

**GEOPHYSICAL REPORT**

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on the

**BONG 5 MINERAL CLAIM**

Twin Lakes Area  
Osoyoos Mining Division

82E-4E, 5E  
49°16' North Latitude, 119°43' West Longitude

for

**GRANT F. CROOKER**  
Box 404  
Keremeos, BC  
V0X 1N0  
(OWNER AND OPERATOR)

by

**GRANT F. CROOKER, P.Geo.**  
**GFC CONSULTANTS INC.**

May, 1999

**GEOLOGICAL SURVEY BRANCH**  
**REPORT**

25,934

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## 1.0 SUMMARY

The Orofino Mountain property consists of six four-post mineral claims covering 32 units in the Osoyoos Mining Division and is owned and operated by Grant F. Crooker of Keremeos, BC. It is located 11 kilometres northeast of Keremeos and 7 kilometres southeast of Twin Lakes in southern British Columbia (NTS 82E-4E, 5E).

Access is via Highway 3A from Keremeos (23 kilometres) or Penticton (23 kilometres), turning south onto a secondary road at the Twin Lakes Golf Course. A network of logging and mining roads give access to all areas of the property.

The Orofino Mountain property (King property) is located within the Orofino Mountain Gold Camp that consists of three principal properties. These are the Orofino Mountain (King), Grandoro and Twin Lakes. Production from the entire camp is reported by Hedley and Watson (1945) to be 24,058 tons of ore yielding 8,858 ounces of gold and a little silver. The King Property is estimated to have produced 1000 to 2000 tons of "ore".

The Orofino Mountain Gold Camp is located about nine kilometers northwest of the better known Fairview Gold Camp. The Fairview Gold Camp produced over 500,000 tons of ore yielding 0.12 ounces gold/ton and 1.42 ounces silver per/ton. The geological, geochemical and structural setting of the Orofino Mountain Gold Camp is similar to the Fairview Gold Camp.

Mineralization on the Orofino Mountain property (King showings) consist of quartz veins containing pyrite, chalcopyrite, galena and visible gold. Gold values generally increase with an increase in sulphide content. The best mineralized quartz veins appear to strike north to northwesterly with near vertical dips. The King showing consists of the Upper King and Lower King adits. The Lower King adit has been driven for approximately 50 metres with the last 25 metres stoped. Production from the stope is estimated to be between 1000 and 2000 tons. The Upper King adit has been driven for approximately 25 metres with a winze to a lower level. The tonnage from the Upper King adit is not known as the winze is full of water.

During the period 1973 through 1987, the present owner, in conjunction with several junior mining companies carried out geological mapping, prospecting, rock sampling, magnetic and VLF-EM geophysical surveying and soil geochemical sampling over the property. The rock sampling yielded gold values ranging from nil up to 10.8 ounces /ton across 0.9 metres (Lower King adit). Surface sampling from a trench above the Lower King adit consistently yielded assays of over one ounce/ton gold across 12 to 24 inches. The encouraging results from these surveys culminated in a program of trenching and diamond during 1987, mainly in the area of the King adits.

The trenching program was successful in demonstrating 400 metres of strike length on the Lower King vein structure and 100 metres of strike length on the Upper King vein structure. Sampling of the trenches gave gold values from nil to 38,000 ppb. Samples taken from the northern extension of the Lower King vein structure gave the most encouraging results, with gold values of 38,000 ppb over 7 centimetres (calcite bearing, rusty pyritic wall rock) and 20,000 ppb over 1.7 metres (white quartz vein with no visible sulphides).

Christopher (1987) made the following comments on the 1987 drill program: "Drilling on the Upper and Lower King vein structures revealed a complex fault pattern with veins displaced left laterally by steep northeast faults and in an undetermined fashion by shallow faults. Drilling has indicated a non-uniform distribution of values with auriferous zones probably controlled by the intersections of structural trends".

Drill results varied from nil where the vein was faulted off, to 0.866 oz Au/ton in sludge from 23.48 to 25.0 metres in drill hole DDH-87-5 (Upper King). Drilling on the southern extension of the Lower King vein structure gave several intersections of gold greater than 0.05 ounces per ton across widths less than 1.0

metre, while drilling on the northern extension of the structure did not give any intersections of gold greater than 0.05 ounces per ton. Drilling on the southern extension of the Upper King vein structure gave two intersections of gold greater than 0.05 ounces per ton. Two holes drilled 250 metres south of the Lower King vein structure intersected three to six metres of quartz vein but no anomalous values in gold.

During 1998, stream sediment samples were collected from the major drainages on the property, and a grid was established over a portion of the King 5 mineral claim and magnetic and VLF-EM surveys carried out.

The stream sediment sampling yielded positive results, with five samples yielding weakly to moderately anomalous gold values (15 to 115 ppb). One anomalous sample was collected below the confluence of the East and West Forks of Park Rill, while the other four anomalous samples were collected from the West Fork. The stream sediment samples with anomalous gold values show a weak correlation with arsenic and lead values. On the basis of the stream sediment sampling, the area draining into the West Fork of Park Rill has the strongest potential to host additional gold mineralization.

The magnetic survey defined three zones of magnetism (low, moderate, high) within the grid area and shows a gradual increase in total field magnetic values from the northeast corner to the southwest corner of the grid. The area appears to be underlain by intrusive rocks, and the differences in magnetism may be caused by a variation in the content of magnetite or mafic minerals within the intrusive.

The VLF-EM survey delineated number of north and northeast trending conductor systems. No causes are apparent for the conductor systems, although some may be caused by faults or shear zones that may host auriferous quartz veins.

The 1999 work program consisted of completing the grid and magnetic and VLF-EM surveys on the King 5 mineral claim. The magnetic survey confirmed the prominent, northwest-southeast trending magnetic high in the central portion of the grid. Zones of moderate magnetic values flank the magnetic high to the southwest and northeast, with low magnetic values in the northeast corner of the grid. The grid area appears to be underlain by intrusive rocks, and the differences in magnetism may be caused by a variation in the content of magnetite or mafic minerals within the intrusive.

