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PROJECTS UNIT

REPORT ON  
GEOPHYSICAL SURVEY OF  
BUTT 1-73  
BUTT TOWNSHIP  
EASTERN ONTARIO MINING DIVISION  
BURKS FALLS AREA, ONTARIO

May 23, 1975

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BUTT 1-73

INTRODUCTION:

Noranda Exploration became aware of a potentially economic graphite deposit in Butt township in 1973. The property was subsequently geologically mapped and further work was indicated to evaluate its zones of concentration. In this regard, an I.P. survey and a limited vertical loop survey was conducted over the property.

LOCATION:

The property consists of ten unpatented contiguous mining claims numbered E0-380387-92 inclusive and E0-380176-79 inclusive. Claims E0-380179, E0-380392 cover parts of the north half of lots 5 and 6 respectively in Concession X, Butt township. The remaining claims lie north of Concession X in the unsubdivided portion of Butt township.

ACCESS:

The property is easily reached by car along a good gravel road which leads from the fire tower road from Highway #518 at the north end of Sand Lake.

TOPOGRAPHY:

The property is characterized by rolling hills and ridges approximately 100-200 feet high. Some of the cliff faces are difficult to traverse making surveying rather slow.

LINECUTTING:

The original grid that was cut on the property proved inadequate for the geophysical survey. For this reason a second grid was cut.

The base line with an azimuth 35 degrees was cut from the #3 post of claim #EO-380179. Traverse lines were then cut at right angles to the base line and at 400 foot intervals. In total approximately 8.2 miles of line were cut, chained and picketed.

GENERAL GEOLOGY:

Only two main rock types can be found on the property, paragneiss and graphite bearing quartzites, both displaying a general NE-SW trend. In the centre of the property where the quartzites are located the trends are contorted with varying degrees of dip.

INSTRUMENT AND SENSITIVITY:

INDUCED POLARIZATION:

The instrument used was a McPhar 660 I.P. unit. It operates in the frequency domain and obtains frequency effect and apparent resistivity data. A cross correlation of the two (ie Metal Factor) is also plotted.

The survey was conducted using a 200 feet dipole-dipole array, consisting of a current dipole and a potential dipole. The two dipoles are separated from each other in multiples of

200 feet giving greater depth penetration with each separation. These are then plotted as N-1,2,3,4 values.

When contoured the data gives significant information regarding location, depth, concentration and dip of a conductive or disseminated source.

INSTRUMENTS AND SENSITIVITY:

ELECTROMAGNETIC:

The electromagnetic survey was conducted using a Vertical Loop Electromagnetic Unit (V.E.M.), manufactured by Crone Geophysics Limited.

The instrument consists of a transmitting and receiving unit. The transmitter is composed of a transmitting coil, signal generating console and 12 volt battery. The receiver is composed of a search coil, signal amplifier, clinometer and headphones.

The transmitting coil produces a primary magnetic field when it is subjected to an alternating current. If the alternating primary magnetic field comes in contact with a conductive body a current within the conductor will occur. It in turn will produce a magnetic field of its own which is termed the "secondary".

The direction of the resultant field (i.e. primary plus secondary) is measured at given receiving stations by using the search coil with its attached clinometer. The deviation of the resultant from the horizontal primary magnetic field is measured in degrees of dip. Readings are taken using transmitting frequencies of 1830 Hz and 390 Hz. The correlation of the results

between the two frequencies gives an indication of the relative conductivity of the anomalous body.

The range of penetration of the primary field is normally considered to be approximately one-half the separation distance between the transmitter and receiver; however, other factors such as conductive overburden must also be taken into consideration.

The results of the V.E.M. survey are shown on the prints accompanying this report.

GEOPHYSICAL RESULTS:

INDUCED POLARIZATION:

As seen on the accompanying map an anomalous zone trending approximately NE-SW extends almost the entire width of the property.

The anomaly shape is fairly well defined to the west, particularly on lines 22E and 26E. The central and eastern portions of the property displayed broader and more complex anomalies. These correspond to areas of known folding and flat lying quartzites with up to 5% graphite.

In general the I.P. responses would suggest near surface sources (i.e. less than 50 feet) with no indication of a greater graphite concentration at depth.

VERTICAL LOOP SURVEY:

The I.P. results indicated a linear anomalous zone of significant strength to warrant further work. In an attempt to better define the axis of the anomaly a limited vertical loop

survey was conducted.

The results of this survey failed to give any definite crossovers except on a few isolated lines; possibly due to local concentrations. For this reason the survey was discontinued.

CONCLUSIONS AND RECOMMENDATIONS:

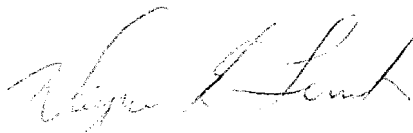
An anomalous I.P. zone was located extending approximately 6200 feet in length.

It is relatively narrow on the western portion of the grid with considerable broadening around Lake Sheehan. A geological survey indicated that the anomaly is the expression of graphite in quartzites.

Although the surface concentration of graphite is not economic it is recommended that the anomaly be tested at depth on or near line 42E.

Respectfully submitted,

NORANDA EXPLORATION COMPANY, LIMITED



Wayne E. Lunt  
Geophysicist



Show instrument technical data in each space for type of survey submitted or indicate "not applicable"

### GEOPHYSICAL TECHNICAL DATA

#### GROUND SURVEYS

Number of Stations 433 Number of Readings 150 VEM IP & Res.  
Station interval 100 feet  
Line spacing 400 feet  
Profile scale or Contour intervals EM - 1" equals 20 degrees I.P. - 1., 1.5, 2. 3. 4. 7.5 10.0  
(specify for each type of survey)

#### MAGNETIC

Instrument \_\_\_\_\_  
Accuracy - Scale constant \_\_\_\_\_  
Diurnal correction method \_\_\_\_\_  
Base station location \_\_\_\_\_

#### ELECTROMAGNETIC

Instrument Crone V.E.M.  
Coil configuration Vertical Loop Tx  
Coil separation 400'; 800'; 1200'  
Accuracy ± 2 degrees of dip  
Method:  Fixed transmitter  Shoot back  In line  Parallel line  
Frequency 1830 Hz 390 Hz  
Parameters measured Degrees of dip of the resultant e.m.f.  
(specify V.L.F. station)

#### GRAVITY

Instrument \_\_\_\_\_  
Scale constant \_\_\_\_\_  
Corrections made \_\_\_\_\_  
Base station value and location \_\_\_\_\_

Elevation accuracy \_\_\_\_\_

#### INDUCED POLARIZATION - RESISTIVITY

Instrument McPhar 660  
Time domain \_\_\_\_\_ Frequency domain Yes  
Frequency .31 and 5.0 Hz Range N = 6  
Power 250 K.V.  
Electrode array Dipole - dipole  
Electrode spacing 200 feet  
Type of electrode Porous pot and aluminium foil