## OF THE

# sturgeon lake and kakagi lake areas, ontario 

FOR<br>sault meadows energy corporation

BY

DIGHEM LIMITED

## SUMMARY AND RECOMMENDATIONS


#### Abstract

A total of 549 km of survey was flown in April and July, 1984, over properties held by Sault Meadows Energy Corporation in the Sturgeon Lake and Kakagi Lake areas.


The survey outlined several discrete bedrock conductors in the midst of many overburden conductors. The bedrock anomalies generally warrant further investigation using appropriate surface exploration techniques, providing they have not been explored earlier.

## LOCATION MAP



## CONTENTS

INTRODUCTION ..... 1
SECTION I: SURVEY RESULTS ..... I- 1
CONDUCTORS IN THE SURVEY AREA ..... I- 1
Sturgeon Lake ..... I- 1
Kakagi Lake ..... I- 6
SECTION II: BACKGROUND INFORMATION ..... II- 1
ELECTROMAGNETICS ..... II- 1
Geometric interpretation ..... II- 2
Discrete conductor analysis ..... II- 2
X-type electromagnetic responses ..... II-10
The thickness parameter ..... II-11
Resistivity mapping ..... II-12
Interpretation in conductive environments. ..... II-16
Reduction of geologic noise. ..... II-18
EM magnetite mapping ..... II-19
Recognition of culture ..... II-21
TOTAL FIELD MAGNETICS ..... II-24
MAPS ACCOMPANYING THIS REPORT
APPENDICES
A. The Flight Record and Path Recovery
B. EM Anomaly List

A DIGHEMIII survey was flown over a number of claim blocks with 300 m line-spacings for Sault Meadows Energy Corporation. A total of 122 km was flown on April 22, 1984 in the Sturgeon Lake area of Ontario (Figure 1a), and 427 km was flown from July 6 to 8 in the Kakagi Lake area (Figure 1b).

The NSM Astar turbine helicopter flew at an average airspeed of $115 \mathrm{~km} / \mathrm{h}$ with an EM bird height of approximately 32 m. Ancillary equipment consisted of a Sonotek PMH 5010 magnetometer with its bird at an average height of 47 m , a Sperry radio altimeter, a Geocam sequence camera, an RMS GR33 analog recorder, a Sonotek SDS 1200 digital data acquisition system and a Digidata 1140 9-track 800-bpi magnetic tape recorder. The analog equipment recorded four channels of EM data at approximately 900 Hz , two channels of EM data at approximately 7200 Hz , two ambient EM noise channels (for the coaxial and coplanar receivers), two channels of magnetics (coarse and fine count), and a channel of radio altitude. The digital equipment recorded the EM data with a sensitivity of 0.2 ppm and the magnetic field to one nT (i.e., one gamma).

Appendix A provides details on the data channels, their respective sensitivities, and the flight path recovery procedure. Noise levels of less than 2 ppm are generally maintained for wind speeds up to $35 \mathrm{~km} / \mathrm{h}$. Higher winds may cause the system to be grounded because excessive bird swinging produces difficulties in flying the helicopter. The swinging results from the $5 \mathrm{~m}^{2}$ of area which is presented by the bird to broadside gusts. The DIGHEM system nevertheless can be flown under wind conditions that seriously degrade other AEM systems.

It should be noted that the anomalies shown on the electromagnetic anomaly map are based on a near-vertical, half plane model. This model best reflects "discrete" bedrock conductors. Wide bedrock conductors or flat-lying conductive units, whether from surficial or bedrock sources, may give rise to very broad anomalous responses on the EM profiles. These may not appear on the electromagnetic anomaly map if they have a regional character rather than a locally anomalous character. These broad conductors, which more closely approximate a half space model, will be maximum coupled to the horizontal (coplanar) coil-pair and are clearly evident on the resistivity map. The resistivity

## - I-1 - <br> SECTION I: SURVEY RESULTS

## CONDUCTORS IN THE SURVEY AREA

The electromagnetic anomaly map shows the anomaly locations with the interpreted conductor type, dip, conductance and depth being indicated by symbols. Direct magnetic correlation is also shown if it exists. The strike direction and length of the conductors are indicated when anomalies can be correlated from line to line. When studying the map sheets for follow-up planning, consult the anomaly listings appended to this report to ensure that none of the conductors are overlooked.

## Sturgeon Lake

The Sturgeon Lake survey covered two small areas with 122 km of flying, the results of which are shown on one map sheet for each parameter. Table $I-1$ summarizes the $E M$ responses on the Sturgeon Lake sheet with respect to conductance grade and interpretation.

The resistivity map shows the conductive properties of the Sturgeon Lake area. Some of the resistivity lows (i.e., conductive areas) coincide with bedrock conductors and others indicate lakes. The resistivity is generally greater than 300 ohm-m over the lakes, but often is below 30 ohm-m

EM ANOMALY STATISTICS OF THE STURGEON LARE AREANUMBER OFCONDUCTOR GRADE CONDUCTANCE RANGE RESPONSES

| 6 | $>99$ MHOS | 1 |
| :--- | ---: | ---: |
| 5 | $50-99$ MHOS | 0 |
| 4 | $20-49$ MHOS | 5 |
| 3 | $10-19$ MHOS | 4 |
| 2 | $5-9$ MHOS | 1 |
| 1 | $<\quad 5$ MHOS | 61 |
| $X$ | INDETERMINATE | 51 |

TOTAL123
NUMBER OF
CONDUCTOR MODEL MOST LIKELY SOURCE RESPONSES
B DISCRETE BEDROCK ..... 11
S COVER ..... 103
L CULTURE ..... 9
TOTAL ..... 123
over bedrock conductors. The resistivity patterns may aid geologic mapping and in extending the length of known zones.

A powerline runs through part of the Sturgeon Lake area. It influences the resistivity and electromagnetic anomaly patterns somewhat but has negligible effect on the usefulness of airborne exploration of the property.

The total field magnetic map is quite inactive except for the southwest corner.

The enhanced magnetic map shows a number of individual magnetic zones much more distinctly than the total field magnetic map. For example, there is a magnetic correlation with 105D-106B* which shows clearly on the enhanced map but which is barely visible on the total field map. The enhanced map, which is proprietary to Dighem Limited, is more suited to exploration than the total field map.

The following description of EM anomalies focusses primarily on the probably bedrock conductors (interpretive symbol "B" or "B?"). Anomalies which have been interpreted as due to conductive overburden (interpretive symbol "S" or "S?") or culture ("L") are generally ignored in this discussion.

[^0]Anomalies $1 E-2 E$, $4 \mathrm{E}-5 \mathrm{xA}$

These two conductors may occur along a single geologic horizon over a strike length in excess of 4600 ft . They are non-magnetic, but are located adjacent to magnetic features. The conductance grade is 3 to 4. Well-defined resistivity anomalies are associated with the conductors. They are excellent targets.

Anomaly 7C
A single-line grade 1 conductor occurs near a lake. It is non-magnetic and poorly conductive.

Anomaly 15 xB

Anomaly 18A
The single-line anomaly represents an excellent target. Magnetic correlation exists with this highly conductive grade 6 conductor. A strong resistivity anomaly occurs.

Both the resistivity and enhanced magnetic maps suggest the conductor may extend westward to line 17.

Anomaly 101A

Anomaly 102A

Anomaly 105D-106B
An excellent single-line target, with a strong resistivity anomaly, occurs on the north flank of a small enhanced magnetic feature. The conductance grade is 3 .

This two-line conductor also forms an excellent target. The conductance grade varies from 1 to 4. The conductor may appear to be on strike with 102A. However, it correlates directly with an enhanced magnetic anomaly, whereas 102A occurs on a magnetic flank.

figure lb
THE SURVEY AREA
A strong single-line grade 4
conductor, with a well-defined
resistivity anomaly, yields an
attractive target. A small
magnetic correlation exists.

## Kakagi Lake

The Kakagi Lake survey covered five small areas with 427 km of flying, the results of which are shown on two map sheets for each parameter. Table I-2 summarizes the EM responses on the Kakagi Lake sheets with respect to conductance grade and interpretation.

The resistivity maps show the conductive properties of the survey areas. Most of the resistivity lows (i.e., conductive areas) coincide with lakes and, apparently, structural zones. The resistivity patterns may aid in geologic mapping and in extending the length of known zones.

NUMBER OF CONDUCTOR GRADE CONDUCTANCE RANGE RESPONSES


50-99 MHOS 0
20-49 MHOS
10-19 MHOS 21
642 48720

NUMBER OF RESPONSES

26
694

The total field and enhanced magnetic maps are highly active. A comparison of the total field magnetic map with the resistivity map shows the existence of a number of probable structures. Note the zone which runs through 212 K and 215 J of sheet 2 . Another example is the zone which runs along line 313. It has a major impact on the resistivity map as it separates two conductive areas.

A low resistivity zone, having a width in excess of $1 / 2$ mile, encompasses $301 \mathrm{~K}-3046$, $305 \mathrm{D}-\mathrm{G}$, etc. Several EM anomalies in this zone have been interpreted as "S?". They may actually be caused by weak bedrock or structural conductivity, rather than conductive overburden. Nevertheless, those anomalies that are interpreted as "S" or "S?" do not have the features which are characteristic of mineralization.

The following description of EM anomalies focusses primarily on the probably bedrock conductors (interpretive symbol "B" or "B?"). Anomalies which have been interpreted as due to conductive overburden (interpretive symbol "S" or "S?") or culture ("L") are generally ignored in this discussion.

Anomaly 202B

Anomalies 207D-208C, 211A-214B

A weak single-line EM anomaly occurs without magnetic association. There is a local resistivity low. This grade 1 anomaly is not attractive but it could reflect weak bedrock conductivity.

These grade 1 EM anomalies coincide with or occur close to magnetic features. They have also generated distinct resistivity lows. These anomalies likely reflect bedrock conductors.

2080

212K
This grade 1 non-magnetic anomaly appears to occur along a structure which strikes parallel to the flight line. Note the location of this anomaly on the resistivity and total field magnetic maps. If this anomaly reflects bedrock conductivity, then other EM

> anomalies on this same structure (e.g., $213 \mathrm{H}, 214 \mathrm{R}$ ) may have a similar cause.

301K-304G

3080

A single-line grade 4 EM anomaly occurs which is an excellent target. It correlates directly with a 30 gamma magnetic anomaly as can be seen on the profile. This target appears to occur within a northstriking structure as suggested by the total field magnetic map. The direct correlation between EM and magnetics, however, can only be seen on the enhanced magnetic map. This example illustrates the benefit of having Dighem's proprietary enhanced magnetic map in addition to the total field magnetic map.
A grade 1 conductor runs across four lines, coinciding with a resistivity low and a magnetic high.

A bedrock conductor is the most probable cause of the non-magnetic


#### Abstract

grade 3 EM anomaly. It occurs within a conductive lake, but the anomaly shapes from the various coil combinations imply that a bedrock conducter has contributed to the overall response. It is located within a north-striking structure as can be seen on both the total field magnetic and resistivity maps.


Only one bedrock conductor appears to exist on the 400-series lines of sheet 2. This is 401G-402G, of which only 401 G is a fairly interesting target. The other EM anomalies, without exception, appear to reflect conductive surface material. Some of the "S?" anomalies may be structurally controlled, e.g., 409C-412A.

The 500 -series lines of sheet 3 contain only two bedrock conductors, as follows:

510L-511M
A two-line grade 3 conductor occurs within a lake. The lack of a correlating resistivity low suggests it may simply reflect a more conductive part of the lake bottom. As a result, the conductor is
questionable. There is no magnetic correlation.

517E-519D, 517D, 517F

These anomalies are, in all likelihood, caused by bedrock conductors. They occur in a conductive lake but their anomaly characteristics are highly indicative of a bedrock source. The conductors occur on the north flank of an enhanced magnetic high.

Anomalies 504D-506G and 524C have the interpretive symbol "S?" and, hence, probably have a surficial origin. There is a possibility that they reflect very weak bedrock conductivity.

Arcuate patterns to the magnetics and resistivity on the east side of the 500 -series grid indicates that the conductive patterns are structurally controlled. The arcuate resistivity anomaly, encompassing 527F, 529B, 529F, etc, correlates with a conductive lake which is arcuate in shape.

The 600-series lines contain only one bedrock conductor, 623I, which may extend eastward to 624D. There is a
magnetic association as can best be seen on the enhanced magnetic map. Anomaly 623 I is of conductance grade 3, and is a fairly attractive target.

As for the other survey blocks, the "S?" anomalies might be worth investigating if the geology was particularly attractive. Anomalies $613 \mathrm{~F}, 615 \mathrm{I}$ and $617 \mathrm{I}-618 \mathrm{H}$ are perhaps somewhat more attractive than the other anomalies of this type.

