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VANCOUVER, B.C.

A GEOPHYSICAL REPORT  
ON THE  
TOM GROUP  
SWAKUM MOUNTAIN AREA  
MERRITT, BRITISH COLUMBIA  
NICOLA MINING DIVISION

92 I / 2E, 7E

CO-ORDINATES  
50° <sup>16.1'</sup> ~~50.7'~~ North Latitude  
120° <sup>43.5'</sup> ~~42.80'~~ West Longitude

FILMED

OWNER  
DECADE INTERNATIONAL DEVELOPMENT LTD.  
1700 - 750 West Pender Street  
Vancouver, British Columbia

OPERATOR  
DECADE INTERNATIONAL DEVELOPMENT LTD.

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

CONSULTANT  
HAROLD M. JONES, P.ENG.

15,003  
July 28, 1986

HAROLD M. JONES, P.ENG.  
CONSULTING GEOLOGIST

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## SUMMARY

Between July 9 - 13, 1986 one consultant geologist and one field assistant conducted a VLF-EM survey on Harry 2 and a part of Harry claim. These claims are a part of the 40 unit Tom Group, located on Swakum Mountain 19 km north-northeast of Merritt, B.C.

A grid was laid out which covered Harry 2 claim at 200 m line separations as well as the southeastern part of Harry claim. Stations were marked on all grid lines at 50 metre intervals. Readings were taken at each station using a Ronka VLF-EM, using the Seattle station as a transmitter. Dip angle and quadrature, in percent, were recorded.

All data was plotted on appropriate maps. One shows the basic data, the second all data in profile form, the third as contoured Fraser filtered data.

A number of conductors are indicated in the Fraser filtered data. One is coincident with an old mineral showing, another with a probable fault zone. The source of the remaining conductors is not known.

It is concluded and recommended that the survey area be geologically mapped, soil sampled in the vicinity of the conductors and covered by a magnetometer survey. If results of this work are encouraging, the above exploration should be expanded to cover the entire Tom Group.

## INTRODUCTION

The Tom Group of claims is located in the Merritt area of southwestern British Columbia, in the Nicola Mining Division. It covers an aeromagnetic anomaly which, from a study by Trenholme (1984), was hypothesized as representing a favourable andesite-limestone contact in the Nicola Group rocks. He hypothesizes that the contact swings south, near the old Thelma mine, to the west, then northwest, and finally to the southeast, thus outlining the nose of a south-plunging anticline.

The limestone-volcanic contact just north of the claims contains several silver-lead-zinc deposits - the old Thelma, Alameda and Lucky Mike - from which small shipments were made in the early 1930's. If Trenholme's hypothesis is correct, then the magnetic low on the claims could reflect limestone hosting other silver-bearing deposits along its contact.

