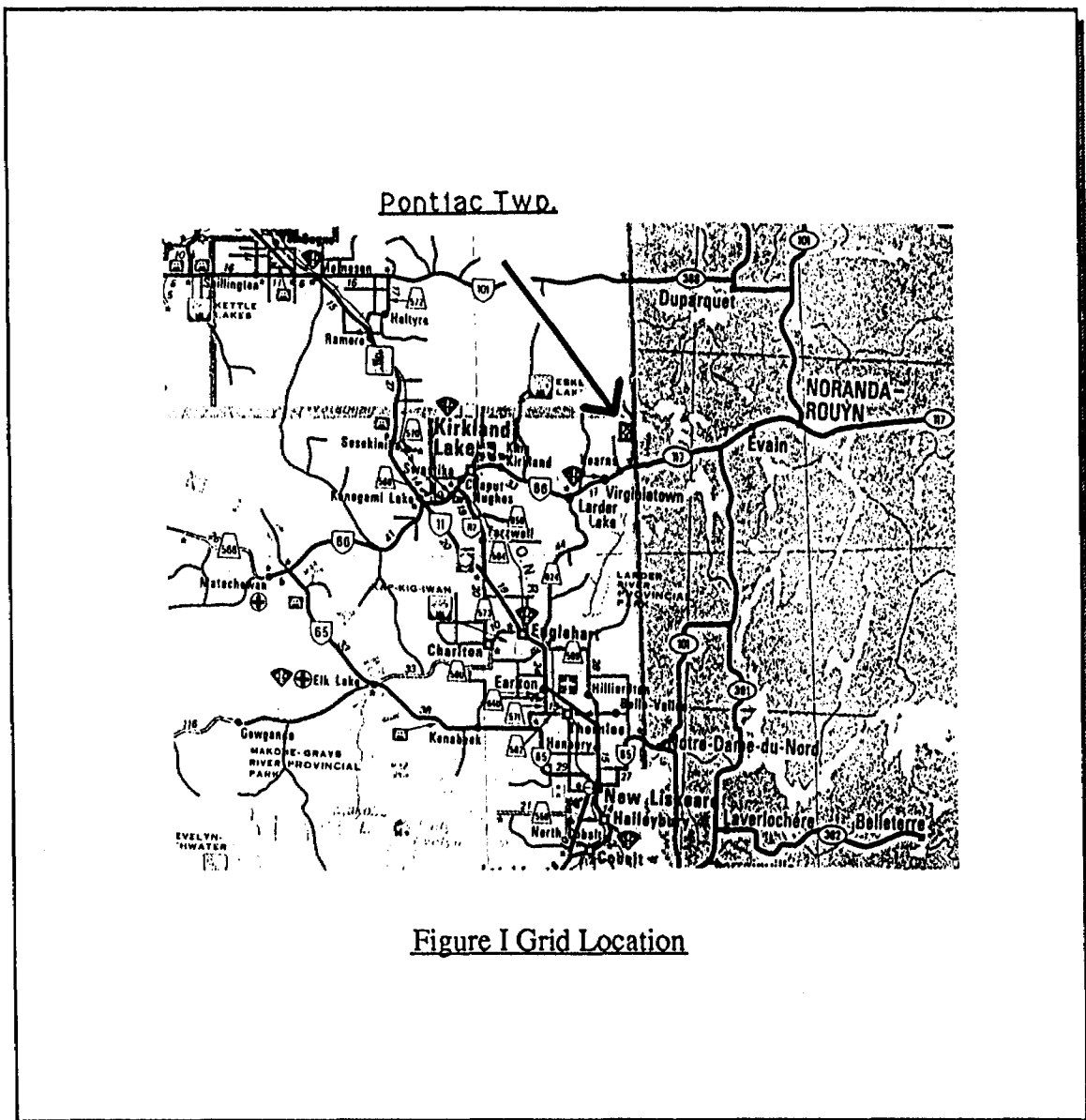
28		1			1	Pickup wire
29		1			2	Pickup wire
	14.25	6	7	2.75	30	

\*Each receiver is Rx, operator and coil man.

## THE UTEM DESIGN PHILOSOPHY

UTEM uses a large, fixed, horizontal transmitter loop as its source. The loop may range in size from 300m x 300m up to as large as 4km x 4km. In general, smaller loops are used over conductive terrain or for shallow sounding whereas larger loops may only be used over resistive terrain. Depending on the noise levels, measurements may be made out to a distance of 1.5 to 2 times the loop dimensions. Lines may be surveyed out from the edge of the loop (used to detect dipping conductors) but may also be read across the loop wire through the centre of the loop (used mainly to detect horizontal conductors). The magnetic field of the UTEM transmitter may also be measured down boreholes to depths up to 2.8 kilometres.

While surveying on surface, the vertical component of the magnetic field ( $H_z$ ) of the loop is always measured. However, horizontal in-line ( $H_x$ ) and cross-line ( $H_y$ ) components may also be



measured if more detailed information is required. A receiver coil mounted on a portable tripod is used to measure the magnetic field. For down-hole surveys, a similar coil of smaller diameter is used to measure the axial (along-borehole) component of the magnetic field. Due to the greater distance between coil and receiver, however, the signal is transmitted to surface digitally using a fibre-optic data link. The UTEM system is also capable of measuring the two horizontal components of the electric field ( $E_x$ , and  $E_y$ ), but this is used only for very specific geological problems. A dipole sensor comprised of two electrodes is used to measure the electric field components.

The UTEM transmitter passes a low-frequency (4 Hz to 90 Hz) current of a precisely regulated waveform through the transmitter loop. The frequency may be set to any value within the operating range of the transmitter, but is usually set at 31 Hz so as to minimize powerline effects (60 Hz noise). Since the receiver coil responds to the time derivative of the magnetic field, the system really "sees" the step response of the ground. UTEM is the only time domain system which measures the step response of the ground. All other systems to date transmit a modified step current so that they "see" the (im)pulse response of the ground at the receiver.

The transmitted ("primary") field induces current flow in the ground below and around the transmitter loop (i.e. in the "half-space") which itself produces a measurable EM field called the secondary field. This current flow has an inherent "inertia" which resists the change in primary field direction (at each step). This inertial effect is called self-inductance: it limits the rate at which current can change. Inductance is only dependent on the shape and size of a conductive path. It takes a certain amount of time for the current to be redirected by the new primary field direction and reestablished to full amplitude; this time is called the time (decay) constant. The time constant of a good conductor is greater than that of a poor conductor because the terminal current level is greater whereas the rate of change is limited by the inductance of the current path. The ratio of the inductance to the resistance of the current path is the time constant.

The large scale current which is induced in the half-space by the primary field produces the half-space response as seen in typical UTEM profiles. Other currents may be induced in locally more conductive zones (conductors). In general, these have greater time constants than the half-space response because their conductivity is greater. Such responses are superimposed upon (and distorted by) the half-space response. Using a scale modeling tank, the UTEM responses of many different conductive bodies have been measured (in free space). These responses take the form of one or several decaying patterns with a variety of amplitudes and shapes. They have been assembled into type curve suites which are available from Lamontagne Geophysics.



## SURVEY DESIGN

The survey area was covered by eight transmitter loops. The loops were positioned so as to maximize primary field coupling for the areas of interest, however second best loop placements had to be used due to active logging activities in the area. A diagram showing loop position is located at the back of this report.

## DATA PRESENTATION

The data are plotted in "channel 1 normalized" form whereby a different reduction formula is used for channel 1 and the rest of the channels.

The channel 1 data are reduced before plotting according to the formula:

$$R1_c = (Ch1_c - H^P_c) / (H^P) \times 100\%$$

The other channels are reduced using a slightly different formula:

$$\text{Hz: } Rn_c = (Chn_c - Ch1_c) / (Ch1_c) \times 100\%$$

$$\text{Hx: } Rn_c = (Chn_c - Ch1_c) / (H^P) \times 100\%$$

The data may be plotted in either *point normalized* or *continuously normalized* form. In point normalized form the normalizing factor in the denominator of the above expressions ( $H^p$  for Hx and  $Ch1_c$  for Hz) is the observed channel 1 amplitude or computed primary field at a single chosen station on the survey line. Thus at every station the field is expressed as a percentage of the normalizing field at the point of normalization. This point is denoted by "\*\*\*\*>" on the plot. In continuously normalized form the normalizing factor in the denominator is the local  $ch1$  value or computed primary field. In this form the response is thus continuously amplified as a function of offset from the loop as the primary exciting field diminishes. Although this type of normalization considerably distorts the response shape, it permits anomalies to be easily identified at a wide range of distances from the loop. Interpretation of the shape of the anomaly is usually done on the point normalized profiles.

## DATA PRESENTATION

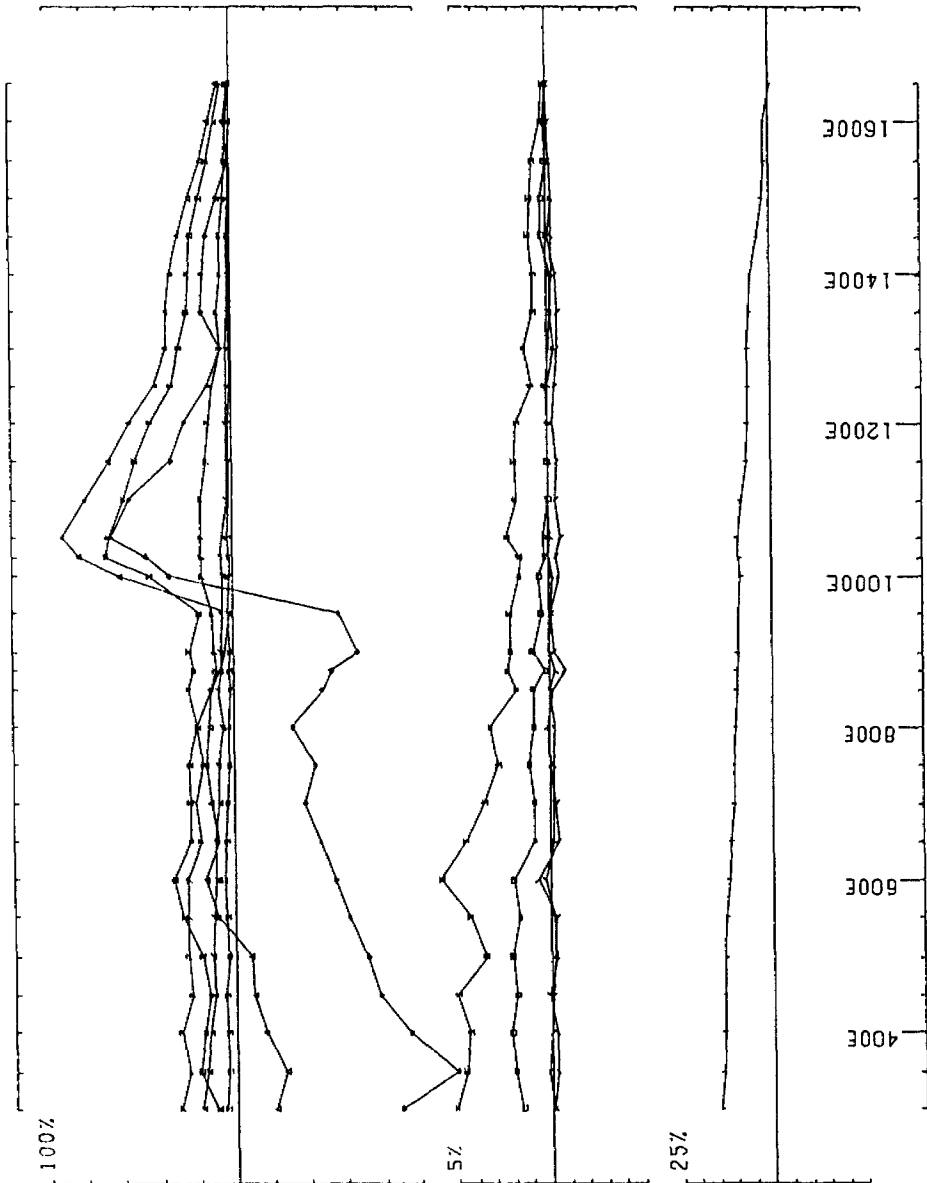
The data are plotted on three axes. On the bottom axis channel 1 (latest time) is plotted alone. The intermediate to late time channels (ch5 - ch2) are plotted on the center axis. The early time channels (Ch10 - ch6) along with a repeat of channel 5 for comparison are plotted at the top on a reduced scale. Due to the large channel 1 response the data has been plotted with the calculated primary field subtracted rather than channel 1 and consequently all channels are normalized by (divided by) the calculated primary field. The symbols used to identify the channels on the plots as well as the mean delay time for each channel is shown in the table below. The Y axis on each plot represents the difference from 100% of channel 1 (or calculated primary field in the case of channel 1).

UTEM SYSTEM MEAN DELAY TIME		
<u>channel number</u>	<u>delay time (msec)</u>	<u>Symbol</u>
1	12.8	
2	6.4	/
3	3.2	\
4	1.6	□
5	0.8	○
6	0.4	△
7	0.2	×
8	0.1	◇
9	0.05	◇
10	0.025	◇

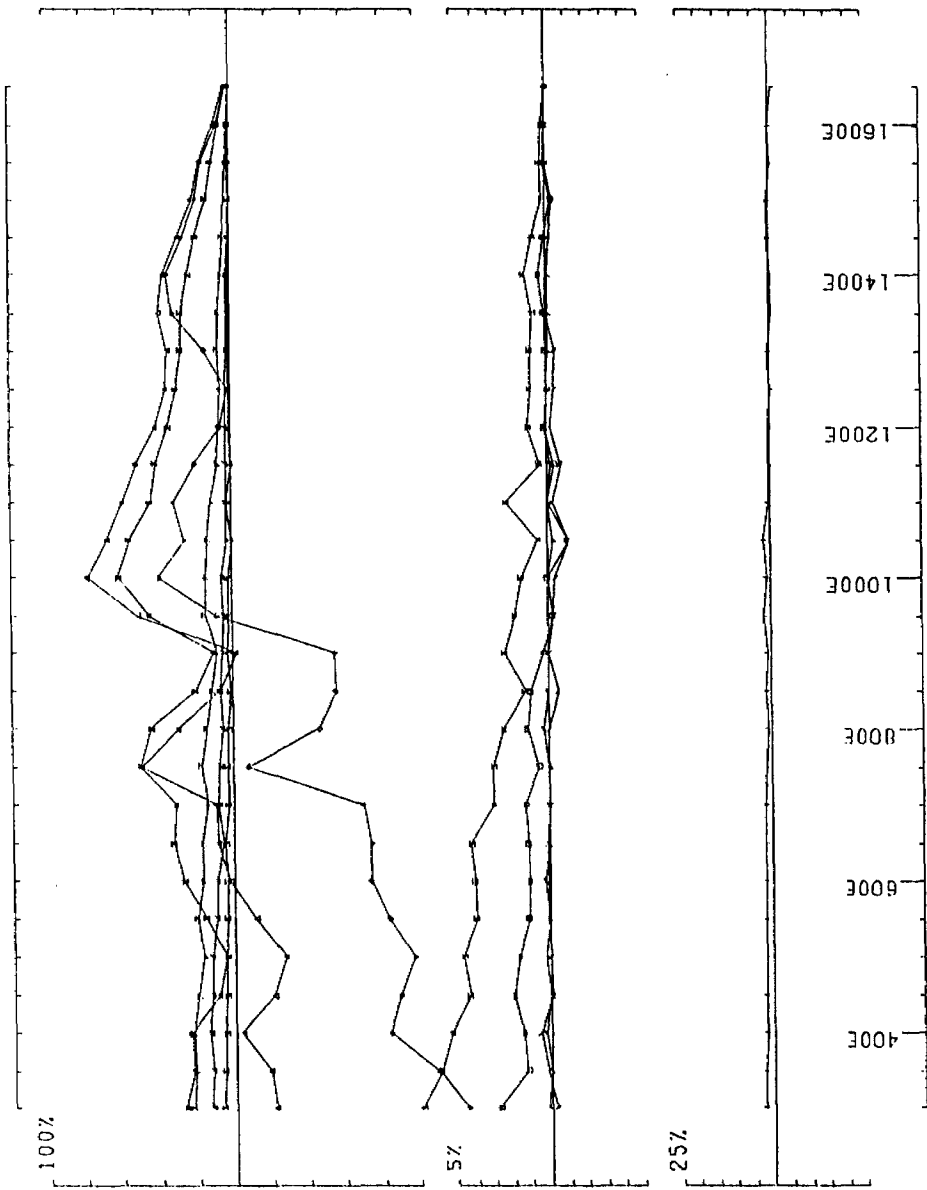
UTEM PROFILES

Hz

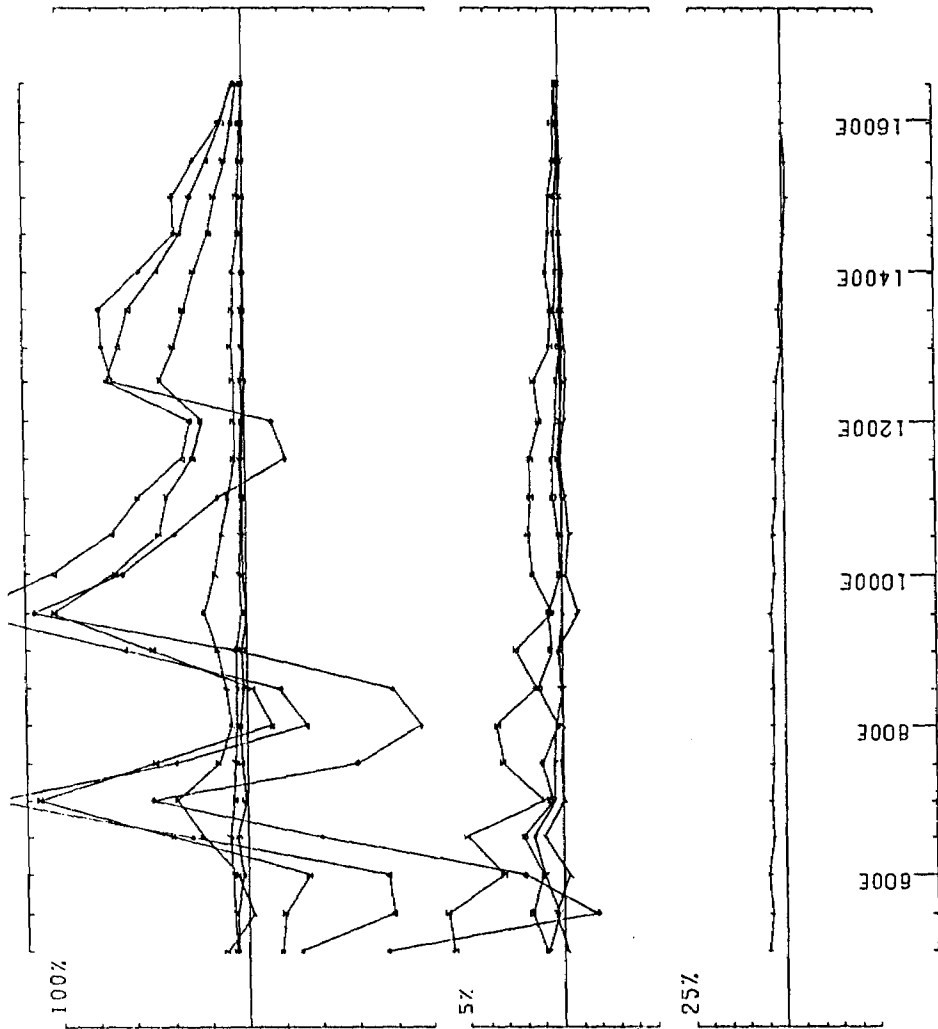
UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
CONDUCTED BY RAMONRAGNE GEOPHYSICS LTD JOB 8026 BASE FREQ 1421 30.97  
LOOP NO 1 LINE 1000 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



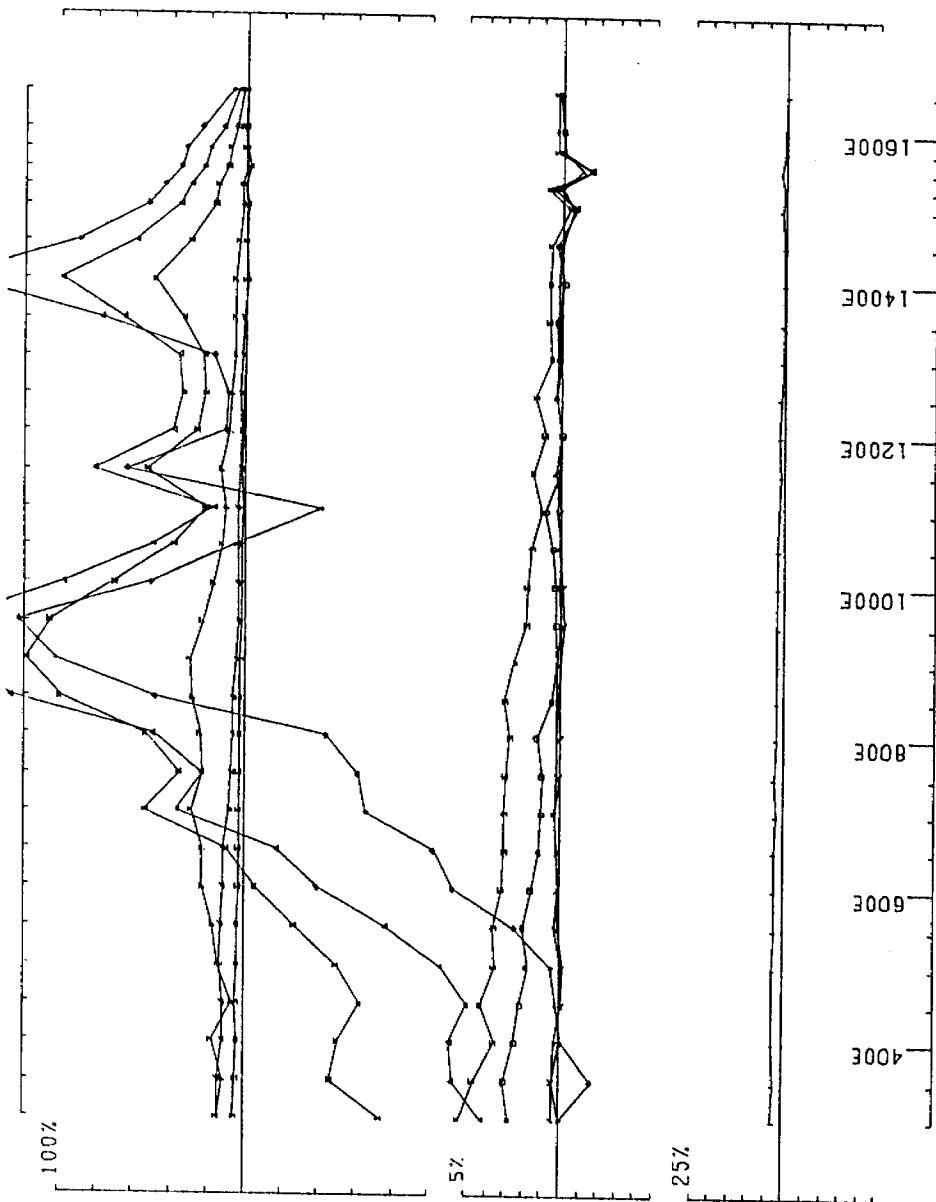
UTER SURVEY AT PONTIAC TWP. FOR NORTHCOTE EXPLORATION  
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
LOOP NO 1 LINE 800 S COMPONENT H2 SECONDARY FIELD CH3 CONTIN. NORM.



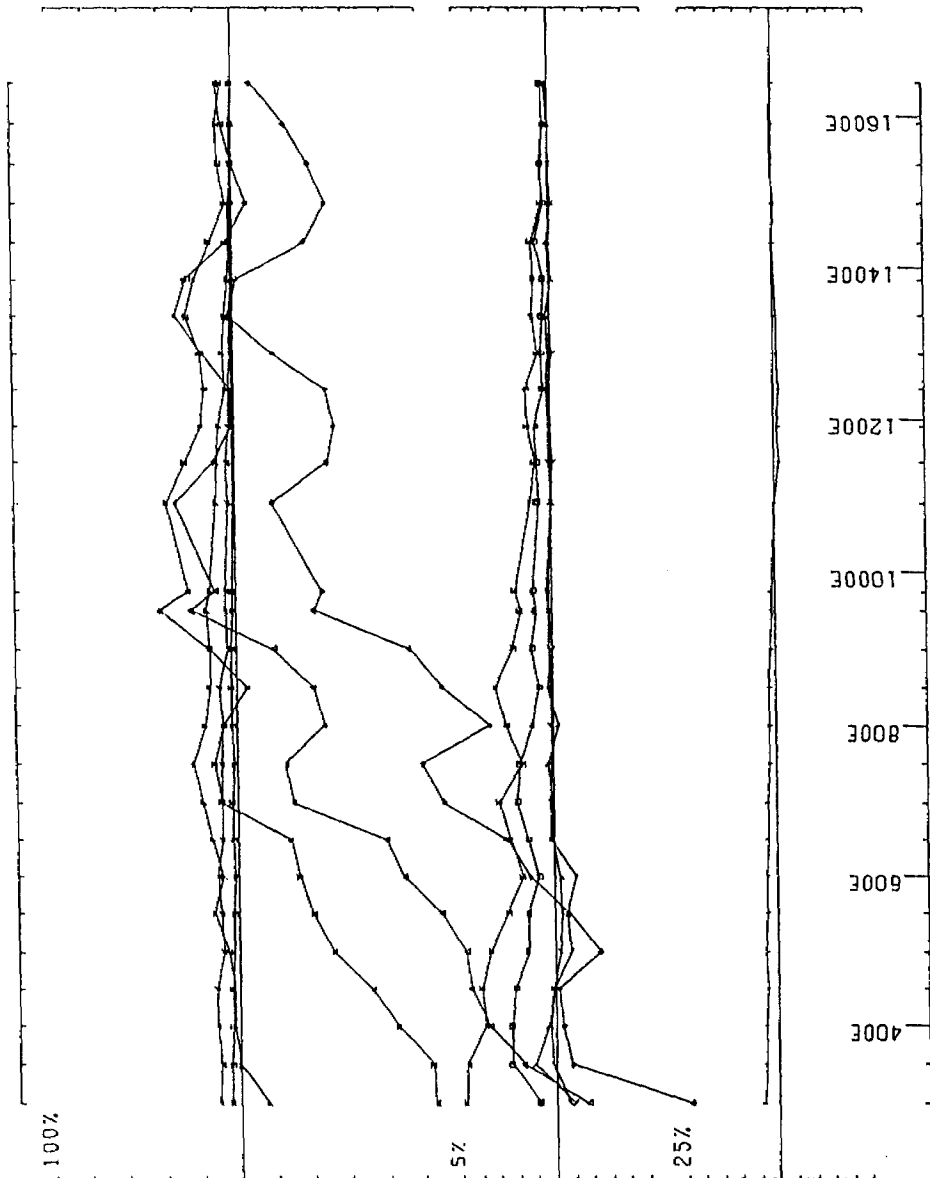
UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.87  
LOOP NO 1 LINE 600 S COMPONENT H2 SECONDARY FIELD CH1 CONTIN. NDRM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
LOOP NO 1 LINE 400 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NDRM.

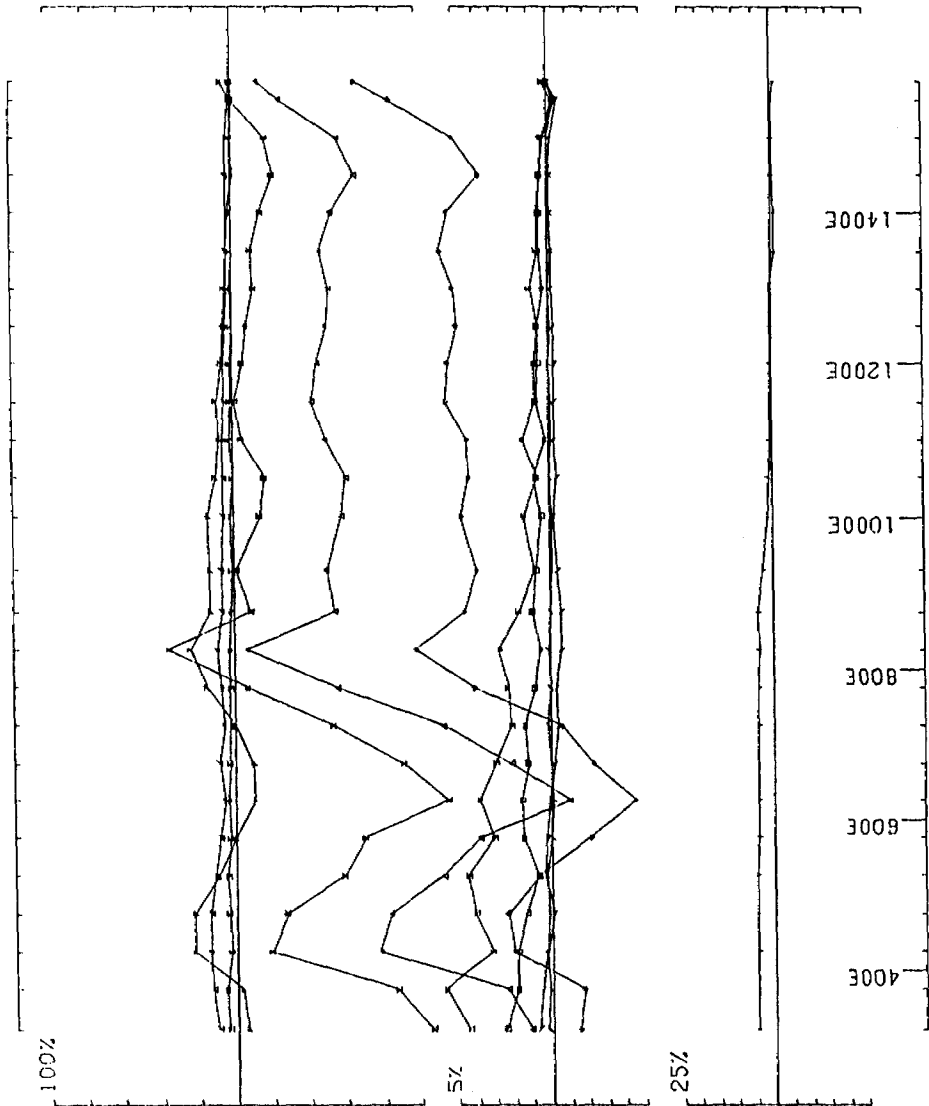


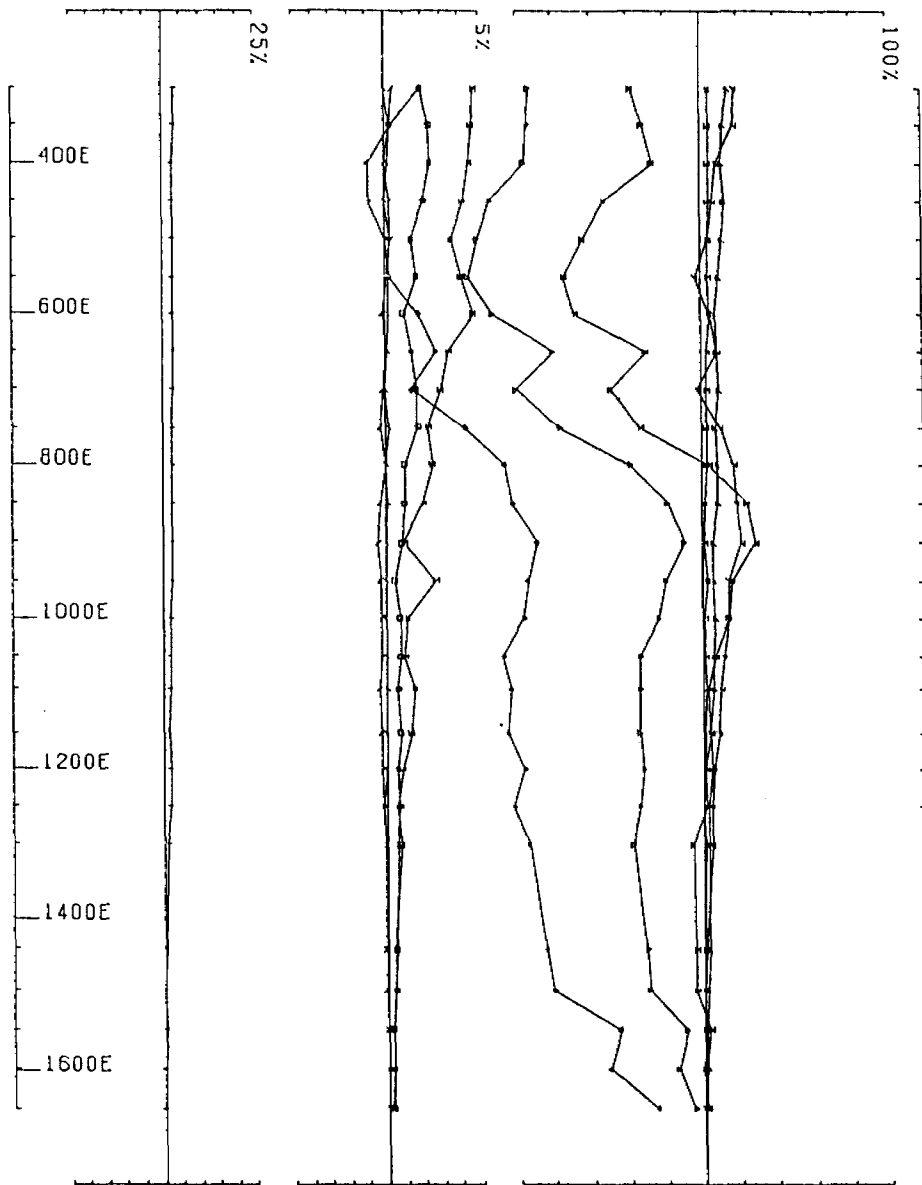
ITEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.97  
LOOP NO 1 LINE 200 S COMPONENT HZ SECONDARY FIELD CH3 CONTIN. NDRM.



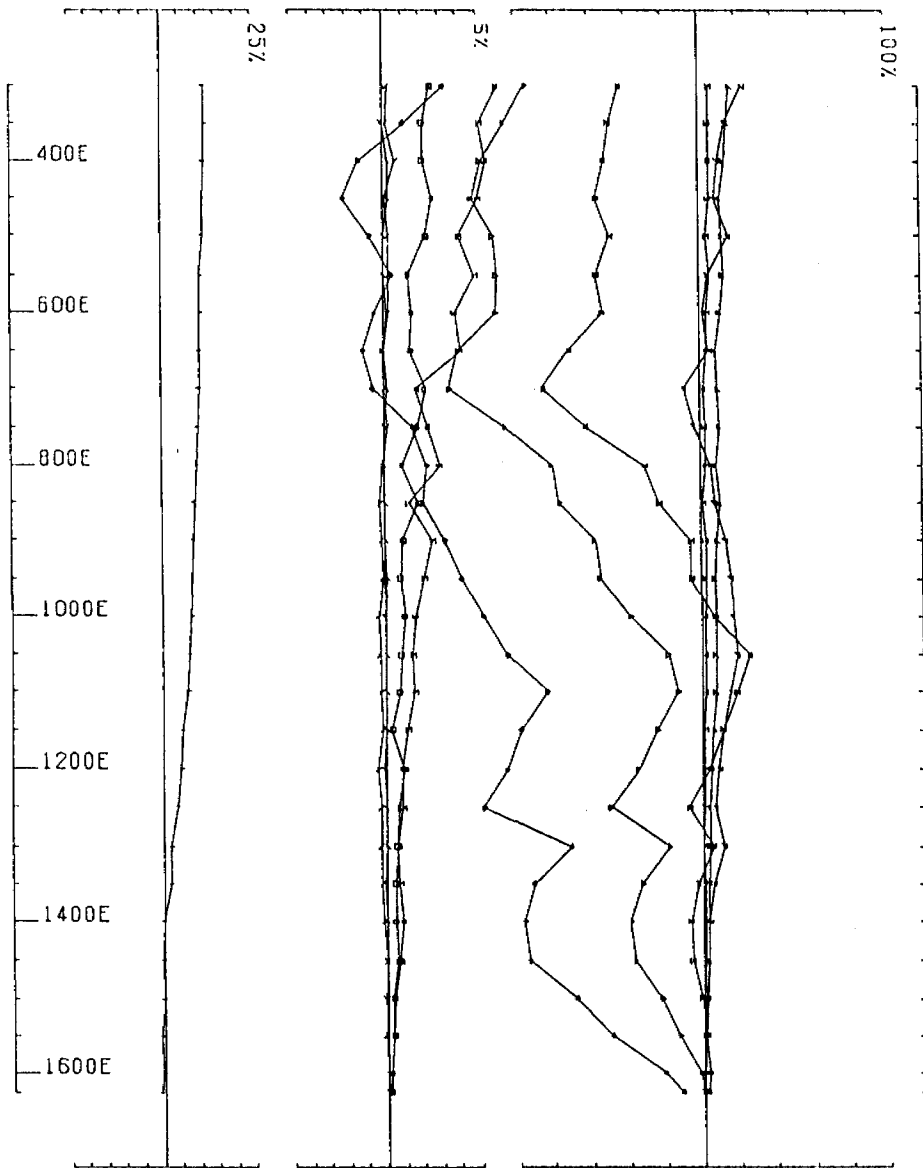


ITEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
LOOP NO 1 LINE 0 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

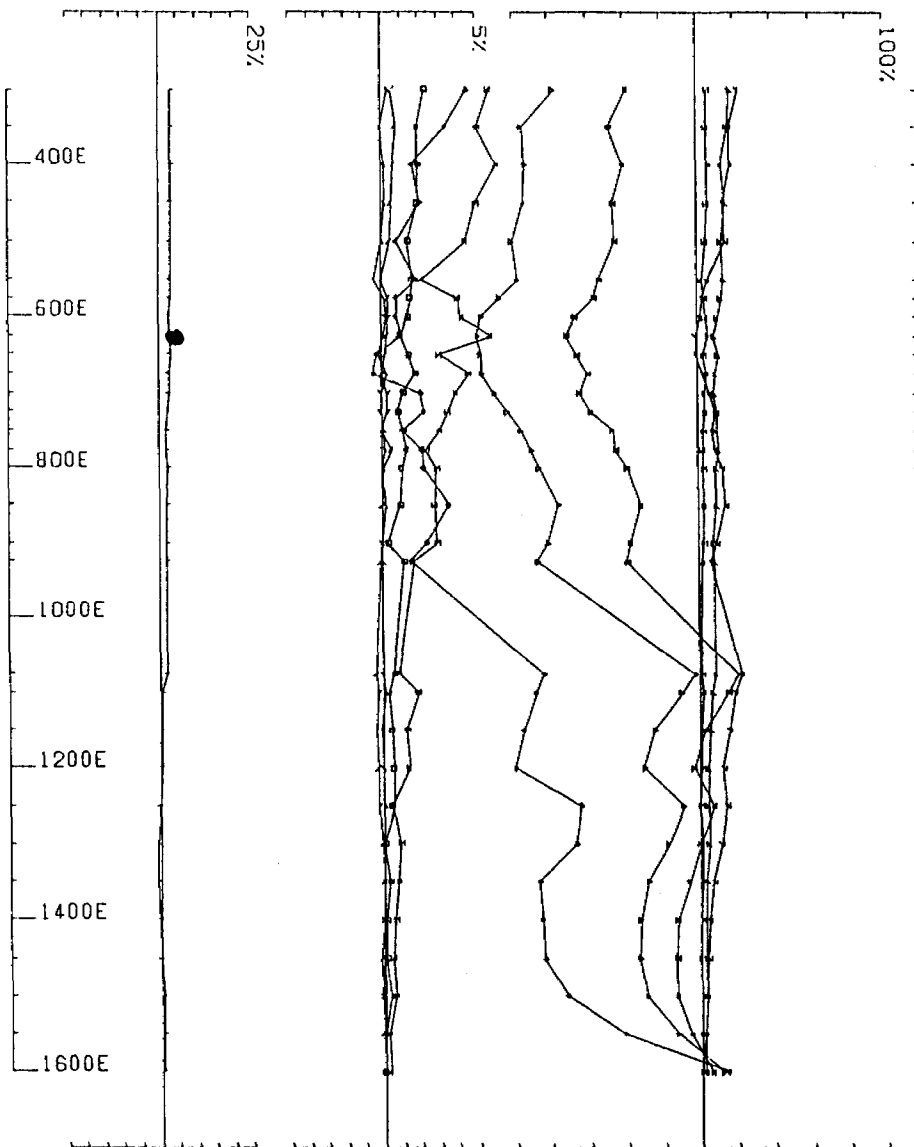




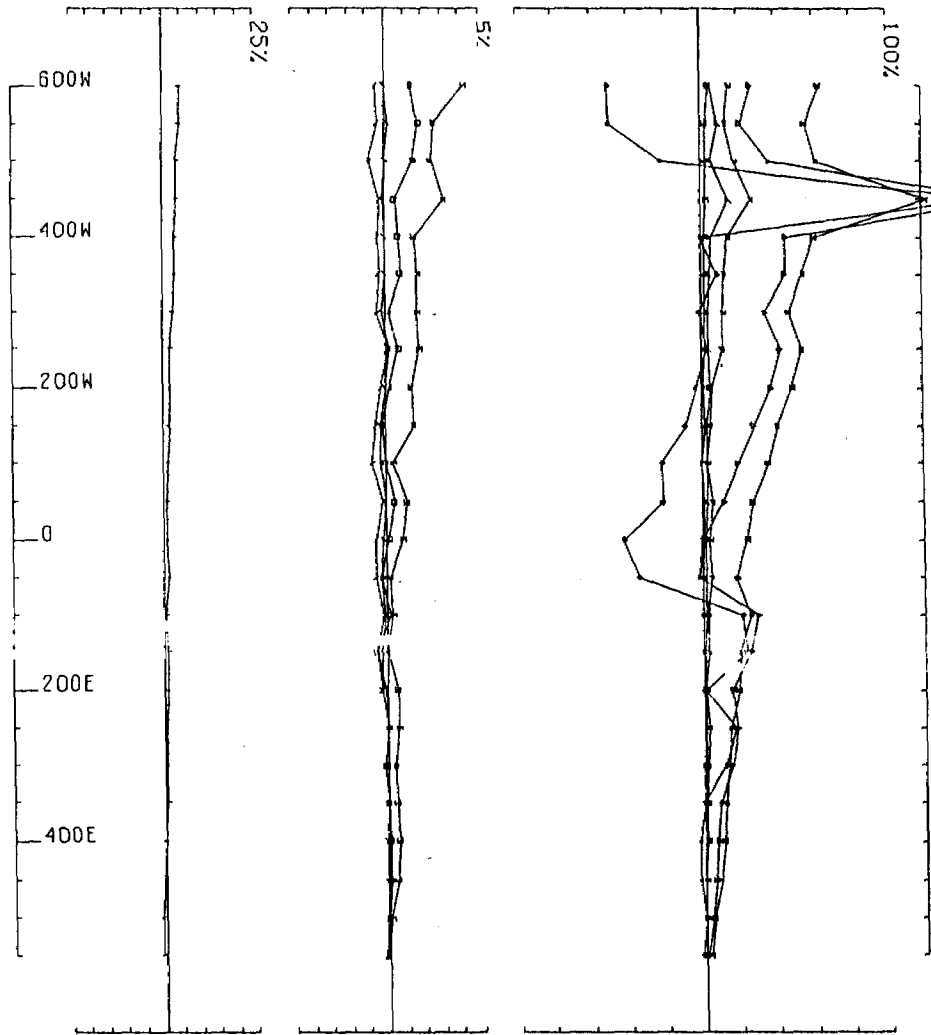
UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.87  
 LOOP NO 1 LINE 200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



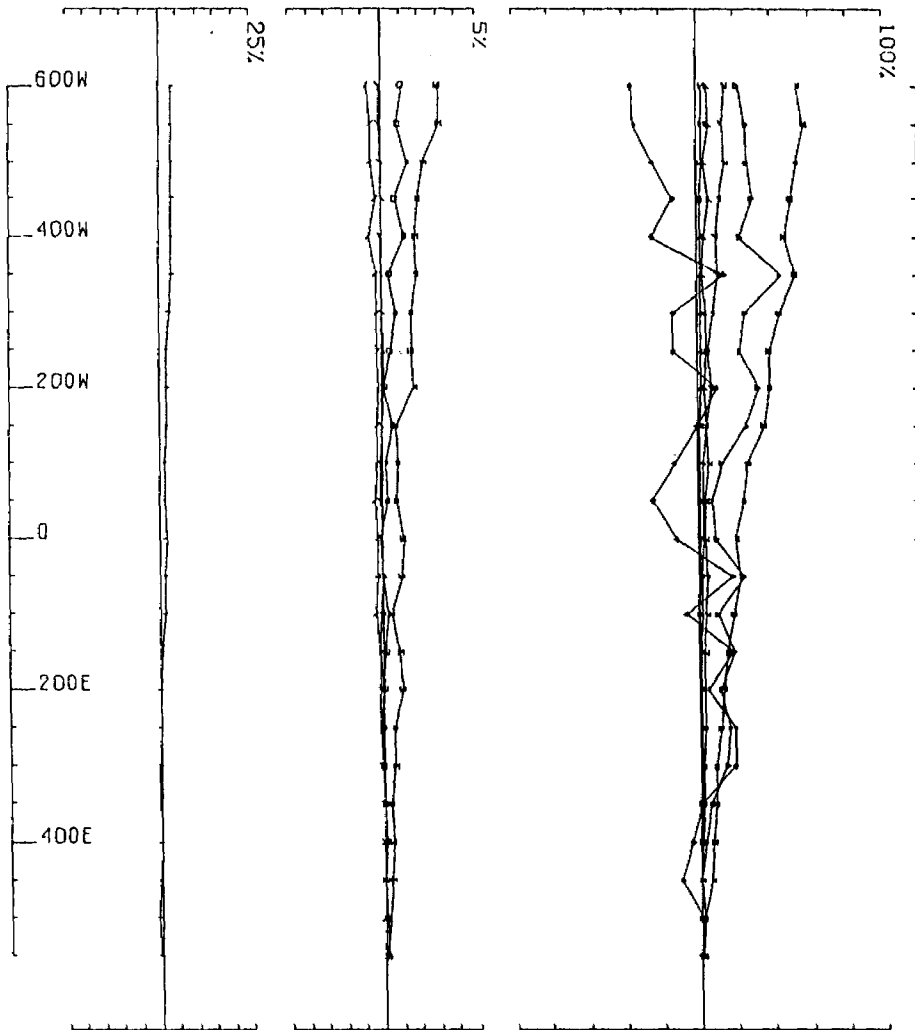
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTADNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 1 LINE 400 N COMPONENT HZ SECONDARY FIELD CH3 CONTIN. NDRM



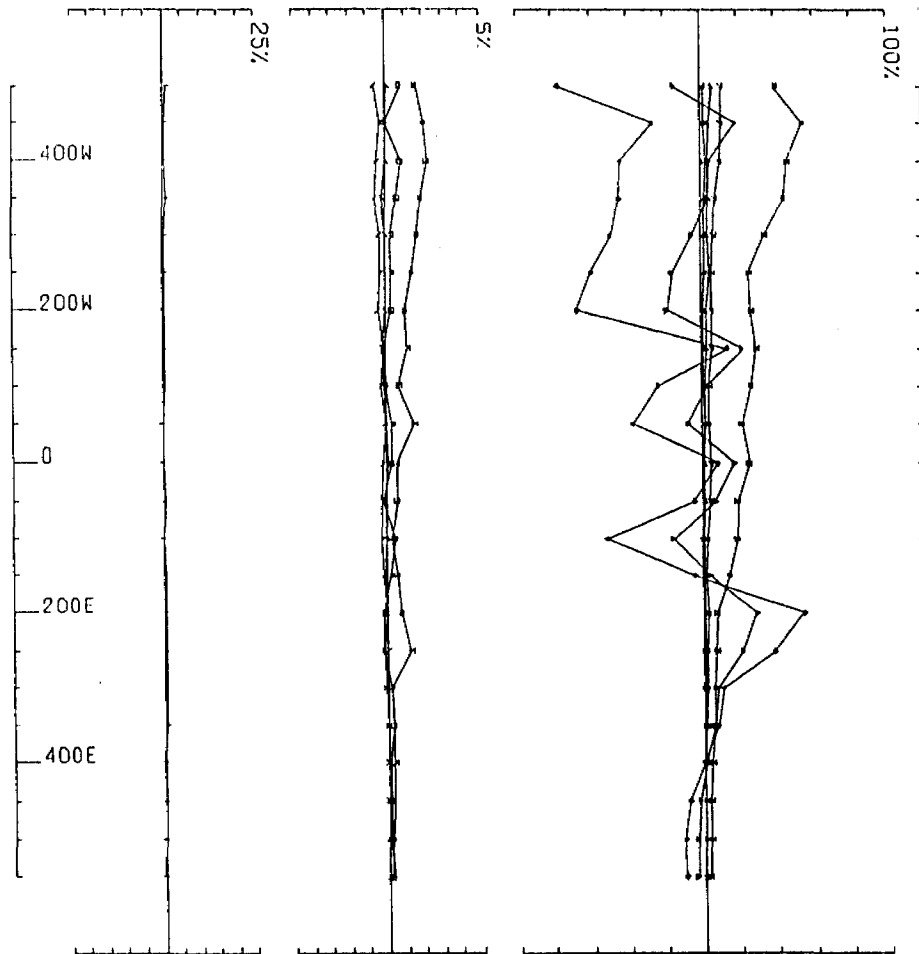
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 1 LINE 500 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



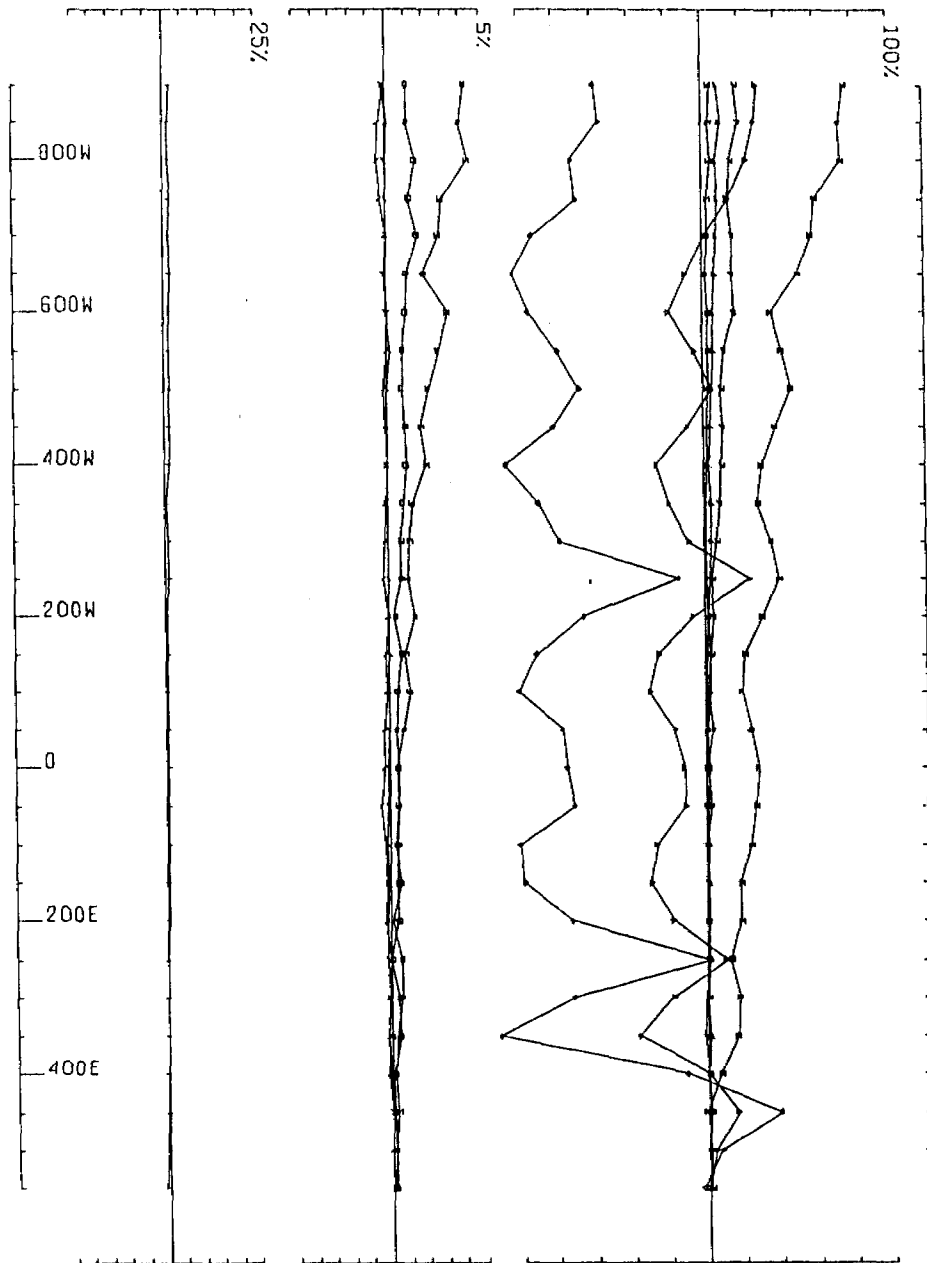
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 500N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NDRM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 400N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NDRM.

