

MAR 19690022: ALBERTA

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REPORT TO
ROVING EXPLORATION SERVICES LTD.
ON
GEOLOGICAL EXAMINATION
PERMIT NOS. 77, 78, 81
ALBERTA

October 31st, 1969

James R. Glass
Consulting Geologist

profiles & maps from
previous radiometric Survey

700060
INDEXING DOCUMENT NOS 700066

INTRODUCTION

In accordance with the written instructions of Mr. Jack Cook of Roving Exploration Services Ltd. the writer made a cursory geological examination of three areas in which a previous radiometric survey had indicated anomalous radioactive conditions at a number of specific locations. These locations were plotted on a map of Scale 1" = 2 miles which was used as a field guide. The areas examined were located on Prospecting Permit No. 81, Prospecting Permit No. 78 and Prospecting Permit No. 77 as outlined by the Government of Alberta. These permit areas are located in north-east corner of the Province of Alberta and can be reached by float aeroplane based at Fort Smith, N. W. T.

SUMMARY & CONCLUSIONS

Four of the areas inspected were found to contain small shear zones associated with small slightly anomalous radioactive anomalies. Three of these zones were associated with hornblende-amphibolite rich rocks, the metasedimentary series which generally contains the uranium mineralization in this region. The fourth zone was associated with a pegmatite phase in a granitic rock.

No evidence of surface economic uranium mineralization was found. Unless the airborne radiometric anomalies are numerically high or spatially suggestive of strong faulting no further work should be done on the areas inspected.

GENERAL GEOLOGY

The rocks underlying this portion of Alberta are Precambrian in age. Granite and granite gneiss are the major constituents but locally biotite granite or metasedimentary rocks are found in abundance. The metasedimentary series is made up of quartzite, biotite-sericite schists, amphibolite-hornblende schists, and highly altered sediments. The regional strike is north 10 to 20 degrees east with dips at high angles, mainly to the west.

Several major faults cut the area. All of them strike in northerly direction. All the rock sequences show evidence of deformation due to this faulting.

Radioactivity and uranium mineralization are known to be associated with the metasedimentary rock series and with both major faults. It has been noted however that the mass effect of some slightly radioactive, large biotite granite and granite gneiss bodies has produced airborne radioactive anomalies equivalent to those found over some zones of uranium mineralization.

AREAS INSPECTED

PERMIT NO. 77

Area 77-1 Background .015

This area was inspected geologically and surveyed in detail with a scintillometer over an area $\frac{1}{4}$ mile by $\frac{1}{2}$ mile. The rocks underlying this area are very coarse granite-granite pegmatites which have locally been sheared in a northerly direction. Evidence of a major fault is seen but no anomalous radioactive conditions exist along the fault scarp. Below the fault scarp biotite rich granite with iron staining was seen; part of the metasedimentary series. Careful prospecting with the scintillometer failed to give any anomalous readings.

One small shear zone of width one inch and length fifteen feet was found in the pegmatite rock. This zone gave anomalous readings on the scintillometer two and one half times background.

Area 77-2

The west side of Wylie Lake contains so many reefs the pilot would not land the aeroplane. This area was not inspected.

PERMIT NO. 78

Area 78-1 Background .005 - .01

This area was inspected geologically and the outcrop surveyed with a scintillometer in some detail over an area one mile long and up to $\frac{1}{2}$ mile wide. Several traverses were made over the target area.

The area is underlain by a series of pink granite-gneiss bands alternating with black biotite, amphibolite rich rocks. These zones appear to be separated in many instances by local faults. Lineation in the area is N. 20 E.

Three small radioactive anomalies ($2\frac{1}{2} \times$ background) associated

Areas Inspected Cont.

with minute fractures were found. In all instances the fractures were near or at the contact between pink granite gneiss and black hornblende, amphibolite schists. These small shears were only $\frac{1}{2}$ inch wide and up to 2 feet in length.

Near the target area the background values over one ridge of granite gneiss showed an increase but not enough to be considered anomalous. The background increase was from the .005-.01 range to .01 - .015.

Area 78-2 Background .01

This area was inspected geologically and surveyed in some detail with a scintillometer over an area of $\frac{1}{4}$ mile and $\frac{1}{2}$ mile. Once again the predominant rock in the area is granite gneiss which contains a minor amount of dark biotite-amphibolite rich lenses.

The major structural fracture is a very evident fault which crosses the peninsula in a direction N. 20 E. The very large prominent outcrop of granite gneiss which makes up the fault scarp on the west side of this fault very evidently contains high background readings. Readings along strike for a length of $\frac{1}{4}$ mile and up to a width of several hundred feet are in the order of .015, with individual readings reaching .02. Along this zone the rock is a fresh unaltered granite gneiss which shows no evidence of uranium mineralization.

It was noted while flying the area with the scintillometer that the continuation of this zone north into Permit Area No. 122 contains high radioactive counts.

Areas Inspected Cont.

PERMIT AREA NO. 81

Area 81-1

This area could not be accurately located using the existing maps so no ground traverses were made. The area was inspected from the air however and the radioactive count noted on the scintillometer. Nothing of interest was seen.

Area 81-2

One traverse was made across this area. The low land containing the Tethul River has no outcrop. The first outcrop north of the river is a very prominent granite gneiss escarpment which is very evidently fault controlled.

Traverses were made across this outcrop but no readings above background were obtained.

Area 81-3 Background .015

The area surrounding this location was surveyed in detail using the scintillometer.

A very prominent fault controlled ridge which extends nearly to Donovan Lake, dominates this area. The fault north of the ridge has an east-west direction and the fault bounding the southern limit has a direction of E. 20° S.

The rock is dominantly granite-gneiss with very minor amounts of dark biotite-hornblende rich material.

No readings on the ridge or in the flat country below the ridge were above background count.

Areas Inspected Cont.

While flying this area and noting the radioactive count on the scintillometer it was found that readings as high as three times background were found in the fault zone north of the main prominent ridge. At this particular location however the fault is not in Alberta, but is north of the geographic boundary and is therefore in the North West Territories, not in the area contained by Permit No. S1.