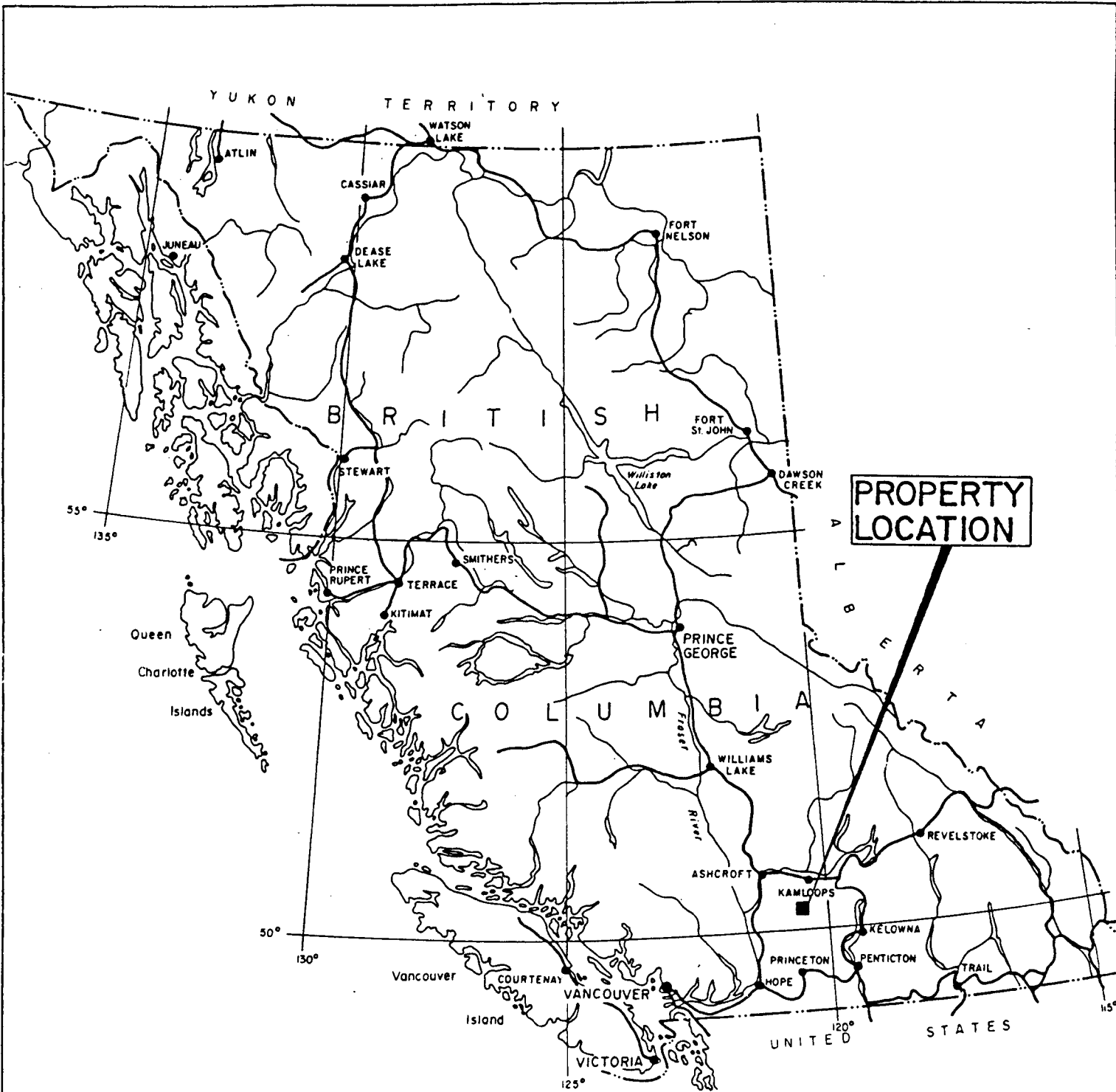
Magnetometer surveys, accompanied by geological mapping, were conducted as part of the Tom Group in 1984 and 1985. The aeromagnetic pattern was not reflected in the ground magnetics.

This report describes the work performed on the Tom Group between July 9 - 13, 1986 and the results obtained.

### **Location and Access**

The Tom, Dick, John, Harry and Harry 2 claims (Tom Group) are located in the Nicola Mining Division, 3 km due south of Swakum Mountain and 19 km north-northeast of Merritt.

The claims are very accessible by the Swakum Mountain logging road. At about 22 km on this road it passes through the southeast corner of the Tom claim. At 22.5 km this road crosses the old Swakum Mountain access road. This latter road passes along the eastern boundary of the Tom claim (see Figure 2).



DECADE INTERNATIONAL DEVELOPMENT LTD.

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VANCOUVER, B.C.

**TOM CLAIM GROUP**

**LOCATION MAP**

MERRITT AREA

N.T.S. 92 I - 7E

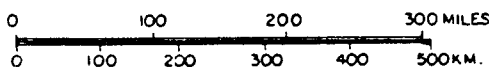
NICOLA M.D., B.C.