## SECTION II: BACKGROUND INFORMATION

## ELECTROMAGNETICS


#### Abstract

DIGHEM electromagnetic responses fall into two general classes, discrete and broad. The discrete class consists of sharp, well-defined anomalies from discrete conductors such as sulfide lenses and steeply dipping sheets of graphite and sulfides. The broad class consists of wide anomalies from conductors having a large horizontal surface such as flatly dipping graphite or sulfide sheets, saline water-saturated sedimentary formations, conductive overburden and rock, and geothermal zones. A vertical conductive slab with a width of 200 m would straddle these two classes.


The vertical sheet (half plane) is the most common model used for the analysis of discrete conductors. All anomalies plotted on the electromagnetic map are analyzed according to this model. The following section entitled Discrete conductor analysis describes this model in detail, including the effect of using it on anomalies caused by broad conductors such as conductive overburden.

The conductive earth (half space) model is suitable for broad conductors. Resistivity contour maps result from the


#### Abstract

use of this model. A later section entitled Resistivity mapping describes the method further, including the effect of using it on anomalies caused by discrete conductors such as sulfide bodies.


Geometric interpretation

The geophysical interpreter attempts to determine the geometric shape and dip of the conductor. This qualitative interpretation of anomalies is indicated on the map by means of interpretive symbols (see EM map legend). Figure II-1 shows typical DIGHEM anomaly shapes and the interpretive symbols for a variety of conductors. These classic curve shapes are used to guide the geometric interpretation.

## Discrete conductor analysis

The EM anomalies appearing on the electromagnetic map are analyzed by computer to give the conductance (i.e., conductivity-thickness product) in mhos of a vertical sheet model. This is done regardless of the interpreted geometric shape of the conductor. This is not an unreasonable procedure, because the computed conductance increases as the electrical quality of the conductor increases, regardless of its true shape. DIGHEM anomalies are divided into six


Figure II-1 Typical DIGHEM anomaly shapes
grades of conductance, as shown in Table II-1. The conductance in mhos is the reciprocal of resistance in ohms.

Table II-1. EM Anomaly Grades

| Anomaly Grade | Mho Range |
| :---: | :---: |
|  | $>99$ |
| 5 | $50-99$ |
| 4 | $20-49$ |
| 3 | $10-19$ |
| 2 | $5-99$ |
| 1 | $<$ |

The conductance value is a geological parameter because it is a characteristic of the conductor alone; it generally is independent of frequency, and of flying height or depth of burial apart from the averaging over a greater portion of the conductor as height increases. 1 Small anomalies from deeply buried strong conductors are not confused with small anomalies from shallow weak conductors because the former will have larger conductance values.

Conductive overburden generally produces broad EM responses which are not plotted on the EM maps. However, patchy conductive overburden in otherwise resistive areas

1 This statement is an approximation. DIGHEM, with its short coil separation, tends to yield larger and more accurate conductance values than airborne systems having a larger coil separation.
can yield discrete anomalies with a conductance grade (cf. Table II-1) of 1 , or even of 2 for conducting clays which have resistivities as low as 50 ohm-m. In areas where ground resistivities can be below 10 ohm-m, anomalies caused by weathering variations and similar causes can have any conductance grade. The anomaly shapes from the multiple coils often allow such conductors to be recognized, and these are indicated by the letters $S, H, G$ and sometimes $E$ on the map (see EM legend).

For bedrock conductors, the higher anomaly grades indicate increasingly higher conductances. Examples: DIGHEM's New Insco copper discovery (Noranda, Canada) yielded a grade 4 anomaly, as did the neighbouring copper-zinc Magusi River ore body; Mattabi (copper-zinc, Sturgeon Lake, Canada) and whistle (nickel, Sudbury, Canada) gave grade 5; and DIGHEM's Montcalm nickel-copper discovery (Timmins, Canada) yielded a grade 6 anomaly. Graphite and sulfides can span all grades but, in any particular survey area, field work may show that the different grades indicate different types of conductors.

Strong conductors (i.e., grades 5 and 6) are characteristic of massive sulfides or graphite. Moderate conductors (grades 3 and 4) typically reflect sulfides of a less massive character or graphite, while weak bedrock conductors
(grades 1 and 2) can signify poorly connected graphite or heavily disseminated sulfides. Grade 1 conductors may not respond to ground EM equipment using frequencies less than 2000 Hz .

The presence of sphalerite or gangue can result in ore deposits having weak to moderate conductances. As an example, the three million ton lead-zinc deposit of Restigouche Mining Corporation near Bathurst, Canada, yielded a well defined grade 1 conductor. The 10 percent by volume of sphalerite occurs as a coating around the fine grained massive pyrite, thereby inhibiting electrical conduction.

Faults, fractures and shear zones may produce anomalies which typically have low conductances le.g., grades 1 and 2). Conductive rock formations can yield anomalies of any conductance grade. The conductive materials in such rock formations can be salt water, weathered products such as clays, original depositional clays, and carbonaceous material.

On the electromagnetic map, a letter identifier and an interpretive symbol are plotted beside the EM grade symbol. The horizontal rows of dots, under the interpretive symbol, indicate the anomaly amplitude on the flight record. The
vertical column of dots, under the anomaly letter, gives the estimated depth. In areas where anomalies are crowded, the letter identifiers, interpretive symbols and dots may be obliterated. The EM grade symbols, however, will always be discernible, and the obliterated information can be obtained from the anomaly listing appended to this report.

The purpose of indicating the anomaly amplitude by dots is to provide an estimate of the reliability of the conductance calculation. Thus, a conductance value obtained from a large ppm anomaly ( 3 or 4 dots) will tend to be accurate whereas one obtained from a small ppm anomaly (no dots) could be quite inaccurate. The absence of amplitude dots indicates that the anomaly from the coaxial coil-pair is 5 ppm or less on both the inphase and quadrature channels. Such small anomalies could reflect a weak conductor at the surface or a stronger conductor at depth. The conductance grade and depth estimate illustrates which of these possibilities fits the recorded data best.

Flight line deviations occasionally yield cases where two anomalies, having similar conductance values but dramatically different depth estimates, occur close together on the same conductor. Such examples illustrate the reliability of the conductance measurement while showing that the depth estimate can be unreliable. There are a
number of factors which can produce an error in the depth estimate, including the averaging of topographic variations by the altimeter, overlying conductive overburden, and the location and attitude of the conductor relative to the flight line. Conductor location and attitude can provide an erroneous depth estimate because the stronger part of the conductor may be deeper or to one side of the flight line, or because it has a shallow dip. A heavy tree cover can also produce errors in depth estimates. This is because the depth estimate is computed as the distance of bird from conductor, minus the altimeter reading. The altimeter can lock onto the top of a dense forest canopy. This situation yields an erroneously large depth estimate but does not affect the conductance estimate.

Dip symbols are used to indicate the direction of dip of conductors. These symbols are used only when the anomaly shapes are unambiguous, which usually requires a fairly resistive environment.

A further interpretation is presented on the EM map by means of the line-to-line correlation of anomalies, which is based on a comparison of anomaly shapes on adjacent lines. This provides conductor axes which may define the geological structure over portions of the survey area. The absence of
conductor axes in an area implies that anomalies could not be correlated from line to line with reasonable confidence.

DIGHEM electromagnetic maps are designed to provide a correct impression of conductor quality by means of the conductance grade symbols. The symbols can stand alone with geology when planning a follow-up program. The actual conductance values are printed in the attached anomaly list for those who wish quantitative data. The anomaly ppm and depth are indicated by inconspicuous dots which should not distract from the conductor patterns, while being helpful to those who wish this information. The map provides an interpretation of conductors in terms of length, strike and dip, geometric shape, conductance, depth, and thickness (see below). The accuracy is comparable to an interpretation from a high quality ground $E M$ survey having the same line spacing.

The attached EM anomaly list provides a tabulation of anomalies in ppm, conductance, and depth for the vertical sheet model. The EM anomaly list also shows the conductance and depth for a thin horizontal sheet (whole plane) model, but only the vertical sheet parameters appear on the EM map. The horizontal sheet model is suitable for a flatly dipping thin bedrock conductor such as a sulfide sheet having a thickness less than 10 m . The list also shows the
resistivity and depth for a conductive earth (half space) model, which is suitable for thicker slabs such as thick conductive overburden. In the EM anomaly list, a depth value of zero for the conductive earth model, in an area of thick cover, warns that the anomaly may be caused by conductive overburden.

Since discrete bodies normally are the targets of EM surveys, local base (or zero) levels are used to compute local anomaly amplitudes. This contrasts with the use of true zero levels which are used to compute true EM amplitudes. Local anomaly amplitudes are shown in the EM anomaly list and these are used to compute the vertical sheet parameters of conductance and depth. Not shown in the EM anomaly list are the true amplitudes which are used to compute the horizontal sheet and conductive earth parameters.
x-type electromagnetic responses

DIGHEM maps contain $x$-type EM responses in addition to EM anomalies. An $x$-type response is below the noise threshold of 3 ppm , and reflects one of the following: a weak conductor near the surface, a strong conductor at depth (e.g., 100 to 120 m below surface) or to one side of the flight line, or aerodynamic noise. Those responses that


#### Abstract

have the appearance of valid bedrock anomalies on the flight profiles are indicated by appropriate interpretive symbols (see EM map legend). The others probably do not warrant further investigation unless their locations are of considerable geological interest.


## The thickness parameter

DIGHEM can provide an indication of the thickness of a steeply dipping conductor. The amplitude of the coplanar anomaly (e.g., CPI) increases relative to the coaxial anomaly (e.g., CXI) as the apparent thickness increases, i.e., the thickness in the horizontal plane. (The thickness is equal to the conductor width if the conductor dips at 90 degrees and strikes at right angles to the flight line.) This report refers to a conductor as thin when the thickness is likely to be less than 3 m , and thick when in excess of 10 m . Thin conductors are indicated on the EM map by the interpretive symbol "D", and thick conductors by "T". For base metal exploration in steeply dipping geology, thick conductors can be high priority targets because many massive sulfide ore bodies are thick, whereas non-economic bedrock conductors are often thin. The system cannot sense the thickness when the strike of the conductor is subparallel to the flight line, when the conductor has a shallow dip, when
the anomaly amplitudes are small, or when the resistivity of the environment is below 100 ohm-m.

Resistivity mapping

Areas of widespread conductivity are commonly encountered during surveys. In such areas, anomalies can be generated by decreases of only 5 m in survey altitude as well as by increases in conductivity. The typical flight record in conductive areas is characterized by inphase and quadrature channels which are continuously active. Local EM peaks reflect either increases in conductivity of the earth or decreases in survey altitude. For such conductive areas, apparent resistivity profiles and contour maps are necessary for the correct interpretation of the airborne data. The advantage of the resistivity parameter is that anomalies caused by altitude changes are virtually eliminated, so the resistivity data reflect only those anomalies caused by conductivity changes. The resistivity analysis also helps the interpreter to differentiate between conductive trends in the bedrock and those patterns typical of conductive overburden. For example, discrete conductors will generally appear as narrow lows on the contour map and broad conductors (e.g., overburden) will appear as wide lows.

The resistivity profile (see table in Appendix A) and the resistivity contour map present the apparent resistivity using the so-called pseudo-layer (or buried) half space model defined in Fraser (1978)2. This model consists of a resistive layer overlying a conductive half space. The depth channel (see Appendix A) gives the apparent depth below surface of the conductive material. The apparent depth is simply the apparent thickness of the overlying resistive layer. The apparent depth (or thickness) parameter will be positive when the upper layer is more resistive than the underlying material, in which case the apparent depth may be quite close to the true depth.

The apparent depth will be negative when the upper layer is more conductive than the underlying material, and will be zero when a homogeneous half space exists. The apparent depth parameter must be interpreted cautiously because it will contain any errors which may exist in the measured altitude of the EM bird (e.g., as caused by a dense tree cover). The inputs to the resistivity algorithm are the inphase and quadrature components of the coplanar coil-pair. The outputs are the apparent resistivity of the

[^1]conductive half space (the source) and the sensor-source distance. The flying height is not an input variable, and the output resistivity and sensor-source distance are independent of the flying height. The apparent depth, discussed above, is simply the sensor-source distance minus the measured altitude or flying height. Consequently, errors in the measured altitude will affect the apparent depth parameter but not the apparent resistivity parameter.

The apparent depth parameter is a useful indicator of simple layering in areas lacking a heavy tree cover. The DIGHEM system has been flown for purposes of permafrost mapping, where positive apparent depths were used as a measure of permafrost thickness. However, little quantitative use has been made of negative apparent depths because the absolute value of the negative depth is not a measure of the thickness of the conductive upper layer and, therefore, is not meaningful physically. Qualitatively, a negative apparent depth estimate usually shows that the EM anomaly is caused by conductive overburden. Consequently, the apparent depth channel can be of significant help in distinguishing between overburden and bedrock conductors.

The resistivity map often yields more useful information on conductivity distributions than the EM map. In
comparing the $E M$ and resistivity maps, keep in mind the following:
(a) The resistivity map portrays the absolute value of the earth's resistivity. (Resistivity $=1 /$ conductivity.)
(b) The EM map portrays anomalies in the earth's resistivity. An anomaly by definition is a change from the norm and so the EM map displays anomalies, (i) over narrow, conductive bodies and (ii) over the boundary zone between two wide formations of differing conductivity.