Respectfully Submitted

James R. Glass

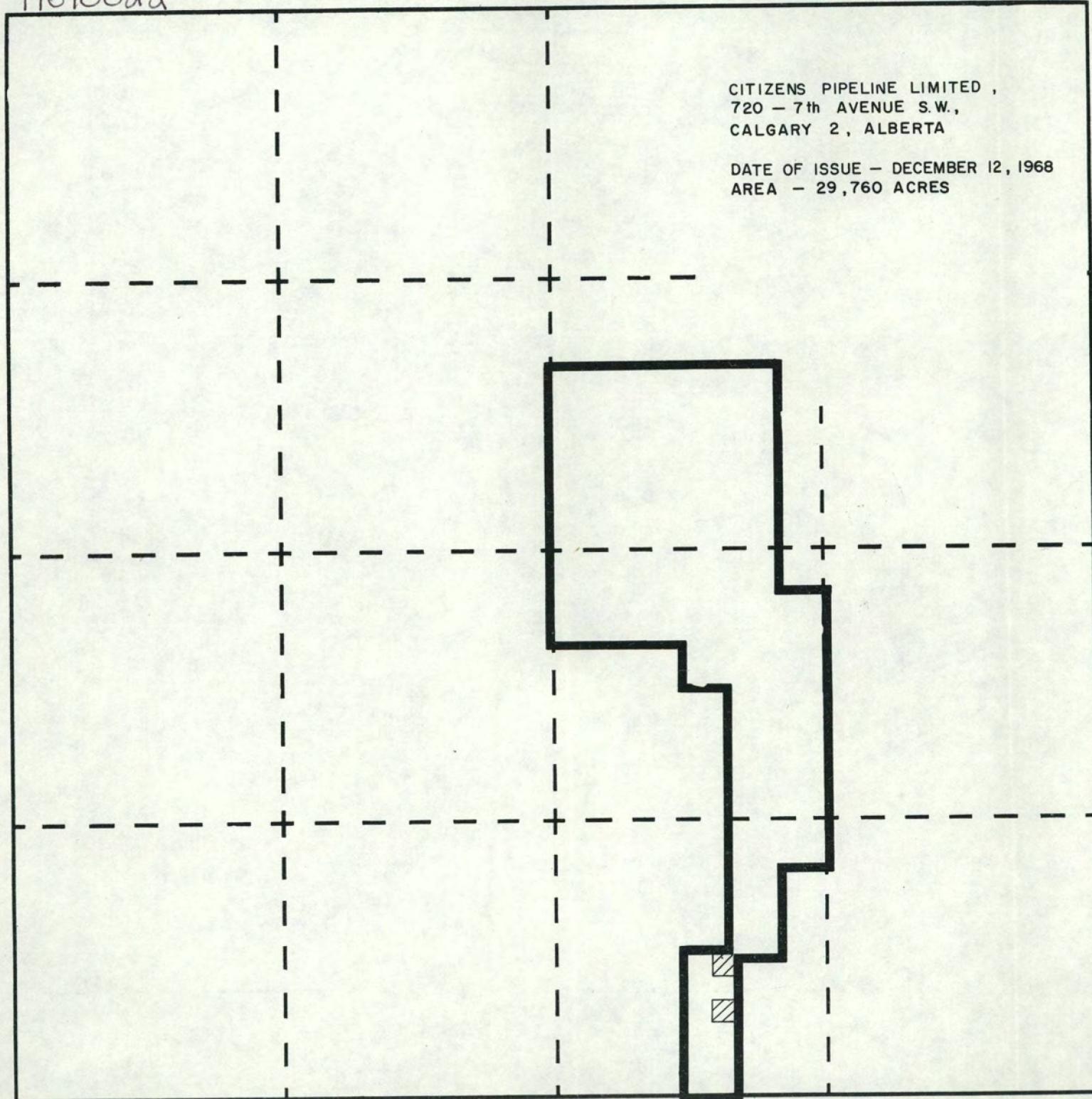
Consulting Geologist

QUARTZ MINERAL EXPLORATION PERMIT No. 78

19690022

CITIZENS PIPELINE LIMITED ,
720 - 7th AVENUE S.W.,
CALGARY 2, ALBERTA

DATE OF ISSUE - DECEMBER 12, 1968
AREA - 29,760 ACRES

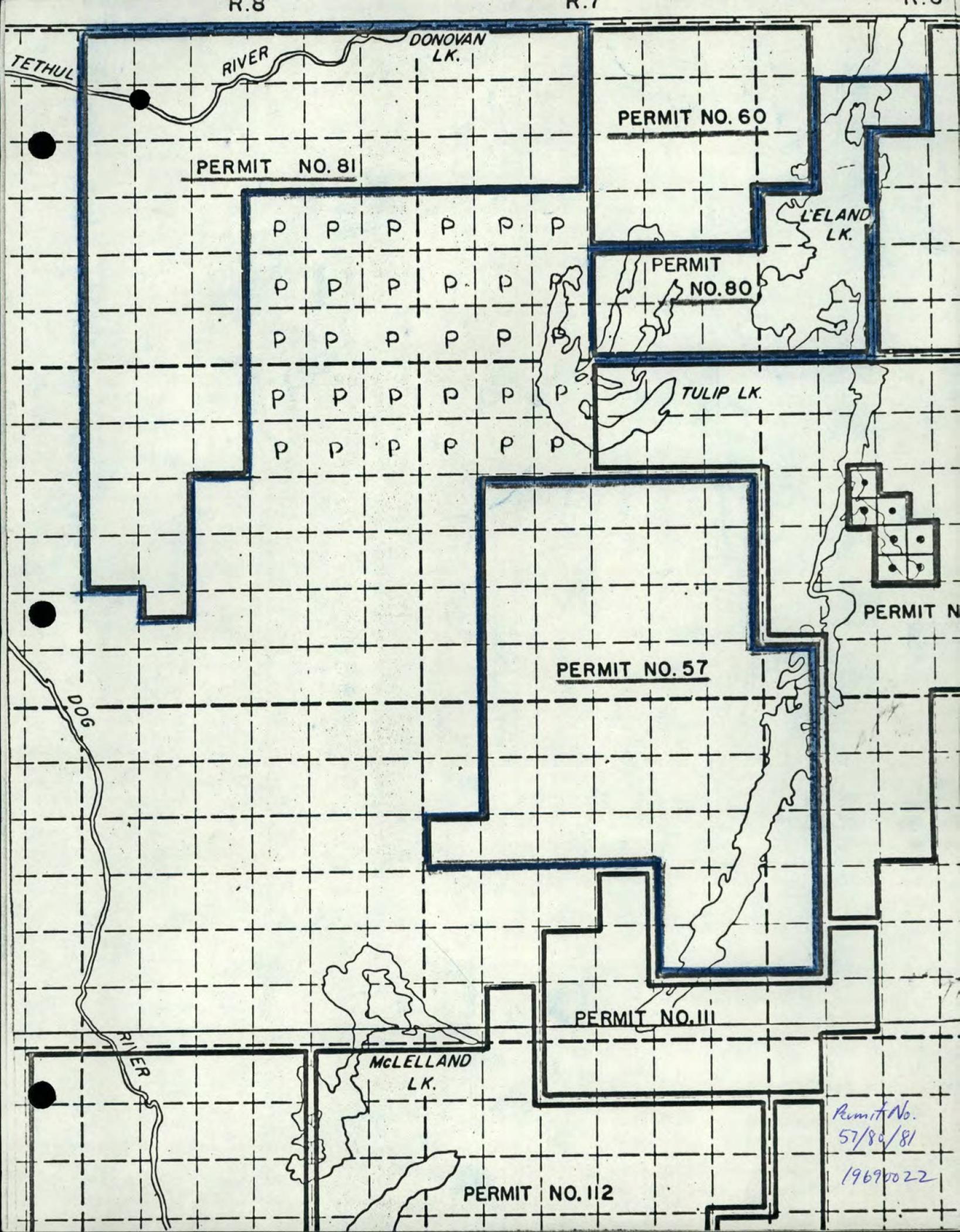


R.4

R.3 W.4 M.

R.8

R.7



PERMIT NO. 41

