

Permit Blocks 4370, 4407 & 4408

NTS.

95 I.

N.W., S.W.

26-6-4-12

for

Report of the Seismograph Survey

FORT SIMPSON AREA, N.W.T.

Permit Blocks 4370, 4407 & 4408

NTS. 95 I. N.W., S.W.

26-6-4-12

for

CENTRAL-DEL RIO OILS LTD.

by

CANWEST GEOPHYSICAL LIMITED

from

February 17, 1971 to March 23, 1971

Submitted by: D. Mc Innis

John O'Bertos, Central-Del Rio Oils Limited



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## ENCLOSURES

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## INTRODUCTION

This seismic reflection survey of Fort Simpson, N.W.T. was shot for Central-Del Rio Oils Ltd. The survey was initiated February 17 and completed March 23, 1971 by Canwest Geophysical Limited, Party #122. It comprised 172.1 miles in all.

## LOCATION

The prospect is located approximately 60 miles northwest of Fort Simpson, N.W.T. It was accessible from Fort Simpson via a winter tractor trail.

## TOPOGRAPHY

The area is flat and completely covered by timber.

## RECORD QUALITY

Record quality was fair throughout the prospect. Multiple holes were tested on Line 23. Six holes per shot point were drilled to a depth of 35-45 feet and loaded with 1 1/4 pounds of dynamite. No noticeable improvement in record quality was achieved.

Forty-eight traces were found to be unnecessary for reflection shooting. The shallow basement reflection merged with the first breaks. Therefore, in future shooting in the area, it is recommended that the spread be shortened if the first breaks are not required for a refraction interpretation.

#### FIELD PROCEDURES

Field data was recorded with 48 DFS III Binary Gain Amplifiers and a TI 508 tape transport. An SIE ERC-10 electrostatic camera provided field monitor records.

Mark L-2 geophones with a natural frequency of 14 cps were used. The phones (9 per trace wired 3-3-3 series parallel) were spaced at 25 foot intervals. (See Geophone Response Curve, Figure #2).

A recording filter of 8/36 - 124 was selected with the final gain set at 90 mv. With 48 trace recording and shot hole intervals of 440 feet, subsurface coverage of 1200% was achieved. (See Spread Diagram, Figure #3).

An inline even split refraction shot with a near trace inline offset of 2,640 feet was recorded every half mile along each line. (See Spread Diagram, Figure #3A).

#### DRILLING CONDITIONS

Drilling conditions were poor. A total of 11 drilling

rigs carried out this phase of the field operation. They had an average production rate of 39.8 feet per hour.

Formations encountered included the following: muskeg, gravel, sand, clay, sandstone, shale, rocks and boulders.

One hole per shot point was drilled to a depth of 35-45 feet and loaded with 1 1/4 pounds of dynamite.

#### DOZERS

An average of three bulldozers was employed full time, since the area was completely covered with brush, and all lines had to be dozed. Bain Brothers Construction, Edmonton had the contract for all bulldozing and line cleanup.

#### SURVEYING

Horizontal and vertical control was maintained with a theodolite.

The co-ordinates were based on a survey by Globe Universal Sciences for previous seismic work.

The Globe survey was based on a control plan established by Imperial Oil Ltd.; this control plan had a reference meridian of  $123^{\circ}$  longitude.

All sun shots made by Canwest Geophysical were converted to the same reference point; therefore, the co-ordinates established by Canwest are compatible with the ones established by Globe.

The highest elevation recorded was 867 feet at V.P. 15 and V.P. 27, Line 23 and the lowest was 477 feet between VP 361 and VP 363, Line 12.

Respectfully submitted

CANWEST GEOPHYSICAL LIMITED



D. Mc Innis

## TABULATION I

### RECORDING STATISTICS

|                                   |                   |
|-----------------------------------|-------------------|
| 1. Commencement date, first shot  | February 17, 1971 |
| 2. Completion date, last shot     | March 23, 1971    |
| 3. Total miles shot               | 172.1 miles       |
| 4. Number of profiles shot        | 2,119 profiles    |
| 5. Total number of shots          | 2,316 shots       |
| 6. Total recording hours, field   | 322.0 hours       |
| 7. Total recording hours, driving | 172.5 hours       |
| 8. Total recording hours          | 494.5 hours       |
| 9. Total dynamite used            | 6,749 pounds      |
| 10. Dynamite used per profile     | 3.2 pounds        |
| 11. Dynamite used per shot        | 2.9 pounds        |
| 12. Total caps used               | 2,827 caps        |
| 13. Caps used per profile         | 1.3 caps          |
| 14. Caps used per shot            | 1.2 caps          |

## TABULATION 2

### DRILLING STATISTICS

|     |                                 |               |
|-----|---------------------------------|---------------|
| 1.  | Total number holes drilled      | 2,432 holes   |
| 2.  | Total footage drilled           | 113,180 feet  |
| 3.  | Total drill hours, field        | 2843.5 hours  |
| 4.  | Total drill hours, driving      | 1,569.5 hours |
| 5.  | Total drill hours               | 4,413.5 hours |
| 6.  | Average holes per 10 hour shift | 8.6 holes     |
| 7.  | Average feet drilled per hour   | 39.8 feet     |
| 8.  | Rock bits used                  | 229 bits      |
| 9.  | Welmac bits used                | 221 bits      |
| 10. | Insert bits used                | 861 bits      |
| 11. | Footage per bit                 | 86.3 feet     |
| 12. | Extra water truck hours         | 1,385.0 hours |

DOZING STATISTICS AND LINE CLEANUP

No statistics are available, since Bain Brothers Construction, Edmonton, had the contract for all bulldozing and line cleanup.

### TABULATION 3

#### PERSONNEL ROSTER

|                    |                                  |
|--------------------|----------------------------------|
| 1. R.E. Pattinson  | Crew Supervisor                  |
| 2. J. Ketchey      | Party Manager                    |
| 3. M.A. Keane      | Relief Party Manager             |
| 4. R. Early        | Observer                         |
| 5. D. Hartzell     | Relief Observer                  |
| 6. D. Evans        | Shooter                          |
| 7. R. Moher        | Line Truck Driver                |
| 8. P. Razynski     | Line Truck Driver                |
| 9. B. Holewa       | Supply Truck Driver              |
| 10. F. Seiferling  | Surveyor                         |
| 11. J. Schafer     | Surveyor                         |
| 12. C. Trefankenko | Surveyor                         |
| 13. C. Hale        | Rodman                           |
| 14. L. Lugullo     | Rodman                           |
| 15. H. French      | Rodman                           |
| 16. A. Lowtee      | Mechanic                         |
| 17. C. Ogilvy      | Line Helper (Geophone Placement) |
| 18. B. Johnson     | Line Helper                      |
| 19. D. Heim        | Line Helper                      |
| 20. J. Hart        | Line Helper                      |
| 21. W. Fidelak     | Line Helper                      |
| 22. S. Butler      | Junior Observer                  |

