42A01SE8905 2.3542 OTTO

010

RECEIVED
NOV - 5 1980
MINING LANDS SECTION

MINOREX LIMITED

ASSESSMENT REPORT

MURDOCK CREEK PROPERTY

OTTO TOWNSHIP

LARDER LAKE MINING DIVISION

John F. Stones
Geologist B.Sc.

80-10-22

1.0 INTRODUCTION

The Murdock Creek property consists of sixteen contiguous claims numbered 545231 to 545232 inclusive, 546534 to 546538 inclusive, 546543 to 546547 inclusive and 546553 to 546556 inclusive in Otto Township.

The claims were acquired to cover the contact of the Otto Stock and the surrounding Keewatin mafic and felsic metavolcanics and metasediments. Upon the release of the September 1979 airborne E.M. survey, several conductors were located within the claim group. During the 1980 summer field season, Minorex personnel completed follow-up ground work to test the anomalies.

The surveys consisted of:

- detailed geological mapping at a scale of 1 inch to 200 feet
- a horizontal shootback electromagnetic survey
- a gamma ray spectrometer survey.

2.0 LOCATION AND ACCESS

All sixteen claims are located in the northeast corner of Otto Township, approximately 4 miles southwest of Kirkland Lake along Highway 112. The Ontario Northland Railway (ONR) bisects the property and provides an excellent access route. Access can be gained by proceeding a quarter of a mile southeast along the railway from the overpass on Highway 112 or travelling half a mile northwest along the tracks from the railroad crossing on the Adams Mine Road (Highway 650).

3.0 TOPOGRAPHY AND VEGETATION

Relief in the area varies from lowland bogs and swamps bordering streams in the central portion of the property to steep ridges in the northern area. Two streams both flowing in a south-westerly direction are dammed by beavers.

Murdock Creek located north of the claim group dips southward into the northwest corner of the property.

Stands of jackpine, poplar and alders are native to the region of the property. Jackpines populate steep ridges of metavolcanics whereas poplar thrive in flat laying areas where the soils are better developed. Alders inhabit marshy ravines between ridges, swampy lowlands and the fringes of beaverponds.

...../2

4.0 PREVIOUS WORK

4.1 Assessment Files

In 1950, Mrs. Agnes Milligan reported a vein of pitchblende along the railway on the present claim 546534. Mr. W.S. Savage, Resident Geologist at the time visited the showing and found no evidence of radioactivity.

4.2 K.L.I.P.

An airborne electromagnetic and total intensity magnetic survey was flown over the area in 1979 to stimulate mining exploration in the Kirkland Lake area. The survey was funded by the Kirkland Lake Initiatives Program and compiled and interpreted by the Ontario Geological Survey. A total of 10 conductors were located on the present claim group.

4.3 Field Observations

Numerous overgrown trenches and pits not recorded in the assessment files were discovered while mapping. Many of the pits are located on quartz veins which were prospected for gold.

5.0 GEOLOGY

5.1 General Geology

The Murdock Creek property is underlain by rocks which form part of the Abitibi Greenstone Belt. Mafic and felsic metavolcanics and metasediments of Keewatin Age are in contact with an intrusive body of syenite known as the Otto Stock which is located southwest of the property. The contact trends in a northwesterly direction across the southern extremity of the claim group.

5.2 Table of Lithologies

Precambrian

Proterozoic	Alkalic Intrusive Rocks - mafic syenite, syenite contaminated by country rocks

...../3

5.2 Table of Lithologies (Cont'd)

Intrusive Contact

Archean

Felsic Metavolcanics (Keewatin)
- iron formation, silicic tuff and agglomerate

Felsic Metavolcanics and Metasediments (Keewatin)
- basalt, andesite, chloritic mafic tuff, agglomerate, altered (bleached, carbonatized) volcanic and sedimentary rocks
- andesite, porphyry, amygdaloidal and spherulitic dacite
- metavolcanics amphibolite and amphibolite gneiss.