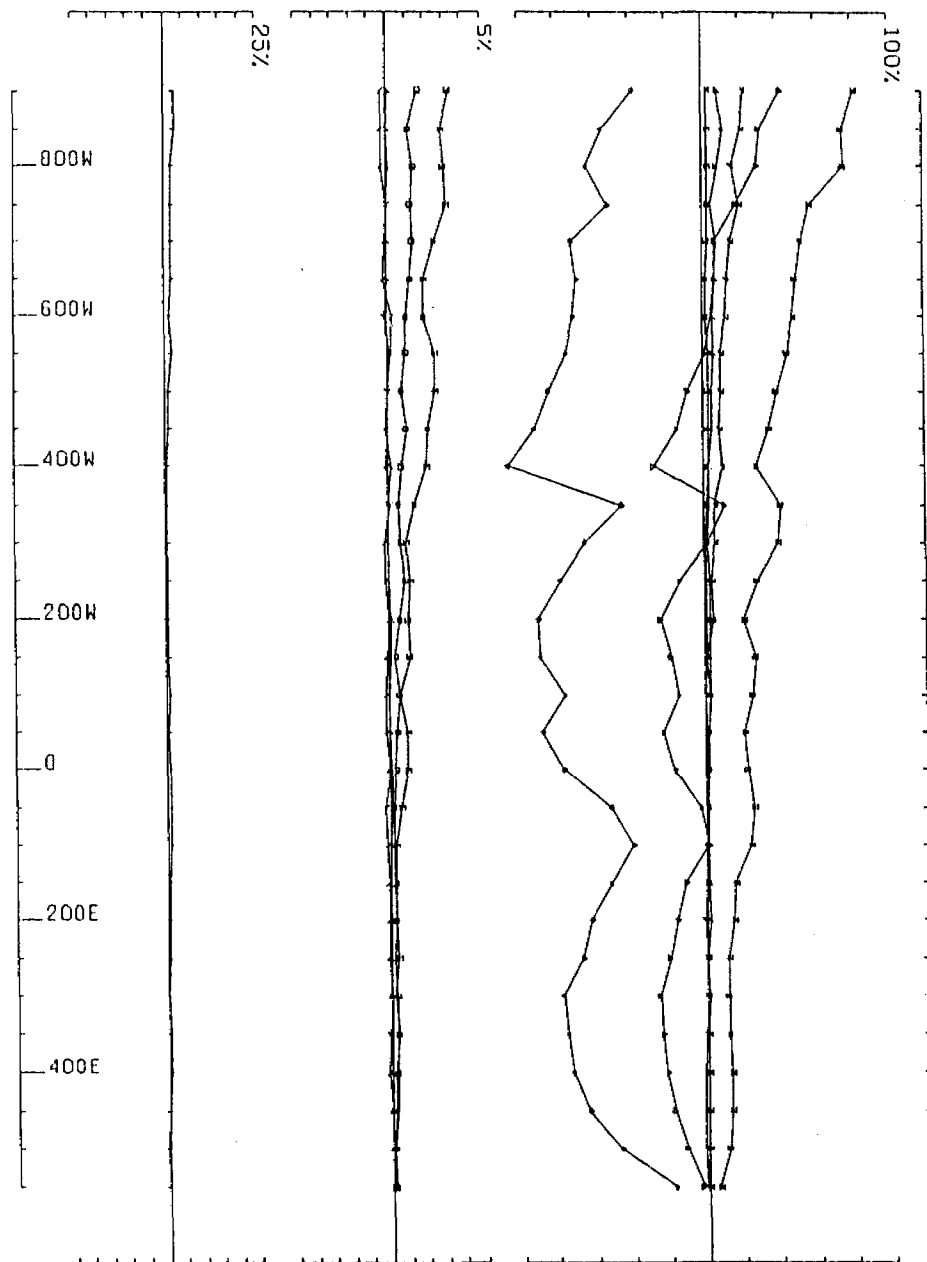


UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 2N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

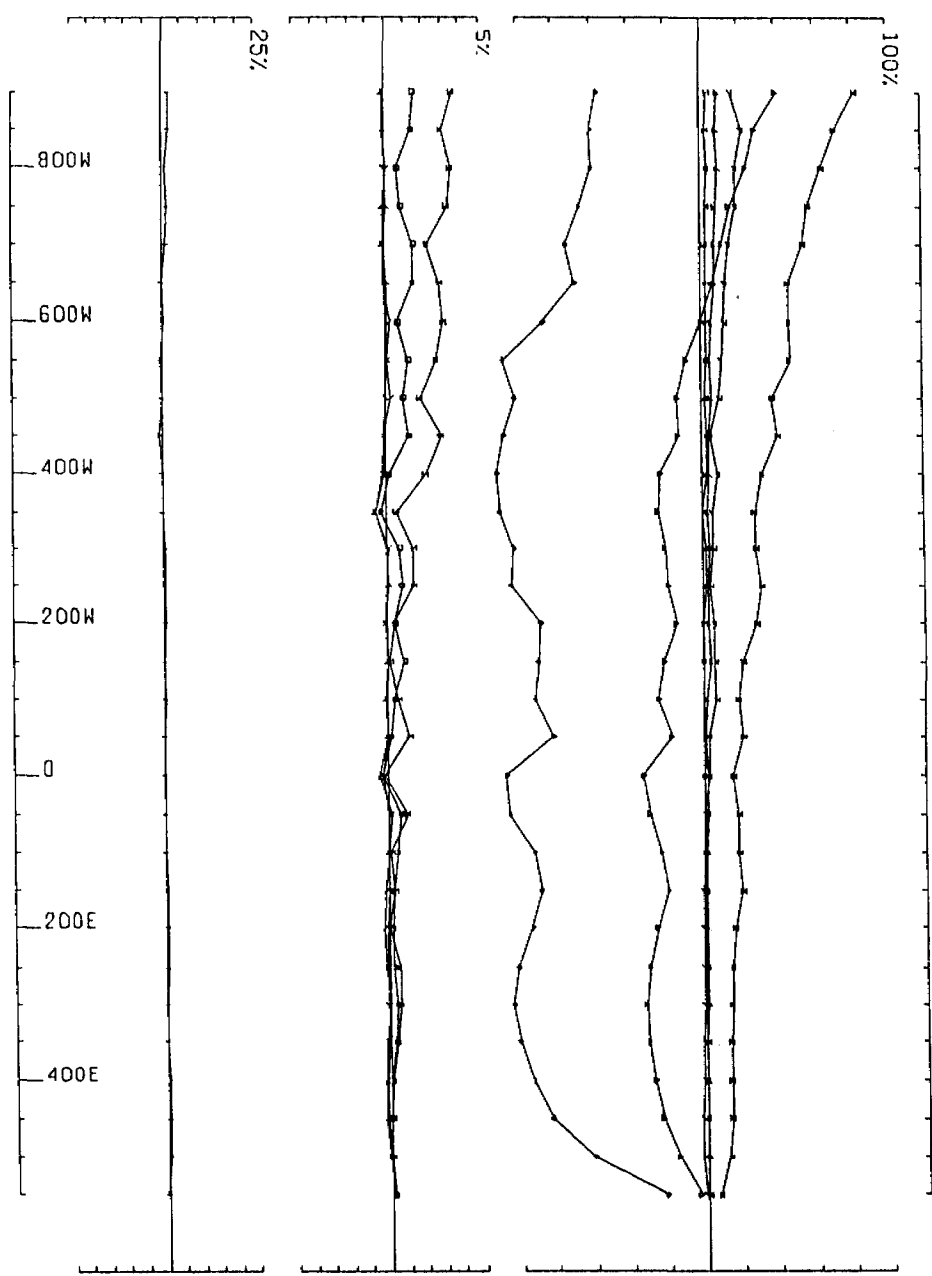


UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 0 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

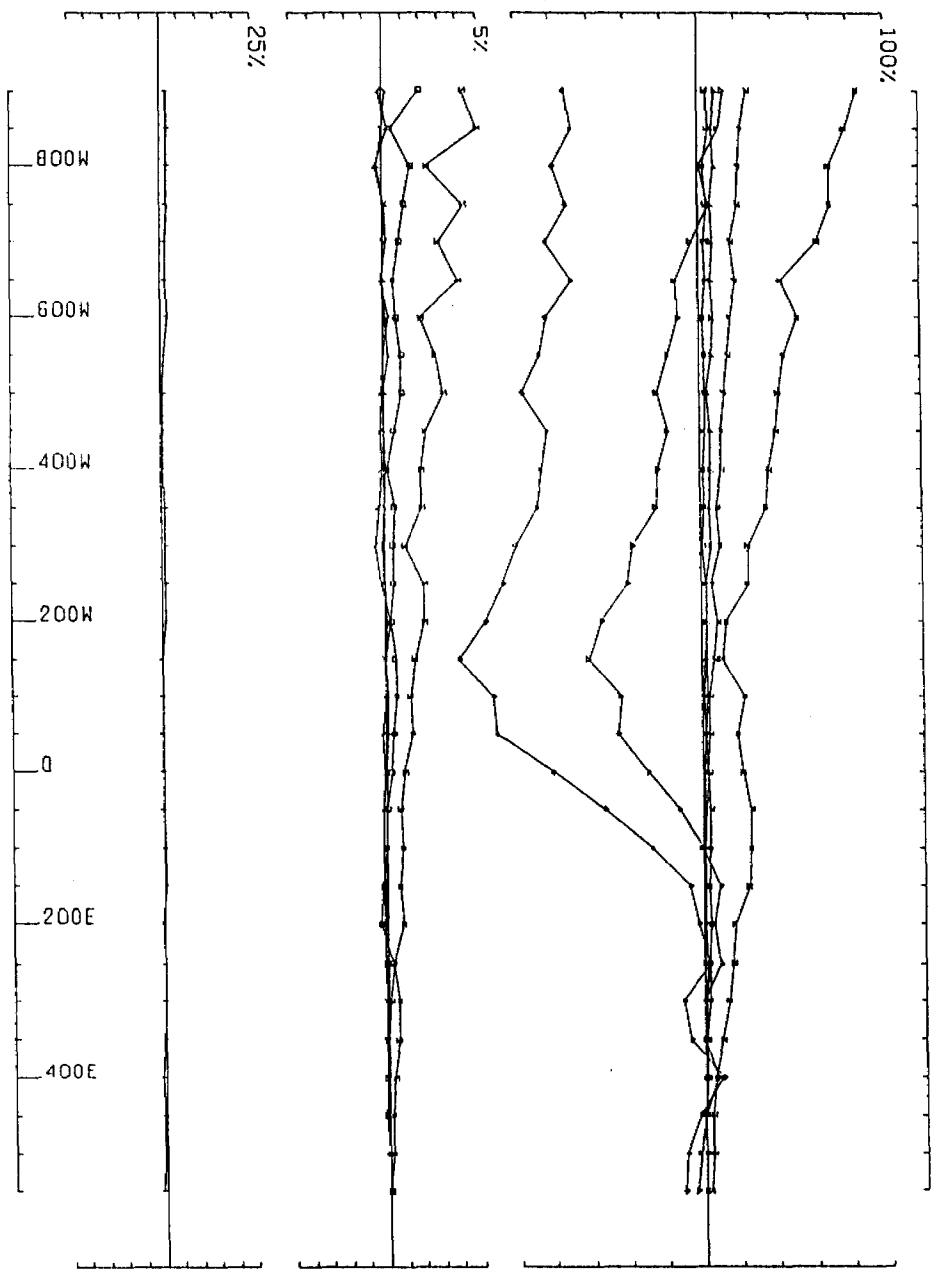




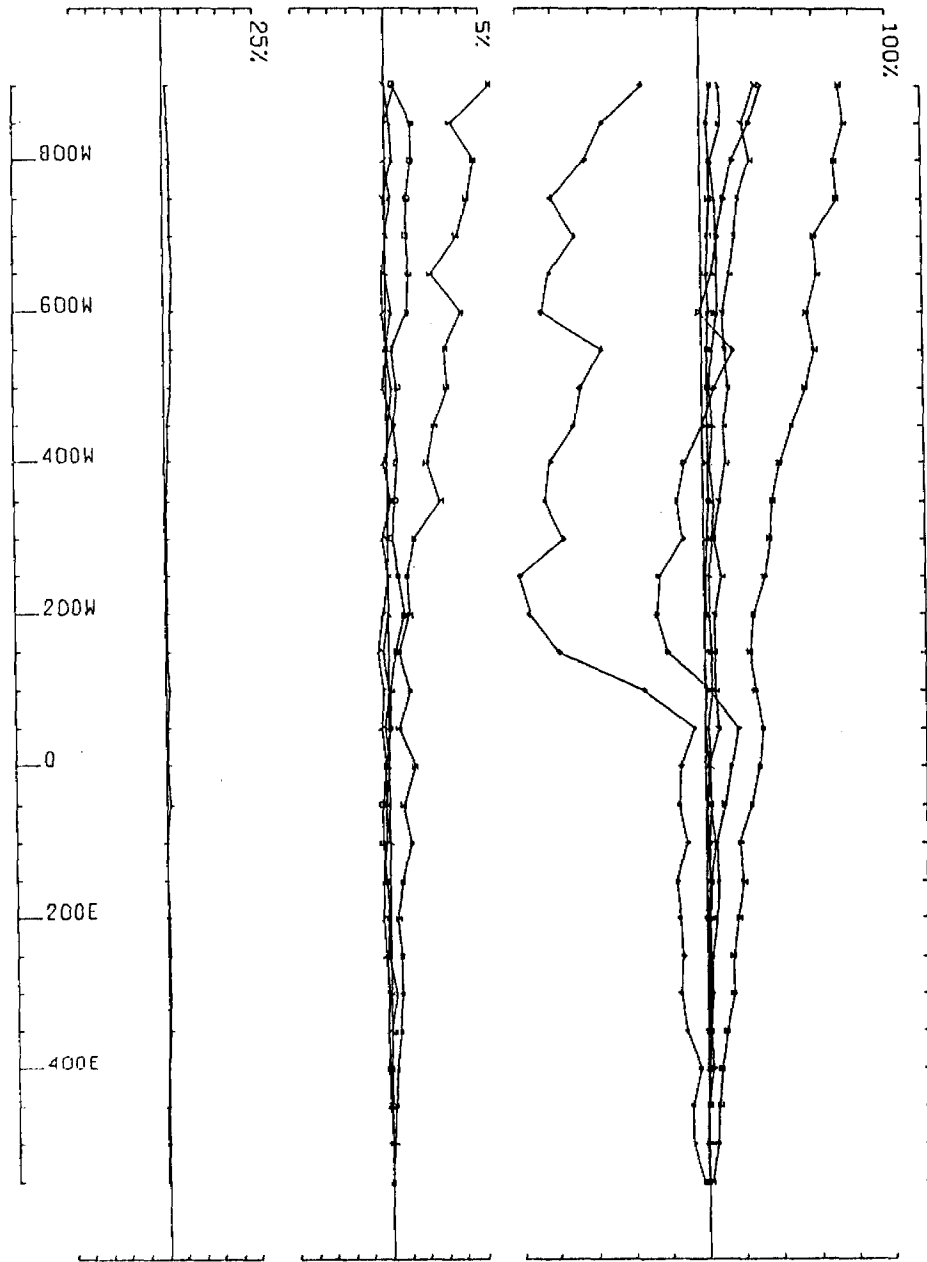
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 200S COMPONENT HZ SECONDARY FIELD CHJ CDNTJN. NDRM.



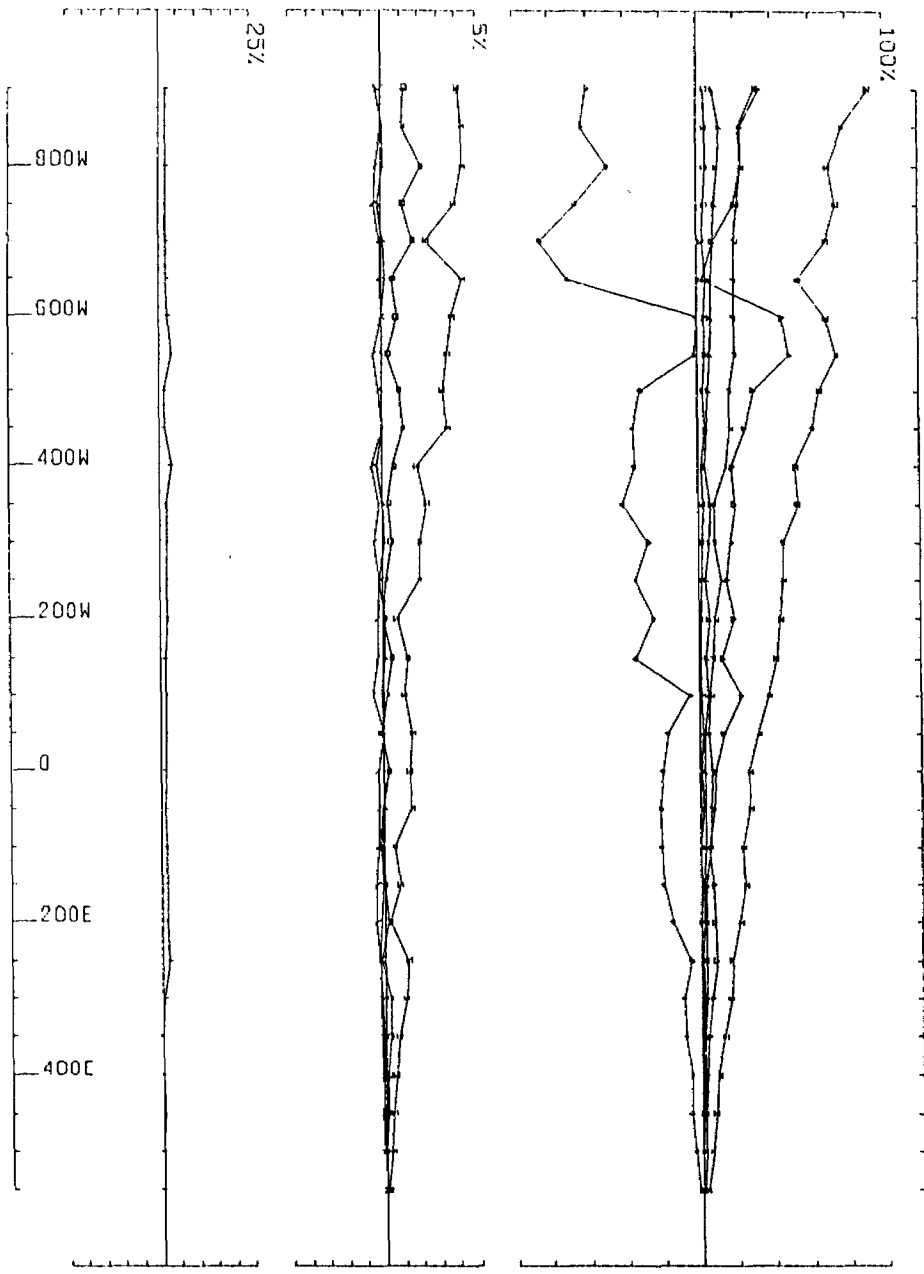
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 4005 COMPONENT HZ SECONDARY FIELD CHJ CONTJN. NORM.



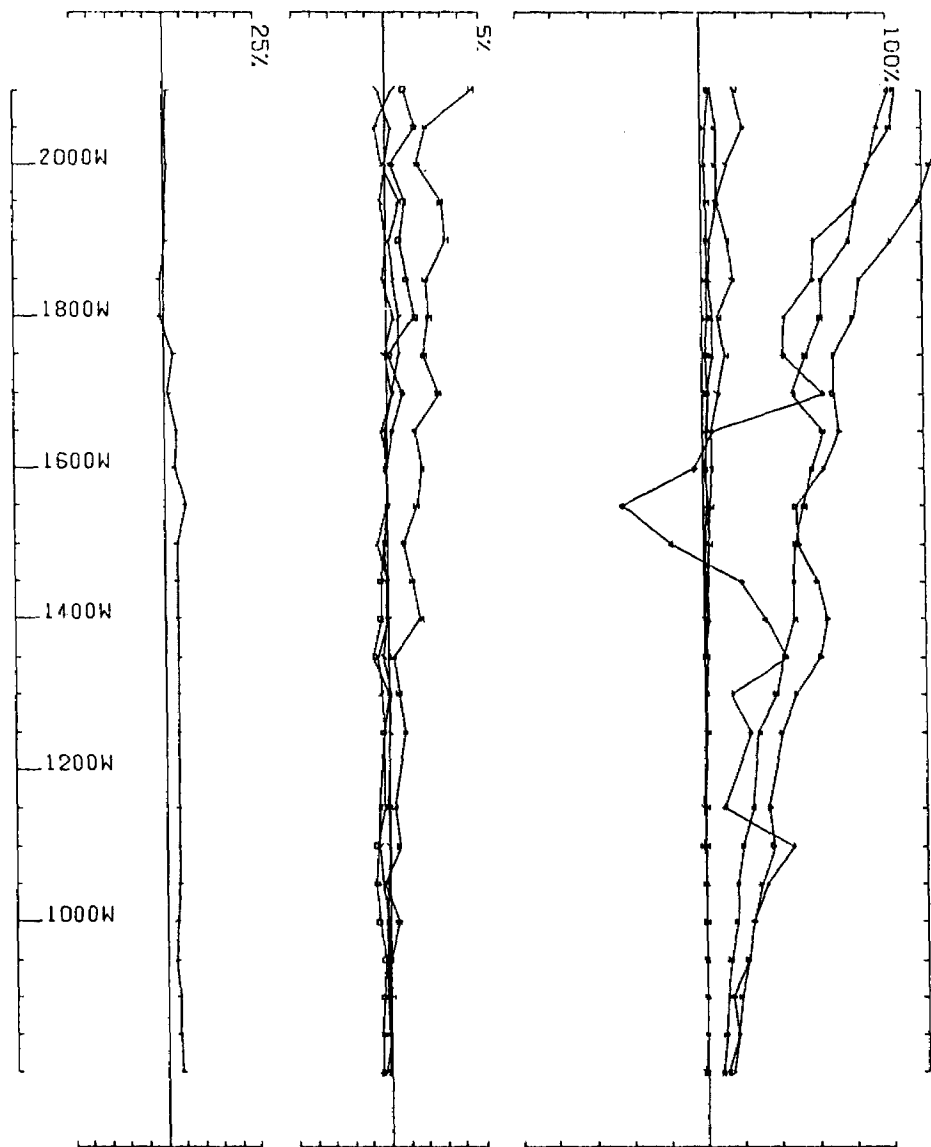
UTAH SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 6005 COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



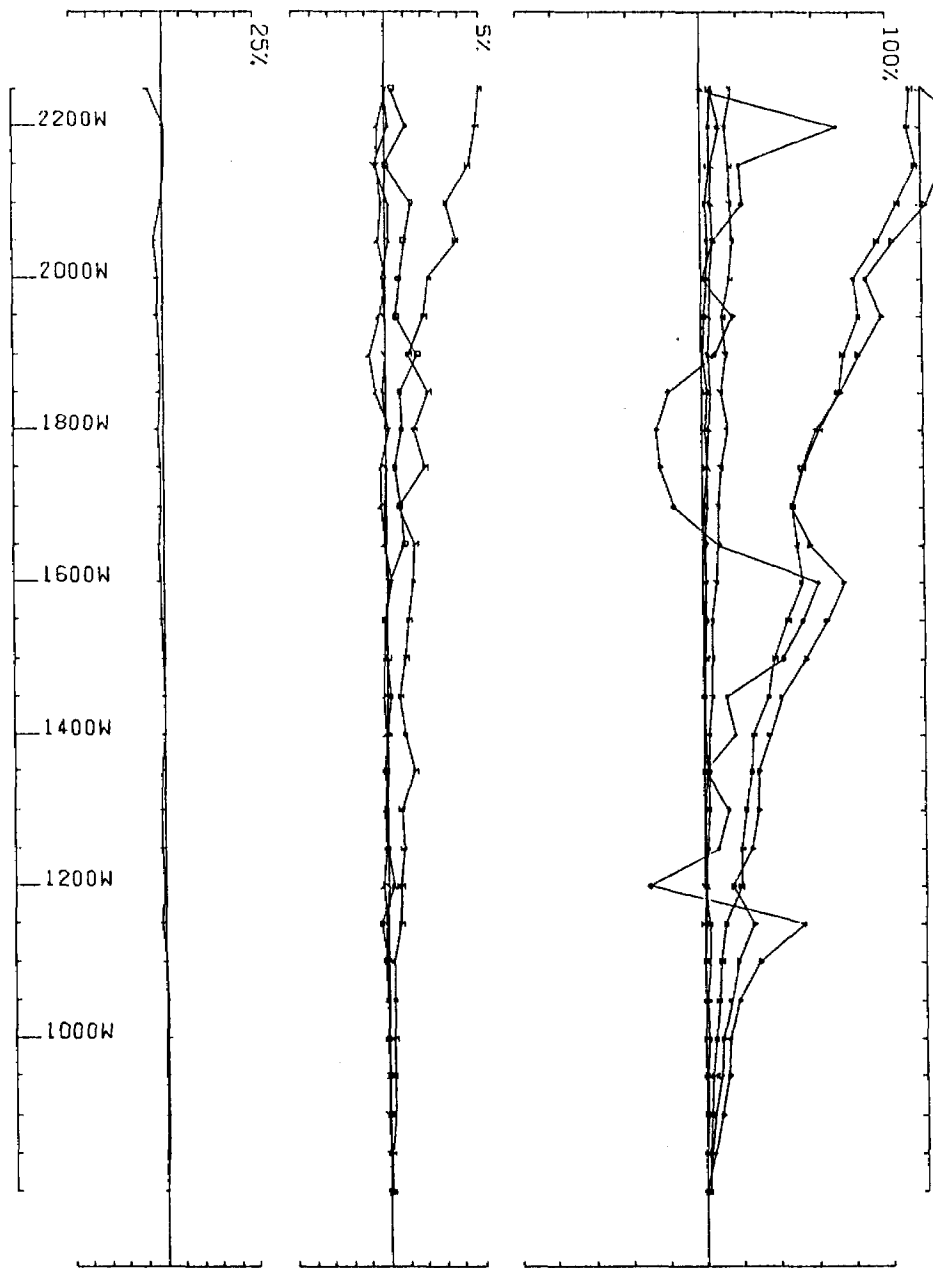
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 0005 COMPONENT HZ SECONDARY FIELD CHJ CONTIN. NORM.



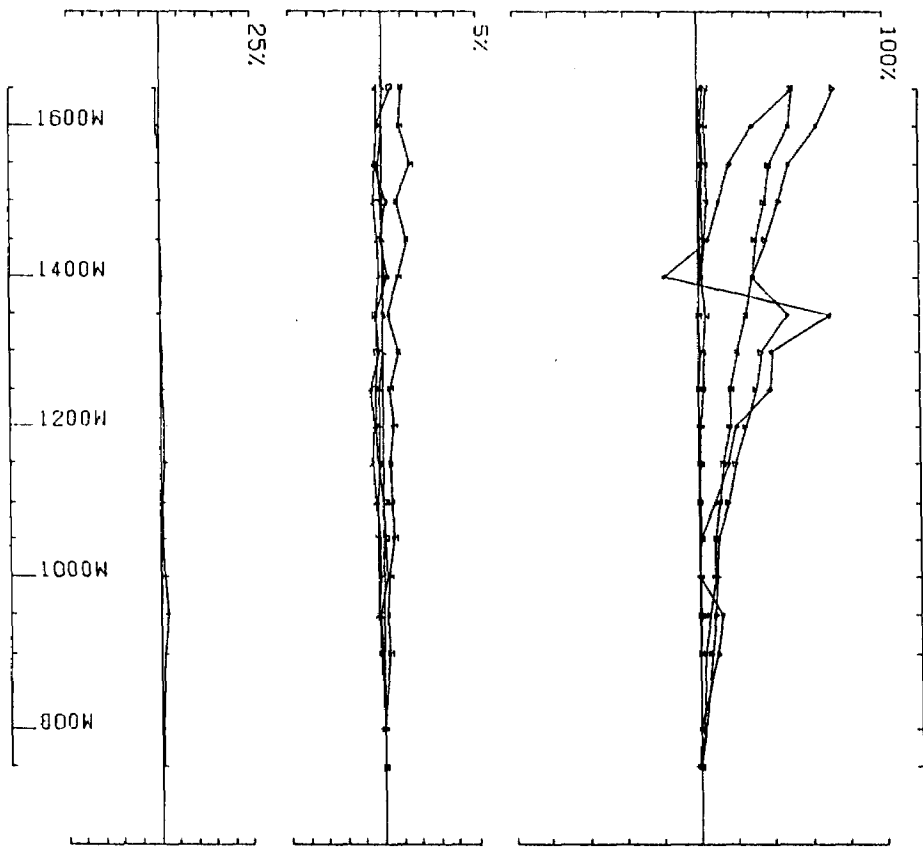
UTEH SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 10003 COMPONENT HZ SECONDARY FIELD CHI CONTIN. NDRN.



UTEM SURVEY AT PONTIAC TWP FOR NORTHCATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 400 S COMPONENT HZ SECONDARY FIELD CHJ CONTIN. NDRM.

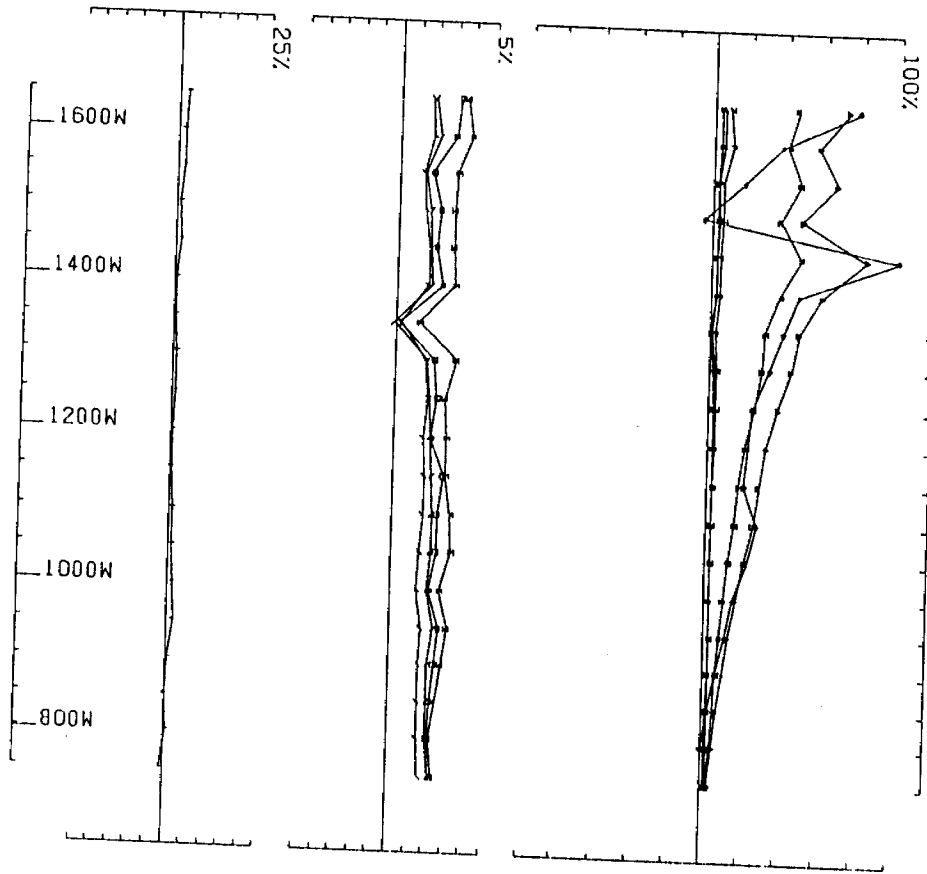


UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 600 S COMPONENT HZ SECONDARY FIELD CH3 CDNTJN- NDRM.

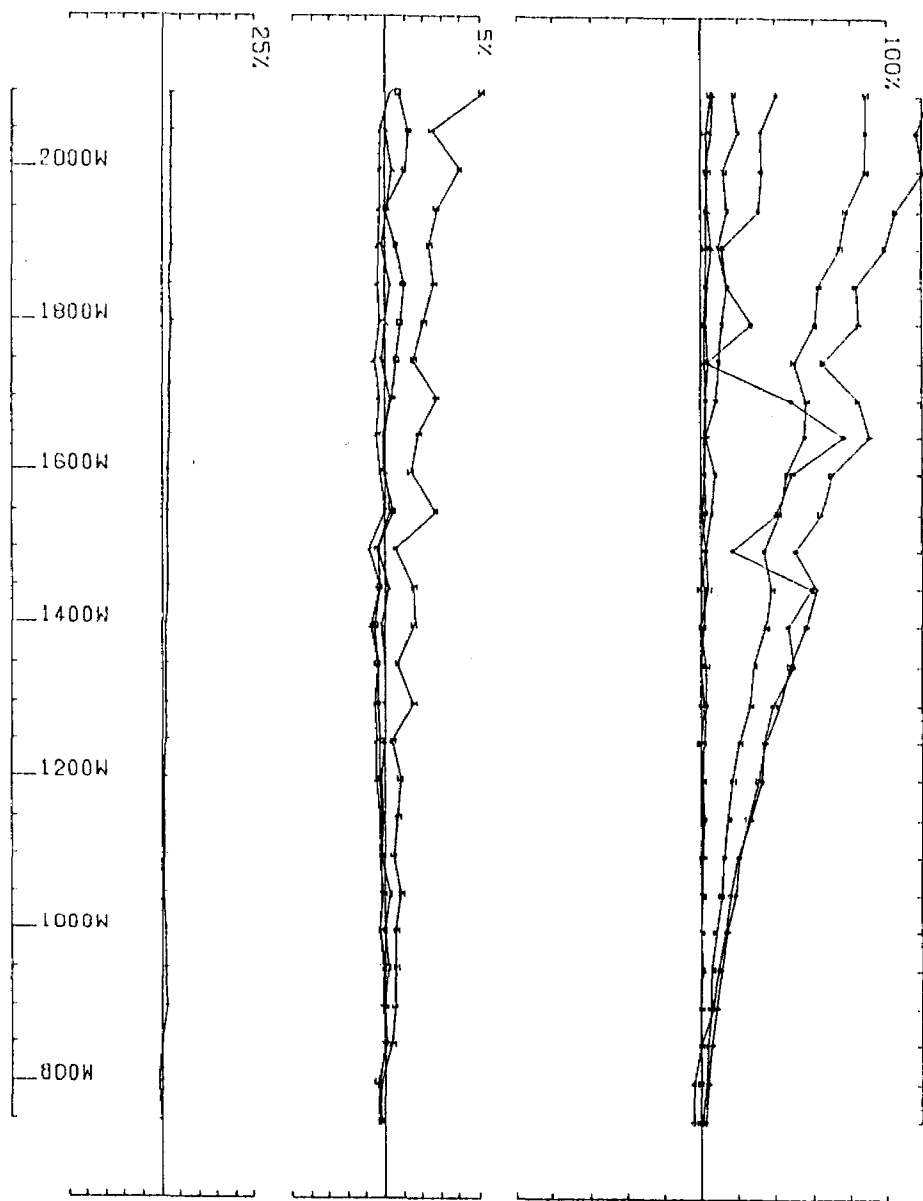


UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 800 S COMPONENT HZ SECONDARY FIELD CH1 CONTJN. NDRH.

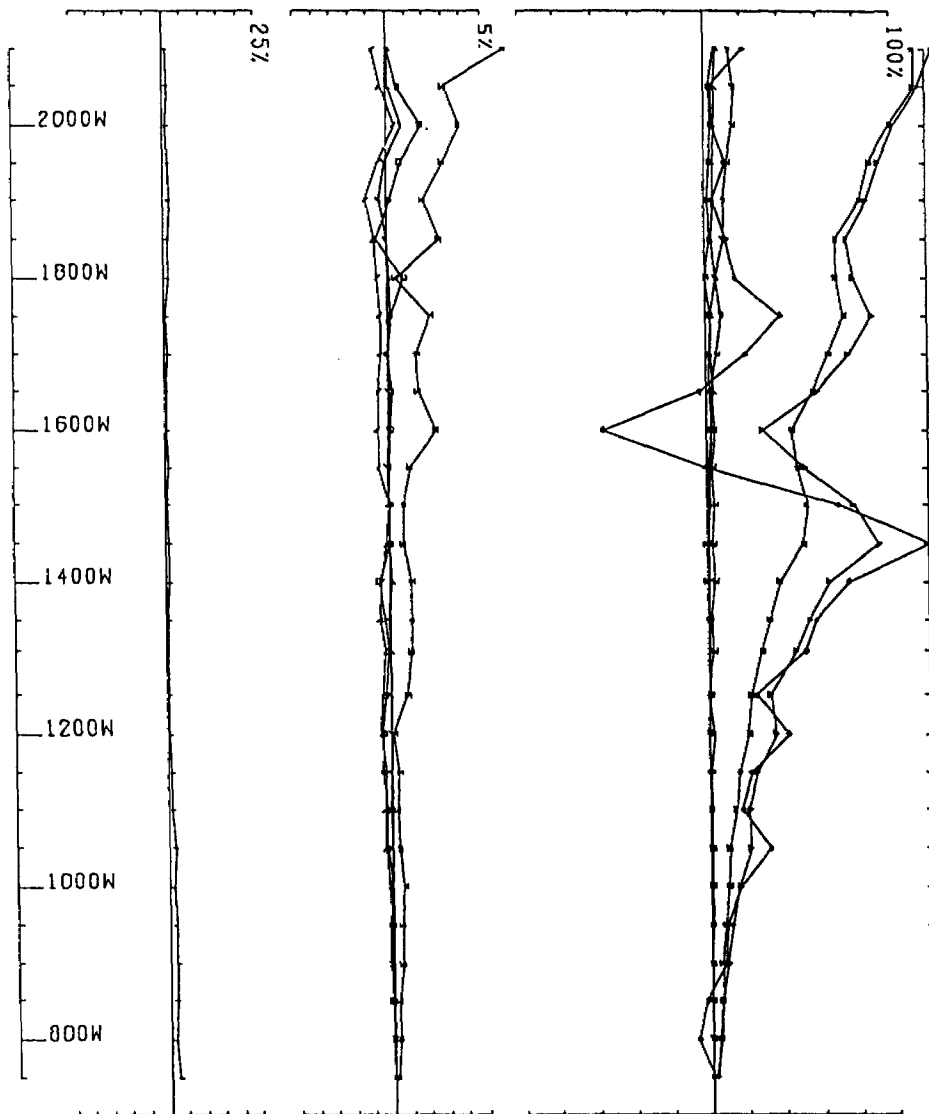




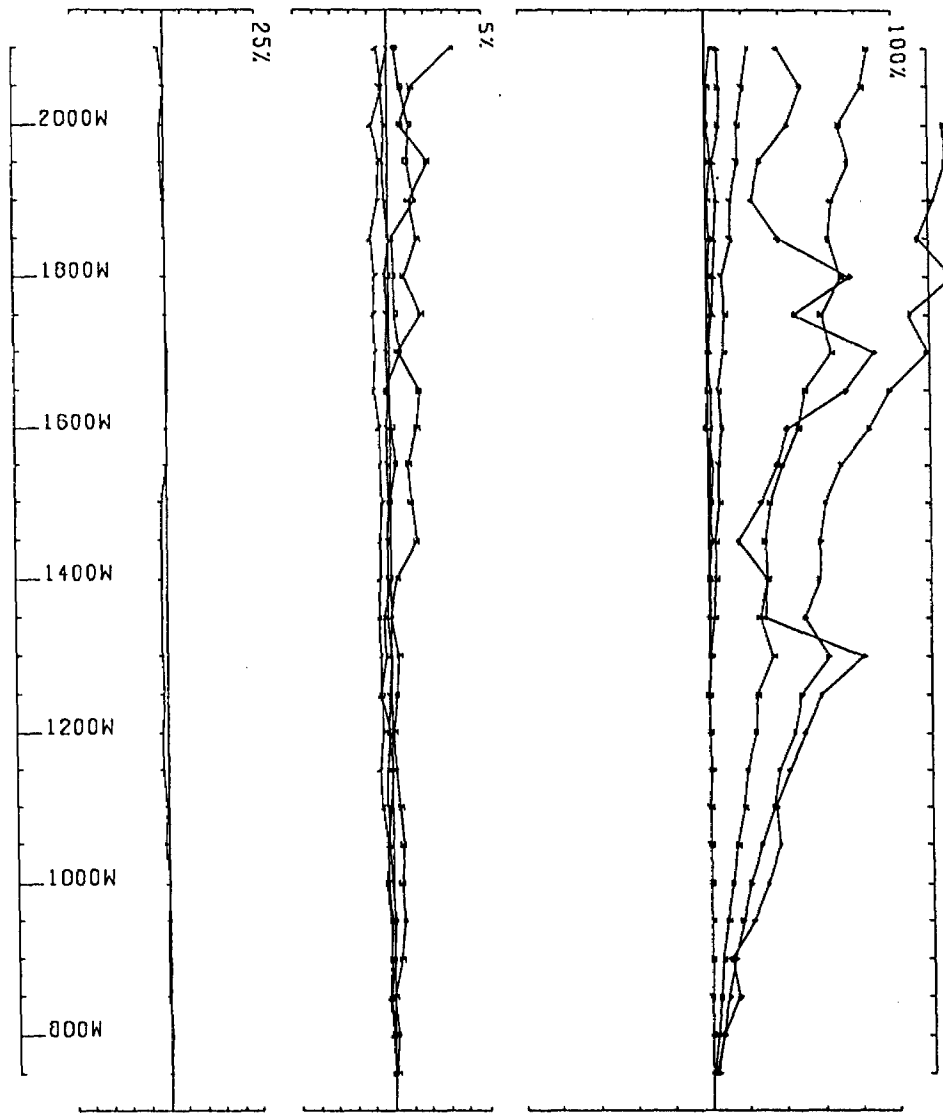
UTAH SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 1000 S COMPONENT HZ SECONDARY FIELD CHJ CONTIN. NORM.



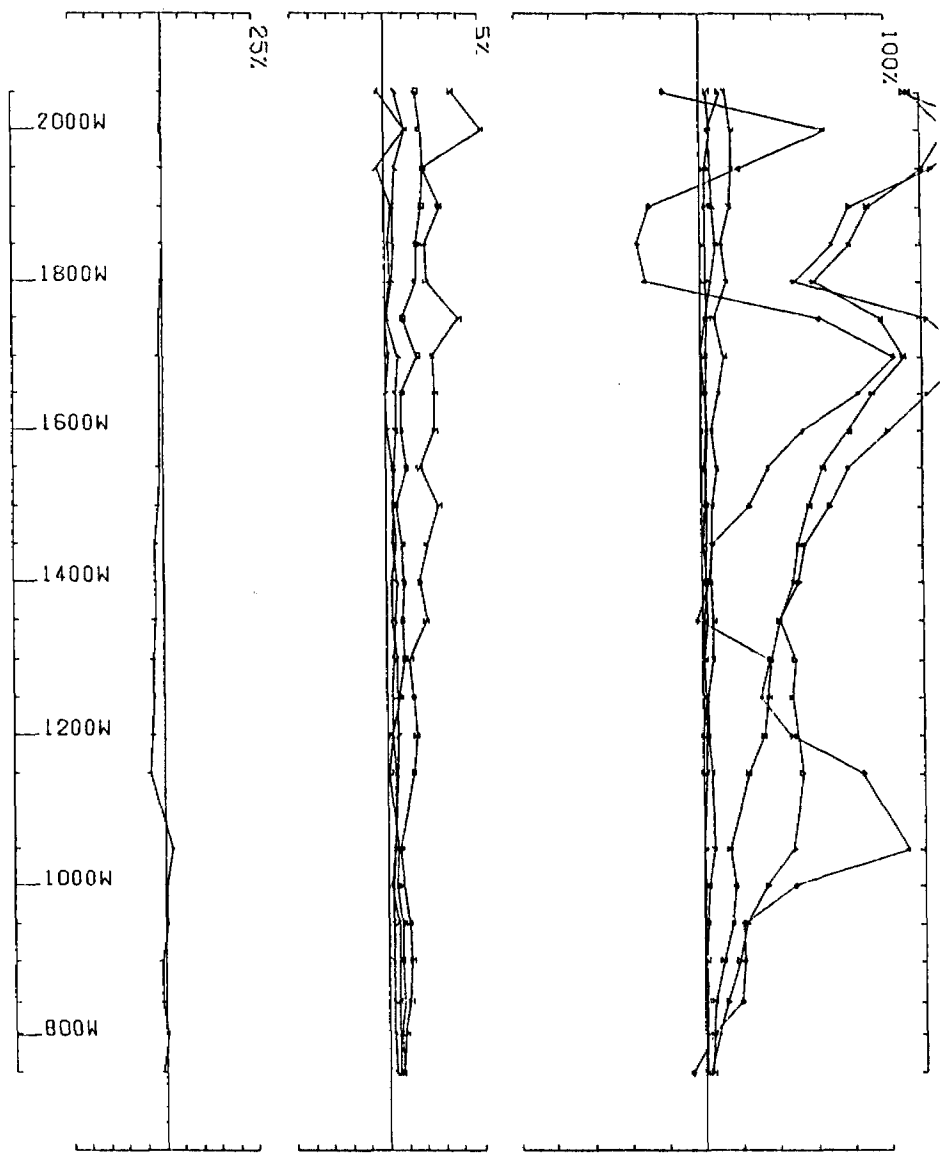
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 1200 5 COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



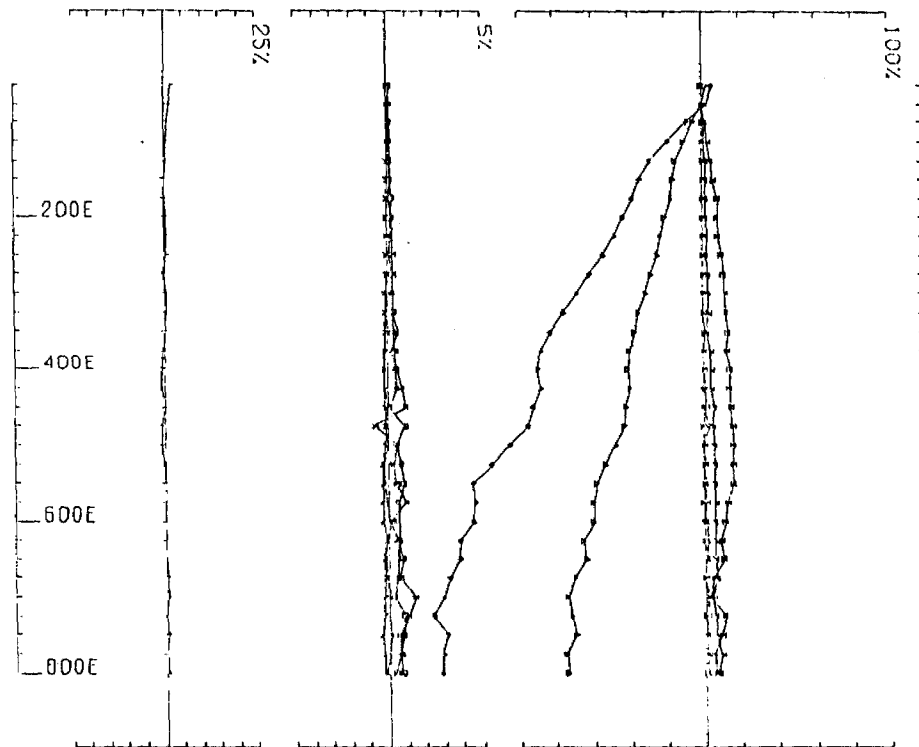
UTEM SURVEY AT PONTIAC TWP FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.07  
 LOOP NO 5 LINE 1400 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



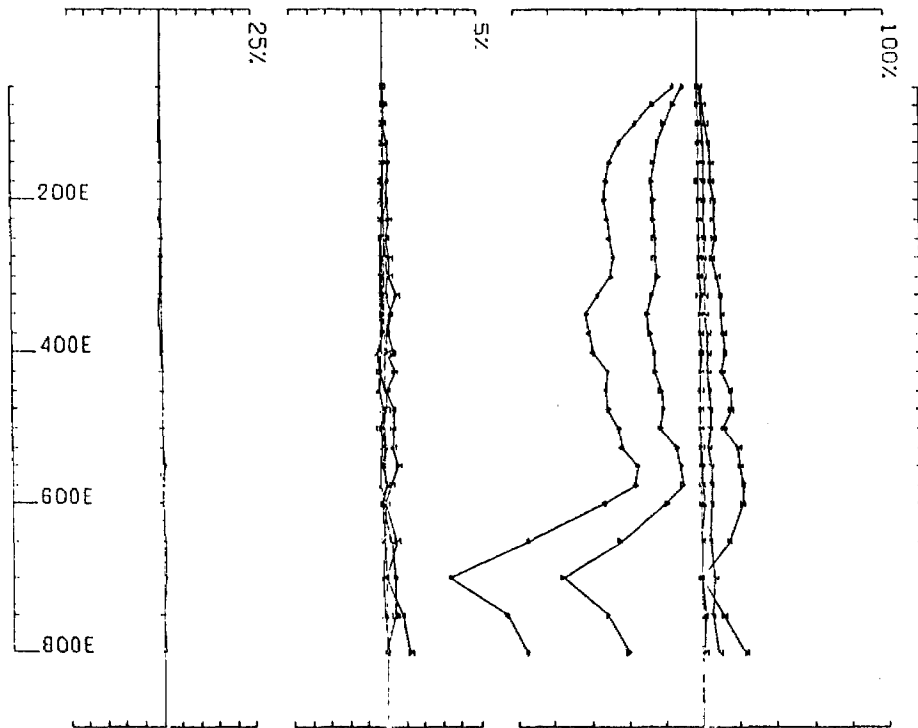
UTEM SURVEY AT PONTIAC TWP FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LANONTACNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 5 LINE 1600 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



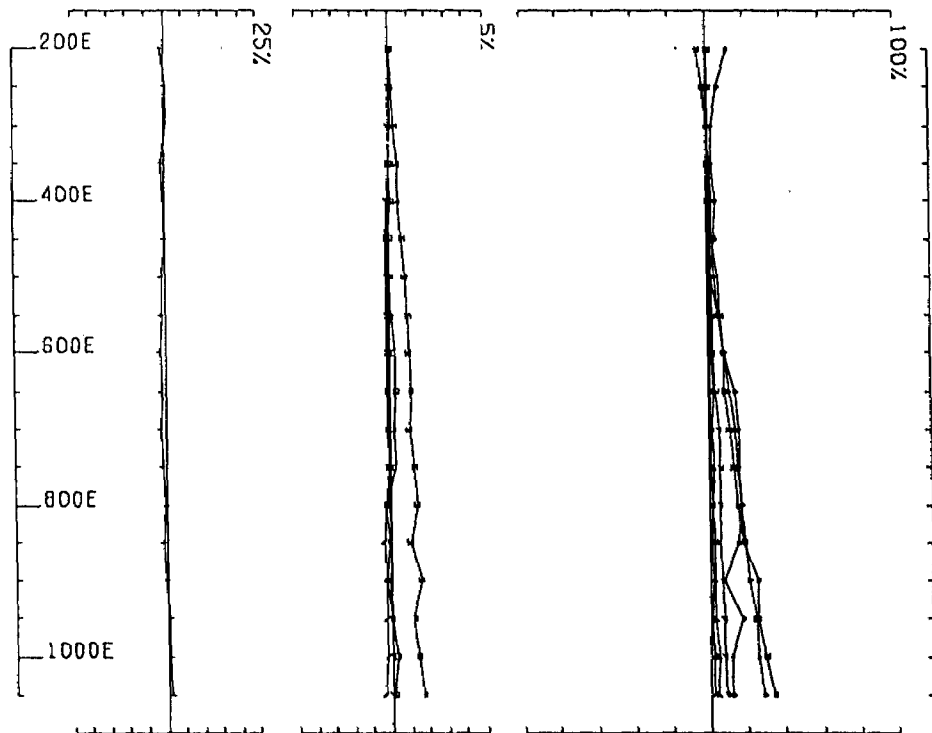
UTEM SURVEY AT PONTIAC TWP FOR NORTHCOTE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 11121 30.97  
 LOOP NO 5 LINE 1800 S COMPONENT 11Z SECONDARY FIELD CH1 CONTIN. NDRM.



UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 6 LINE 400 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NDRM.

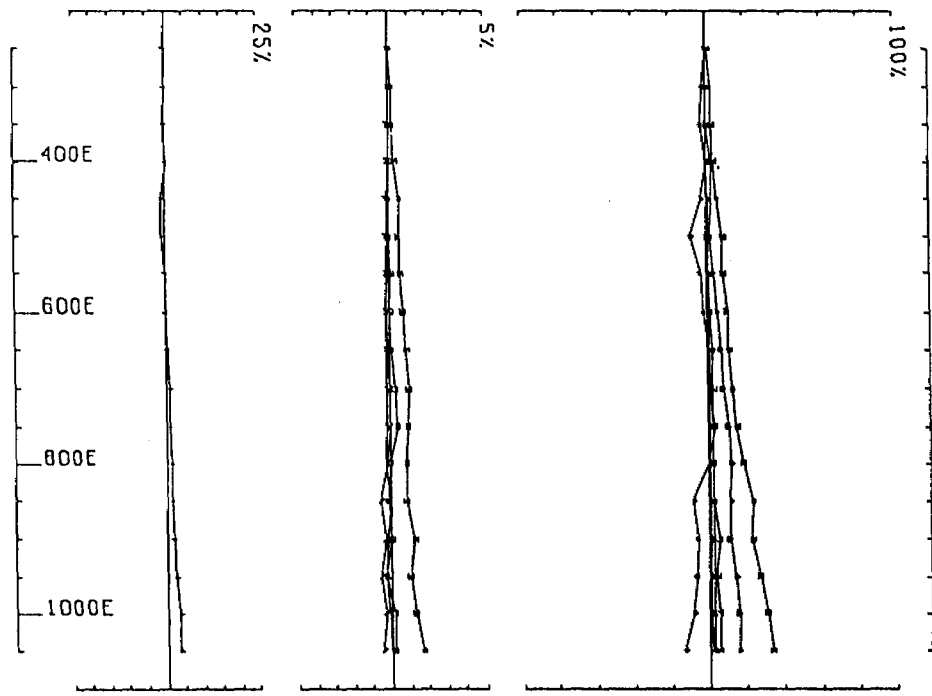


UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30-97  
 LOOP NO 6 LINE 600 S COMPONENT HZ SECONDARY FIELD CHJ CONTIN. NDRM.

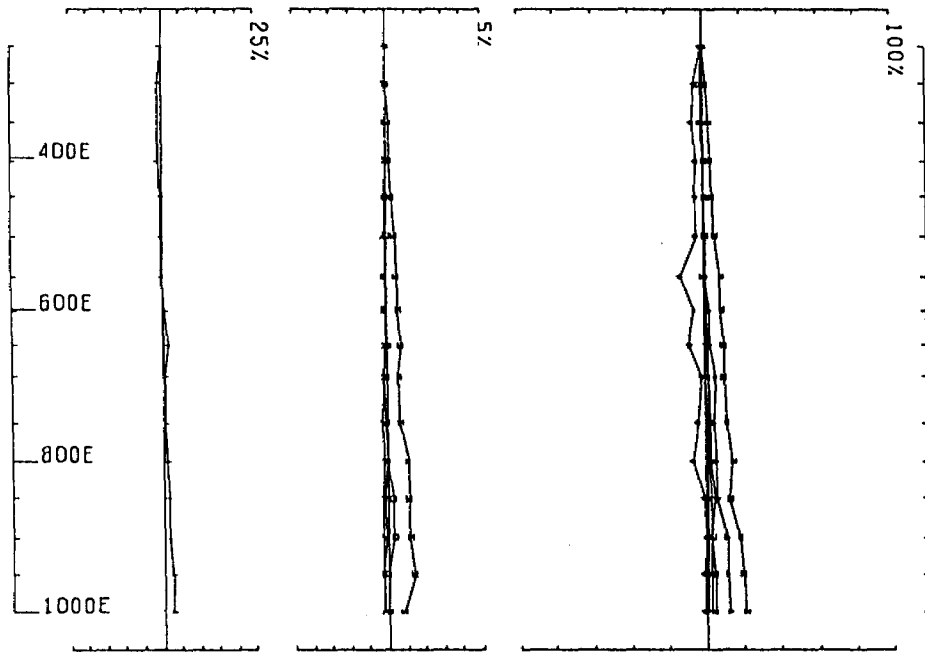


UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9028 BASE FREQ (HZ) 30.97  
 LOOP NO 7 LINE 3400 W COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

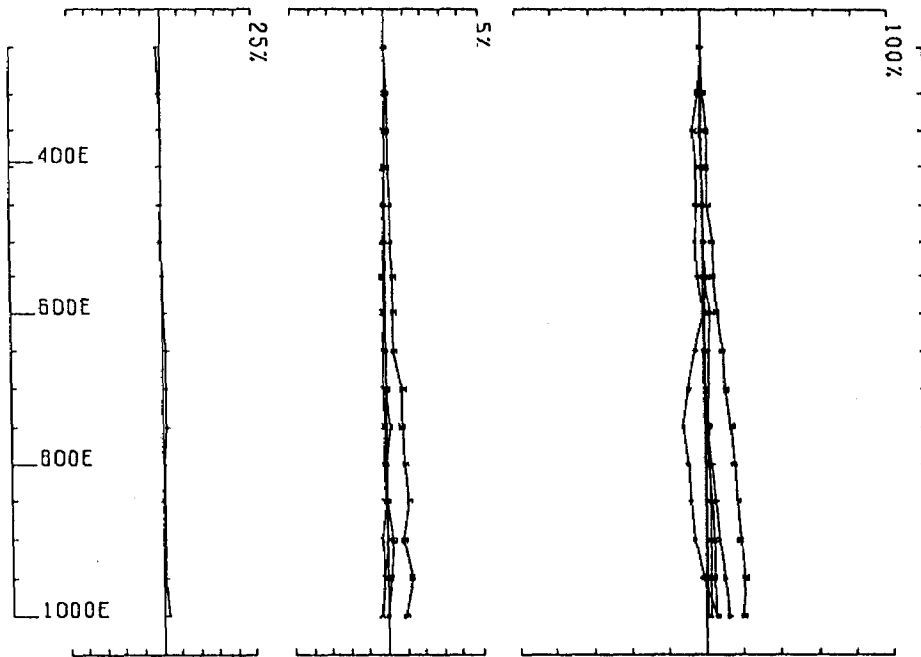




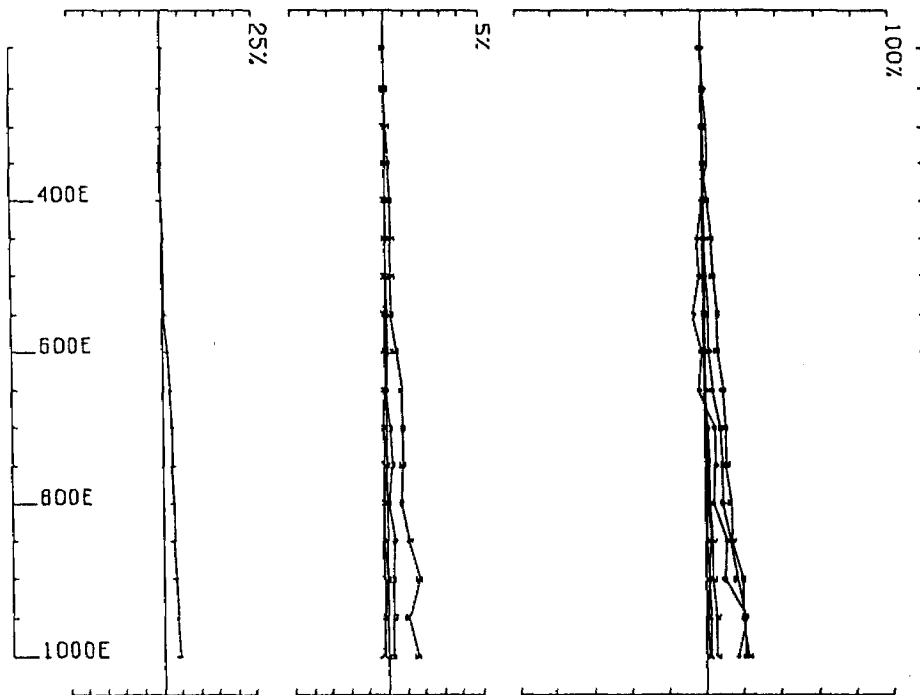
UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.07  
 LOOP NO 7 LINE 3600 N COMPONENT HZ SECONDARY FFIELD CH1 CONTIN. NORM.



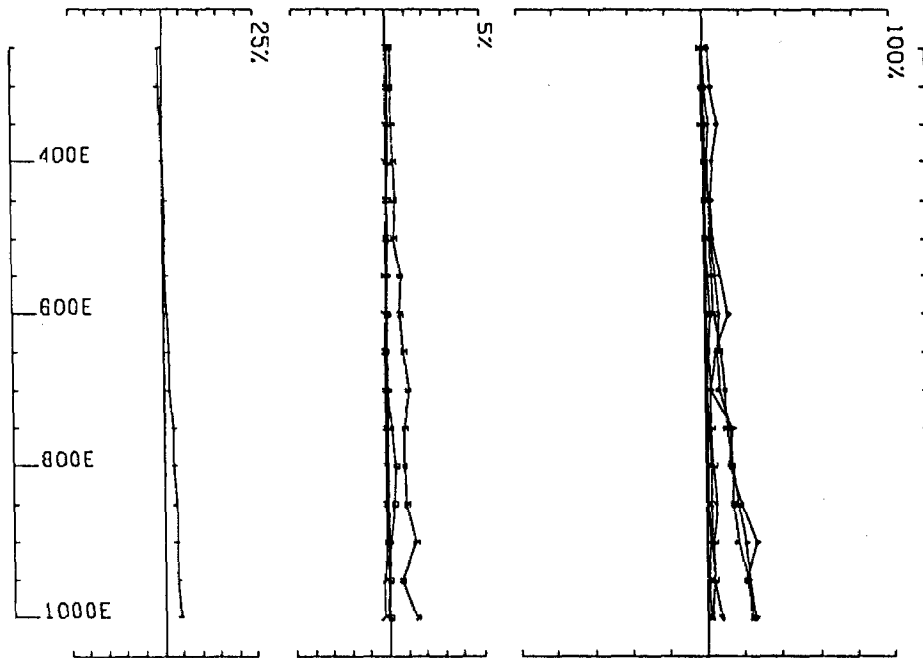
UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.07  
 LOOP NO 7 LINE 3800 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NDRN.



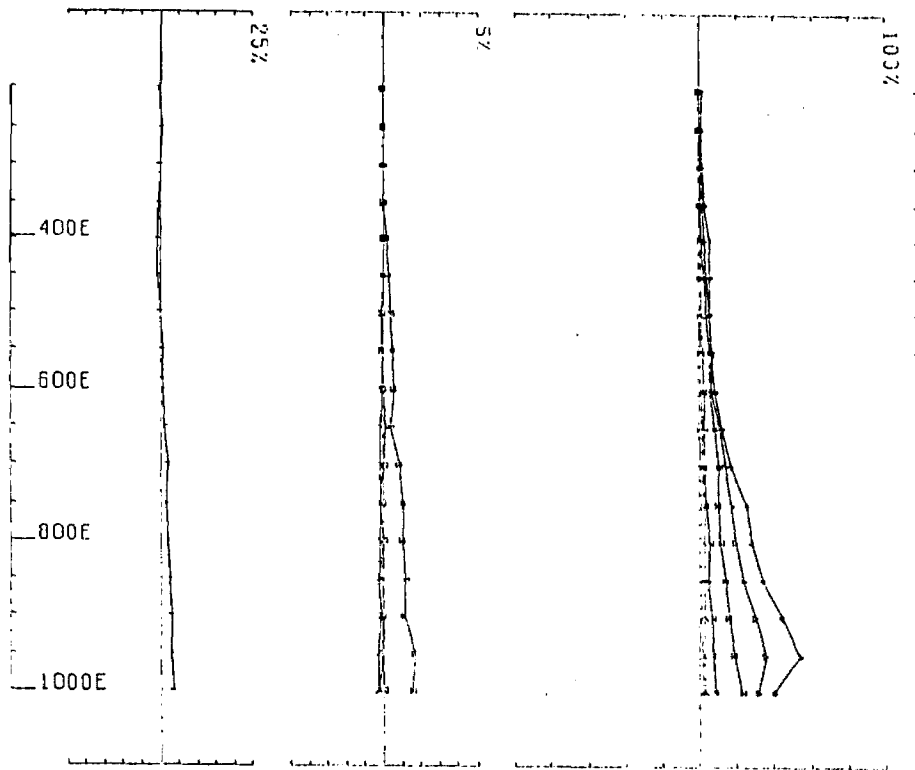
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 7 LINE 4000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



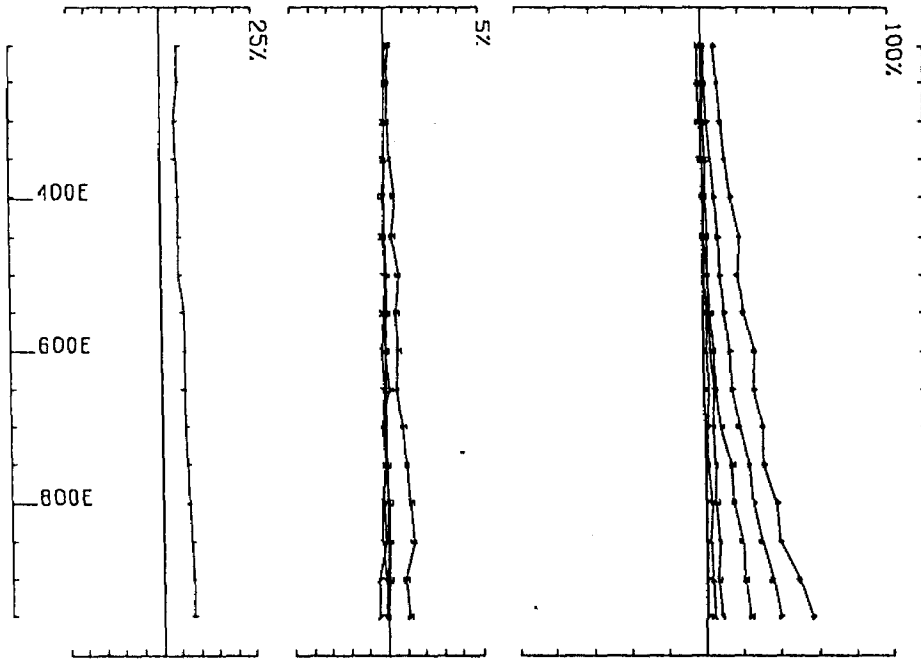
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30-97  
 LOOP NO 7 LINE 4200 N COMPONENT HZ SECONDARY FIELD CH3 CONTIN. NDRM.