## PROCESSING

| <u>Sequence</u> | <u>Description</u> |
|-----------------|--------------------|
| 1               | Trace Scaling      |
| 2               | Trace Mute         |
| 3               | N.M.O.             |
| 4               | Digital Filtering  |
| 5               | Trace Collection   |
| 6               | Auto Statics       |
| 7               | Stack              |
| 8               | Digital Filtering  |
| 9               | Trace Scaling      |
| 10              | Film Display       |
| 11              | Statics            |
| 12              | Film Display       |

## GEOLOGY

### Results and Conclusions

The following maps are enclosed with this report:

#### Horizon Maps:

Lonely Bay  
Cold Lake Salt  
Precambrian

#### Isochron Maps:

Lonely Bay to Cold Lake Salt  
Cold Lake Salt to Precambrian

The horizon maps indicate a structurally high area extending throughout all of permit 4407 with the exception of the southeast quarter. The high area extends southward into the northwest portion of 4370 and westward into the southeast portion of permit 4408. This structural high is most pronounced on the Cold Lake Salt map which shows that the salt is totally present throughout most of permit 4407 and has been removed in varying amounts throughout most of permits 4370 and 4408.

The presence of structure on the Lonely Bay horizon which generally conforms to the Salt structure is due to the collapse of the Lonely Bay horizon as the salt is being removed. All of the collapsed area would be infilled with low velocity sediments in contrast to the high velocity of the salt material. Due to this velocity-contrast the Precambrian horizon map displays pseudo-structure corresponding to the salt structure.

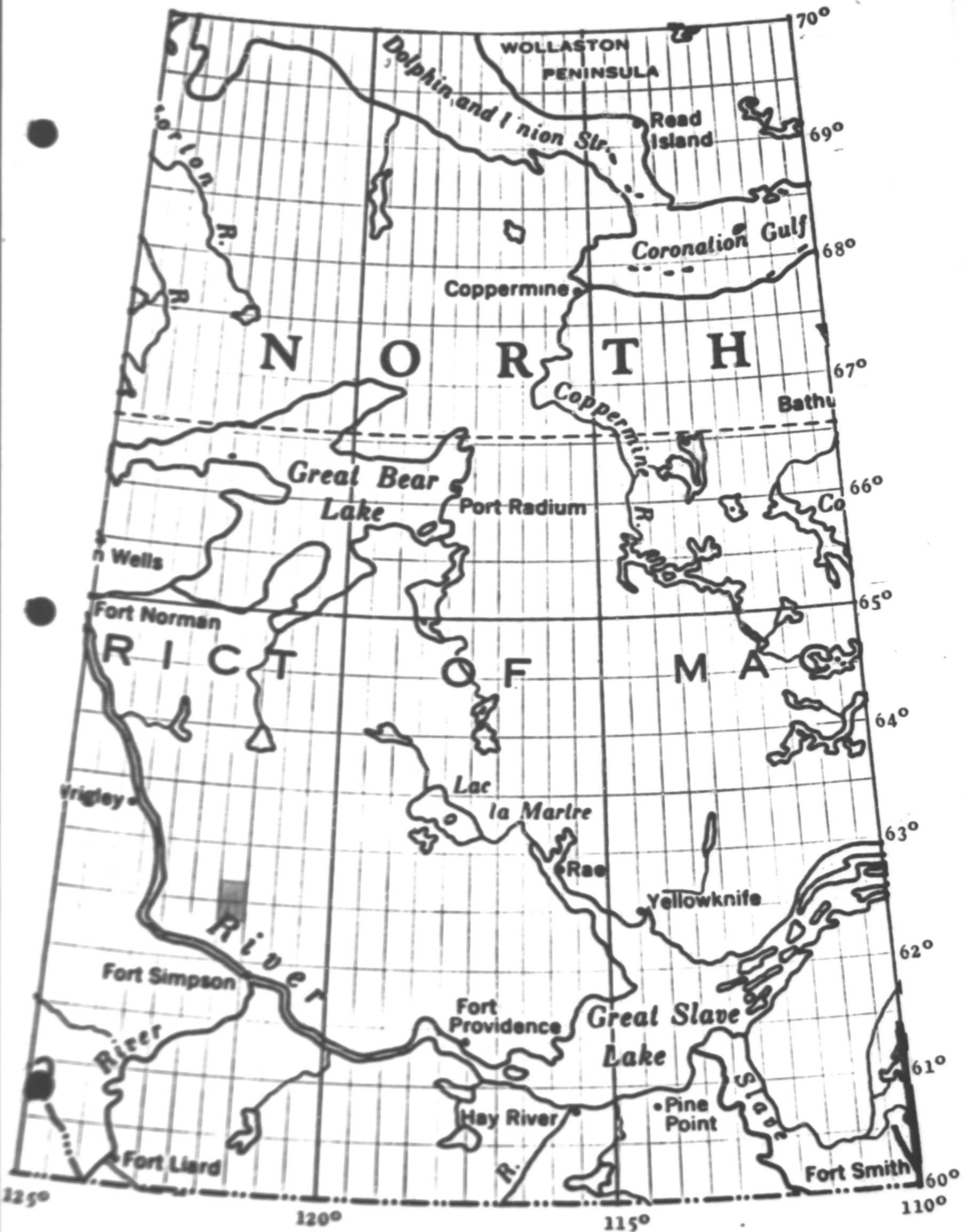
Thickening between the Cold Lake Salt and Precambrian

interval in permit 4407 further substantiates the presence of the salt structure. The Lonely Bay to Cold Lake Salt isochron map does not show any significant thinning over the salt feature which indicates that the salt structure lies in a regional geological setting.