4 PERMIT NO. 137

WYLIE LK.

BURSTALL
LK. P

4

T NO. 126

FLORENCE
LK.

PERMIT NO.
104

PERMIT NO. 77

WINNIFRED
LK.

PERMIT NO. 44

25

PERMIT NO. 104

Permit No. #
19690022

A

NO.61

MERCREDI
LK.

PERMIT NO.127

PERMIT NO.122

PERMIT

PERMIT NO.78

PERMIT NO.53

ASHT
LK

CHARLES LK.

PERMIT

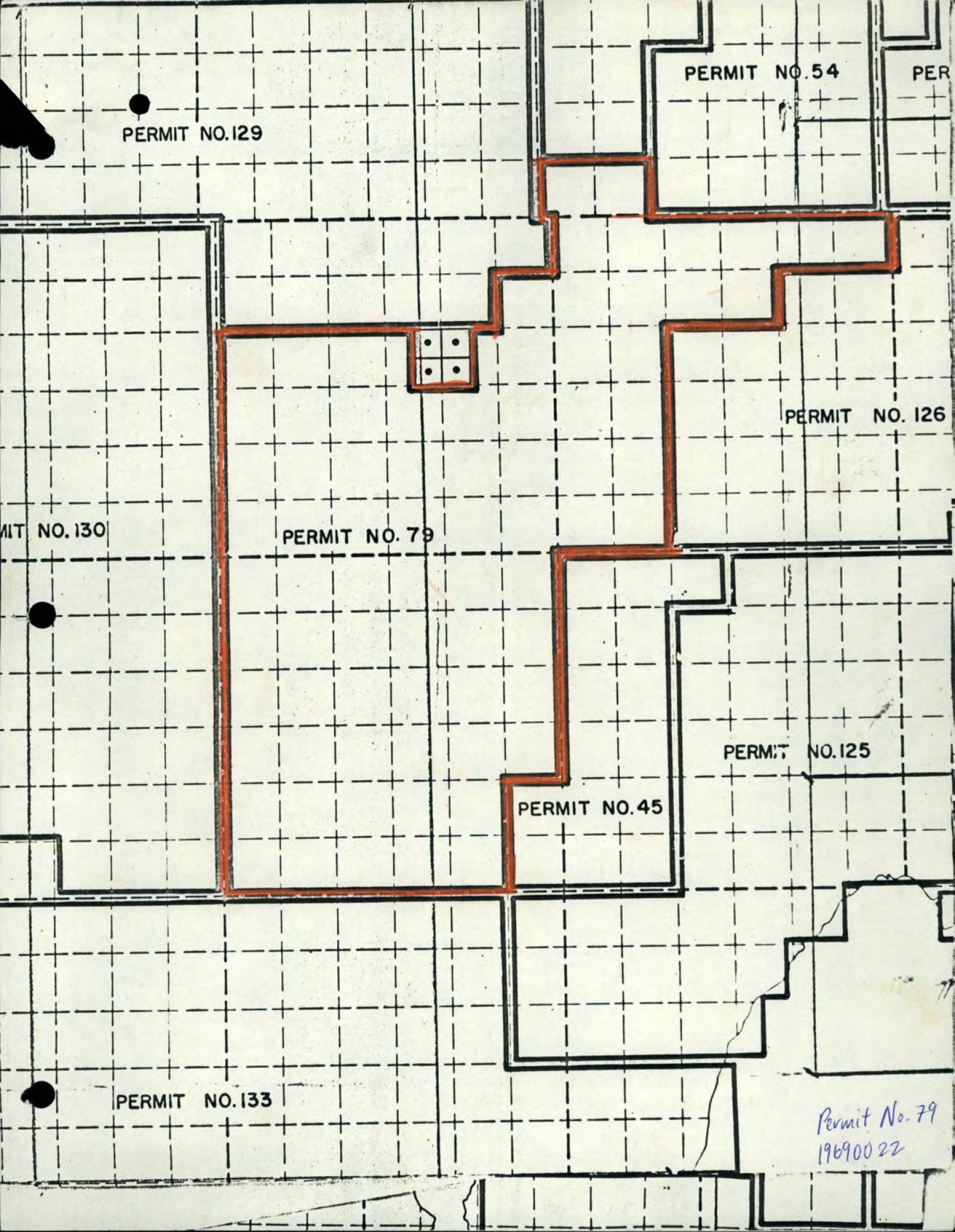
PERMIT NO. 29

POTTS
LK.