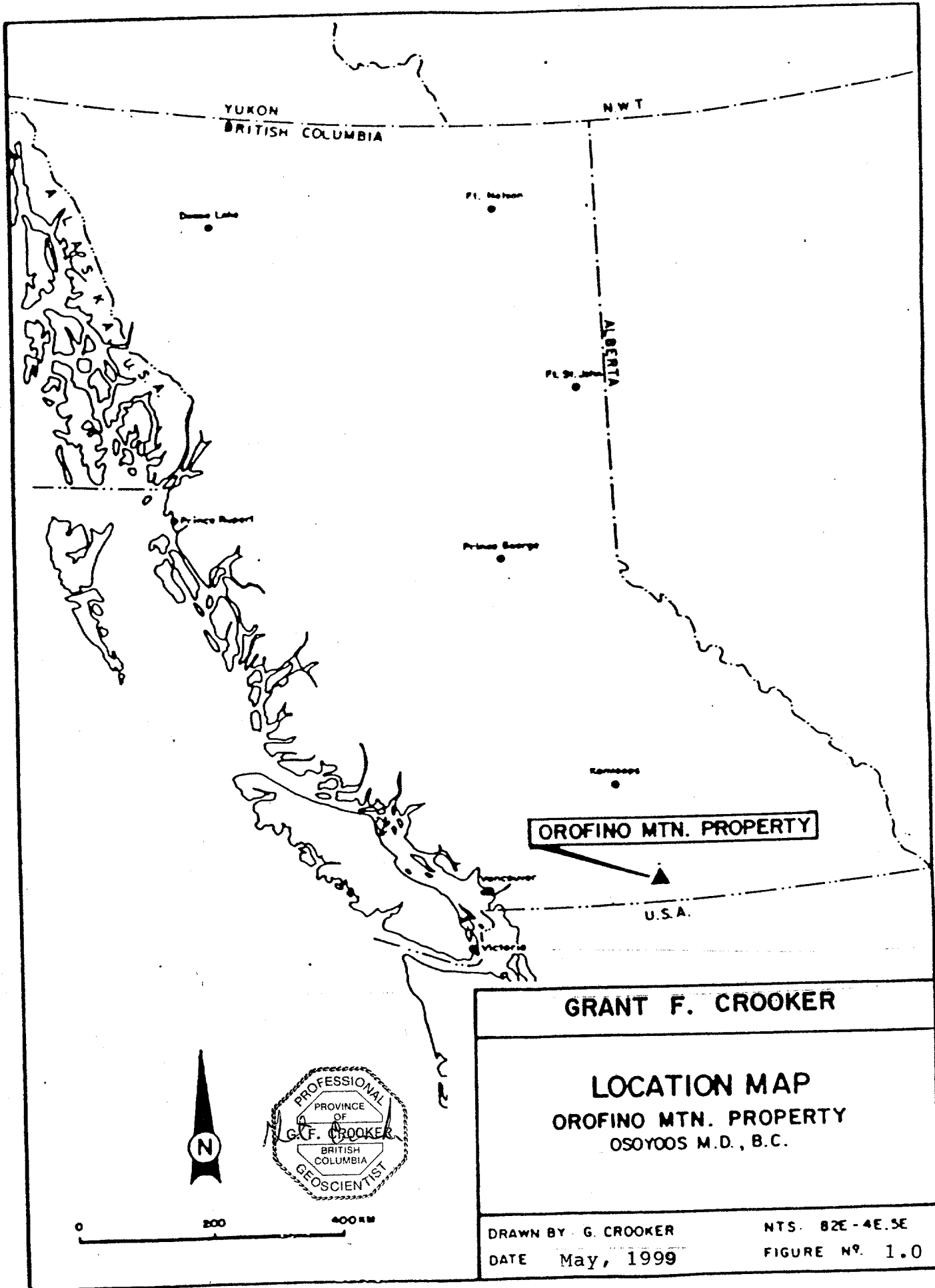
A number of weak to moderate to strong, north and northeast trending conductor systems were delineated by the VLF-EM survey. No causes are apparent for the conductor systems, although some may be caused by faults or shear zones that could host auriferous quartz veins.

Additional exploration is warranted on the property and should be conducted as follows:

- conduct geological mapping and prospecting determine the causes of the VLF-EM conductor systems
- conduct soil sampling over grid area to determine source of anomalous (gold) stream sediment samples from the West Fork of Park Rill (1998 survey)

Respectfully submitted,

  
Grant F. Crocker, P. Geo.,  
Consulting Geologist



YUKON  
BRITISH COLUMBIA

N.W.T.

Pt. Muelson

Dawson Lake

ALBERTA

Pt. St. Joseph

Prince Rupert

Prince George

Kamloops

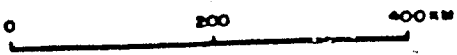
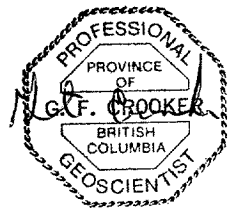
**OROFINO MTN. PROPERTY**

U.S.A.

**GRANT F. CROOKER**

**LOCATION MAP**  
**OROFINO MTN. PROPERTY**  
OSOYOOS M.D., B.C.

DRAWN BY G. CROOKER      NTS. 82E-4E.5E  
DATE May, 1999      FIGURE NO. 1.0



## 2.0 INTRODUCTION

### 2.1 GENERAL

Fieldwork was carried out on the Orofino Mountain property (King claims) from March 23<sup>rd</sup> to April 28<sup>th</sup>, 1999. Grant F. Crooker, P. Geo. conducted the exploration program.

The exploration program consisted of completing grid lines and magnetic and VLF-EM surveying over the remainder of the King 5 mineral claim not covered by the 1998 survey.

### 2.2 LOCATION AND ACCESS

The property (Figure 1.0) is located 11 kilometres northeast of Keremeos and 7 kilometres southeast of Twin Lakes in southern British Columbia. The property lies between 49° 14' and 49° 16' north latitude and 119° 40' and 119° 43' west longitude (NTS 82E-4E, 5E).

Access is via Highway 3A from Keremeos (23 kilometres) or Penticton (23 kilometres), turning south onto a secondary road at the Twin Lakes Golf Course. This all weather two wheel drive secondary road leads to the northern claim boundary of the property and is maintained 12 months of the year. A network of logging and mining roads give access to all areas of the property.

### 2.3 PHYSIOGRAPHY

The property is located in the Okanagan Highlands of southern British Columbia. Elevation varies from 1000 metres to 1600 metres above sea level and topography varies from rolling hills to steep slopes. Most of the area is timbered with larch, spruce, fir and pine trees, with open areas covered with bunch grass and sagebrush. Much of the area has been logged over the past 50 years by both clear cut and selective logging methods.

Park Rill flows through the western portion of the property and contains a flow of water all year long. Smaller branches of Park Rill drain many areas of the property, and springs and swamps are found in many locations.

### 2.4 PROPERTY AND CLAIM STATUS

The King, King 2 to 5 and MO mineral claims (Figure 2.0) are owned and operated by Grant F. Crooker of Box 404, Keremeos, BC, V0X 1N0. The property consists of six four-post mineral claims covering 32 units in the Osoyoos Mining Division.