5.3 Description of Lithologies

5.3.1 Intermediate to Mafic Metavolcanics

Volcanics examined on the claim group are andesitic to basaltic in composition and occur as massive, pillowed or foliated flows. Weathered outcrop exposures are generally dark grey-green to black in color. Altered outcrops display pale grey-green to white bleached spots on surface due to carbonization. Evidence of low grade metamorphism is featured by outcrops of amphibolite and amphibolite gneiss, characterized by a coarse granular texture on surface.

Cross fracturing is common on outcrop surfaces and distinct pillowed lavas were noted in a prominent ridge in the northeast corner of the property. No top determination was made due to the deformation of the pillow structures.

White and pink feldspar and quartz veins are a common feature. In some instances, thin foliated feldspar veins produce a banded appearance similar to the felsic tuffs. Aplitic dikes and veins of mafic and pink felsic syenite intrude the metavolcanics and can be observed in rock cuts along the railway.

Occurrences of sulphide mineralization are associated with quartz veins, quartz carbonate veins and zones of mafic tuff. A quartz carbonate vein intruding andesitic volcanics in the northeastern area of the property assayed 0.12 oz silver and 1.72% copper. On claim 398632, five (5) old trenches were located on a massive zone of sulphide facies iron formation in a dark grey tuff. Assay values for this area were low with respect to copper, silver and gold.

...../4

5.3.2 Felsic Metavolcanics

The south-central portion of the property is characterized by finely banded felsic tuffs interbedded with the mafic metavolcanics. The tuffs are siliceous and cherty with banded magnetite found in some areas. Low grade metamorphism of the tuff produces zones of foliated chlorite schist.

Sulphide mineralization in the form of pyrite and pyrrhotite occurs as narrow stratabound bodies within the tuff horizon. No significant assay values were obtained from these sulphide zones.

5.3.3 Alkalic Intrusives

Injections of black mafic syenite as well as felsic pink syenite intrude the volcanics in the southern region of the claim group. Small aplite dikes and syenite injections are encountered in rock cuts along the Ontario Northland Railway. Xenoliths of metavolcanics were noted in some of the larger syenite dikes intruding into the surrounding country rock. Black biotite rich mafic syenite is intruded by dikes of younger pink syenite and aplitic dikes.

The feldspar rich pink syenites are more resistant to erosion and protude as small ridges on outcrop surfaces.

Outcrops of banded gneissic syenites with stretched phenocrysts of quartz and feldspar as well as mafic minerals possibly amphibole are the result of local metamorphism. Along the contact between the mafic and felsic syenite, malachite staining is visible along narrow stringers of pyrite and chalcopyrite. Quartz and calcite veining is common in fissures and along joint planes.

5.3.4 Structure

A prominent lineament or fault structure trends in a northwesterly direction across the central portion of the claim group. Shorter lineaments subparallel this feature to the north and south. Bedding in the felsic tuffs trends 110-120° southeast and dips southwest. Pillowed lavas found in the northeast corner of the property appear to top to the east.

6.0 GEOPHYSICAL SURVEYS

6.1 Horizontal Shootback E.M. Survey

A horizontal loop E.M. survey was undertaken between the dates of May 10 and July 1, 1980 by Minorex personnel. Readings were taken at 50 foot

...../5

6.0 Horizontal Shootback E.M. Survey (Cont'd)

stations along parallel lines spaced 400 feet apart. Low frequency (390 Hertz) and medium frequency (1830 Hertz) readings were taken at each station.

Both operators traverse along the same line and in turn transmit and receive to measure the dip angle of the field. The two dip angles are then added together and the resultant dip angle is the measure of conductivity. The maximum penetration using the 200 foot coil spacing is approximately 100 feet.

6.2 Survey Results

Due to the relatively high resultant dip angles, the results were profiled at a scale of 1 inch to 40 degrees on the accompanying map. Values in excess of ± 15 degrees were considered to be anomalous. Five moderately strong anomalies designated A,B,C,D & E are located on lines 32 west, 28 west, 20 west, 16 west and 20 east.

These discontinuous anomalies appear to correspond to a series of small sulphide lenses that tend to pinch and swell.

7.0 RECOMMENDATIONS

The conductors merit further investigation by geological mapping and geochemical sampling. A vertical loop survey along with a magnetometer survey should be completed to delineate the extent of these sulphide bodies.