PERMIT NO.31

78

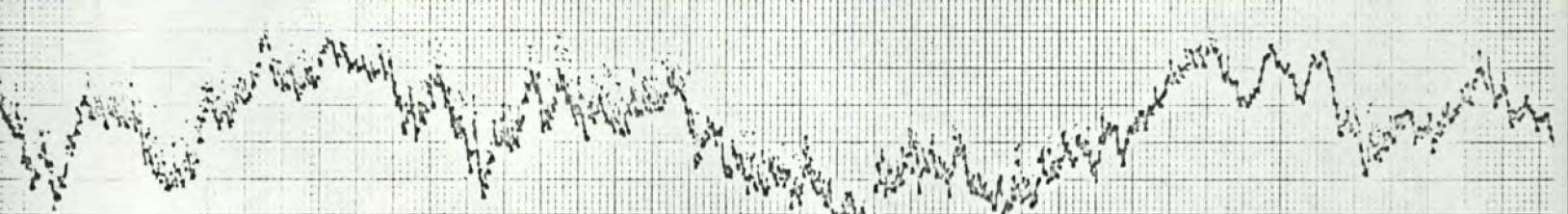
Permit No.78
19690072



Altimeter

0 ft. above ground level
CAMBRIDGE, MASS., U.S.A.

0 cps.



Potassium

100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

1/2

Uranium

ONICS, INC.
CAMBRIDGE, MASS., U.S.A.

100 cps.

0 cps.

Thorium

ONICS, INC.
CAMBRIDGE, MASS., U.S.A.

100 cps.

0 cps.

Total Count

Permit No. 57
Line No. 13

#1

19690022

800 cps.

CAMBRIDGE, MASS., U.S.A.

ONICS, INC.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

30

Uranium

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Thorium

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Permit 77
Line 13

Total Count

300 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Locality 77-1
Permit No. 77
Line No. 13

Total Count

MECHANICS FOR ELECTRONICS, INC.

H

CAMBRIDGE, MASS., U.S.A.

19690022
#2

I

Altimeter

0 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Potassium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

100 cps.

MECHANICS FOR ELECTRONICS, INC.

Uranium

16

100 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Thorium

10

100 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

19690022
77-3
Line 32
Total Count

Locality 77-3
Permit No. 77
Line 32

#3

800 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

Bonzer Altimeter

0 ft. above ground
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.

0 cps.

K 40

Potassium

100 cps

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.

0 cps.

U₃O₈ (

Uranium

100 CPS

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.

0 cps.

Thorium (Ti 208)
Thorium

100 CPS

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.

0 cps.

77-47
Total Count

Locality 77-3
Permit No. 77
Line No. 33

Total Count

800 CPS

800 cps.

19690022
44

MECHANICS FOR ELECTRONICS, INC.

0 cps.

14

Uranium

100 cps.

m

MECHANICS FOR ELECTRONICS, INC.

0 cps.

Thorium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

0 cps.

Total Count

Locality 78-1
Permit No. 78
Line No. 2

100 cps.

78-1

MECHANICS FOR ELECTRONICS, INC.

Permit No. 78
Line 1-s

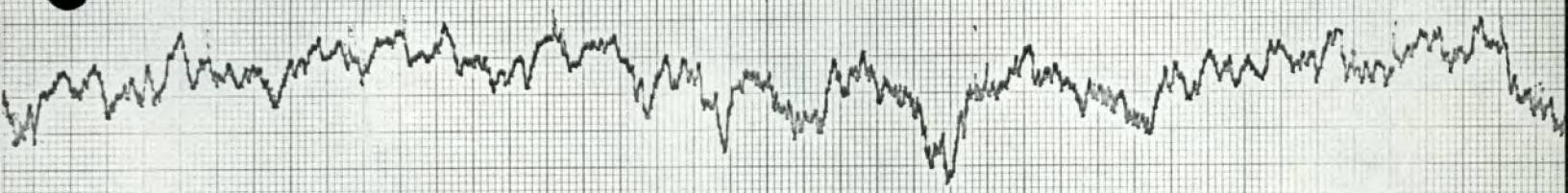
19690022
#5

MECHANICS FOR ELECTRONICS, INC.

Altimeter
0 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.



Potassium

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

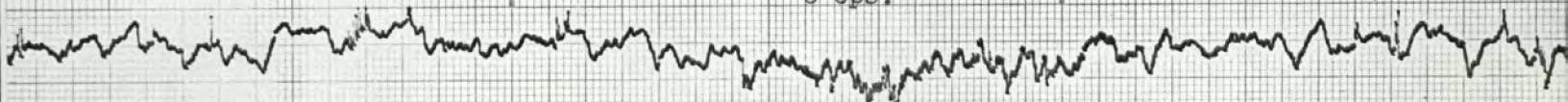
1/4

Uranium

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.



Thorium

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.



Total Count

Locality 78-1
Permit No. 78
Line No. 3

19690022
#6

800 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

Permit N-78

35

Altimeter

MECHANICS FOR ELECTRONICS, INC.

0 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

Potassium

MECHANICS FOR ELECTRONICS, INC.

100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

100

Uranium

MECHANICS FOR ELECTRONICS, INC.

100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

Thorium

MECHANICS FOR ELECTRONICS, INC.