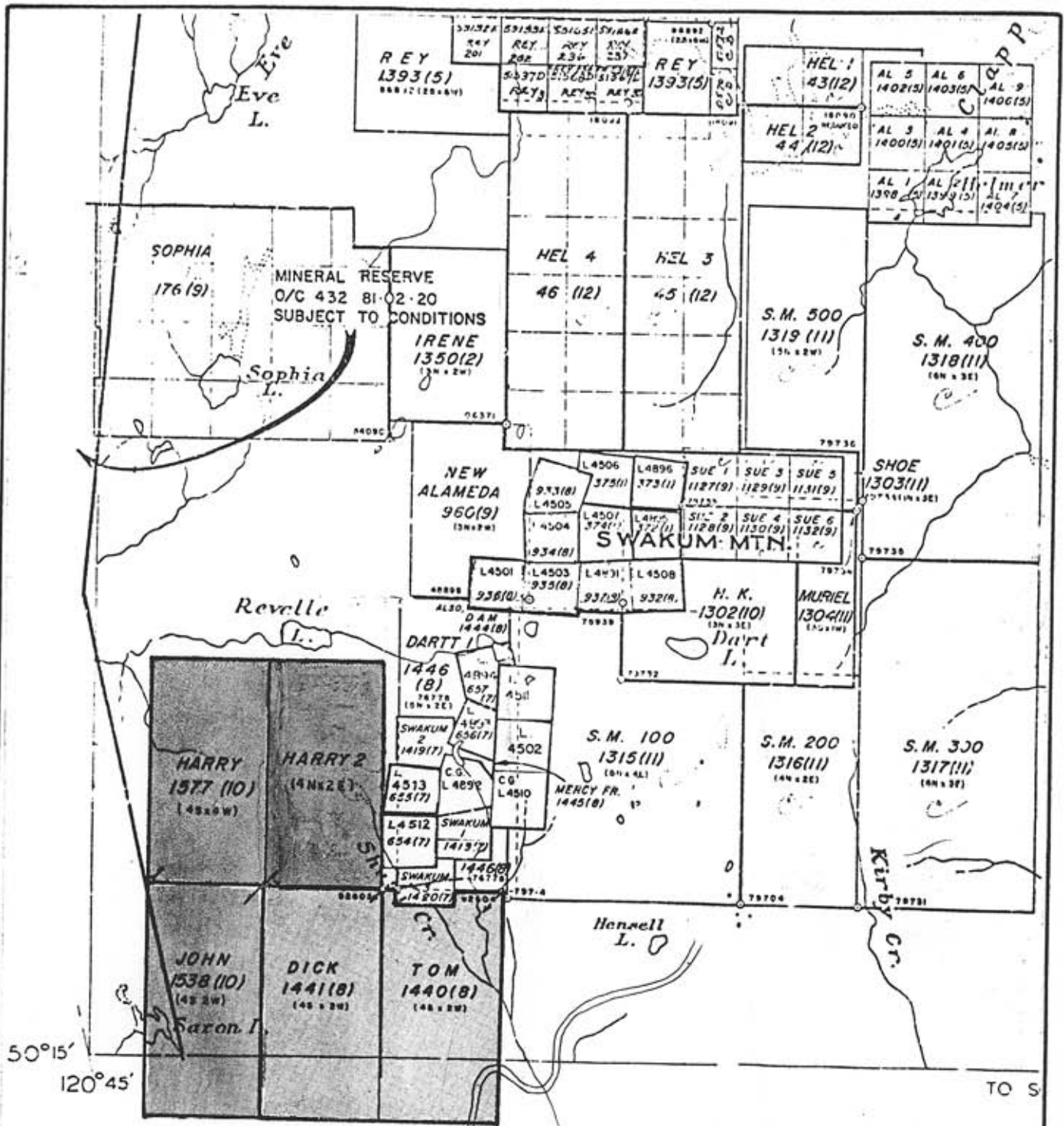
SCALE AS SHOWN

H. M. JONES

JULY 1986

FIG. 1





For up to date information on claims in any area you should refer to the Mining Act and the Mining Regulations.

To Merritt 20Km.



FROM 92I-7E CLAIM MAP, JULY 13, 1984.

DECADE INTERNATIONAL DEVELOPMENT LTD.  
 H.M. JONES & ASSOCIATES INC. VANCOUVER B.C.

**TOM CLAIM GROUP  
 CLAIM MAP**

MERRITT AREA  
 N.T.S. 92I-7E NICOLA MD., B.C.

0 1 2 3 KM.

SCALE 1:50,000  
 H. M. JONES

JULY 1986

FIG. 2

### Topography and Vegetation

Topography of the claims area is one of gentle relief. Low rolling hills are separated by generally shallow draws. An exception to this is Shuta Creek, which is contained in a relatively deep, very steep sided gully.

Vegetation is variable. A number of grassy meadows and small ridges are scattered throughout open to thickly forested areas. The latter contains many windfalls, making foot progress slow.

Local areas were logged in the past. Small stands of commercial grade spruce and fir are present within the claims.

### Property

The Tom Group consists of four claims totalling 40 units. They are:

<u>Claim Name</u>	<u>No. of Units</u>	<u>Record Nos.</u>	<u>Date of Record</u>
Tom	8	1440(8)	8 August 1983
Dick	8	1441(8)	8 August 1983
Harry	8	1577(10)	10 October 1985
John	8	1538(10)	10 October 1985
Harry 2	8	Not yet available	25 July 1986

Harry claim was in contravention with Dartt 2 claim when it was staked in 1985. Dartt 2 has since lapsed. An "Application to Reduce the Size of a Mineral Claim", dated July 18, 1986 was filed to reduce the Harry claim from sixteen to eight units, thus removing that part of Harry claim which was voided by the overstaking of Dartt 2. On July 9 - 10, Harry 2 claim was staked to cover the above open ground. The claim reduction and staking tidys up the land status and keeps the claim group at 40 units.

