

OTTAWA

FINAL GEOPHYSICAL REPORT  
REFLECTION SEISMIC SURVEY

Yellowknife - Fort Resolution Project, N.W.T.

P.G.S. No. 19-4-70-1  
P.M. No. 4626, a Index No. 5371

For the **Days** 1970 to January 28, 1970

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Date \_\_\_\_\_

FINAL GEOPHYSICAL REPORT

REFLECTION SEISMIC SURVEY

Nahanni (North)-Berry Island Project, N. W. T.  
Project No. 2-6-4-70-1

Report for work performed on  
Permits No. 5369-71 inclusive, and 4626  
during the period,  
January 1, 1970 to January 28, 1970

Reflection seismic program shot  
for Gulf Oil Canada Ltd. by  
Teledyne Exploration Ltd.,  
Party No. 619.

R.A. Halvorsen

R.A. Halvorsen, Geophysicist  
Gulf Oil Canada Ltd.

Date: MAY 4 1970



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B: STATISTICAL DATA

1. Dates

Mobilization of vehicles and aircraft	- January 1, 1970
Recorder left base	- January 8
Recording commenced	- January 13
Recording completed	- January 28
Equipment released	- Crew began move to Antoine Lake Project

2. Production

Number of miles shot	- 51.1
Number of shots taken	- 510
Number of stations	- 460
Number of recording days	- 20.35
Average daily production:	
Miles shot	- 2.51
Stations shot	- 22.6
Days lost due to weather	- None
Days lost due to Equipment failure	- None

3. Equipment

Teledyne Party 619  
1 - 2 Ton Ford, Recorder  
3 - 1 Ton Ford for shooting and Line trucks  
2 - 1/2 Ton Fords, Surveyor trucks  
1 - 1/2 Ton Ford, Party Chief's vehicle  
1 - 1500 Gallon Fuel truck  
1 - 3 Ton flat deck Winch truck

Recording Equipment

(a) instruments	- SDS 1010, Binary Gain Digital
(b) detectors	- EVS2-14 c/s
(c) number of cables used	- 13
(d) length of each cable	- 990 feet
(e) number of detector strings	- 75
(f) number of detectors/string	- 9
(g) detector spacing	- 15 feet
(h) distance between group centres	- 160 feet

Sando Drilling Company

3 - Top-drive Auger drills  
2 - 500 gallon water trucks

Sloan Drilling Company

2 - Mayhew 1000 drills  
1 - 1100 gallon water truck  
1 - 1800 gallon water truck

Borak Construction Company

2 - D6C Caterpillar tractors  
1 - D7-17A Caterpillar tractors

4. Personnel

Teledyne Party 619

1 - Party Chief  
2 - Field Computers  
1 - Observer  
1 - Shooter  
2 - Surveyors  
2 - Rodmen  
8 - Recording helpers  
1 - Mechanic

Sando Drilling Company

1 - Drill supervisor  
3 - Drillers  
3 - Waterjacks  
2 - Waterhaulers

Sloan Drilling Company

2 - Drillers  
2 - Waterjacks  
2 - Toolpushers

Borak Construction Company

6 - Cat skinners  
1 - Cat foreman

Crown Catering

2 - Cooks  
1 - Camp attendant

5. Navigation

Equipment

- Wilde T1-A Theodolite

Method used to locate stations

- Ties to Geodetic survey line and old seismic lines.
- Star Shots.

6. Conditions

Typical winter season conditions prevailed. Temperatures ranged from a high of 0°F to a low of -45°F. Winds moderate, frequent blowing snow.

Radio communication was maintained through single side band using Fort Nelson station. FM radio units were used in the field to maintain communication between the recording crew, the bulldozer camp, and the main camp office.

A late winter freezeup delayed the project due to poor ice conditions on the MacKenzie River crossing.

C: FIELD CONDITIONS

Reflection seismic control consisting of 300 per cent CDP coverage was obtained. Shot point spacing was 640 feet, all shots were taken "inline or split."

Shot holes averaged 40 feet in depth and the average charge was 2½ lb. of dynamite.

D: DATA PROCESSING

The field computers employed by Teledyne assembled the basic field data and added survey information to the field data sheets. First arrival breaks were plotted and the basic data was submitted to the Calgary Interpretation Centre of Gulf Oil Canada.

Processing at the Calgary office included weathering and elevation corrections and primary velocity analysis. The data was presented in a 300 per cent CDP stacked record section form and the interpretation was based on these sections. Typical parameters are listed below:

Ve	- 11,500 ft./sec.
Datum	- 500 ft. AMSL
Coverage	- 300% CDP
Presentation	- Structure
Plot	- Optical, unsmoothed (or smoothed)
Filter	- BLFC 5, 20, 60, 75

No particular difficulty was encountered when tying the new data to the existing trade data (dark solid shot points).

#### E: RESULTS AND INTERPRETATION

General prospects for the area were discussed in the preceding report covering Project No. 2-6-4-67-1.

Control shot north of the MacKenzie River on Permits No. 5370 and 5371 was designed to evaluate areas adjacent to a major fault zone. The control line programmed south of the river (Line 6) was located to determine if the faulted zone extended southwestward of the previously mapped limits. The new control is outlined in orange on the Shot Point Locations and Elevations Map.