100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

Total Count

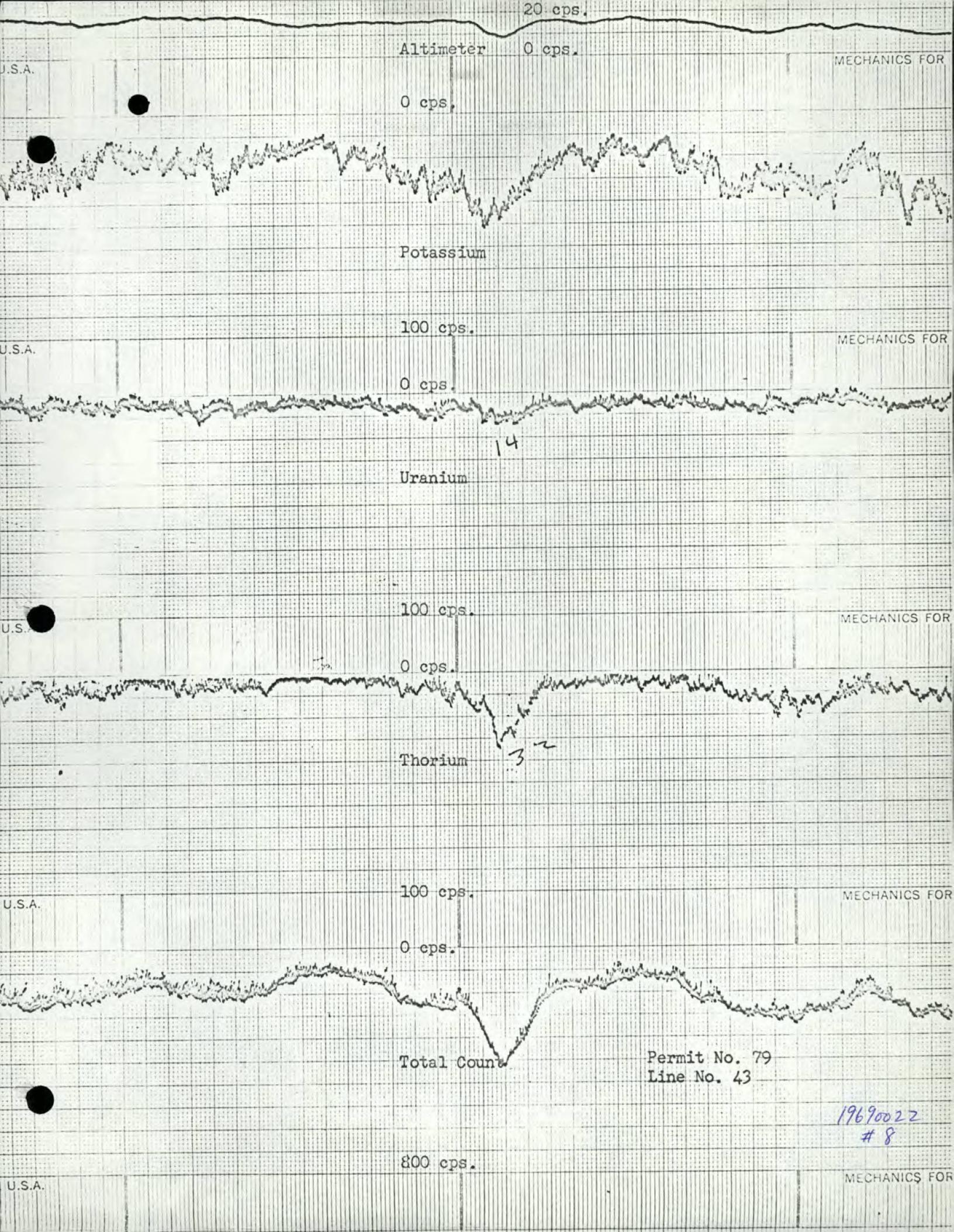
800 cps.

CAMBRIDGE, MASS., U.S.A.

19690022
#7

Permit No. 78
Locality No. 78-2
Line No. 26

MECHANICS FOR ELECTRONICS, INC.



Altimeter

0 ft. above ground

MECHANICS FOR ELECTRONICS, INC.

0 cps.

Potassium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

0 cps.

Uranium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

0 cps.

Thorium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

0 cps.

Total Count

Permit No. 80
Line No. 23

19690022
#9

800 cps.

Altimeter

CAMBRIDGE, MASS., U.S.A.

0 ft. above ground level

0 cps.

Potassium

100 cps.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Uranium

100 cps.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Thorium

100 cps.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Total Count

Locality 81-3
Permit No. 81
Line 24

19690022
#10

800 cps.

Altimeter

0 ft. above ground
MECHANICS FOR ELECTRONICS, INC. CAMBRIDGE, MASS., U.S.A.

0 c.p.s.

Potassium K-40

100 cps.

MECHANICS FOR ELECTRONICS, INC. CAMBRIDGE, MASS., U.S.A.

0 ft.

Uranium

100 cps.

MECHANICS FOR ELECTRONICS, INC. CAMBRIDGE, MASS., U.S.A.

0 cps.

Thorium

100 cps.

MECHANICS FOR ELECTRONICS, INC. CAMBRIDGE, MASS., U.S.A.

0 cps.

Total Count

100 cps.

Locality S1-2
Permit No. 81
Flight Line No. 33

19690022
#11

S1-2

0 ft. above ground
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE

0 cps.

Potassium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE

0 cps.

10

10

Uranium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE

0 cps.

26

Thorium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE

0 cps.

Total Count

Locality 81-2

Permit No. 81

Line 34

800 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE

19690022
#12

81-2

Altimeter

CAMBRIDGE, MASS., U.S.A.

0 ft. above ground

0 cps.

Potassium

CAMBRIDGE, MASS., U.S.A.

100 cps.

0 cps.

Uranium

CAMBRIDGE, MASS., U.S.A.

100 cps.

0 cps.

Thorium

CAMBRIDGE, MASS., U.S.A.

100 cps.

0 cps.

Total Count

Locality 81-2
Permit No. 81
Line No. 35

196900 22
#13

100 cps.

Altimeter

MECHANICS FOR ELECTRONICS, INC.

0 ft. above ground level

CAMBRIDGE, MASS., U.S.A.

0 cps.

Potassium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Urinium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Thorium

100 cps.

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Total Count

Permit No. 81

800 cps.

19690022
#14
Permit No. 81
Line No. 45

Potassium

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

16

2

22

Uranium

MECHANICS FOR 100 CPS. ELECTRONICS, INC.

CAMBRIDGE, MASS.

0 cps.

Thorium

MECHANICS FOR 100 CPS. ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Total Count

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

800 cps.

Permit #1
Line # 49

Locality 81-1
Permit No. 81
Line No. 49

81-1

19690022
#15

MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

Altimeter

CAMBRIDGE, MASS., U.S.A.

ft. above ground level

cps.

Potassium

CAMBRIDGE, MASS., U.S.A.

100 cps.

0 cps.

Uranium

CAMBRIDGE, MASS., U.S.A.

100 cps.

0 cps.

Thorium

CAMBRIDGE, MASS., U.S.A.

100 cps.

0 cps.

Locality 81-1
Permit No. 81

19690022
#16

Total Count
0 cps.

Line No. 50

Altimeter

0 ft. above ground level

CAMBRIDGE, MASS., U.S.A.

0 cps.

Potassium

100 cps.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Uranium

100 cps.

CAMBRIDGE, MASS., U.S.A.

0 cps.

40

Thorium

40

CAMBRIDGE, MASS., U.S.A.

100 cps.

0 cps.

Total Count

800 cps.

CAMBRIDGE, MASS., U.S.A.

Locality 81-1
Permit No. 81
Line No. 51

19690022
#17

Altimeter

NICS, INC. 0 ft. above ground level
CAMBRIDGE, MASS., U.S.A.

0 cps.

Potassium

NICS, INC. 100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

Uranium

NICS, INC. 100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

Thorium

NICS, INC. 100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

Total Count

800 cps.