All claims are owned by Decade International Development Ltd., 1700 -750 West Pender Street, Vancouver, British Columbia.

### History

A number of old mine workings are known on and south of Swakum Mountain. These were all located between 1900 and 1916. They include the Last Chance, Thelma Group, Alameda Group, Corona, and Gold Gossan Group. These deposits all occur in the greenstone and limestones of the Nicola Group. The limestones are interbedded with the greenstones and are thought to be a series of lenses rather than continuous beds (Cockfield, W.E., 1961).

The deposits consist of veins, disseminations and replacements carrying lead, zinc and copper minerals, and in one deposit, scheelite. Some of the deposits contain tetrahedrite. It is from the latter deposits that limited shipments of selected ore was mined and shipped to the Trail Smelter. Reported production (Cockfield, W.D., 1961) was:

<u>Mine</u>	<u>Tons</u>	<u>Ozs. Gold</u>	<u>Ozs. Silver</u>	<u>Lbs. Copper</u>	<u>Lbs. Lead</u>	<u>Lbs. Zinc.</u>
Last Chance	26	2.0	137	1,932	1,753	-
Alameda	3	1.0	52	-	576	-
Thelma	89	1.0	7,419	-	9,683	10,237

Of particular interest is the Thelma property, located immediately north of the Tom claim. While production was small, the ore shipped from this deposit averaged 83.35 oz/ton silver, 0.01 oz/ton gold, 5.40% lead and 5.72% zinc. The vein on this property occurs on a north-striking limestone-volcanic contact and trends toward the Tom claim.



In the early 1960's a considerable amount of exploration was conducted on Swakum Mountain on the Last Chance property and its vicinity by Torwest Resources Ltd. They conducted geophysical surveys and diamond drilling, testing the known copper-tungsten skarn zone and a self-potential geophysical anomaly. Results were not encouraging. No recent work is known in the area.

In 1984 and 1985, the writer conducted geological mapping and a magnetometer surveys over the Tom and Dick claims. Results from this work found that the claim is underlain by Nicola volcanic and sedimentary rocks. No limestone-volcanic contact was seen. The magnetics show one north-northwest and several weak north-trending anomalies.

## GEOLOGY

### General Geology

The Swakum Mountain area is located within a large area of Triassic-aged Nicola Group rocks which are bounded to the east and west by Jurassic and (?) Later Coast Intrusions.

The Nicola Group rocks are largely volcanic rocks, often referred to as greenstones. They vary from fine-grained to coarsely porphyritic types. They are predominantly green, but also occur in various shades of purple, red, brown, gray or black. The rocks are chiefly andesites, but include basalts and feldspar porphyries. Much breccia and tuff is associated with lavas. The latter are partly altered to chlorite, epidote and calcite. Minor amounts of sedimentary rocks are associated with the volcanic members. Limestone is the most abundant type with much lesser argillite and conglomerate. The limestone bands generally consist of a series of lenses rather than continuous beds.

The Coast Intrusions are mostly medium to coarse-grained granodiorites, or quartz diorites, but locally include more acidic or more basic types. None of the plutonic rocks are exposed in the Swakum Mountain area.

### **Local Geology**

Nicola Group rocks are fairly well exposed on the Tom, Dick and Harry 2 claims, usually on the higher, rounded ridges. They are best described as greenstones, consisting of dark green, brown and black fine-grained to coarsely porphyritic andesites, amygdaloidal flows and breccias. Most rocks are altered with hornblende strongly chloritized and feldspar epidotized.

Massive grey limestone, which is exposed just north of the property at the old Thelma mine, was not seen on the property. However, several poorly exposed occurrences of orange-brown ankerite limestone, similar to that in the old Thelma workings, was seen on Harry 2 claim.

One of these areas has an old caved shaft and several shallow open pits. A quartz-filled shear zone, attitude N45E/85W, is exposed in the shaft. It consists of irregular, vuggy quartz banding in greenstone mineralized with minor galena and malachite. Massive ankerite occurs along the footwall. There may be other old workings in this area but they were not searched for during this survey.

### **FIELD WORK**

A grid was laid out on Harry 2 for control on the VLF-EM survey. This was done using a Silva compass and hip chain. Two baselines were laid out, one following the west boundary of Harry 2 claim, the other its east boundary. These lines were well flagged and marked with stations at 100 m spacings.

Grid lines were then run due east-west from these baselines for 1000 m, with their baseline closures measured and recorded. Stations were laid out at 50 m intervals on each line. Also, some lines were run to the west for 500 - 600 m on Harry claim (Figure 3). A total of 2 km of baseline and 16.7 km of grid lines were laid out. VLF-EM survey totalled 16.7 line kilometres.