Claim	Units	Mining Division	Tenure No.	Record Date m/d/y	Expiry Date m/d/y
MO	2	Osoyoos	246159	10/15/76	10/15/06 *
King	12	Osoyoos	246352	05/08/81	05/08/04 *
King 2	4	Osoyoos	246366	08/31/81	08/31/03
King 3	4	Osoyoos	246367	08/31/81	08/31/99
King 4	2	Osoyoos	246413	11/12/82	11/12/99
King 5	8	Osoyoos	246701	05/01/87	05/01/00 *

\* Upon acceptance of this report





## 2.5 AREA AND PROPERTY HISTORY

The Orofino Gold Camp dates to the 1890's when the Fairview Gold Camp was discovered. Mineralization at the Orofino Camp consists of quartz veins with pyrite, chalcopyrite, galena and visible gold.

The three main properties within the Orofino Camp are the Twin Lakes (Twin Lakes 1-4), Grandoro (Lots 1448 and 1449) and the Orofino Mountain property (MO, King, King 2 to King 5). The British Columbia minfile documents the occurrences as 82E-SW-10 (Twin Lakes), 82E-SW-11 (Grandoro) and 82E-SW-113 (Orofino Mountain). The Orofino Mountain property is the subject of this report.

Production from the entire camp is reported by Hedley and Watson (1945) to be 24,058 tons yielding 8,858 ounces of gold and a little silver. Most of the production has been from the Twin Lakes and Grandoro properties during the period 1930 to 1941. A limited amount of production came from the King showings on the Orofino Mountain property.

The Lower King adit has been driven for approximately 50 metres with the last 25 metres stoped. Production from the stope is estimated to be between 1000 and 2000 tons. The Upper King adit has been driven for approximately 25 metres with a winze to a lower level. The tonnage from the Upper King adit is not known as the winze is full of water.

During the period 1973 through 1987 the present owner, in conjunction with several junior mining companies carried out geological mapping, prospecting, rock sampling, magnetic and VLF-EM geophysical surveying and soil geochemical sampling over the property. These surveys gave encouraging results and in the summer of 1987 a program of trenching and diamond was carried out, mainly in the area of the King workings.

Thirty-one trenches were excavated on the property totalling 1200 metres in length and 3291 cubic metres of material excavated. The trenching program was successful in demonstrating 400 metres of strike length on the Lower King vein structure and 100 metres of strike length on the Upper King vein structure. Sampling of the trenches gave gold values from nil to 38,000 ppb. Samples taken from the northern extension of the Lower King vein structure gave the most encouraging results, with gold values of 38,000 ppb over 7 centimetres (calcite bearing, rusty pyritic wall rock) and 20,000 ppb over 1.7 metres (white quartz vein with no visible sulphides).

The 1987 drill program consisted of 23 NQ diamond drill holes totalling 1,404.56 metres, mainly on the King showings. Christopher (1987) made the following comments on the drill program: "Drilling on the Upper and Lower King vein structures revealed a complex fault pattern with veins displaced left laterally by steep northeast faults and in an undetermined fashion by shallow faults. Drilling has indicated a non-uniform distribution of values with auriferous zones probably controlled by the intersections of structural trends".

Drill results varied from nil where the vein was faulted off, to 0.866 oz Au/ton for sludge from 23.48 to 25.0 metres in drill hole DDH-87-5 (Upper King). Drilling on the southern extension of the Lower King vein structure gave several intersections of gold greater than 0.05 ounces per ton across widths less than 1.0 metre, while drilling on the northern extension of the structure did not give any intersections of gold greater than 0.05 ounces per ton. Drilling on the southern extension of the Upper King vein structure gave two intersections of gold greater than 0.05 ounces per ton. Two holes drilled 250 metres south of the Lower King vein structure intersected three to six metres of quartz vein but no anomalous values in gold.

Table 2.0 summarizes the drill results for all intersections greater than 0.05 oz Au/ton.

TABLE 2.0 - DRILL INTERSECTIONS > 0.05 oz. GOLD/TON				
Drill Hole	From/To (m)	Interval (m)	Type	oz. Au/ton
87-1	49.40-50.00	0.6	Core	0.069
87-1	50.65-50.88	0.23	Core	0.269
87-1	50.88-51.22	0.64	Core	0.081
87-1	51.52-52.72	1.2	Core	0.051
87-1	50.76-52.29	1.53	Sludge	0.069
87-2	63.26-64.79	1.53	Sludge	0.101
87-3	31.10-32.62	1.52	Sludge	0.079
87-4	43.85-45.10	1.25	Core	0.05
87-4	46.50-47.60	1.1	Core	0.18
87-4	43.45-44.97	1.52	Sludge	0.055
87-4	46.49-48.02	1.53	Sludge	0.096
87-5	23.00-24.00	1	Core	0.65
87-5	21.93-23.48	1.53	Sludge	0.054
87-5	23.48-25.00	1.52	Sludge	0.866
87-7	31.50-32.50	1	Core	0.087
87-14	49.24-49.69	0.45	Core	0.343
87-14	50.61-51.06	0.45	Core	0.169
87-14	49.24-50.76	1.52	Sludge	0.142
87-14	50.76-52.29	1.53	Sludge	0.074
87-17	4.34-5.34	1	Core	0.144
87-17	3.96-5.49	1.53	Sludge	0.261

In 1990 the Orofino Mountain property was optioned jointly with the Grandoro property. Part of the 1990 work program consisted of evaluating an old tailings pond located on the MO claim. The tailings are believed to be from milling of ore from the Grandoro property.

Evaluation of the tailings was carried out using a flagged grid with a 20 metre line spacing and a ten metre spacing between samples. A two to eight kilogram sample of tailings were taken at each sample location. Determination of grade and tonnage was done using a crude polygon ore reserve calculation. Tailing reserves were calculated to be 12,850 tonnes grading 1.97 grams/tonne, giving a total of 25,314 grams or 814 ounces of gold.

No further work was carried out on the Orofino Mountain property until 1998, when stream sediment samples were collected over the entire property, and magnetic and VLF-EM surveys were carried out over a portion of the King 5 mineral claim. Four of the stream sediment samples from the West Fork of Park Rill yielded weakly to moderately anomalous gold values ranging from 15 to 115 ppb.

The magnetic survey defined three zones of magnetism (low, moderate, high) within the grid. The most prominent magnetic feature is a northwest-southeast trending magnetic high in the central portion of the King 5 mineral claim.

The VLF-EM survey delineated number of north and northeast trending conductor systems. No causes are apparent for the conductor systems, although some may be caused by faults or shear zones that may host auriferous quartz veins.

### 3.0 EXPLORATION PROCEDURE

The 1999 exploration program consisted of establishing grid lines and carrying out magnetic and VLF-EM surveying over the remainder of the King 5 mineral claim not covered by the 1998 survey.