*John O'Bertos*

John O'Bertos

Area Geophysicist



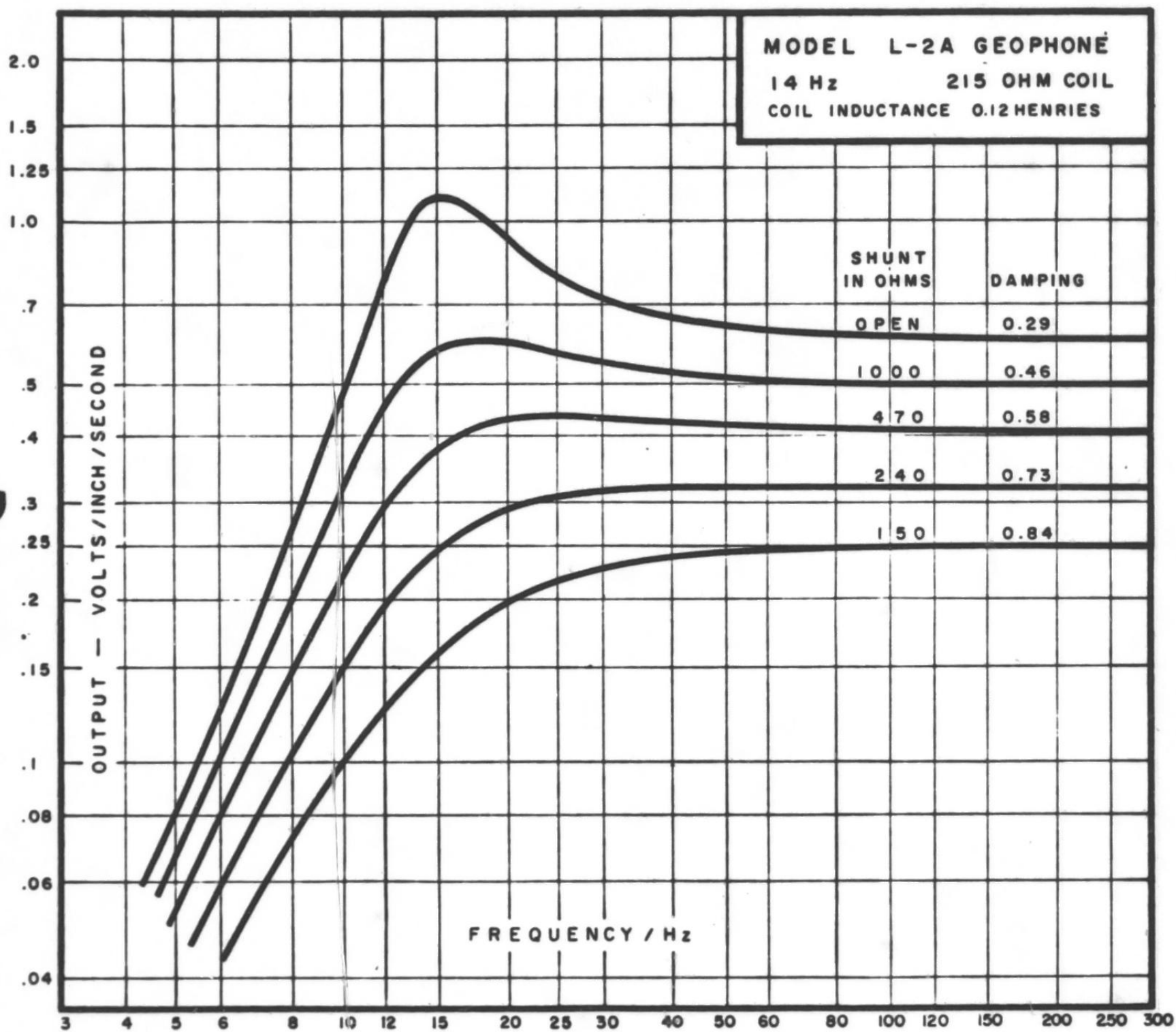
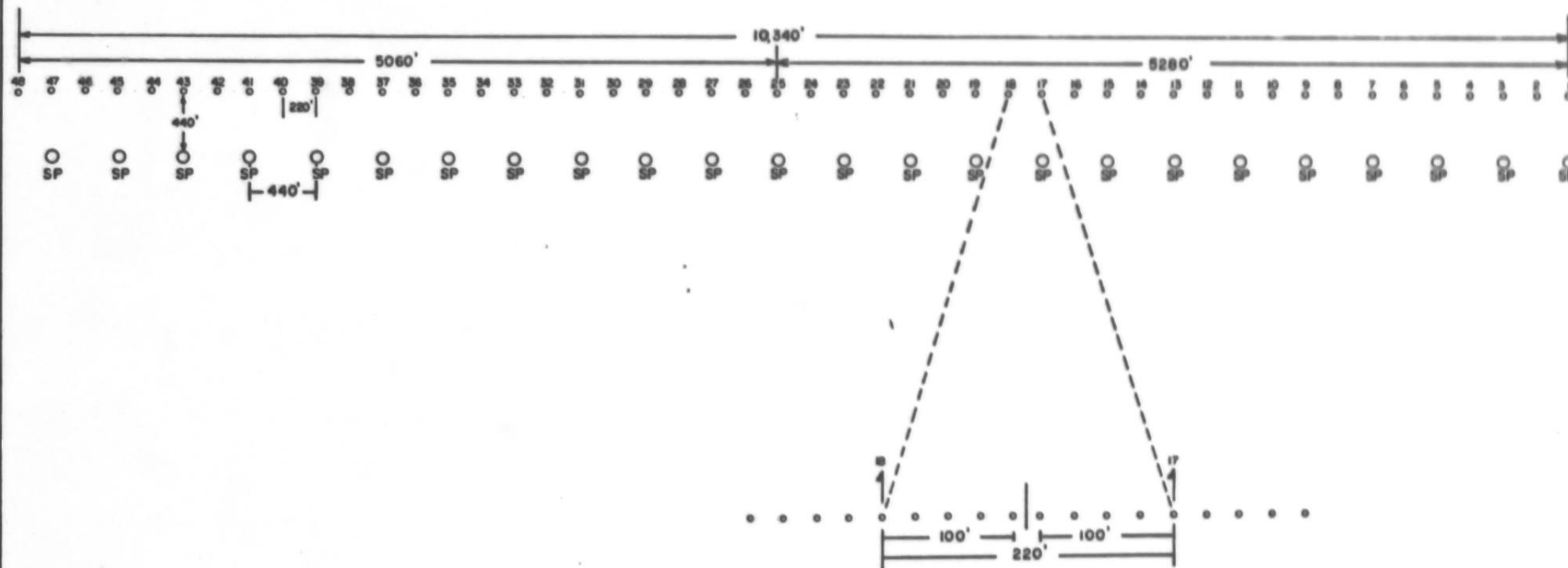