Each line was surveyed using a Ronka VLF-EM unit, taking dip angle and quadrature readings at each station. Seattle station, 18.6 kc/s, was used as signal-source. All dip angle data was reduced by the "Fraser filter" method.

Maps, on a scale of 1:5000 were compiled of all basic data, dip angle and quadrature profiles and contoured Fraser filtered data. They accompany this report as Figures 3, 4 and 5.

## GEOPHYSICAL RESULTS

The VLF-EM data - in percent dip angle and quadrature - were plotted in profile form (Figure 4). These plots show many irregularities, many of which are thought to be due to topography.

One cross-over, which also coincides with topography, may be significant. It is located on line 2S at 4+25E, at the base of a 30 metre high cliff. This type of terrain is not typical of the property and may represent a fault scarp. In the Fraser filtered data this area shows as conductor B-B' (Figure 5). It appears to be part of a discontinuous north-trending feature running the length of the survey area. Other than Nicola volcanics exposed in the cliffs, outcrop is sparse along this trend.

The contoured Fraser filtered data indicates a number of conductors. One, conductor A-A', coincides with the only mineralized showing found on the property and described under Local Geology. This conductor may(?) reflect the shear zone exposed in the old working.

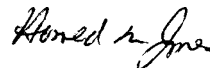
### CONCLUSION

The VLF-EM survey located a number of conductors. These could reflect geological structures - contacts, faults, etc. - or mineralization. Geological mapping in conjunction with soil sampling and a magnetometer survey are required to assess the various conductors.

### RECOMMENDATIONS

It is recommended that the area covered by the geophysical survey be geologically mapped and selectively soil sampled in the vicinity of the various conductors. A magnetometer survey should also be run over the 1986 grid. If results of the above work are encouraging, exploration should be expanded to cover the entire claim block.

Respectfully submitted,



Harold M. Jones, P.Eng.

## REFERENCES

B.C.M.M. Annual Reports 1926 to 1934

Cockfield, W.E. (1961) Geology and Mineral Deposits of Nicola Map area, B.C. Geol. Surv. Canada Memoir 249.

Geol. Surv. Canada Aeromagnetic Map 521G.

Jones, H.M. (1984) A Geological-Geophysical Report on Tom, Dick and Harry Claims, Swakum Mountain Area, Merritt Area, filed for assessment work.

Jones, H.M. (1985) A Geological-Geophysical-Geochemical Report on the Tom Group, Swakum Mountain Area, Merritt, B.C., filed for assessment work.

Trenholme, L.S. (1984) A Report on the Tom Claim (No. 1440), private report.

### CERTIFICATE

I, Harold M. Jones, of the City of Vancouver, British Columbia, do hereby certify that:

1. I am a Consulting Geological Engineer with offices at 310 - 543 Granville Street, Vancouver, B.C.
2. I am a graduate of the University of British Columbia in Geological Engineering, 1956.
3. I have practised my profession as a Geological Engineer for over 25 years.
4. I am a member of the Association of Professional Engineers of British Columbia, Registration No. 4681.
5. I conducted a geophysical survey on the Harry and Harry 2 claims between July 9 - 13, 1986. I also conducted geological-geophysical programs on the Tom Group in 1984 and 1985.
6. I have no interest in, nor do I expect to receive any interest, direct or indirect, in the Tom Group, or in Decade International Development Ltd., or its securities.

Dated at Vancouver, B.C. this 28th day of July, 1986.



HAROLD M. JONES, P.Eng.

**APPENDIX I**

**STATEMENT OF COSTS**

**HAROLD M. JONES, P.ENG.  
CONSULTING GEOLOGIST**

STATEMENT OF COSTS

Wages:

Harold M. Jones. P.Eng. - July 9-13, 1986		
5 days at \$350/day	\$ 1,750	
Marlow Mackillop - July 9-13, 1986		
5 days at \$125/day	<u>625</u>	\$ 2,375.00

Room and Board		
5 days at \$40/person/day		400.00

Vehicles		
Rental, fuel, tolls		404.93

Field supplies		
Flagging, hip chain thread, etc.		85.00

Equipment rental		
VLF-EM - \$200/week		200.00

Report and map preparation		
Report	750	
Drafting	150	
Secretarial	<u>100</u>	<u>1,000.00</u>

Total		<u><u>\$ 4,464.93</u></u>
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*Harold M. Jones*



TOM CLAIM GROUP  
VLF - EM SURVEY  
BASIC DATA  
MERRITT AREA

N.T.S. 92 1-2E, 7E NICOLA M.D., B.C.