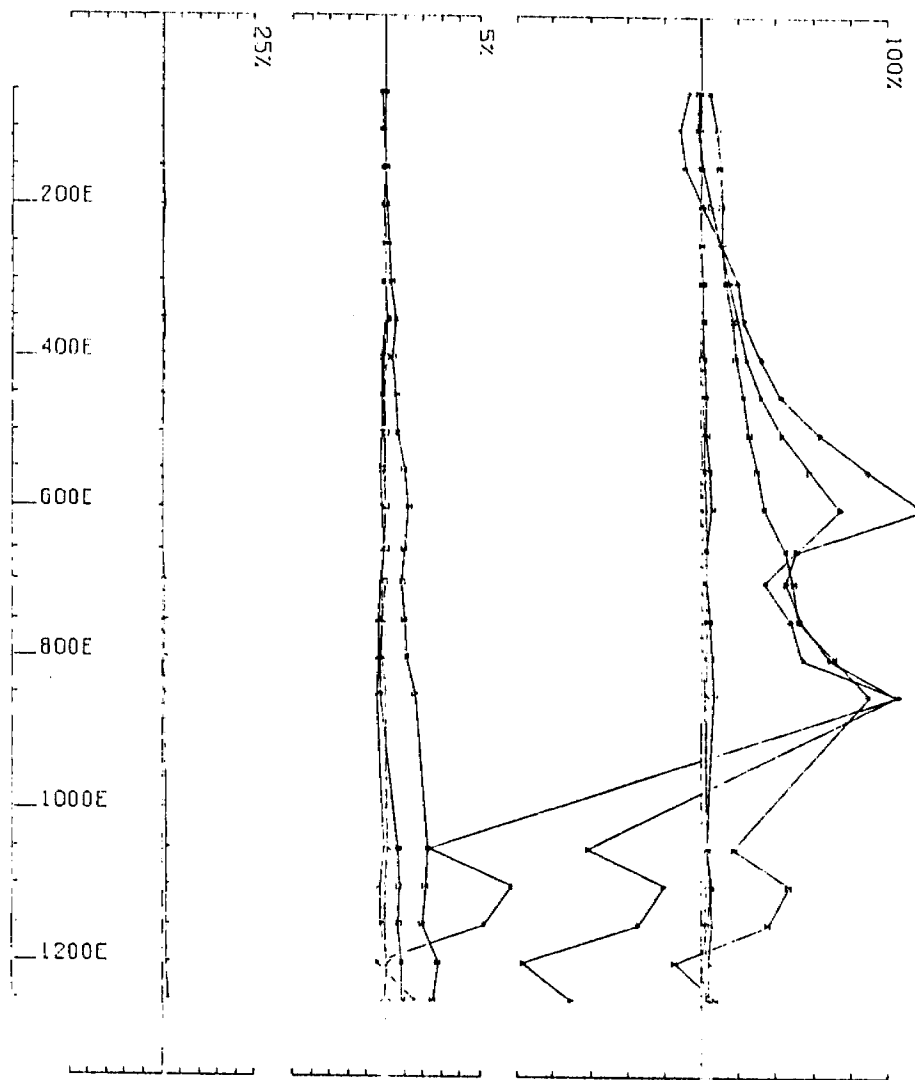
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 7 LINE 4400 N COMPONENT HZ SECONDARY FIELD CH) CONTIN. NORM.



UTEM SURVEY AT PONTIAC TWP. FOR NUKIHOATE EXPLORATION  
 CONDUCTED BY LAMONTAGHE GEOPHYSICS LTD JOB 0026 BASE FREQ 1121 30.07  
 LOOP NO 7 LINE 4600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NUM.

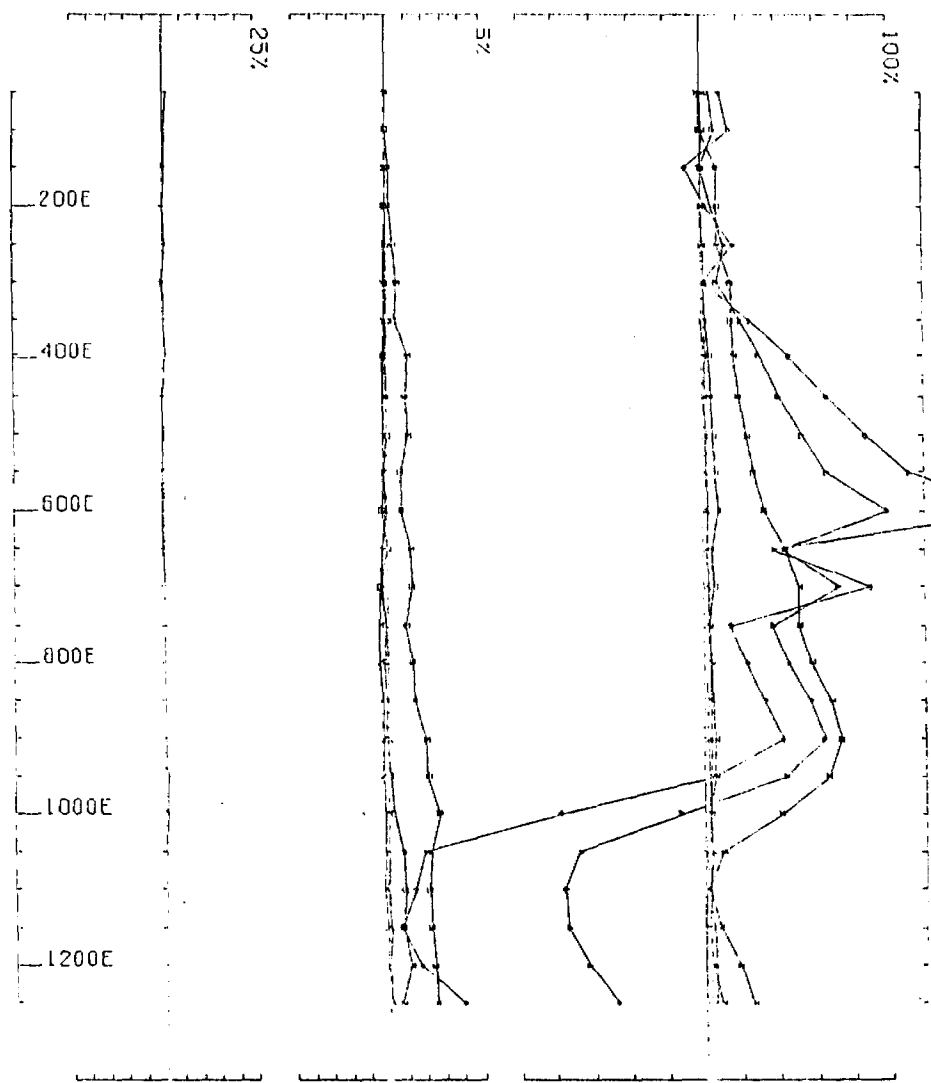


UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 7 LINE 4800 N COMPONENT HZ SECONDARY FIELD CH) CONTIN. NORM.

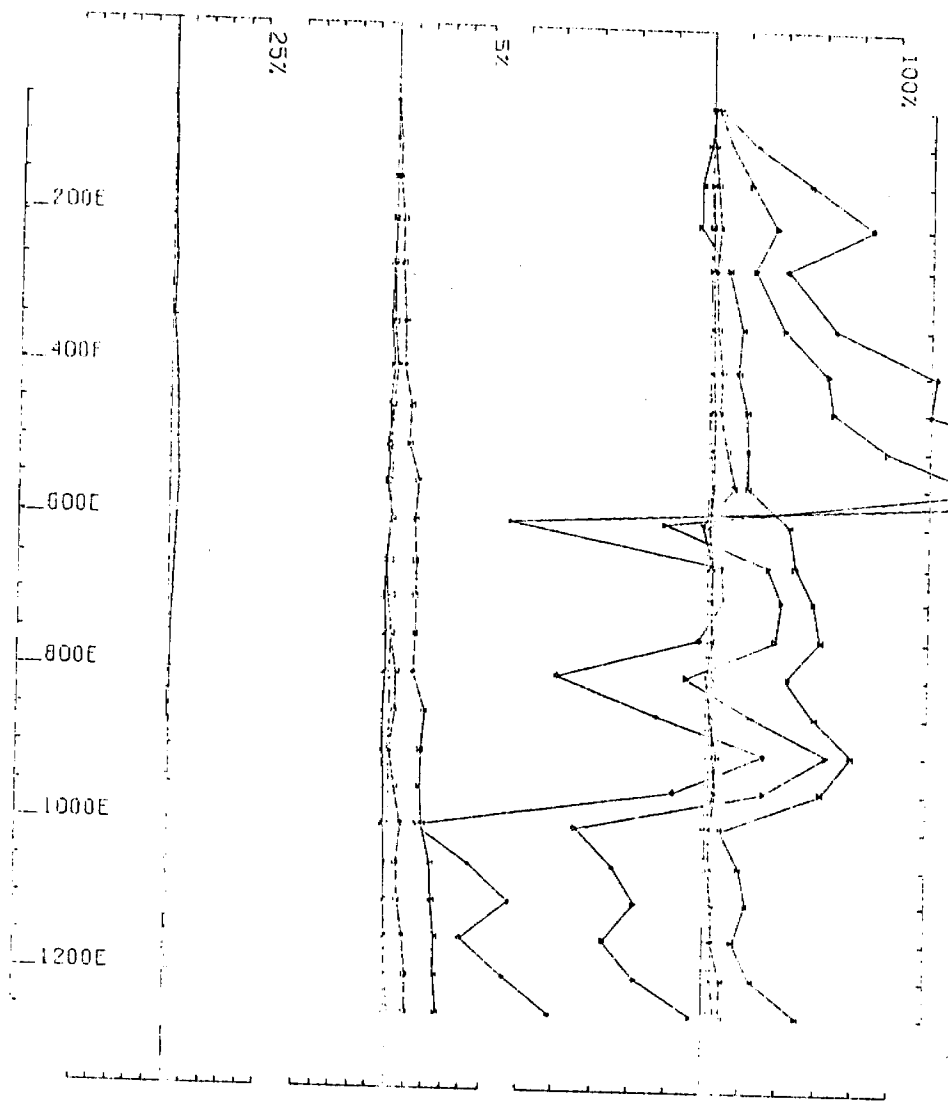


STEM SURVEY AT PONTIAC TWP FOR HORTHCOTE INT INC  
 CONDUCTED BY LAMONTAGNE GEOPHYSICALS LTD JOB 9026 BASE FREQ HZ 30.97  
 LOOP NO 8A LINE 600 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

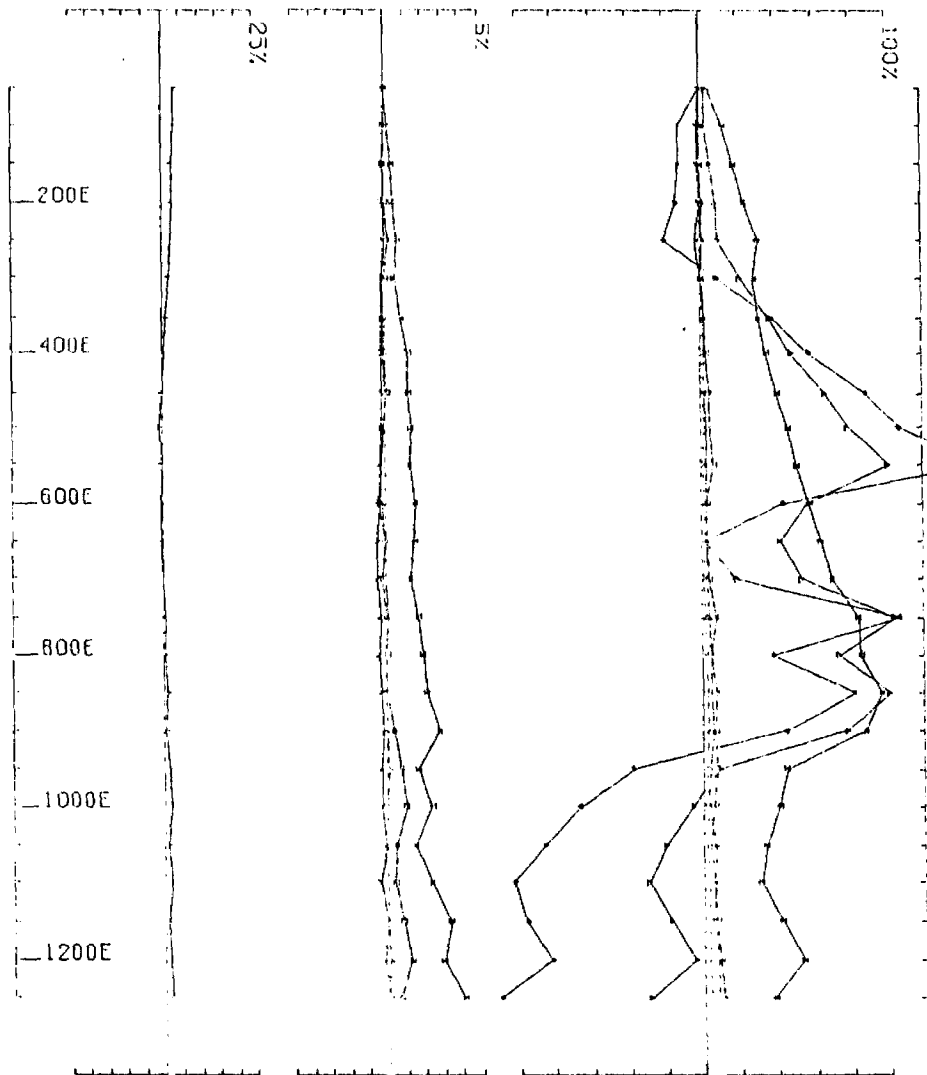




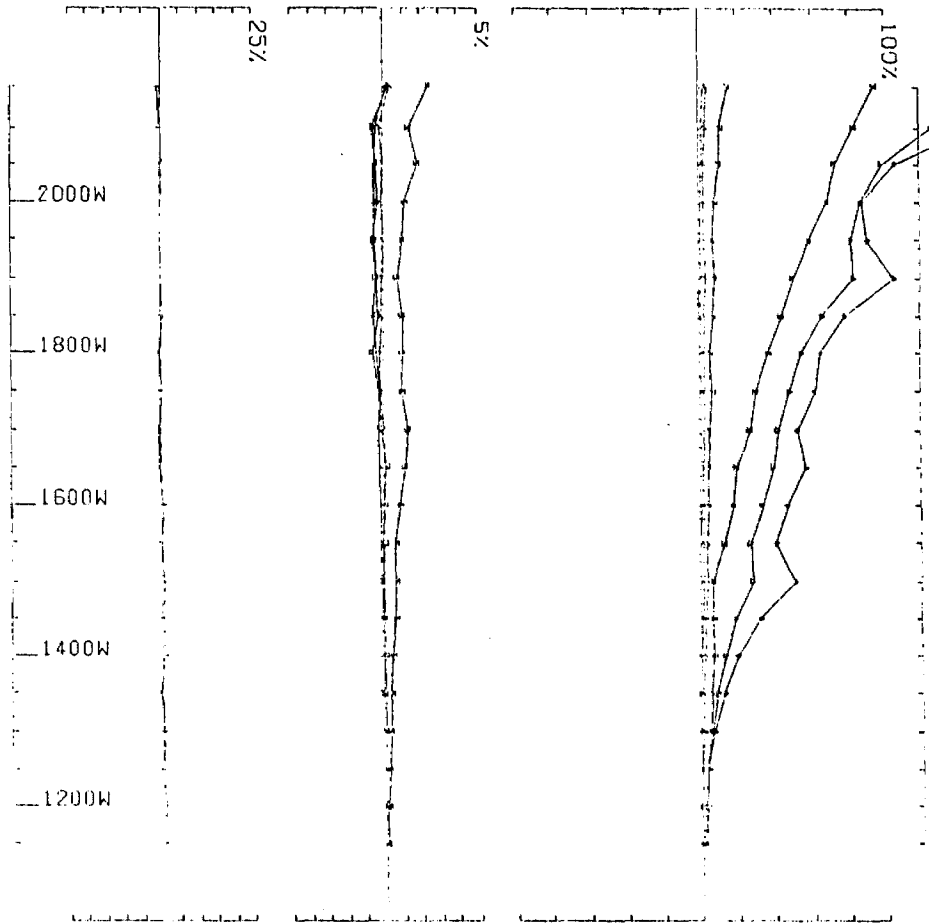
ITEM SURVEY AT PONTIAC TWP FOR HORTHCOTE INT INC  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ HZ 30.97  
 LOOP NO 8A LINE 800 N COMPONENT HZ SECONDARY FIELD CHI UNFIN. NUM.



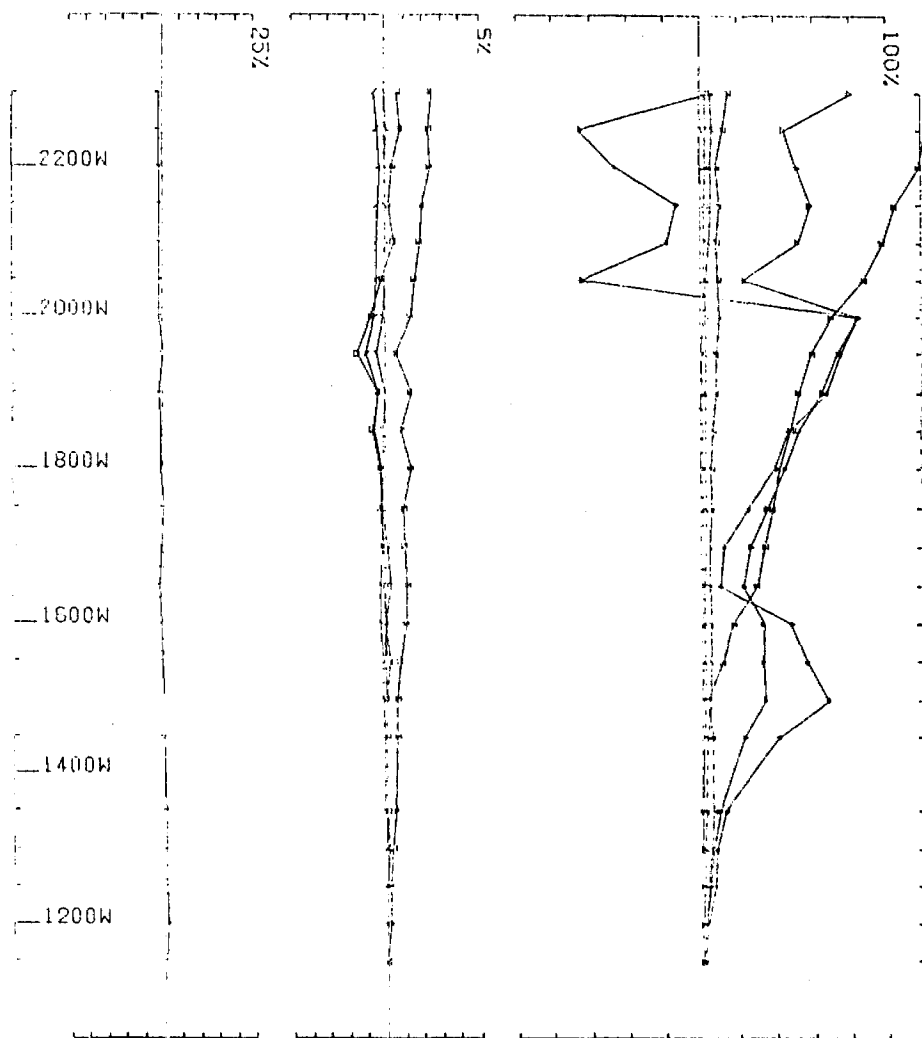
ITEM SURVEY AT PONTIAC TWP FOR IMPHOCATE INT INC  
 CONDUCTED BY LAMONTAGNE GEOPHYSICALS LTD JOB 9026 BASE FREQ 421 30.97  
 LOOP NO 8A LINE 1000 N COMPONENT 87 SECONDARY FIELD CHI CONTIN. NORM.



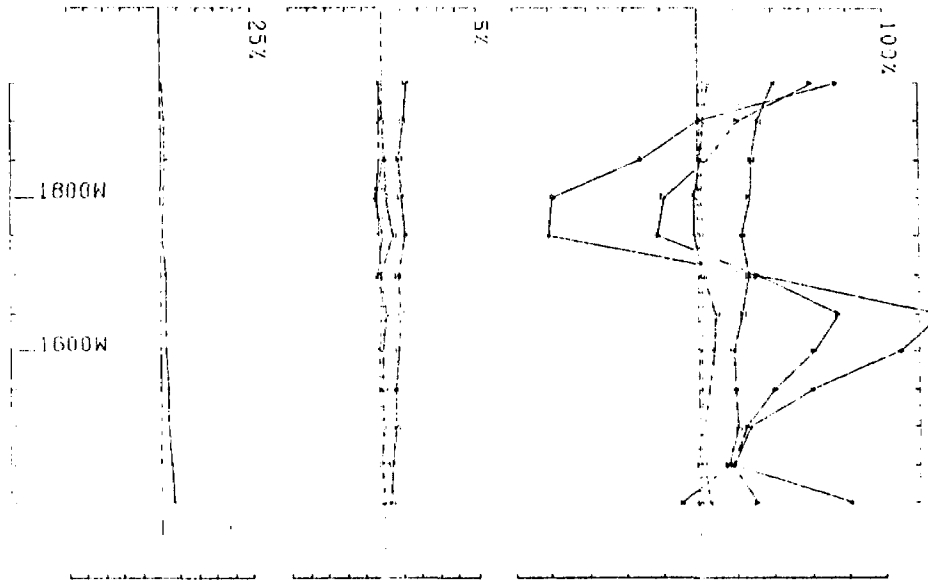
ITEM SURVEY AT PONTIAC TWP FOR BORTHGATE ENI INC  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 421 30.97  
 LOOP NO 8A LINE 1200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



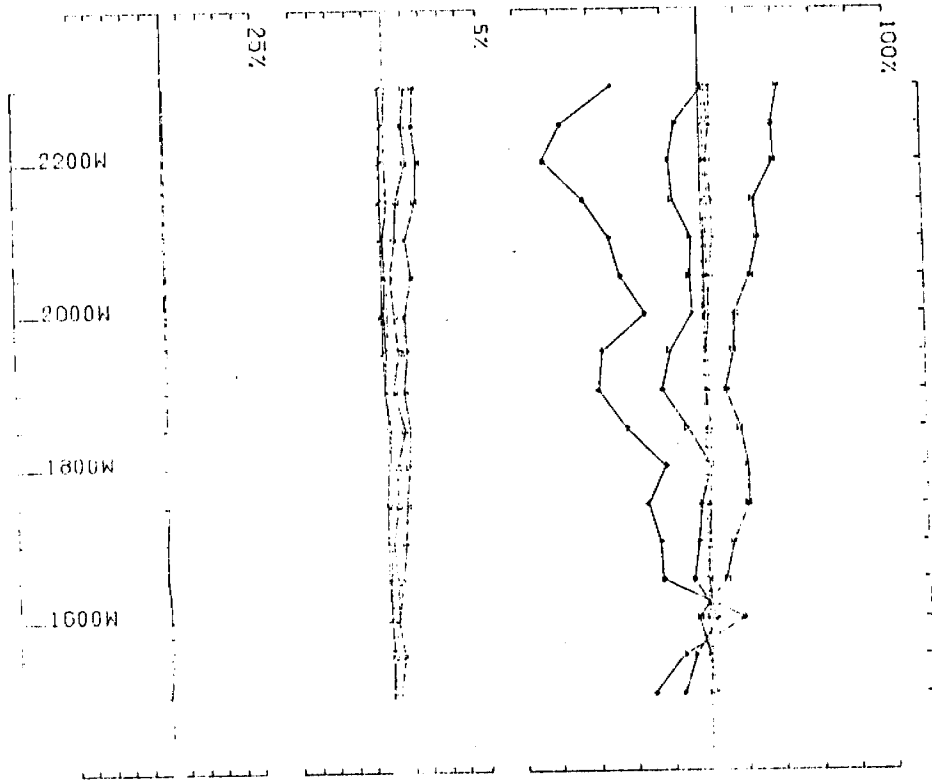
JTEM SURVEY AT PONTIAC TWP FOR HORTHCATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 1021 30.97  
 LOOP NO 6 LINE 0 S COMPONENT HZ SECONDARY FIELD CH1 CONFIN. CORR.



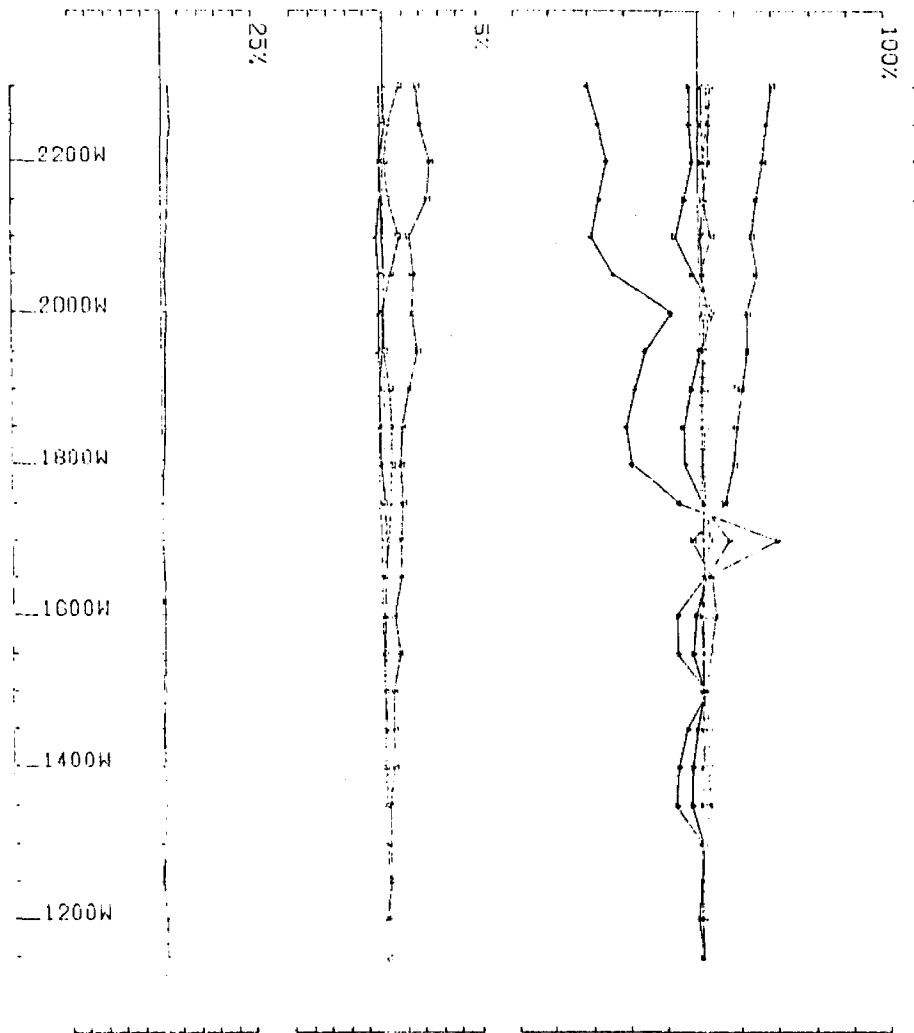
ITEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICAL LTD JOB 9026 BASE FREQ 1121 30.97  
 LOOP NO 6 LINE 200 S COMPONENT 1/2 SECONDARY FIELD CH3 CONTIN. NDRM.



JTEM SURVEY AT PONTIAC TWP FOR UNCONVENTIONAL EXPLORATION  
 CONDUCTED BY LIMONTAGNE GEOPHYSICAL LTD JOB 9026 BASE FREQ 421 30.97  
 LOOP NO 8 LINE 400 N COMPONENT OF SECONDARY FIELD CH3 CARTON. NORM.

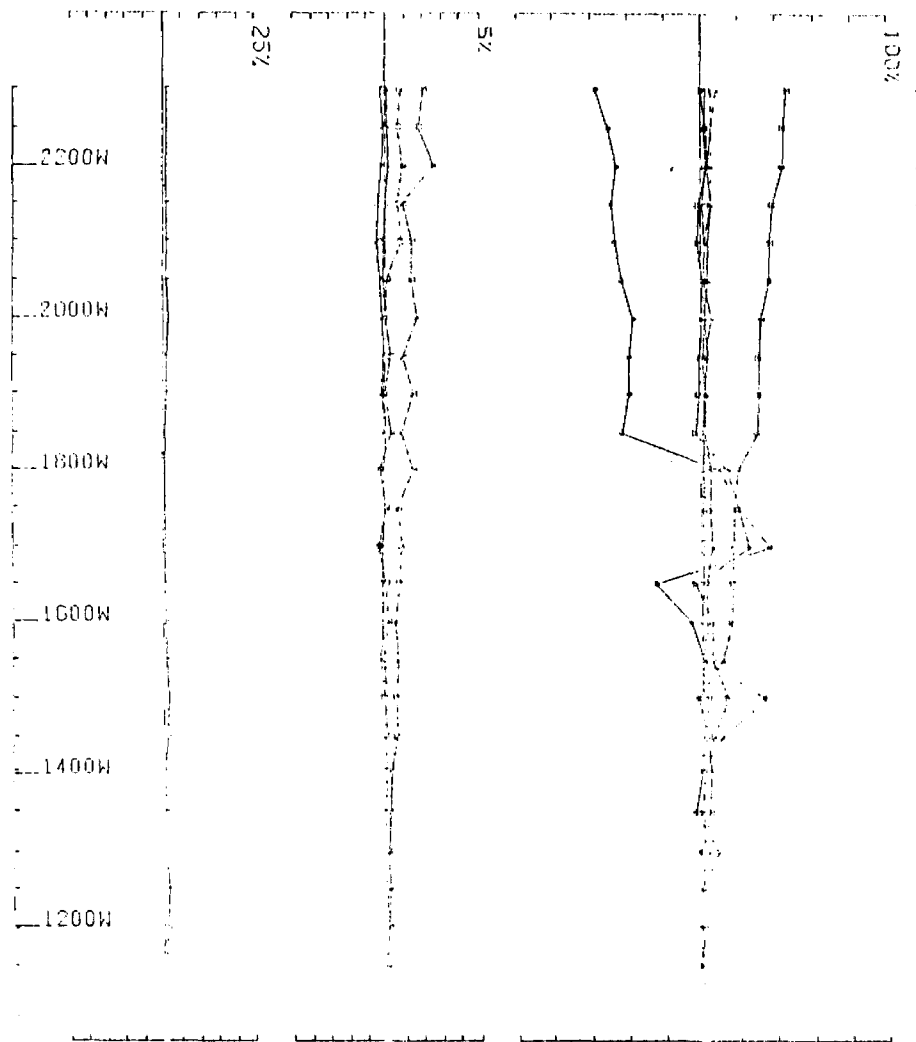


JTEH SURVEY AT PONTIAC TWP FOR CARBONATE EXPLORATION  
 CONDUCTED BY LA MONTAINE GEOPHYSICAL LTD JOB 9026 BASE FREQ 471 30.97  
 LOOP NO 8 LINE 600 N COMPONENT 47 SECONDARY FIELD CH1 CONTIN. NDRH.

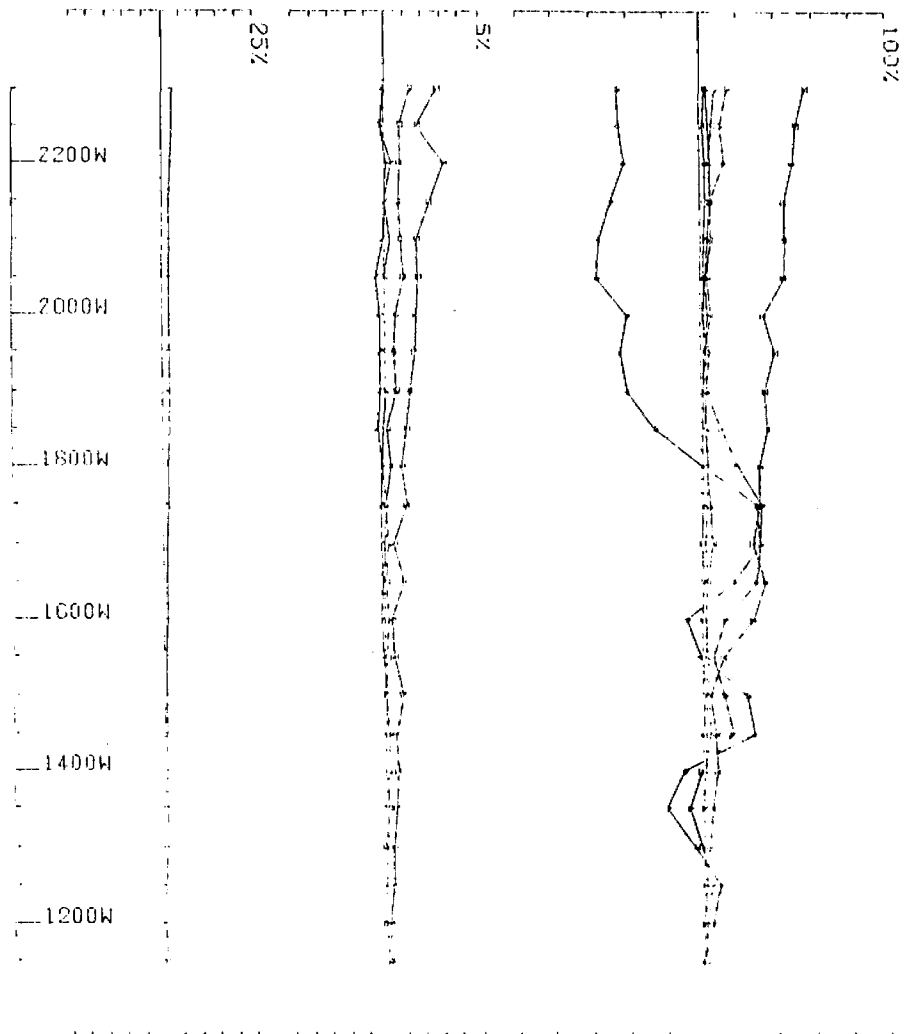


JTEH SURVEY AT PONTIAC TWP FOR PETROBRAS EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICALS LTD JOB 9026 BASE FREQ 121.30.97  
 LOOP NO 6 LINE 800 N COMPONENT 12 SECONDARY FIELD CH3 CONT'D. HDRH.

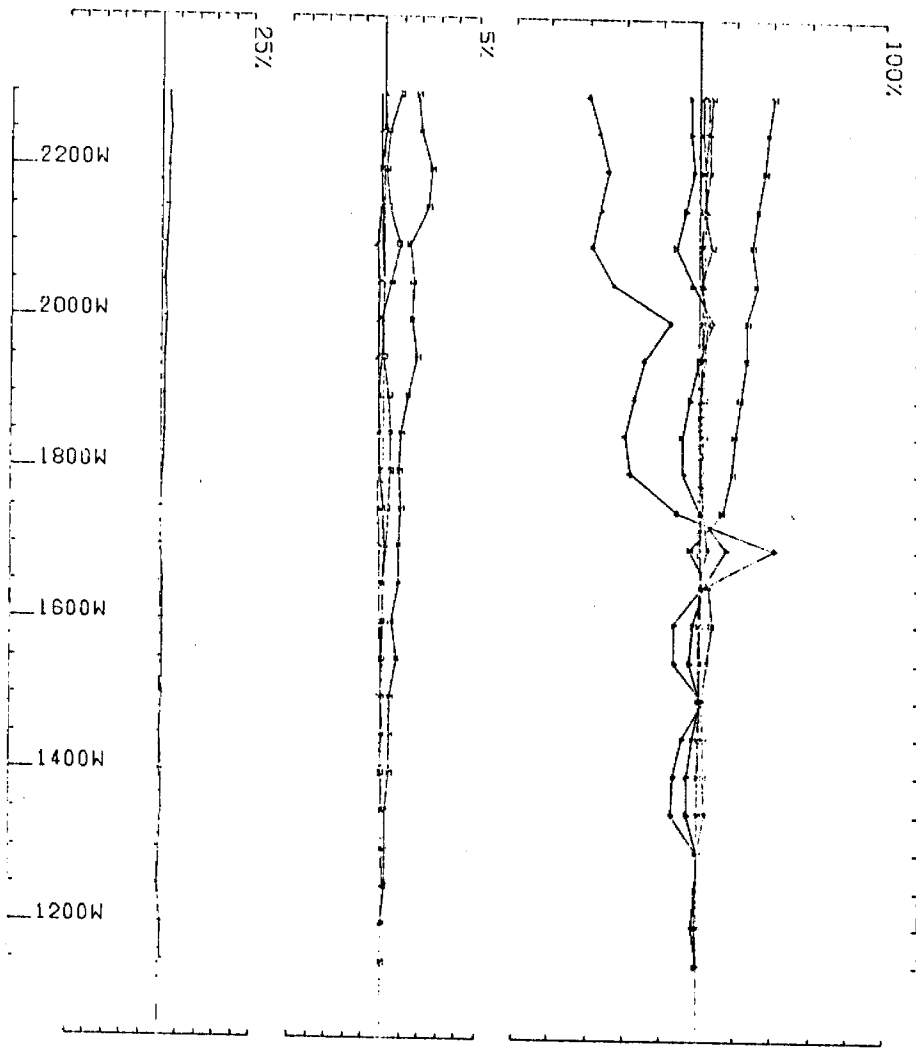




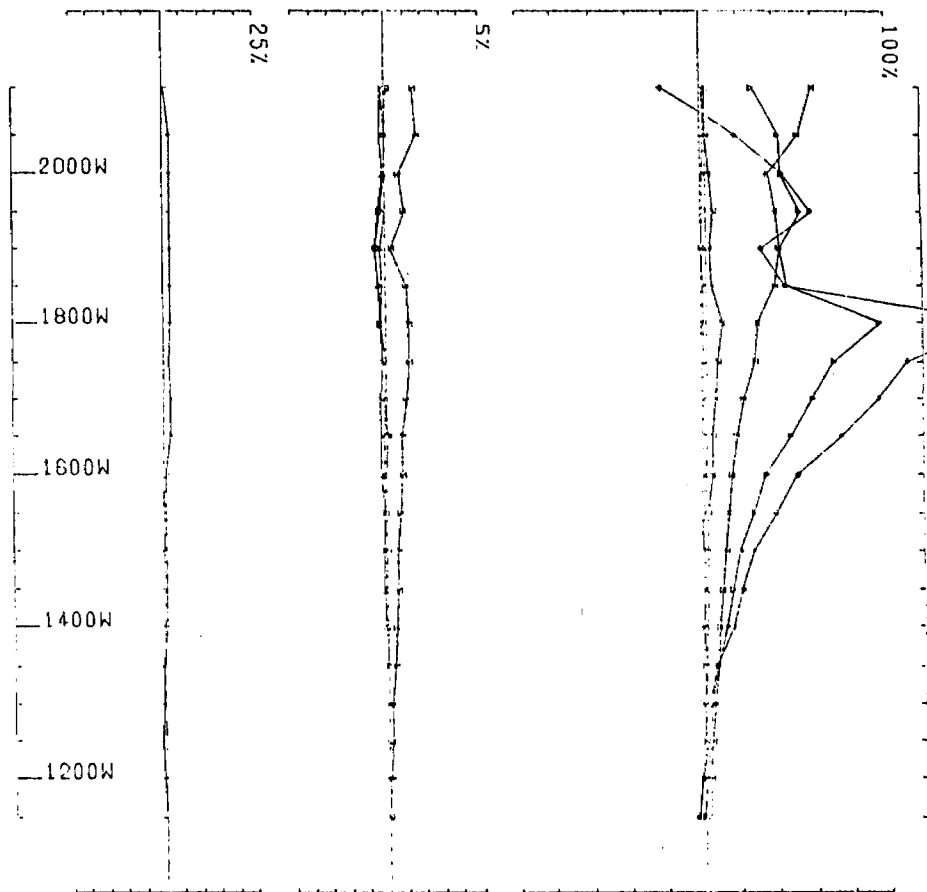
JTCN SURVEY AT MONTIC TWP FOR PETROGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICAL LTD JOB 9026 BASE FREQ 107 50.97  
 LOOP NO 8 LIFT 1000 N COMPONENT IS SECONDARY FIELD CH1 GATEIN. NORM.



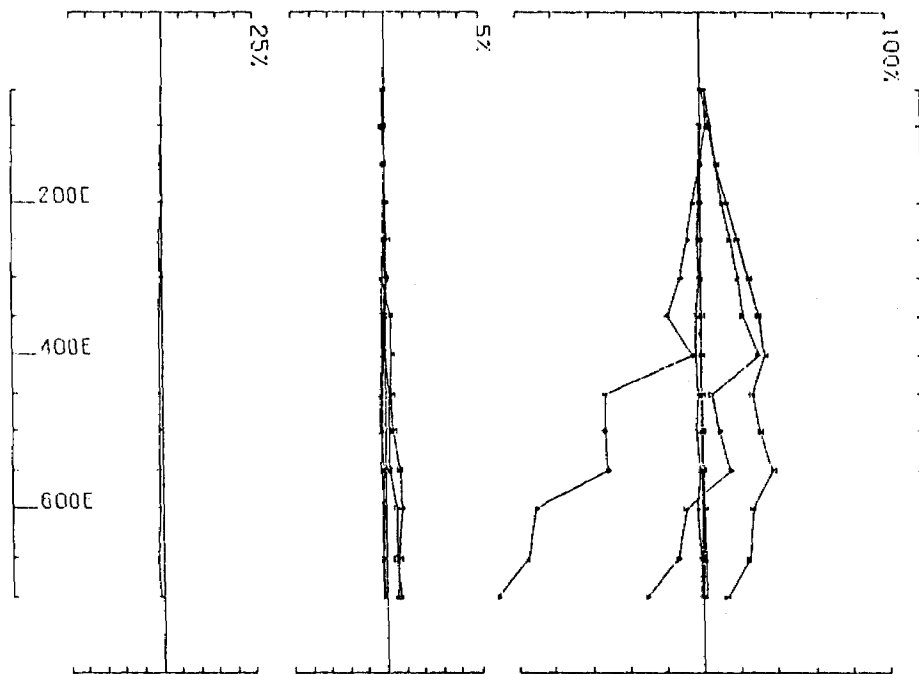
JTEH SURVEY AT PONTIAC TWP FOR BARTHOLIC EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICAL LTD JOB 9026 BASE FREQ 373 30.97  
 LOOP NO 8 LINE 1200 N COMPONENT HZ SECONDARY FIELD CHI 00111. NORH.



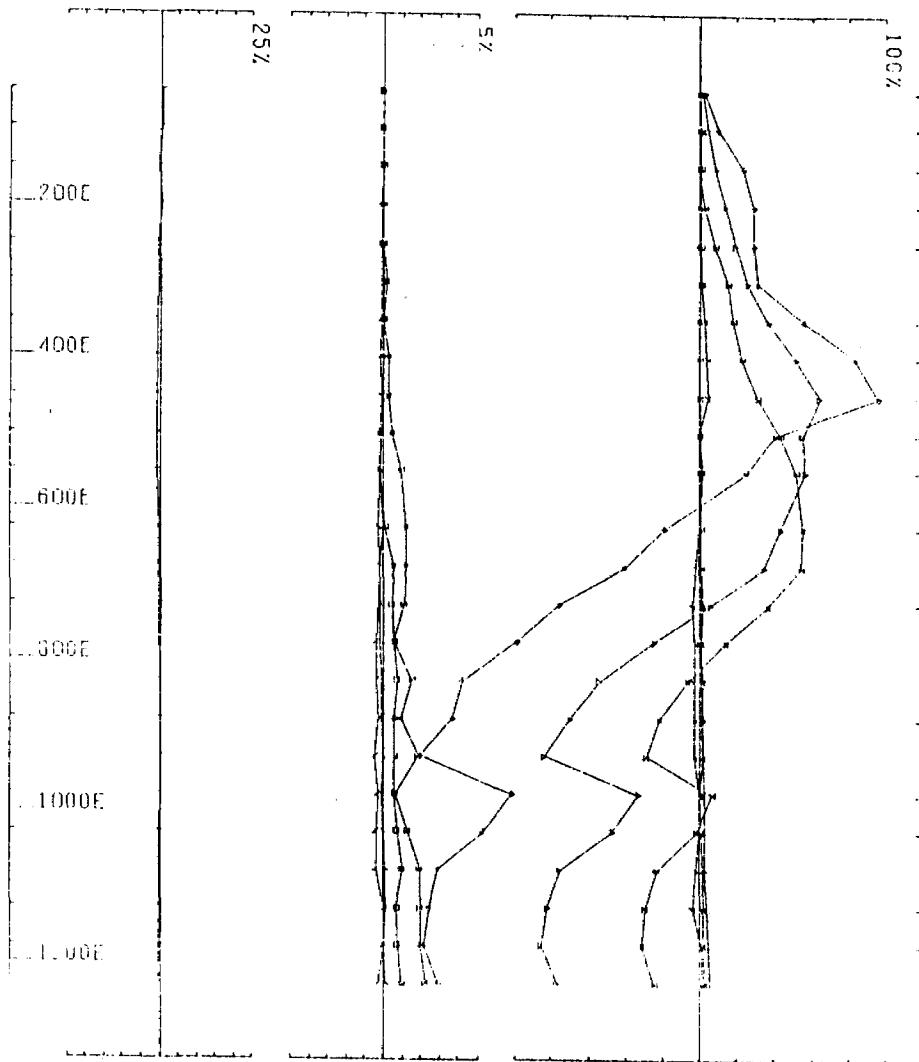
STEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 421 30.97  
 LOOP NO 8 LINE 800 N COMPONENT 02 SECONDARY FIELD CH3 CONTIN. NDR11.



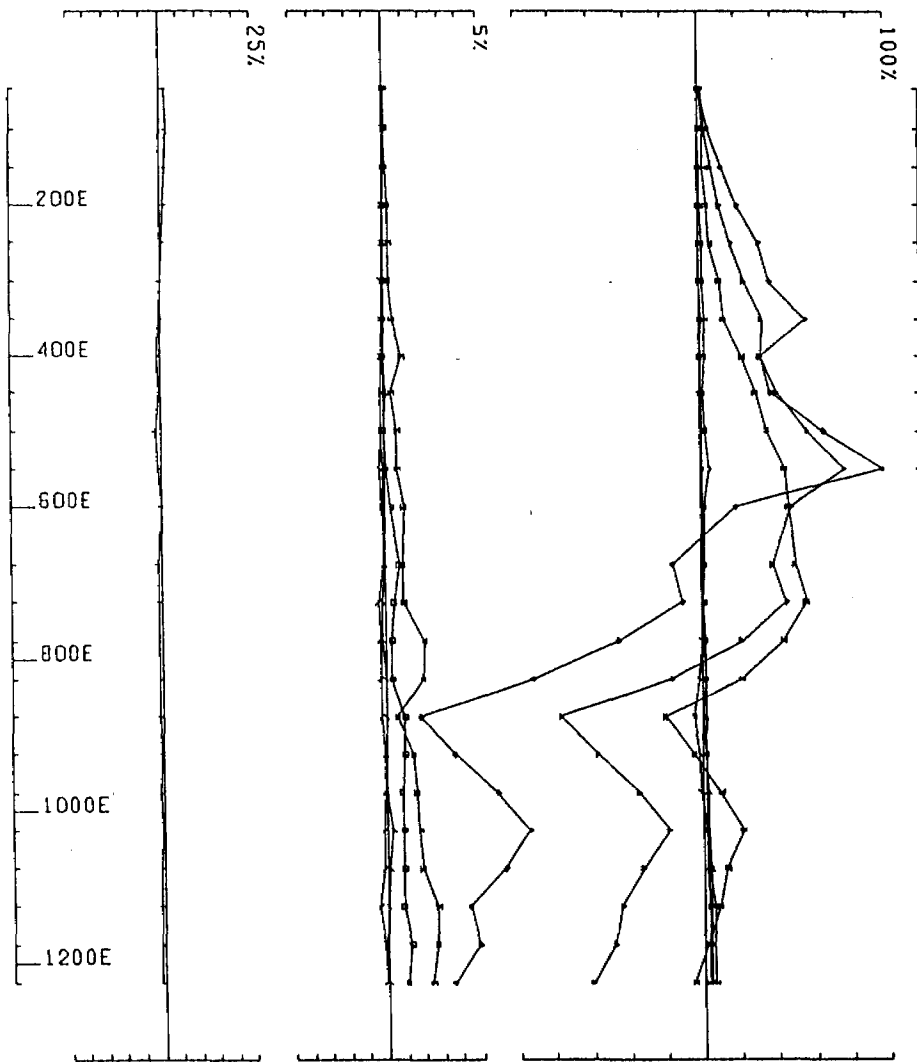
ITEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 1121 30.97  
 LOOP NO 8 LINE 200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



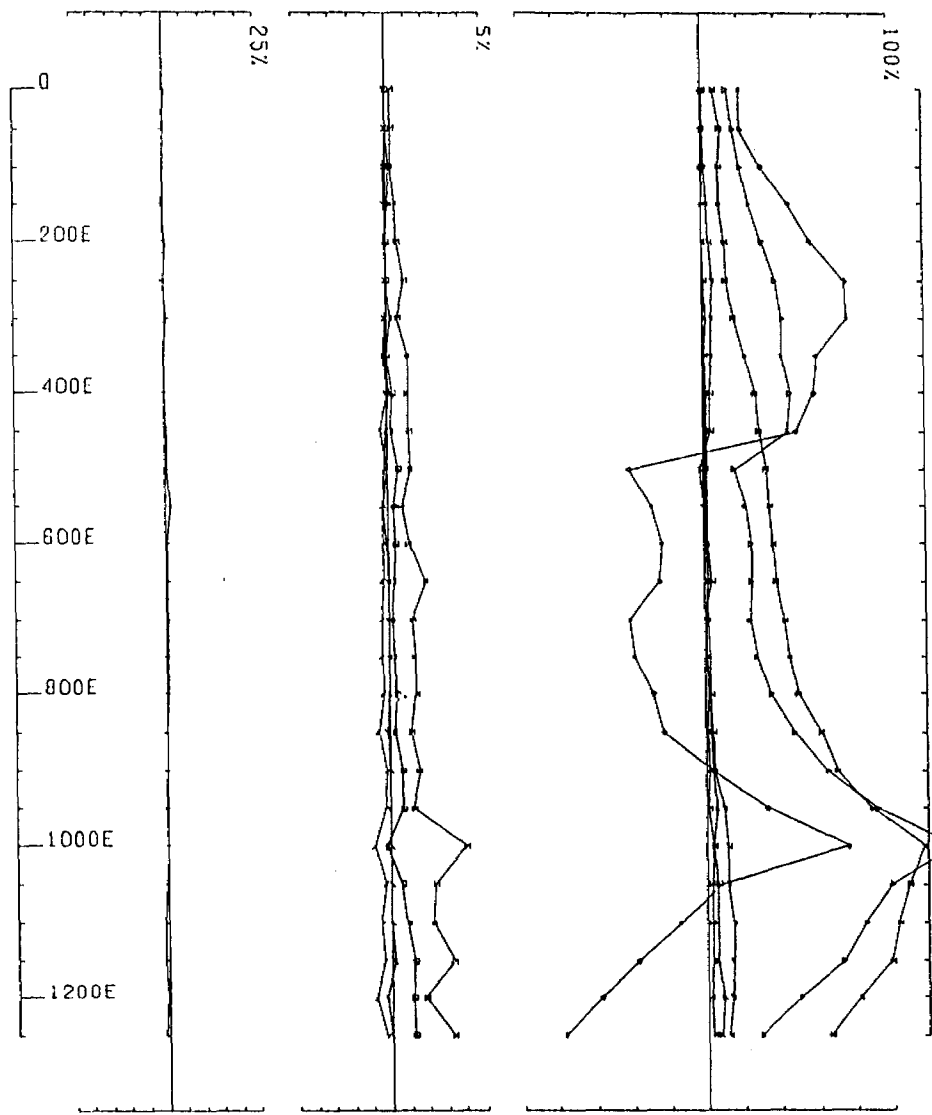
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9A LINE 1800 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.