The resistivity map might be likened to a total field map and the EM map to a horizontal gradient in the direction of flight3. Because gradient maps are usually more sensitive than total field maps, the EM map therefore is to be preferred in resistive areas. However, in conductive areas, the absolute character of the resistivity map usually causes it to be more useful than the EM map.

3 The gradient analogy is only valid with regard to the identification of anomalous locations.

## Interpretation in conductive environments

Environments having background resistivities below 30 ohm-m cause all airborne EM systems to yield very large responses from the conductive ground. This usually prohibits the recognition of discrete bedrock conductors. The processing of DIGHEM data, however, produces six channels which contribute significantly to the recognition of bedrock conductors. These are the inphase and quadrature difference channels (DIFI and DIFQ), and the resistivity and depth channels (RES and DP) for each coplanar frequency; see table in Appendix A.

The EM difference channels (DIFI and DIFQ) eliminate up to $99 \%$ of the response of conductive ground, leaving responses from bedrock conductors, cultural features $\{\mathrm{e} . \mathrm{g}$. , telephone lines, fences, etc.) and edge effects. An edge effect arises when the conductivity of the ground suddenly changes, and this is a source of geologic noise. While edge effects yield anomalies on the EM difference channels, they do not produce resistivity anomalies. Consequently, the resistivity channel aids in eliminating anomalies due to edge effects. On the other hand, resistivity anomalies will coincide with the most highly conductive sections of conductive ground, and this is another source of geologic
noise. The recognition of a bedrock conductor in a conductive environment therefore is based on the anomalous responses of the two difference channels (DIFI and DIFQ) and the two resistivity channels (RES). The most favourable situation is where anomalies coincide on all four channels.

The DP channels, which give the apparent depth to the conductive material, also help to determine whether a conductive response arises from surficial material or from a conductive zone in the bedrock. When these channels ride above the zero level on the electrostatic chart paper (i.e., depth is negative), it implies that the EM and resistivity profiles are responding primarily to a conductive upper layer, i.e., conductive overburden. If both DP channels are below the zero level, it indicates that a resistive upper layer exists, and this usually implies the existence of a bedrock conductor. If the low frequency DP channel is below the zero level and the high frequency $D P$ is above, this suggests that a bedrock conductor occurs beneath conductive cover.

Channels REC1, REC2, REC3 and REC4 are the anomaly recognition functions. They are used to trigger the conductance channel CDT which identifies discrete conductors. In highly conductive environments, channel REC2
is deactivated because it is subject to corruption by highly conductive earth signals. Similarly, in moderately conductive environments, REC4 is deactivated. Some of the automatically selected anomalies (channel CDT) are discarded by the geophysicist. The automatic selection algorithm is intentionally oversensitive to assure that no meaningful responses are missed. The interpreter then classifies the anomalies according to their source and eliminates those that are not substantiated by the data, such as those arising from geologic or aerodynamic noise.

Reduction of geologic noise

Geologic noise refers to unwanted geophysical responses. For purposes of airborne EM surveying, geologic noise refers to EM responses caused by conductive overburden and magnetic permeability. It was mentioned above that the EM difference channels (i.e., channel DIFI for inphase and $D I F Q$ for quadrature) tend to eliminate the response of conductive overburden. This marked a unique development in airborne EM technology, as DIGHEM is the only EM system which yields channels having an exceptionally high degree of immunity to conductive overburden.

Magnetite produces a form of geological noise on the inphase channels of all EM systems. Rocks containing less than $1 \%$ magnetite can yield negative inphase anomalies caused by magnetic permeability. When magnetite is widely distributed throughout a survey area, the inphase EM channels may continuously rise and fall reflecting variations in the magnetite percentage, flying height, and overburden thickness. This can lead to difficulties in recognizing deeply buried bedrock conductors, particularly if conductive overburden also exists. However, the response of broadly distributed magnetite generally vanishes on the inphase difference channel DIFI. This feature can be a significant aid in the recognition of conductors which occur in rocks containing accessory magnetite.

## EM magnetite mapping

The information content of DIGHEM data consists of a combination of conductive eddy current response and magnetic permeability response. The secondary field resulting from conductive eddy current flow is frequency-dependent and consists of both inphase and quadrature components, which are positive in sign. On the other hand, the secondary field resulting from magnetic permeability is independent of frequency and consists of only an inphase component which
is negative in sign. When magnetic permeability manifests itself by decreasing the measured amount of positive inphase, its presence may be difficult to recognize. However, when it manifests itself by yielding a negative inphase anomaly (e.g., in the absence of eddy current flow), its presence is assured. In this latter case, the negative component can be used to estimate the percent magnetite content.

A magnetite mapping technique was developed for the coplanar coil-pair of DIGHEM. The technique yields channel "FEO" (see Appendix A) which displays apparent weight percent magnetite according to a homogeneous half space model. 4 The method can be complementary to magnetometer mapping in certain cases. Compared to magnetometry, it is far less sensitive but is more able to resolve closely spaced magnetite zones, as well as providing an estimate of the amount of magnetite in the rock. The method is sensitive to $1 / 4 \%$ magnetite by weight when the $E M$ sensor is at a height of 30 m above a magnetitic half space. It can individually resolve steeply dipping narrow magnetite-rich bands which are separated by 60 m . Unlike magnetometry, the EM magnetite method is unaffected by remanent magnetism or magnetic latitude.

[^2]The EM magnetite mapping technique provides estimates of magnetite content which are usually correct within a factor of 2 when the magnetite is fairly uniformly distributed. EM magnetite maps can be generated when magnetic permeability is evident as indicated by anomalies in the magnetite channel FEO.

Like magnetometry, the $E M$ magnetite method maps only bedrock features, provided that the overburden is characterized by a general lack of magnetite. This contrasts with resistivity mapping which portrays the combined effect of bedrock and overburden.

## Recognition of culture

Cultural responses include all EM anomalies caused by man-made metallic objects. Such anomalies may be caused by inductive coupling or current gathering. The concern of the interpreter is to recognize when an $E M$ response is due to culture. Points of consideration used by the interpreter, when coaxial and coplanar coil-pairs are operated at a common frequency, are as follows:

1. Channels CXS and CPS (see Appendix A) measure 50 and 60 Hz radiation. An anomaly on these channels shows
that the conductor is radiating cultural power. Such an indication is normally a guarantee that the conductor is cultural. However, care must be taken to ensure that the conductor is not a geologic body which strikes across a power line, carrying leakage currents.
2. A flight which crosses a line (e.g., fence, telephone line, etc.) yields a center-peaked coaxial anomaly and an m-shaped coplanar anomaly. 5 When the flight crosses the cultural line at a high angle of intersection, the amplitude ratio of coaxial/coplanar (e.g., CXI/CPI) is 4. Such an EM anomaly can only be caused by a line. The geologic body which yields anomalies most closely resembling a line is the vertically dipping thin dike. Such a body, however, yields an amplitude ratio of 2 rather than 4. Consequently, an m-shaped coplanar anomaly with a CXI/CPI amplitude ratio of 4 is virtually a guarantee that the source is a cultural line.
3. A flight which crosses a sphere or horizontal disk yields center-peaked coaxial and coplanar anomalies with a CXI/CPI amplitude ratio (i.e., coaxial/coplanar) of $1 / 4$. In the absence of geologic bodies of this geometry, the most likely conductor is a metal roof or

[^3]small fenced yard. 6 Anomalies of this type are virtually certain to be cultural if they occur in an area of culture.
4. A flight which crosses a horizontal rectangular body or wide ribbon yields an m-shaped coaxial anomaly and a center-peaked coplanar anomaly. In the absence of geologic bodies of this geometry, the most likely conductor is a large fenced area. 6 Anomalies of this type are virtually certain to be cultural if they occur in an area of culture.
5. EM anomalies which coincide with culture, as seen on the camera film, are usually caused by culture. However, care is taken with such coincidences because a geologic conductor could occur beneath a fence, for example. In this example, the fence would be expected to yield an m-shaped coplanar anomaly as in case \#2 above. If, instead, a center-peaked coplanar anomaly occurred, there would be concern that a thick geologic conductor coincided with the cultural line.

6 It is a characteristic of EM that geometrically identical anomalies are obtained from: (1) a planar conductor, and (2) a wire which forms a loop having dimensions identical to the perimeter of the equivalent planar conductor.
6. The above description of anomaly shapes is valid when the culture is not conductively coupled to the environment. In this case, the anomalies arise from inductive coupling to the $E M$ transmitter. However, when the environment is quite conductive (e.g., less than 100 ohm-m at 900 Hz ), the cultural conductor may be conductively coupled to the environment. In this latter case, the anomaly shapes tend to be governed by current gathering. Current gathering can completely distort the anomaly shapes, thereby complicating the identification of cultural anomalies. In such circumstances, the interpreter can only rely on the radiation channels CXS and CPS, and on the camera film.

## TOTAL FIELD MAGNETICS

The existence of a magnetic correlation with an EM anomaly is indicated directly on the EM map. An EM anomaly with magnetic correlation has a greater likelihood of being produced by sulfides than one that is non-magnetic. However, sulfide ore bodies may be non-magnetic (e.g., the Kidd Creek deposit near Timmins, Canada) as well as magnetic (e.g., the Mattabi deposit near Sturgeon Lake, Canada).

The magnetometer data are digitally recorded in the aircraft to an accuracy of one $n T$ (i.e., one gamma). The digital tape is processed by computer to yield a total field magnetic contour map. When warranted, the magnetic data also may be treated mathematically to enhance the magnetic response of the near-surface geology, and an enhanced magnetic contour map is then produced. The response of the enhancement operator in the frequency domain is illustrated in Figure II-2. This figure shows that the passband components of the airborne data are amplified 20 times by the enhancement operator. This means, for example, that a 100 nT anomaly on the enhanced map reflects a 5 nT anomaly for the passband components of the airborne data.

The enhanced map, which bears a resemblance to a downward continuation map, is produced by the digital bandpass filtering of the total field data. The enhancement is equivalent to continuing the field downward to a level (above the source) which is $1 / 20$ th of the actual sensorsource distance.

Because the enhanced magnetic map bears a resemblance to a ground magnetic map, it simplifies the recognition of trends in the rock strata and the interpretation of


Figure II-2 Frequency response of magnetic enhancement operator.
geological structure. It defines the near-surface local geology while de-emphasizing deep-seated regional features. It primarily has application when the magnetic rock units are steeply dipping and the earth's field dips in excess of 60 degrees.

## MAPS ACCOMPANYING THIS REPORT

Twelve map sheets accompany this report:

Electromagnetic Anomalies Resistivity Total Field Magnetics Enhanced Magnetics

3 map sheets
3 map sheets
3 map sheets
3 map sheets

Respectfully submitted, DIGHEM LIMITED


AE DCF-455

## THE FLIGHT RECORD AND PATH RECOVERY

Both analog and digital flight records were produced. The analog profiles were recorded on chart paper in the aircraft during the survey. The digital profiles were generated later by computer and plotted on electrostatic chart paper at a scale of $1: 15,840$ The digital profiles are listed in Table A-1.

In Table $A-1$, the log resistivity scale of 0.03 decade $/ \mathrm{mm}$ means that the resistivity changes by an order of magnitude in 33 mm . The resistivities at $0,33,67,100$ and 133 mm up from the bottom of the digital flight record are respectively $1,10,100,1,000$ and $10,000 \mathrm{ohm}-\mathrm{m}$.

The fiducial marks on the flight records represent points on the ground which were recovered from camera film. Continuous photographic coverage allowed accurate photo-path recovery locations for the fiducials, which were then plotted on the geophysical maps to provide the track of the aircraft.

The fiducial locations on both the flight records and flight path maps were examined by a computer for unusual helicopter speed changes. Such speed changes may denote
an error in flight path recovery. The resulting flight path locations therefore reflect a more stringent checking than is normally provided by manual flight path recovery techniques.