0 100 200 300 METRES

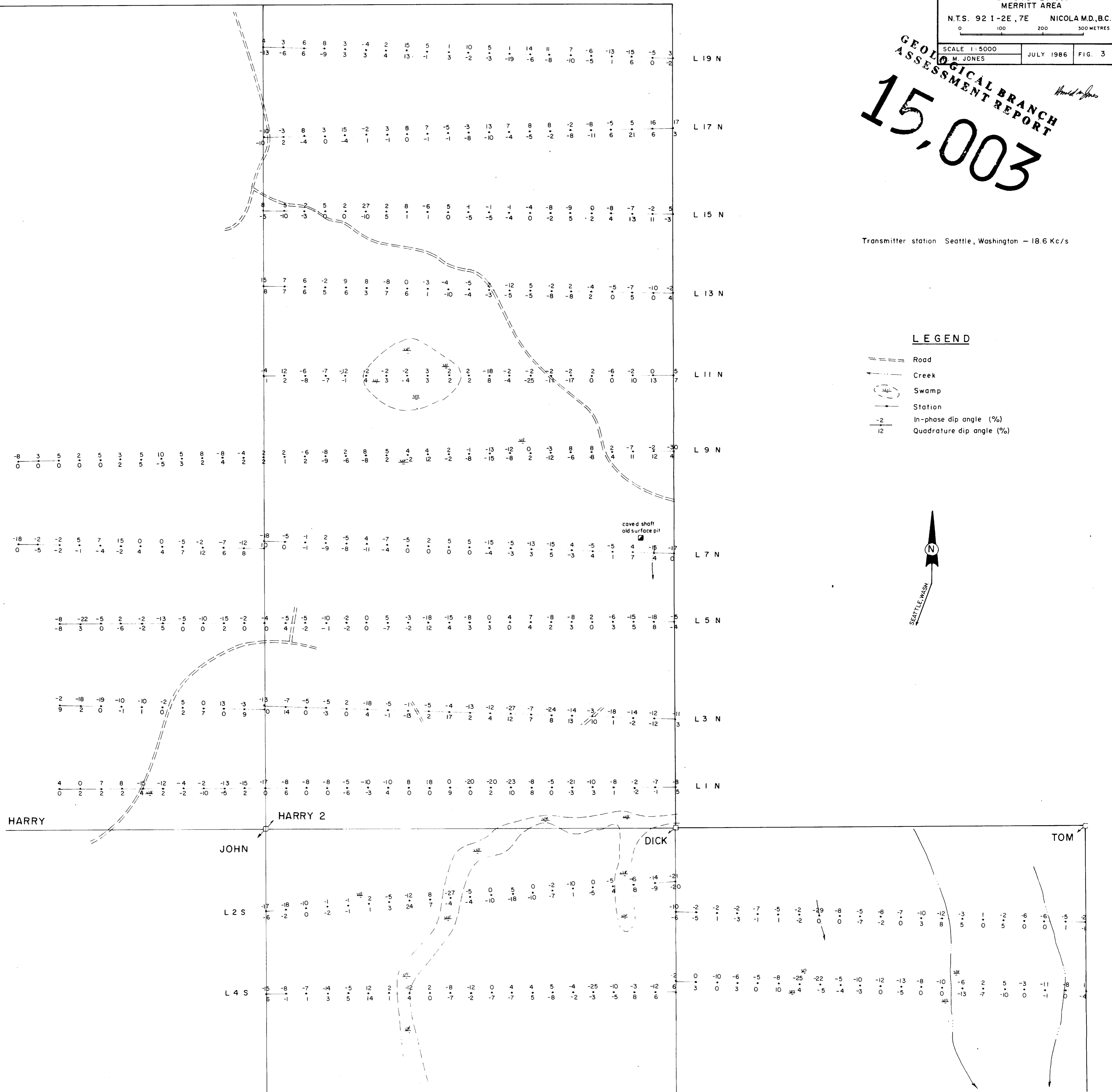
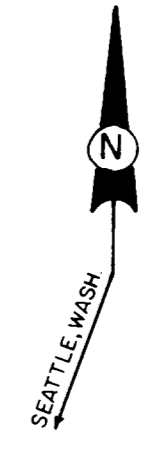
SCALE 1:5000  
M. JONES JULY 1986 FIG. 3