UTM SURVEY AT PONTIAC TWP FOR NORTHEAST EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ 1421 30.07  
 LOOP NO 9A LINE 2000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

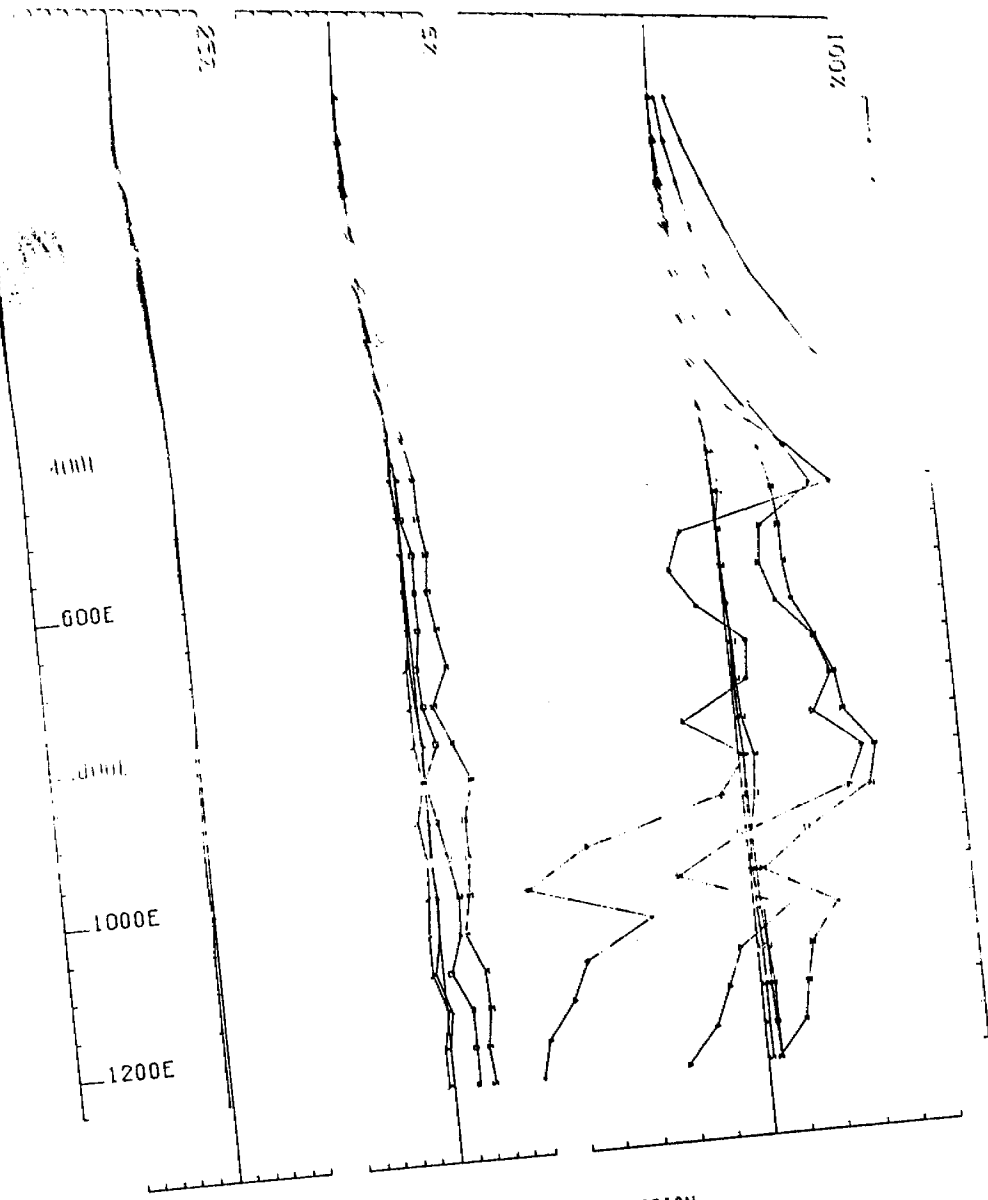


UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9A LINE 2200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

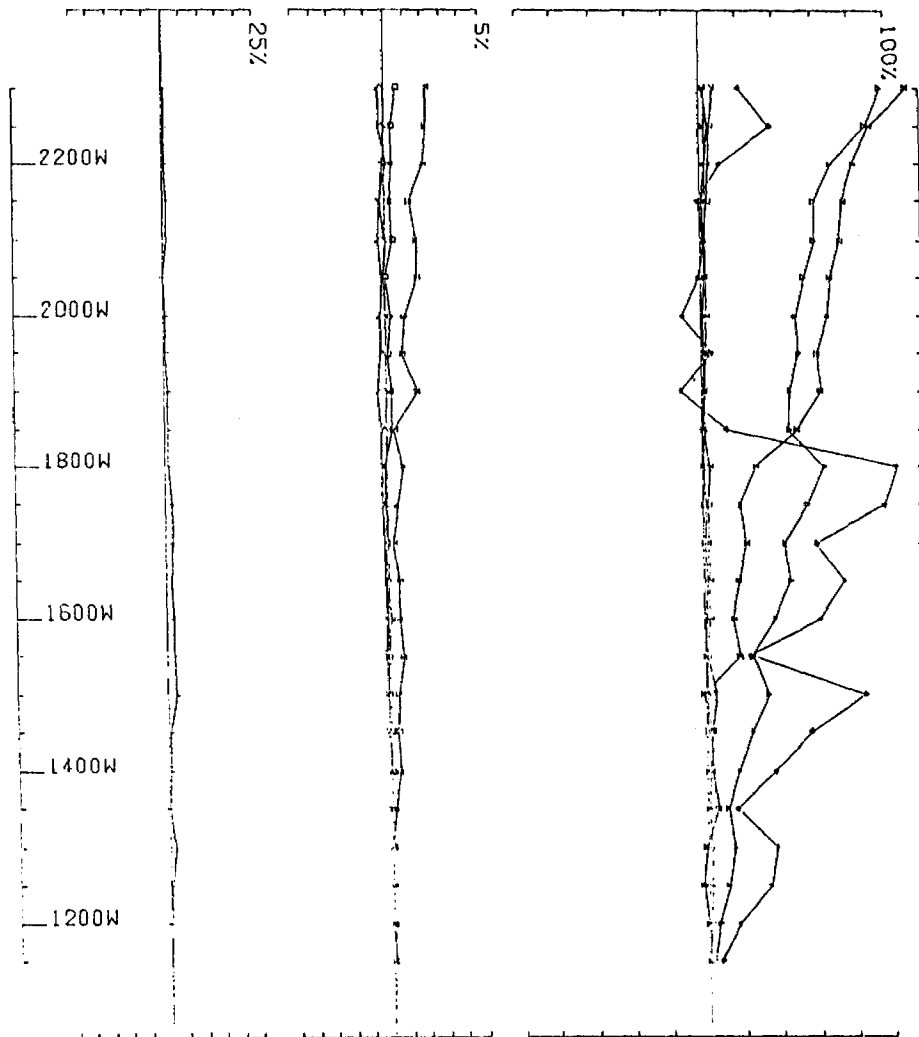


UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 9A LINE 2600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

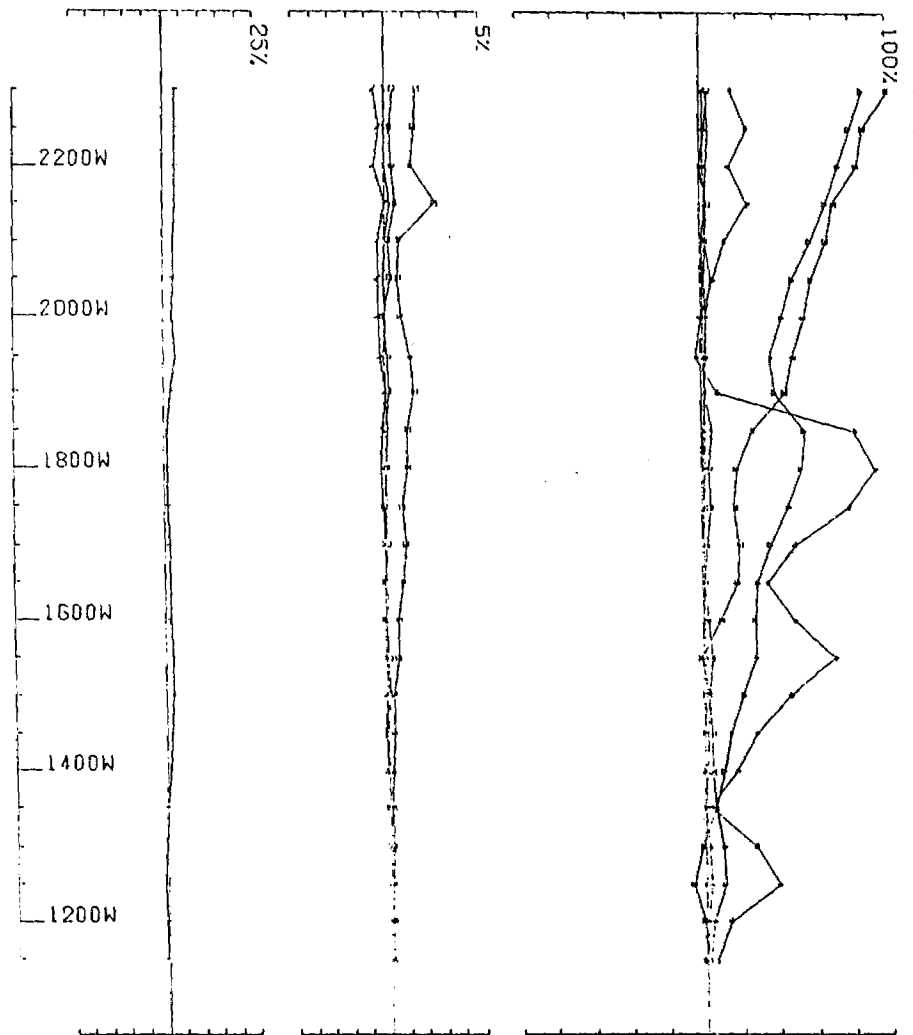




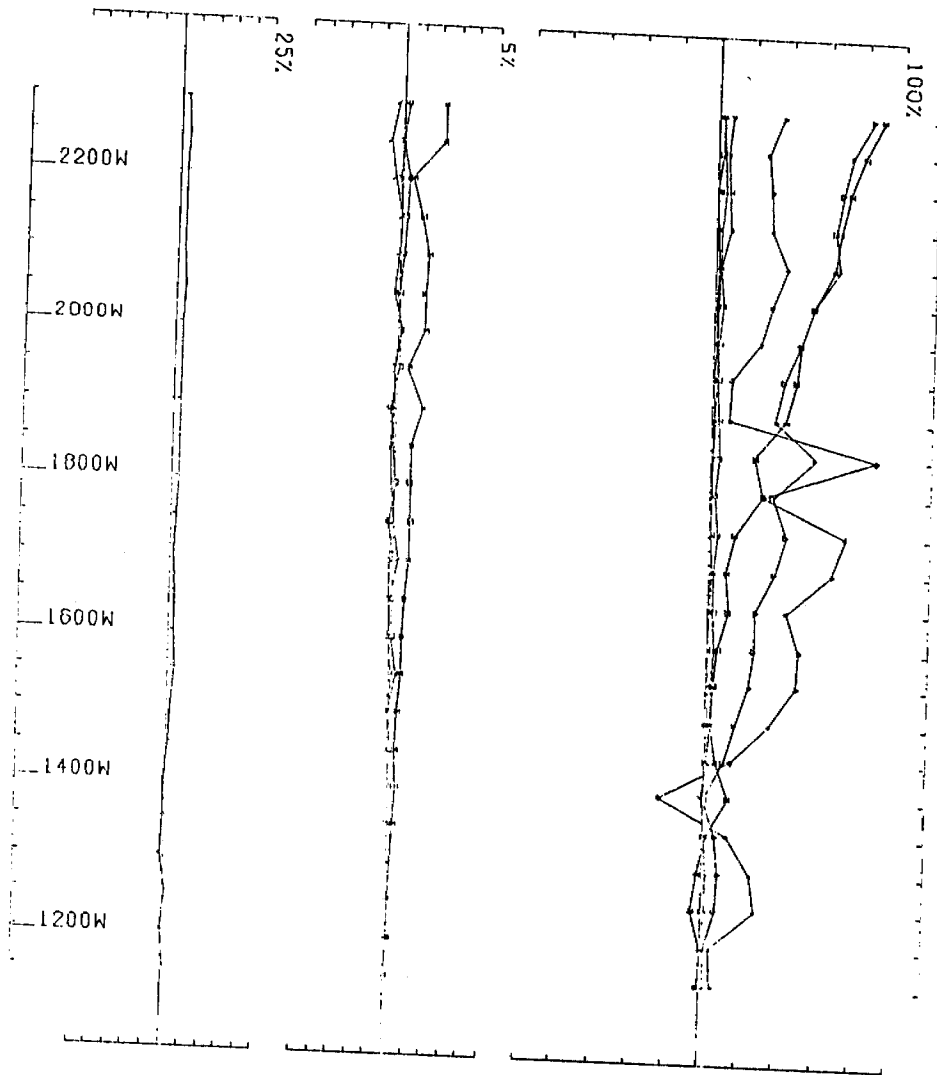
ITEM SURVEY AT PONGING TWP FOR NORTHCATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9A LINE 2400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



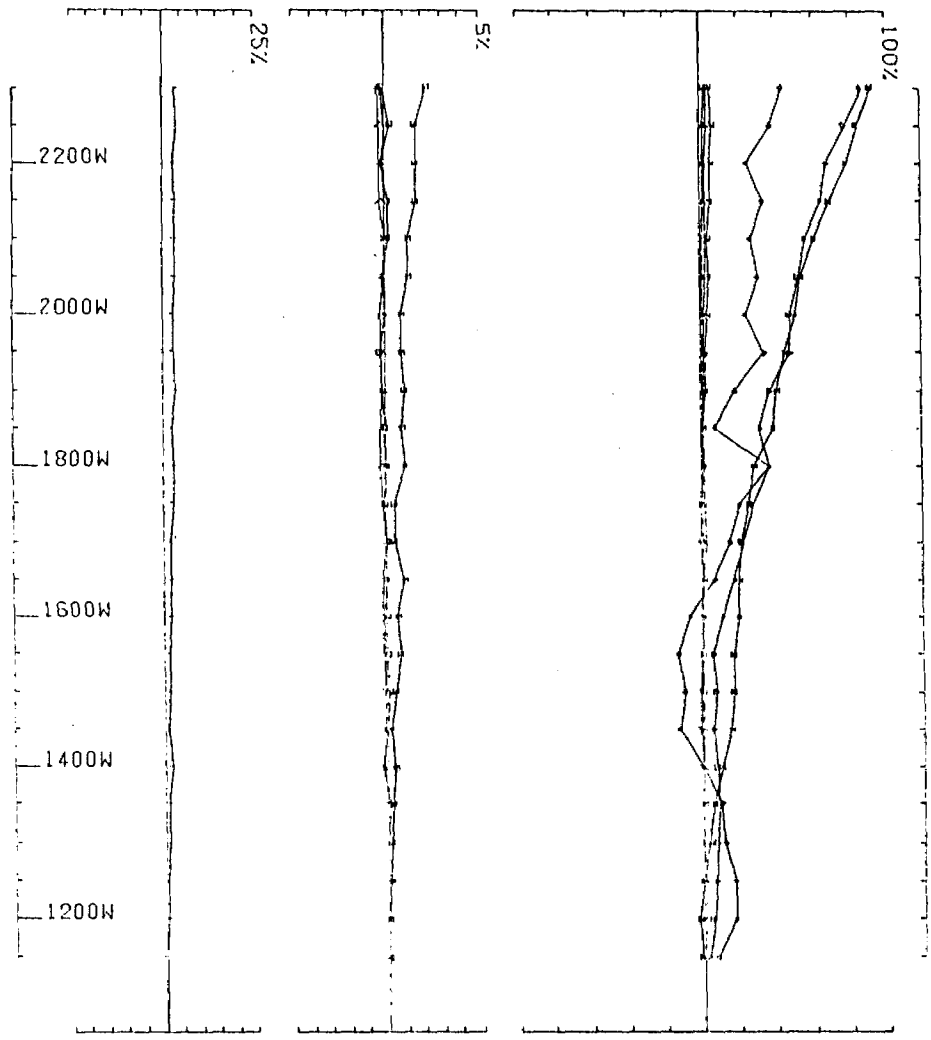
UTEM SURVEY AT PONTIAC TWP FOR HORTHCATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 1121 30.97  
 LOOP NO 9 LINE 1400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORH.



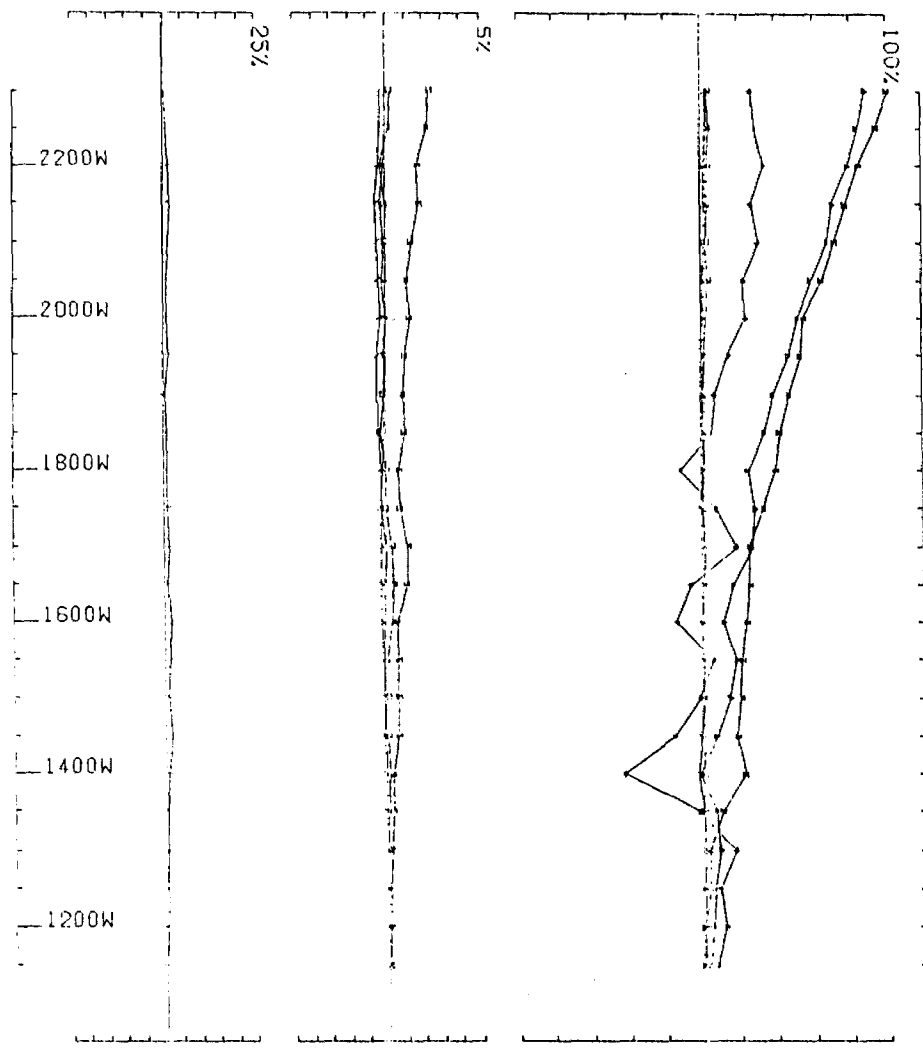
ITEM SURVEY AT PONTIAC TWP FOR HORTICATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9 LINE 1600 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORH.



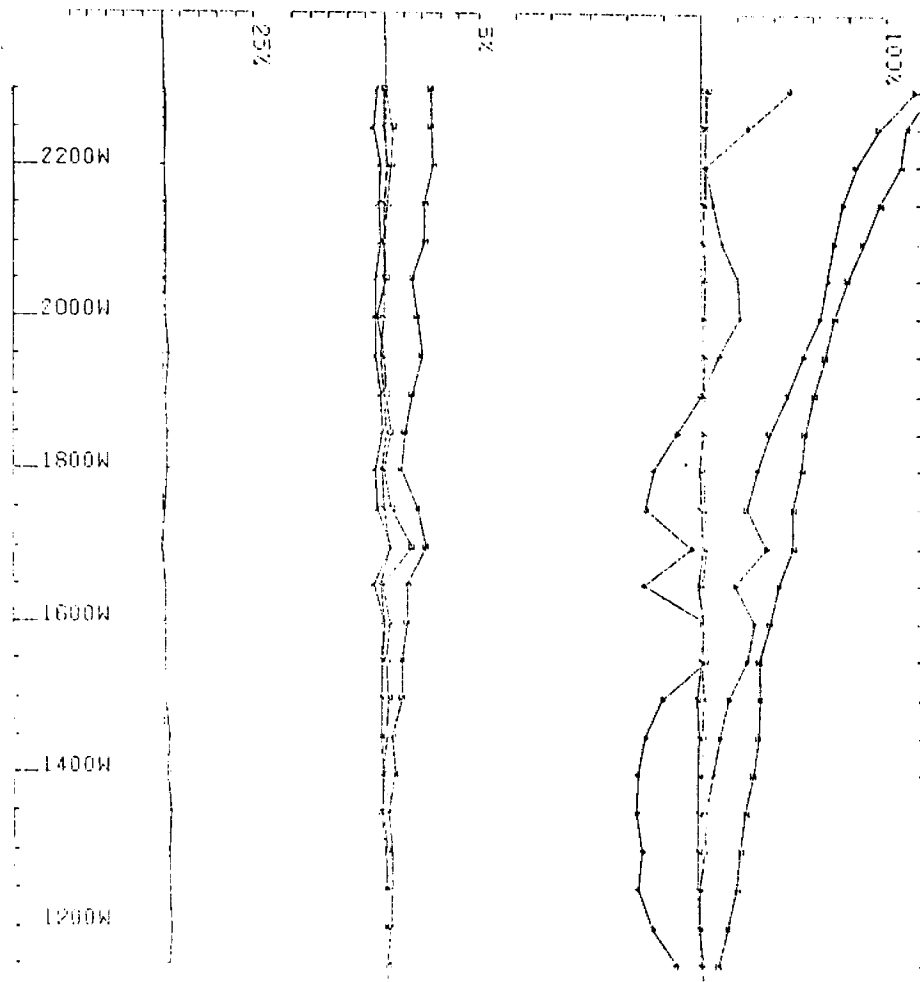
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 1121 30.97  
 LOOP NO 9 LINE 1800 N COMPONENT 112 SECONDARY FIELD CHI CONTIN. NORM.



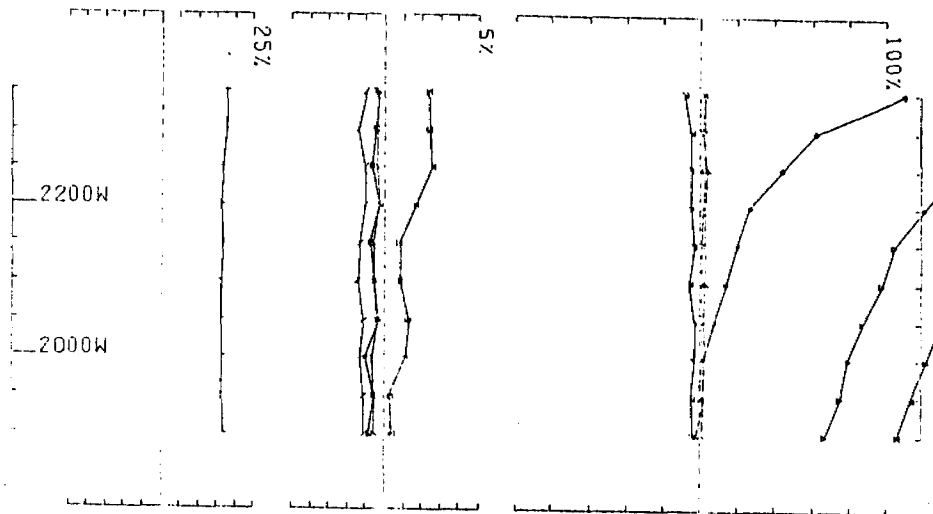
STEM SURVEY AT PONTIAC TWP FOR HORTHGAIE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSIY'S LTD JOB 9026 BASE FREQ 1171 30.97  
 LOOP NO 9 LINE 2000 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.



ITEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICAL LTD JOB 9026 BASE FREQ HZI 30.97  
 LOOP NO 9 LINE 2200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NUM.

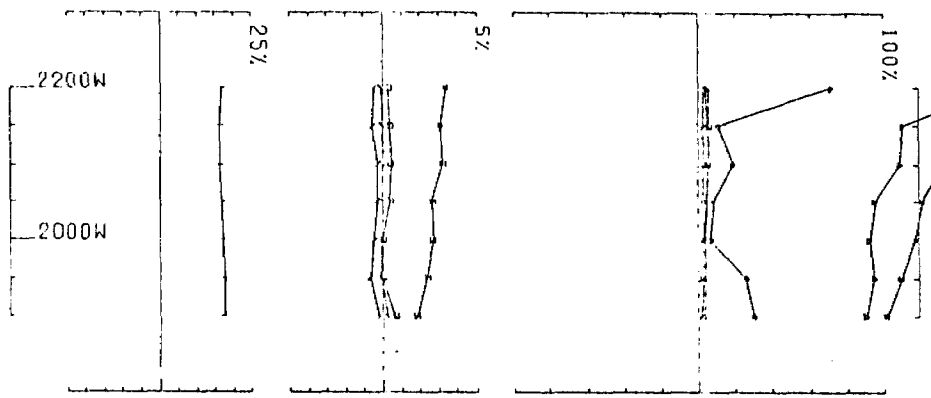


JTEN SURVEY AT PONTIAC TWP FOR NAVIGATE EXPLORATION  
 CONDUCTED BY LARONIGNE GEOPHYSICAL LTD JOB 9026 BASE FREQ 1071 30.97  
 LOOP NO 9 LINS 2400 N COMPONENT RZ SECONDARY FIELD CH3 CENTER NORTH

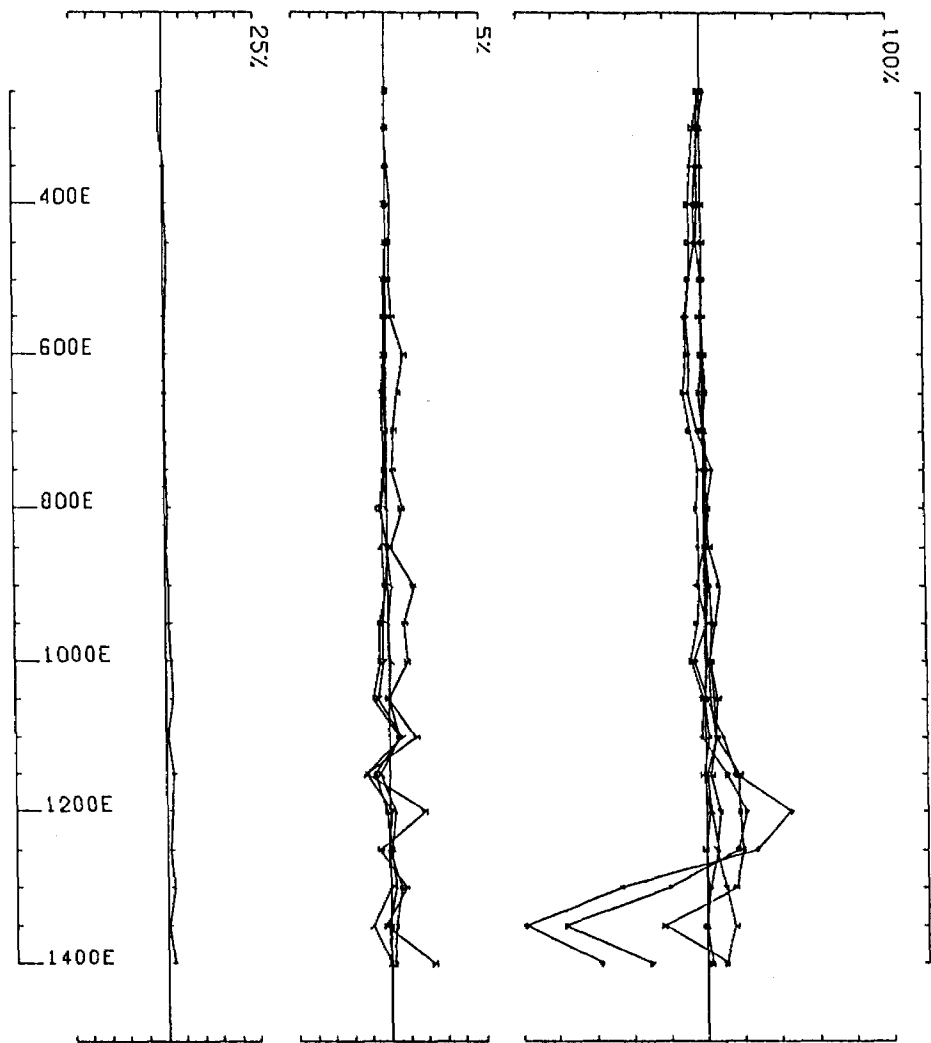


JTEM SURVEY AT PONTIAC TWP FOR BORTHCATE EXPLORATION  
 CONDUCTED BY LANONTADNE GEOPHYSICS LTD JOB 9026 DATE FREQ 1HZ 30.97  
 LOOP NO 9 LINE 2600 N COMPONENT NZ SECONDARY FIELD CHI CONTIN. NDRM

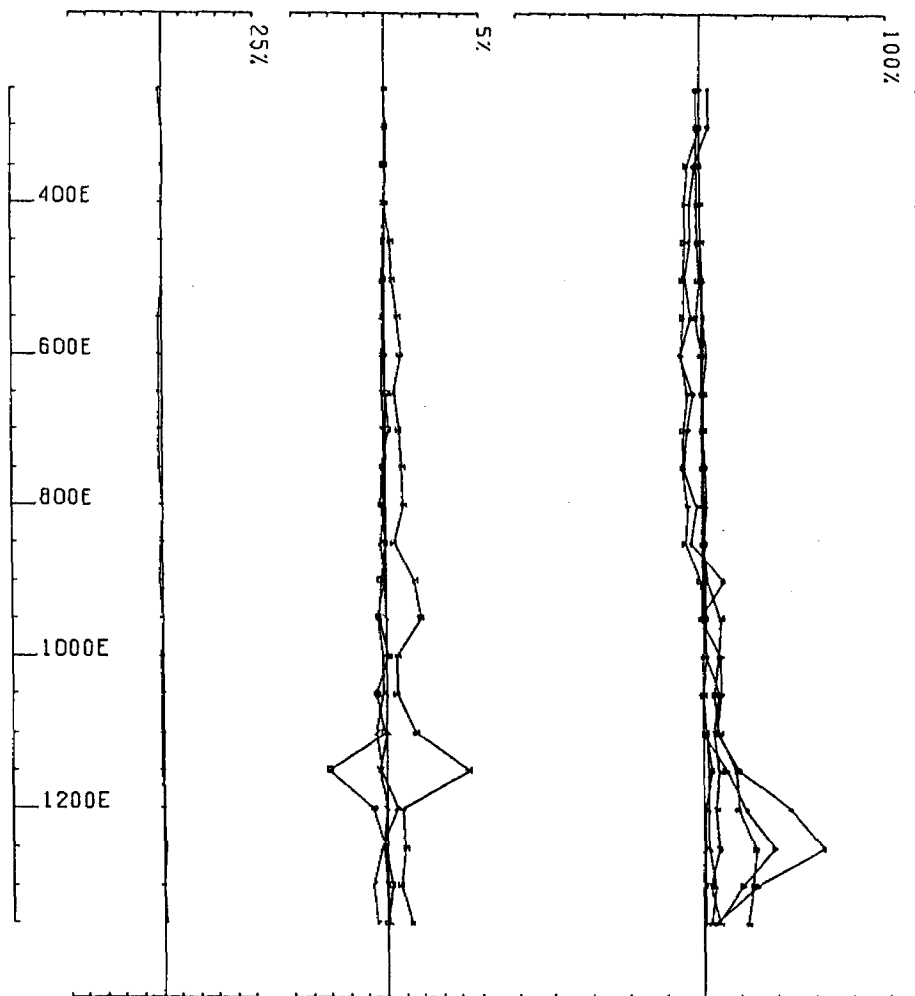




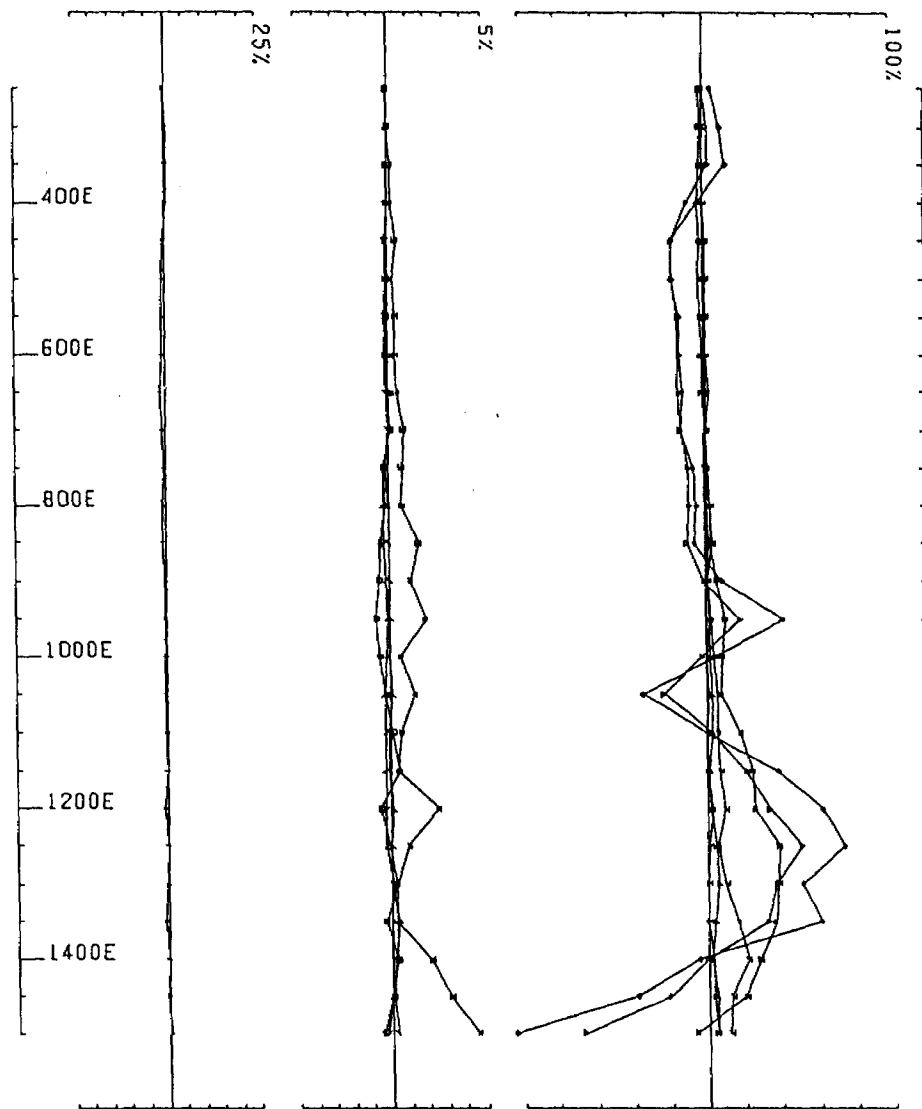
UTM SURVEY AT PONTIAC TWP FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.07  
 LOOP NO 9 LINE 2800 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NUM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 10 LINE 3200 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB DD26 BASE FREQ (HZ) 30.07  
 LOOP NO 10 LINE 3000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHQATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 10 LINE 2800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



APPENDIX B(III)

"UTEM SURVEY RESULTS - PONTIAC TWP."

By: J. B. Boniwell & Ryder-Turner  
Excalibur International Consultants

December 1990

UTEM SURVEY RESULTS  
PONTIAC TWP. CLAIMS  
LARDER LAKE AREA, ONTARIO

for

OROFINO RESOURCES LIMITED

by

A. Ryder-Turner

J. B. Boniwell

Exploration Geophysical Consultants

December 7, 1990



**EXGALIBUR  
INTERNATIONAL  
CONSULTANTS LTD.**

LIST OF CONTENTS

---

Introduction	Page 1
Location and Access	2
Field Work	3
Survey Results	5
Conclusions and Recommendations	7
Appendix 1 - Anomalies	
Appendix 2 - Profiles	



LIST OF DRAWINGS

---

DWG. NO.	TITLE	SCALE
EIC-2303	Locality Plan	1:2,000,000
-2304	Plan of Interpretation	1:10,000
-2305A-I	UTEM Profiles, Loop #1	1:10,000
-2306A-I	UTEM Profiles, Loop #4	1:10,000
-2307A-H	UTEM Profiles, Loop #5	1:10,000
-2308A-B	UTEM Profiles, Loop #6	1:10,000
-2309A-H	UTEM Profiles, Loop #7	1:10,000
-2310A-H	UTEM Profiles, Loop #8	1:10,000
-2311A-D	UTEM Profiles, Loop #8A	1:10,000
-2312A-H	UTEM Profiles, Loop #9	1:10,000
-2313A-G	UTEM Profiles, Loop #9A	1:10,000
-2312A-C	UTEM Profiles, Loop #10	1:10,000



## INTRODUCTION

---

A UTEM III survey was proposed and carried out on prospective ground currently held under mineral claim by Orofino Resources within Pontiac Township, District of Cochrane. The area is deemed interesting in terms of volcanogenic massive sulphide exploration largely due to similarities in stratigraphy with known prospects and mines located within the Noranda camp.

The absence of responses obtained in previous airborne EM surveys, in particular the 1979 OGS KLIP (Kirkland Lake Incentive Program) survey which utilized the INPUT Mk. VI system, was cause for minor concern in view of the overall resistive nature of the area. However, it was noted that these previous surveys were not optimally designed for the likely conditions to be encountered in this locale and that sufficient ambiguity existed to justify further exploration, albeit at depth.



LOCATION AND ACCESS

---

The area surveyed comprises 11 claims centrally located within Pontiac Township; they sit astride the Cheminis road (EIC-2303).

Access to the area was obtainable at all stages of the survey by two-wheel drive vehicle along the Cheminis Road, an all-weather gravel road, itself reached from Highway 66, east of Virginiatown. The survey crew was quartered at the Mel-Tree Motor Inn, Larder Lake, for the duration of the survey.



FIELD WORK

---

The target hoped-for would comprise a deeply-buried, massive sulphide body containing sufficient interconnected sulphides of inherent low resistivity, e.g. intercalated pyrite, pyrrhotite and chalcopyrite, to produce a significant conductivity contrast between itself and the host rock. To this end, a large-loop, deeply penetrating EM system, specifically the UTEM III operated by Lamontagne Geophysics Ltd. (LGL), was sub-contracted to perform the required investigation and data acquisition. The survey on the Pontiac Township claims was carried out during a three-week stint in October 1990.

Two visits to the area were made in the period by Excalibur International Consultants Ltd. (EIC) as prime contractor, primarily to assess the grid and to oversee and direct the survey in progress. As was expected, both the line-cutting and the geophysical survey had been (and were being) executed in a good professional manner, despite the operational difficulties encountered. In addition, the data were monitored and verified by EIC through the course of the survey to ensure continued data quality and provide adjustment as required.



The morphological aspects of the area were, in some ways, worse than had been anticipated. In certain rugged parts, the presence of cliffs severely hampered the laying and retrieval of transmitter loops, while low, flat areas in the centre of the grid contained extensive swamp, which with the onset of winter further slowed operations. To add to the logistical woes, logging east of the Cheminis Road had extended further north than forecast, and was active throughout the survey resulting in considerable lost time to the em. crew repairing loops and relocating grid lines. Once realized, the problems confronting the survey forced a redesign of programme parameters. To compound matters, the annually limited hunting season became open at this time, and loops were regularly being broken by hunters and moose alike.

In the end a total of 72 line kilometres of data were obtained by LGL, almost exclusively of the vertical magnetic component (Hz). Several lines of the in-line horizontal magnetic component (Hx) were incidentally collected where an anomaly was suspected to occur. The contractor's report, detailing survey procedure and containing descriptions of the UTEM III system accompanies this report.



## SURVEY RESULTS

---

Despite the difficulties aforementioned and the high ambient noise levels encountered -- a phenomenon experienced in earlier surveys here, then put down to microwave transmissions -- data of a high quality were eventually obtained. As no long wavelength, late-time anomalies were observed in the data, it is clear that the target sought, viz. a deep massive sulphide body, was not detected. However, due to the overall resistive nature of the bedrock and lack of deep overburden, a number of weaker conductors and other features were observed resident in the data.

The general north-south strike established by geology is confirmed in the geophysics as a number of poorly conductive trends. These include several discreet conductor sources and some fairly extensive interface effects. The latter are merely indicative of bulk conductivity changes in the host rocks, although at times the sharpness of the defining response suggests a relatively rapid, as opposed to gradational change. These contrasts imply a formational boundary of some description, which though not necessarily important except as a mapping tool, can nonetheless be used as a guide when seeking a conductor on or near some special specific intraformational contact.



Some local perturbations to these noted trends are also visible, and indeed, when compared to the geology, are clearly related to recognized faults.

The individual conductors recognized are hardly distinguished, either in terms of conductivity or size. Notwithstanding, three have been selected as being worthy of follow-up, that is, drill testing. In general, they have been selected either because of shape or length of decay, or they are considered to represent the best response in a trend. By their very weakness, however, it is difficult to predict the nature of their sources. They may only be weakly mineralized pyritic zones, or poorly developed graphitic horizons. An evident exception is Anomaly C which is located near a known occurrence.



## CONCLUSIONS AND RECOMMENDATIONS

---

The UTEM III survey has provided a clear, though unpromising view of the survey area and its potential targets. No response that could be attributed to a deep massive sulphide deposit is recognizable in the data obtained. Three weaker anomalies, while deemed suitable for further investigation in the form of drilling, have been selected however in the hope that they relate to basically unconducting massive sulphides.

Anomaly C of this group deserves a reasonable amount of extra consideration, despite its low order of standing, due to its proximity to a known occurrence.

It is to be emphasized here that this has proved an extremely difficult area in which to acquire data. The combination of rugged and swampy topography, active logging and hunting involving a number of consequent loop breaks, the onset of winter, and an overall high level of ambient EM noise, from whatever source, all have conspired to extend the survey beyond its allocated time frame. Despite the difficulties, the survey was completed in a workmanlike fashion, with the final data quality being rated of high professional standard.





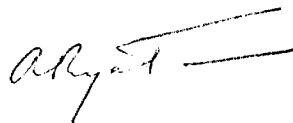
The diamond drill holes recommended for the follow-up testing number three as follows:

#OP-90-1: Collar at 10+00S / 9+00E  
to be drilled grid E at  $-65^{\circ}$  for 230 m

#OP-90-2: Collar at 10+00N / 8+50E  
to be drilled grid E at  $-65^{\circ}$  for 230 m

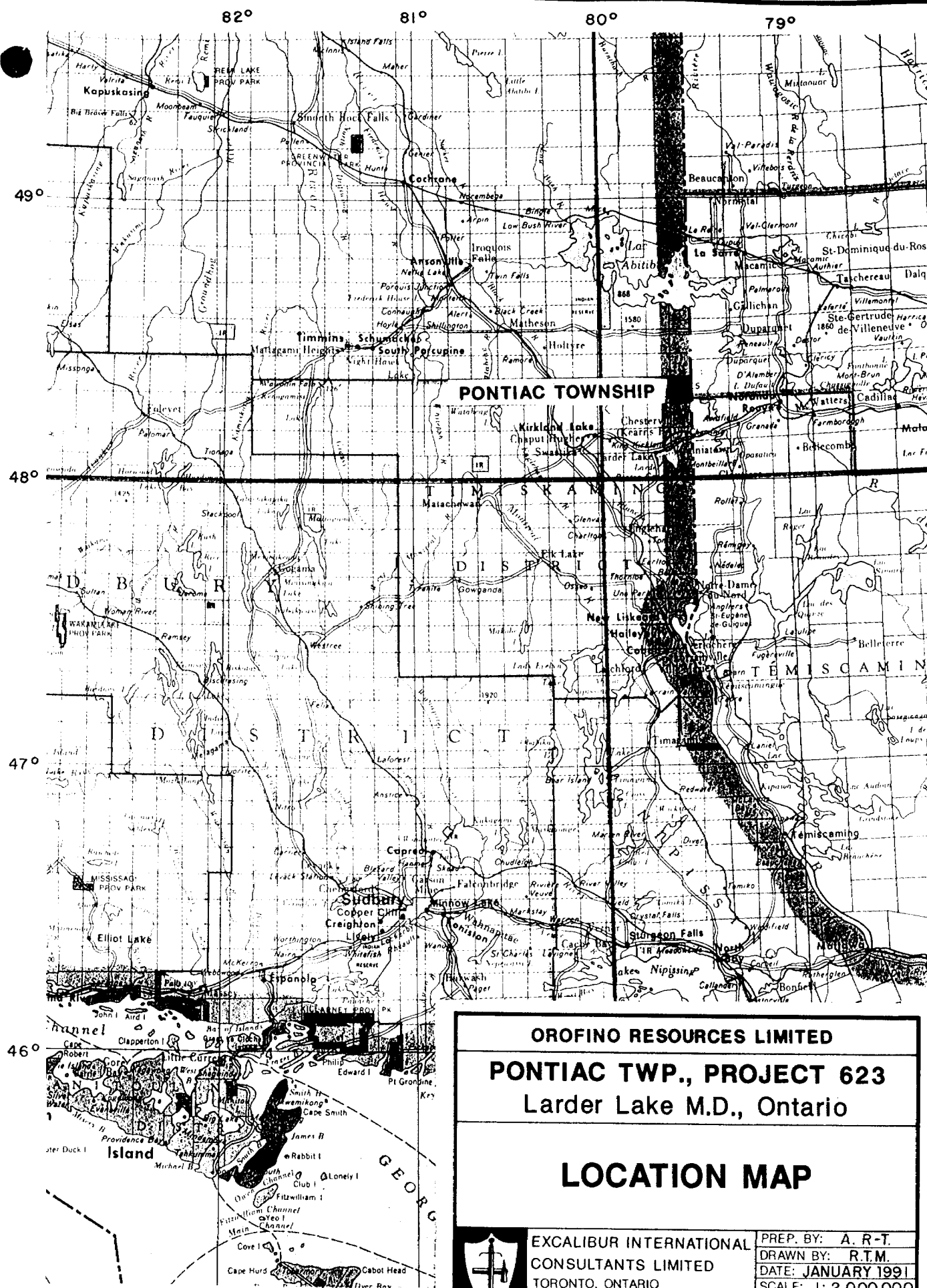
#OP-90-3: Collar at 5+00N / 0+00E  
to be drilled grid E at  $-65^{\circ}$  for 200 m


Respectfully submitted,



A. Ryder-Turner/ J. B. Boniwell,  
Exploration Geophysical Consultants





<b>OROFINO RESOURCES LIMITED</b>	
<b>PONTIAC TWP., PROJECT 623</b>	
Larder Lake M.D., Ontario	
<b>LOCATION MAP</b>	
	<b>EXCALIBUR INTERNATIONAL</b> <b>CONSULTANTS LIMITED</b> TORONTO, ONTARIO
	PREP. BY: A. R. T. DRAWN BY: R. T. M. DATE: JANUARY 1991 SCALE: 1: 2,000,000
DWG. No. E.I.C. - 2303	

APPENDIX 1

---



## ANOMALIES

---

### ANOMALY A

---

Located on Line 10+00N at 10+00E. This is the best response on the grid in terms of decay. A short strike length conductor attributable to a local enhancement in conductivity of an otherwise non-conducting formational horizon.

### ANOMALY B

---

Located on Line 10+00S at 10+00E. This is positioned at the southern edge of the survey area, and presumably extends further south. It appears to be part of a weakly conductive formational conductor; however its more classical shape distinguishes it from other responses on the same horizon.

### ANOMALY C

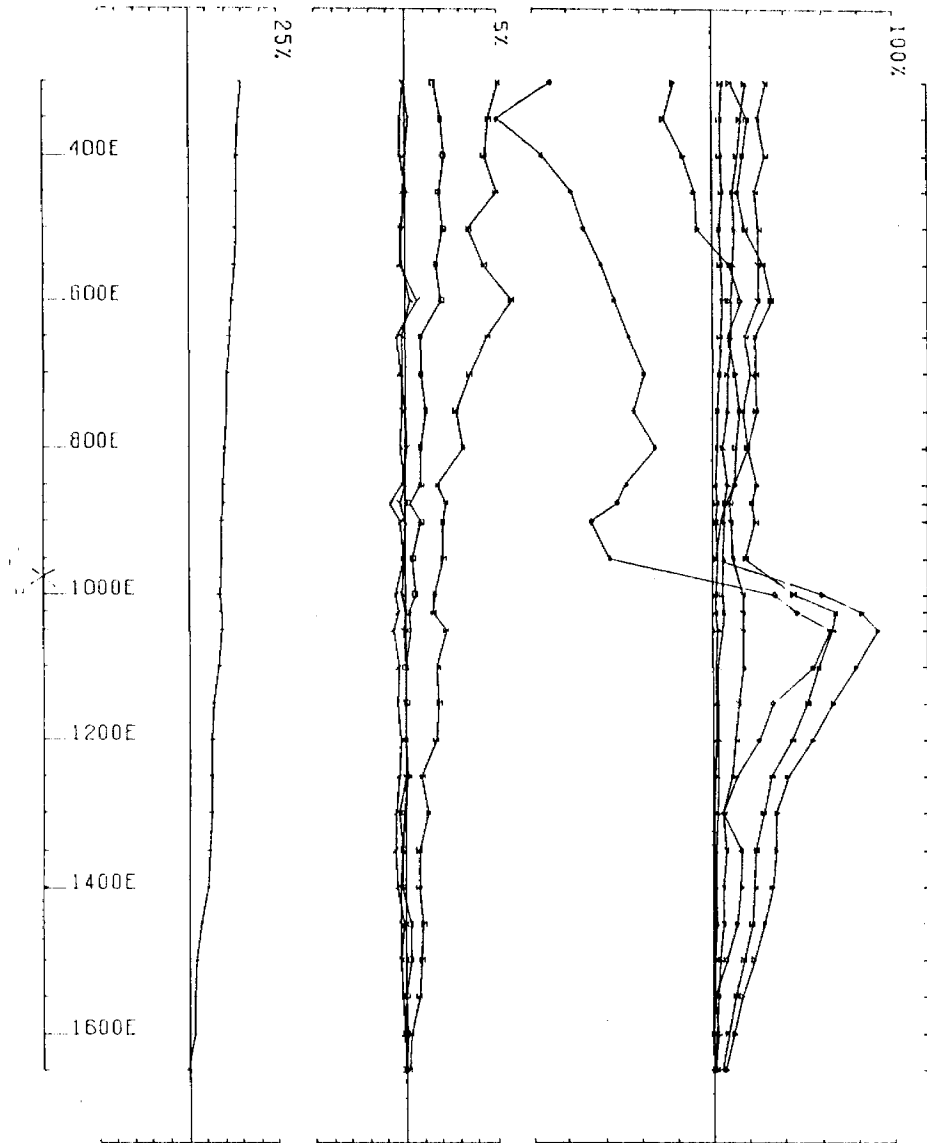
---

Located on Line 5+00N at 0+00E. A very weak, short strike length conductor. Though less conductive than other conductors located on the grid, it nonetheless has a well-defined shape. Proximity to a known occurrence further increases its rating.

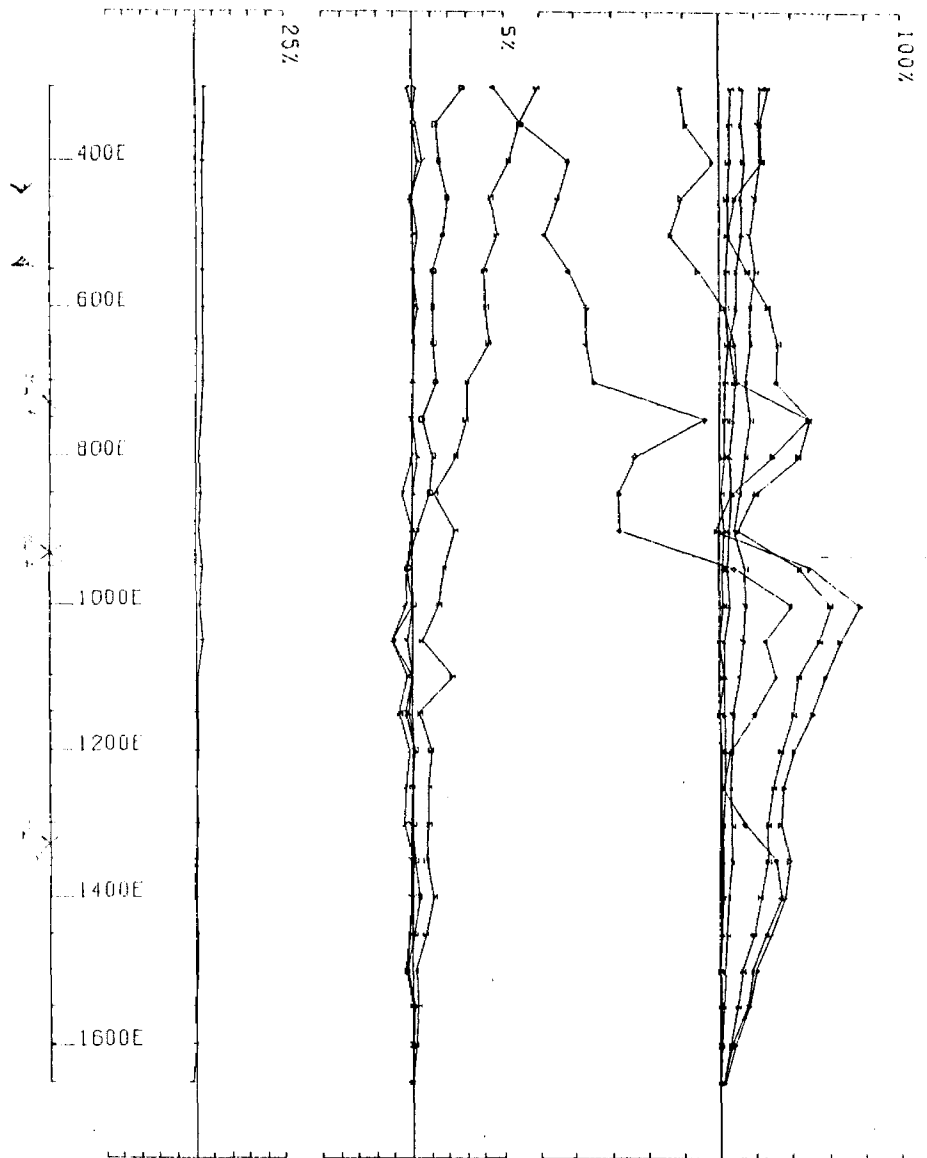
APPENDIX 2

---

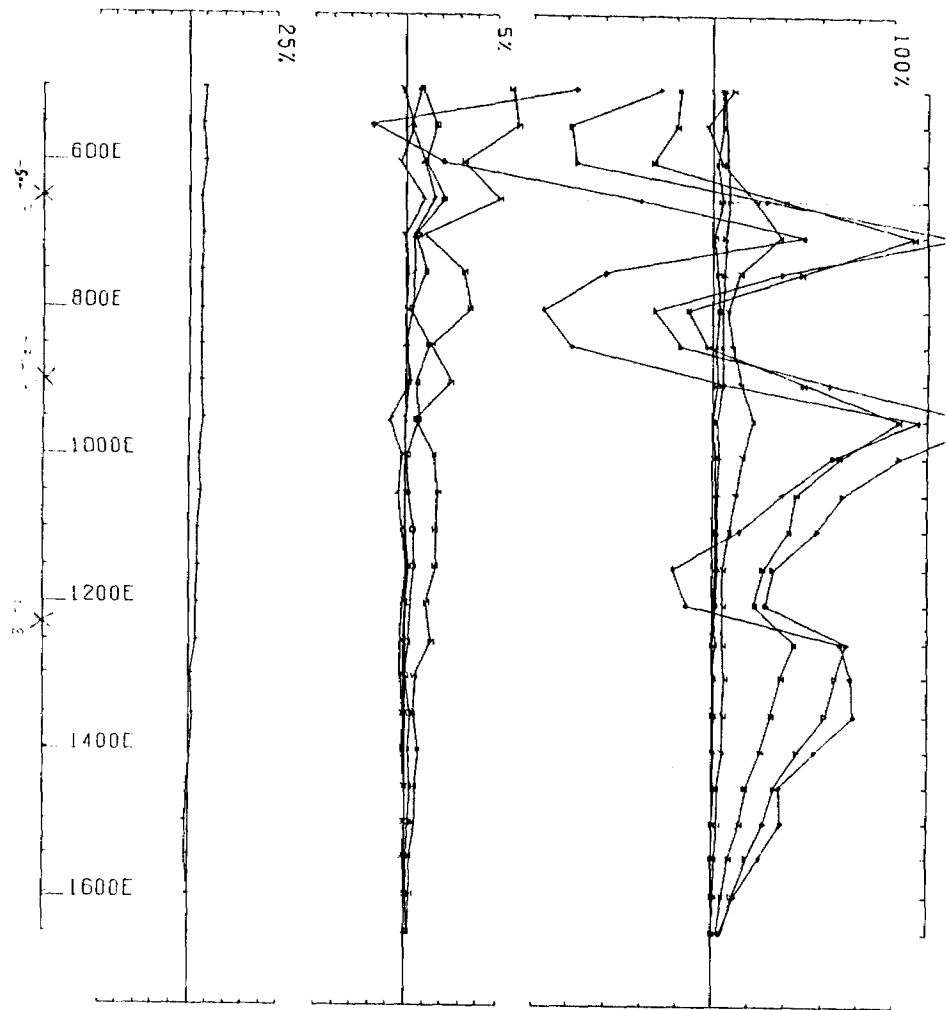




UTEM SURVEY AT PONTIAC TWP. FOR NORTHORATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.07  
 LOOP NO 1 LINE 1000 S COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

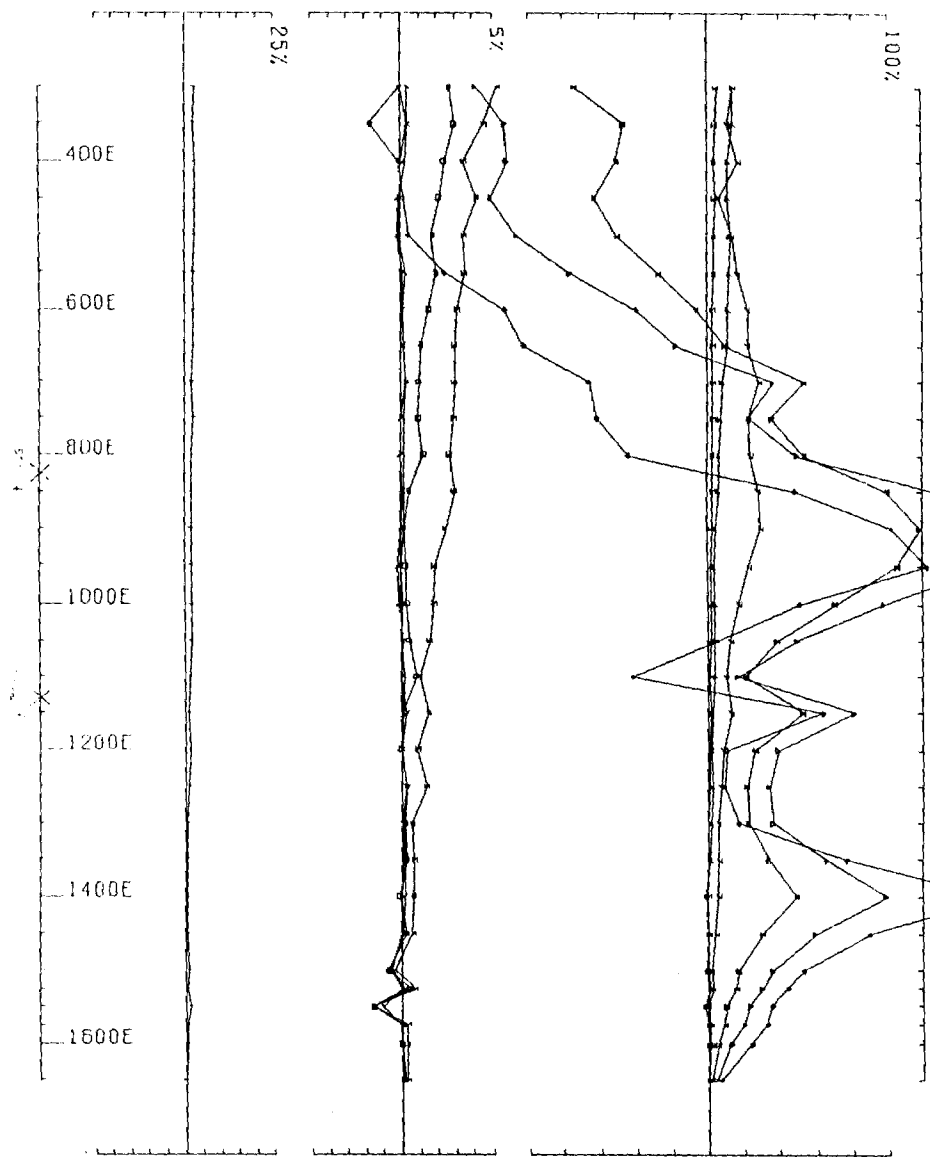


UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 1 LINE 800 S COMPONENT HZ SECONDARY FIELD CH3 CONTIN. NORM.

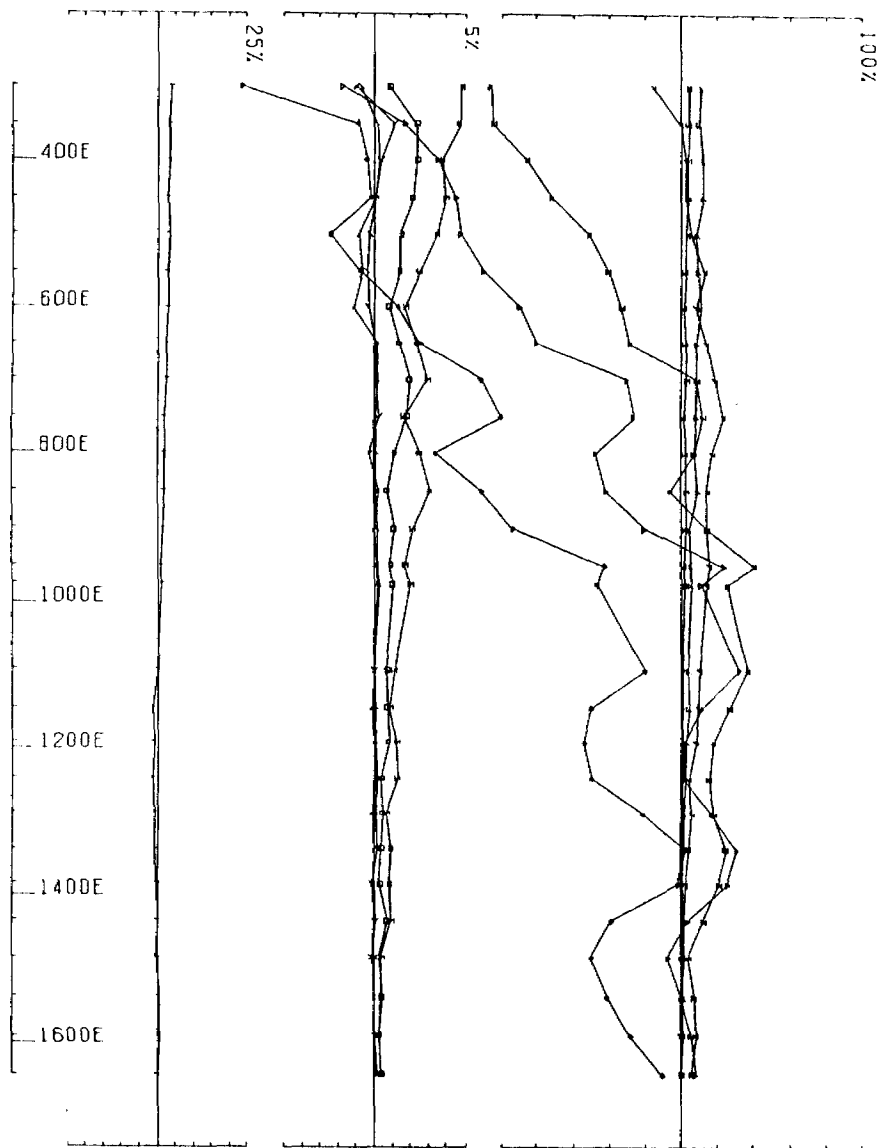


UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 1 LINE 600 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NDRM.