FIG. 2

# FT. SIMPSON

## SPREAD LAYOUT DIAGRAM (REFLECTION SHOOTING)

NORTH OR EAST →

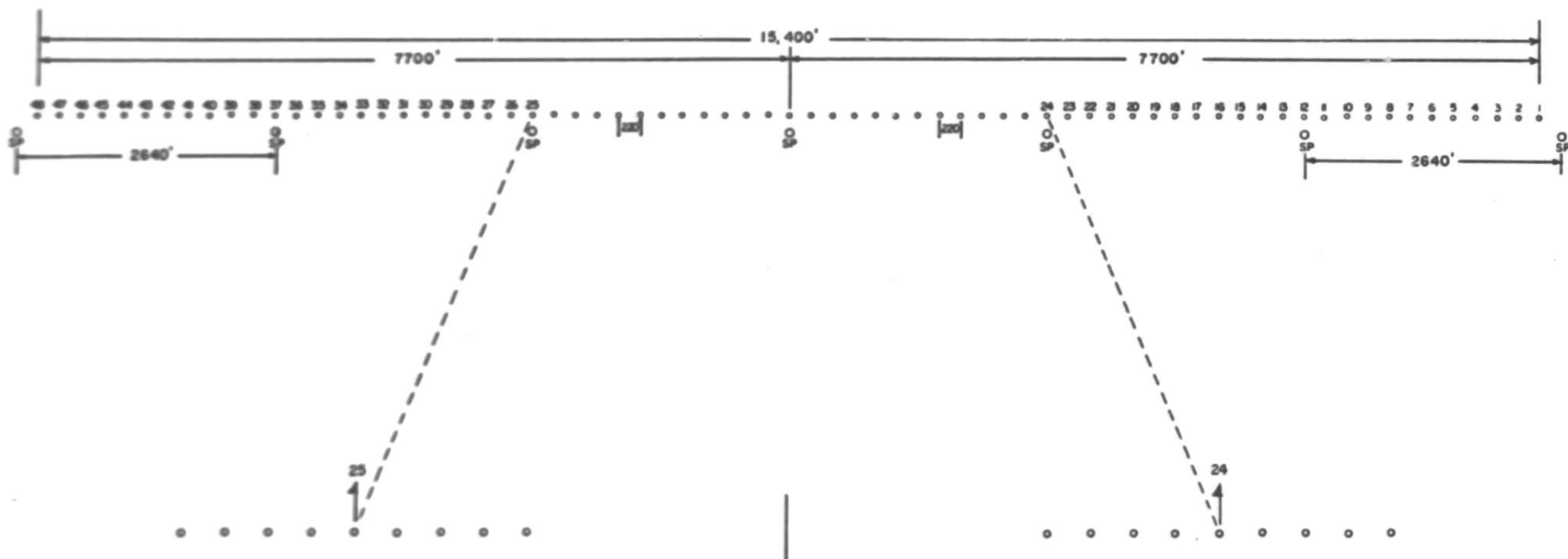


|                        |                                  |
|------------------------|----------------------------------|
| SHOT HOLE PATTERN      | : SINGLE HOLE                    |
| SHOT POINT INTERVAL    | : 440'                           |
| HOLE DEPTH             | : 45'                            |
| ENERGY SOURCE          | : DYNAMITE                       |
| GEOPHONE GROUP CENTRES | : 220'                           |
| GEOPHONES              | : 9 PHONE HARNESS AT 25' SPACING |

FIG. 3

# FT. SIMPSON SPREAD LAYOUT DIAGRAM (REFRACTION SHOOTING)

NORTH OR EAST →



|                        |                                  |
|------------------------|----------------------------------|
| SHOT HOLE PATTERN      | : SINGLE HOLE                    |
| SHOT POINT INTERVAL    | : 2640'                          |
| HOLE DEPTH             | : 45'                            |
| ENERGY SOURCE          | : DYNAMITE                       |
| GEOPHONE GROUP CENTRES | : 220'                           |
| GEOPHONES              | : 9 PHONE HARNESS AT 25' SPACING |

