

BOVIE LAKE

Geophysical Report

BOVIE LAKE, N.W.T.

BOVIE N.W.T.

Lat: 60 deg. 00 min. to 60 deg. 20 min. N
Long: 122 deg. 30 min. to 122 deg. 55 min. W

Program Number	9229-N10-10E
Operator's Report Name	Northcor Bovie/Celibeta Seismic Program 1984
Type of Survey	Reflection Seismic
Survey Locality	Northwest Territories
Year of Field Work	1984
Operator	Northcor Energy Ltd., Calgary, Alberta
Prime Contractor	Sefel Geophysical Ltd., Calgary, Alberta
Exploration Agreement	E.A. No. 168
Author of Report	Empress Exploration Consultants Calgary, Alberta
Date of Report	December, 1984
Commencement of Survey	February 10, 1984
Completion of Survey	March 9, 1984

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ENCLOSURES

1. Seismic Shot Point Map
2. Seismic Sections: one pre-fold paper copy and
one film copy for Lines NB-1 to 24
(for Lines NCB-37 and 41 see Celibeta Report)
3. Interpretive Maps: one pre-fold paper print of each

Time Structural Maps:

- Near Top Mississippian
- Within Mississippian
- Near Banff
- Near Top Devonian
- Tetcho
- Mid-Devonian Carbonate

Isochronal Map:

- Tetcho to Mid-Devonian Carbonate

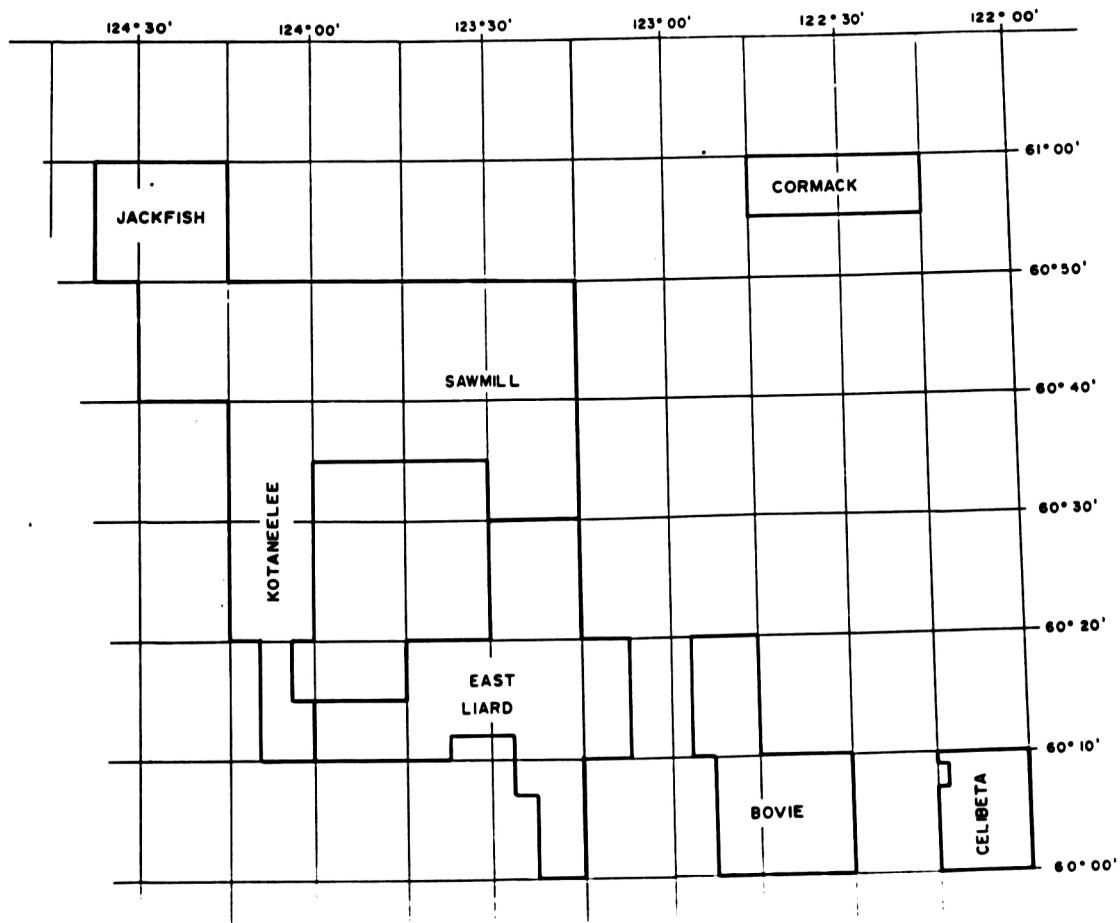
INTRODUCTION

The Prospect lies immediately north of the southern boundary of the Northwest Territories , some 140 kilometers due north of Fort Nelson B.C., and some 35 kilometers southeast of Fort Liard, N.W.T.