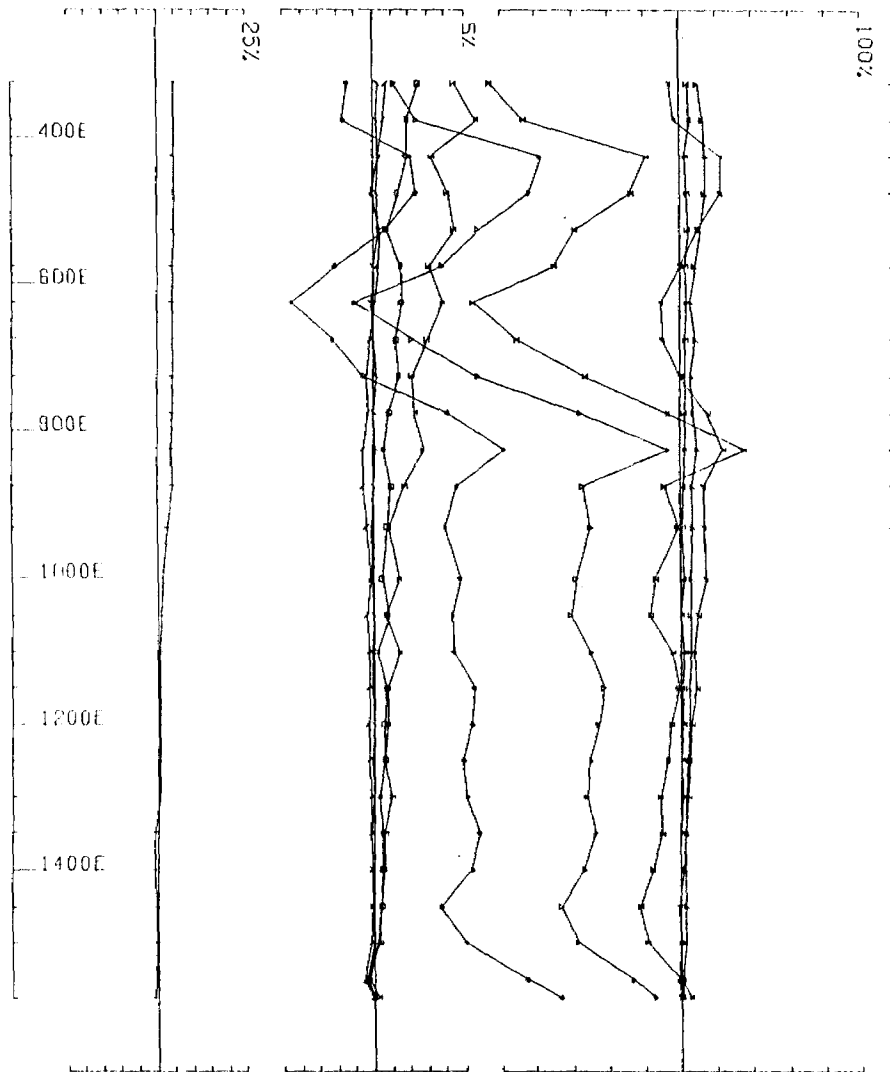




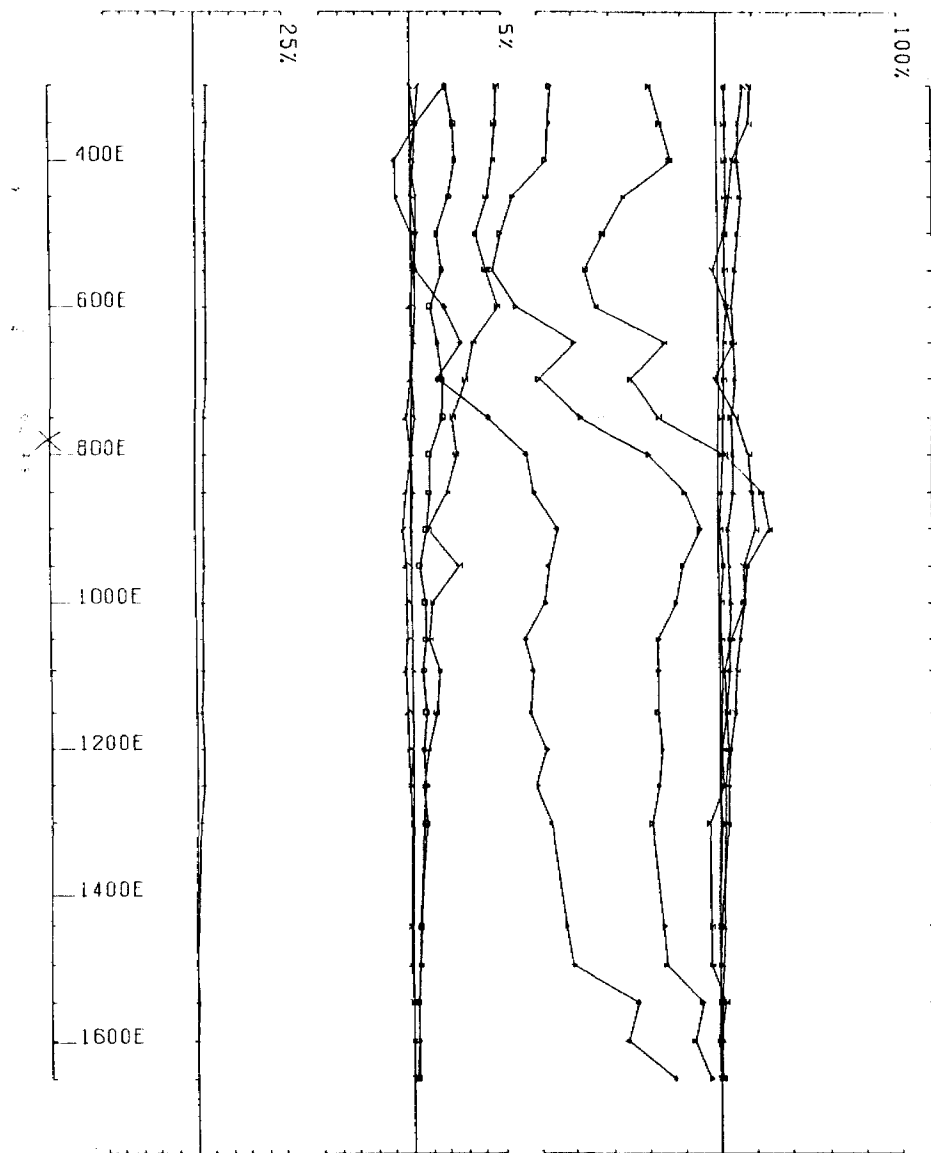
UTEM SURVEY AT PONTIAC TWP. FOR NORTHCOTE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 1 LINE 400 S COMPONENT HZ SECONDARY FIELD CH3 CONTIN. NORM.



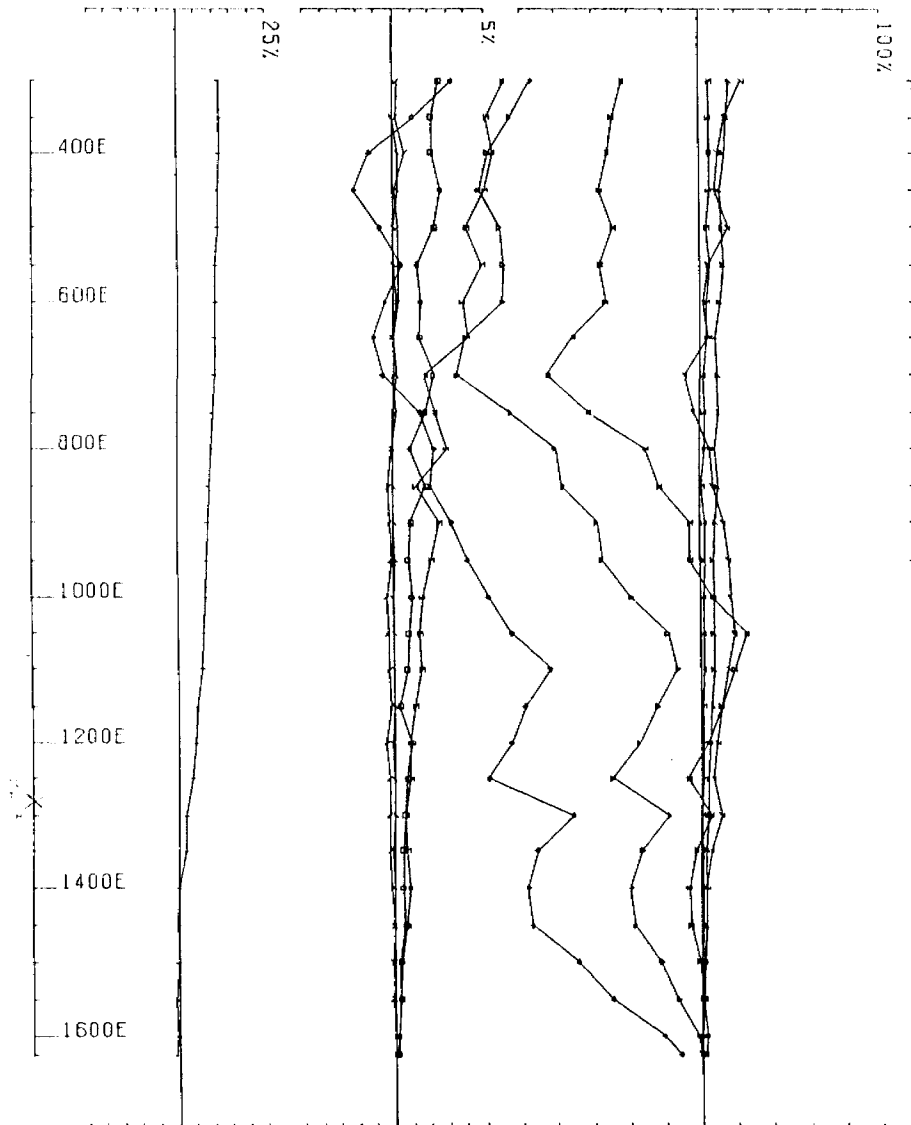
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTADNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 1 LINE 200 S COMPONENT HZ SECONDARY FIELD (CH) CONTIN. NORM.



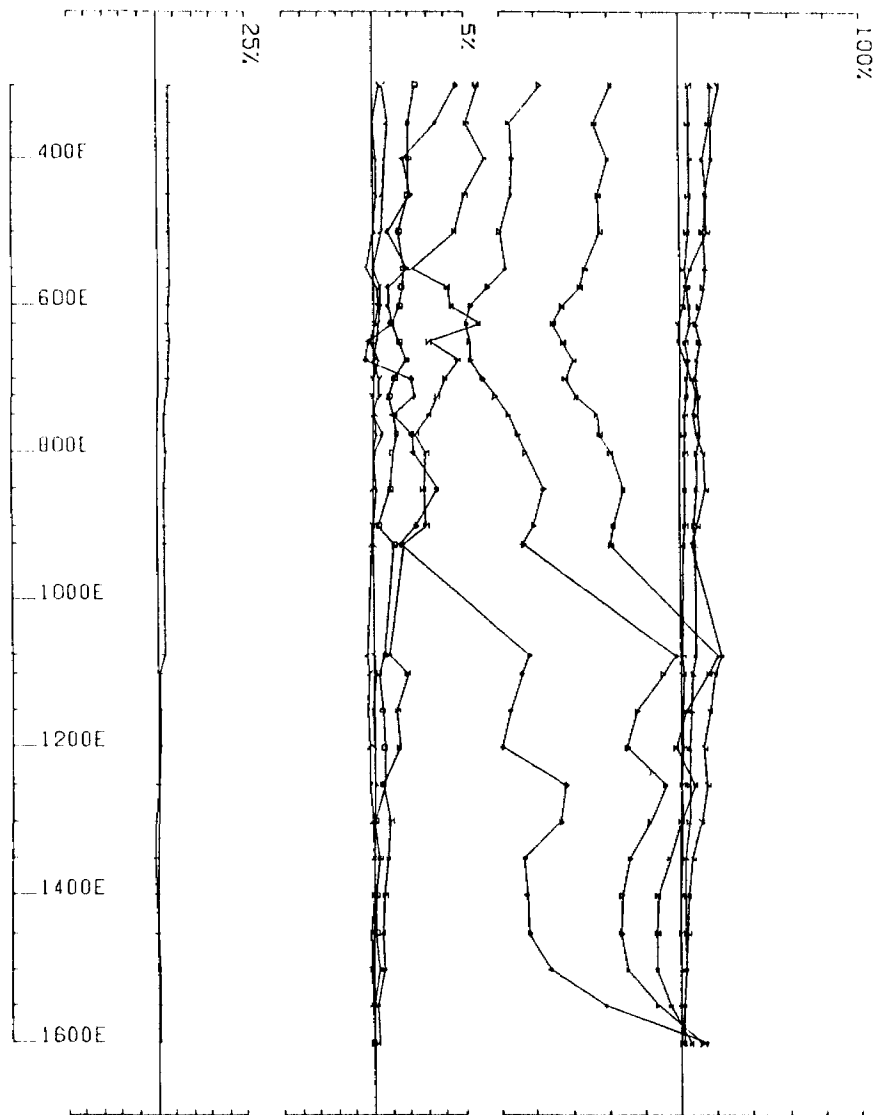
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 1 LINE 0 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



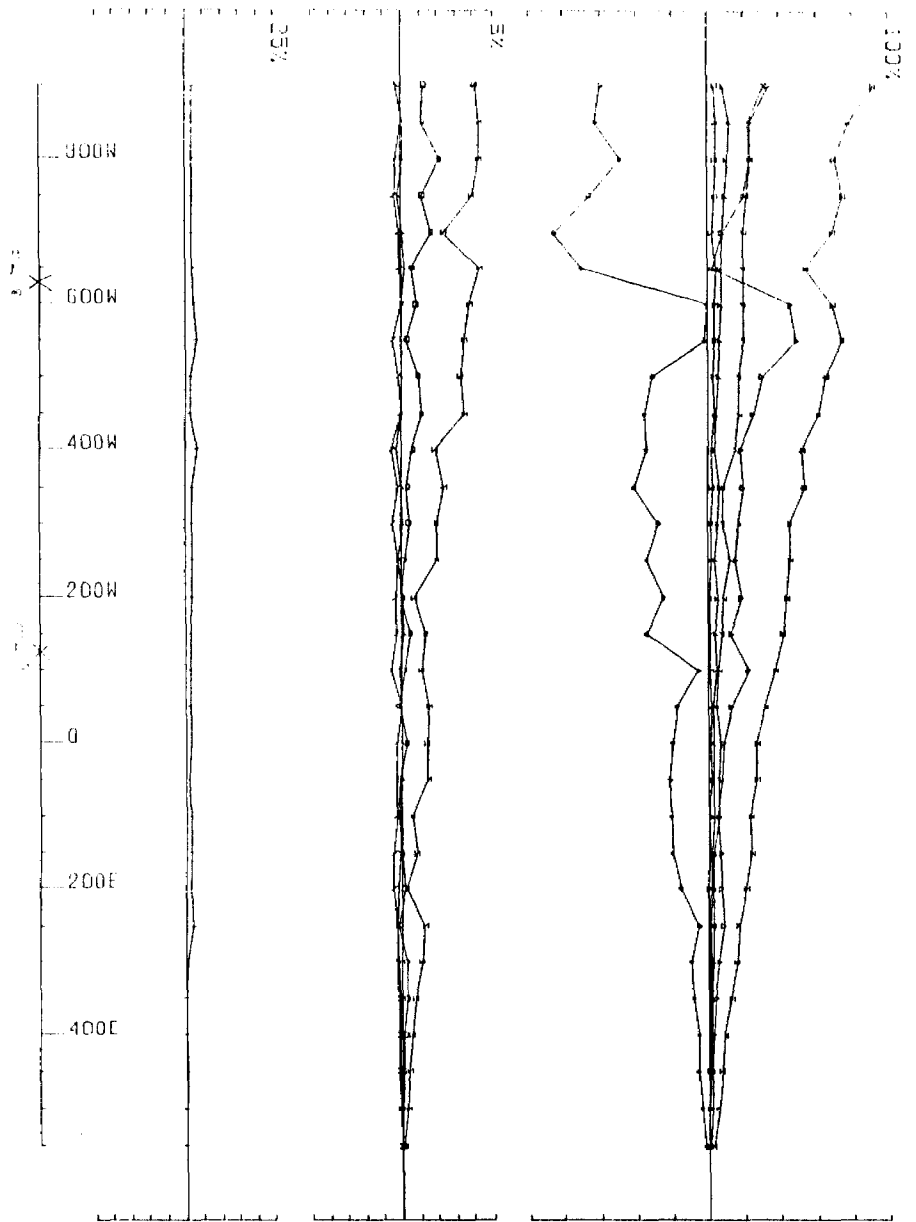
UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LANONTADNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 1 LINE 200 N COMPONENT HZ SECONDARY FIELD CHJ CONTIN. NORM.



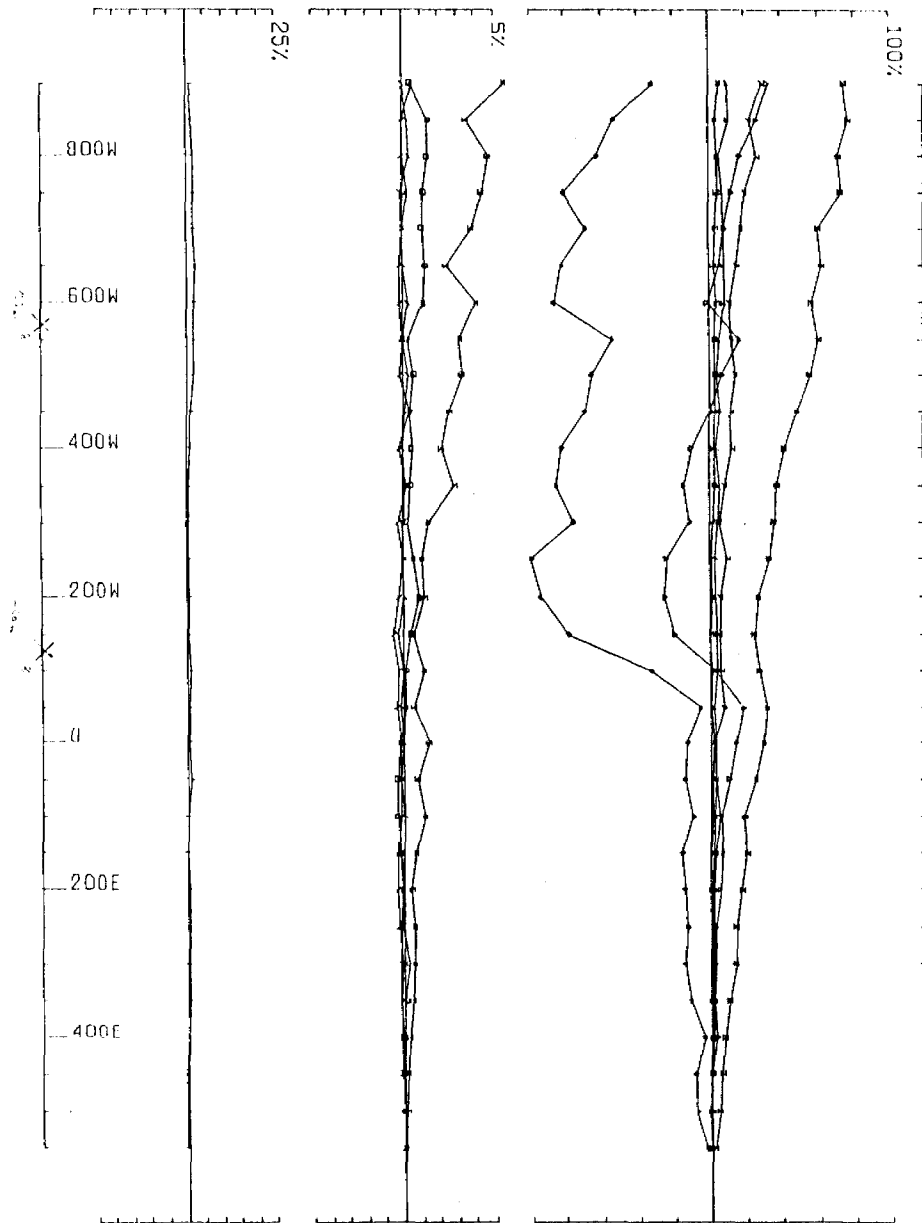
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 1 LINE 400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM



UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 1 LINE 500 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

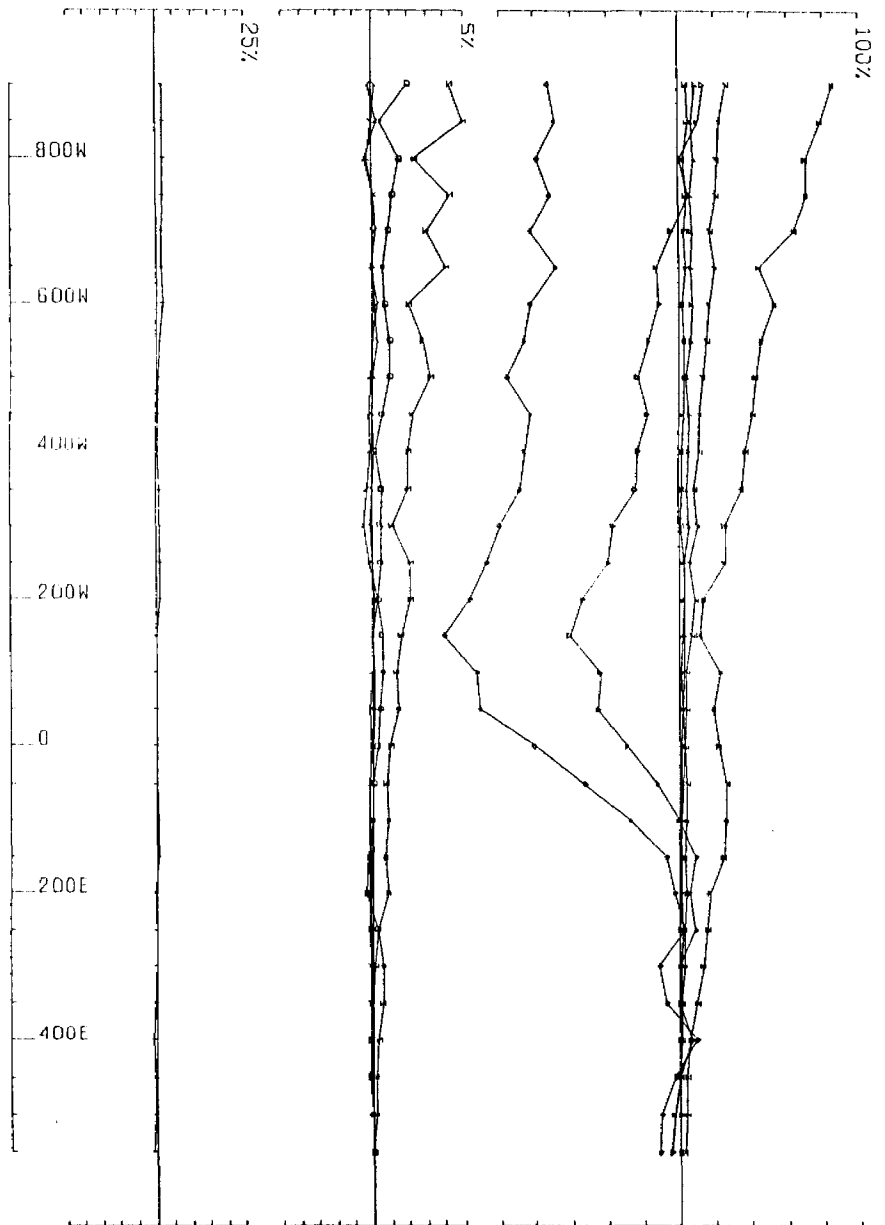


UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 1005 COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

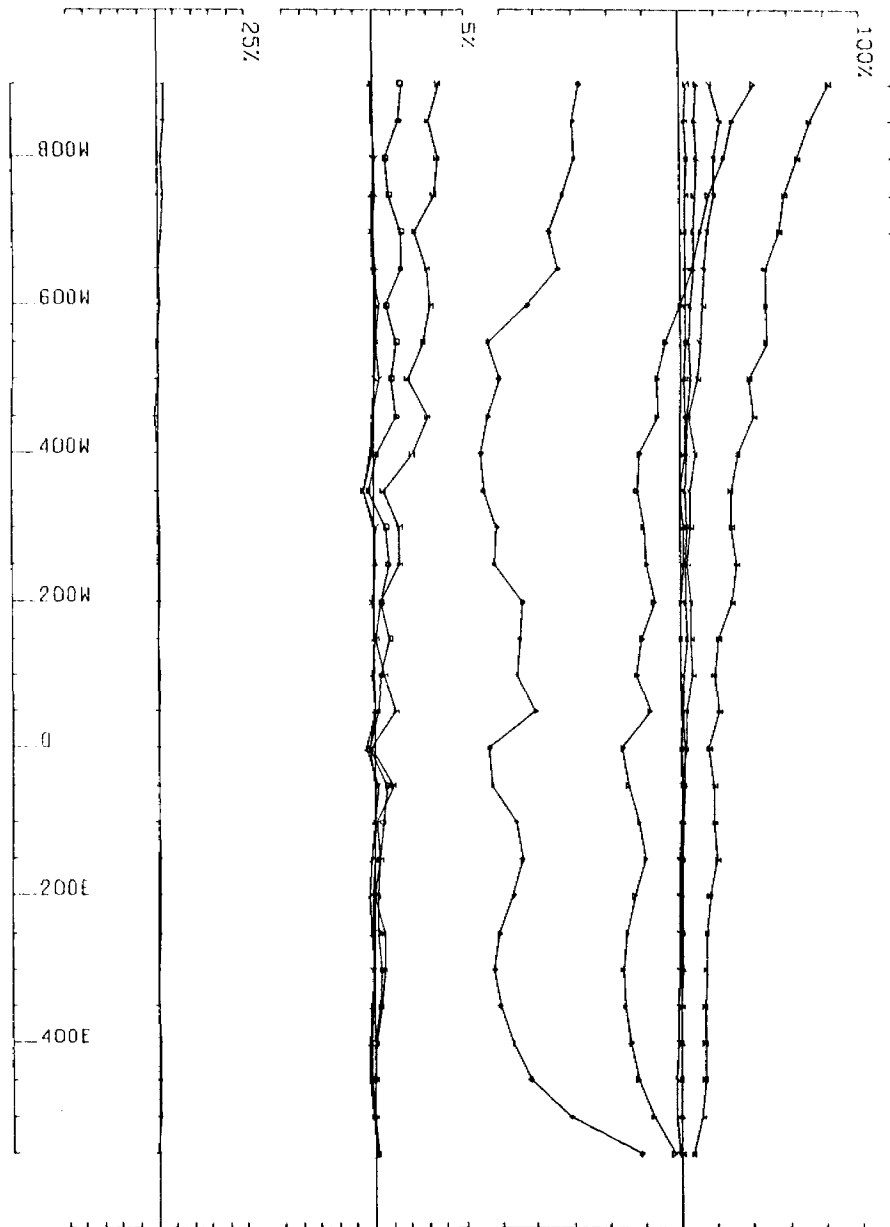


UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 0005 COMPONENT HZ SECONDARY FIELD CHJ CDNTJN. NDRM.

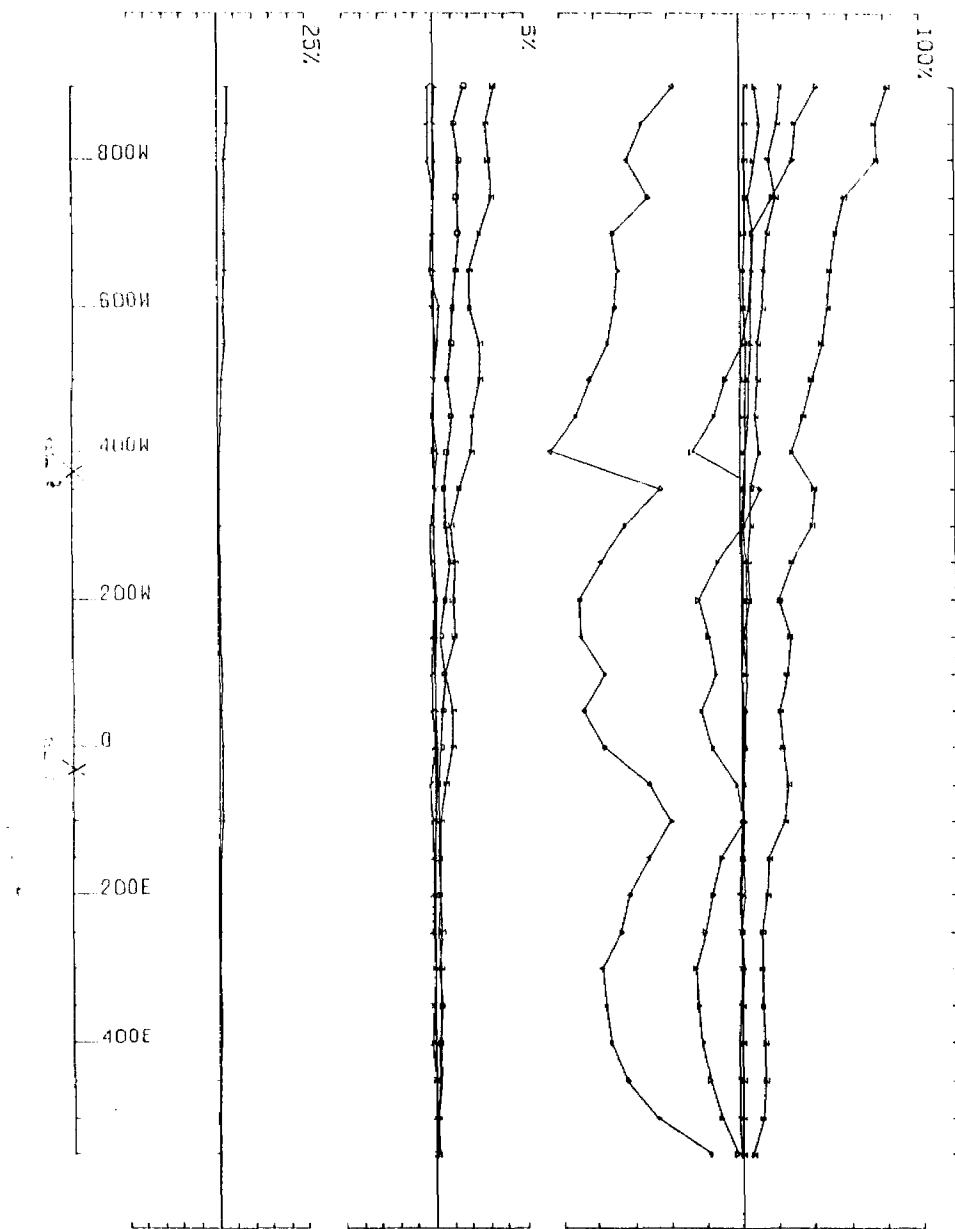




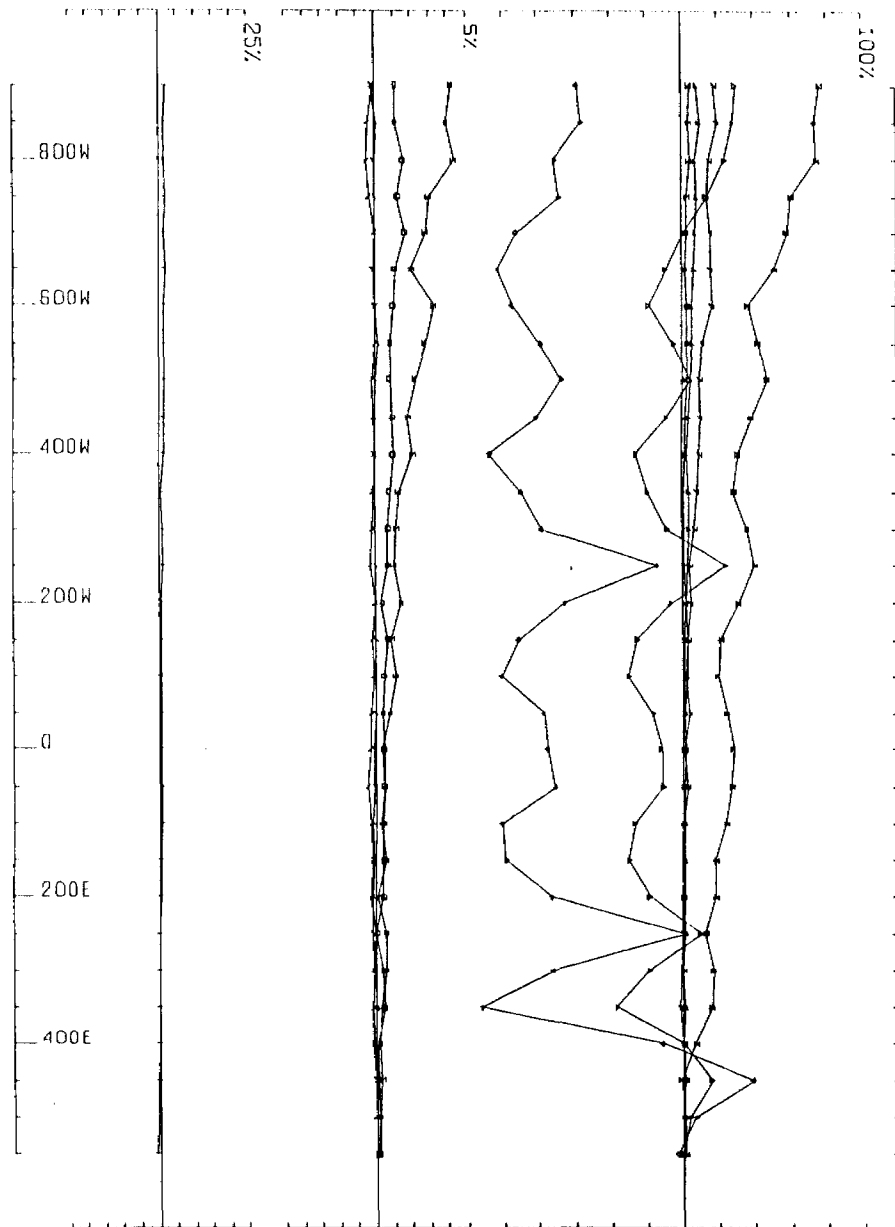
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 600S COMPONENT HZ SECONDARY FIELD CH1 CONTJN. NDRM.



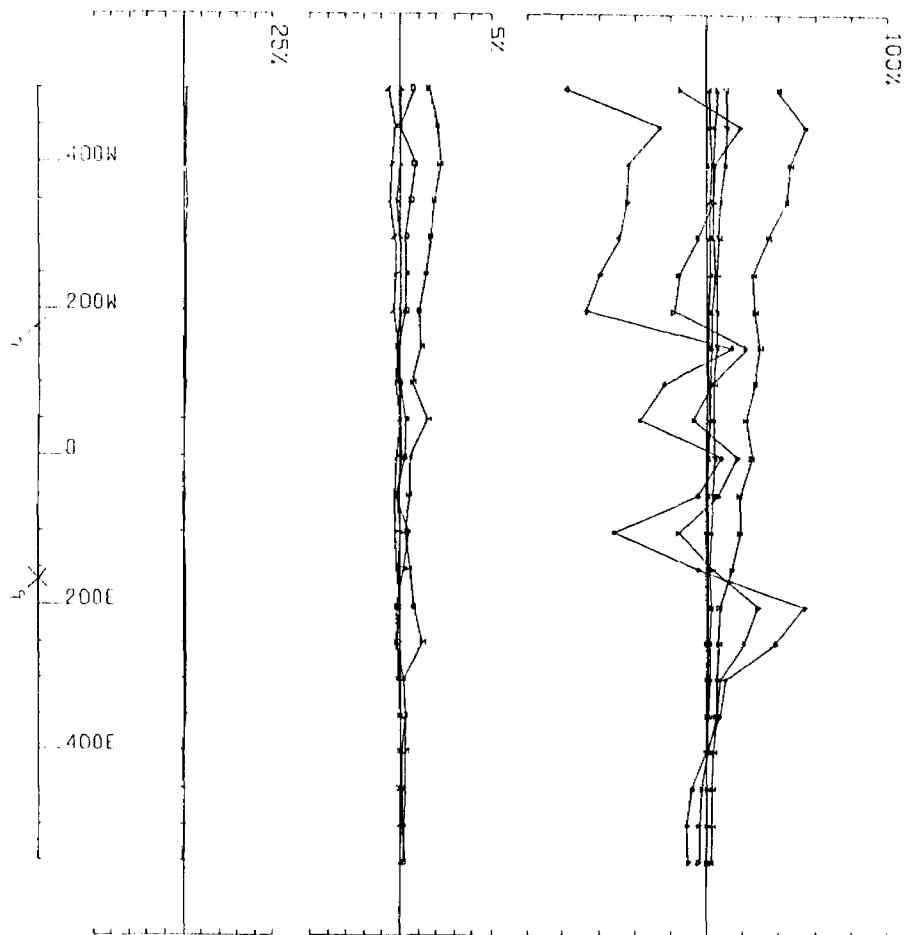
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 400S COMPONENT HZ SECONDARY FIELD CHJ CDNTJN. NORM.



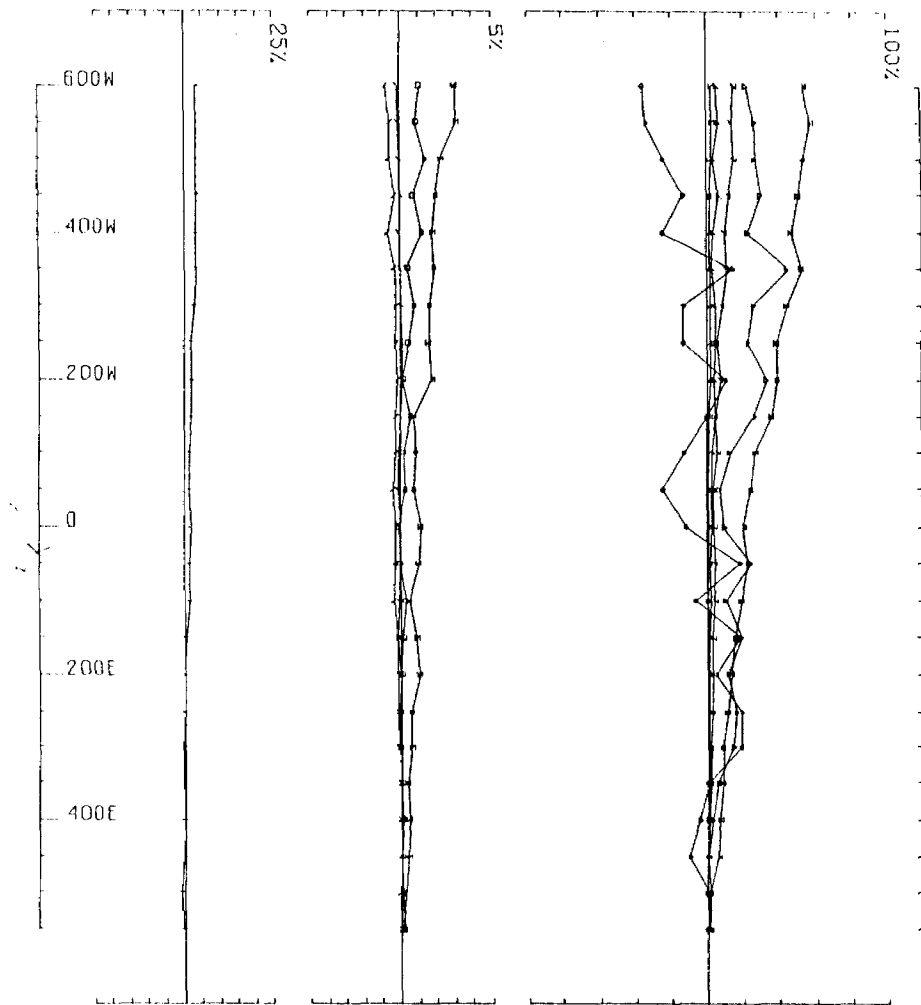
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 200S COMPONENT HZ SECONDARY FIELD CH3 CONTJN. NDRM.



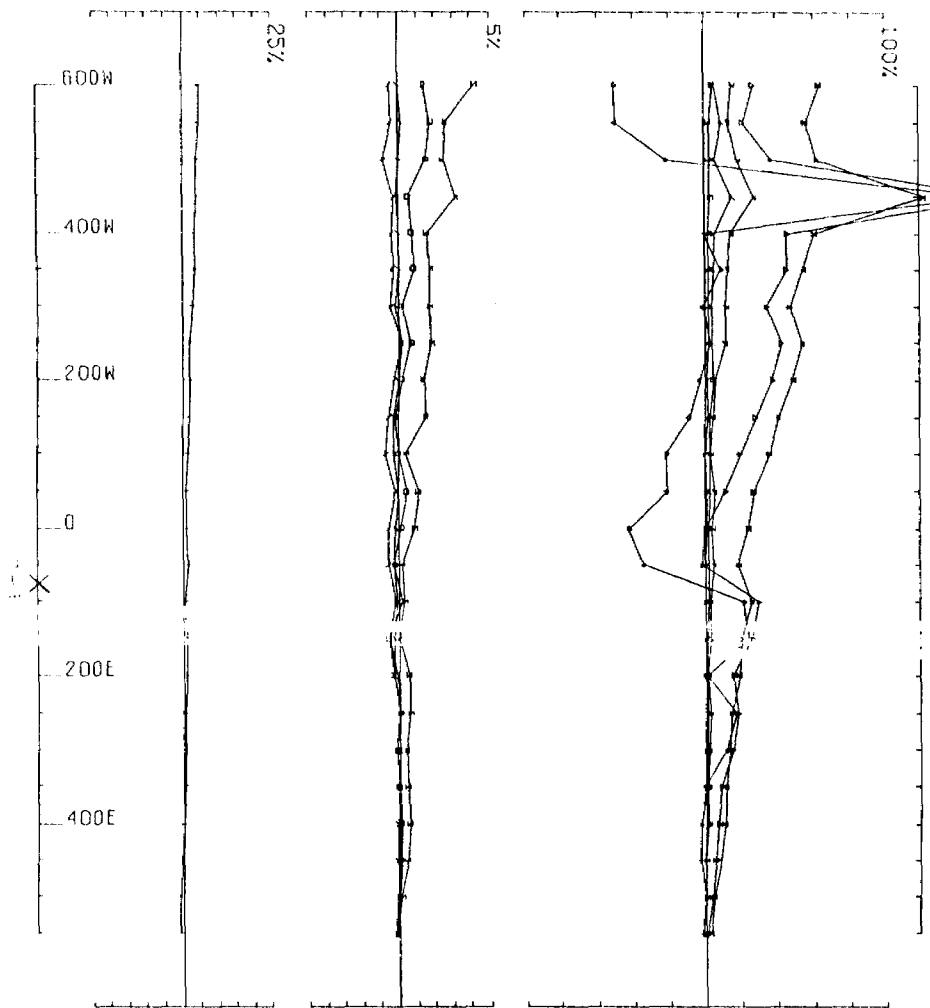
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 0 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



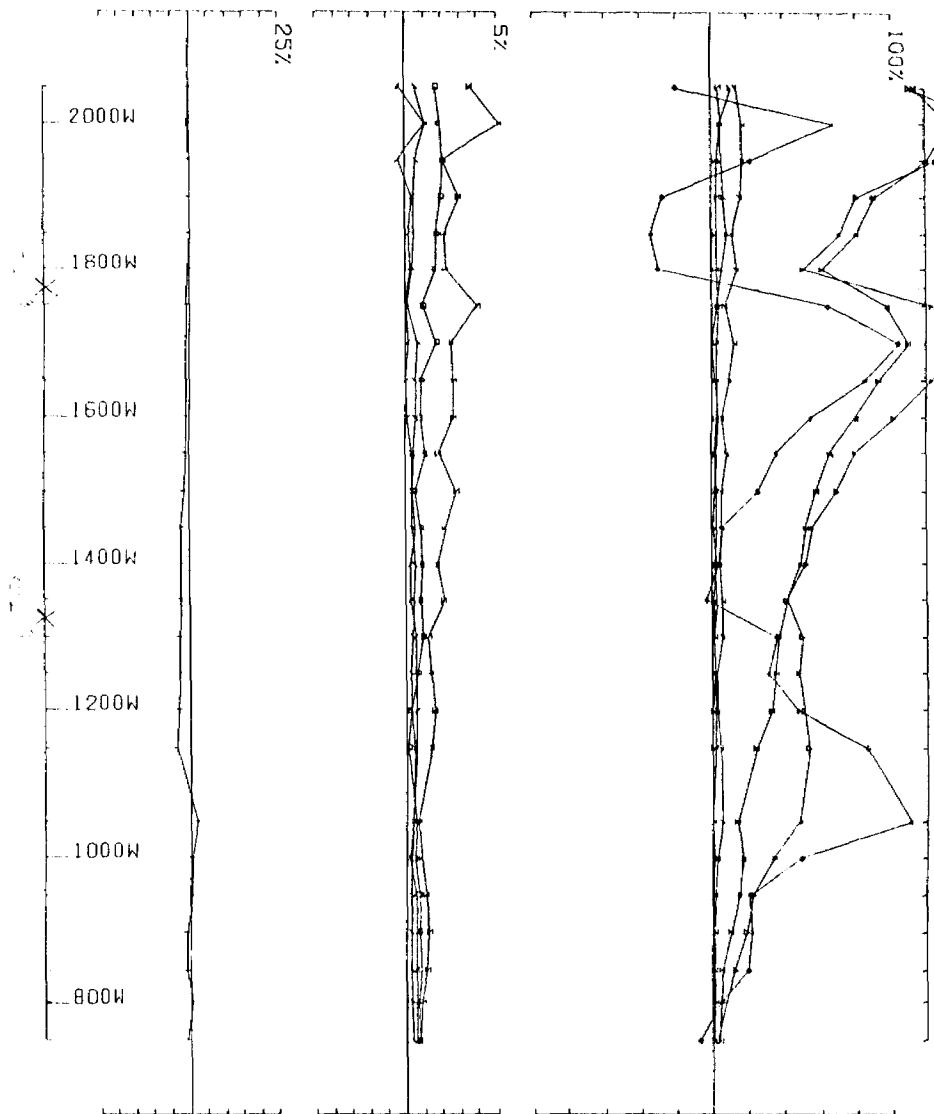
UTAH SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 2N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9D26 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 400N COMPONENT HZ SECONDARY FIELD CHJ CONTJN. NDRM.

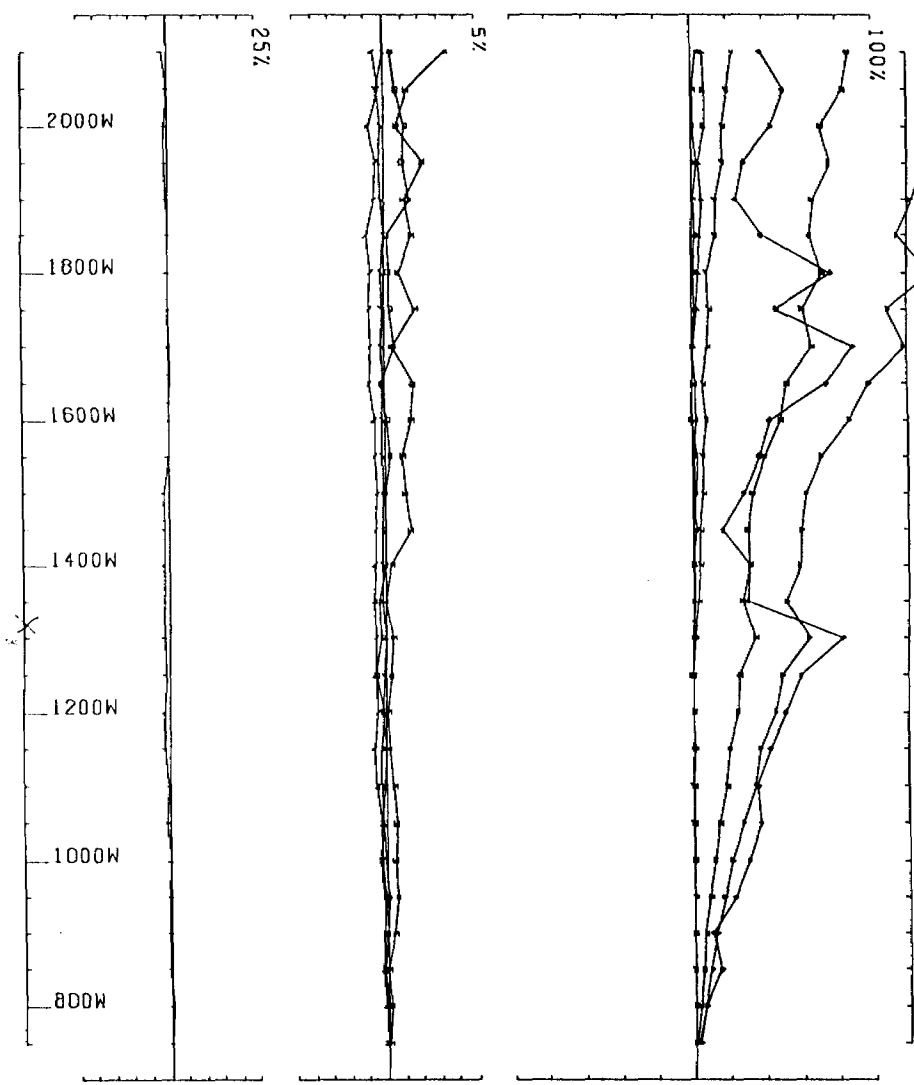


UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 4 LINE 500N COMPONENT HZ SECONDARY FIELD CH1 CDNTJN. NDRM.

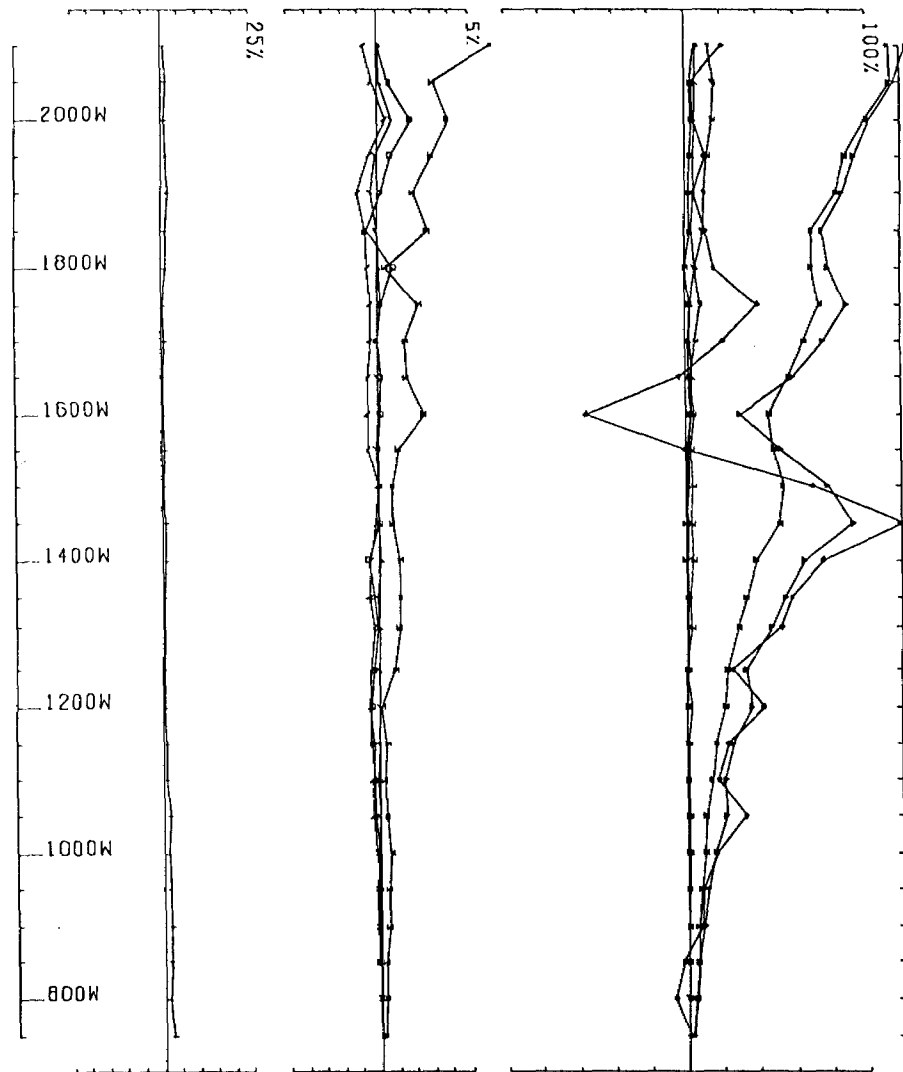


ITEM SURVEY AT PONTIAC TWP FOR NORTHDATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 1800 S COMPONENT HZ SECONDARY FIELD (CH) CONTIN. NDRM.

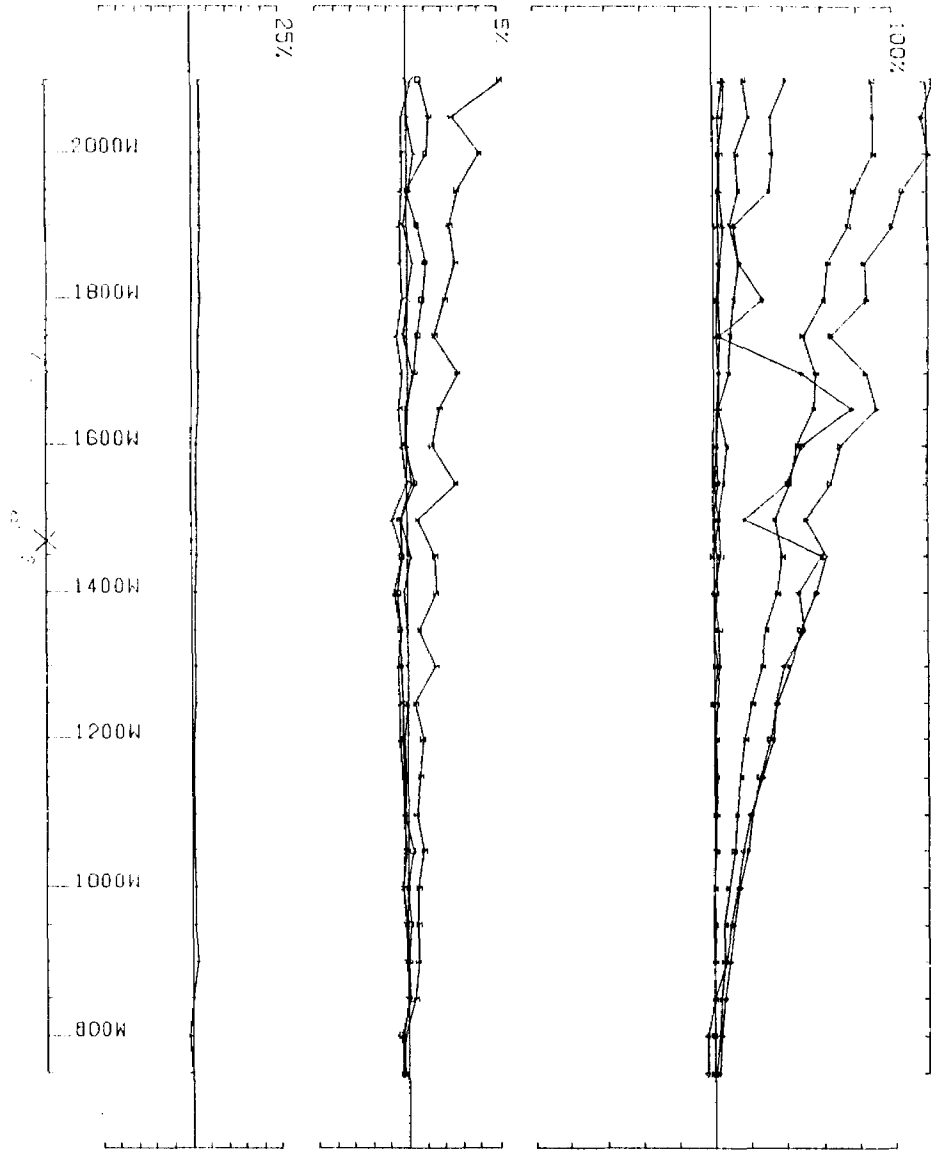




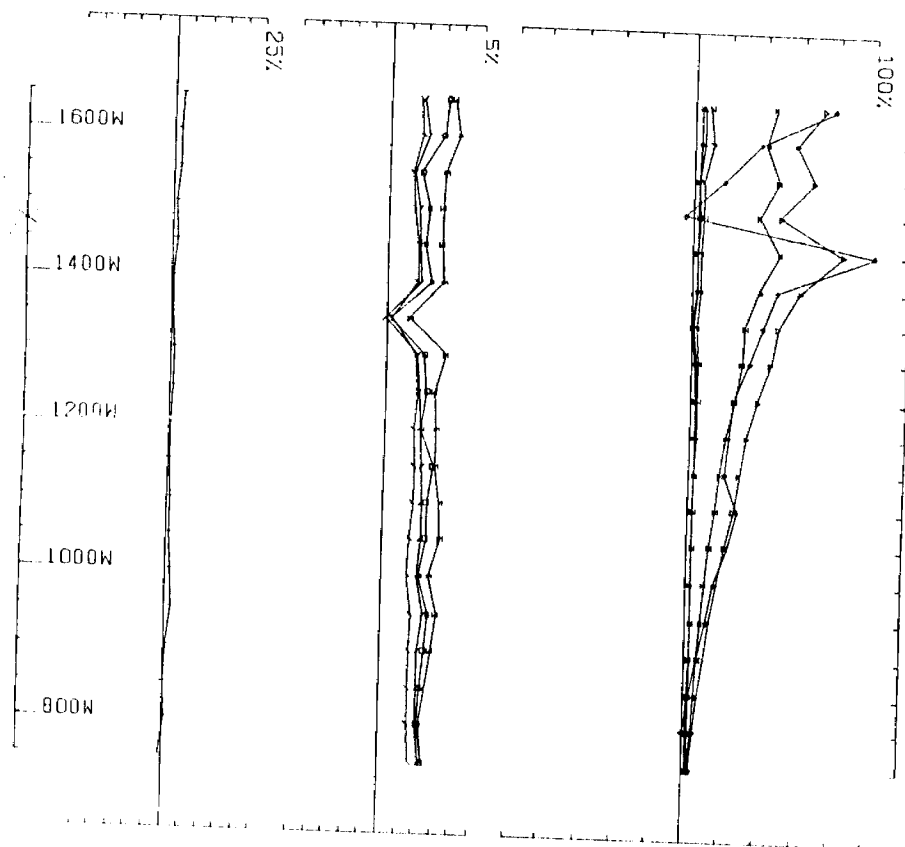
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 5 LINE 1600 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NDRN.