FIG. 3A

1200% SUBSURFACE COVERAGE

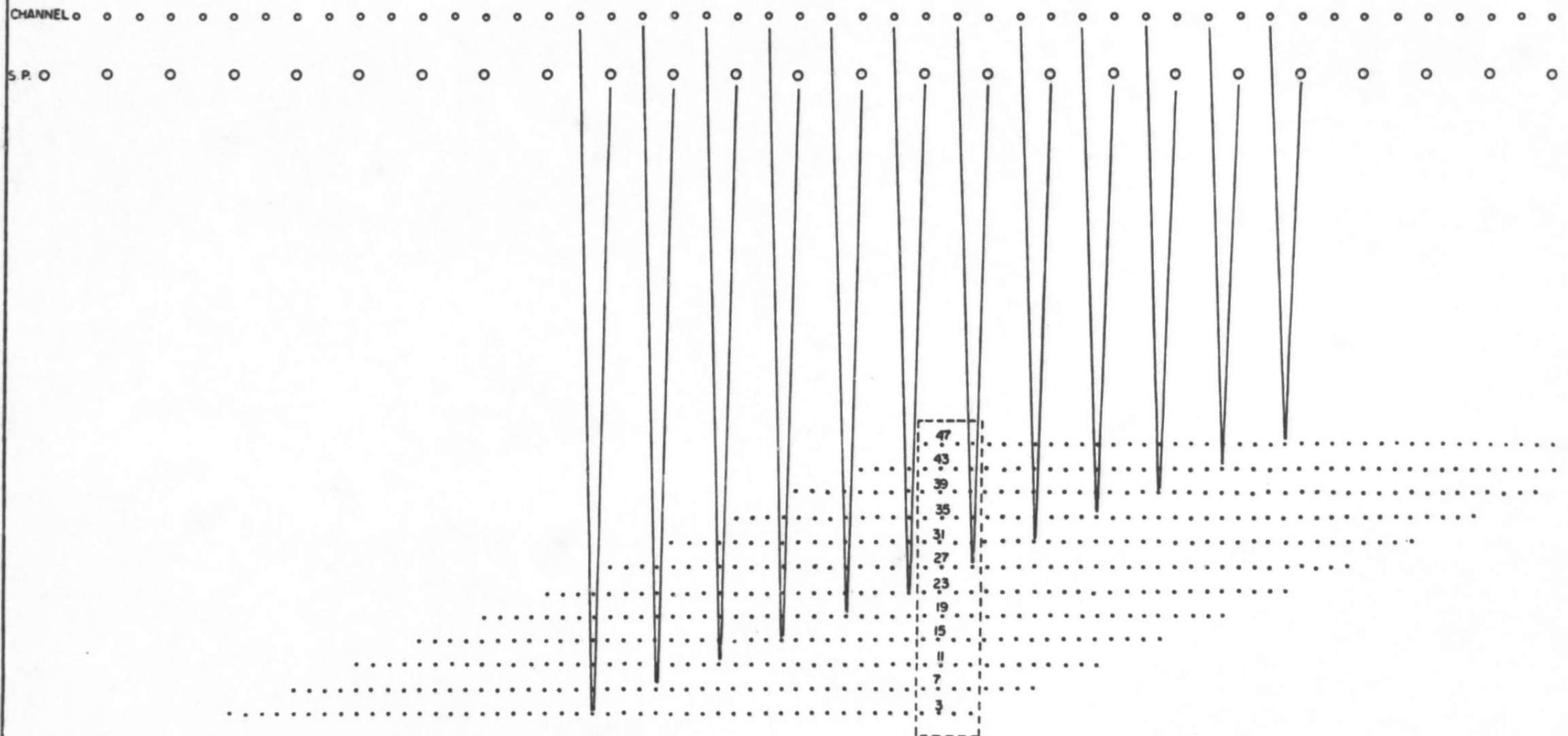


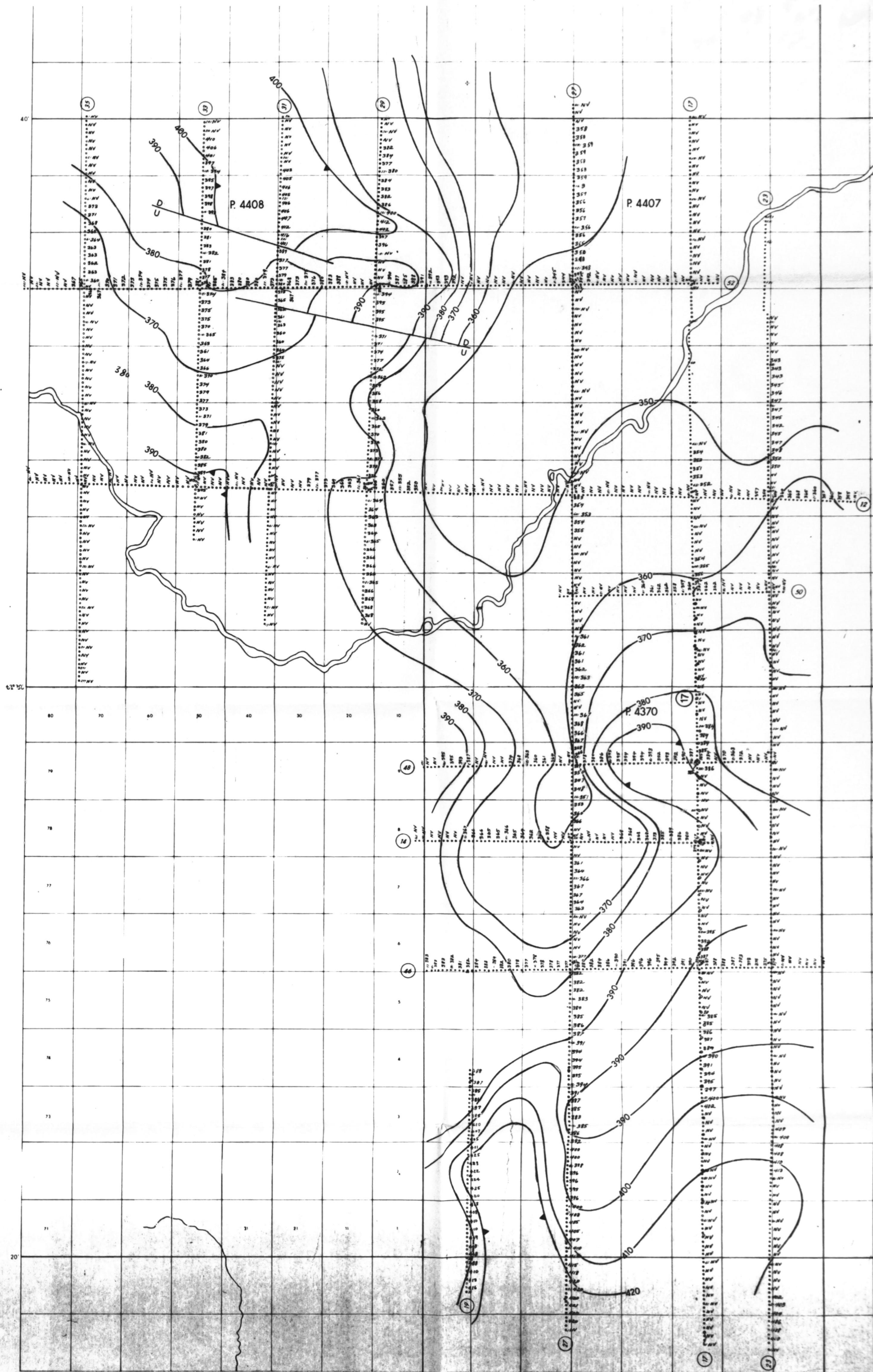
FIG. 4



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ISOCHRON  
COLD LAKE SALT TO PRECAMBRIAN  
FT. SIMPSON AREA

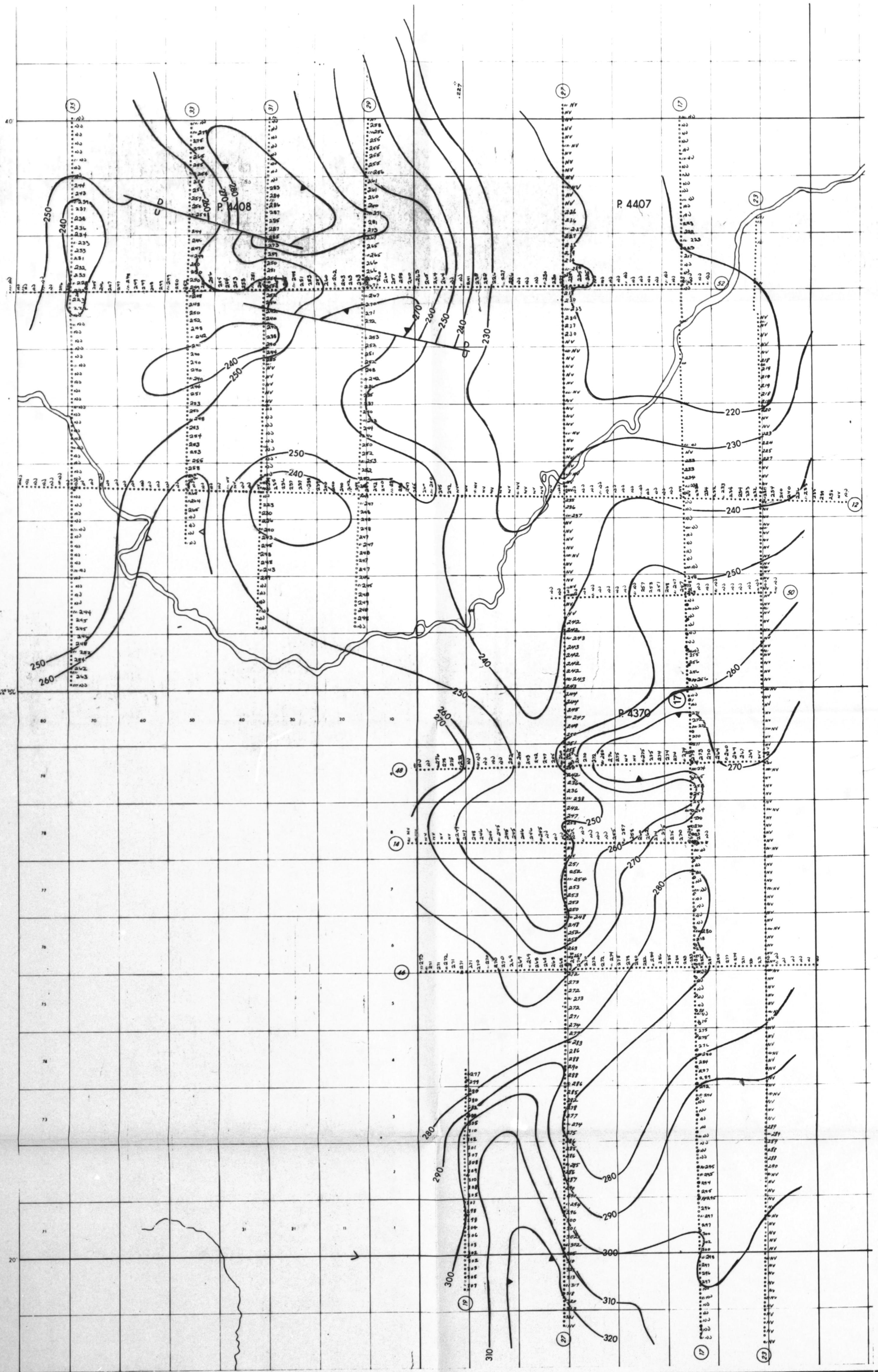
|                        |            |             |
|------------------------|------------|-------------|
| DATUM                  | GEOLOGY    | J. O'BERTOS |
| V.C.                   | GEOPHYSICS | DATE        |