John F. Stones
Geologist B.Sc.

October 22, 1980

ELECTROMAGNETIC SURVEY TECHNICAL DATA

Instrument	Crone CEM
Coil Configuration	Transmitting coil horizontal, receiving coil vertical
Coil Separation	200 feet
Accuracy	± 0.5 degrees
Method	Horizontal shootback
Frequency	Medium 1830 hertz Low 390 hertz
Parameters Measured	Dip angle of conductor
Line spacing	Parallel lines 400 feet apart
Station intervals	50 foot spacings

RADIOMETRIC SURVEY TECHNICAL DATA

Instrument	McPhar T.V.-5 Scintillometer
Values measured	Total count, measuring total count across the entire gamma energy spectrum for maximum sensitivity
Energy windows	Total count at 0.20 Mev.
Height of instrument	24 inches above ground
Background	4,000 counts per minute
Detector size	Sodium iodide crystal 1-3/4 inches x 2 inches
Overburden	Glacial till of variable thickness 0-30 feet
Line spacing	Parallel lines 400 feet apart
Station intervals	50 foot spacings

Ontario

Ministry of Nat

GEOPHYSICAL – GEOLOC
TECHNICAL DAT

42A01SE8905 2.3542 OTTO

900

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) Linecutting, Geological Mapping, Horizontal Shootback E.M.

Township or Area Otto Twp

Claim Holder(s) Minorex Limited - P.O. Box 7
Thetford Mines, Que. G6G 5R9

Survey Company Minorex Limited

Author of Report John F. Stones, Geologist B.Sc.

Address of Author P.O.Box 7,Thetford Mines,P.Q.G6G 5R9

Covering Dates of Survey April 15 - July 15, 1980
(linecutting to office)

Total Miles of Line Cut 16.8 miles

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
--Electromagnetic	20
--Magnetometer	
--Radiometric	
--Other	
Geological	40
Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer _____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: Oct.22, 1980 SIGNATURE: J.F. Stones
Author of Report or Agent

Res. Geol. _____ Qualifications 2.3236

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
	EM1 G.
545231	✓ ✓
545232	✓ ✓
546534	✓ ✓
546535	✓ ✓
546536	✓ ✓
546537	✓ ✓
546538	✓ ✓
546543	✓ ✓
546544	✓ ✓
546545	✓ ✓
546546	✓ ✓
546547	1/2 1/2
546553	✓ ✓
546554	✓ ✓
546555	✓ ✓
546556	✓ ✓

If space insufficient, attach list

TOTAL CLAIMS 16

OFFICE USE ONLY

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS - If more than one survey, specify data for each type of survey

Number of Stations _____ Number of Readings _____

Station interval _____ Line spacing _____

Profile scale _____

Contour interval _____

MAGNETIC

Instrument _____

Accuracy – Scale constant _____

Diurnal correction method _____

Base Station check-in interval (hours) _____

Base Station location and value _____

_____

ELECTROMAGNETIC

Instrument _____

Coil configuration _____

Coil separation _____

Accuracy _____

Method: ☐ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency _____
(specify V.L.F. station)