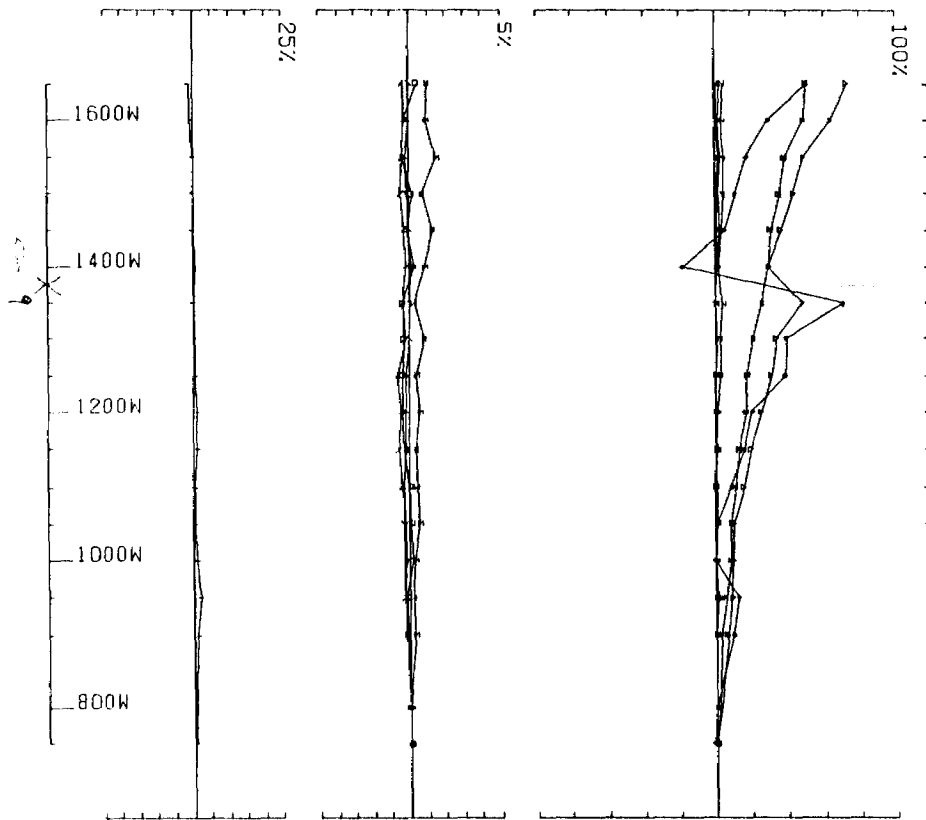
UTM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.07  
 LOOP NO 5 LINE 1400 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



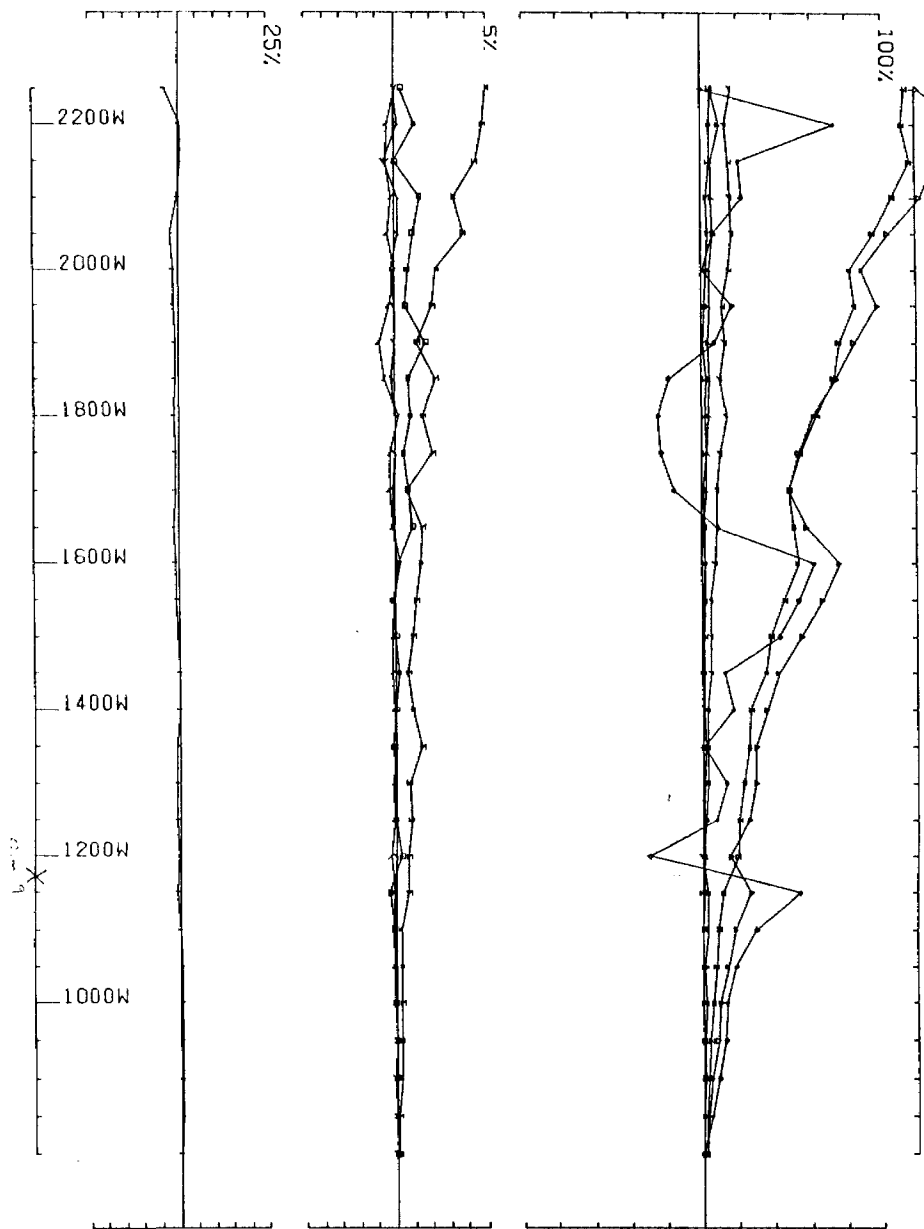
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 1200 5 COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



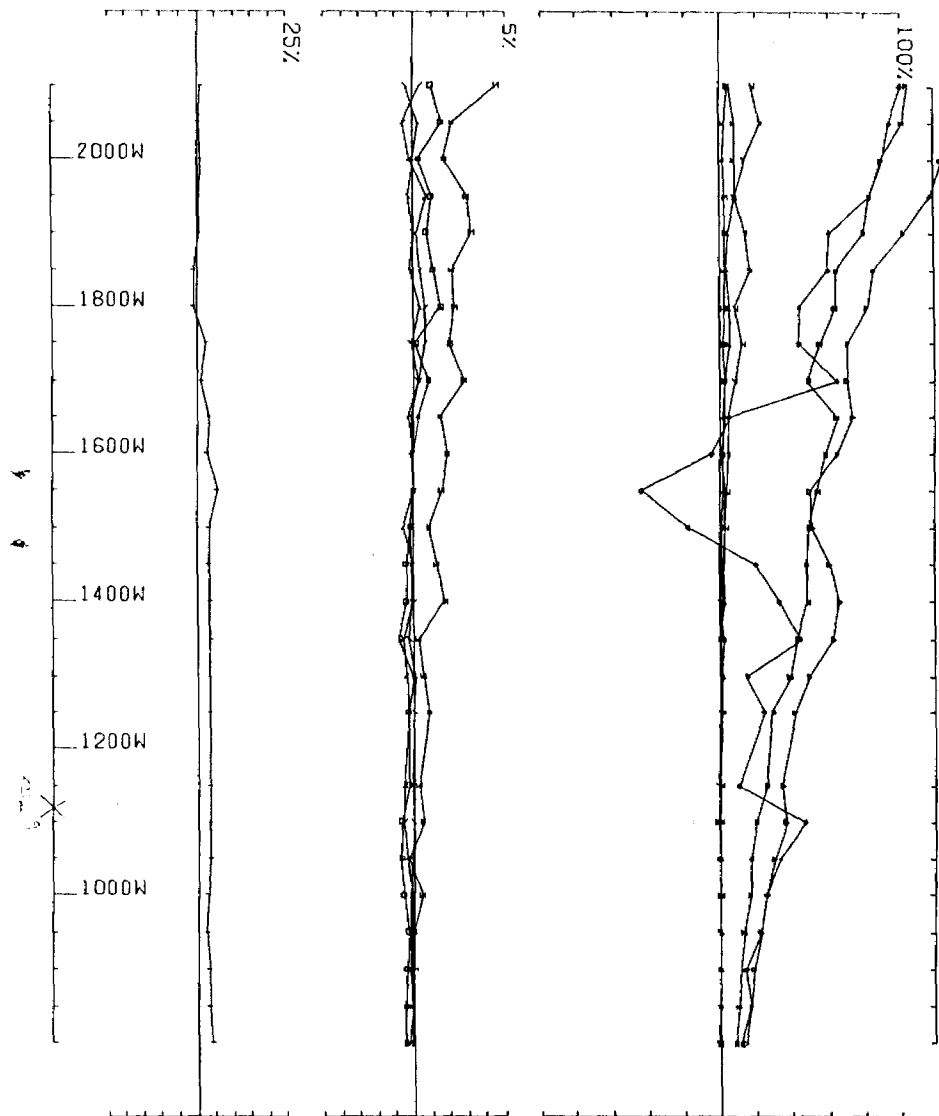
UTEM SURVEY AT PONTIAC TWP FOR NORTHCOTE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 1000 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



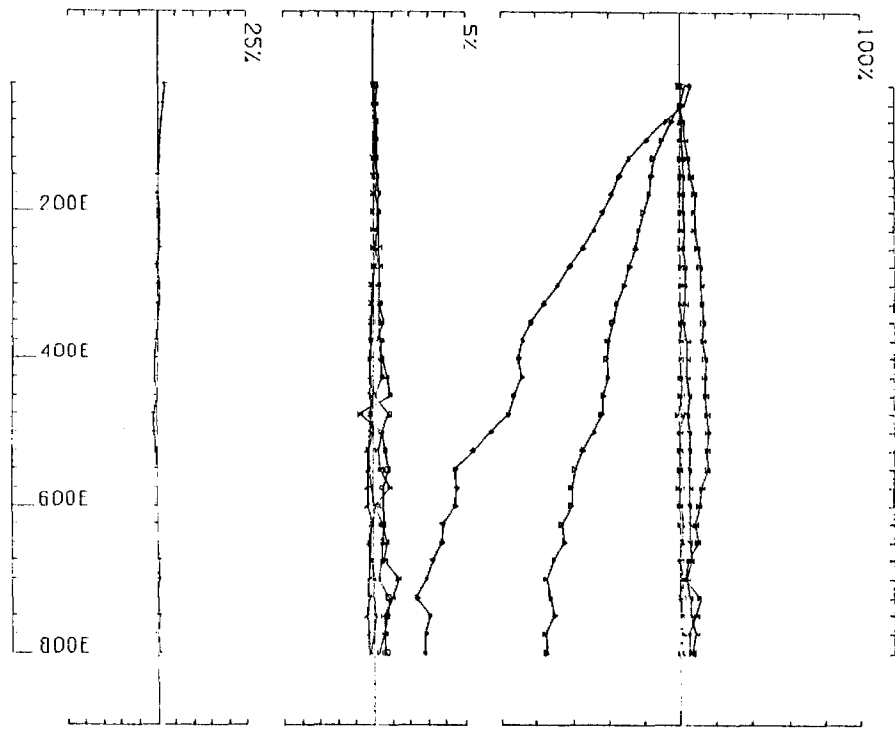
UTAH SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 000 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORTH.



UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 600 S COMPONENT HZ SECONDARY FIELD CH1 CDNTJN. NDRM.

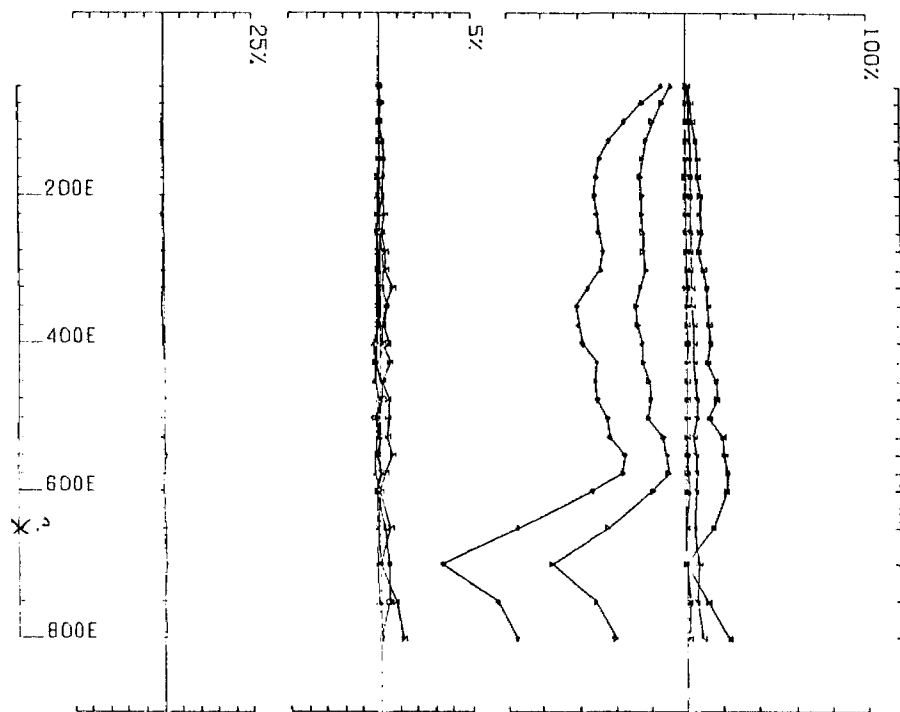


UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 5 LINE 400 S COMPONENT HZ SECONDARY FIELD CH3 CONTJN. NDRM.

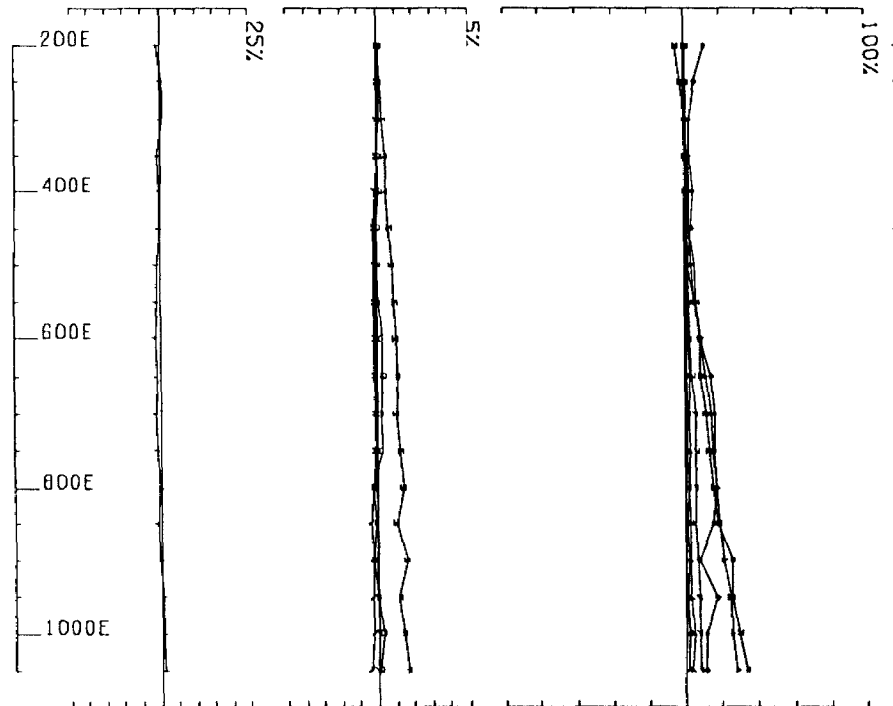


UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 6 LINE 400 S COMPONENT HZ SECONDARY FIELD CH3 CONTIN. NORM.

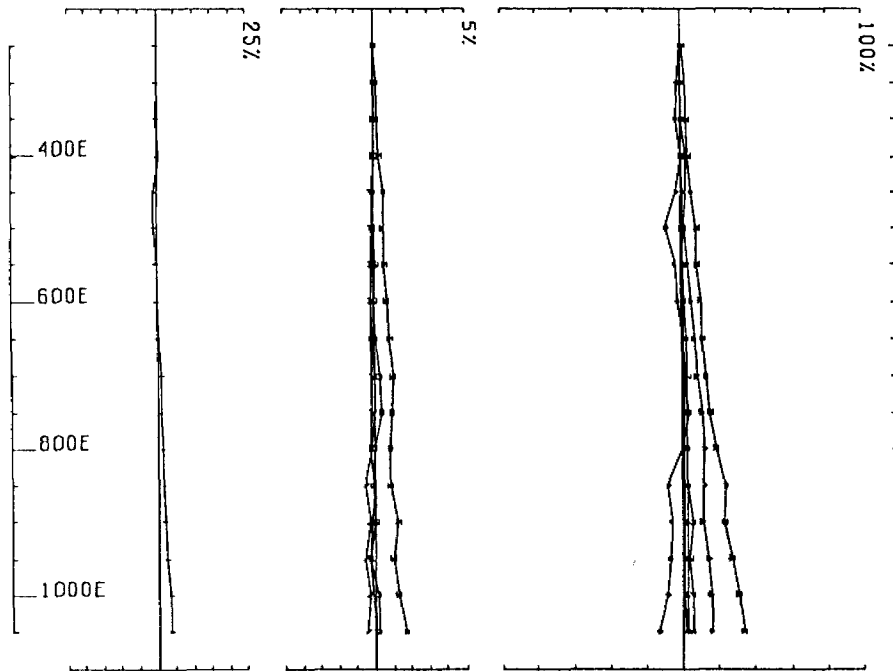




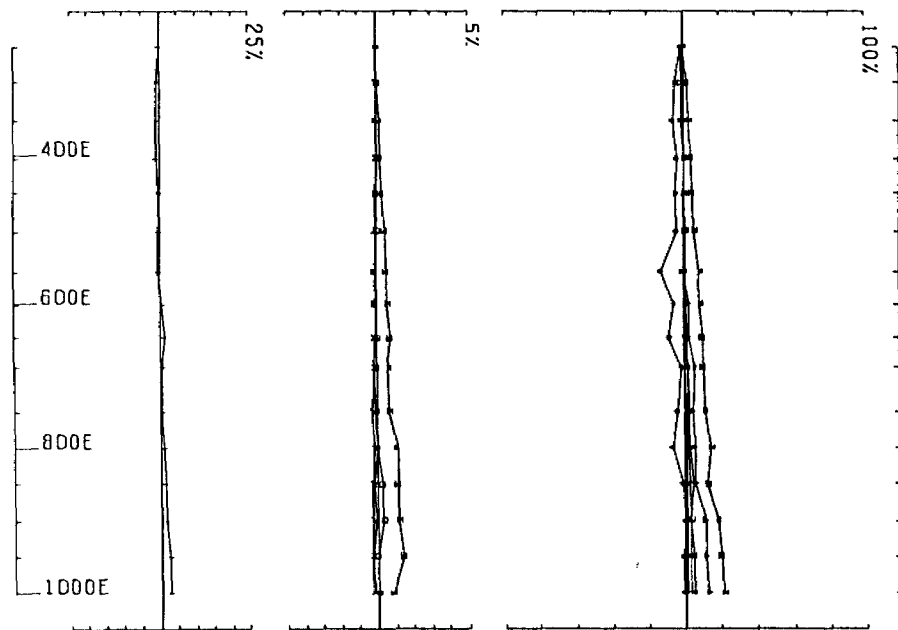
ITEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICALS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 6 LINE 600 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



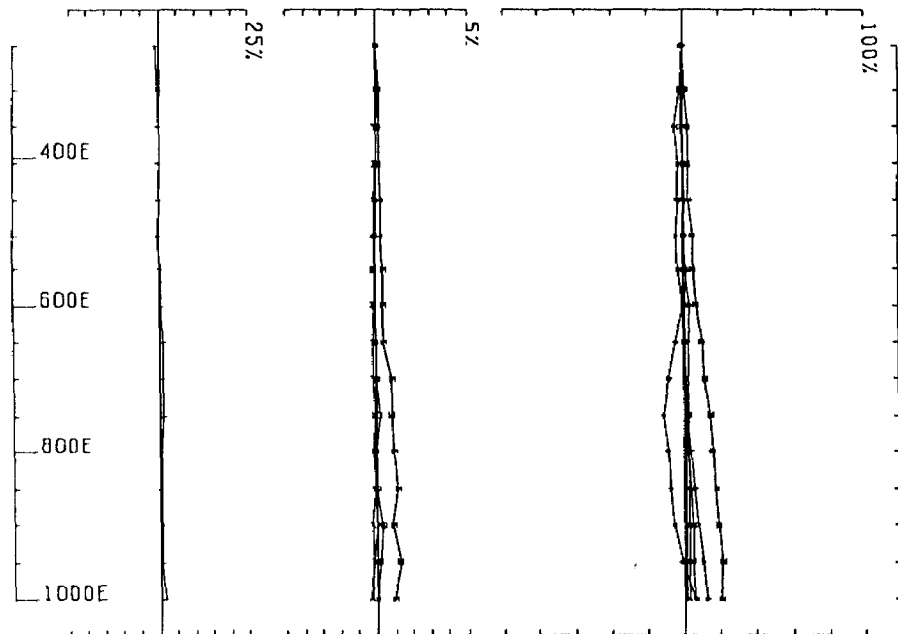
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 7 LINE 3400 N COMPONENT HZ SECONDARY FJELD CHJ CONTIN. NORM.



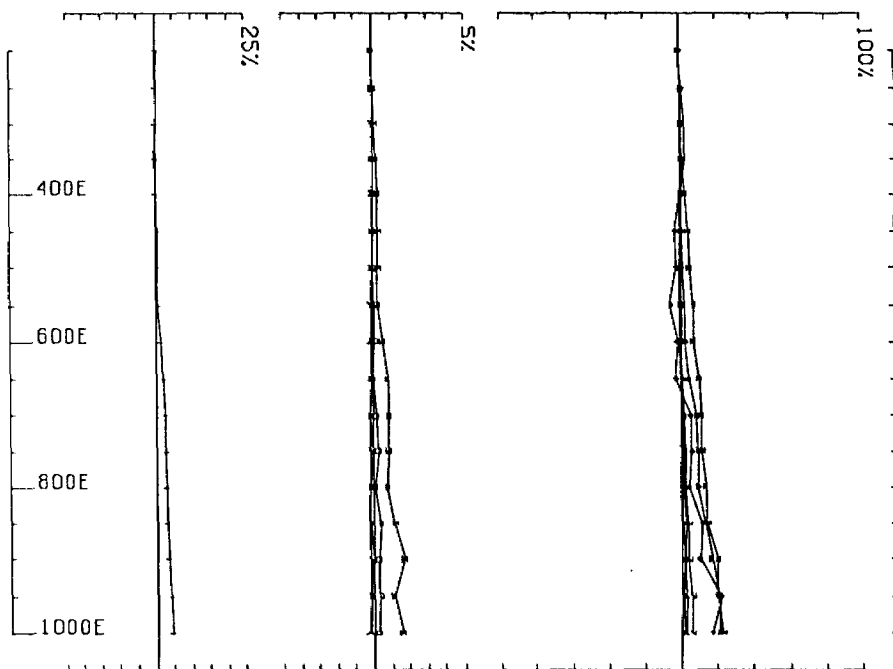
UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 7 LINE 3600 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.



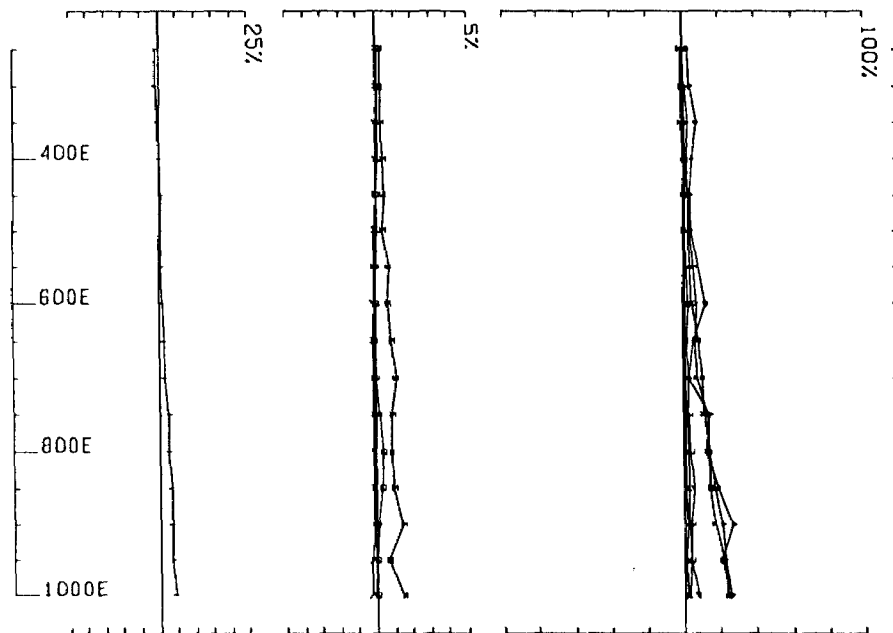
UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 7 LINE 3800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



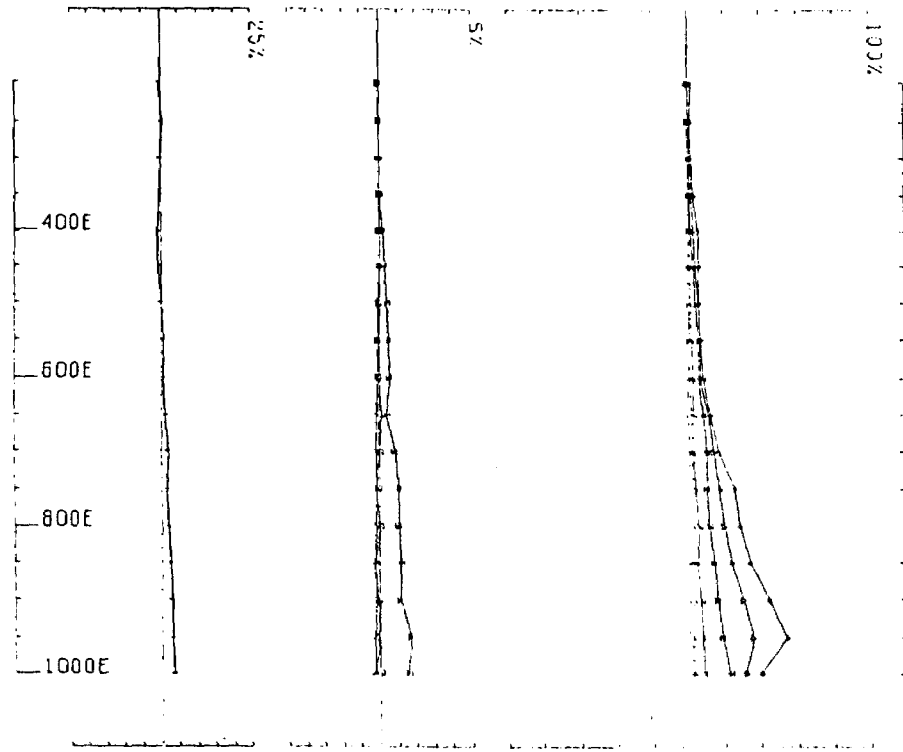
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 7 LINE 4000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 90.97  
 LOOP NO 7 LINE 4200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NDRN.

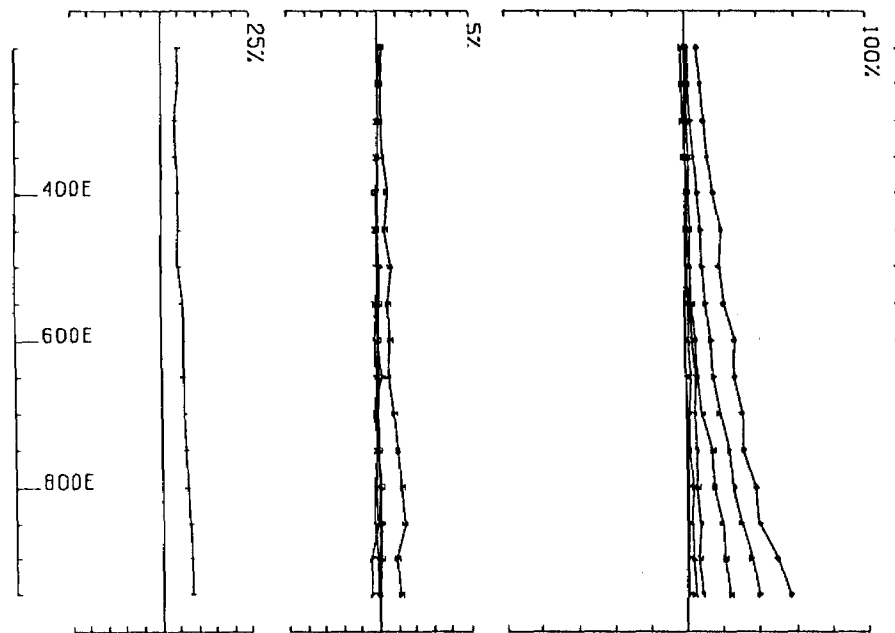


UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 7 LINE 4400 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

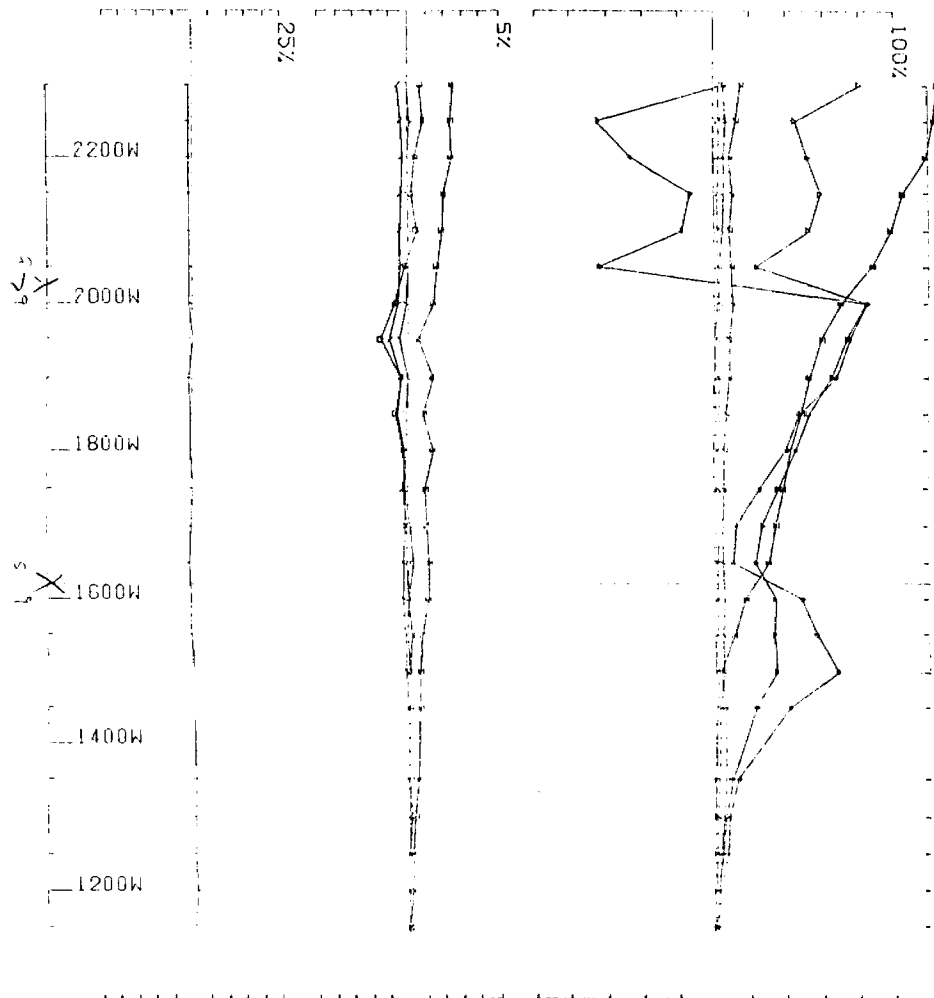


JTEM SURVEY AT PONTIAC TWP. FOR NUKHOATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 0026 BAS. FREQ 120.00.07  
 LOOP NO 7 LINE 4600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NUMB.

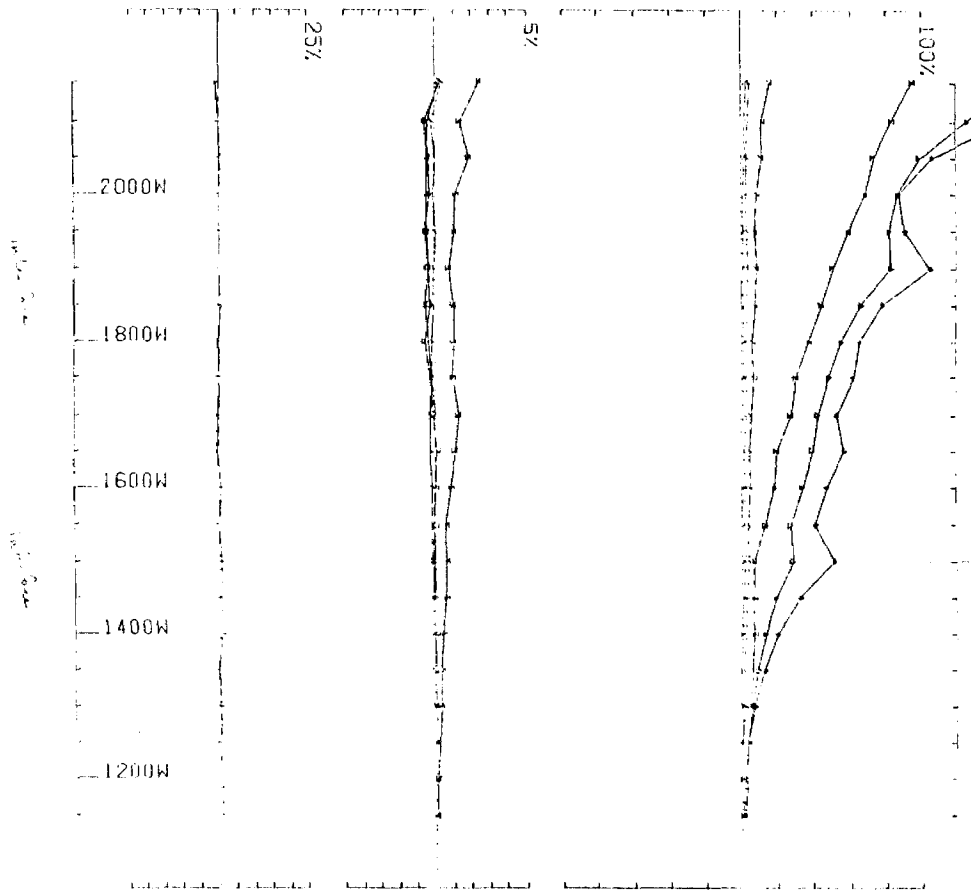




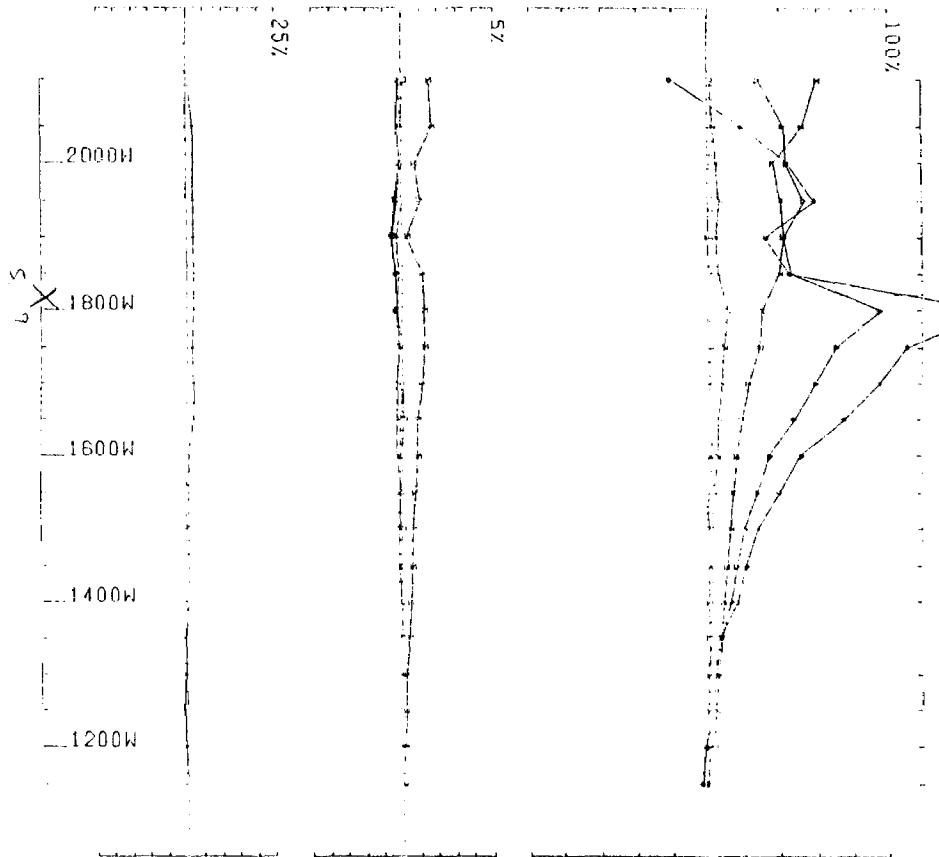
UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 8026 BASE FREQ (HZ) 30.97  
 LOOP NO 7 LINE 4800 N COMPONENT HZ SECONDARY FIELD CH) CONTIN. NORM.



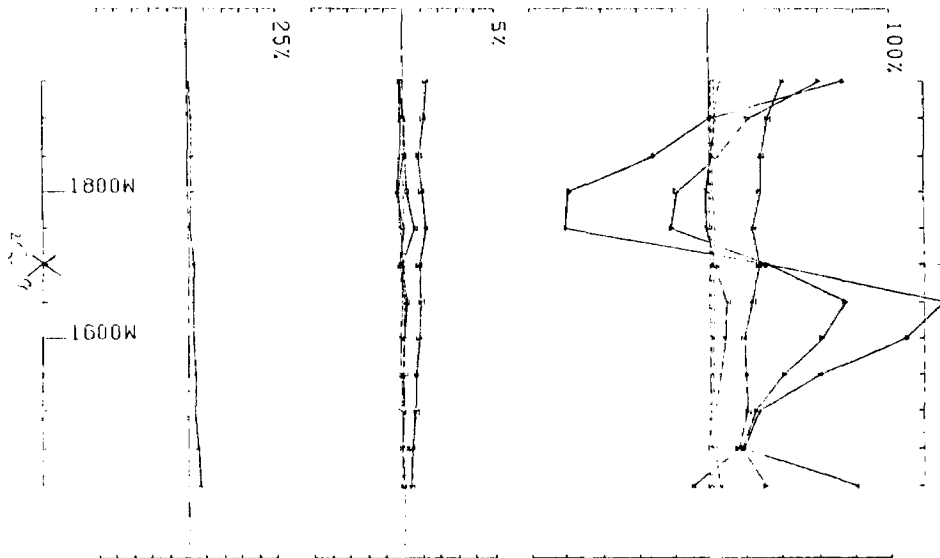
ITEM SURVEY AT PONTIAC TWP FOR HORTHCATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 8 LINE 200 S COMPONENT HZ SECONDARY FIELD CHJ CONTIN. NORM.



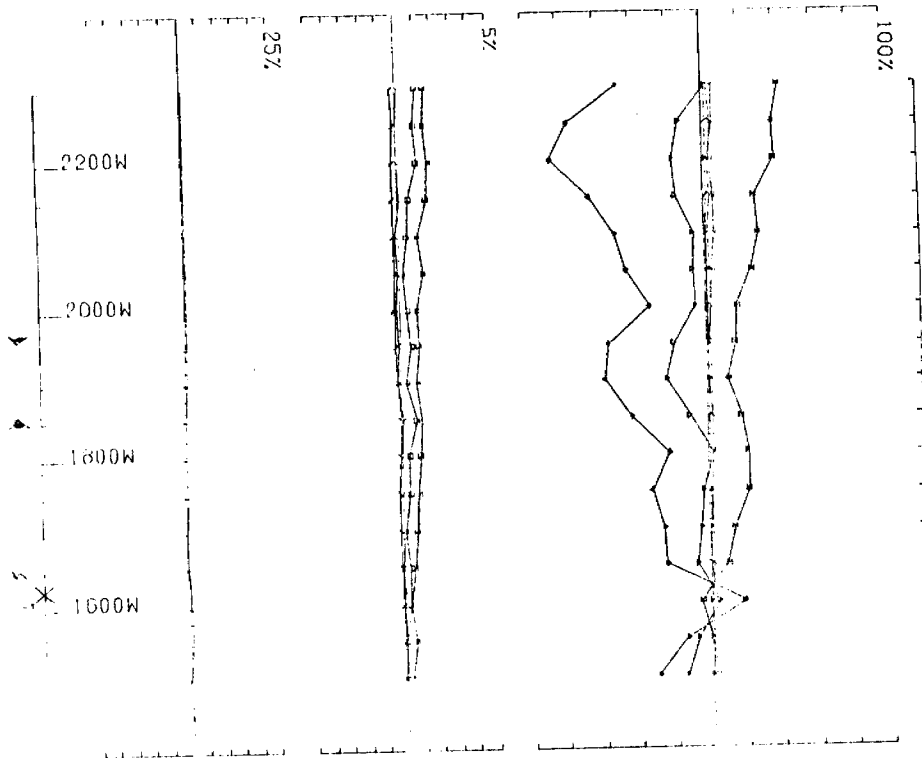
JTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 30.97  
 LOOP NO 8 LINE 0 S COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



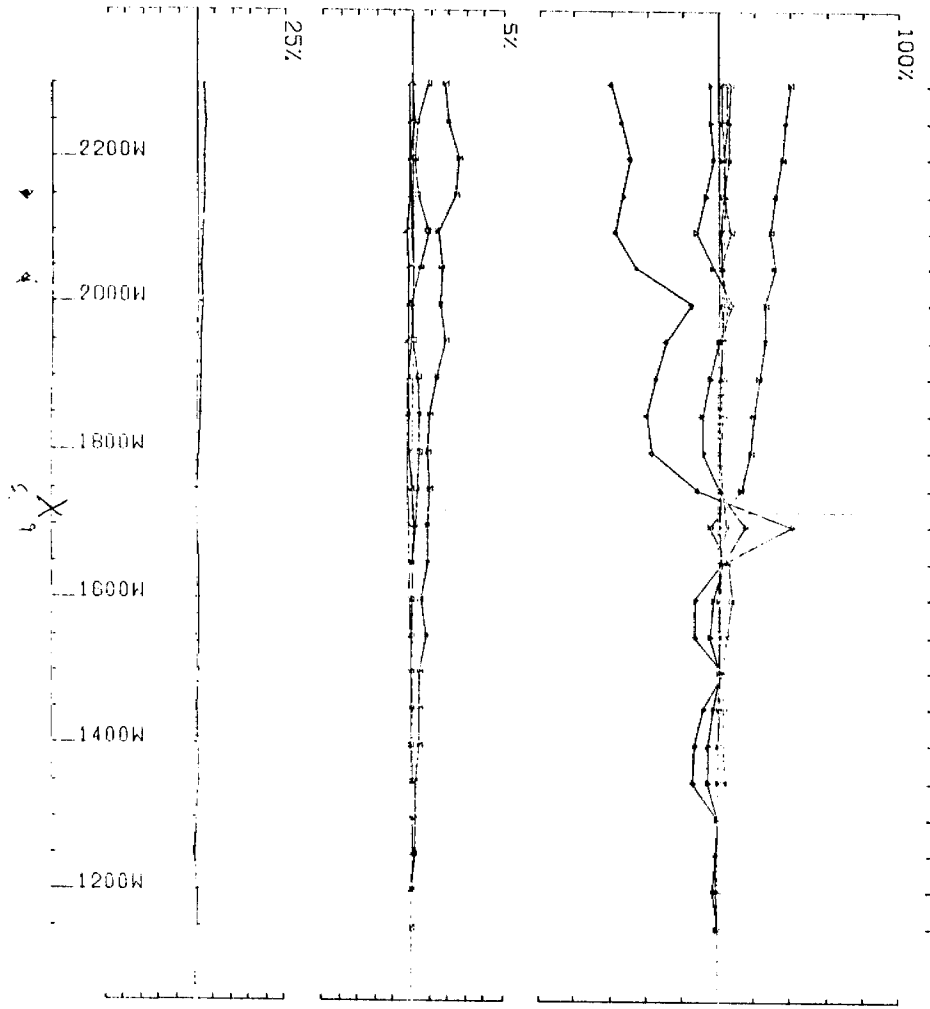
ITEM SURVEY AT PONTIAC TWP FOR PROSPECTIVE EXPLORATION  
 CONDUCTED BY LAHONTAGNE GEOPHYSICAL LTD JOB 8026 BASE FREQ 451 30.97  
 LOOP NO 8 LINE 200 N COMPONENT #7 SECONDARY FIELD CH3 CENTER, NORM.



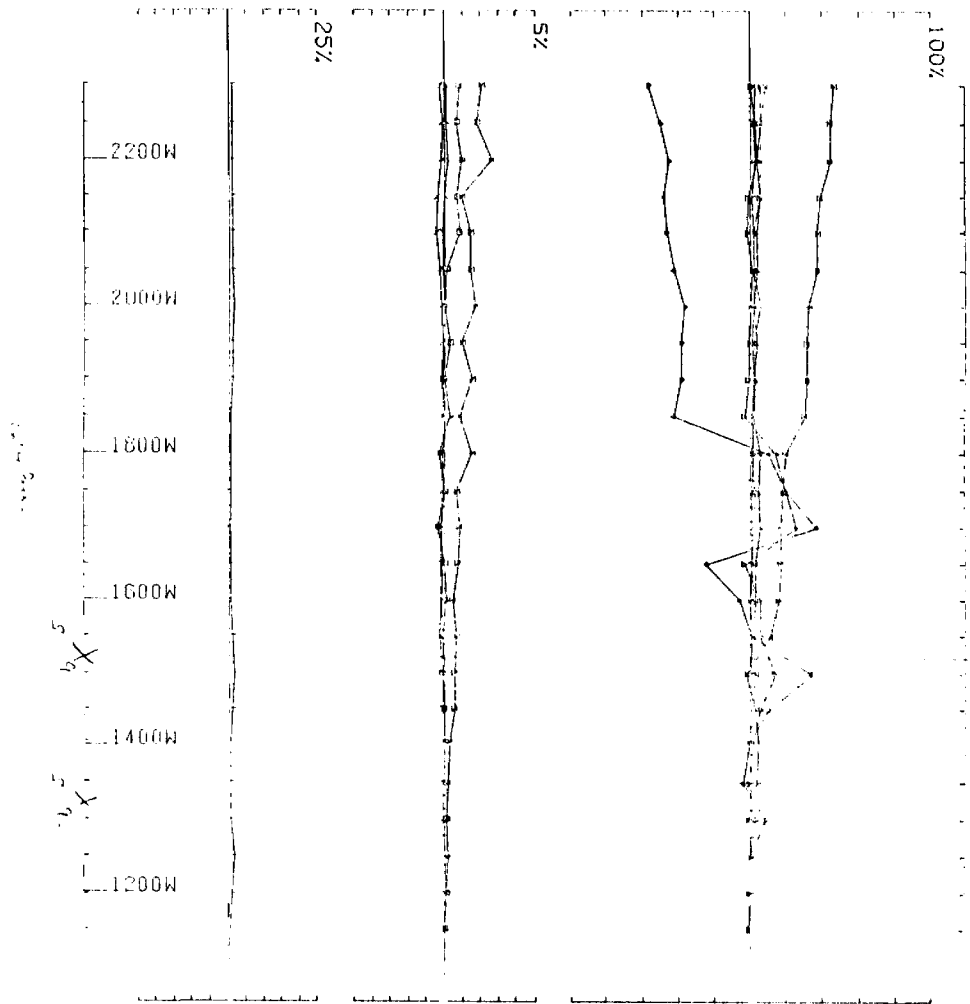
TEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 421 30.97  
 LOOP NO 8 LINE 400 N COMPONENT HZ SECONDARY FIELD CH1 CR11N. NORM.



SITE SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY TAHONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 421.30.97  
 LOOP NO 8 LINE 600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

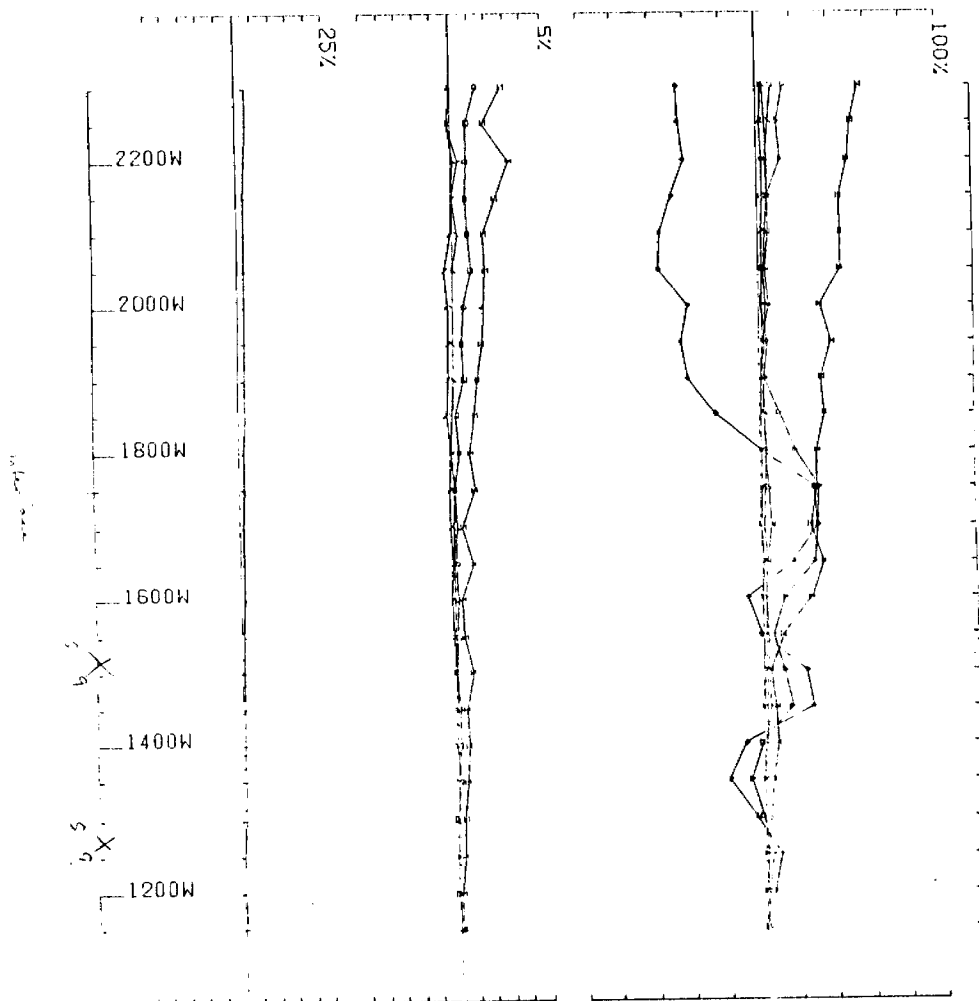


ITEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 4HZ 30.97  
 LOOP NO 8 LINE 800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

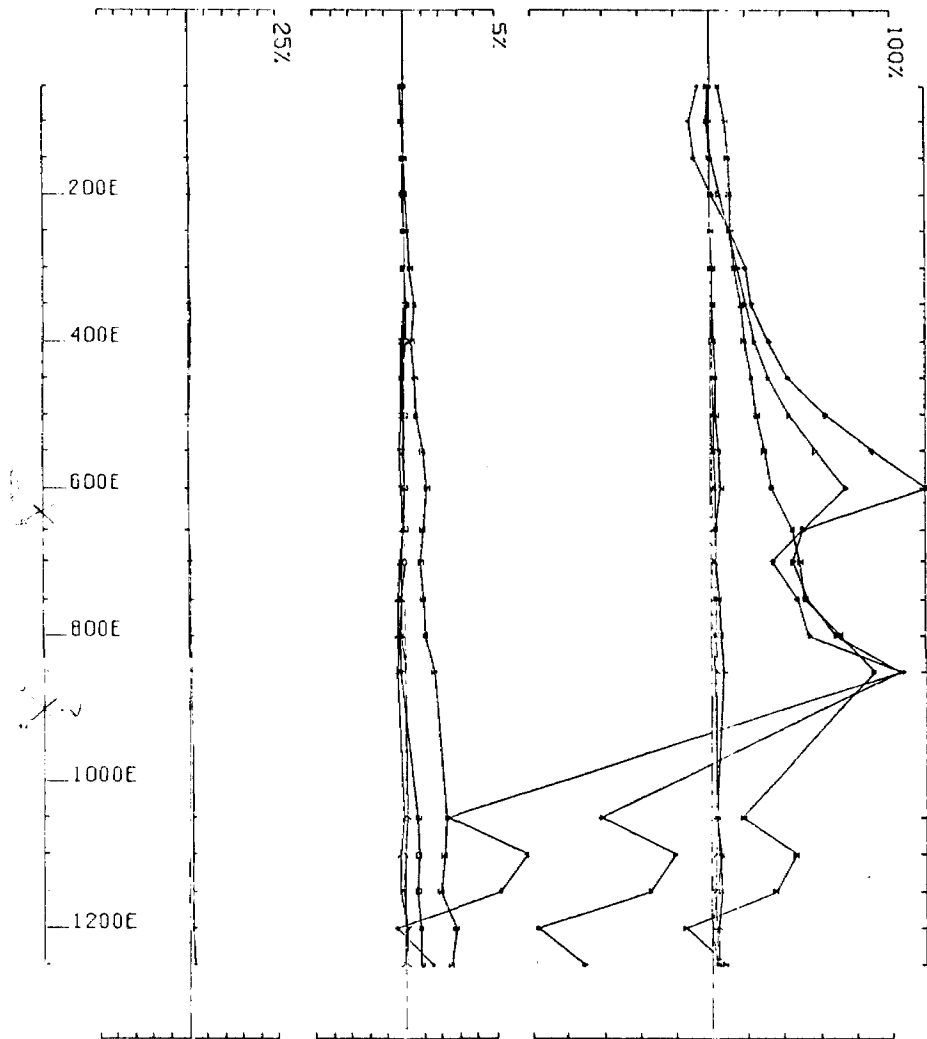


JTEH SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTADNE GEOPHYSICS LTD JOB 9026 BASE FREQ 4121 30.97  
 LOOP NO 8 LINE 1000 N COMPONENT HZ SECONDARY FIELD CH1 SECTION. NORTH.

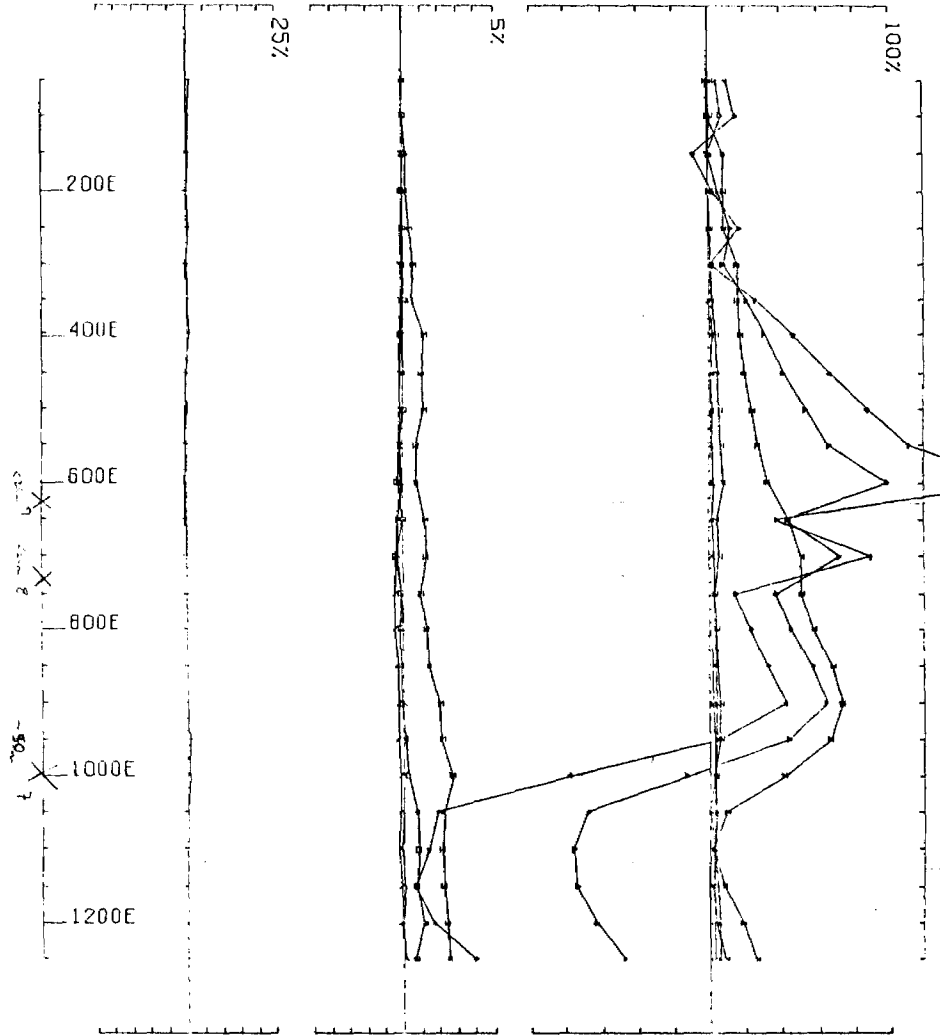




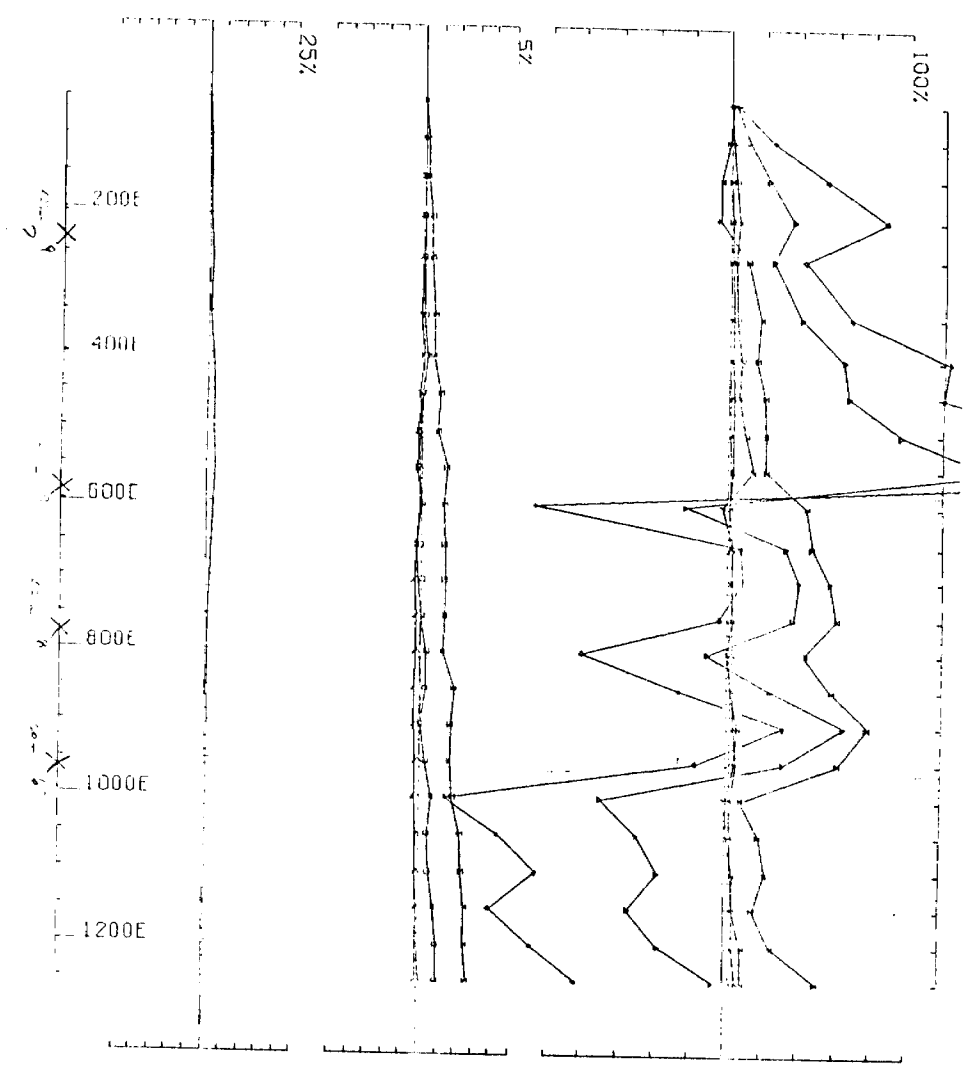
MTEH SURVEY AT PONTIAC TWP FOR HORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 1121 30.97  
 LOOP NO 8 LINE 1200 N COMPONENT HZ SECONDARY FIELD CH1 UNIT N. NORM.