| CONTOUR INT. .005 sec. |            | JUNE, 1971  |



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HORIZON  
**PRECAMBRIAN**  
FT. SIMPSON AREA

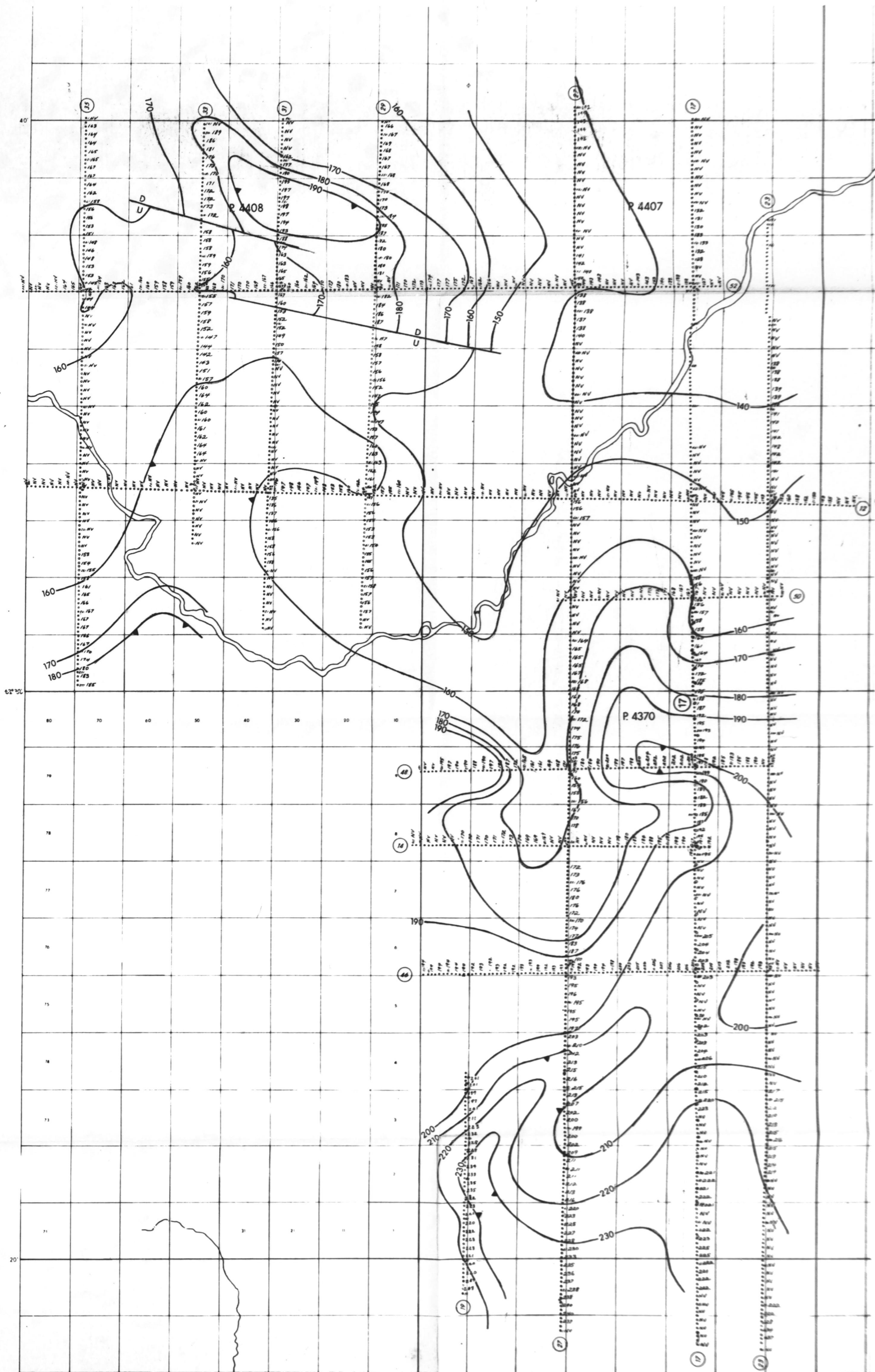
|                       |                        |
|-----------------------|------------------------|
| DATUM                 | GEODESY                |
| V.C.                  | GEOPHYSICS J. O'BERTOS |
| CONTOUR INT. 200 sec. | DATE JUNE, 1971        |