Table A-1. The Digital Profiles

| Channel <br> Name (Freq) |  |  | Scale |
| :---: | :---: | :---: | :---: |
|  |  | Observed parameters | units/mm |
| MAG |  | magnetics | 10 nT |
| ALT |  | bird height | 3 m |
| CXICxO | ( 900 Hz ) | vertical coaxial coll-pair inphase | 1 ppm |
|  | ( 900 Hz ) | vertical coaxial coil-pair quadrature | 1 ppm |
| cxs | ( 900 Hz ) | ambient noise monitor (coaxial receiver) | 1 ppm |
| $\begin{aligned} & \mathrm{CPI} \\ & \mathrm{CPQ} \end{aligned}$ | ( 900 Hz ) | horizontal coplanar coil-pair inphase | 1 ppm |
|  | ( 900 Hz ) | horizontal coplanar coil-pair quadrature | 1 ppm |
| CPQ CPS | ( 900 Hz ) | ambient noise monitor (coplanar receiver) | 1 ppm |
| $\begin{array}{\|l\|l\|l\|} \mathrm{CPI} \\ \mathrm{CPQ} \end{array}$ | ( 7200 Hz ) | horizontal coplanar coil-pair inphase | 1 ppm |
|  | ( 7200 Hz ) | horizontal coplanar coil-pair quadrature | 1 ppm |
|  |  | Computed Parameters |  |
| DIFI ( 900 Hz ) |  | difference function inphase from CXI and CPI | 1 ppm |
| DIFQ$\text { REC } 1$ | ( 900 Hz ) | difference function quadrature from $C X Q$ and $C P Q$ | 1 ppm |
|  |  | first anomaly recognition function | 1 ppm |
| REC2 |  | second anomaly recognition function | 1 ppm |
| REC3 |  | third anomaly recognition function | 1 ppm |
| REC4 |  | fourth anomaly recognition function | 1 ppm |
| CDT |  | conductance | 1 grade |
| RES | ( 900 Hz ) | log resistivity | . 03 decade |
| RES | ( 7200 Hz ) | log resistivity | .03 decade |
|  | ( 900 Hz ) | apparent depth | 3 m |
| DP | $(7200 \mathrm{~Hz}$ ) | apparent depth | 3 m |
| FEO\% | ( 900 Hz ) | apparent weight percent magnetite | 0.258 |

AA DCF-416(A)

APPENDIXBB

EM ANOMALY LIST
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COAXIAL COPLANAR COPLANAR . VERTICAL . HORIZONTAL CONDUCTIVE
    900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH
```

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M . MHOS M OHM-M M

|  |  | 1 |  | IGHT | 3) |  |  |  | - |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A | 360 | S | 2 | 6 | 0 | 16 | 36 | 129 | - | 1 | 0 | 1 | 16 | 316 | 0 |
| B | 356 | S | 3 | 10 | 0 | 24 | 47 | 212 | - | 1 | 0 | 1 | 10 | 336 | 0 |
| D | 350 | S | 2 | 4 | 0 | 16 | 25 | 127 | - | 1 | 0 | 1 | 19 | 555 | 0 |
| E | 323 | B | 21 | 8 | 20 | 10 | 41 | 8 | - | 35 | 23 | 4 | 108 | 11 | 85 |
|  |  | 2 |  | IGHT | 3) |  |  |  | - |  |  |  |  |  |  |
| B | 394 | S | 4 | 4 | 0 | 8 | 13 | 75 | - | 1 | 0 | 1 | 11 | 772 | 0 |
| D | 411 | L | 6 | 1 | 0 | 2 | 2 | 10 | - | 28 | 50 | 1 | 195 | 1035 | 0 |
| E | 413 | B | 0 | 1 | 10 | 2 | 14 | 13 | - | 18 | 53 | 7 | 139 | 5 | 121 |
| H | 421 | S | 6 | 1 | 2 | 8 | 14 | 66 | - | 1 | 0 | 1 | 7 | 903 | 0 |
|  |  | 3 |  | IGHT | 3) |  |  |  | - |  |  |  |  |  |  |
| B | 490 | S | 0 | 8 | 0 | 23 | 63 | 174 | - | 1 | 0 | 1 | 13 | 228 | 0 |
| C | 488 | S | 0 | 10 | 1 | 26 | 88 | 202 | - | 1 | 0 | 1 | 14 | 151 | 0 |
| D | 456 | S | 0 | 7 | 0 | 16 | 35 | 134 | - | 1 | 0 | 1 | 8 | 445 | 0 |
| E | 446 | L | 4 | 1 | 5 | 2 | 11 | 3 | . | 26 | 50 | 3 | 187 | 20 | 153 |
|  |  | 4 |  | IGHT | 3) |  |  |  | - |  |  | - |  |  |  |
| C | 530 | S | 1 | 3 | 2 | 9 | 27 | 76 | - | 1 | 0 | 1 | 17 | 410 | 0 |
| D | 539 | S | 1 | 2 | 1 | 1 | 5 | 20 | - | 1 | 0 | 1 | 18 | 1833 | 0 |
| E | 549 | B | 1 | 2 | 9 | 3 | 13 | 46 | - | 13 | 57 | 8 | 161 | 3 | 146 |
|  |  | 5 |  | IGHT | 3) |  |  |  | - |  |  | - |  |  |  |
| B | 624 | S | 0 | 0 | 1 | 0 | 2 | 6 | - | 1 | 7 | 1 | 67 | 3097 | 9 |
| D | 603 | S | 0 | 2 | 0 | 7 | 10 | 62 | - | 1 | 0 | 1 | 10 | 1116 | 0 |
| E | 598 | S | 1 | 4 | 1 | 10 | 32 | 89 | - | 1 | 0 | 1 | 15 | 406 | 0 |
|  |  | 6 |  | IGHT | 3) |  |  |  | - |  |  | - |  |  |  |
| A | 638 | S | 0 | 2 | 0 | 6 | 13 | 56 | - | 1 | 0 | 1 | 9 | 924 | 0 |
| B | 654 | S | 0 | 1 | 2 | 2 | 6 | 30 | - | 1 | 0 | 1 | 19 | 1233 | 0 |
| D | 680 | S | 5 | 1 | 2 | 1 | 3 | 18 | - | 1 | 0 | 1 | 7 | 2567 | 0 |
|  |  | 7 |  | IGHT | 3) |  |  |  | - |  |  | - |  |  |  |
| C | 720 | B? | 5 | 1 | 0 | 1 | 18 | 18 | - | 1 | 7 | 1 | 90 | 98 | 67 |
|  |  | 9 |  | IGHT | 3) |  |  |  | - |  |  | - |  |  |  |
| A | 866 | S | 0 | 1 | 1 | 8 | 24 | 64 | - | 1 | 0 | 1 | 15 | 540 | 0 |
| B | 862 | S | 0 | 2 | 0 | 8 | 9 | 75 | - | 1 | 0 | 1 | 0 | 1393 | 0 |
| E | 838 | S | 4 | 0 | 1 | 0 | 3 | 0 | - | 8 | 91 | 1 | 203 | 538 | 153 |
|  |  | 10 |  | IGHT | 3) |  |  |  | - |  |  | - |  |  |  |
| A | 877 | S | 1 | 1 | 2 | 3 | 9 | 30 | - | 1 | 0 | 1 | 17 | 1108 | 0 |


| COAXIAL | COPLANAR | COPLANAR | VERTICAL | HORIZONTAL CONDUCTIVE |  |
| ---: | ---: | ---: | :---: | :---: | :---: | :---: |
| 900 HZ | 900 HZ | 7200 HZ | DIKE | SHEET | EARTH |

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M . MHOS M OHM-M M


* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

| COAXIAL | COPLANAR | COPLANAR | VERTICAL | - HORIZONTAL CONDUCTIVE |  |
| ---: | ---: | ---: | ---: | ---: | ---: |
| 900 HZ | 900 HZ | 7200 HZ | DIKE | - SHEET | EARTH |

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD • COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M . MHOS M OHM-M M

| LINE 19 |  | FLIGHT | 3) |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| E 2850 S | 4 | 1 | 2 | 4 | 12 | 24 | - | 1 | 0 |  | 1 | 26 | 608 | 0 |
| LINE 20 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| A 2919 S | 0 | 7 | 2 | 24 | 69 | 193 | - | 1 | 0 |  | 1 | 9 | 225 | 0 |
| C 2929 S | 1 | 2 | 1 | 2 | 6 | 26 | . | 1 | 0 |  | 1 | 32 | 1056 | 0 |
| D 2935 S | 1 | 1 | 1 | 4 | 7 | 35 | - | 1 | 0 |  | 1 | 18 | 1154 | 0 |
| E 2941 S | 4 | 2 | 2 | 4 | 12 | 41 | 。 | 1 | 0 |  | 1 | 20 | 785 | 0 |
| LINE 101 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| A 1388 B? | 2 | 1 | 4 | 1 | 8 | 8 | - | 1 | 36 |  | 1 | 106 | 445 | 70 |
| LINE 102 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| A 1466 B | 4 | 1 | 5 | 3 | 17 | 8 | - | 17 | 54 |  | 3 | 174 | 19 | 142 |
| E 1445 S | 2 | 1 | 5 | 0 | 5 | 10 | . | 1 | 0 |  | 1 | 115 | 567 | 72 |
| LINE 105 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| A 2078 B | 17 | 6 | 20 | 9 | 40 | 15 | . | 36 | 22 |  | 4 | 111 | 11 | 87 |
| C 2094 S | 0 | 1 | 0 | 1 | 4 | 14 | - | 1 | 16 |  | 1 | 58 | 1752 | 18 |
| D 2100 B | 0 | 2 | 0 | 5 | 15 | 27 | - | 1 | 4 | . | 1 | 51 | 483 | 21 |
| LINE 106 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| A 2162 S | 4 | 2 | 0 | 0 | 4 | 24 | - | 1 | 0 |  | 1 | 100 | 732 | 56 |
| B 2152 B | 12 | 7 | 22 | 9 | 42 | 8 | - | 25 | 19 |  | 2 | 124 | 27 | 92 |
| C 2132 S | 1 | 1 | 0 | 0 | 2 | 8 | . | 1 | 0 | - | 1 | 53 | 6910 | 0 |
| LINE 107 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| A 2195 L | 0 | 2 | 2 | 1 | 19 | 24 | - | 1 | 10 | - | 2 | 113 | 10 | 105 |
| LINE 108 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| D 2260 L | 1 | 6 | 3 | 4 | 21 | 45 | . | 2 | 18 | - | 1 | 141 | 174 | 85 |
| LINE 109 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| F 2296 L | 5 | 2 | 1 | 2 | 10 | 27 | - | 14 | 60 | - | 1 | 205 | 877 | 53 |
| LINE 110 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| C 2350 L | 1 | 1 | 0 | 1 | 13 | 19 | - | 1 | 15 | - | 1 | 133 | 47 | 114 |
| LINE 111 |  | FLIGHT | 3) |  |  |  | - |  |  |  |  |  |  |  |
| C 2391 L | 0 | 1 | 2 | 1 | 8 | 44 | - | 1 | 0 | . | 1 | 33 | 1213 | 0 |

* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART .
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT .
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

COAXIAL COPLANAR COPLANAR • VERTICAL • HORIZONTAL CONDUCTIVE 900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M. MHOS M OHM-M M

| LI |  | 201 | (FLIGHT |  | 3) |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A | 97 | S | 0 | 8 | 0 | 20 | 34 | 165 |  | 1 | 0 | 1 | 13 | 142 | 0 |
| B | 114 | S | 0 | 1 | 0 | 1 | 3 | 12 |  | 1 | 0 | 1 | 21 | 5002 | 0 |
| C | 126 | S | 0 | 1 | 0 | 3 | 6 | 28 |  | 1 | 0 | 1 | 14 | 1565 | 0 |
| LI |  | 202 |  | GHT | 3) |  |  |  |  |  |  |  |  |  |  |
| B | 237 | B? | 0 | 2 | 3 | 8 | 20 | 80 |  | 1 | 0 | 1 | 19 | 626 | 0 |
| E | 222 | S | 0 | 8 | 0 | 25 | 77 | 159 |  | 1 | 0 | 1 | 10 | 172 | 0 |
| F | 220 | S | 3 | 8 | 0 | 25 | 77 | 159 |  | 1 | 0 | 1 | 117 | 1035 | 0 |
|  | E | 203 | (FLIGHT |  | 3) |  |  |  |  |  |  |  |  |  |  |
| B | 256 | S | 6 | 19 | 12 | 53 | 183 | 165 |  | 3 | 0 | 1 | 16 | 32 | 4 |
| F | 273 | S | 0 | 10 | 0 | 30 | 144 | 173 |  | 2 | 0 | 1 | 13 | 62 | 0 |
| G | 293 | S | 0 | 9 | 0 | 31 | 108 | 225 |  | 1 | 0 | 1 | 7 | 444 | 0 |
| H | 296 | S | 0 | 9 | 0 | 28 | 57 | 222 |  | 1 | 0 | 1 | 5 | 318 | 0 |
| I | 303 | S | 0 | 2 | 0 | 5 | 3 | 47 | - | 1 | 0 | 1 | 0 | 2462 | 0 |
| J | 309 | S | 0 | 1 | 0 | 2 | 0 | 12 |  | 1 | 0 | 1 | 40 | 5748 | 0 |
|  | E | 204 | (FLIGHT |  | 3) |  |  |  |  |  |  |  |  |  |  |
| A | 396 | S | 8 | 18 | 8 | 33 | 42 | 178 |  | 3 | 0 | 1 | 32 | 86 | 4 |
| B | 391 | S | 2 | 7 | 5 | 14 | 52 | 71 |  | 2 | 9 | 1 | 68 | 179 | 25 |
| G | 376 | S | 6 | 20 | 5 | 56 | 240 | 345 | - | 2 | 0 | 1 | 15 | 294 | 0 |
| H | 362 | S | 2 | 1 | 1 | 4 | 7 | 41 | - | 1 | 0 | 1 | 19 | 1513 | 0 |
| I | 358 | S | 0 | 2 | 1 | 5 | 7 | 52 |  | 1 | 3 | 1 | 97 | 999 | 0 |
| K | 350 | S | 0 | 1 | 0 | 4 | 7 | 47 | . | 1 | 0 | 1 | 157 | 1035 | 0 |
|  | E | 205 | (FLIGHT |  | 3) |  |  |  |  |  |  |  |  |  |  |
| A | 408 | S | 5 | 3 | 10 | 27 | 133 | 36 |  | 5 | 9 | 1 | 29 | 111 | 0 |
| D | 415 | S | 0 | 6 | 2 | 21 | 99 | 121 | - | 1 | 0 | 1 | 16 | 494 | 0 |
| F | 424 | S | 3 | 9 | 2 | 28 | 134 | 140 |  | 2 | 0 | 1 | 17 | 56 | 4 |
| H | 439 | S | 0 | 5 | 0 | 18 | 53 | 132 |  | 1 | 0 | 1 | 9 | 259 | 0 |
| L | 450 | S | 4 | 9 | 0 | 24 | 61 | 183 |  | 1 | 0 | 1 | 43 | 749 | 0 |
| M | 454 | S | 0 | 4 | 0 | 15 | 36 | 110 | - | 1 | 0 | 1 | 34 | 721 | 0 |
| N | 463 | S? | 0 | 0 | 0 | 3 | 0 | 31 | . | 1 | 0 | 1 | 7 | 3595 | 0 |
|  |  | 206 | (FLIGHT |  | 3) |  |  |  |  |  |  |  |  |  |  |
| A | 597 | S | 6 | 12 | 5 | 30 | 26 | 104 | - | 2 | 2 | 1 | 25 | 151 | 0 |
| C | 590 | S | 0 | 18 | 4 | 55 | 222 | 367 |  | 1 | 0 | 1 | 0 | 311 | 0 |
| E | 580 | S | 8 | 26 | 14 | 83 | 327 | 314 | - | 2 | 0 | 1 | 17 | 112 | 0 |
| H | 562 | S | 7 | 52 | 18 | 146 | 650 | 499 |  | 2 | 0 | 1 | 6 | 104 | 0 |
| K | 550 | S | 4 | 8 | 0 | 26 | 114 | 177 |  | 1 | 0 | 1 | 10 | 106 | 0 |
| M | 544 | S | 0 | 1 | 0 | 3 | 6 | 12 | - | 1 | 7 | 1 | 61 | 1007 | 21 |

* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART •
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT .
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

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COAXIAL COPLANAR COPLANAR . VERTICAL . HORIZONTAL CONDUCTIVE
``` 900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M. MHOS M OHM-M M


-* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

COAXIAL COPLANAR COPLANAR , VERTICAL . HORIZONTAL CONDUCTIVE 900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M . MHOS M OHM-M M

* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART .
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT -
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.
\begin{tabular}{cccccc} 
COAXIAL & COPLANAR & COPLANAR . VERTICAL & HORIZONTAL CONDUCTIVE \\
900 HZ & 900 HZ & 7200 HZ & DIKE & SHEET EARTH
\end{tabular}

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M. MHOS M OHM-M M

.* Estimated depth may be unreliable because the stronger part
- OF the conductor may be deeper or to one side of the flight
- LINE, OR bECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

COAXIAL COPLANAR COPLANAR • VERTICAL • HORIZONTAL CONDUCTIVE 900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M. MHOS M OHM-M M

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{2}{|l|}{\[
\begin{aligned}
& \text { COAXIAL } \\
& 900 \mathrm{HZ}
\end{aligned}
\]} & \multicolumn{2}{|l|}{\[
\begin{gathered}
\text { COPLANAR } \\
900 \mathrm{HZ}
\end{gathered}
\]} & \multicolumn{2}{|l|}{\[
\begin{gathered}
\text { COPLANAR } \\
7200 \mathrm{HZ}
\end{gathered}
\]} & & \multicolumn{2}{|l|}{\[
\begin{gathered}
\text { VERTICAL } \\
\text { DIKE }
\end{gathered}
\]} & \multicolumn{2}{|l|}{\begin{tabular}{l}
- HORIZONTAL \\
- SHEET
\end{tabular}} & \multicolumn{2}{|l|}{CONDUCTIVE EARTH} \\
\hline ANOMALY/ R & REAL & QUAD & REAL & QUAD & REAL & QUAD & - & COND & DEPTH* & COND & DEPTH & RESIS & DEPTH \\
\hline FID/INTERP & PPM & PPM & PPM & PPM & PPM & PPM & - & MHOS & M & MHOS & M & OHM-M & M \\
\hline LINE 314 & & (FLIGHT & 2) & & & & - & & & & & & \\
\hline A 1184 S & 0 & 5 & 0 & 12 & 52 & 81 & - & 1 & 0 & 1 & 27 & 194 & 7 \\
\hline B 1179 S & 0 & 4 & 0 & 12 & 48 & 87 & - & 1 & 0 & 1 & 24 & 222 & 4 \\
\hline D 1170 S & 2 & 20 & 9 & 58 & 169 & 176 & - & 1 & 0 & 1 & 10 & 172 & 0 \\
\hline F 1161 S & 0 & - 9 & 0 & 27 & 115 & 198 & - & 1 & 0 & - 1 & 7 & 113 & 0 \\
\hline G 1154 S? & 4 & 2 & 1 & 3 & 14 & 11 & - & 9 & 50 & - 1 & 136 & 1035 & 0 \\
\hline I 1149 S & 3 & 35 & 1 & 16 & 59 & 121 & - & 1 & 0 & - 1 & 9 & 162 & 0 \\
\hline J 1140 S? & 3 & 0 & 0 & 0 & 7 & 4 & - & 2 & 50 & 1 & 130 & 366 & 93 \\
\hline LINE 315 & & (FLIGHT & 2) & & & & - & & & & & & \\
\hline A 1209 S & 1 & 12 & 2 & 27 & 135 & 162 & - & 1 & 0 & - 1 & 12 & 402 & 0 \\
\hline B 1215 S & 1 & 19 & 3 & 43 & 188 & 247 & - & 2 & 0 & - 1 & 17 & 52 & 5 \\
\hline C 1222 S? & 1 & 15 & 0 & 7 & 21 & 63 & - & 1 & 1 & 1 & 31 & 337 & 9 \\
\hline E 1237 S? & 8 & 3 & 8 & 8 & 24 & 30 & - & 14 & 40 & 2 & 85 & 28 & 58 \\
\hline G 1251 S? & 2 & 26 & 8 & 13 & 36 & 83 & - & 3 & 13 & 2 & 73 & 48 & 42 \\
\hline LINE 316 & & (FLIGHT & 2) & & & & - & & & & & & \\
\hline A 1308 S & 1 & 6 & 1 & 16 & 77 & 65 & - & 2 & 0 & 1 & 16 & 71 & 1 \\
\hline B 1305 S & 1 & 15 & 0 & 16 & 80 & 97 & - & 2 & 0 & 1 & 15 & 101 & 0 \\
\hline C 1295 S & 0 & - 8 & 3 & 23 & 75 & 50 & - & 3 & 1 & 1 & 12 & 63 & 0 \\
\hline E 1282 S & 1 & 3 & 7 & 9 & 29 & 75 & - & 1 & 0 & 1 & 26 & 359 & 4 \\
\hline F 1275 S & 1 & 0 & 3 & 2 & 4 & 21 & - & 1 & 2 & - 1 & 65 & 364 & 37 \\
\hline H 1266 B & 6 & 65 & 12 & 13 & 49 & 47 & . & 10 & 11 & 2 & 74 & 31 & 44 \\
\hline LINE 317 & & FLIGHT & 2) & & & & - & & & & & & \\
\hline A 1332 S & 1 & 9 & 0 & 27 & 109 & 166 & - & 1 & 0 & 1 & 11 & 505 & 0 \\
\hline D 1344 S & 2 & 210 & 0 & 27 & 115 & 172 & . & 1 & 0 & 1 & 12 & 458 & 0 \\
\hline H 1361 S? & 1 & 1 & 0 & 2 & 6 & 28 & - & 1 & 0 & 1 & 20 & 1798 & 0 \\
\hline I 1365 S? & 0 & 1 & 0 & 3 & 8 & 39 & - & 1 & 0 & 1 & 19 & 1406 & 0 \\
\hline K 1371 S? & 4 & 0 & 0 & 1 & 8 & 13 & - & 1 & 19 & 1 & 75 & 758 & 37 \\
\hline LINE 401 & & FLIGHT & 2) & & & & - & & & & & & \\
\hline A 1655 S & 1 & 5 & 1 & 17 & 70 & 117 & - & 1 & 0 & 1 & 15 & 136 & 0 \\
\hline B 1660 S & 1 & 4 & 0 & 12 & 59 & 71 & - & 1 & 0 & - 1 & 10 & 135 & 0 \\
\hline C 1669 s & 1 & 15 & 0 & 26 & 95 & 189 & - & 1 & 0 & 1 & 12 & 112 & 0 \\
\hline D 1671 s & 1 & 15 & 0 & 23 & 21 & 204 & - & 1 & 0 & - 1 & 9 & 432 & 0 \\
\hline E 1676 S & 1 & 2 & 0 & 3 & 18 & 40 & - & 1 & 0 & 1 & 21 & 225 & 0 \\
\hline F 1681 S & 2 & 7 & 0 & 12 & 48 & 101 & - & 1 & 0 & - 1 & 15 & 173 & 0 \\
\hline G 1684 B & 7 & 74 & 10 & 95 & 444 & 326 & - & 2 & 0 & 1 & 8 & 182 & 0 \\
\hline I 1692 S & 0 & 4 & 1 & 5 & 14 & 36 & - & 1 & 0 & 1 & 23 & 473 & 0 \\
\hline LINE 402 & & (FLIGHT & 2) & & & & & & & - & & & \\
\hline A 1748 S & 4 & 410 & 3 & 27 & 148 & 76 & & 6 & 0 & 1 & 17 & 28 & 5 \\
\hline
\end{tabular}
-* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART .
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT .
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{2}{|l|}{\[
\begin{aligned}
& \text { COAXIAL } \\
& 900 \mathrm{HZ}
\end{aligned}
\]} & \multicolumn{2}{|l|}{COPLANAR} & \multicolumn{2}{|l|}{COPLANAR} & & \multicolumn{2}{|l|}{VERTICAL DIKE} & & \multicolumn{2}{|l|}{HORIZONTAL SHEET} & \multicolumn{2}{|l|}{CONDUCTIVE EARTH} \\
\hline \multicolumn{15}{|l|}{ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH} \\
\hline FID/INTERP & PPM & PPM & PPM & PPM & PPM & PPM & & MHOS & M & & MHOS & M & OHM-M & M \\
\hline LINE 402 & & LIGHT & 2) & & & & & & & - & & & & \\
\hline B 1744 S & 1 & 5 & 0 & 14 & 62 & 120 & & 1 & 0 & & 1 & 12 & 236 & 0 \\
\hline C 1737 s & 0 & 7 & 0 & 13 & 53 & 103 & & 1 & 0 & & 1 & 16 & 232 & 0 \\
\hline D 1735 S & 0 & 7. & 0 & 3 & 48 & 41 & & 2 & 13 & & 1 & 25 & 267 & 5 \\
\hline F 1725 S & 1 & 23 & 5 & 22 & 122 & 69 & & 1 & 0 & & 1 & 0 & 256 & 0 \\
\hline G 1723 B? & 1 & 20 & 5 & 62 & 225 & 135 & & 5 & 0 & - & 1 & 14 & 34 & 4 \\
\hline H 1716 S & 1 & 4 & 1 & 16 & 84 & 94 & & 2 & 0 & & 1 & 20 & 112 & 3 \\
\hline J 1708 S & 0 & 2 & 5 & 4 & 24 & 42 & & 1 & 0 & - & 1 & 35 & 42 & 19 \\
\hline LINE 403 & & FIGHT & 2) & & & & & & & - & & & & \\
\hline A 1762 S & 3 & 6 & 0 & 8 & 35 & 39 & & 1 & 0 & - & 1 & 17 & 104 & 0 \\
\hline B 1764 S & 1 & 3 & 0 & 14 & 29 & 53 & & 1 & 0 & - & 1 & 14 & 288 & 0 \\
\hline C 1773 s & 0 & 5 & 0 & 16 & 54 & 122 & & 1 & 0 & - & 1 & 19 & 248 & 0 \\
\hline D 1777 S & 0 & 2 & 0 & 2 & 11 & 35 & & 1 & 0 & - & 1 & 32 & 590 & 5 \\
\hline E 1782 S & 1 & 2 & 0 & 5 & 24 & 41 & & 1 & 0 & - & 1 & 17 & 291 & 0 \\
\hline F 1785 S & 2 & 7 & 0 & 13 & 77 & 81 & & 1 & 0 & - & 1 & 18 & 663 & 0 \\
\hline G 1799 S & 0 & 19 & 3 & 50 & 216 & 242 & & 1 & 0 & - & 1 & 4 & 345 & 0 \\
\hline H 1805 S & 2 & 6 & 0 & 16 & 70 & 130 & & 1 & 0 & - & 1 & 22 & 94 & 6 \\
\hline LINE 404 & & FIGHT & - 2) & & & & & & & - & & & & \\
\hline A 1862 S ? & 0 & 2 & 0 & 3 & 11 & 22 & & 1 & 11 & - & 1 & 61 & 684 & 27 \\
\hline B 1851 S? & 2 & 2 & 0 & 4 & 13 & 35 & & 1 & 0 & - & 1 & 27 & 839 & 0 \\
\hline C 1846 S? & 1 & 3 & 0 & 3 & 18 & 53 & & 1 & 0 & - & 1 & 24 & 607 & 0 \\
\hline E 1841 S & 0 & 13 & 1 & 31 & 148 & 141 & & 3 & 0 & - & 1 & 11 & 69 & 0 \\
\hline F 1837 S & 2 & 16 & 2 & 42 & 122 & 148 & & 2 & 0 & - & 1 & 11 & 30 & 0 \\
\hline H 1824 S & 4 & 4 & 0 & 11 & 56 & 46 & & 2 & 0 & - & 1 & 28 & 90 & 10 \\
\hline LINE 405 & & LIGHI & - 2) & & & & & & & - & & & & \\
\hline B 1965 S? & 0 & 3 & 0 & 6 & 5 & 54 & & 1 & 0 & - & 1 & 3 & 2264 & 0 \\
\hline C 1975 S? & 2 & 1 & 0 & 4 & 6 & 37 & & 1 & 0 & - & 1 & 19 & 1839 & 0 \\
\hline D 1988 S ? & 1 & 11 & 1 & 33 & 164 & 183 & & 1 & 0 & - & 1 & 0 & 435 & 0 \\
\hline E 200\% 63 & 0 & 3 & 1 & 9 & 39 & 76 & & 1 & 0 & - & 1 & 17 & 287 & 0 \\
\hline LINE 406 & & LIGHT & - 2) & & & & & & & - & & & & \\
\hline A 2076 S? & 1 & 3 & 0 & 13 & 29 & 109 & & 1 & 0 & - & 1 & 16 & 483 & 0 \\
\hline B 2058 S? & 0 & 6 & 1 & 17. & 65 & 134 & & 1 & 0 & . & 1 & 7 & 199 & 0 \\
\hline C 2050 S? & 1 & 2 & 1 & 8 & 25 & 66 & & 1 & 0 & - & 1 & 20 & 486 & 0 \\
\hline D 2046 S ? & 0 & 1 & 1 & 2 & 3 & 22 & & 1 & 0 & - & 1 & 19 & 3370 & 0 \\
\hline F 2038 S & 1 & 8 & 1 & 21 & 22 & 82 & & 1 & 0 & - & 1 & 17 & 590 & 0 \\
\hline G 2036 S & 2 & 8 & 1 & 21 & 102 & 140 & & 2 & 0 & - & 1 & 13 & 97 & 0 \\
\hline LINE 407 & & LIGHT & - 3) & & & & & & & - & & & & \\
\hline A 1969 S & 0 & 1 & 0 & 2 & 3 & 33 & & 1 & 0 & - & 1 & 10 & 2795 & 0 \\
\hline
\end{tabular}
-* estimated depth may be unreliable because the stronger part -
- OF THE CONDUCTOR MAY bE DEEPER OR TO ONE SIDE OF THE FLIGHT
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.
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    COAXIAL COPLANAR COPLANAR . VERTICAL . HORIZONTAL CONDUCTIVE
    ```
    900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M. MHOS M OHM-M M