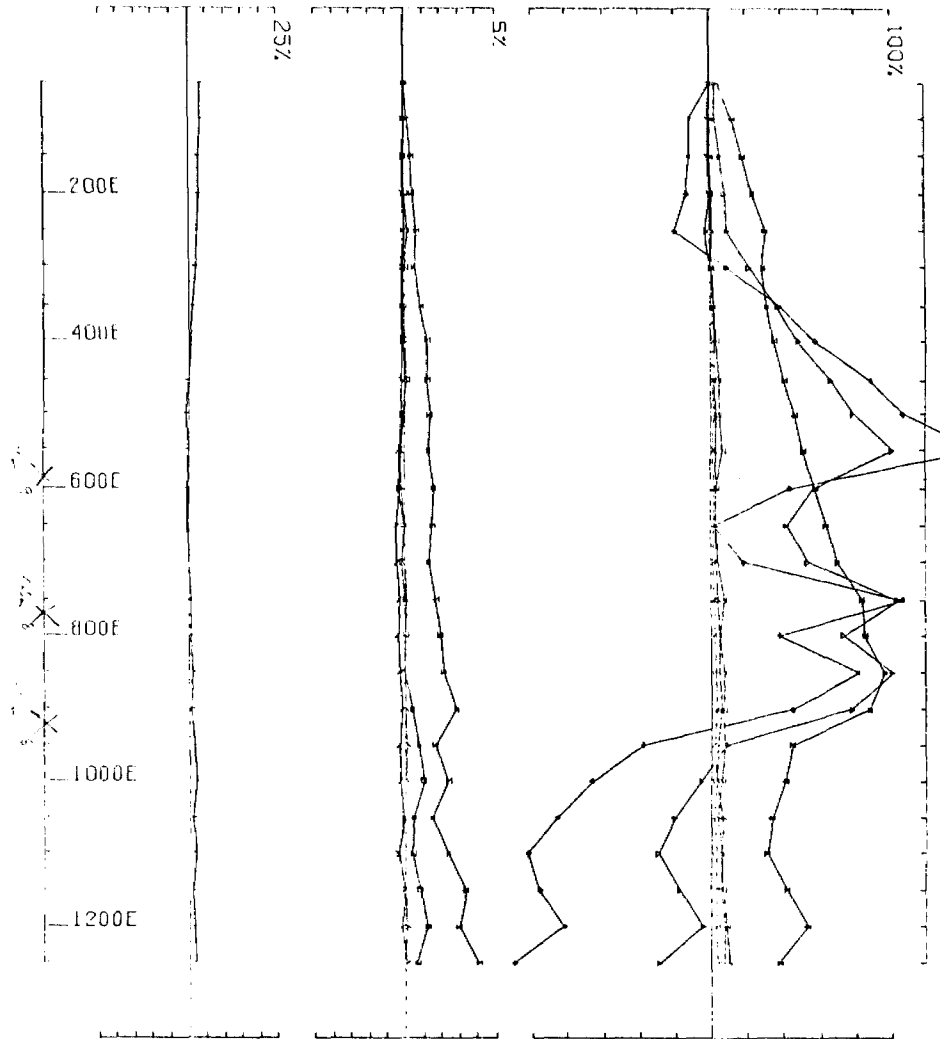
TEM SURVEY AT PONTIAC TWP FOR NORTHGATE INT INC  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ HZ 30.97  
 LOOP NO 8A LINE 600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



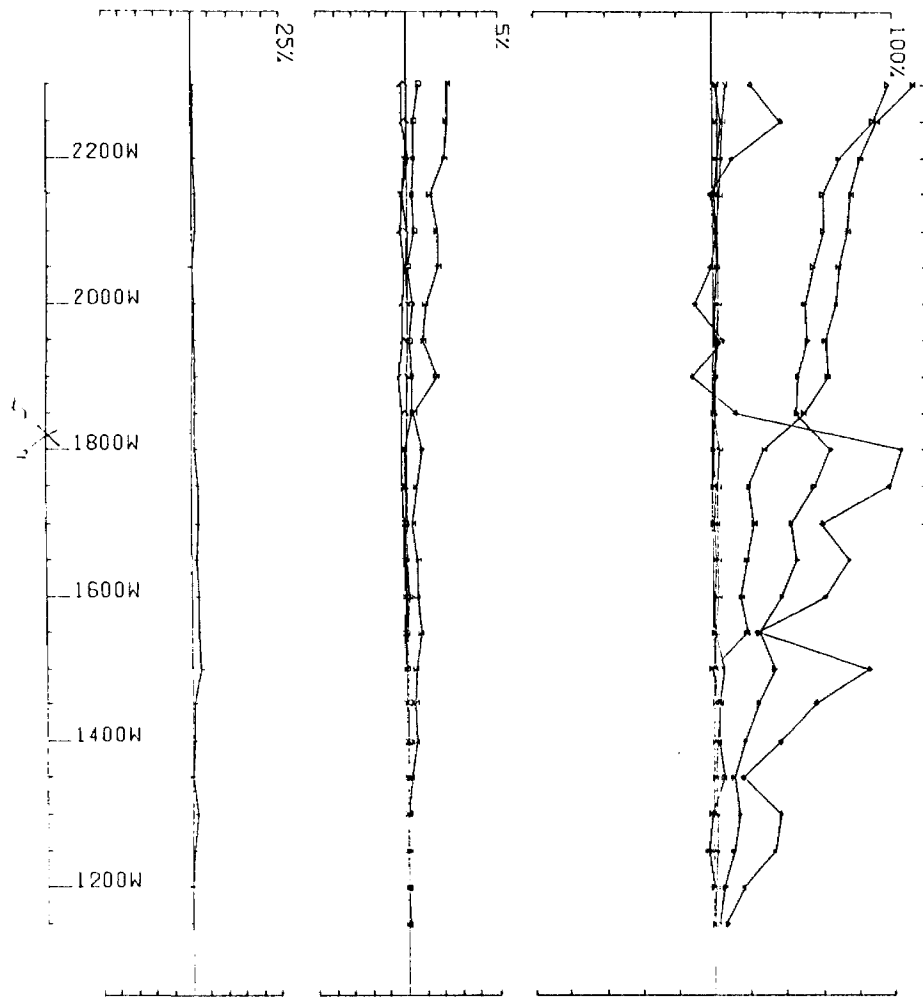
ITEM SURVEY AT PONTIAC TWP FOR NORTHCOTE INT INC  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 8A LINE 800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



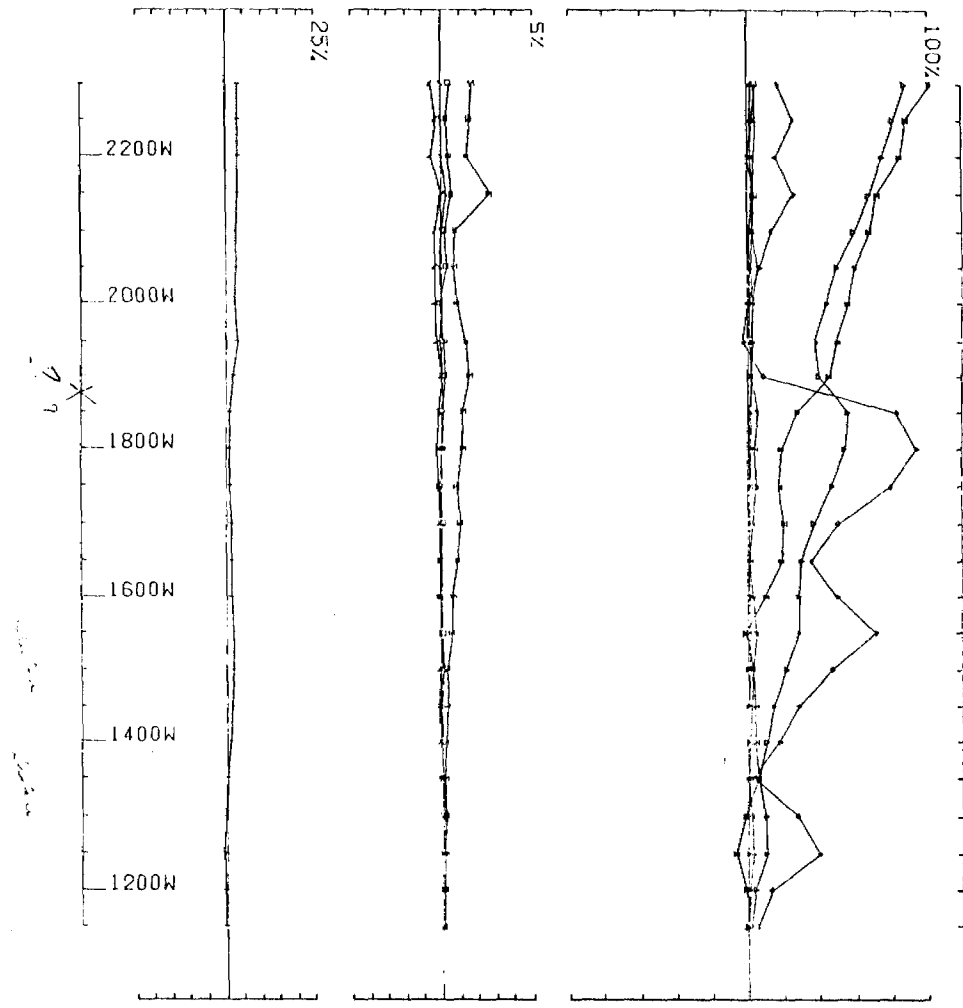
ITEM SURVEY AT PONTIAC TWP FOR NORTHGATE INT INC  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ HZ 30.97  
 LOOP NO 8A LINE 1000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



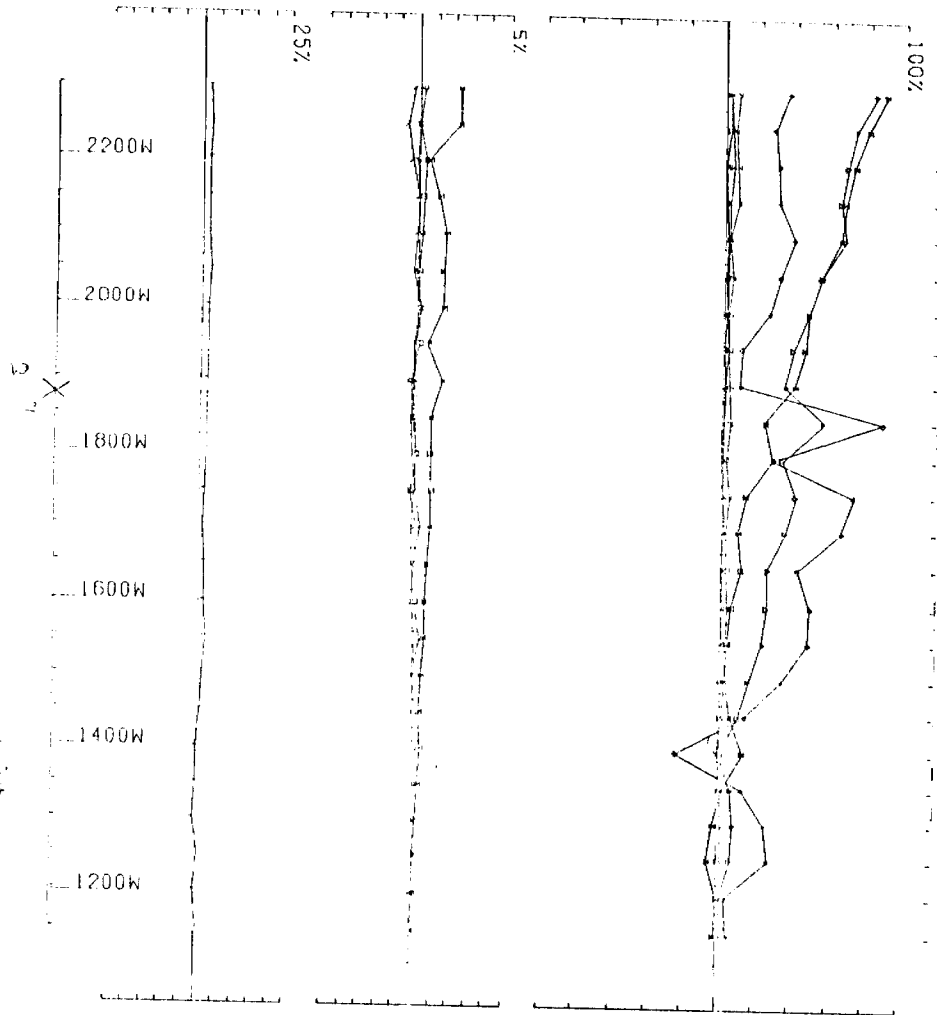
ITEM SURVEY AT PONTIAC TWP FOR NORTHGATE INT INC  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ HZ 30.97  
 LOOP NO 8A LINE 1200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9D26 BASE FREQ (HZ) 30.97  
 LOOP NO 9 LINE 1400 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

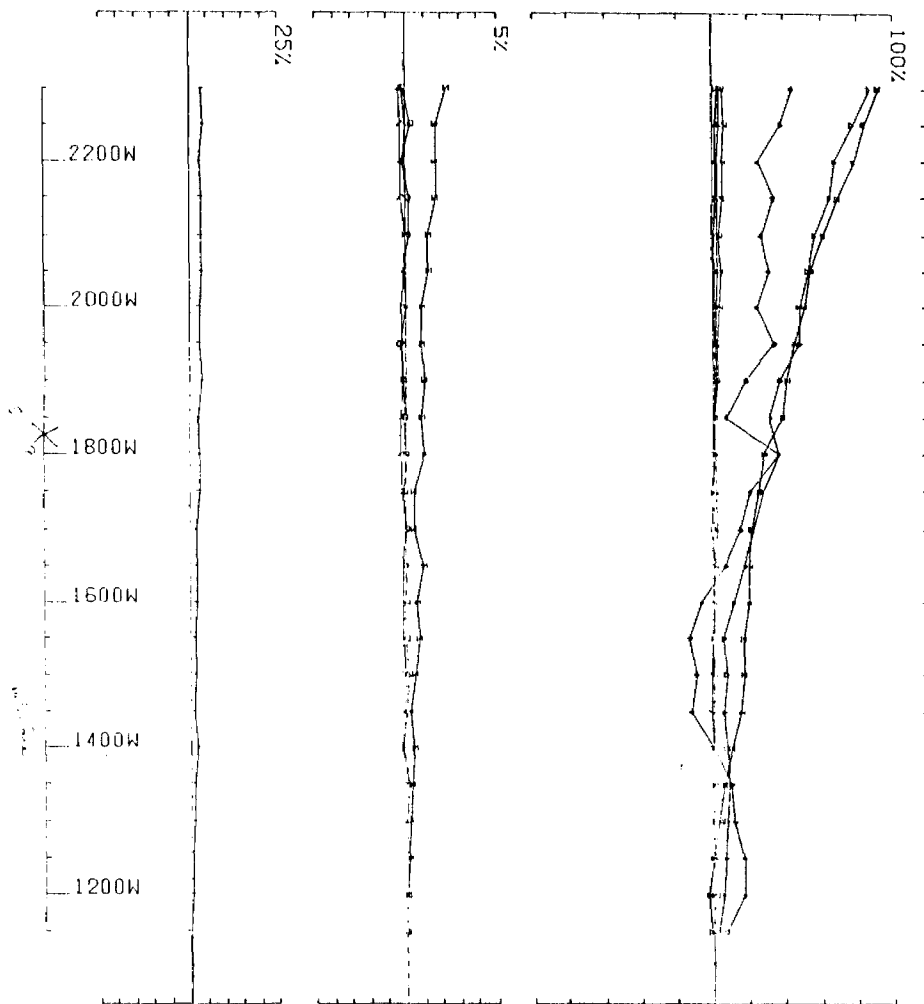


UTEM SURVEY AT PONTIAC TWP FOR HORTHCOTE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9 LINE 1600 N COMPONENT HZ SECONDARY FIELD CH1 EDNTIN. NDRH.

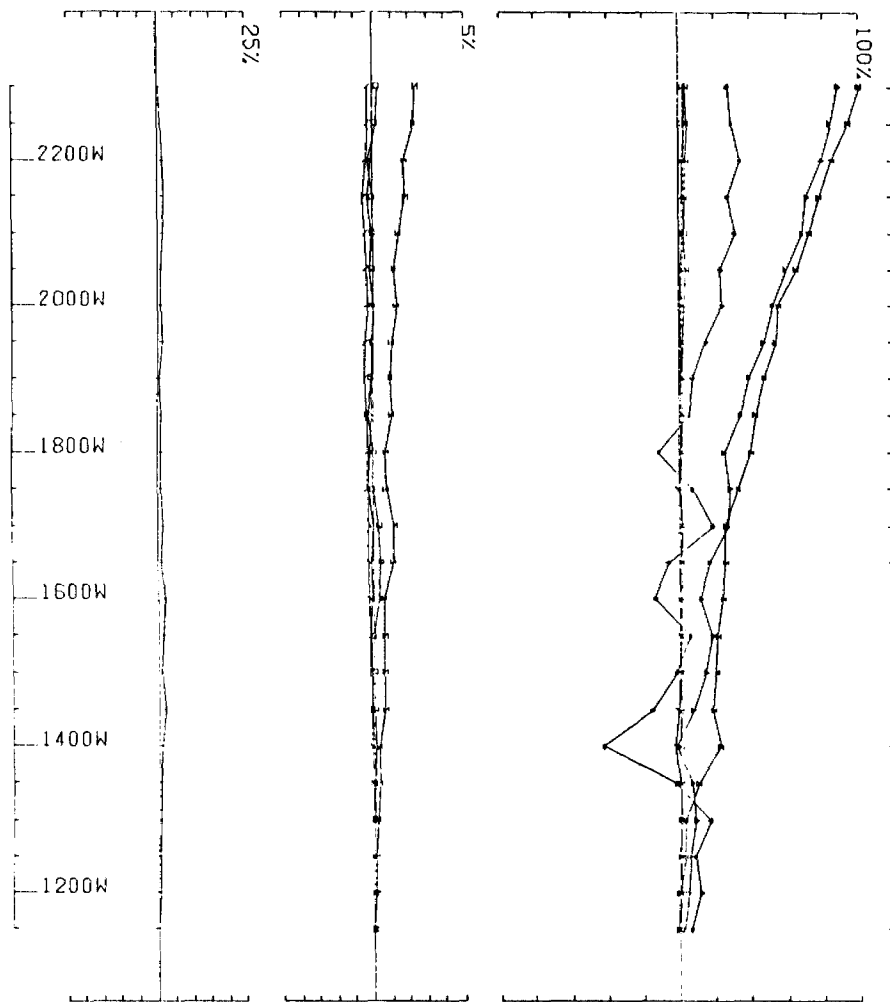


TEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ HZ 30.97  
 LOOP NO 9 LINE 1800 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

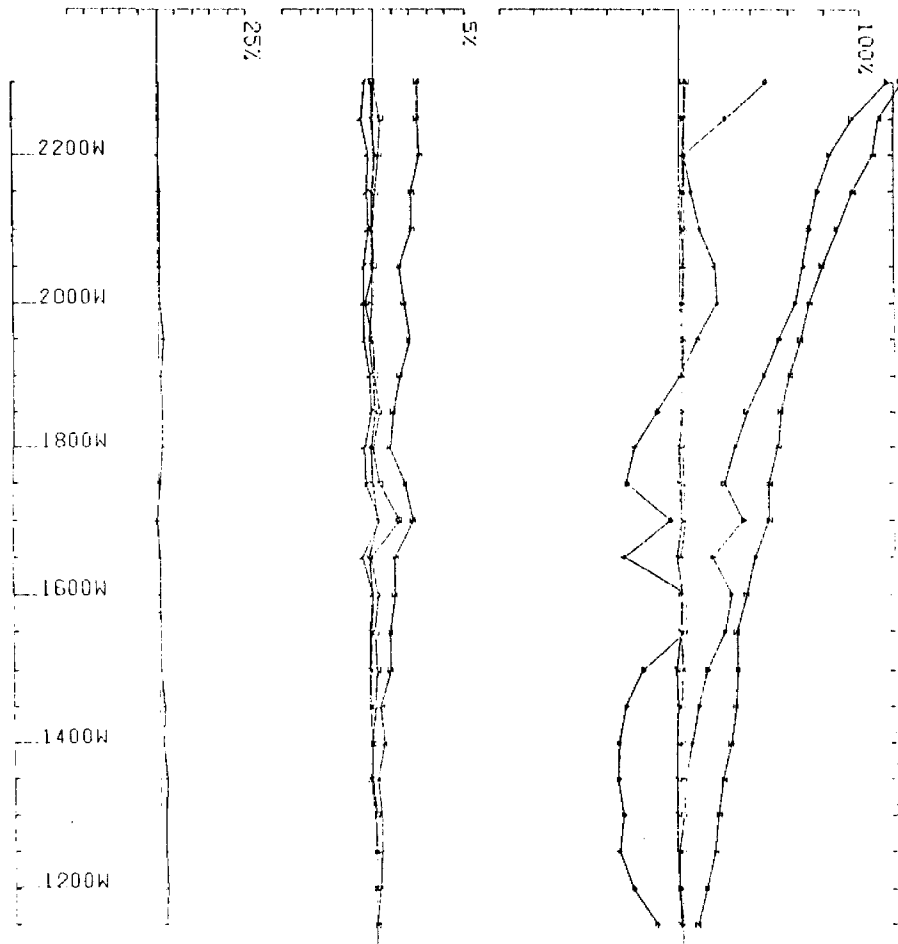




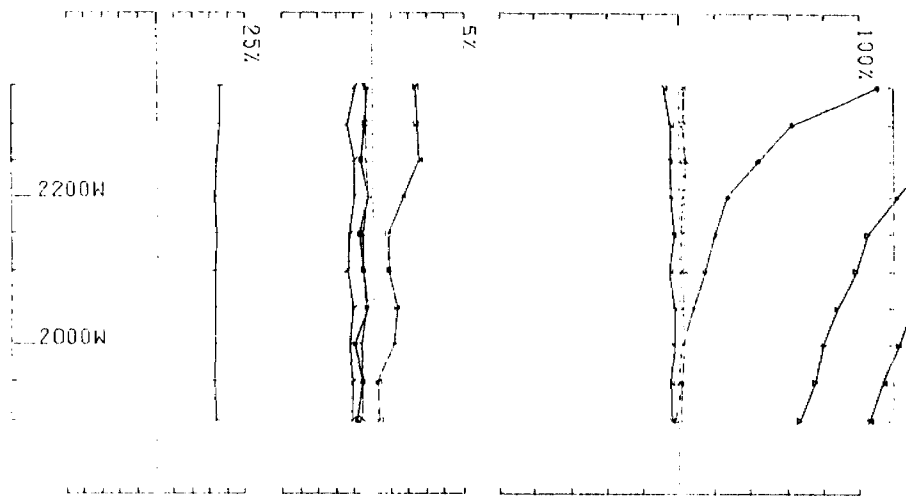
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9 LINE 2000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NDRN.



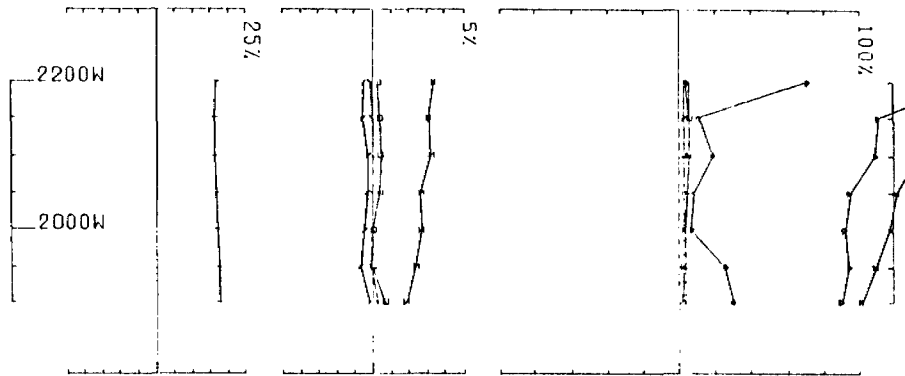
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9 LINE 2200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NDRM.



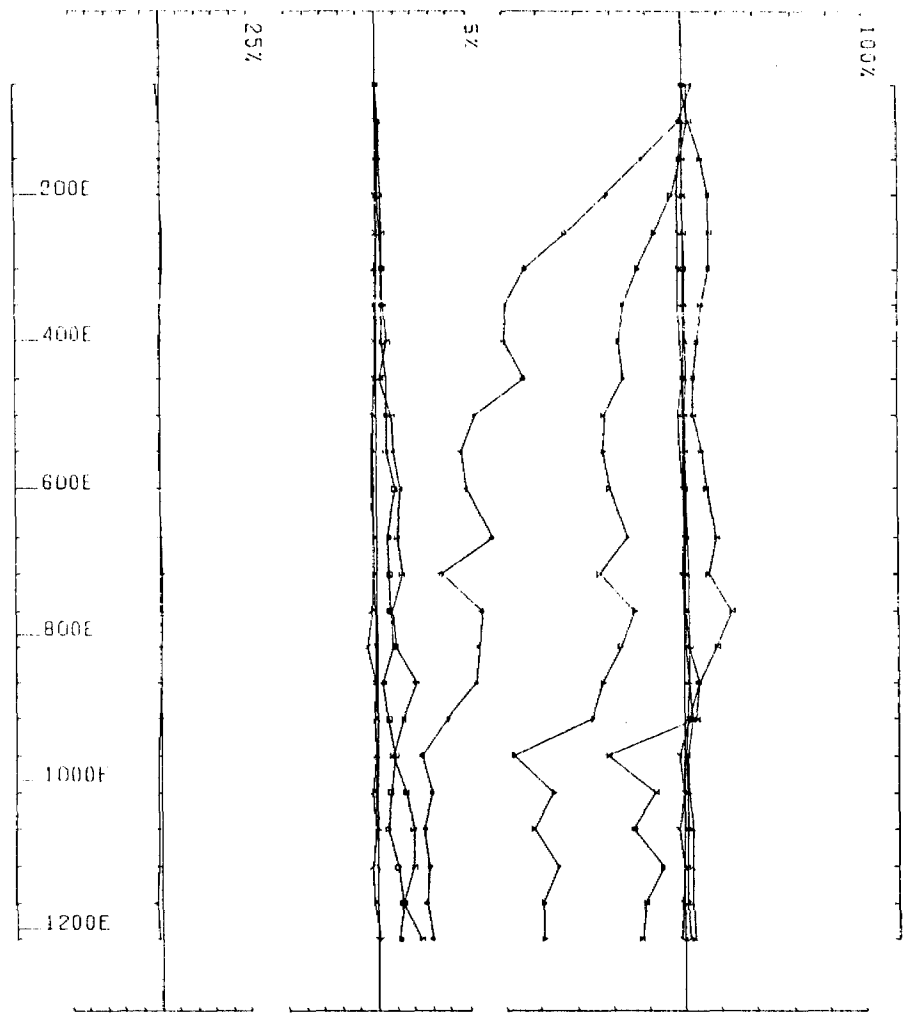
ITEM SURVEY AT PONTIAC TWP FOR HORTHGATE EXPLORATION  
 CONDUCTED BY LAMONT-DHNE GEOPHYSICS LTD JOB 9026 BASE FREQ (10/1 30.97)  
 LOOP NO 9 LINE 2400 N COMPONENT HZ SECONDARY FIELD CHI POINTIN. NUMM.



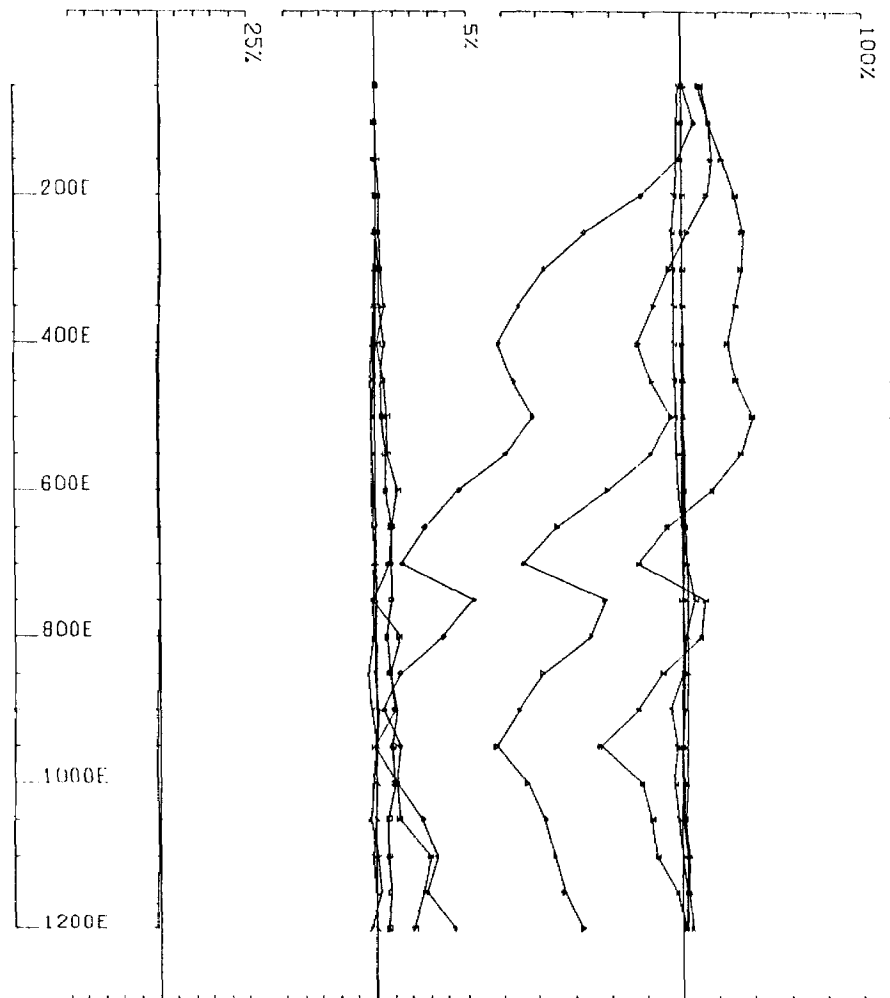
ITEM SURVEY AT PONTIAC TWP FOR MORTGAGE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ 10.7 Hz  
 LOOP NO 9 LINE 2600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM



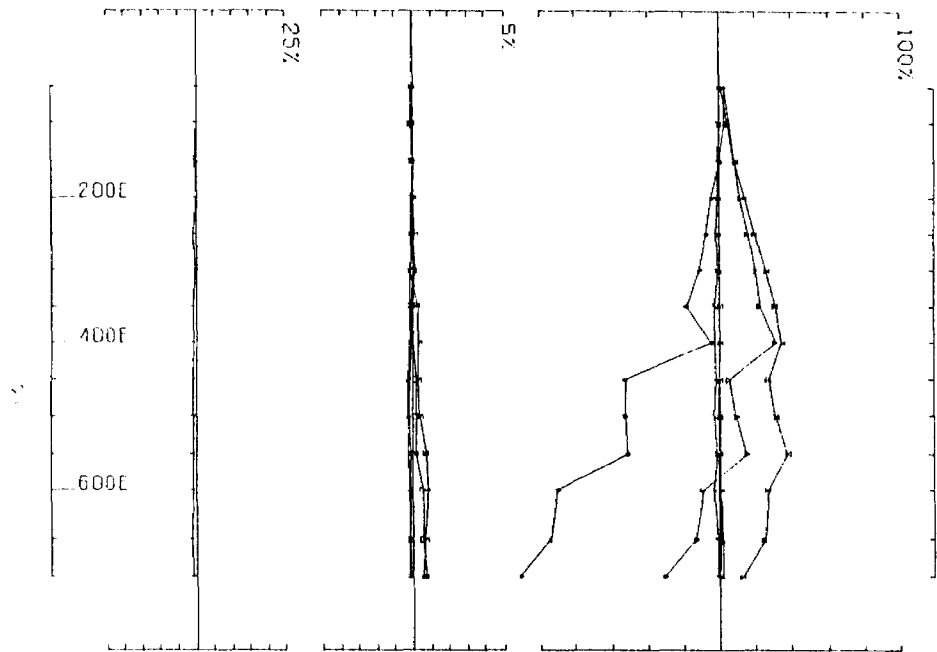
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 8026 BASE FREQ 1HZ 30.97  
 LOOP NO 9 LINE 2800 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.



TEM SURVEY AT PONTIAC TWP FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.07  
 LOOP NO 9A LINE 1400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

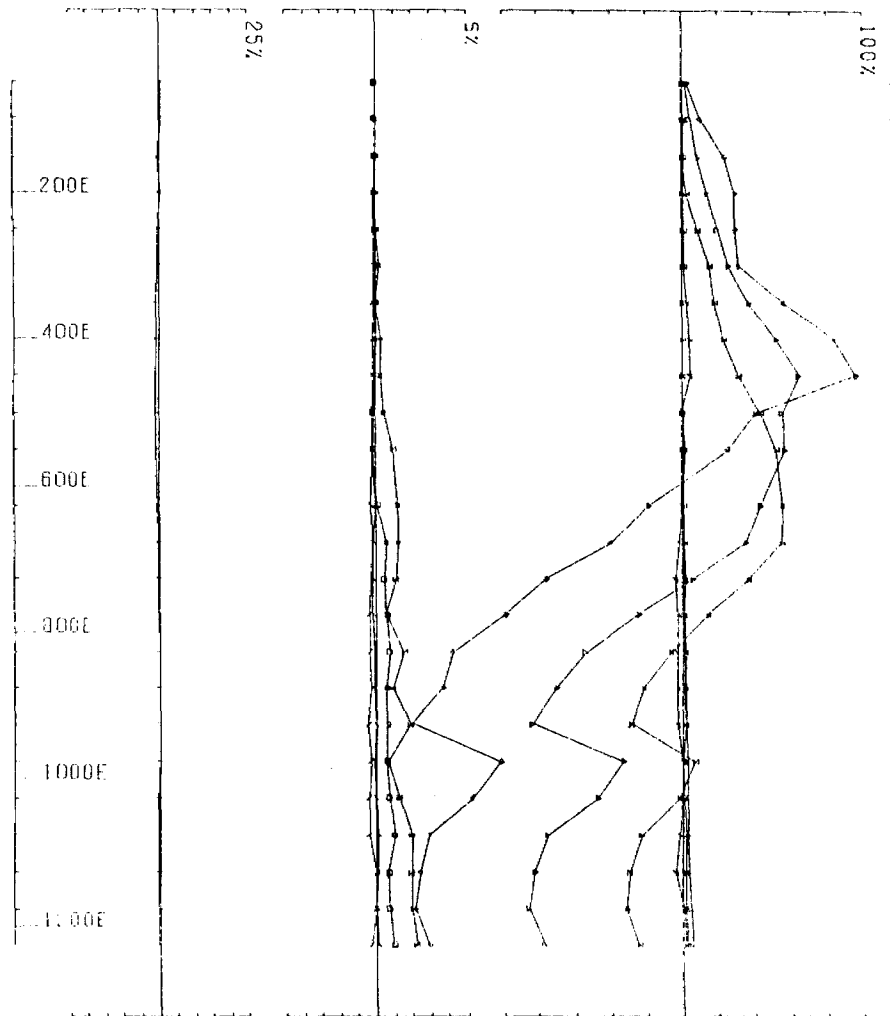


UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9A LINE 1600 N COMPONENT H2 SECONDARY FIELD CH1 CONTIN. NORM.

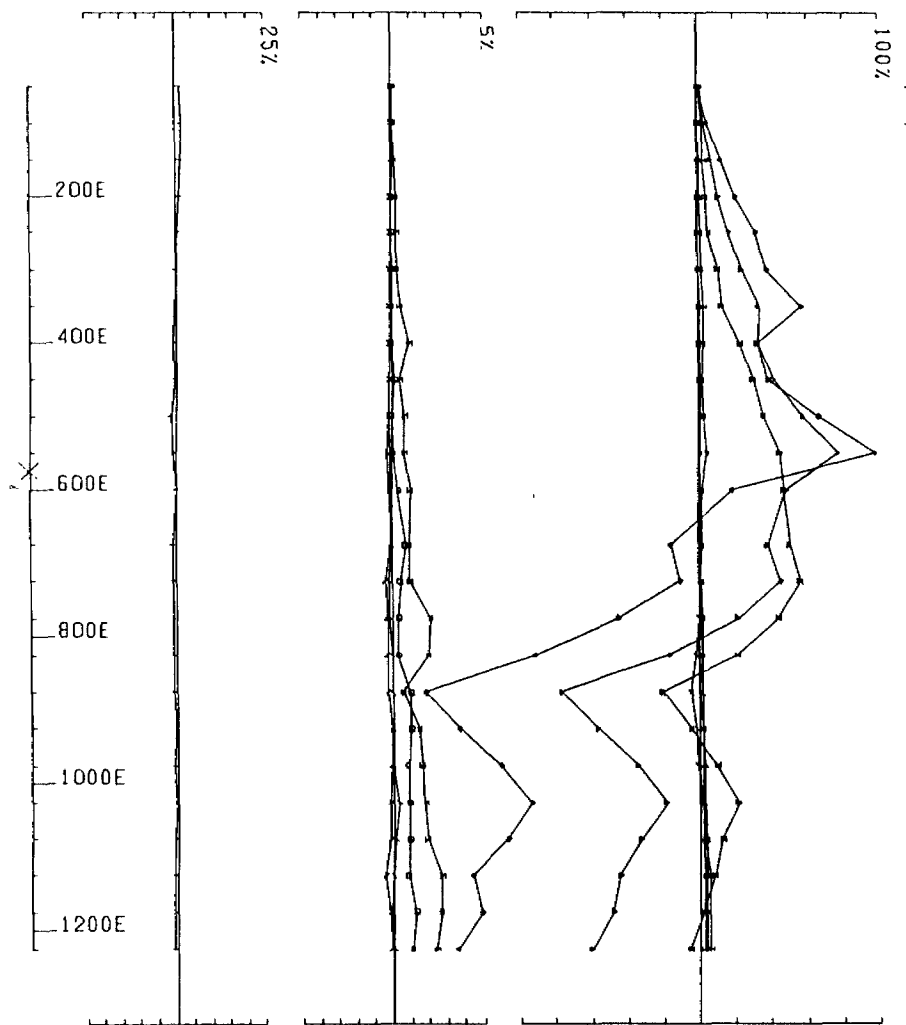


UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9A LINE 1800 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

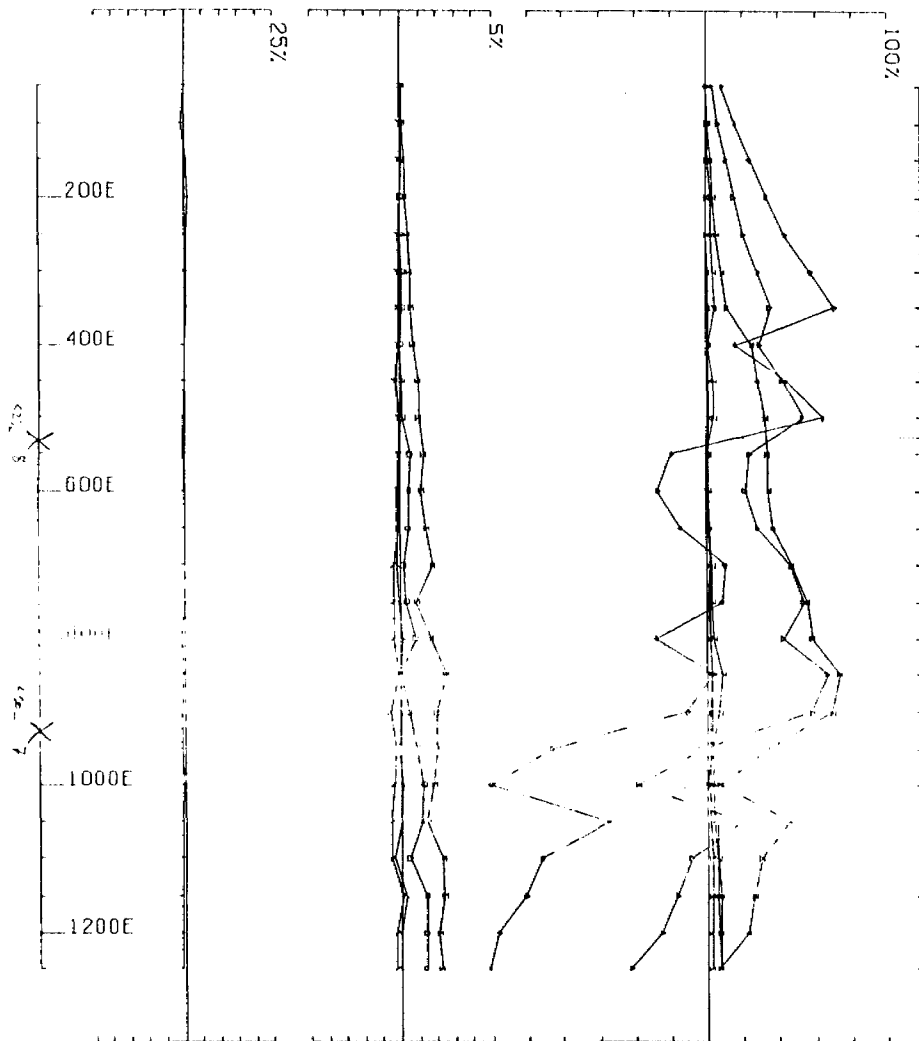




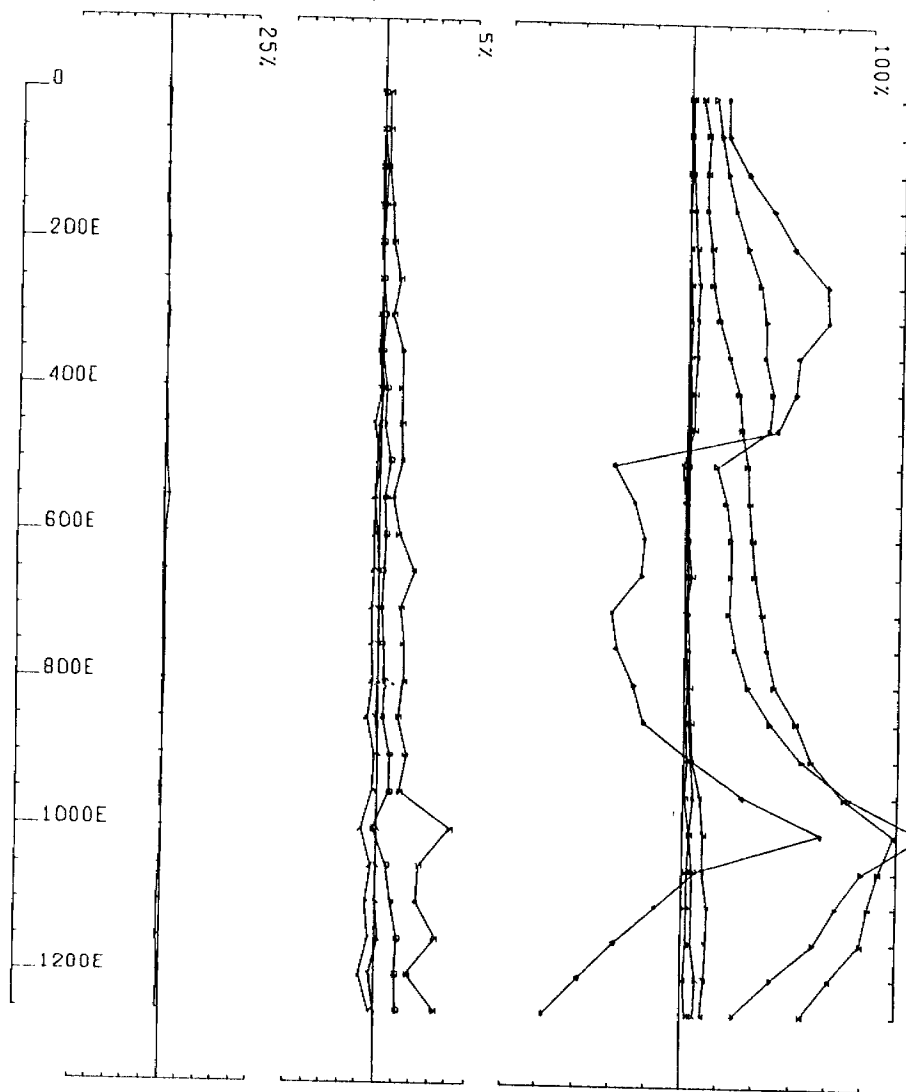
UTEM SURVEY AT PONTIAC TWP FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.07  
 LOOP NO 9A LINE 2000 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.



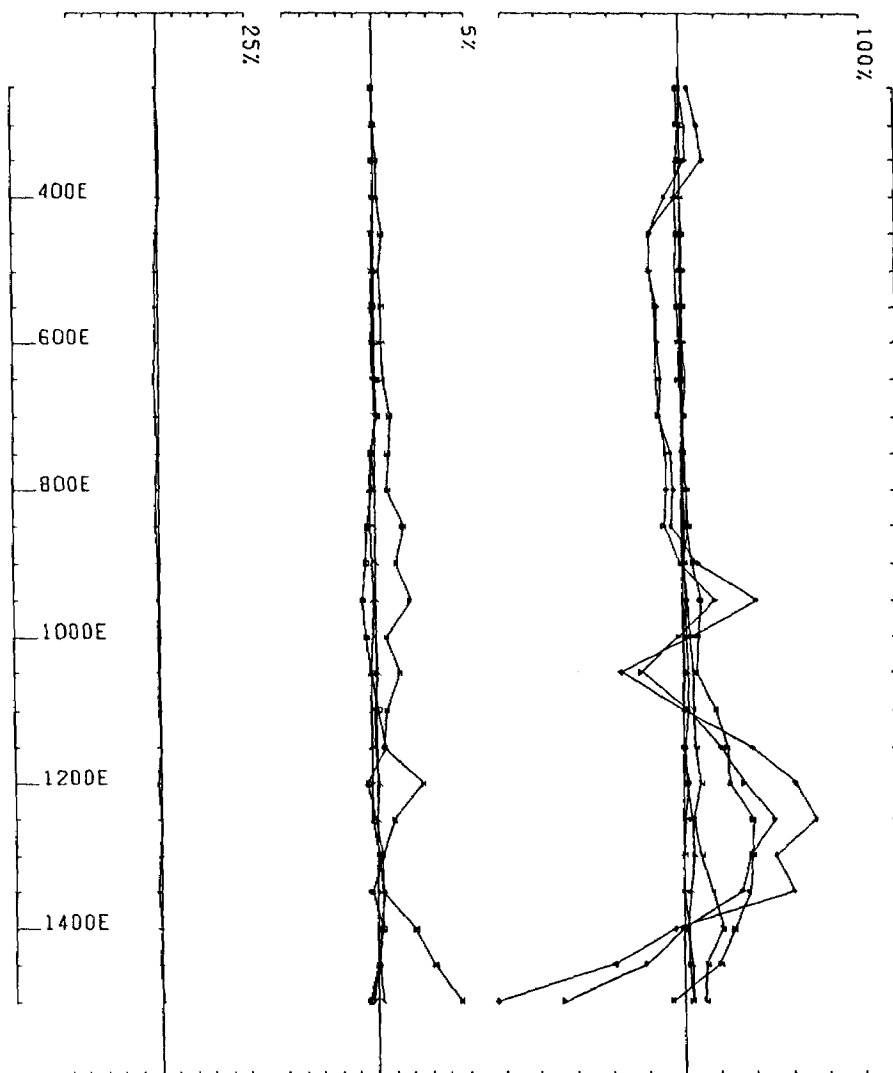
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9A LINE 2200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



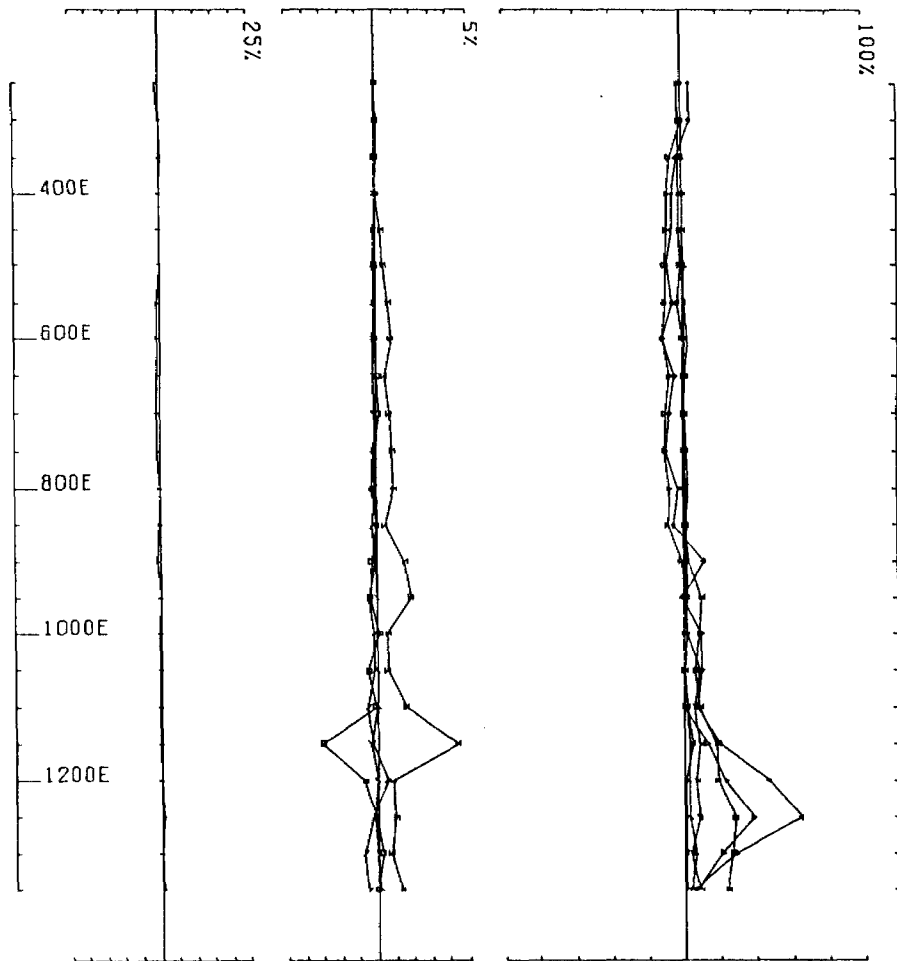
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9026 BASE FREQ (HZ) 30.97  
 LOOP NO 9A LINE 2400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



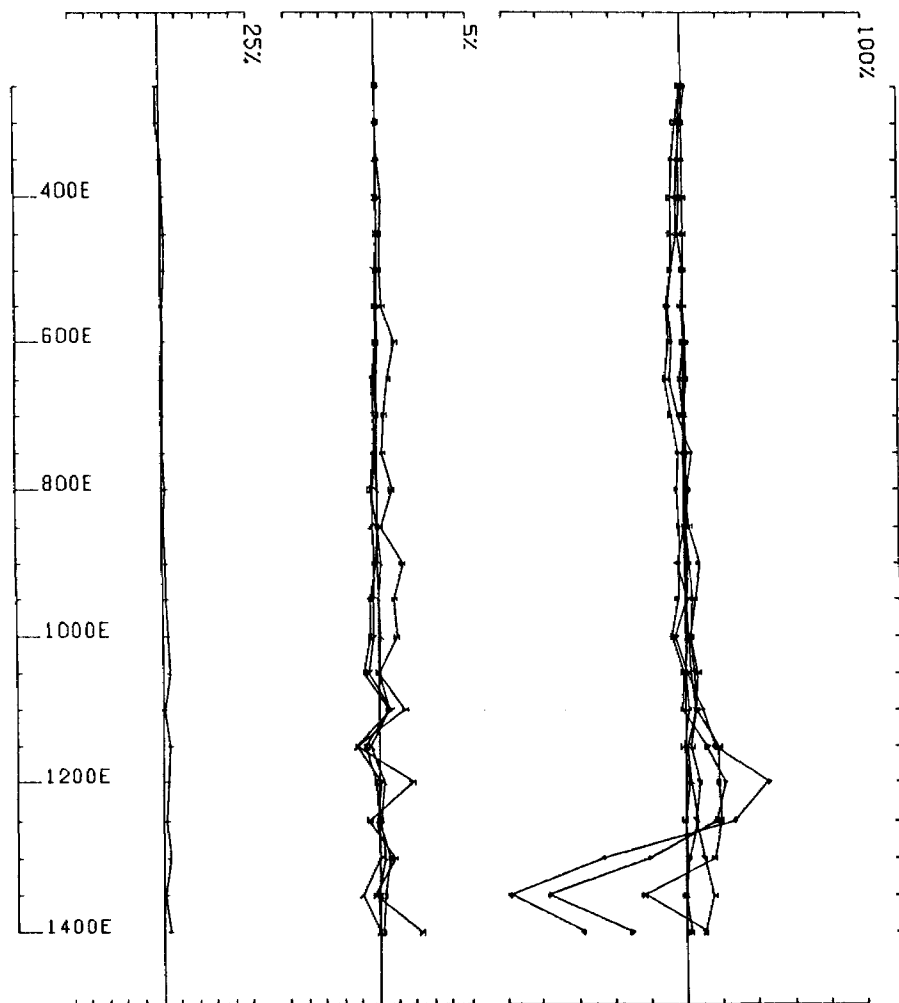
UTEM SURVEY AT PONTIAC TWP FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 9A LINE 2600 N COMPONENT H2 SECONDARY FIELD CH1 CONTIN. NORM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHDATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 10 LINE 2800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHOATE EXPLORATION  
 CONDUCTED BY LANONTAGNE GEOPHYSICS LTD JOB 0026 BASE FREQ (HZ) 30.07  
 LOOP NO 10 LINE 3000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



UTEM SURVEY AT PONTIAC TWP. FOR NORTHGATE EXPLORATION  
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9028 BASE FREQ (HZ) 30.97  
 LOOP NO 10 LINE 3200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



Ontario



32D05SE0001 2.14427 PONTIAC

900

Ministry of  
Northern Development  
and Mines

Ministère du  
Développement du Nord  
et des Mines

Geoscience Approvals Section  
Mining Lands Branch  
159 Cedar Street, 4th Floor  
Sudbury, Ontario  
P3E 6A5

Toll Free: 1-800-465-3880  
Telephone: (705) 670-7264  
Fax: (705) 670-7262

Our File: 2.14427  
Transaction #: W9180.05087

April 7, 1992

Mining Recorder  
Ministry of Northern Development  
and Mines  
4 Government Road East  
Kirkland Lake, Ontario  
P2N 1A2

Dear Sir:

RE: APPROVAL OF ASSESSMENT WORK ON MINING CLAIMS L 1115983 ET AL IN  
PONTIAC TOWNSHIP.

The deficiencies in this survey, as outlined in the Notice of  
Deficiency of February 11, 1992, have not been fully rectified within  
the specified 45 day time limit.

The Assessment Credits for this submission as outlined on the attached  
Assessment Work Credit form have been approved as of March 27, 1992.

Please indicate this approval on your records.

If you have any questions please contact Clive Stephenson at  
(705) 670-7251.

Yours sincerely,

Ron C. Gashinski  
Senior Manager, Mining Lands Branch  
Mines and Minerals Division

*dsj*  
CDS/jl

Enclosures:

cc: Resident Geologist  
Kirkland Lake, Ontario

Assessment Files Office  
Toronto, Ontario



CLAIM NUMBER	VALUE OF ASSESSMENT WORK DONE ON THIS CLAIM	VALUE APPLIED TO THIS CLAIM	VALUE ASSIGNED FROM THIS CLAIM	RESERVE
L1115983	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1115984	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1115985	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1115986	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1115987	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1115988	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129000	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1129001	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1129002	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1129003	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1129004	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1129005	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129006	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129007	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129008	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1129009	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1129010	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129011	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129012	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129013	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129014	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129015	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129016	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129017	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129018	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129620	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129621	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129622	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129623	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129624	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129625	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129626	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129627	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129628	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129629	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129630	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129631	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129632	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129633	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129634	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129635	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129636	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129637	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00

CLAIM NUMBER	VALUE OF ASSESSMENT WORK DONE ON THIS CLAIM	VALUE APPLIED TO THIS CLAIM	VALUE ASSIGNED FROM THIS CLAIM	RESERVE
L1129638	\$ 1377.30	\$ 1200.00	\$ 177.30	\$ 0.00
L1129639	\$ 1377.30	\$ 1200.00	\$ 177.30	\$ 0.00
L1129640	\$ 1377.30	\$ 1200.00	\$ 177.30	\$ 0.00
L1129641	\$ 1377.30	\$ 1200.00	\$ 177.30	\$ 0.00
L1129642	\$ 1377.30	\$ 1200.00	\$ 177.30	\$ 0.00
L1129643	\$ 1377.30	\$ 1600.00	\$ 0.00	\$ 0.00
L1129644	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129645	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129646	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129647	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129648	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129649	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129650	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129651	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129652	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129653	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129654	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129655	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1129656	\$ 900.00	\$ 1200.00	\$ 0.00	\$ 0.00
L1129657	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129658	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129659	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129660	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129661	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129662	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129663	\$ 900.00	\$ 1200.00	\$ 0.00	\$ 0.00
L1129664	\$ 900.00	\$ 1200.00	\$ 0.00	\$ 0.00
L1129665	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129666	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129667	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129668	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129669	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129670	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129671	\$ 900.00	\$ 1200.00	\$ 0.00	\$ 0.00
L1129672	\$ 900.00	\$ 1200.00	\$ 0.00	\$ 0.00
L1129673	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129674	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129675	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129676	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129677	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129678	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1129679	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137912	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00

CLAIM NUMBER	VALUE OF ASSESSMENT WORK DONE ON THIS CLAIM	VALUE APPLIED TO THIS CLAIM	VALUE ASSIGNED FROM THIS CLAIM	RESERVE
L1137913	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1137914	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1137915	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1137916	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137917	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137918	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137919	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137920	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137921	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137922	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137923	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137924	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137925	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137926	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137927	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137929	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137930	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137931	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137932	\$ 900.00	\$ 1200.00	\$ 0.00	\$ 0.00
L1137933	\$ 900.00	\$ 1200.00	\$ 0.00	\$ 0.00
L1137934	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137935	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137936	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137937	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137938	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137939	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1137940	\$ 900.00	\$ 2000.00	\$ 0.00	\$ 0.00
L1137941	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137942	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137943	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1137944	\$ 1377.30	\$ 2000.00	\$ 0.00	\$ 0.00
L1152568	\$ 1377.30	\$ 1200.00	\$ 177.30	\$ 0.00
L1152569	\$ 1377.30	\$ 1200.00	\$ 177.30	\$ 0.00
L1152570	\$ 1377.30	\$ 1200.00	\$ 147.30	\$ 30.00
L1152571	\$ 1377.30	\$ 1200.00	\$ 177.30	\$ 0.00
L1152572	\$ 1377.30	\$ 1200.00	\$ 177.30	\$ 0.00
L1152573	\$ 900.00	\$ 1200.00	\$ 0.00	\$ 0.00
L1152574	\$ 900.00	\$ 1200.00	\$ 0.00	\$ 0.00
L1152575	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1152576	\$ 900.00	\$ 0.00	\$ 900.00	\$ 0.00
L1152593	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1152594	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00

CLAIM NUMBER	VALUE OF ASSESSMENT WORK DONE ON THIS CLAIM	VALUE APPLIED TO THIS CLAIM	VALUE ASSIGNED FROM THIS CLAIM	RESERVE
L1152595	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1152596	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1152597	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1152598	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1152599	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1152600	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1152601	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1152602	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1152603	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1155459	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1155460	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1155461	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1155462	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1155463	\$ 1377.30	\$ 651.00	\$ 726.30	\$ 0.00
L1155464	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1155465	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1155466	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1155467	\$ 1377.30	\$ 0.00	\$ 1377.30	\$ 0.00
L1155468	\$ 337.50	\$ 0.00	\$ 337.50	\$ 0.00
L1155469	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
L1155470	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
L1155471	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
L1155472	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
TOTALS	\$177,081.00	\$177,051.00	\$ 55,975.50	\$ 30.00

Note: Changes from original submission are as per the instructions on the reverse of the report of work form, namely that credits are to be cut back starting with the claim listed last, working backwards. In the Notice of Deficiency I requested additional instructions if this was not the desired choice.