Locality 81-1
Permit No. 81
Line No. 53

19690022
#18

500 ft.

Altimeter

10 ft. above ground level
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Potassium

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Uranium

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Thorium

100 cps.
MECHANICS FOR ELECTRONICS, INC.

CAMBRIDGE, MASS., U.S.A.

0 cps.

Total Count

800 cps.

Locality 81-1

Permit No. 81

Line no. 54.

19690022

#19

CAMBRIDGE, MASS., U.S.A.

Altimeter

0 ft. above ground level
CAMBRIDGE, MASS., U.S.A.

0 cps.

Potassium

100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

Uranium

100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

Thorium

100 cps.
CAMBRIDGE, MASS., U.S.A.

0 cps.

Total Count

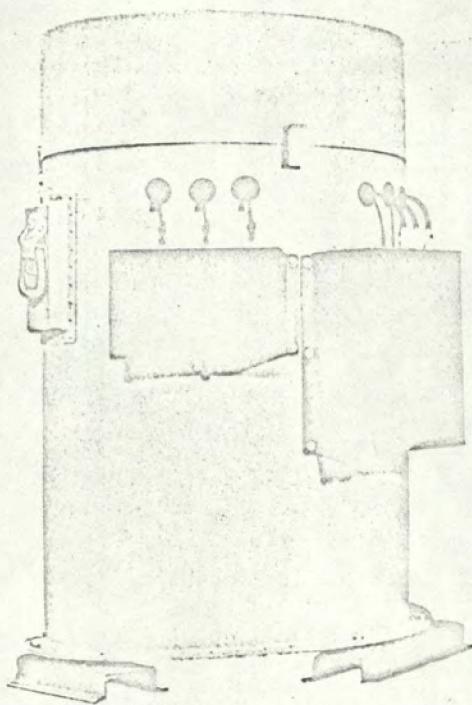
800 cps.

Locality 81-1
Permit No. 81
Line No. 55

19690022
#20

FOUR CHANNEL DIFFERENTIAL GAMMA RAY SPECTROMETER

Model DGRS - 1000



DESCRIPTION

The Model DGRS-1000, four channel differential gamma ray spectrometer has been developed to provide the survey and mining industry with a system to obtain precise radioactive quantitative analysis from aircraft, and ground vehicles.

The system may be used for bore hole logging with a special detector, in laboratories, or at base camps.

The four channels are: 1. potassium -40 2. bismuth -214 3. thallium -208 4. total count or integral. Spectral interaction has been eliminated by using specially developed techniques, which results in 100% discrimination between the three radioactive elements.

A large volume detector, 8" x 4" NaI (TI) coupled to three matched photomultiplier tubes is used to obtain high sensitivity. The pulse height at the output of the detector is maintained constant as function of temperature by using spectrum stabilization techniques. As a reference element, the radioactive isotope Cesium -137 is used. The system conforms to the USAEC recommended standard instrument module and bin design as covered by TID-20893.

FEATURES

Integrated circuits have been used throughout the system, which resulted in a unique and small package and also provides maximum reliability. All analogue and pulse processing circuitry has been temperature compensated by using the latest integrated circuits. Each channel may be used for spectrum analysis by using spectrum scanning techniques. Plug-in modular construction allows system building, from one to four channels.

Temperature compensated analogue computer circuits are used, to provide spectral interaction elimination, resulting in 100% discrimination.

The system has been designed, incorporating nuclear instrumentation techniques, with an extended operating temperature range.

ROVING EXPLORATION SERVICES LTD.
520 - 5th AVENUE S.W.
CALGARY, ALBERTA

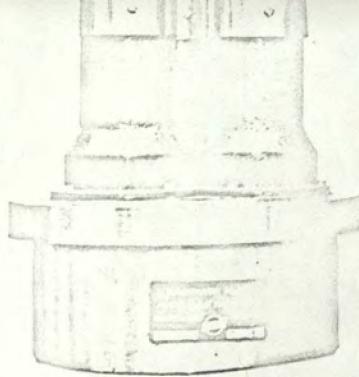
NUCLEAR INSTRUMENT DIVISION

1415 LAWRENCE AVENUE WEST • TORONTO 15, ONTARIO, CANADA

TELEPHONE: 248-6483 (AREA CODE 416)

JANUARY, 1969

ness is 4". Larger or smaller crystals to special order. The crystal is coupled to three selected photomultiplier tubes. The gain and focus of each photomultiplier tube can be varied individually. The crystal is mounted in a low background stainless steel case with a thin entrance window. The three photomultiplier tubes are magnetically shielded and are mounted with stainless steel tube bases. The crystal assembly is mounted in a protective enclosure which is lined with 6" of polyurathene foam to protect the crystal from thermal shocks. An ambient temperature change of 75°C per hour will cause a change of temperature inside the enclosure of not more than 10°C per hour. The crystal is suspended in 6" of semi-hard foam.



Pre-Amplifier - Main pulse amplifier

The pre-amplifier is a low noise, low gain m.o.s. amplifier. The outputs of the photomultiplier tubes are summed at the input of the pre-amplifier. To prevent loading of the photomultiplier tubes, a very high input impedance is required. The pulse shape appearing at the output is R-C shaped, with a decay constant of about 30 μ s. The main pulse amplifier consists of an amplifying section of which the gain can be selected, a pulse current limiter, a delay line pulse shaping network and a low impedance output buffer. The output pulse is gaussian shaped with a pulse width of about 1 μ s. The maximum output is 10 volts. Both amplifiers are mounted on the detector enclosure.

PRE-AMPLIFIER SPECIFICATIONS

Input impedance: 1 M Ohms - negative going pulses.
Input capacity: 5 pf
Gain: XI.
Input pulse time constant: 30 μ s.

SYSTEM SPECIFICATIONS

Power Requirement: 110 V.A.C. or 12 V.D.C.,
or 28 V.D.C. at 75 Watts.
Instrument Weight: 55 lbs.
Detector Weight: 8" x 4" crystal housing-75 lbs.

MAIN AMPLIFIER SPECIFICATIONS

Gain: 1 - 2 - 4 - 8 - 10.
Overload recovery: for 250 x overload about 20 μ s.
Pulse shape: Gaussian - pulse width 1 μ s.
Output: 0 to 10 volt maximum - positive going.
Maximum output load: 50 Ohms.
Stability: .1%/ $^{\circ}$ C.
Differential linearity: \pm 1%
Output impedance: .5 Ohms.