#### 3.1 GRID PARAMETERS

- baseline direction north-south
- survey lines perpendicular to baseline
- survey line separation 100 metres
- survey station spacing 25 metres
- survey total - 11.0 kilometres
- declination 20°

#### 3.2 GEOPHYSICAL SURVEY PARAMETERS

##### TOTAL FIELD MAGNETIC SURVEY

- survey line separation 100 metres
- survey station spacing 25 metres
- survey total - 10.0 kilometres
- measured total magnetic field in nanoteslas
- instrument - Scintrex MP-2 magnetometer
- instrument accuracy  $\pm 1$  nanotesla
- operated faced north for all readings

Readings were taken along the baseline to obtain standard readings for all baseline stations. All loops ran off the baseline were then corrected to these standard values by the straight line method.

The 1999 total field magnetic contours are illustrated on Figure 3.0 along with the 1998 contours. The data is listed in Appendix I.

##### VLF-EM SURVEY

- survey line separation 100 metres
- survey station spacing 25 metres
- survey total - 13.0 kilometres
- transmitting station - Seattle - 24.8 KHz
- direction faced - southeasterly
- instrument - Geonics EM-16
- in-phase (dip angle) and out-of-phase (quadrature) components measured in percent

The 1999 VLF-EM profiles are illustrated on Figure 4.0 along with the 1998 profiles. The data is listed in Appendix I.

## 4.0 GEOLOGY AND MINERALIZATION

### 4.1 REGIONAL GEOLOGY

The Orofino Mountain property is located near the tectonic boundary of the Intermontane Belt and the Omineca Crystalline Belt. The regional geology has been mapped by Bostock (1940, 1941), Cairnes (1940) and Little (1961). The area is underlain by irregular, easterly trending belts of quartzite, chert and greenstone of Triassic and earlier age. These rocks belong to the Shoemaker and Old Tom formations.

These sedimentary and volcanic rocks have been intruded by Mesozoic age granitic bodies varying from gabbro to granodiorite in composition. Little (1961) has referred to these bodies as Nelson and Valhalla plutonic rocks. On the north and west Eocene volcanic rocks are block faulted against older sedimentary, volcanic and granitic units.

### 4.2 CLAIM GEOLOGY

The oldest rocks on the property are quartzites of the Triassic Shoemaker Formation. These quartzites form two relatively narrow bands that strike west and northwest across the King and King 2 mineral claims. They vary from massive to thinly bedded and are light grey in colour.

The sedimentary rocks appear to be rafts or pendants in an intrusive complex. The intrusive complex consists of three rock types; 1) Altered rocks of uncertain origin that vary from massive coarse grained hornblende gabbro and biotite diorite to finer biotite schist. 2) Pinkish, medium grained diorite containing hornblende and biotite and 3) Light grey, porphyritic and coarse grained granite containing biotite and hornblende.

### 4.3 MINERALIZATION

Mineralization on the Orofino Mountain property (King), consisting of quartz veins with significant gold values, forms part of the Orofino Mountain Gold Camp. The Orofino Mountain Gold Camp is adjacent to the Fairview Gold Camp and has similar characteristics.

The quartz veins on the Orofino Mountain property contain pyrite, chalcopyrite, galena and visible gold. Gold values generally increase with an increase in sulphide content. The best mineralized quartz veins appear to strike north to northwesterly with near vertical dips. Trenching and drilling has indicated left lateral offset of the King vein along steep faults with additional displacement by relatively flat structures.

Gold values on surface range from nil to greater than one ounce per ton across widths of one metre. Diamond drilling has shown that the quartz veins with gold values greater than 0.05 ounces per ton across widths of 30 centimetres persist to a vertical depth of 30 metres.

## 5.0 GEOPHYSICS

### 5.1 MAGNETIC SURVEY

A total of 10.0 kilometres of total field magnetic survey was carried out over the King 5 mineral claim during 1999. Magnetic contours for 1998 and 1999 are displayed on Figure 3.0, and the magnetic interpretation is based on the 1998 and 1999 data.

The magnetic data can generally be divided into three zones of magnetism, low, moderate and high. The high magnetic values (greater than 57,000 nT) form a northwest-southeast trending magnetic high in the central portion of the grid, extending from approximately line 700S and 900W to line 200N and 1900W. The magnetic high is flanked to the north and south by zones of moderate magnetic values (between 56,000 and 57,000 nT). Low magnetic values (less than 56,000 nT) occur in the extreme northeast corner of the grid, extending from approximately line 000 and 900W to line 700N and 1900W.

Detailed geological mapping has not been carried out over the grid, so no definite conclusions can be made about the variation in magnetism. Most of the area appears to be underlain by intrusive rocks, and the differences in magnetism may be caused by a variation in the content of magnetite or mafic minerals within the intrusive.

Quartzite and chert have been mapped regionally in the vicinity of the northern portion of the grid, and the lower magnetic values in this area may be related to these less magnetic rocks.

### 5.2 VLF-EM SURVEY

A total of 13.0 kilometres of VLF-EM survey was carried out over the King 5 mineral claim during 1999. VLF-EM profiles for 1998 and 1999 are displayed on Figure 4.0, and the electromagnetic interpretation is based on the 1998 and 1999 data.

VLF-EM profiles show a weak to moderate response to conductivity. Topographic bias, due to up and down-slope VLF instrument orientation is indicated on a number of grid lines in the southern portion of the grid. Topographic bias in rugged terrain can produce profile characteristics that resemble real conductors although they are usually broad and follow topographic contours.

A number of north and northeast trending, weak to strong conductor systems were delineated by the survey, with most conductor systems varying from 100 to 300 metres in length. The most significant conductor system (labelled A, Figure 4.0) trends northeasterly and extends from line 500N and 900W to line 200S and 1575W. This weak to strong conductor system is approximately 700 metres long, and no cause is apparent for it. A second conductor system (labelled B, Figure 4.0) also trends northeasterly and extends from line 600N and 1875W to line 700N and 1825W. This strong conductor system occurs near the contact of older intrusive rocks and younger volcanic rocks, and may represent a fault zone.

A number of other conductor systems occur within the grid area, but no causes are apparent for them.

## 6.0 CONCLUSIONS

6.1 The magnetic survey defined three zones of magnetism (low, moderate, high) with the most prominent magnetic feature a northwest-southeast trending magnetic high in the central portion of the grid. Zones of moderate magnetic values flank the magnetic high to the southwest and northeast, with low magnetic values in the northeast corner of the grid. The grid area appears to be underlain by intrusive rocks, and the differences in magnetism may be caused by a variation in the content of magnetite or mafic minerals within the intrusive.