Parameters measured _____

GRAVITY

Instrument _____

Scale constant _____

Corrections made _____

_____

Base station value and location _____

_____

Elevation accuracy _____

INDUCED POLARIZATION RESISTIVITY

Instrument _____

Method ☐ Time Domain ☐ Frequency Domain

Parameters -- On time _____ Frequency _____

-- Off time _____ Range _____

-- Delay time _____

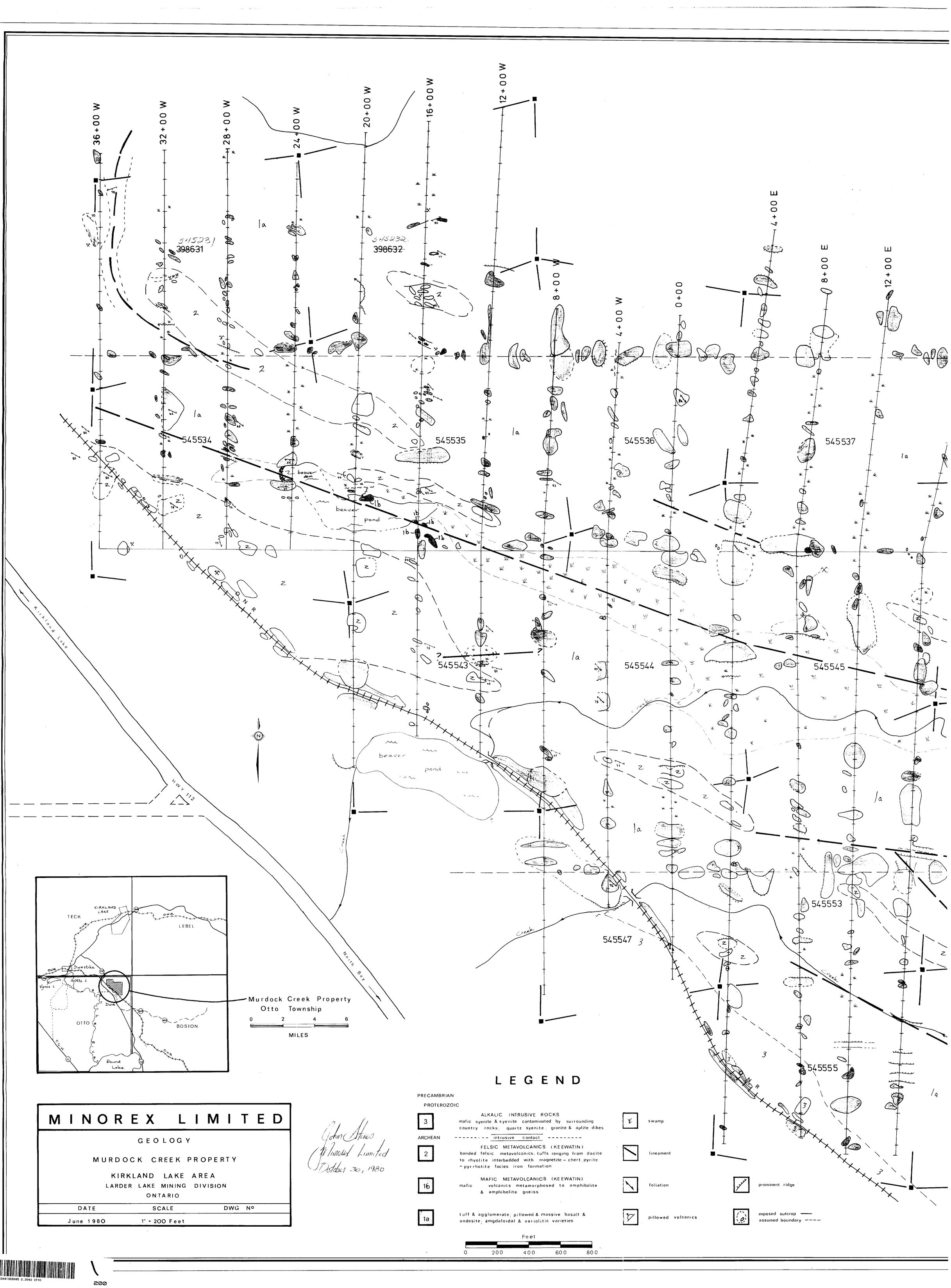
-- Integration time _____

Power _____

Electrode array _____

Electrode spacing _____

Type of electrode _____



MINOREX LIMITED

GEOLOGY

MURDOCK CREEK PROPERTY

KIRKLAND LAKE AREA
LARDER LAKE MINING DIVISION
ONTARIO

DATE	SCALE	DWG No
June 1980	1" = 200 Feet	

John Stevens
for Minorex Limited
October 30, 1980

LEGEND

PRECAMBRIAN

PROTEROZOIC

3 — ALKALIC INTRUSIVE ROCKS
mafic syenite & syenite contaminated by surrounding country rocks; quartz syenite, granite & aplite dikes

ARCHEAN

---------- intrusive contact ----------

2 — FELSIC METAVOLCANICS (KEEWATIN)
banded felsic metavolcanics, tuffs ranging from dacite to rhyolite interbedded with magnetite – chert pyrite – pyrrhotite facies iron formation