WARRANTY

The instrument is warranted free from material defects and poor workmanship for a period of one year from the date of shipment and defective material will be replaced free of charge during this period unless the equipment has been modified, adjusted and/or changed as a result of misuse, in which case this warranty is void.

Should repairs outside the warranty be required, then repairs will be made at our standard service rates.

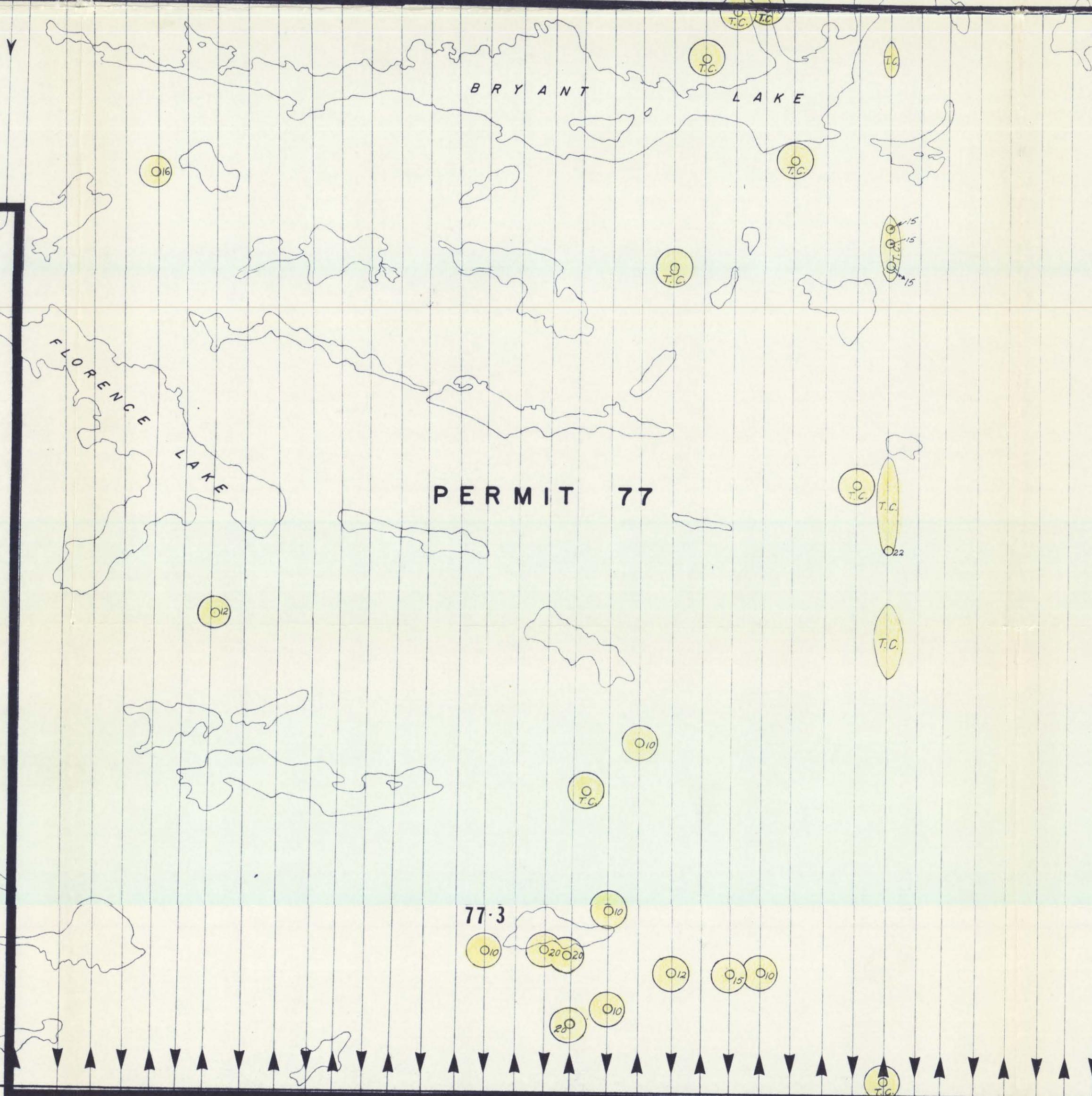
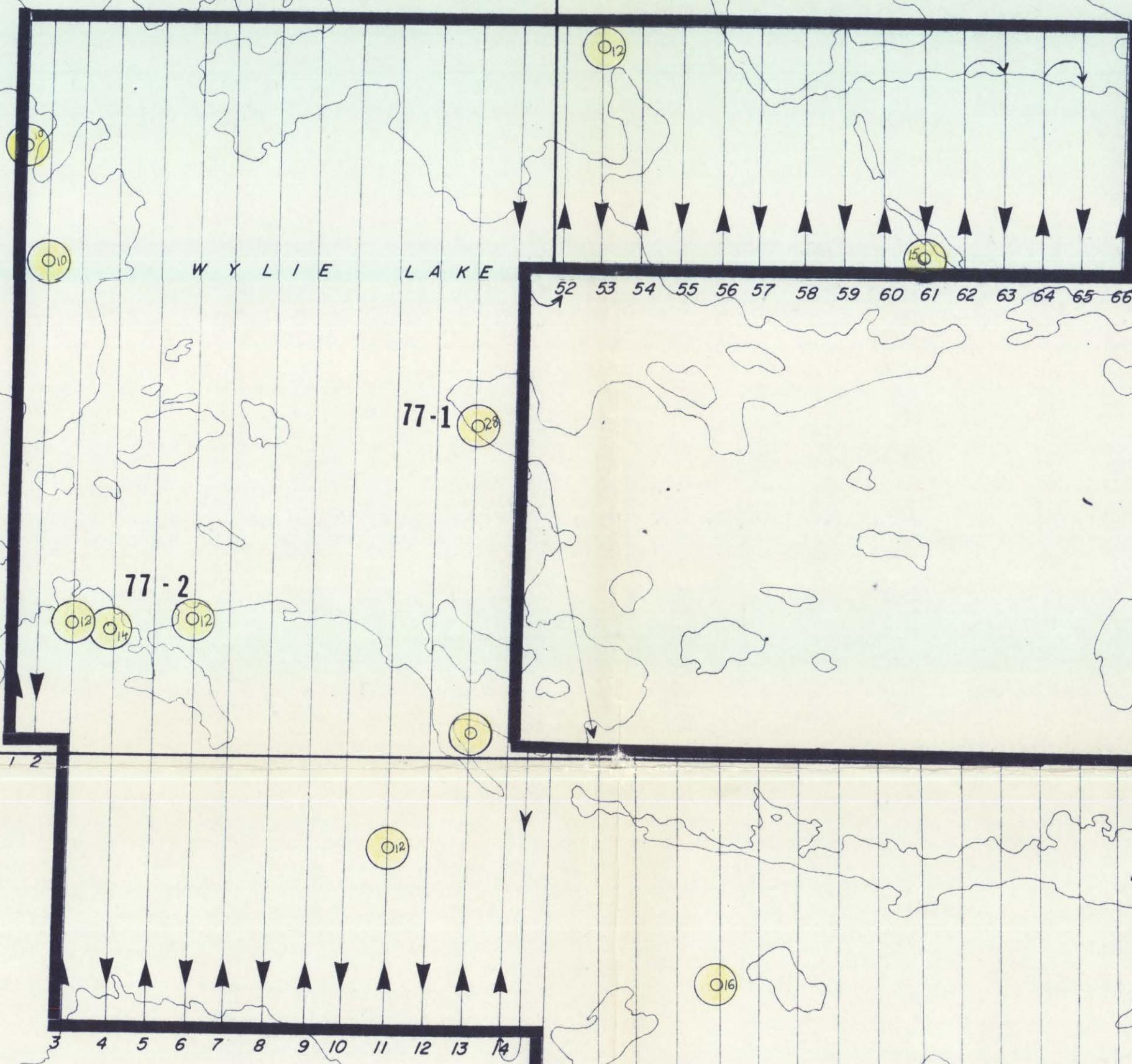
RESERVED RIGHTS