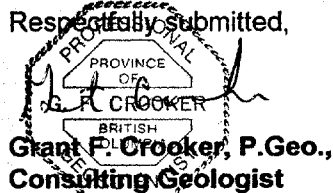
6.2 A number of weak to moderate to strong, north and northeast trending conductor systems were delineated by the VLF-EM survey. No causes are apparent for the conductor systems, although some may be caused by faults or shear zones that could host auriferous quartz veins.

## 7.0 RECOMMENDATIONS

7.1 Additional exploration is warranted on the property and should be conducted as follows:

- conduct geological mapping and prospecting determine the causes of the VLF-EM conductor systems
- conduct soil sampling over the grid area to determine source of anomalous (gold) stream sediment samples from the West Fork of Park Rill (1998 survey)

Respectfully Submitted,

  
**Grant F. Crooker, P. Geo.,  
Consulting Geologist**

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Ulrich, G.D. (1973): Report on Geological and Geochemical Surveys of the Jetex Resources Ltd. Property, Blind Creek, B.C., Osoyoos Mining Division. Assessment report # 4,382.



**9.0 CERTIFICATE OF QUALIFICATIONS**

I, Grant F. Crooker, of Upper Bench Road, PO Box 404, Keremeos, British Columbia, Canada, V0X 1N0 do certify that:

I am a consulting Geologist registered with the Association of Professional Engineers and Geoscientists of the Province of British Columbia (Registration No. 18,961);

I am a Fellow of the Geological Association of Canada (Registration No. 3,758) and I am a Member of Canadian Institute of Mining, Metallurgy and Petroleum;

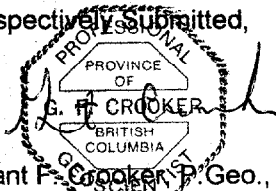
I am a graduate of the University of British Columbia with a Bachelor of Science degree (B.Sc.) from the Faculty of Science having completed the Major Program in Geology;

I have practised my profession as a geologist for over 25 years, and since 1980, I have been practising as a Consulting Geologist and, in this capacity have examined and reported on numerous mineral properties in North and South America;

I have based this report on field examinations within the area of interest and on a review of the technical and geological data;

I am the owner of the King Claim Group;

Respectfully Submitted,

  
Grant F. Crooker, P. Geo.,  
Consulting Geologist

**APPENDIX I**

**MAGNETIC AND VLF-EM DATA**

Grant F. Crooker

Line and Station: +=Northing/Easting  
 -=Southing/Westing

Area: King Claims  
 Grid: King  
 Date: May, 1999  
 Instrument Type:  
 Scintrex MP-2:  
 Geonics EM-16:  
 Station:  
 Data Types: #1  
 #2  
 #3

File Name: KIGE0199

Details:  
 Corrected Total Field Magnetic Values  
 In-Phase and Quadrature Values  
 Seattle, Facing Easterly  
 Corrected Total Field Magnetic Values  
 VLF-EM In Phase Values (percent)  
 VLF-EM Quadrature Values (percent)

N/S	E/W	#1	#2	#3
line 700				
700	-1900	55355	20	5
700	-1875	55551	24	6
700	-1850	55385	20	6
700	-1825	55243	8	6
700	-1800	55421	1	8
700	-1775	56450	2	11
700	-1750	55431	5	11
700	-1725	55421	5	12
700	-1700	55466	4	13
700	-1675	55617	2	11
700	-1650	55598	4	12
700	-1625	55541	2	11
700	-1600	55672	3	10
700	-1575	55662	3	10
700	-1550	55648	8	8
700	-1525	55632	10	7
700	-1500	55708	11	7
700	-1475	55773	8	5
700	-1450	55669	1	2
700	-1425	55675	10	8
700	-1400	55776	4	2
700	-1375	55684	13	6
700	-1350	55914	1	-2
700	-1325	55806	9	2
700	-1300	55743	10	3
700	-1275	55829	11	4
700	-1250	55870	6	4
700	-1225	55909	3	5
700	-1200	55765	-3	1
700	-1175	55916	-6	3
700	-1150	55937	0	4
700	-1125	55909	0	1
700	-1100	55921	11	7
700	-1075	55969	10	3
700	-1050	55973	8	4
700	-1025	55932	16	-6
700	-1000	55976	13	-2
700	-975	55882	25	0
700	-950	56020	32	-6
700	-925	55975	20	-10
700	-900	56032	10	-6
line 600				
600	-1900	56529	-10	13
600	-1875	56467	-26	11
600	-1850	56681	-14	-7
600	-1825	56632	-7	20

600	-1800	57031	3	18
600	-1775	56756	8	13
600	-1750	56746	14	16
600	-1725	56355	18	17
600	-1700	56037	13	10
600	-1675	56172	18	12
600	-1650	55836	20	10
600	-1625	55618	22	9
600	-1600	55383	15	7
600	-1575	55249	11	2
600	-1550	55300	13	6
600	-1525	55356	15	5
600	-1500	55534	13	4
600	-1475	55530	7	-4
600	-1450	55743	15	2
600	-1425	55687	21	-1
600	-1400	55345	20	-5
600	-1375	55414	30	0
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600	-1325	55561	30	3
600	-1300	55527	26	4
600	-1275	55757	27	4
600	-1250	55792	22	4
600	-1225	55763	19	0
600	-1200	55821	14	3
600	-1175	55818	11	-1
600	-1150	55871	7	-2
600	-1125	55727	8	-4
600	-1100	55881	11	-1
600	-1075	55791	8	-6
600	-1050	55846	10	-4
600	-1025	55824	4	-2
600	-1000	55856	13	-4
600	-975	55817	22	2
600	-950	56036	15	-2
600	-925	55966	3	0
600	-900	55937	-2	1
line -				
-300	-1900		20	-3
-300	-1875		24	-2
-300	-1850		24	-2
-300	-1825		18	-3
-300	-1800		15	-6
-300	-1775		17	-3
-300	-1750		21	1
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-300	-1700		21	0
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-300	-1575		11	-3
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-300	-1325		-23	-9
-300	-1300		-21	-8
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-300	-1250		-20	-10
-300	-1225		-15	-9
-300	-1200		-13	-9

-300	-1175		-11	-9
-300	-1150		-8	-6
-300	-1125		-12	-6
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-300	-975		-17	-7
-300	-950		-1	-2
-300	-925		14	4
-300	-900		5	0
line -400				
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-400	-1875		27	3
-400	-1850		27	3
-400	-1825		28	1
-400	-1800		29	4
-400	-1775		28	3
-400	-1750		24	2
-400	-1725		22	3
-400	-1700		18	1
-400	-1675		15	0
-400	-1650		10	0
-400	-1625		10	4
-400	-1600		6	3
-400	-1575		1	2
-400	-1550		0	2
-400	-1525		-3	1
-400	-1500		-9	-2
-400	-1475		-16	-4
-400	-1450		-19	-7
-400	-1425		-20	-9
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-400	-1300		-15	-2
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-400	-1250		-21	-3
-400	-1225		-22	-5
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-400	-975		-1	-2
-400	-950		0	-3
-400	-925		3	-1
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line -500				
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-500	-1675	57527	4	2
-500	-1650	57309	0	-1
-500	-1625	57165	-5	-2