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HORIZON  
COLD LAKE SALT  
FT. SIMPSON AREA

|                       |             |
|-----------------------|-------------|
| DATUM                 | GEOLOGY     |
| V.C.                  | GEOPHYSICS  |
| CONTOUR INT. 010 sec. | DATE        |
|                       | J. O'BERTOS |
|                       | JUNE, 1971  |

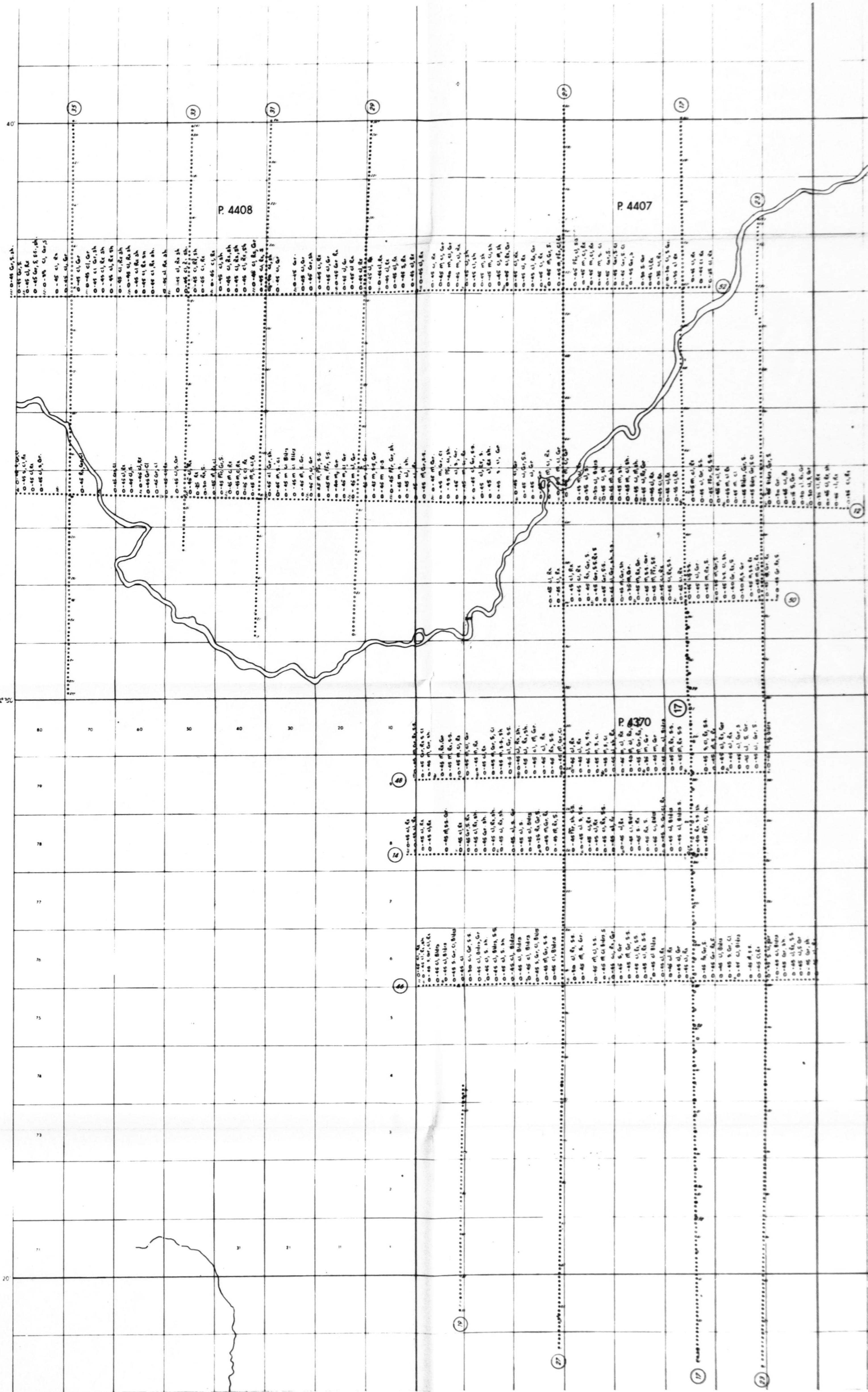


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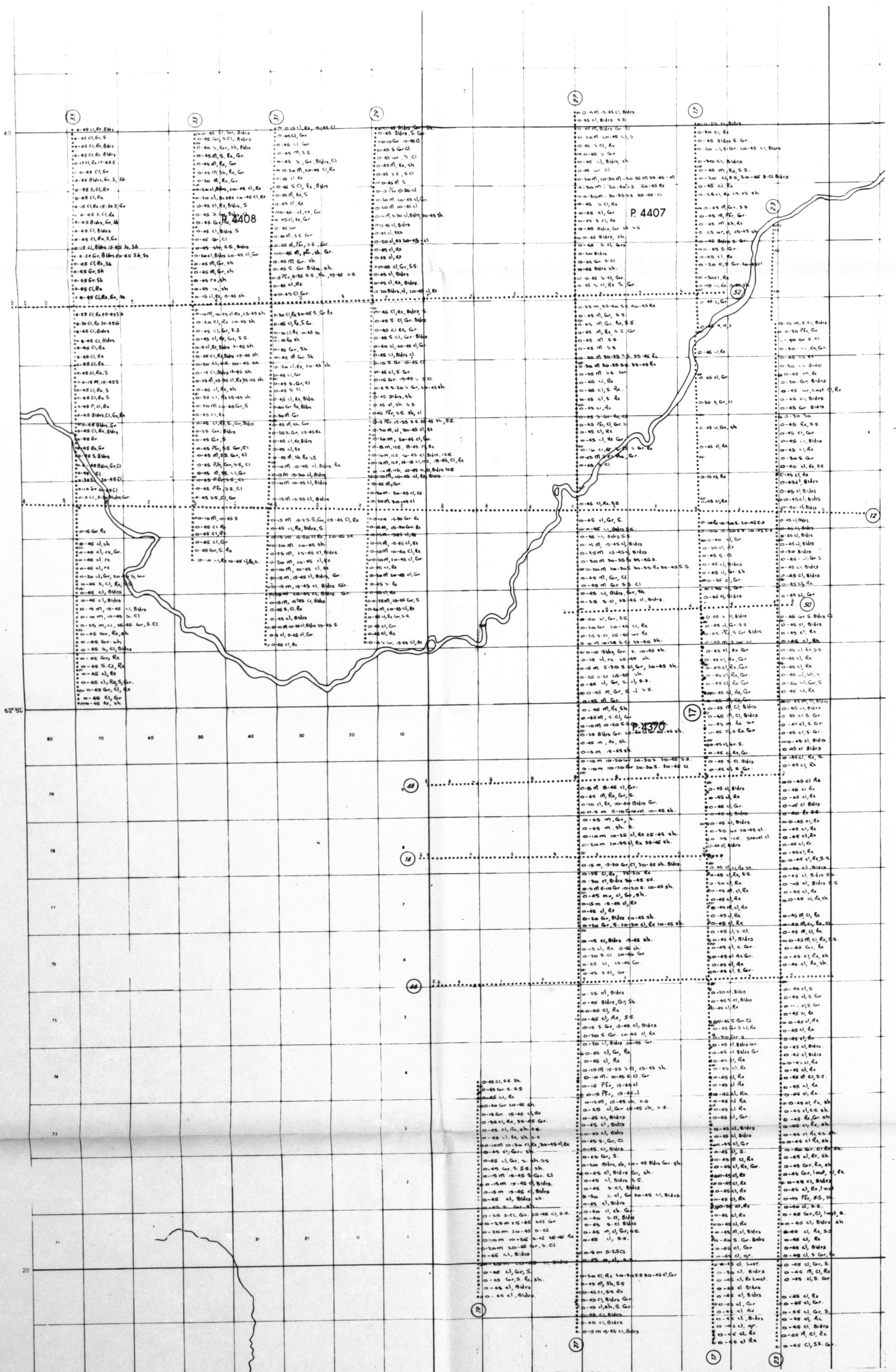
HORIZON  
**LONELY BAY**  
FT. SIMPSON AREA