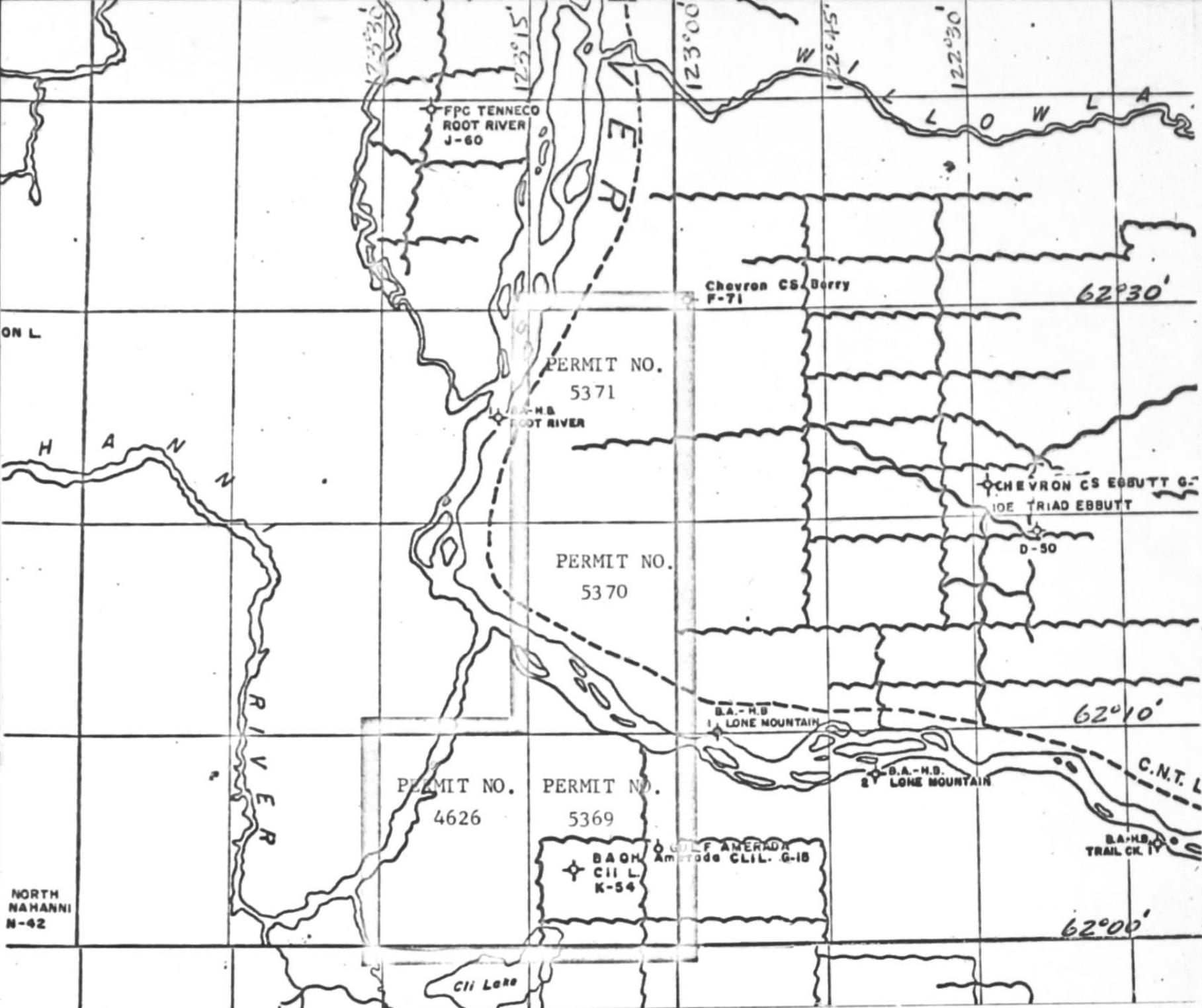
Line 6 showed only a steeply west-dipping event at Middle Devonian level. The fault zone was not evident on this profile. Presumably, the fault swung westward beyond the limits of Line 6 or terminated in the vicinity of the MacKenzie River.

Control on Permits No. 5370 and 5371 has delineated three anomalous high closures located on the upthrown side of the fault zone. The locations of these features are as follows:

1. Sections 58, 59, Grid Area 62°20' - 123°00'.
2. Sections 31, 32, 41, 42, Grid Area 62°30' - 123°00'.
3. Sections 24, 25, Grid Area 62°30' - 123°00'.

A similar high closure centered on Section 48, Grid Area 62°20' - 123°00', is contoured on the downthrown side of the fault.

It is anticipated that an evaluation by drilling \*will be considered for this project. \*(During the 1970-71 winter season)



Gulf Oil Canada Limited  
Calgary, Alberta

Northern Exploration  
Division

Final Geophysical Report

NAHANNI (NORTH) - BERRY ISLAND PROJECT, N. W. T.

Project Location Map  
(Project No. 2-6-4-70-1)

 Outline of Project Area

Scale: 1" = 8 miles

by: R.A. Halvorsen

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Date: MAY 4 1970

Figure No. 1