1b — MAFIC METAVOLCANICS (KEEWATIN)
mafic volcanics metamorphosed to amphibolite & amphibolite gneiss

1a — tuff & agglomerate; pillowed & massive basalt & andesite; amgdaloidal & variolitic varieties

swamp

lineament

foliation

pillowed volcanics

prominent ridge

exposed outcrop ——
assumed boundary - - - -

Feet
0 200 400 600 800

42A01SE8985 2.3542 OTTO

200

L 36 + 00 W
L 32 + 00 W
L 28 + 00 W
L 24 + 00 W
L 20 + 00 W
L 16 + 00 W
L 12 + 00 W
L 8 + 00 W
L 4 + 00 W
L 0 + 00
L 4 + 00 E
L 8 + 00 E
L 12 + 00 E

MURDOCK CREEK

545231
398631

545232
398632

A
B
C
D

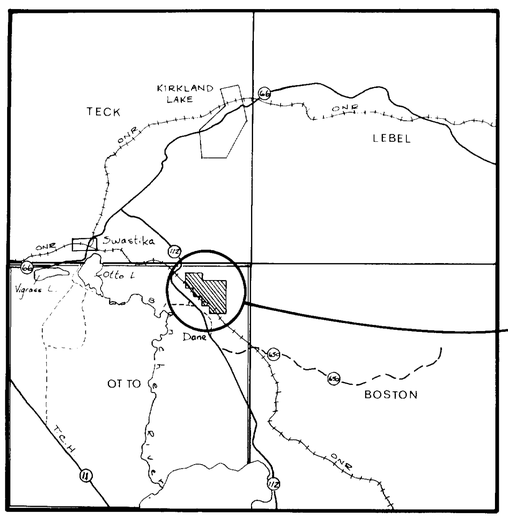
545534
545535
545536
545537
545543
545544
545545
545547
545553
545555

beaver pond
beaver pond
Creek
Creek
Creek
Creek

ONR

Kirkland Lake
HWY 112
North Bay

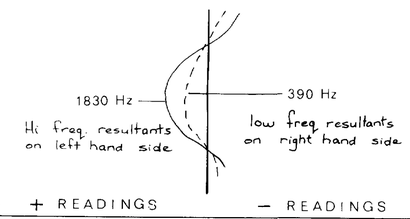
N



Murdock Creek Property
Otto Township

0 2 4 6
MILES

LEGEND



+ READINGS	— READINGS
INSTRUMENT:	CRONE CEM
FREQUENCY:	1830, 390 Hz
COIL SPACING:	200 FEET
PROFILE SCALE:	1" = 40'

0 200 400 600 800
FEET

MINOREX LIMITED

HORIZONTAL SHOOTBACK SURVEY

MURDOCK CREEK PROPERTY

KIRKLAND LAKE AREA
LARDER LAKE MINING DIVISION
ONTARIO

DATE	SCALE	DWG NO.
June 1980	1" = 200 Feet	

John A. Jones
Minorex Limited
October 30, 1980

42A01SE0005 2.3542 OTTO

0+00
4+00 E
8+00 E
12+00 E
16+00 E
20+00 E
24+00 E
28+00 E
beaver pond
TIE LINE
BASE LINE
TIE LINE
545536
545537
545538
545544
545545
545546
545553
545554
545555
545556
1a
2
3
Creek
swamp
lineament
foliation
prominent ridge
pillowed volcanics
exposed outcrop
assumed boundary

L 20 + 00 W
L 16 + 00 W
L 12 + 00 W
L 8 + 00 W
L 4 + 00 W
L 0 + 00
L 4 + 00 E
L 8 + 00 E
L 12 + 00 E
L 16 + 00 E
L 20 + 00 E
L 24 + 00 E
L 28 + 00 E

TIE LINE

BASE LINE

TIE LINE

545232
398632

545535
545536
545537
545538
545543
545544
545545
545546
545547
545553
545554
545555
545556

B
C
D

beaver pond
beaver pond
Creek
Creek
Creek