-500	-1600	57231	-6	-4
-500	-1575	57127	-11	-4
-500	-1550	57542	-13	-4
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line -600				
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-600	-1000	57978	29	8

-600	-975	57743	29	8
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-600	-900	58093	38	11
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-700	-1525	56860	-7	-6
-700	-1500	56797	-10	-6
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-700	-1450	56861	-20	-6
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-700	-1175	57344	-6	-7
-700	-1150	56758	1	-3
-700	-1125	56958	2	-2
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-700	-1025	57165	45	16
-700	-1000	57273	52	14
-700	-975	57562	39	15
-700	-950	57495	41	18
-700	-925	57453	39	18
-700	-900	57793	26	12
line -800				
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-800	-1875	56379	7	4
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-800	-1825	56442	11	2
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-800	-1750	56506	6	1
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-800	-1700	56561	5	0
-800	-1675	56494	2	0
-800	-1650	56519	-3	-2
-800	-1625	56592	-4	-5
-800	-1600	56593	-5	-7
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-800	-975	56669	16	8
-800	-950	56785	24	10
-800	-925	56787	26	11
-800	-900	56991	27	10
line -900				
-900	-1900	56383	7	8
-900	-1875	56412	6	4
-900	-1850	56432	9	5
-900	-1825	56453	7	4
-900	-1800	56450	3	1
-900	-1775	56476	3	-1
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-900	-1725	56476	1	0
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-900	-1675	56523	-4	-1
-900	-1650	56532	-7	-2
-900	-1625	56510	-12	-6
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-900	-1150	56826	5	-3
-900	-1125	56307	1	-2
-900	-1100	56470	8	0
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-900	-1050	56534	15	3
-900	-1025	56655	22	6
-900	-1000	56656	21	7
-900	-975	56785	31	9
-900	-950	56860	28	8
-900	-925	56900	27	7
-900	-900	57038	28	5
line -1000				
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-1000	-1850	56325	4	2



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-1000	-1750	56370	-2	-1
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-1000	-1250	56628	-8	-11
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-1000	-1050	56870	24	6
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-1000	-975	56704	26	12
-1000	-950	56906	30	10
-1000	-925	56761	34	7
-1000	-900	56793	27	2
line -1100				
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-1100	-1850	56179	-2	4
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-1100	-1800	56228	-4	4
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-1100	-1750	56281	-7	-1
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-1100	-1650	56330	-26	-6
-1100	-1625	56261	-24	-5
-1100	-1600	56308	-18	-4
-1100	-1575	56415	-19	-5
-1100	-1550	56441	-15	-5
-1100	-1525	56365	-19	-7
-1100	-1500	56385	-17	-10
-1100	-1475	56553	-14	-9
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-1100	-1375	56471	-11	-12
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-1100	-1300	56521	-8	-8
-1100	-1275	56522	1	-5
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-1100	-1100	56609	14	4
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-1100	-1025	56521	-4	4
-1100	-1000	56560	-4	6
-1100	-975	56366	5	8
-1100	-950	56727	-1	13
-1100	-925	56850	17	4
-1100	-900	57000	18	7
line -1200				
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-1200	-1850	56202	-6	4
-1200	-1825	56232	-5	4
-1200	-1800	56201	-3	3
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-1200	-1725	56262	-5	2
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-1200	-1600	56273	-9	-3
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-1200	-1550	56265	-8	-5
-1200	-1525	56319	-4	-1
-1200	-1500	56264	-4	0
-1200	-1475	56336	-8	-4
-1200	-1450	56368	-5	-1
-1200	-1425	56349	-4	0
-1200	-1400	56384	-1	-3
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-1200	-1350	56404	5	1
-1200	-1325	56466	5	2
-1200	-1300	56591	6	0
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-1200	-1200	56512	-17	-3
-1200	-1175	56420	-15	0
-1200	-1150	56254	-15	2
-1200	-1125	56501	-5	11
-1200	-1100	56364	1	8
-1200	-1075	56394	8	11
-1200	-1050	56483	15	12
-1200	-1025	56522	13	9
-1200	-1000	56472	20	10
-1200	-975	56556	21	7
-1200	-950	56534	26	9
-1200	-925	56585	23	5
-1200	-900	56608	28	3
line -1300				
-1300	-1900		1	0
-1300	-1875		15	2
-1300	-1850		14	0
-1300	-1825		15	4
-1300	-1800		8	3
-1300	-1775		14	9
-1300	-1750		8	6
-1300	-1725		5	3
-1300	-1700		3	2
-1300	-1675		12	5
-1300	-1650		9	4

-1300 -1625  
-1300 -1600  
-1300 -1575  
-1300 -1550  
-1300 -1525  
-1300 -1500  
-1300 -1475  
-1300 -1450  
-1300 -1425  
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-1300 -1375  
-1300 -1350  
-1300 -1325  
-1300 -1300  
-1300 -1275  
-1300 -1250  
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-1300 -1050  
-1300 -1025  
-1300 -1000  
-1300 -975  
-1300 -950  
-1300 -925  
-1300 -900

11 3  
11 2  
13 4  
12 -2  
10 1  
11 0  
9 0  
7 0  
7 -2  
3 -1  
4 -1  
3 2  
-9 -3  
-5 -1  
-3 0  
-6 -1  
-2 0  
-1 3  
-1 2  
-1 3  
5 -1  
9 1  
14 5  
20 3  
20 2  
17 4  
23 4  
29 5  
25 2  
20 -2

**APPENDIX II**

**GEOPHYSICAL EQUIPMENT SPECIFICATIONS**

GEONICS LIMITED

V EM 16

**Source of Primary Field** VLF transmitting stations

**Transmitting Stations Used:** Any desired station frequency can be supplied with the instrument in the form of plug-in tuning units. Two tuning units can be plugged in at one time. A switch selects either station.

**Operating Frequency Range:** About 15-25 Hz.

**Parameters Measured:**

- 1- The vertical in-phase component (tangent of the tilt angle of the polarization ellipsoid).
- 2- The vertical out-of-phase (quadrature) component (the short axis of the polarization ellipsoid compared to the long axis).