The survey was undertaken to study the geological section of the Area, particularly late Paleozoic features associated with faulting and the delineation of a possible Mid-Devonian Carbonate edge.

Party 506 of Sefel Geophysical Ltd., under the direction of Empress Exploration Consultants, Calgary, Alberta, began recording operations February 16, 1984. A total of approximately twenty-nine (twenty-three recording) days were worked, during which time two hundred and seventy-one kilometers of twelve hundred percent CDP continuous sub-surface coverage were surveyed. Field work was completed March 9, 1984. The data were processed by Sefel Geophysical Ltd., Calgary, Alberta.

Reflection quality is generally good for the upper part of the section, the character, amplitude and definition of these events being correlative. The pre-mid-Devonian seismic responses are poor, as is the Top Devonian in the northwest portion of the Prospect.



STATISTICAL SUMMARY

Tractors arrived at the program site February 10, 1984, drilling began February 12, 1984, and recording commenced February 16, 1984. The field survey was completed March 9, 1984 - a total of twenty-nine days being worked, of which twenty-three were recording days.

Forty-three Canadian personnel - the total field complement - were employed on the program.

Basic Crew

- 1 - Party Manager
- 1 - Clerk
- 1 - Mechanic
- 3 - Camp Staff (Cook, Helper and Camp Attendant)
- 4 - Survey Crew
- 1 - Observer
- 1 - Junior Observer
- 1 - Shooter
- 1 - Shooter's Helper
- 4 - Line Truck Drivers
- 8 - Recording Helpers
- 4 - Drillers
- 4 - Drill Helpers
- 2 - Water Truck Drivers
- 4 - Cat Skinners
- 1 - Tractor Operator
- 1 - Cat Foreman
- 1 - Cat Supervisor

Two hundred and seventy-one kilometers of seismic coverage were obtained, the daily production averaging twelve kilometers. No serious delays were experienced.

The muskeg-covered terrain is comprised of rolling hills which, at times, resulted in a slowing of normal vehicular movement. Sufficient ice accumulated on the lakes and rivers to allow safe travel for equipment and air-servicing.

The weather remained reasonably cold, winds relatively light and snowfall average. No weather-related delays were experienced.

f. DESCRIPTION OF DATA ACQUISITION EQUIPMENT AND FIELD PROCEDURES

(see also the attached section label)

energy/source array: 2 kg dynamite charge in a single
hole 11 m deep, holes spaced
100 m apart in-line with spread

detector type/array: 10 Hz Mark L-15 geophones using
an in-line pattern grouping 9
geophones at 3 m intervals in a
symmetrical split spread
1200 m - 25 m x 25 m - 1200 m
with groups 25 m apart

recording system: 96 channel MDS-10 recording
instrument employing the SEGB
format recording 4 seconds of
data at 2 ms sampling interval.
The recording filter was
12/18 - 172/72 Hz.

g. DESCRIPTION OF DATA PROCESSING

(see also the attached section label)

1. Seismic Reflection

- demultiplex with gain removal, 2 ms sample rate
- instrument and geophone phase compensation
- CDP trace gathers - (1200%)
- gain application
- spiking deconvolution; 60 ms operator,
1% pre-whitening, window 150-1650 ms
- weathering statics; datum 500 m above sea level,
weathering velocity 610 m/sec.
- datum velocity 3700 m/sec.
- velocity analysis
- normal move-out
- automatic residual statics -
(350-1400 ms window, + - 20 ms lag)
- common offset stack
- residual NMO
- mute
- stack - (1200%)
- wave equation migration
- bandpass filter - (10/20 - 60/70 Hz)
- trace equalization

FIELD RECORDING

DATE SHOT SHOT BY SOURCE TYPE SOURCE PATTERN CHARGE SIZE GEOPHONE TYPE GEOPHONE PATTERN INSTRUMENTS FORMAT RECORDING FILTER RECORD LENGTH SAMPLE INTERVAL GROUP INTERVAL SHOT POINT INTERVAL SPREAD GEOMETRY	MARCH 1984 SEFEL GEOPHYSICAL LTD. PARTY NO. 506 DYNAMITE SINGLE HOLE 2 KG AT 11 M GEOSPACE-10 HZ 9 AT 3 M INTERVALS MOS-10 96 TRACE SEC8 12/18 - 125/72 HZ 4 SEC 2 MS 25 M 100 M 1200-25-X-25-1200 M
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DIGITAL PROCESSING