|        |          |            |            |
|--------|----------|------------|------------|
| DATUM  | UNIT     | DATE       | BY         |
| WGS 84 | 1:50,000 | JUNE, 1971 | J. O'BRIEN |





|                                                                                       |  |                                       |  |
|---------------------------------------------------------------------------------------|--|---------------------------------------|--|
|  |  | <b>CENTRAL - DEL RIO OILS LIMITED</b> |  |
|                                                                                       |  | District                              |  |
| <b>7 SHOT HOLE DATA</b>                                                               |  |                                       |  |
| DATE                                                                                  |  | REVISION                              |  |
| BY                                                                                    |  | BY                                    |  |
| DRAWN                                                                                 |  | DATE                                  |  |

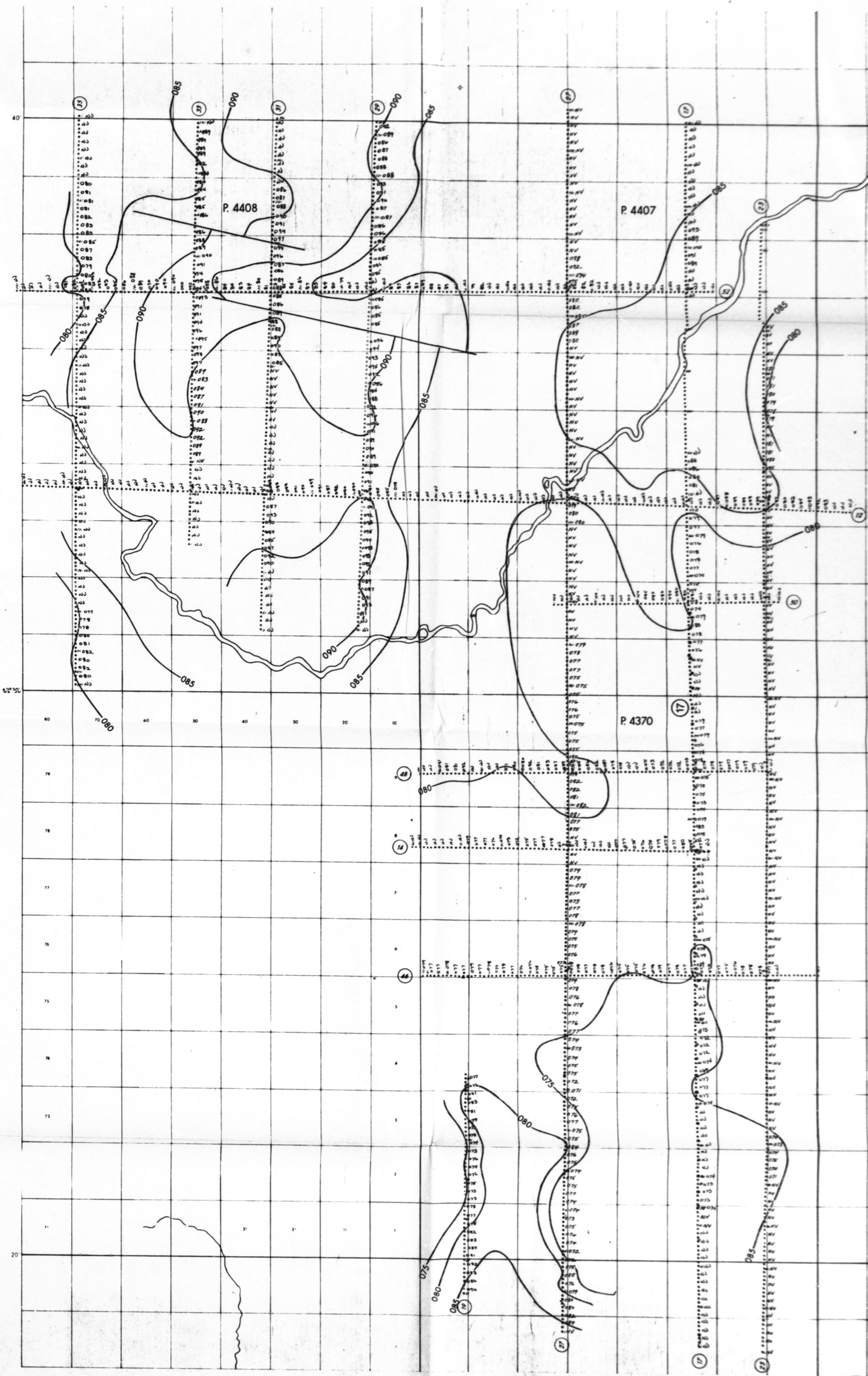


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District

7. SHOT HOLE DATA

| DATUM        | GEOLGY     |
|--------------|------------|
| V.C.         | GEOPHYSICS |
| CONTOUR INT. | DATE       |

August, 1971



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ISOCHRON  
LONELY BAY TO COLD LAKE SALT  
FT. SIMPSON AREA

|            |            |
|------------|------------|
| BATHY      | GEOLIST    |
| 40         | GEOLIST    |
| CONTOUR IN | DATE       |
| 005 sec    | JUNE, 1971 |