**Method of Reading:** In-phase from a mechanical inclinometer and quadrature from a calibrated dial. Nulling by audio tone

**Scale Range:** In-phase  $\pm 150\%$ ; quadrature  $\pm 40\%$

**Readability:**  $\pm 1\%$

**Operating Temperature Range:** -40 to 50° C.

**Operating Controls:** ON-OFF switch, battery testing push button, station selector, switch, volume control, quadrature dial  $\pm 40\%$ , inclinometer  $\pm 150\%$

**Power Supply:** 6 size AA alkaline cells  $\approx 200$  hrs.

**Dimensions:** 42 x 14 x 9 cm (16 x 5.5 x 3.5 in)

**Weight:** 1.6 kg. (3.5 lbs)

**Instrument Supplied With:** Monotonic speaker, carrying case, manual of operation, 3 station selector plug-in tuning units (additional frequencies are optional) set of batteries.

**Manufacturer:** Geonics Limited  
1745 Meyerside Drive/Unit 8  
Mississauga, Ontario  
L5T 1C5

## MP-2 PROTON PRECESSION MAGNETOMETER

**Resolution:** 1 gamma

**Total Field Accuracy:**  $\pm$  gamma over full operating range

**Range:** 20,000 to 100,000 gammas in 25 overlapping steps.

**Internal Measuring Program:** A reading appears 1.5 seconds after depression of Operate Switch & remains displayed for 2.2 secs. Recycling feature permits automatic repetitive readings at 3.7 sec. intervals.

**External Trigger:** External trigger input permits use of sampling intervals longer than 3.7 seconds.

**Display:** 5 digit LED readout displaying total magnetic field in gammas or normalized battery voltage.

**Data Output:** Multiplied precession frequency and gate time outputs for base station recording using interfacing optionally available from Scintrex.

**Gradient Tolerance:** Up to 5,000 gammas/meter.

**Power Source:** 8 size D cells  $\approx$  25,000 readings at 25° C under reasonable conditions.

**Sensor:** Omnidirectional, shielded, noise-cancelling dual coil, optimized for high gradient tolerance.

**Harness:** Complete for operation with staff or back pack sensor.

**Operating Temperature Range:** -35 to +60° C.

**Size:** Console, 8 x 16 x 25 cm; Sensor, 8 x 15 cm; Staff 30 x 66 cm;

**Weights:** Console, 1.8 kg; Sensor, 1.3 kg; Staff, 0.6 kg;

**Manufacturer:** Scintrex  
222 Snidercroft Road  
Concord, Ontario

**APPENDIX III**  
**COST STATEMENT**

## COST STATEMENT

### SALARIES

Grant Crooker, Geologist  
March 23 - April 28, 1999  
14 days @ \$ 400.00/day \$ 5,600.00

### MEALS AND ACCOMMODATION

Grant Crooker - 10 days @ \$ 60.00/day 600.00

### TRANSPORTATION

Vehicle Rental (Blazer 4 x 4)  
March 23 - April 28, 1999  
10 days @ \$ 60.00/day 600.00

Gasoline 88.68

### EQUIPMENT RENTAL

Magnetometer (Scintrex MP-2)  
March 23 - April 28, 1999  
3 days @ \$ 25.00/day 75.00

VLF-EM (Geonics EM-16)  
March 23 - April 28, 1999  
7 days @ \$ 25.00/day 175.00

SUPPLIES 70.00

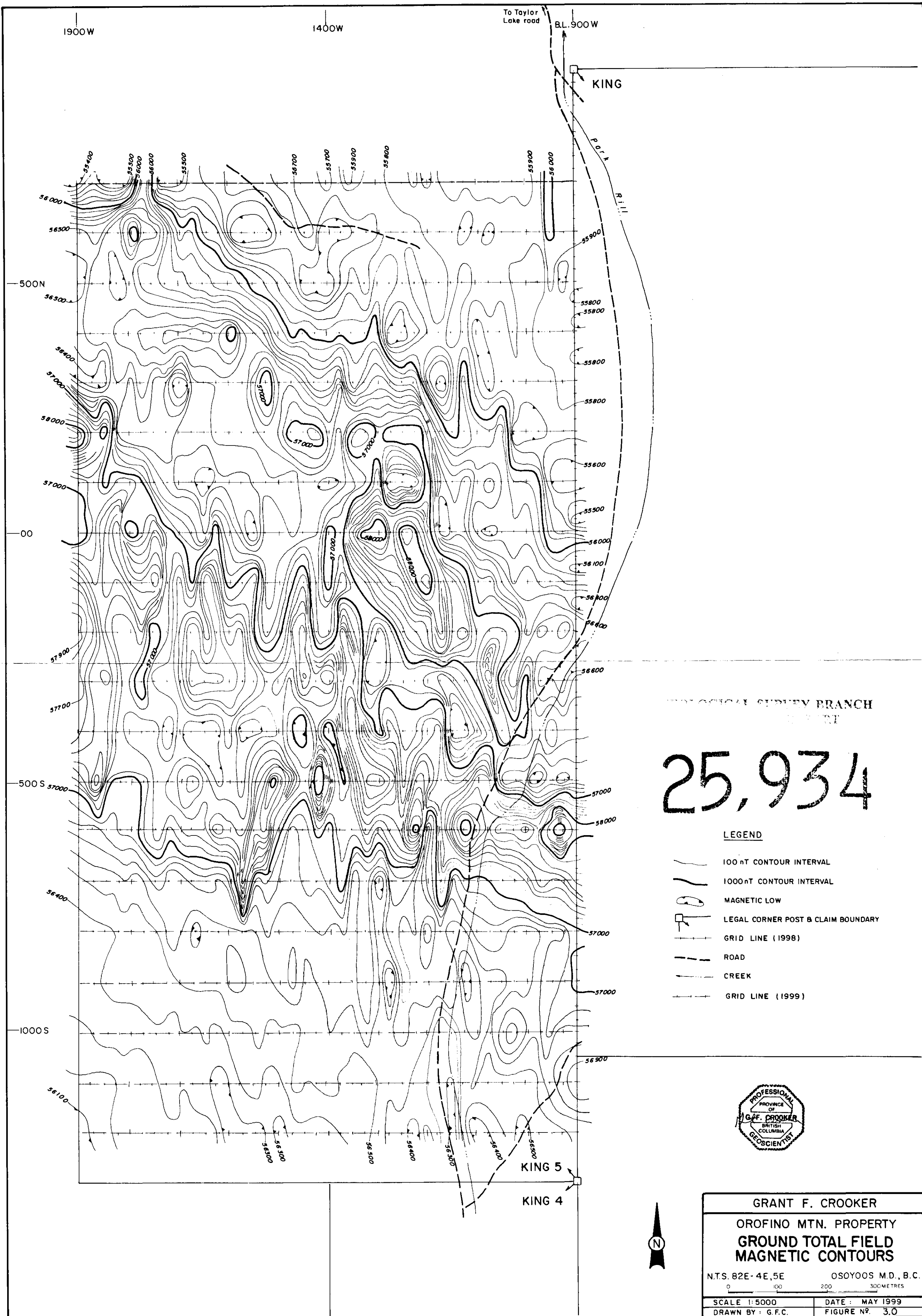
DRAFTING 200.00

### PREPARATION OF REPORT

(Reproduction, copying, telephone, overhead)