**GEOLOGICAL BRANCH**  
**ASSESSMENT REPORT**  
**15,003**

Transmitter station Seattle, Washington - 18.6 Kc/s

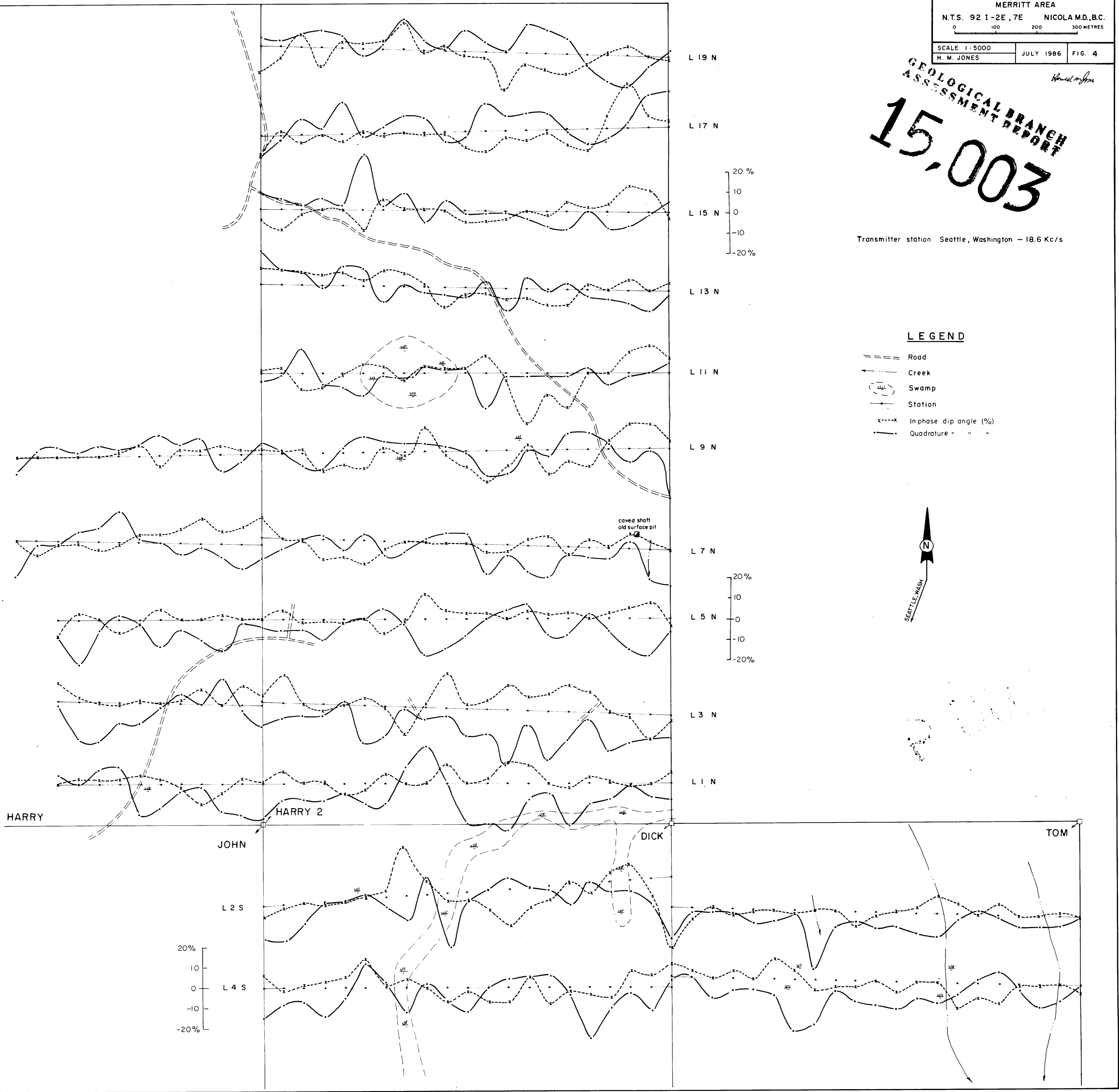
**LEGEND**

- Road
- Creek
- Swamp
- Station
- In-phase dip angle (%)
- Quadrature dip angle (%)



*H.M. Jones*  
**GEOLOGICAL BRANCH**  
**ASSESSMENT REPORT**  
**15,003**

Transmitter station Seattle, Washington - 18.6 Kc/s



HARRY

JOHN

HARRY 2

DICK

TOM

20%  
10  
0  
-10  
-20%

20%  
10  
0  
-10  
-20%



**LEGEND**

- == Road
- Creek
- ⊖ Swamp
- Station
- x---x In phase dip angle (%)
- Quadrature " " "