COAXIAL COPLANAR COPLANAR . VERTICAL . HORIZONTAL CONDUCTIVE 900 HZ 900 HZ 7200 HZ . DIKE • SHEET EARTH

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M . MHOS M OHM-M M


\footnotetext{
-* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART •
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT -
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.
}


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-* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART •
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT -
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

\section*{COAXIAL COPLANAR COPLANAR . VERTICAL . HORIZONTAL CONDUCTIVE} 900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M. MHOS M OHM-M M

.* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

\begin{tabular}{ccccccc} 
COAXIAL COPLANAR COPLANAR & VERTICAL & HORIZONTAL CONDUCTIVE \\
900 HZ & 900 HZ & 7200 HZ & DIRE & SHEET & EARTH
\end{tabular}

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M . MHOS M OHM-M M

** ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT
- LINE, OR BECAUSE OF A SHALIOW DIP OR OVERBURDEN EFFECTS.

COAXIAL COPLANAR COPLANAR . VERTICAL . HORIZONTAL CONDUCTIVE 900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD : COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M . MHOS M OHM-M M

.* estimated depth may be unreliable because the stronger part
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

> COAXIAL COPLANAR COPLANAR . VERTICAL . HORIZONTAL CONDUCTIVE 900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH
anomaly/ real quad real quad real quad . COND depth*. COND depth resis depth FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M . MHOS M OHM M M


\footnotetext{
** estimated depth may be unreliable because the stronger part .
- of the conductor may be deeper or to one side of the flight .
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERbURDEN EFFECTS.
}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
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& \text { ANAR } \\
& 0 \mathrm{HZ}
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\] & \[
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\text { COPL } \\
720
\end{array}
\] & \[
\begin{aligned}
& \text { ANAR } \\
& 0 \mathrm{HZ}
\end{aligned}
\] & & VERT
DI & ICAL KE &  & \begin{tabular}{l}
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\end{tabular} & CONDU EAR & \begin{tabular}{l}
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\end{tabular} \\
\hline \multicolumn{4}{|l|}{ANOMALY/ REAL} & QUAD R & REAL & QUAD & REAL & QUAD & & COND & DEPTH* & COND & DEPTH & RESIS & DEPTH \\
\hline & D/INTE & ERP & PPM & PPM & PPM & PPM & PPM & PPM & & MHOS & M & - MHOS & M & OHM-M & M \\
\hline & INE 5 & 524 & & FLIGHT & 6) & & & & - & & & - & & & \\
\hline & 2271 & S? & 3 & 1 & 1 & 1 & 4 & 11 & - & 1 & 0 & 1 & 52 & 1578 & 8 \\
\hline & INE & 525 & & FLIGHT & 6) & & & & - & & & - & & & \\
\hline A & 2372 & S & 2 & 7 & 1 & 12 & 28 & 141 & - & 1 & 0 & 1 & 12 & 484 & 0 \\
\hline & 2360 & S & 1 & 24 & 1 & 58 & 251 & 416 & . & 1 & 1 & 1 & 2 & 321 & 0 \\
\hline & C 2357 & S & 1 & 9 & 1 & 26 & 51 & 145 & - & 1 & 0 & 1 & 14 & 314 & 0 \\
\hline & 2322 & S? & 1 & 2 & 1 & 6 & 9 & 47 & - & 1 & 0 & 1 & 16 & 1243 & 0 \\
\hline & INE & 526 & & FLIGHT & 6) & & & & - & & & - & & & \\
\hline & 2388 & S & 3 & 13 & 3 & 30 & 135 & 135 & - & 1 & 0 & 1 & 18 & 270 & 0 \\
\hline & 2399 & S & 1 & 9 & 1 & 23 & 86 & 97 & . & 2 & 0 & 1 & 14 & 173 & 0 \\
\hline & 2401 & S & 1 & 11 & 1 & 27 & 61 & 98 & - & 1 & 0 & 1 & 11 & 451 & 0 \\
\hline & INE & 527 & & FLIGHT & 6) & & & & - & & & - & & & \\
\hline & 2569 & S & 1 & 12 & 6 & 48 & 235 & 162 & - & 1 & 0 & 1 & 8 & 250 & 0 \\
\hline & 2537 & S & 1 & 3 & 0 & 7 & 15 & 74 & - & 1 & 2 & 1 & 71 & 837 & 0 \\
\hline F & 2531 & S & 0 & 3 & 0 & 9 & 12 & 72 & - & 1 & 0 & 1 & 16 & 1066 & 0 \\
\hline & 2511 & S & 0 & 22 & 6 & 61 & 303 & 291 & - & 1 & 0 & 1 & 5 & 231 & 0 \\
\hline & INE & 528 & & FLIGHT & 6) & & & & - & & & - & & & \\
\hline & 2605 & S? & 2 & 1 & 1 & 1 & 5 & 28 & - & 1 & 0 & 1 & 32 & 1698 & 0 \\
\hline & B 2624 & S & 2 & 1 & 1 & 4 & 27 & 15 & - & 3 & 13 & - 1 & 36 & 158 & 15 \\
\hline & 2635 & S & 2 & 2 & 0 & 7 & 22 & 59 & . & 1 & 0 & 1 & 22 & 505 & 0 \\
\hline & INE & 529 & & FLIGHT & 6) & & & & - & & & - & & & \\
\hline & B 2712 & S & 2 & 4 & 1 & 8 & 39 & 17 & - & 2 & 22 & - 1 & 51 & 672 & 0 \\
\hline & C 2710 & S & 4 & 2 & 1 & 7 & 26 & 20 & - & 2 & 23 & 1 & 29 & 212 & 10 \\
\hline & D 2706 & S & 1 & 4 & 1 & 11 & 45 & 99 & - & 1 & 0 & 1 & 24 & 437 & 1 \\
\hline & 2693 & S & 0 & 4 & 1 & 12 & 37 & 96 & - & 1 & 0 & 1 & 23 & 321 & 1 \\
\hline & INE & 530 & & FLIGHT & 6) & & & & - & & & - & & & \\
\hline & 2780 & S & 0 & 2 & 1 & 5 & 19 & 56 & - & 1 & 0 & 1 & 24 & 512 & 0 \\
\hline & INE & 531 & & FLIGHT & 6) & & & & - & & & - & & & \\
\hline & 2887 & S & 0 & 1 & 0 & 3 & 0 & 32 & - & 1 & 0 & 1 & 3 & 3370 & 0 \\
\hline B & B 2865 & S & 3 & 4 & 0 & 11 & 15 & 68 & - & 1 & 0 & - 1 & 14 & 831 & 0 \\
\hline & D 2852 & S & 1 & 5 & 0 & 17 & 40 & 151 & - & 1 & 0 & 1 & 11 & 391 & 0 \\
\hline & INE & 534 & & FLIGHT & 6) & & & & - & & & - & & & \\
\hline A & A 3073 & S & 2 & 5 & 0 & 13 & 41 & 116 & - & 1 & 0 & 1 & 13 & 306 & 0 \\
\hline B & B 3092 & S & 1551 & 1 & 0 & 2 & 19 & 20 & - & 1 & 0 & 1 & 33 & 239 & 6 \\
\hline
\end{tabular}

anomaly/ real quad real quad real quad . COND depth*. COND depth resis depth FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M . MHOS M OHM-M M



COAXIAL COPLANAR COPLANAR . VERTICAL . HORIZONTAL CONDUCTIVE 900 HZ 900 HZ 7200 HZ. DIKE . SHEET EARTH

ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH FID/INTERP PPM PPM PPM PPM PPM PPM . MHOS M. MHOS M OHM-M M

-* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART
- OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT .
- LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

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COAXIAL COPLANAR COPLANAR . VERTICAL . HORIZONTAL CONDUCTIVE
900 HZ 900 HZ 7200 HZ . DIKE . SHEET EARTH

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    ANOMALY/ REAL QUAD REAL QUAD REAL QUAD . COND DEPTH*. COND DEPTH RESIS DEPTH
FID/INTERP PPM PPM PPM PPM PPM PPM. MHOS M . MHOS M OHM-M M

.* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART - OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT - LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

MINING LANDS COMMENTS:
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Fum.
Report of Work
(Geophysical, Geological,
Geochemical and Expenditures)
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The Mining Act


Type of Survevis)
Slain Holder (s)
Address
Airborne Survey.


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T 1380

DIGUEM II SURVEY.
DC. FRASER DIGHEM LTD TORONTO, ONT


Expenditures (excludes power stripping)
Type of Work Performed
Performed on Claims)
Mining Claims Traversed (List in numerical sequence)


I hereby certify that I have of personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.
\(\stackrel{\text { NoCK }}{ }\)


Ministry of Natural Resources

Report of Work
Geophysical, Geological, Geochemical and Expenditures)

- Please type or print. 18 number of mining claims traver/d exceeds space on this form, attach a list. Only days credits calculated in the Expenditures" section may be entered in the "Expend, Days Cr." columns.
Mining Act
- Do not use shaded areas below.


Credits Requested per Each Claim in Columns at right


Expenditures (excludes power stripping)
Type of Work Performed

Performed on Claim (s)

Calculation of Expenditure Days Credits


Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.