Exploranium Corporation of Canada Ltd., reserves the right to adjust engineering specifications in the best interests of maintaining high quality instrumentation.

R. 3

R. 2

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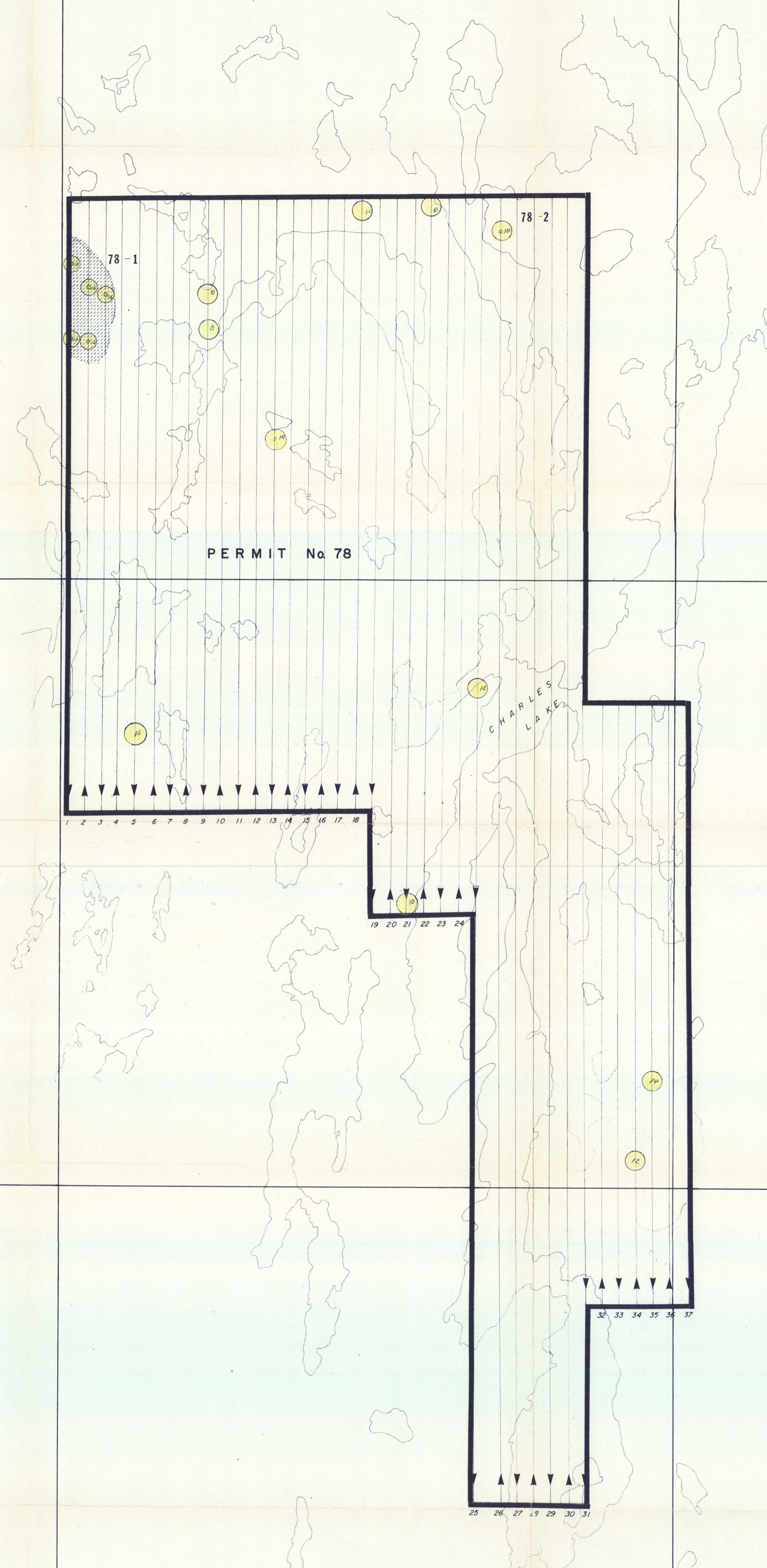
Flight Line
Total count = TC anomaly only
Anomaly — counts per seconds
 $U_3 \cdot O_8$ — Gamma radiation above background

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SCALE: 2"=1 MI	APPROVED: J. T. COOK P. Geologist
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R. 5

R. 4

R 3



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T. 125

T. 124

T | 23

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GAMMA RAY SPECTROMETER SURVEY DGRS 1000

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 Anomaly — counts per seconds
U₃ O₈ — Gamma radiation



R. 5

R. 4

R. 3

TP. 119