TOM CLAIM GROUP  
VLF - EM SURVEY  
FRASER FILTERED  
MERRITT AREA

N.T.S. 92 1 - 2E, 7E NICOLA M.D., B.C.  
0 100 200 300 METRES

SCALE 1:5000 JULY 1986 FIG. 5  
H. M. JONES

*Handwritten signature*

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

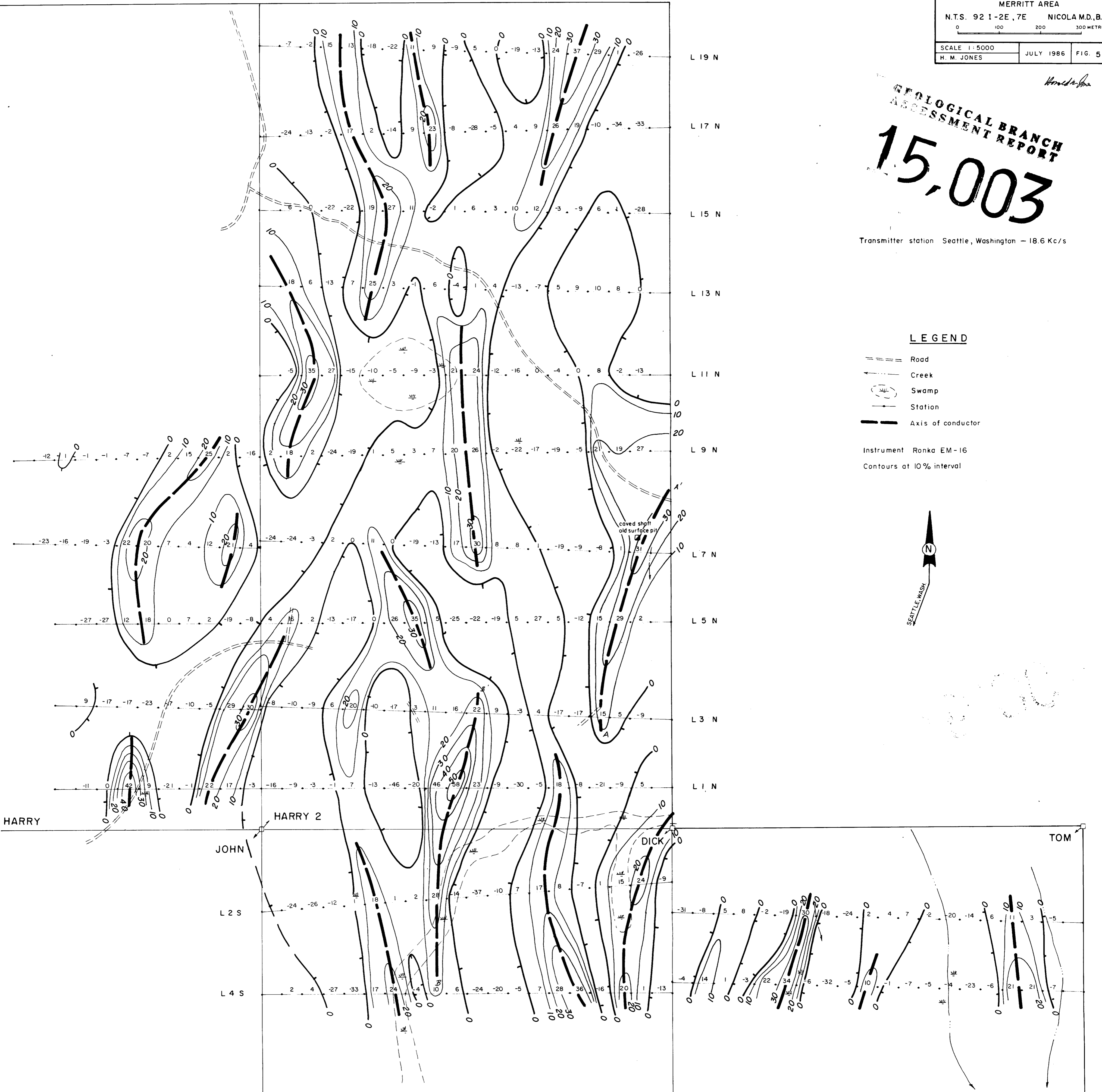
15,003

Transmitter station Seattle, Washington - 18.6 Kc/s

LEGEND

- Road
- Creek
- Swamp
- Station
- Axis of conductor

Instrument Ronka EM-16  
Contours at 10% interval



HARRY

HARRY 2

JOHN

DICK

TOM

L 2 S

L 4 S

L 19 N

L 17 N

L 15 N

L 13 N

L 11 N

L 9 N

L 7 N

L 5 N

L 3 N

L 1 N