Mining Claims Traversed (List in numerical sequence)



Certification Vefifying Report o Work
I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during ardor after its completion and the annexed report is true.
Name and Postal Address of Person Certifying








Report of Work
(Geophysical, Geological, Geochemical and Expenditures)
- If number of mining claims traversed exceeds space on this form, attach a list. Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns. - Do not use shaded areas below.
 Name and Address of Author (of Geo-Technical report)

DC FRASER DIGHEM LTD TORONTO ONT
Credits Requested per Each Claim in Columns at right
Mining Claims Traversed (List in numerical sequence)




Certification Verifying Report of Work
I hereby certify that I have a personal and in:unsts knowledge of the facts set forth in the Report of Wort annexed hereto, having performed the work or wimesied sum during andlor after lis complewori and the annexed report is true.


Munstryof varus Resources

Report of Work FwiW
(Geophysical, Geological!,
Geochemical and Expenditures)


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Credits Requested per Each Claim in Columns at right
Mining Claims Traversed (List in numerical sequence)


Expenditures (excludes power stripping)







Ministry of
Natural
- - urces

Technical Assessment Work Credits

\begin{tabular}{|ll|}
\hline Recorded Holder & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & HERONRY LAKE AREA \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assessment days credit per claim & Mining Claims Assossed \\
\hline  & \begin{tabular}{l}
K 440301 to 306 inclusive 440396 to 399 inclusive 440401 \\
639532 to 536 inclusive 639598 to 600 inclusive 696038 to 043 inclusive 696212-13-20-21 704672-74
\end{tabular} \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims
\(\square\)
No credits have been allowed for the following mining claims

Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)-60:

Ministry of
Natural
sources

Technical Assessment
Work Credits

\begin{tabular}{|ll|}
\hline Recorded Holder & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & BROOKS LAKE AREA \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assessment days credit per claim & Mining Claims Assessed \\
\hline  & \begin{tabular}{l}
K 638545 to 551 inclusive \\
638671 to 679 inclusive \\
638700 to 710 inclusive \\
639154 to 156 inclusive \\
639158 to 167 inclusive \\
696215 to 218 inclusive
\end{tabular} \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims
not sufficiently covered by the suryey
Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)-60: 828 (83/6)
\begin{tabular}{|ll|}
\hline Recorded Holder & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & ROWAN LAKE AREA \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assensment days credit per claim & Mining Claims Assessed \\
\hline  & \begin{tabular}{l}
K 440432 to 439 inclusive 639208-09-10 \\
639483 to 517 inclusive
\end{tabular} \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims
not sufficiently covered by the survey
Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)-60:

Technical Assessment Work Credits
\begin{tabular}{|c|c|}
\hline \multicolumn{2}{|r|}{File} \\
\hline & 2.7325 \\
\hline \[
\begin{array}{rrrr}
\text { Date } & \\
1985 & 02 & 07
\end{array}
\] & Mining Recorder's Report of
Work No. \(\quad\) 195-84-4 \\
\hline
\end{tabular}
\begin{tabular}{|ll|}
\hline Recorded Holder & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & ROWAN LAKE AREA \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assessment days credit per claim & Mining Claims Assessed \\
\hline Geophysical & \\
\hline Electromagnetic 14 days & \\
\hline Magnetometer _ 14 deys & K 639518 to 531 inclusive 640238-39 \\
\hline Radiometric________ days & 640244 to 248 inclusive 640236 \\
\hline Induced poiarization__ days & \[
\begin{aligned}
& 640610-11-12 \\
& 704553-58-63
\end{aligned}
\] \\
\hline Other______ davs & 639157 \\
\hline Section 77 (19) See "Mining Claims Assessed"' column & \\
\hline Geological ___ days & \\
\hline Geochemical _____ days & \\
\hline Man days \(\square \quad\) Airborne \(\square\) & \\
\hline Special provision \(\square \quad\) Ground \(\square\) & \\
\hline Credits have been reduced because of partial coverage of claims. & \\
\hline Credits have been reduced because of corrections to work dates and figures of applicant. & \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claimsnot sufficiently covered by the survey
Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)—60: B28 (83/6)

Technical Assessment
Work Credits

\begin{tabular}{|ll|}
\hline Recorded Holder & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & ROWAN LAKE AREA \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assessment days credit per claim & Mining Claims Assessed \\
\hline \begin{tabular}{l}
Geophysical \\
Radiometric \(\qquad\) days \\
Induced polarization \(\qquad\) days \\
Other \(\qquad\) days \\
Section 77 (19) See "Mining Clsims Assessed" column \\
Geological \(\qquad\) days \\
Geochemical \(\qquad\) days \\
Man days \(\square\) Airborne \(\square\) \\
Special provision \(\square\) Ground \(\square\)
Credits have been reduced because of partial coverage of claims.
Credits have been reduced because of corrections to work dates and figures of applicant.
\end{tabular} & \begin{tabular}{l}
K 638535 to 544 inclusive 638552-53-54 \\
638690 to 697 inclusive
\[
638680-89-98-99
\] \\
440384
\end{tabular} \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claimsnot sufficiently covered by the survey
Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)-60: 828 (83/6)

Ministry of
Natural
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Technical Assessment Work Credits

\begin{tabular}{|ll|}
\hline Recorded Hoider & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & ROWAN LAKE AREA \\
\hline
\end{tabular}


Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims
\(\square\) not sufficiently covered by the survey \(\quad \square\) Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section \(77(19)-60\) : 828 (83/6)

Ministry of
Natural
ources

Technical Assessment
Work Credits

\begin{tabular}{|ll|}
\hline Recorded Holder & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & DOGPAW LAKE AREA \\
\hline
\end{tabular}


Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims
not sufficiently covered by the suryeyInsufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77 (19)—60: 828 (83/6)

\begin{tabular}{|ll|}
\hline Recorded Holder & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & DOGPAW LAKE AREA \\
\hline
\end{tabular}


Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)—60: 828 (83/6)
\begin{tabular}{|c|c|}
\hline \multicolumn{2}{|r|}{File} \\
\hline & 2.7325 \\
\hline Date & Mining Recorder's Report of \\
\hline 19850221 & Work No. 195-84-9 \\
\hline
\end{tabular}
\begin{tabular}{|ll|}
\hline Recorded Holder & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & DOGPAW LAKE AREA \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assessment days credit per claim & Mining Claims Assossed \\
\hline Geophysical & \\
\hline \(\qquad\) 14 days & \\
\hline \(\qquad\) 14 days & \[
\begin{aligned}
& \text { K 639459-60-61 } \\
& 639580 \text { to } 583 \text { inclusive }
\end{aligned}
\] \\
\hline Radiometric______ days & 704684 to 697 inclusive \\
\hline Induced polarization ___ days & \\
\hline Other___ days & \\
\hline Section 77 (19) See "Mining Claims Assessed" column & \\
\hline Geological ___ days & \\
\hline Geochemical _____ days & \\
\hline Man days \(\square\) Airborne \(\triangle\) & \\
\hline Special provision \(\square\) Ground \(\square\) & \\
\hline Credits have been reduced because of partial coverage of claims. & \\
\hline Credits have been reduced because of corrections to work dates and figures of applicant. & \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims
\(\square\) not sufficiently covered by the survey
Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77 (19) - 60 :
220 ( 83 ,6)

Ministry of Natural
phources
Technical Assessment
Work Credits

\begin{tabular}{|ll|}
\hline Recorded Holder & SAULT MEADOWS ENERGY CORP \\
\hline Township or Area & HERONRY LAKE \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assessment days credit per claim & Mining Claims Assossed \\
\hline \begin{tabular}{l}
Geophysical \\
Electromagnetic 14
\(\qquad\) days \\
Magnetometer 14
\(\qquad\) \\
Radiometric \(\qquad\) days \\
Induced polarization \(\qquad\) days \\
Other \(\qquad\) days \\
Section 77 (19) Soe "Mining Cialms Assessed" column \\
Geological \(\qquad\) days \\
Geochemical \(\qquad\) days
Credits have been reduced because of partial coverage of claims.
Credits have been reduced because of corrections to work dates and figures of applicant.
\end{tabular} & \begin{tabular}{l}
K 696107 to 115 inclusive 696117-18-25-26 \\
696196 to 199 inclusive
\end{tabular} \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims
\(\square\) not sufficiently covered by the survey
Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)—60: 828 (83/6)

Technical Assessment Work Credits
\begin{tabular}{|c|c|c|}
\hline Date & & \begin{tabular}{c} 
File \\
\\
\\
1
\end{tabular} \begin{tabular}{llll}
985 & 02 & 07 & \\
\hline
\end{tabular} \\
\hline
\end{tabular}