Therefore, the changes from the original submission effect the following claims:

L. 1155463, L. 1155468 to 472 inclusive.

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions about this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 160 Cedar Street, Sudbury, Ontario, P3E 6A5, telephone (705) 670-7264.

2.1

- Instructions:**
- Please type or print and submit in duplicate.
  - Refer to the Mining Act and Regulations for requirements of filing assessment work or consult the Mining Recorder.
  - A separate copy of this form must be completed for each Work Group.
  - Technical reports and maps must accompany this form in duplicate.
  - A sketch, showing the claims the work is assigned to, must accompany this form.

Recorded Holder(s) <b>OROFINO RESOURCES LIMITED</b>		Client No. <b>178097</b>
Address <b>Suite 2701, 1-First Canadian Place P.O. Box 143, Toronto Ontario</b>		Telephone No. <b>(416) 362-6883 Ext 243</b>
Mining Division <b>LARDER LAKE</b>	Township/Area <b>PONTIAC TWP.</b>	M or G Plan No. <b>M-382</b>
Date Work Performed From: <b>MAY 15, 1990</b>		To: <b>DECEMBER 15, 1990</b>

**Work Performed (Check One Work Group Only)**

Work Group	Type
<input checked="" type="checkbox"/> Geotechnical Survey	<b>Geology (Mapping), Line-cutting, Geochemistry, Geophysics (UTEM)</b>
<input type="checkbox"/> Physical Work, Including Drilling	
<input type="checkbox"/> Rehabilitation	
<input type="checkbox"/> Other Authorized Work	
<input type="checkbox"/> Assays	
<input type="checkbox"/> Assignment from Reserve	

Total Assessment Work Claimed on the Attached Statement of Costs \$ **183,630.00**

**Note:** The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

**Persons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)**

Name	Address
<b>FORPRO RESOURCES (D. Jones)</b>	<b>P.O. Box 1513, South Porcupine, Ontario P0N 1H0</b>
<b>EXCALIBUR CONSULTANTS (J. Bonnell)</b>	<b>10 Hurontario St. Mississauga Ontario L5G 3G7</b>
<b>LAMONTAGNE GEOPHYSICS</b>	<b>115 Grant Timmins Drive, Kingston, Ontario K7L 4U9</b>
<b>TSL LABORATORIES</b>	<b>2031 Riverside Drive, Unit #2, Timmins Ontario P4N 7C3</b>

(attach a schedule if necessary)

**Certification of Beneficial Interest \* See Note No. 1 on reverse side**

I certify that at the time the work was performed, the claims covered in this work report were recorded in the current holder's name or held under a beneficial interest by the current recorded holder.	Date	Recorded Holder or Agent (Signature)
--	------	--------------------------------------

**Certification of Work Report**

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or after its completion and annexed report is true.		
Name and Address of Person Certifying <b>Peter J. DOYLE - Senior Exploration Geologist - Orofino Resources Limited</b>		
Telephone No. <b>(416) 362-6883 Ext 243</b>	Date <b>NOVEMBER 9/91</b>	Certified By (Signature) 

**For Office Use Only**

Total Value Cr. Recorded <b>\$183,600.00</b> <b>30.00</b> <b>(banked)</b>	Date Recorded <b>NOVEMBER 14, 1990</b>	Mining Recorder 	Received Stamp <b>RECEIVED LARDER LAKE MINING DIVISION</b> <b>NOV 14 1991</b>
	Deemed Approval Date <b>FEBRUARY 12, 1992</b>	Date Approved	
	Date Notice for Amendments Sent		

TIME **10:31 am**



**Report of Work Conducted  
After Recording Claim**

Transaction Number

**Mining Act**

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions about this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 150 Cedar Street, Sudbury, Ontario, P3E 8A5, telephone (705) 670-7264.

- Instructions:
- Please type or print and submit in duplicate.
  - Refer to the Mining Act and Regulations for requirements of filing assessment work or consult the Mining Recorder.
  - A separate copy of this form must be completed for each Work Group.
  - Technical reports and maps must accompany this form in duplicate.
  - A sketch, showing the claims the work is assigned to, must accompany this form.

Recorded Holder(s) <b>OROFINO RESOURCES LIMITED</b>	Client No. <b>178097</b>
Address <b>Suite 2701, 1-Find Canadian Place, P.O. Box 143, Toronto Ontario</b>	MSX 1C7 Telephone No. <b>(416) 362-6683 Ext 243</b>
Mining Division <b>LARDER LAKE</b>	Township/Area <b>PONTIAC TWP.</b>
Date Work Performed From: <b>MAY 15, 1990</b>	To: <b>DECEMBER 15, 1990</b>

**Work Performed (Check One Work Group Only)**

Work Group	Type
<input checked="" type="checkbox"/> Geotechnical Survey	<b>Geology (Mapping), Line-cutting, Geochemistry, Geophysics (UTEM)</b>
<input type="checkbox"/> Physical Work, Including Drilling	
<input type="checkbox"/> Rehabilitation	
<input type="checkbox"/> Other Authorized Work	
<input type="checkbox"/> Assays	
<input type="checkbox"/> Assignment from Reserve	

Total Assessment Work Claimed on the Attached Statement of Costs \$ **183,630**

Note: The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

**Persons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)**

Name	Address
<b>FORPRO RESOURCES (D. Jones)</b>	<b>P.O. Box 1513, South Brantford, Ontario P6N 1H0</b>
<b>EXAMBAR CONSULTANTS (E. Benwell)</b>	<b>10 Humbria St. Mississauga Ontario L5G 3G7</b>
<b>LAMONTAGNE GEOPHYSICS</b>	<b>115 Saint Timmins Drive, Kingston, Ontario K7L 4V4</b>
<b>TSL LABORATORIES</b>	<b>2031 Riverside Drive, Unit #2, Timmins Ontario P4N 7C3</b>

(attach a schedule if necessary)

**Certification of Beneficial Interest \* See Note No. 1 on reverse side**

I certify that at the time the work was performed, the claims covered in this work report were recorded in the current holder's name or held under a beneficial interest by the current recorded holder.	Date <b>Nov 9/91</b>	Recorded Holder's Name (Signature) <i>[Signature]</i>
--	-------------------------	--

**Certification of Work Report**

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or after its completion and annexed report is true.		
Name and Address of Person Certifying <b>Peter J. DOYLE - Senior Exploration Geologist - Orofino Resources Limited</b>		
Telephone No. <b>(416) 362-6683 Ext 243</b>	Date <b>NOVEMBER 9/91</b>	Certified By (Signature) <i>[Signature]</i>

**For Office Use Only**

Total Value Cr. Recorded	Date Recorded	Mining Recorder	Received By <b>LARDER LAKE MINING DIVISION</b>
	Deemed Approval Date	Date Approved	<b>NOV 18 1991</b>
	Date Notice for Amendments Sent		

0241 (03/91)

TIME **11:08 am**

DOCUMENT No. W9180-05087

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présente formule sont recueillis en vertu de la Loi sur les mines et serviront à tenir à jour un registre des concessions minières. Adresser toute question sur la collecte de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4<sup>e</sup> étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Oeuvre Main-d'oeuvre	24,781 <sup>00</sup>	34,781 <sup>00</sup>
	Field Supervision Supervision sur le terrain	10,000 <sup>00</sup>	
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type Gallego K Pham	19,200 <sup>00</sup>	115,557 <sup>00</sup>
	Geophysics	62,854 <sup>00</sup>	
	Linecutting	33,503 <sup>00</sup>	
Supplies Used Fournitures utilisées	Type GLENDON		13,564 <sup>00</sup>
	Type Box Map	2,900 <sup>00</sup>	
	District Property	1,193 <sup>00</sup>	
	Field Gear		
	Drafting/Reproduction	1,014 <sup>00</sup>	
	TSL LABS	8,457 <sup>00</sup>	
Equipment Rental Location de matériel			

24 781.00 + Total Direct Costs Total des coûts directs 163,902.00  
 10 000.00 +  
 19 200.00 +  
 62 854.00 +  
 33 503.00 + required to verify expenditures claimed in  
 2 900.00 + in 30 days of a request for verification. If  
 1 193.00 + the Minister may reject for assessment work  
 1 014.00 + not work submitted.  
 8 457.00 +  
 163 902.00 +  
 -----  
 s of completion is claimed at 100% of Assessment Credit.

2. Indirect Costs/Coûts indirects

Note: When claiming Rehabilitation work indirect costs are not allowable as assessment work. Pour le remboursement des travaux de réhabilitation, les coûts indirects ne sont pas admissibles en tant que travaux d'évaluation.

Type	Description	Amount Montant	Totals Total global
Transportation Transport	Type Truck Rental	3,217 <sup>00</sup>	19,728 <sup>00</sup>
	Commercial Air Travel	531 <sup>00</sup>	
	Gas / Repairs	3,314 <sup>00</sup>	
	Geophysical Consultant Travel	2,186 <sup>00</sup>	
	SAMPLE SHIPMENT (BUS)	165 <sup>00</sup>	
Food and Lodging Nourriture et hébergement	Grace us Meals Hotels	10,315 <sup>00</sup>	10,315 <sup>00</sup>
Mobilization and Demobilization Mobilisation et démobiliation			

Sub Total of Indirect Costs Total partiel des coûts indirects 19,728<sup>00</sup>  
 Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)  
 Total Value of Assessment Credit (Total of Direct and Allowable indirect costs) Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles) 19,728<sup>00</sup>

Note: Le titulaire enregistré sera tenu de verser le présent état des coûts dans les 30 jours de la date de dépôt. Si la vérification n'est pas effectuée ou une partie des travaux d'évaluation n'est pas effectuée, le montant des coûts indirects admissibles sera réduit de 50% de la valeur totale des coûts indirects admissibles.  
 3 217.00 +  
 531.00 +  
 3 314.00 +  
 2 186.00 +  
 165.00 +  
 10 315.00 +  
 19 728.00 =

2. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

2. Les travaux déposés trois, quatre ou cinq ans après leur achèvement sont remboursés à 50 % de la valeur totale du crédit d'évaluation susmentionné. Voir les calculs ci-dessous.

Total Value of Assessment Credit	Total Assessment Claimed
x 0.50 =	

Valeur totale du crédit d'évaluation	Evaluation totale demandée
x 0,50 =	

Certification Verifying Statement of Costs

I hereby certify: that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

Attestation de l'état des coûts

J'atteste par la présente: que les montants indiqués sont le plus exact possible et que ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

that as Sarah Explorata Gallego (Recorded Holder, Agent, Position in Company) I am authorized

Et qu'à titre de \_\_\_\_\_ je suis autorisé (titulaire enregistré, représentant, poste occupé dans la compagnie)

to make this certification

à faire cette attestation.

Signature \_\_\_\_\_

Date Nov 9 97







Work Report Number for Applying Reserve	Claim Number (see Note 2)	Number of Claim Units
	L-1129629	1
	L-1129630	1
	L-1129631	1
	L-1129632	1
	L-1129633	1
	L-1129634	1
	L-1129635	1
	L-1129636	1
	L-1129637	1
	L-1129638	1
	L-1129639	1
	L-1129640	1
	L-1129641	1
	L-1129642	1
	L-1129643	1
	L-1129644	1
	L-1129645	1
	(17)	

SubTotal Number of Claims

Value of Assessment Work Done on this Claim	Value Applied to this Claim
\$1377 <sup>7c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$1200 <sup>00</sup>
\$1377 <sup>3c</sup>	\$1200 <sup>00</sup>
\$1377 <sup>3c</sup>	\$1200 <sup>00</sup>
\$1377 <sup>3c</sup>	\$1200 <sup>00</sup>
\$1377 <sup>3c</sup>	\$1600 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$1377 <sup>3c</sup>	\$2000 <sup>00</sup>
\$23,414 <sup>10</sup>	\$29,600 <sup>00</sup>

Total Value Work Done

Total Value Work Applied

(74 years)

Value Assigned from this Claim	Reserve: Work to be Claimed at a Future Date
NIL	NIL
NIL	NIL
NIL	NIL
NIL	NIL
NIL	NIL
NIL	NIL
NIL	NIL
NIL	NIL
NIL	NIL
NIL	NIL
\$177 <sup>3c</sup>	NIL
\$177 <sup>3c</sup>	NIL
\$177 <sup>3c</sup>	NIL
\$177 <sup>3c</sup>	NIL
NIL	NIL
NIL	NIL
NIL	NIL
\$886 <sup>50</sup>	NIL

Total Assigned From

Total Reserve

Credits you are claiming in this report may be cut back. In order to minimize the adverse effects of such deletions, please indicate from which claims you wish to prioritize the deletion of credits. Please mark (✓) one of the following:


1.  Credits are to be cut back starting with the claim listed last, working backwards.
2.  Credits are to be cut back equally over all claims contained in this report of work.
3.  Credits are to be cut back as prioritized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

Note 1: Examples of beneficial interest are unrecorded transfers, option agreements, memorandum of agreements, etc., with respect to the mining claims.

Note 2: If work has been performed on patented or leased land, please complete the following:

I certify that the recorded holder has a beneficial interest in the patented or leased land at the time the work was performed.

Signature: 

Date: Nov 11/97







Work Report Number for Applying Reserve	Claim Number (see Note 2)	Number of Claim Units
*	L-1137930	1
*	L-1137931	1
	L-1137932	1
	L-1137933	1
*	L-1137934	1
*	L-1137935	1
*	L-1137936	1
*	L-1137937	1
*	L-1137938	1
*	L-1137939	1
	L-1137940	1
	L-1137941	1
	L-1137942	1
	L-1137943	1
	L-1137944	1
	L-1152568	1
	L-1152569	1

17 CLAIMS  
 Sum Total Number of Claims (CONT)

Value of Assessment Work Done on this Claim	Value Applied to this Claim
\$900	NIL
\$900	NIL
\$900	\$1200 <sup>00</sup>
\$900	\$1200 <sup>00</sup>
\$900	NIL
\$900	NIL
\$900	NIL
\$900	NIL
\$900	NIL
\$900	NIL
\$900	NIL
\$900	\$2000 <sup>00</sup>
\$1377 <sup>30</sup>	\$2000 <sup>00</sup>
\$1377 <sup>30</sup>	\$2000 <sup>00</sup>
\$1377 <sup>30</sup>	\$2000 <sup>00</sup>
\$1377 <sup>30</sup>	\$2000 <sup>00</sup>
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>
\$18,163 <sup>80</sup>	\$14,800 <sup>00</sup>

Total Value Work Done  
 Total Value Work Applied  
 (37 years)

Value Assigned from this Claim	Reserve: Work to be Claimed at a Future Date
\$900	NIL
\$900	NIL
NIL	NIL
NIL	NIL
\$900	NIL
\$900	NIL
\$900	NIL
\$900	NIL
\$900	NIL
\$900	NIL
\$900	NIL
NIL	NIL
NIL	NIL
NIL	NIL
NIL	NIL
177 <sup>30</sup>	NIL
177 <sup>30</sup>	NIL
\$7554 <sup>60</sup>	NIL

Total Assigned From  
 Total Reserve

Credits you are claiming in this report may be cut back. In order to minimize the adverse effects of such deletions, please indicate from which claims you wish to prioritize the deletion of credits. Please mark (-) one of the following:


- Credits are to be cut back starting with the claim listed last, working backwards.
- Credits are to be cut back equally over all claims contained in this report of work.
- Credits are to be cut back as prioritized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

Note 1: Examples of beneficial interest are unrecorded transfers, option agreements, memorandum of agreements, etc., with respect to the mining claims.

Note 2: If work has been performed on patented or leased land, please complete the following:

I certify that the recorded holder had a beneficial interest in the patented or leased land at the time the work was performed.

Signature:  Date: Nov 11/91

Work Report Number for Applying Reserve	Claim Number (see Note 2)	Number of Claim Units
	L-1152570	1
	L-1152571	1
	L-1152572	1
	L-1152573	1
	L-1152574	1
*	L-1152575	1
62 *	L-1152576	1
*	L-1152593	1
*	L-1152594	1
*	L-1152595	1
*	L-1152596	1
*	L-1152597	1
*	L-1152598	1
*	L-1152599	1
*	L-1152600	1
*	L-1152601	1
*	L-1152602	1

Sub Total Number of Claims (cont)

Value of Assessment Work Done on this Claim	Value Applied to this Claim
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>
\$1377 <sup>20</sup>	\$1200 <sup>00</sup>
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>
\$900	\$1200 <sup>00</sup>
\$900	\$1200 <sup>00</sup>
\$900	NIL
\$900	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$21,504 <sup>90</sup>	\$6000 <sup>00</sup>

Total Value Work Done (15 years)  
Total Value Work Applied

Value Assigned from this Claim	Reserve: Work to be Claimed at a Future Date
\$147 <sup>30</sup>	\$30 <sup>00</sup>
\$177 <sup>30</sup>	NIL
\$177 <sup>30</sup>	NIL
NIL	NIL
NIL	NIL
\$900	NIL
\$900	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$16,074 <sup>90</sup>	\$30 <sup>00</sup>

Total Assigned From Total Reserve

Credits you are claiming in this report may be cut back. In order to minimize the adverse effects of such deletions, please indicate from which claims you wish to prioritize the deletion of credits. Please mark (✓) one of the following:

- Credits are to be cut back starting with the claim listed last, working backwards.
- Credits are to be cut back equally over all claims contained in this report of work.
- Credits are to be cut back as prioritized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

Note 1: Examples of beneficial interest are unrecorded transfers, option agreements, memorandum of agreements, etc., with respect to the mining claims.

Note 2: If work has been performed on patented or leased land, please complete the following:

I certify that the recorded holder had a beneficial interest in the patented or leased land at the time the work was performed.

Date: Nov 11/94  
Signature: [Handwritten Signature]

Work Report Number for Applying Reserve	Claim Number (see Note 2)	Number of Claim Units
*	L-1152603	1
*	L-1155459	1
*	L-1155460	1
*	L-1155461	1
*	L-1155462	1
	L-1155463	1
*	L-1155464	1
*	L-1155465	1
*	L-1155466	1
*	L-1155467	1
	L-1155468	1
	L-1155469	1
	L-1155470	1
	L-1155471	1
	L-1155472	1

151 Claims

Total Number of Claims

Value of Assessment Work Done on this Claim	Value Applied to this Claim
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>
\$1377 <sup>30</sup>	\$1200 <sup>00</sup>

\$20,659<sup>50</sup>/<sub>100</sub>

Total Value Work Done

\$7,200<sup>00</sup>/<sub>52</sub>

Total Value Work Applied

18 years

Value Assigned from this Claim	Reserve: Work to be Claimed at a Future Date
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$177 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>50</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$1377 <sup>30</sup>	NIL
\$177 <sup>30</sup>	NIL
\$177 <sup>30</sup>	NIL
\$177 <sup>30</sup>	NIL
\$177 <sup>30</sup>	NIL

\$13,459<sup>50</sup>/<sub>52</sub>

Total Assigned From

NIL

Total Reserve

Credits you are claiming in this report may be cut back. In order to minimize the adverse effects of such deletions, please indicate from which claims you wish to prioritize the deletion of credits. Please mark (✓) one of the following:

- Credits are to be cut back starting with the claim listed last, working backwards.
- Credits are to be cut back equally over all claims contained in this report of work.
- Credits are to be cut back as prioritized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

Note 1: Examples of beneficial interest are unrecorded transfers, option agreements, memorandum of agreements, etc., with respect to the mining claims.

Note 2: If work has been performed on patented or leased land, please complete the following:

I certify that the recorded holder had a beneficial interest in the patented or leased land at the time the work was performed.

Signature

Date

Nov 11/01



**OROFINO**  
RESOURCES LIMITED

P.O. BOX 143, 1 FIRST CANADIAN PLACE, TORONTO, CANADA M5X1C7 TELEPHONE: (416) 362-6683 TELEX: 06-217766

November 8, 1991

2 . 1 4 4 2 7

Mr. Martin Cuda  
The Mining Recorder  
MINISTRY OF NORTHERN DEVELOPMENT  
AND MINES  
Recording Office  
4 Government Road East  
Kirkland Lake, Ontario  
P4N 1A2

RECEIVED

JAN 21 1992

MINING LANDS BRANCH

**RE: 1990 PONTIAC TOWNSHIP; REVISED ASSESSMENT SUBMISSION**  
**REFUSAL: 057-91**

Dear Sir:

Attached please find (in duplicate) completed copies of the "Report of Work Conducted" and "Statement of Costs" pertaining to Orofino Resources 1990 exploration work on 151 claims in Pontiac Township.

The 1990 program consisted of line-cutting, geological mapping, and geochemistry (rock and soil sampling) as well as a selective geophysical (UTEM) survey. All of the geotechnical work costs with the exception of those pertaining to the UTEM survey have been distributed evenly over the entire 151 claims since the work principally consisted of a property wide line-cutting job followed by a systematic line mapping and outcrop sampling effort. The geophysical (UTEM) survey covered most of the upper two-thirds of the property and total costs attributable to the survey were \$47,730.00.

With total expenditures of \$183,630.00 of which \$47,730.00 for the UTEM work the balance of the geotechnical work costs (\$135,900.00) have been distributed evenly at \$900.00 per claim over the entire 151 claims. In addition the UTEM costs have been distributed equally at \$477.00 over the 100 claims involved in the survey.

Our current plans call for the abandonment of 49 peripheral claims along the NE and southern margins of 151 contiguous claim Pontiac property. To this end I have re-assigned the assessment work from those claims earmarked for abandonment to claims which we wish to retain (See Attached Plan).

.../2

2. 1 4 4 2 8

The claims that we wish to abandon will be allowed to lapse as their respective anniversary dates pass. No work will be applied to maintain the 19 claims NE corner or the 30 claims along the current block southern margin.

I trust these revised forms and re-allocations of expenditures will meet with your approval.

If you have any questions regarding this submission please feel free to contact me directly in our Toronto office at (416) 362-6683 - ext. 243.

Thank you for your assistance.

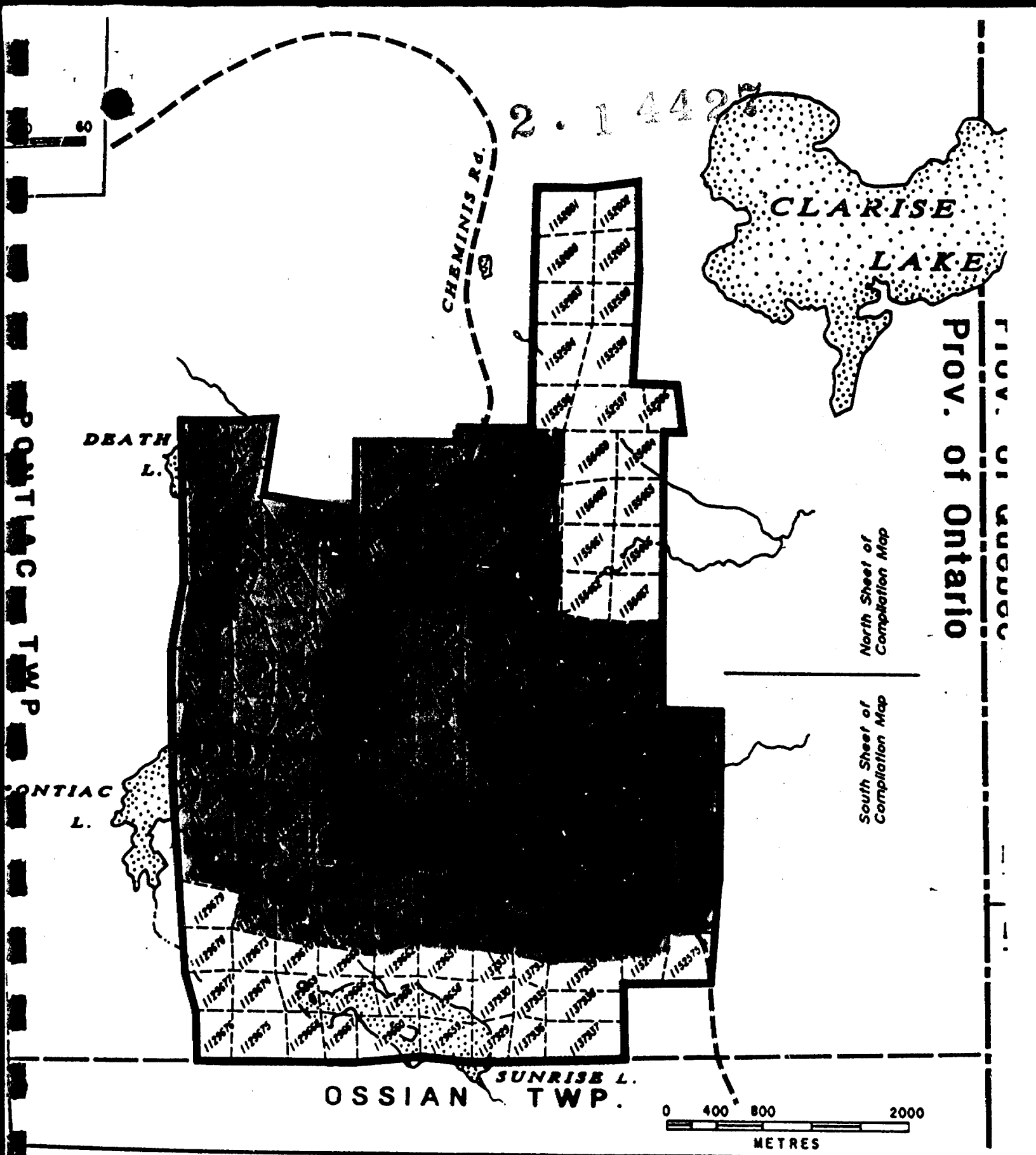
Yours truly,

OROFINO RESOURCES LTD.



Peter J. Doyle  
Senior Exploration Geologist

PJD/ll  
govt.nov



CLAIMS THAT WILL  
 BE ALLOWED TO LAPSE  
 ASSESSMENT WORK ASSIGNED  
 ELSEWHERE IN THE BLOCK

CLAIMS BEING RETAINED  
 ASSESSMENT WORK INCLUDING  
 ASSIGNED CREDITS BEING  
 APPLIED

**OROFINO**  
RESOURCES LIMITED

P.O. BOX 143, 1 FIRST CANADIAN PLACE, TORONTO, CANADA M5X 1C7 TELEPHONE: (416) 362-6683 TELEX: 06-217766

November 13, 1991

Ministry of Northern Development & Mines  
Mining Recorders Office  
4 Government Road  
Kirkland Lake, Ontario  
P2N 1A2

Attention: Francis

RE: REPORT OF WORK FORMS 0241 1) PONTIAC TWP.  
2) ROBERTSON TWP.

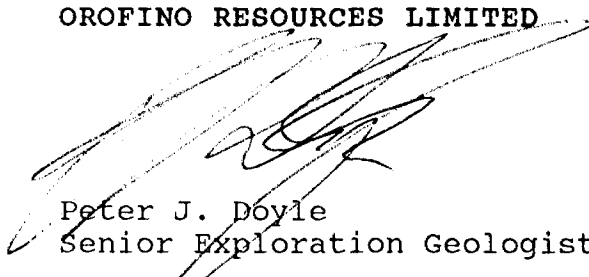
Dear Francis:

Further to our telephone conversation earlier today, I enclose executed copies of the "Report of Work" forms for both of Orofino Resources recent filings with your office.

Thank you for bringing this matter to my attention.

Yours truly,

OROFINO RESOURCES LIMITED



Peter J. Doyle  
Senior Exploration Geologist

PJD/11  
Encl.  
form0241.nov

RECEIVED  
LARDER LAKE  
MINING DIVISION

NOV 18 1991

TIME

11:08 am  
LP

S8E-M

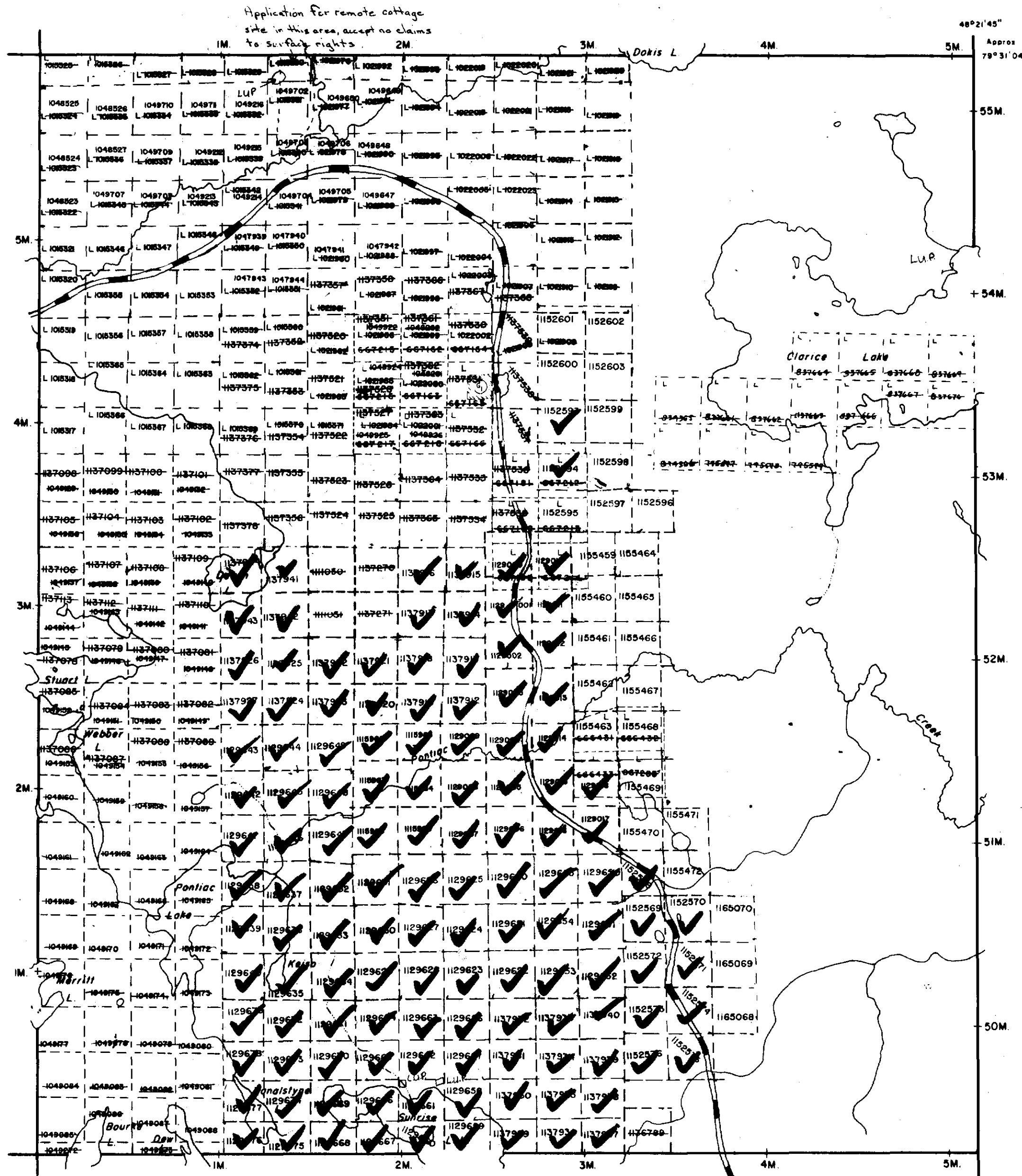
PONTIAC TWP.

S8E-M

DOKIS TWP. M-342

BEN NEVIS TWP. M-325

OSSIAN TWP. M-378



THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

NOTES

400' surface rights reservation along the shores of all lakes and rivers.

SAND and GRAVEL

M.N.R. GRAVEL PIT

NOTICE OF FORESTRY ACTIVITY

THIS TOWNSHIP / AREA FALLS WITHIN THE TIMSKAMING MANAGEMENT UNIT AND MAY BE SUBJECT TO FORESTRY OPERATIONS. THE MNR UNIT FORESTER FOR THIS AREA CAN BE CONTACTED AT: P.O. BOX 129 SWASTIKA, ONT. POK ITO 705-642-3222

LEGEND

- PATENTED LAND
- PATENTED FOR SURFACE RIGHTS ONLY
- LEASE
- LICENSE OF OCCUPATION
- CROWN LAND SALES
- LOCATED LAND
- CANCELLED
- MINING RIGHTS ONLY
- SURFACE RIGHTS ONLY
- HIGHWAY & ROUTE NO.
- ROADS
- TRAILS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKEG
- MINES

\*used only with summer resort locations or when space is limited

TOWNSHIP OF

PONTIAC

DISTRICT OF COCHRANE

LARDER LAKE MINING DIVISION

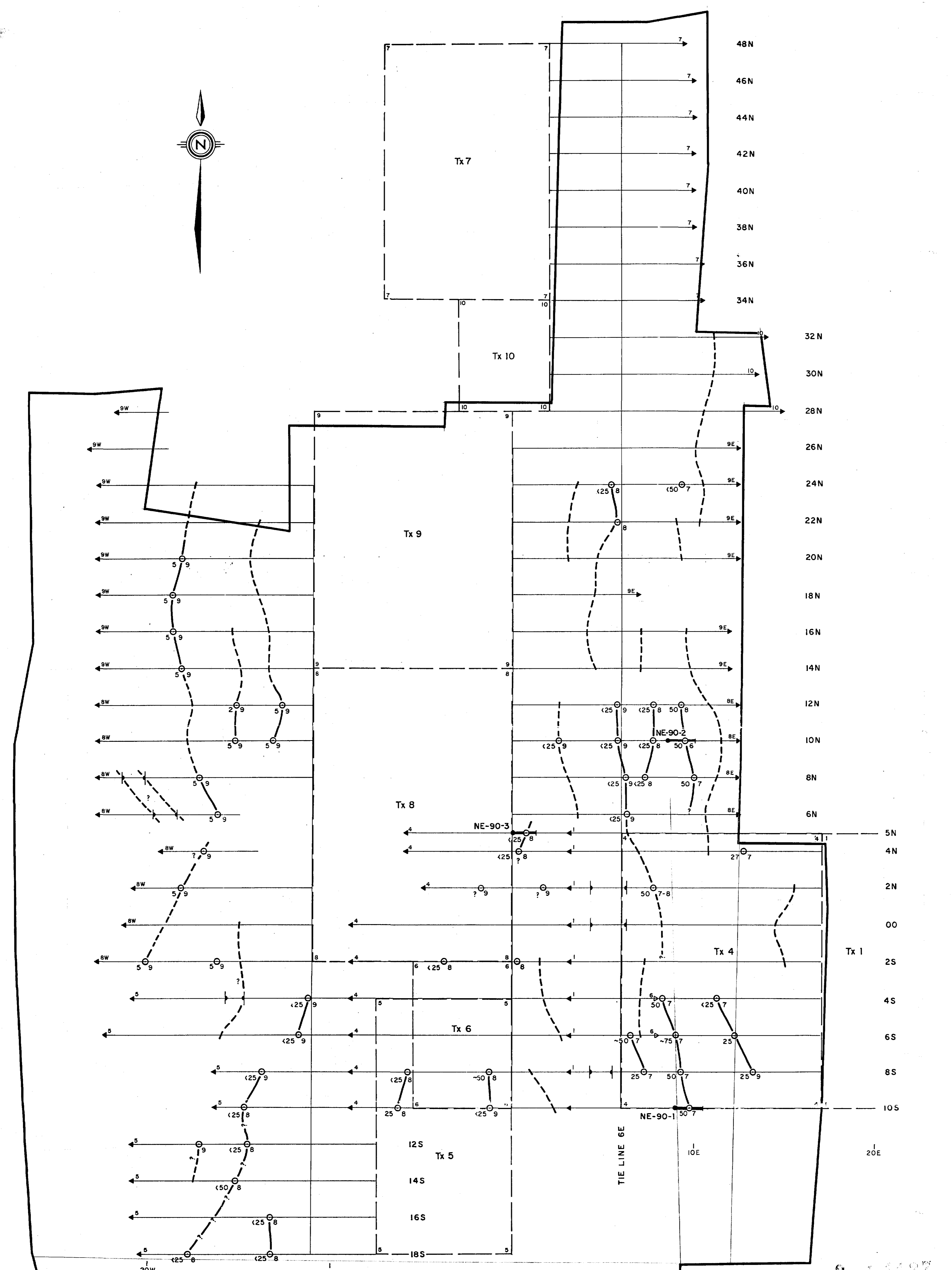
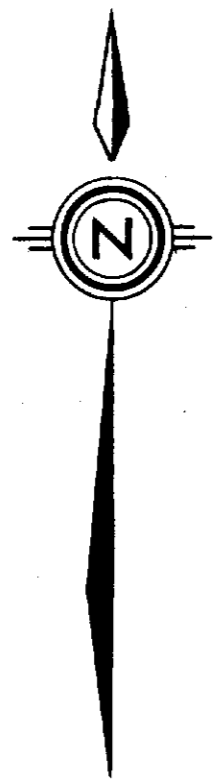
SCALE: 1 INCH = 40 CHAINS (1/2 MILE)

DR. RW Noble  
DATE Feb 10, 72

PLAN NO. M-382

ONTARIO  
MINISTRY OF NATURAL RESOURCES  
SURVEYS AND MAPPING BRANCH





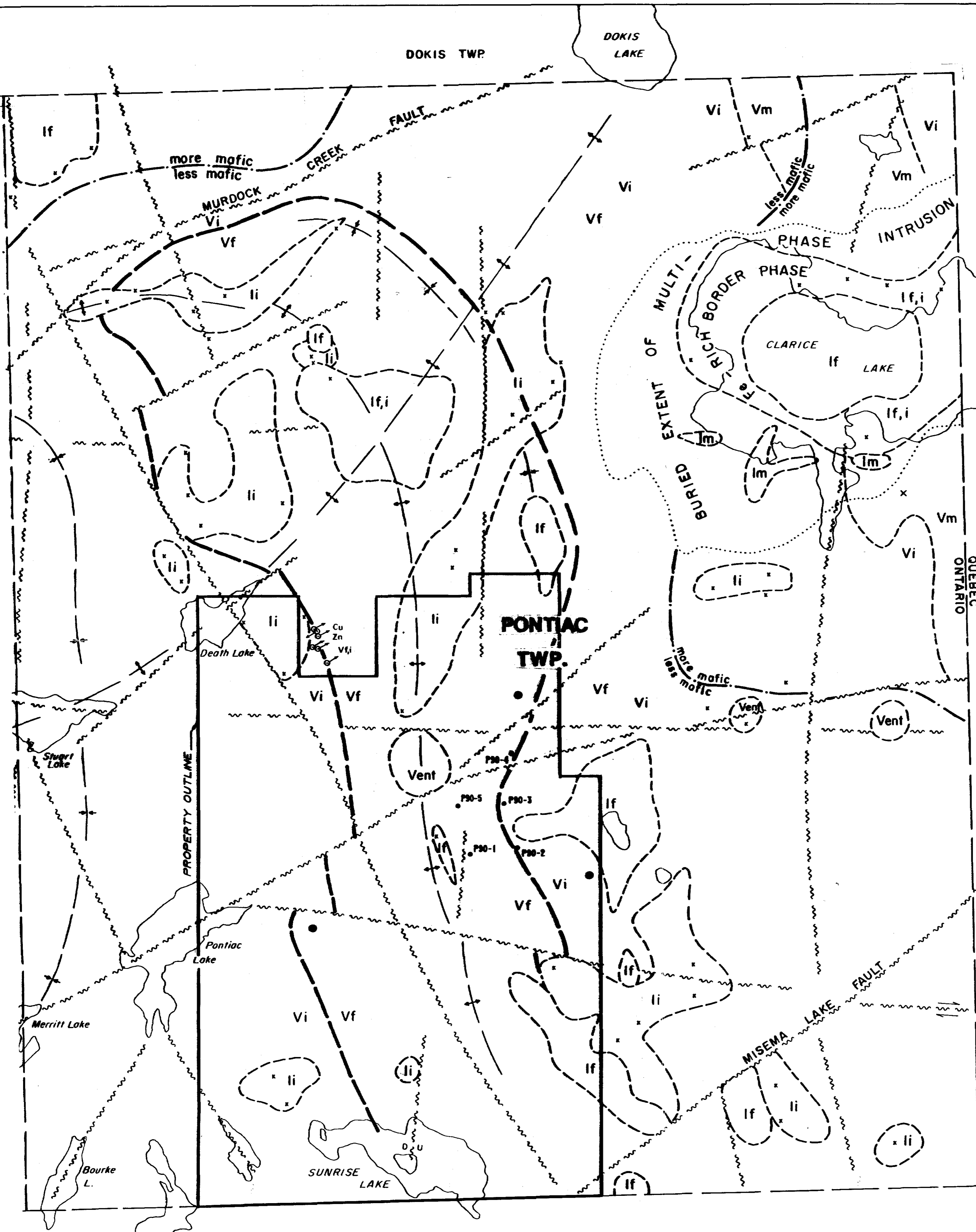
**LEGEND**

- Conductor anomaly.....
- Depth to top (metres).....
- Channel response.....
- Definite conductor axis.....
- Possible conductor axis.....
- Geo-electric contact.....
- Broad conductivity low.....
- Transmitter location and number.....
- End of traverse and number.....

Scale 1cm = 100m

<b>PROFINO RESOURCES LIMITED</b>	
<b>PONTIAC TWP., PROJECT 623</b> Larder lake M.D., Ontario	
<b>UTEM III SURVEY</b> <b>INTERPRETATION MAP</b>	
	EXCALIBUR INTERNATIONAL CONSULTANTS LIMITED TORONTO, ONTARIO
PREP. BY: A. R. T. DRAWN BY: R. T. M. DATE: JANUARY 1991 SCALE: 1" = 10,000	DWG. No. E.I.C.- 2304



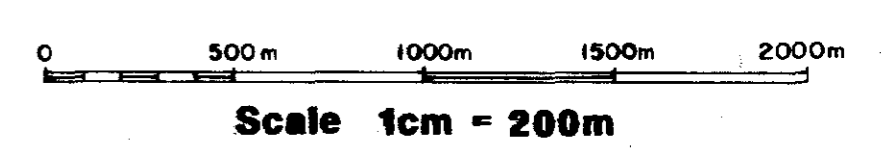


**LEGEND**

- Interpreted fault showing relative movement
- Regional magnetic interface
- Inferred geologic contact
- Outline of buried extent
- Selected outcrop location
- Scintrex AEM anomaly
- Projected fold axis; anticlinal, synclinal
- Past DDH, approximate location showing direction drilled, principal metals, rock types encountered
- Sulphide prospect showing principal metal present
- Favoured contact showing extent recommended for prospecting

**SYMBOLS USED**

- Vf,i,m Volcanics; felsic, intermediate, mafic
- If,i,m Intrusive; felsic, intermediate, mafic

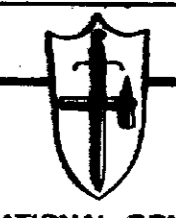


**OROFINO RESOURCES LIMITED**

**Ben Nevis & Pontiac Twp., Ontario**

**PLAN of INTERPRETATION**

SCALE 1:20,000      JULY 1990



EXCALIBUR INTERNATIONAL CONSULTANTS LIMITED  
TORONTO, CANADA



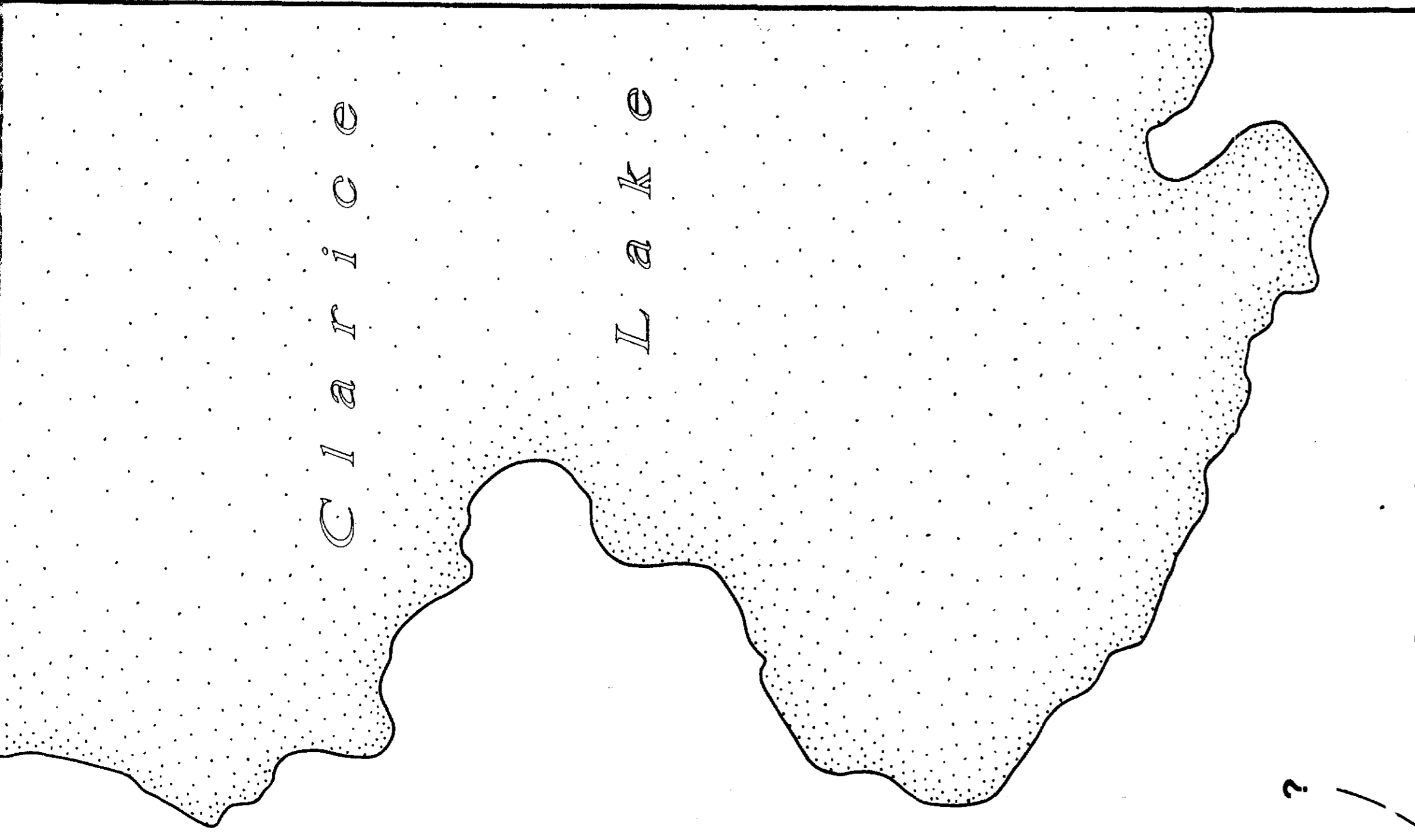












**Legend:**

**GEOLOGY:**

**1 MAFIC TO INTERMEDIATE VOLCANIC**  
 1a massive, 1b pillowed, 1c amygdaloidal, 1d vesicular, 1e festooning, 1f agglomeratic, 1g brecciated, 1h columnar, 1i columnar, 1j columnar, 1k columnar, 1l columnar, 1m columnar, 1n columnar, 1o columnar, 1p columnar, 1q columnar, 1r columnar, 1s columnar, 1t columnar, 1u columnar, 1v columnar, 1w columnar, 1x columnar, 1y columnar, 1z columnar

**2 FELSIC VOLCANIC**  
 2a high level, 2b low level, 2c low level, 2d low level, 2e low level, 2f low level, 2g low level, 2h low level, 2i low level, 2j low level, 2k low level, 2l low level, 2m low level, 2n low level, 2o low level, 2p low level, 2q low level, 2r low level, 2s low level, 2t low level, 2u low level, 2v low level, 2w low level, 2x low level, 2y low level, 2z low level

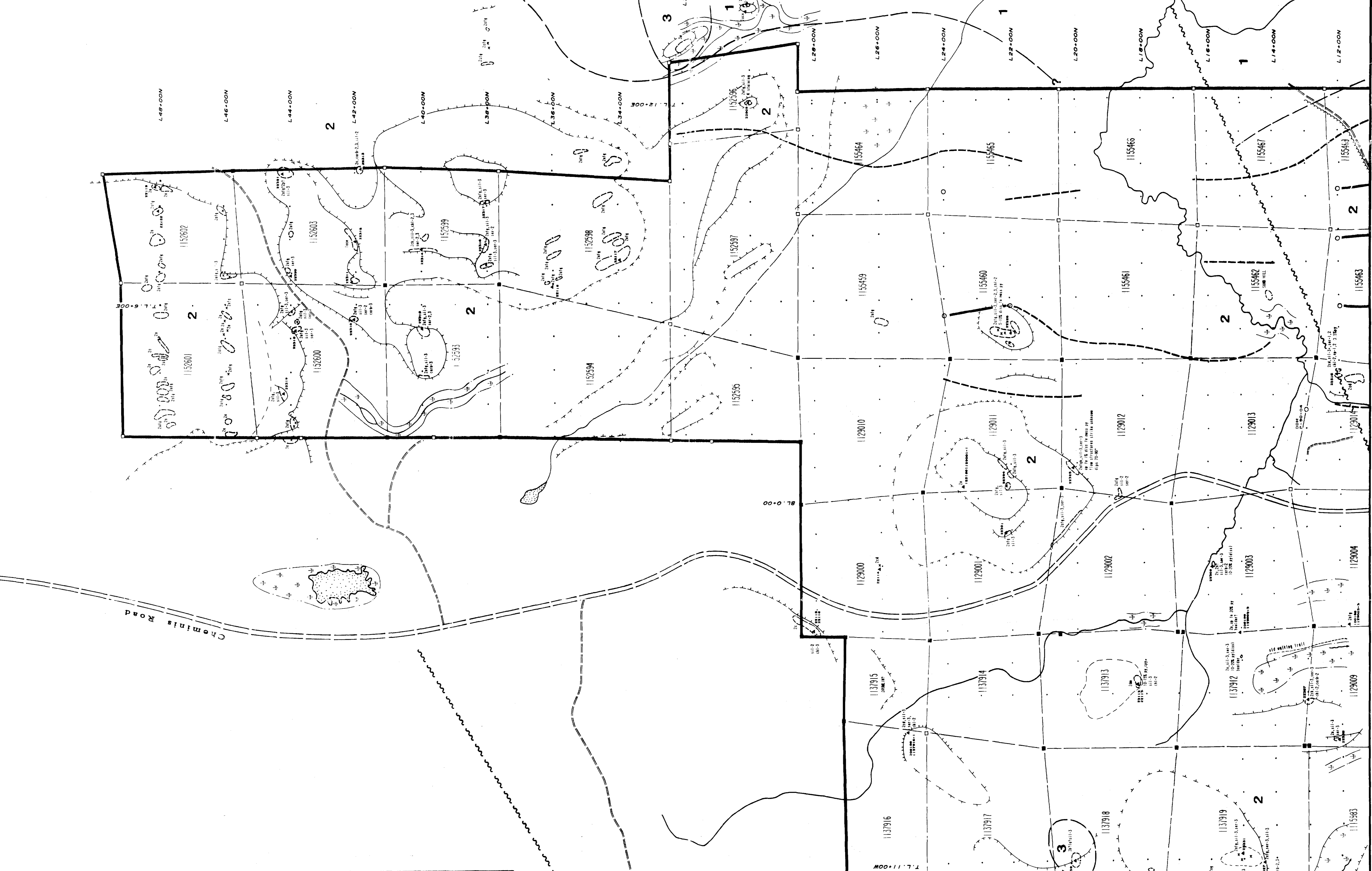
**3 MAFIC TO INTERMEDIATE INTRUSIVE**  
 3a diabase, 3b quartz diabase, 3c hornblende diabase

**4 FELSIC TO INTERMEDIATE INTRUSIVE**  
 4a quartz-feldspar porphyry, 4b quartz-feldspar, 4c quartz-feldspar, 4d quartz-feldspar, 4e quartz-feldspar, 4f quartz-feldspar, 4g quartz-feldspar, 4h quartz-feldspar, 4i quartz-feldspar, 4j quartz-feldspar, 4k quartz-feldspar, 4l quartz-feldspar, 4m quartz-feldspar, 4n quartz-feldspar, 4o quartz-feldspar, 4p quartz-feldspar, 4q quartz-feldspar, 4r quartz-feldspar, 4s quartz-feldspar, 4t quartz-feldspar, 4u quartz-feldspar, 4v quartz-feldspar, 4w quartz-feldspar, 4x quartz-feldspar, 4y quartz-feldspar, 4z quartz-feldspar

**ALTERATION**  
 5a chlorite, 5b chlorite, 5c chlorite, 5d chlorite, 5e chlorite, 5f chlorite, 5g chlorite, 5h chlorite, 5i chlorite, 5j chlorite, 5k chlorite, 5l chlorite, 5m chlorite, 5n chlorite, 5o chlorite, 5p chlorite, 5q chlorite, 5r chlorite, 5s chlorite, 5t chlorite, 5u chlorite, 5v chlorite, 5w chlorite, 5x chlorite, 5y chlorite, 5z chlorite

**MINERALIZATION**  
 6a chalcopyrite, 6b chalcopyrite, 6c chalcopyrite, 6d chalcopyrite, 6e chalcopyrite, 6f chalcopyrite, 6g chalcopyrite, 6h chalcopyrite, 6i chalcopyrite, 6j chalcopyrite, 6k chalcopyrite, 6l chalcopyrite, 6m chalcopyrite, 6n chalcopyrite, 6o chalcopyrite, 6p chalcopyrite, 6q chalcopyrite, 6r chalcopyrite, 6s chalcopyrite, 6t chalcopyrite, 6u chalcopyrite, 6v chalcopyrite, 6w chalcopyrite, 6x chalcopyrite, 6y chalcopyrite, 6z chalcopyrite

**SYMBOLS:**  
 7a road, 7b road, 7c road, 7d road, 7e road, 7f road, 7g road, 7h road, 7i road, 7j road, 7k road, 7l road, 7m road, 7n road, 7o road, 7p road, 7q road, 7r road, 7s road, 7t road, 7u road, 7v road, 7w road, 7x road, 7y road, 7z road

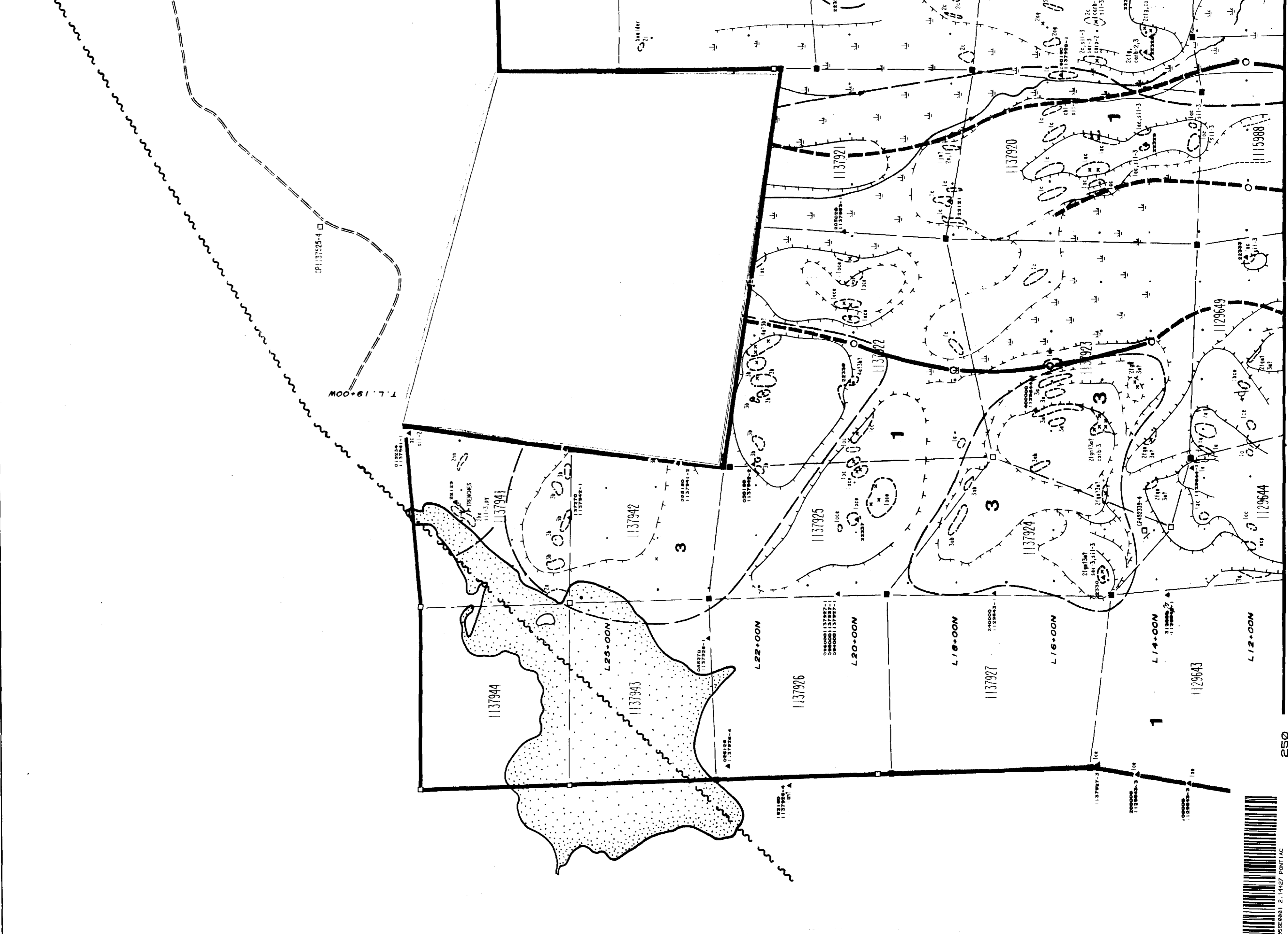


**PROPERTY LOCATION PLAN and CLAIM PLAN**

Map showing the location of the property within the townships of DOKIS TWP., MONTBRAY TWP., PASSERAT TWP., OSSIAN TWP., PONTIAC TWP., and BEN NEVIS TWP. The map also shows the boundary between the Province of Quebec and the Province of Ontario.

Scale: 1:5000

North Arrow



**Orofino Resources Ltd.**

**PONTIAC TWP. PROJ. - No. 623**  
 (Eastern Shear, Larder Lake Mining Div., Ontario N13, 32075)

**COMPILED MAP**  
 (North Sheet)

Scale: 1:5000

Map No. 623

Scale: 1:5000