1 DEMULTIPLEX WITH GAIN REMOVAL PROCESSING SAMPLE RATE 2 INSTRUMENT PHASE COMPENSATION 3 GEOPHONE PHASE COMPENSATION 4 CDP TRACE GATHERS 5 AUTOMATIC GAIN CURVE APPLICATION 6 SPIKING DECONVOLUTION OPERATOR DESIGN WINDOW MIN OFFSET MAX OFFSET OPERATOR LENGTH PREWHITENING 7 WEATHERING STATICS DATUM ELEVATION DATUM VELOCITY WEATHERING VELOCITY 8 AUTOMATIC RESIDUAL STATICS MAX CORRELATION LAG WINDOW 9 VELOCITY ANALYSIS 10 NMO 11 AUTOMATIC RESIDUAL STATICS MAX CORRELATION LAG WINDOW 12 COMMON OFFSET STACK 13 RESIDUAL NMO 14 MUTE 15 STACK 16 WAVE EQUATION MIGRATION 17 BANDPASS FILTER 18 EQUALIZATION 19 FILM DISPLAY	2 MS 1200 PERCENT 150-1650 MS 800-2300 MS 60 MS 1 PERCENT 500 M ASL 3700 M/SEC 610 M/SEC +-30 MS 300-1700 MS +-20 MS 350-1400 MS 1200 PERCENT 10/20 - 60/70 HZ 16 TRACES/IN 7.5 INCHES/SEC
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.NORMAL POLARITY (POSITIVE VALUE PEAK)

PROCESSING PARAMETERS SELECTED BY
 EMPRESS EXPLORATION CONSULTANTS

2. Gravity not applicable
3. Magnetics not applicable
- h. SEISMIC SHOT POINT MAP - enclosed
- i. PROCESSED SECTIONS

one paper pre-fold copy and one film copy
of sections for Lines:

NB-1	NB-9	NB-17
NB-2	NB-10	NB-18
NB-3	NB-11	NB-19
NB-4	NB-12	NB-20
NB-5	NB-13	NB-21
NB-6	NB-14	NB-22
NB-7	NB-15	NB-23
NB-8	NB-16	NB-24

Lines NCB-37 and 41 - see Celibeta Report.

- j. BATHYMETRY not applicable

- k. INTERPRETIVE MAPS

time structural maps:

- Near Top Mississippian
- Within Mississippian
- Near Banff
- Near Top Devonian
- Tetcho
- Mid-Devonian Carbonate

isochronal map:

- Tetcho to mid-Devonian Carbonate

A synthetic seismogram for the Pan Am Home Signal CSP H-50 well (Lat: 60 deg. 09 min. 23 sec. N, Long: 122 deg. 37 min. 45 sec. W) was prepared and is presented below:

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DISCUSSION OF STUDY

Discontinuous parallel mid-Devonian Carbonate edges are present within the Prospect. No interesting anticlinal features associated with these fronts are noted.

On Lines NB 3,4,5 and 22, the Slave Point picks may be higher; those mapped were chosen to accomodate Slave Point character to the west beyond the Prospect.

A major north/south trending fault exists in the eastern third of the Area, extending, at approximately Longitude 122 degrees 37 minutes W, from Latitude 60 degrees 00 minutes to 60 degrees 09 minutes N. Closure, by this fault, to the east, for Mississippian and later sediments, is the dominant anomalous feature.

The strong anomaly, depicted by the Tetcho to mid-Devonian Carbonate isochronal map on Line NB-24 between Shot Points 605 and 685, is an optimistic one based upon poor mid-Devonian Carbonate responses. However, pre-Tetcho and Tetcho correlations support the presentation.

The Near Top Devonian event is indistinct in the northwest segment of the Prospect (Lines NB-1,2,3,4,22). Seismic responses from the pre-mid-Devonian Carbonate top are neither strong nor definitive.

COMMENTS AND CONCLUSIONS

The suspected northwest trending mid-Devonian Carbonate edge does not exist as a continuous front through the Bovie Prospect, but rather is a series of disconnected, but associated, ledges.

Mississippian and shallower sediments comprise the main structural feature closed to the east by the major fault. Further study of the post-Mississippian strata is recommended.

The anomalous condition near Tetcho Time, as suggested by the Tetcho to mid-Devonian Carbonate Isochron, requires detailed, and better, data for evaluation.

The geological characteristics of those sediments lying below the Slave Point Carbonate Top, prevent their seismic analyses.



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