**TOTAL** \$ 100.00  
7,508.68

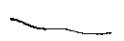


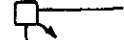
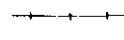
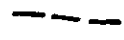
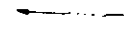
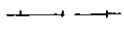


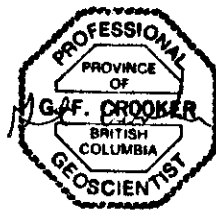



PROFESSORIAL SURVEY BRANCH  
 BC SURVEY

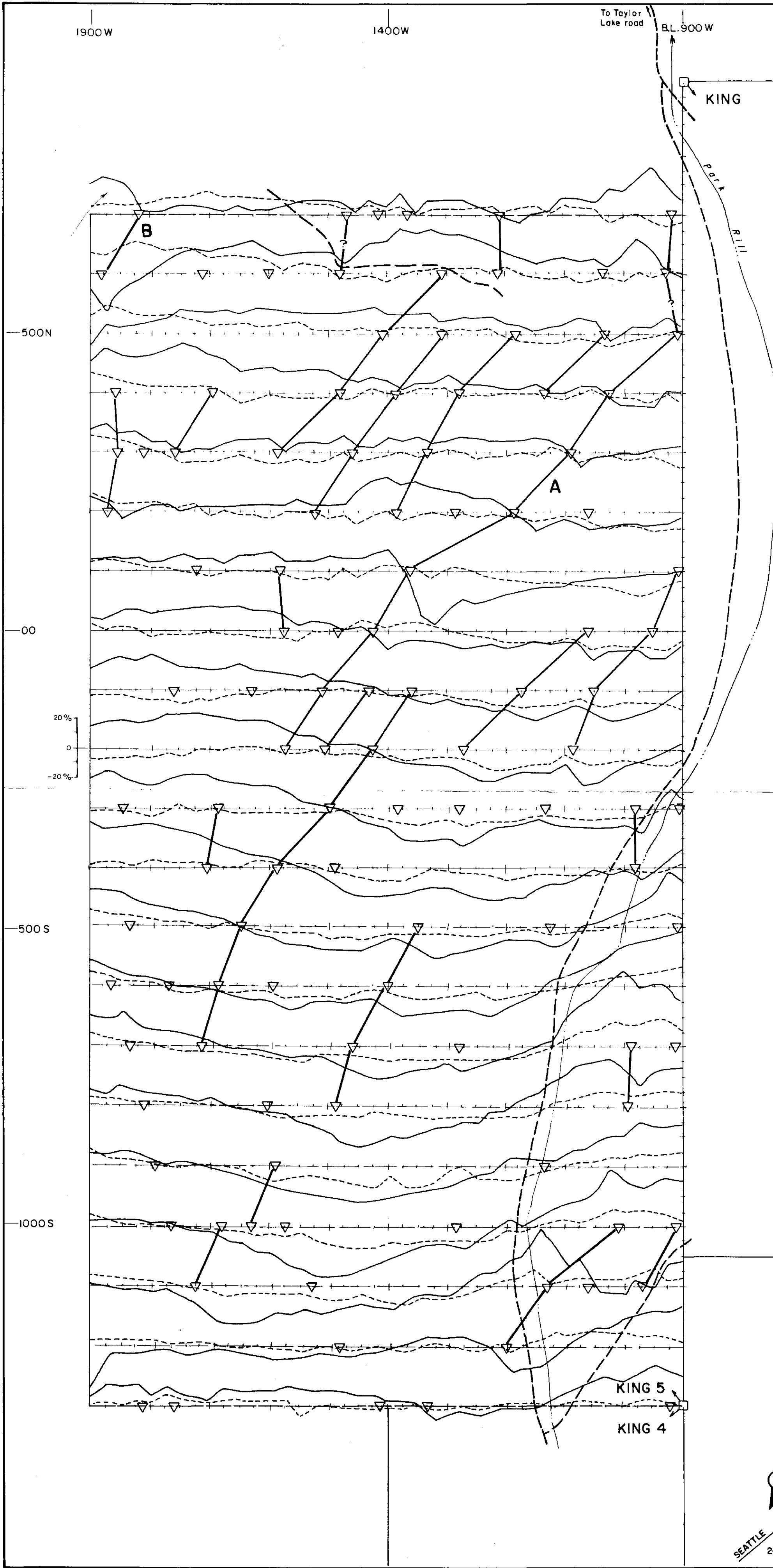
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**LEGEND**

-  100 nT CONTOUR INTERVAL
-  1000 nT CONTOUR INTERVAL
-  MAGNETIC LOW
-  LEGAL CORNER POST & CLAIM BOUNDARY
-  GRID LINE (1998)
-  ROAD
-  CREEK
-  GRID LINE (1999)



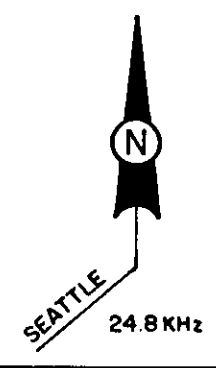
<b>GRANT F. CROOKER</b>	
<b>OROFINO MTN. PROPERTY</b>	
<b>GROUND TOTAL FIELD</b>	
<b>MAGNETIC CONTOURS</b>	
N.T.S. 82E-4E,5E	OSOYOOS M.D., B.C.
	
SCALE 1:5000	DATE: MAY 1999
DRAWN BY: G.F.C.	FIGURE NO. 3.0



- LEGEND**
- ANOMALOUS INFLECTION (IN-PHASE)
  - IN-PHASE
  - QUADRATURE
  - VLF-EM CONDUCTOR
  - LEGAL CORNER POST & CLAIM BOUNDARY
  - GRID LINE (1998)
  - ROAD
  - CREEK
  - GRID LINE (1999)

**GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT**

25,934



GRANT F. CROOKER	
OROFINO MTN. PROPERTY	
VLF-EM PROFILES	
(NLK, SEATTLE, WA.)	
N.T.S. 82E-4E,5E	OSOYOOS M.D., B.C.
SCALE 1:5000	DATE: MAY 1999
DRAWN BY: G.F.C.	FIGURE NO: 4.0