Recorded Holder
\begin{tabular}{ll} 
& GUS KOWALSKI \\
Township or Area & ROWAN \(\angle A K E ~ A R E A ~\)
\end{tabular}
\begin{tabular}{|c|c|}
\hline Type of survey and number ol Assessment days credit per claim & Mining Claims Assossed \\
\hline \begin{tabular}{l}
Geophysical \\
Electromagnetic \(\qquad\) \\
Magnetometer \(\qquad\) 35 \(\qquad\) days \\
Radiometric \(\qquad\) days \\
Induced polarization \(\qquad\) days \\
Other \(\qquad\) days \\
Section 77 (19) See "Mining Claims Assessed" column \\
Geological \(\qquad\) days \\
Geochemical \(\qquad\) days \\
Man days \(\square\) Airborne \\
Special provision \(\square\) Ground \(\square\)
Credits have been reduced because of partial coverage of claims. \\
(x) Credits have been reduced because of corrections to work dates and figures of applicant.
\end{tabular} & ```
K 718841-42-43
    718848 to 853 inclusive
    718856
    718858 -59-60
    729337-38-39-40
    719279-80-81
``` \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)-60: 828 (83/6)


Recorded Hoider

> RAYLLOYD RESOURCES LTD

Township or Area
ROWAN LAKE AREA
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assessment days credit per claim & Mining Claims Assossed \\
\hline Geophysical & \\
\hline Electromagnetic 15 days & \\
\hline Magnetometer 15 \(\qquad\) days & K 729161 to 180 inclusive 729182-83 \\
\hline Radiometric__ days & \\
\hline Induced polarization____ days & \\
\hline Other_____ days & \\
\hline Section 77 (19) See "Mining Claims Assessed" column & \\
\hline Geological ___ days & \\
\hline Geochemical ___ days & \\
\hline Man days \(\square\) Airborne \(\mathbb{\square}\) & \\
\hline Special provision \(\square \quad\) Ground \(\square\) & \\
\hline Credits have been reduced because of partial coverage of claims. & \\
\hline \(\boxed{\square}\) Credits have been reduced because of corrections to work dates and figures of applicant. & \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claimsnot sufficiently covered by the survey
Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)-60:
\begin{tabular}{|ll|}
\hline Recorded Holder & \\
\hline STREAMShip or Area & DOGPAW LAKE AREA \\
\hline
\end{tabular}


Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77 (19)——6:

Ministry of
Natural
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Technical Assessment
Work Credits

\begin{tabular}{|ll|}
\hline Recorded Hoider & GREAT CAMERON LAKE \\
\hline Township or Area & DOGPAW LAKE AREA \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assessment days credit per claim & Mining Claims Assessed \\
\hline  & K 440332 to 338 inclusive 440350 to 364 inclusive 704502-03-04 704707 to 716 inclusive \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

\section*{not sufficiently covered by the survey}

Insufficient tachnical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19)—60: 828 (83/6)

Ministry of
Natural purces
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Technical Assessment Work Credits


Recorded Holder
DAVID A. GRANT
Township or Area
ROWAN LAKE AREA
\begin{tabular}{|c|c|}
\hline Type of survey and number of Assessment days credil per claim & Mining Claims Assossed \\
\hline  & \begin{tabular}{l}
K 718844 to 847 inclusive 718854-55-57 718894 \\
729331 to 336 inclusive 729155 to 160 inclusive \\
copies of all corresponderee foc Do to Yrart \\
Don Eslirger. \\
Heat Cererol hteres \\
604.890 Wast Perder \\
vanc. \(\mathrm{ve}_{6 \mathrm{C}} 159\)
\end{tabular} \\
\hline
\end{tabular}

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims
not sufficiently covered by the survey

Ministry of
Natural
Resources

Mining Recorder
Ministry of Natural Resources
808 Robertson Street
Box 5080
Kendra, Ontario P9N \(3 \times 9\)

Dear Sir:

Enclosed are two copies of a Notice of Intent with statements listing a reduced rate of assessment work credits to be allowed for a technical survey. Please forward one copy to the recorded holder of the claims and retain the other. In approximately fifteen days from the above date, a final letter of approval of these credits will be sent to you. On receipt of the approval letter, you may then change the work entries on the claim record sheets.
For further information, if required, please contact
Mr. R.J. Pichette at 416/965-4888.


Land Management Branch
Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
MFA lW
S. Hurst:mc

Encis.
cc: Sault Meadows Energy Corp Toronto, Ontario
CC: Jack Cureatz Waw, Ontario
cc: David Alexander Grant
Chilliwack, B.C.
cc: Mr. G.H. Ferguson Mining \& Lands Commissioner Toronto, Ontario

Ministry of
Natural Resources

\author{
AMENDED \\ Notice of Intent \\ for Technical Reports \\ 19850221
}
2.7325/195-84-9,195-84-1

An examination of your survey report indicates that the requirements of The Ontario Mining Act have not been fully met to warrant maximum assessment work credits. This notice is merely a warning that you will not be allowed the number of assessment work days credits that you expected and also that in approximately 15 days from the above date, the mining recorder will be authorized to change the entries on his record sheets to agree with the enclosed statement. Please note that until such time as the recorder actually changes the entry on the record sheet, the status of the claim remains unchanged.

If you are of the opinion that these changes by the mining recorder will jeopardize your claims, you may during the next fifteen days apply to the Mining and Lands Commissioner for an extension of time. Abstracts should be sent with your application.

If the reduced rate of credits does not jeopardize the status of the claims then you need not seek relief from the Mining and Lands Commissioner and this Notice of Intent may be disregarded.

If your survey was submitted and assessed under the "Special Provision-Performance and Coverage" method and you are of the opinion that a re-appraisal under the "Man-days" method would result in the approval of a greater number of days credit per claim, you may, within the said fifteen day period, submit assessment work breakdowns listing the employees names, addresses and the dates and hours they worked. The new work breakdowns should be submitted direct to the Land Management Branch, Toronto. The report will be re-assessed and a new statement of credits based on actual days worked will be issued.

\author{
Mining Recorder Ministry of Natural Resources 808 Robartson Streat Box 5080 \\ Kenora, Ontario \\ P9N \(3 \times 9\) \\ \section*{Dear SIr:}
}
RE: Notice of Intent dated February 21, 1985 Geophysical (Electromagnetic \& Magnetometor) Survey on Mining Claims K 440301, et. al., in the Heronry Lake, Rowan Lake. Dogpaw Lake and Brooks Lake Areas

The assessment work credits, as listed with the above-nentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely.
S.E. Yundt

Director
Land Management Branch
Whitney Block, Room 6643
Queen's Park
Toronto: Ontario
H7A 1H3
Phone: (416)965-4888
S. Hurst :mc


Your file: 195-84-1 to 10 Incl. 194-84,196-84,197-84,204-84 205-84
Our File: 2.7325

Mining Recorder
Ministry of Natural Resources
808 Robertson Street
Box 5080
Kenora, Ontario
Pg \(3 \times 9\)
Dear Sir:
Enclosed are two copies of a Notice of Intent with statements listing a reduced rate of assessment work credits to be allowed for a technical survey. Please forward one copy to the recorded holder of the claims and retain the other. In approximately fifteen days from the above date, a final letter of approval of these credits will be sent to you. On receipt of the approval letter, you may then change the work entries on the claim record sheets.
For further information, if required, please contact Mr. R.J. Pichette at 416/965-4888.

Yours sincerely,
\(f\) S.E. YundtDirectorLand Management Branch
Whitney Block, Room 6643Queen's ParkToronto, Ontario
MFA 1W3
S. Hurst:mc
Encls.
cc: Sault Meadows Energy Corp Toronto, Ontario
cc: Jack Cureatz Waw, Ontario
cc: David Alexander Grant Chilliwack, B.C.
cc: Mr. G.H. Ferguson Mining \& Lands Commissioner Toronto, Ontario
cc: Raylloyd Resources Ltd Toronto, Ontario
cc: Streamside Resources Toronto, Ontario
cc: Gus Kowalski
Salt Ste. Marie, Ontario
cc: S. Evanylo Toronto, Ontario
cc: Great Cameron Lake Toronto, Ontario

\author{
Notice of Intent \\ for Technical Reports
}

19850207
2.7325/195-84-1 to 10 inclusive

194-84
196-84
197-84
204-84
205-84

An examination of your survey report indicates that the requirements of The Ontario Mining Act have not been fully met to warrant maximum assessment work credits. This notice is merely a warning that you will not be allowed the number of assessment work days credits that you expected and also that in approximately 15 days from the above date, the mining recorder will be authorized to change the entries on his record sheets to agree with the enclosed statement. Please note that until such time as the recorder actually changes the entry on the record sheet, the status of the claim remains unchanged.

If you are of the opinion that these changes by the mining recorder will jeopardize your claims, you may during the next fifteen days apply to the Mining and Lands Commissioner for an extension of time. Abstracts should be sent with your application.

If the reduced rate of credits does not jeopardize the status of the claims then you need not seek relief from the Mining and Lands Commissioner and this Notice of Intent may be disregarded.

If your survey was submitted and assessed under the "Special Provision-Performance and Coverage" method and you are of the opinion that a re-appraisal under the "Man-days" method would result in the approval of a greater number of days credit per claim, you may, within the said fifteen day period, submit assessment work breakdowns listing the employees names, addresses and the dates and hours they worked. The new work breakdowns should be submitted direct to the Land Management Branch, Toronto. The report will be re-assessed and a new statement of credits based on actual days worked will be issued.

January 10, 1985
S.E. Yundt

Ministry of Natural Resources
Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
MFA 1W3


Dear Sir:
Re: File 2.7325
In response to your correspondence regarding our recent submission, we calculate the number of miles flown over the claims to be 88.01 miles.

Should you require any further information, please do not hesitate to call.

Yours truly,
SAUL MEADOWS ENERGY CORPORATION

S.A. Evanylo
\[
\begin{gathered}
8.01 \times 30^{281} \\
8.09^{1 / 4} \mathrm{da4}
\end{gathered}
\]

RECEIVED JAN 149895
mining lands section
```

Sault Meadows Energy Corporation
Sulte 1014
Box }6
20 Queen Street West
Toronto, Ontario
M5H 3R3

```

Dear Sirs:
RE: Airborne Geophysical (Magnetometer and Electromagnetic) Survey submitted on Mining Claims K 44031 et al in the Areas of Brooks Lake, Dogpaw Lake, Heronry Lake and Rowan Lake

With reference to the above-described subaission, there appears to be a discrepancy in your calculations for assessment work credits. The report states that the total miles flown was 341 ( 549 Km ) and the line spacing was 300 meters. Please provide the number of miles flown over the claims only. When submitting this information, please quote file 2.7325.

For further infomation, please contact Susan Hurst at (416)965-4888.

Yours sincerely,
S.E. Yundt

Director
Land Management Branch
Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: (416)965-4888
S. Hurst:mc
\begin{tabular}{|c|c|c|c|}
\hline \multirow[t]{3}{*}{cc:} & Mining Recorder & \multirow[t]{3}{*}{cc:} & \multirow[t]{4}{*}{\begin{tabular}{l}
Gus Kowalski \\
143 Meadow Park Cr. Sault Ste. Marie, Ontario P6A 4HI
\end{tabular}} \\
\hline & Kenora, Ontario & & \\
\hline & & & \\
\hline \multirow[t]{3}{*}{cc:} & Raylloyd Resources 109 Bayfield Street & & \\
\hline & Barrie, Ontario & \multirow[t]{5}{*}{CC:} & Greamside Resources \\
\hline & LiN 3A9 & & Great Cameron Lake \\
\hline \multirow[t]{3}{*}{cc:} & & & Suite 103 \\
\hline & Suite 103. 46357 Male Rd & & 463 , Yate Rd vap 2 P8 \\
\hline & Chilliwak. B.C. Y2P 2P8 & & Chilitwak. B.C. V2P 2P8 \\
\hline
\end{tabular}

\section*{REGISTERED}

File: 2.7325
```

Sault Meadows Energy Corp
Sulte 1014
Box }6
20 Queen Street West
Toronto, Ontario
M5H 3R3

```
Dear Sirs:
RE: Airborne Geophysical (Magnetometer \& Electromagnetic)
    Survey submitted on Mining Claims K 440301 et al in
    the Areas of Boooks Lake, Dogpay Lake, Heronry Lake
    and Rowan Lake

Enclosed is a copy of our letter dated Movember 16, 1984 requesting additional information for the above-mentioned survey.

Unless you can provide the required date by January 11, 1985 the line wiles will be estimated and assessment credits adjusted accordingly.

For further information, please contact Mr. Ray Pichetee at (416)965-4888.

Yours sincerely.
S.E. Yundt

Director
Land Management Branch
Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: (416)965-4888
S. Hurst:mc
```

cc: Mining Recorder CCi Raylloyd Resources Kenora, Ontario
Barrie, Ontario
cc: Gus Kownlaki Sault Ste. Marie, Ontario
cc: Etreamside Resources Chilliwak, B.C.

```
cc: Sault Meadows Energy Corp Chilliwak, B.C.
Encl.

\section*{Your file: 194 to 197, 204, 205 Our Filas 2.7325}

October 26, 1984

Mining Recorder
Ministry of Matural Resources
808 Robertson Street
Box 5160
Kenora, Ontario
P9N 3X9
Near Sir:
We received reports and maps on October 19, 1984 for an Airborne Geophysical (Electromagnetic and Magnetomater) Survay submitted on Mining Claims K-440301 et al in the Areas of Brooks Lake, Dogpaw Lake, Heronry Lake and Rowan Lake.

This material will be examined and assessed and a statmmit of assessmant work credits will be issued.

Yours sincerely.
S.E. Yundt
Director
Land Managament Branch
Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A IW3
Phone: (416)965-4888
D. Kinvig:ig
cc: Streamside Resources Great Cameron Lake David Grant Ste. 103, 46357 Yale Rd. CChilifiwak, B.C. V2P 2P8.
cc: Raylloyd Resources 109 Bayfield St. Barrie, Ontario L4M 3A9

Sauit Meadows Energy Corp.
(same address as Streamside Resources Inc. 700 - 185 Bloor St. E. Toronto, Ontario MAK 333.
143 Meadow Park Cr. Sault Sta. Marie, Ontario P6A 4Hi

This Survey covers the claims of:
0. Shut meadows ENERGY CoRP.
(2) STREAMSIDE RESOURCES
(3) GREAT CAMEION LAKE RESOURCES
(4) Augustus (Gus) kowalski
(5) DAUTD ALEXANDER GRONT.

AlL BLOCKS HAUE BEEN BLOCKED OUT AND LABELLED.


RECEIVED
\[
\text { OCT } 191984
\]

MINING LANDS SECTION

Dear Sie oe. Madame:
Planse fino encloseo Two comphetle sets OF AIRBORNE GEODIMSICAL SURUEYS AS HAUNE BELEN CARRIED OUT TOR SHURT MEADOUS ENERCI CRCP 9 PARINERS.

RLL BLOCIES HAUE SEEN INDICATED AND 1 HORE YOU FINA EUERVITINE TO SOUR SATISFACTIDN.

THANV You
J. cureaiz

Box 1088
Wawa, entario
pos \(1 K 0\)
705-856.2476.
RECEIVED
OCT 191984
MINING LANDS SECTION

Streamide Resourceslac
700185 Bloor se. E.
TOROMTO, OMI.
M4W \(3 J 3\)
GREMT CAMERON LAKE RESOURES same as strem side.

Daind Grant
Ste 103, 46357 Xale Rd, Chilhieak, SC.
V2P OP8
Gus Komatski
14.3 Meadow lark \(\Omega\).

Sault Ste. Marie, ONPRYO
16 4 4 HI

RANLCOYB Resowices:
109 Boyfielet \(5 \%\)
Branie. onl.
\(\angle 4 M 3 A 9\)
Sault Moaknes Energy Corp.
same as Situsit.






DIGHEM \({ }^{\text {II }}\) SURVEY
KAKAGI LAKE AREA, ONTARIO ELECTROMAGNETIC ANOMALIES

SAULT MEADOWS ENERGY CORPORATION


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\] \\
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DIGHEM \({ }^{\underline{W}}\) SURVEY
KAKAGI LAKE AREA, ONTARIO
ELECTROMAGNETIC ANOMALIES




DIGHEM \({ }^{\text {II }}\) SURVEY
KAKAGI LAKE AREA, ONTARIO
TOTAL FIELD MAGNETICS

SAULT MEADOWS ENERGY CORPORATION

\(=\)
DIGHEM \({ }^{\underline{W}}\) SURVEY
KAKAGI LAKE AREA, ONTARIO TOTAL FIELD MAGNETICS FOR

SAULT MEADOWS ENERGY CORPORATION
Fight Line


\(1 / 2 \quad\) Scale 1:15,840 \(\quad 1\) Miles








\section*{SURVEY}

\section*{area, ONTARIO}

\section*{MAGNETICS}

ERGY CORPORATION



\section*{SURVEY}

\section*{IREA, ONTARIO}

\section*{UAGNETICS}

RGY CORPORATION
isomagnetic lines
```


[^0]:    * EM anomaly $B$ on line 106.

[^1]:    2 Resistivity mapping with an airborne multicoil electromagnetic system: Geophysics, v. 43, p. 144-172.

[^2]:    4 Refer to Fraser, 1981, Magnetite mapping with a multicoil airborne electromagnetic system: Geophysics, v. 46, p. 1579-1594.

[^3]:    5 See Figure II-1 presented earlier.

