

CELIBETA

Geophysical Report

**CELIBETA, N.W.T.**

CELIBETA N.W.T.

Lat: 60 deg. 00 min. to 60 deg. 10 min. N  
Long: 122 deg. 00 min. to 122 deg. 15 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	March 2, 1984
Completion of Survey	March 22, 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 NCL 1-9,  
NCB-37, NCB-39, NCB-41
3. Interpretive Maps: one pre-fold paper print of each

#### Time Structural Maps:

- Top Devonian
- Tetcho
- Jean Marie
- Near Top Slave Point
- Chinchaga/Basal Sandstone

#### Isochronal Maps:

- Tetcho to Near Top Slave Point
- Near Top Slave Point to Chinchaga/Basal Sandstone

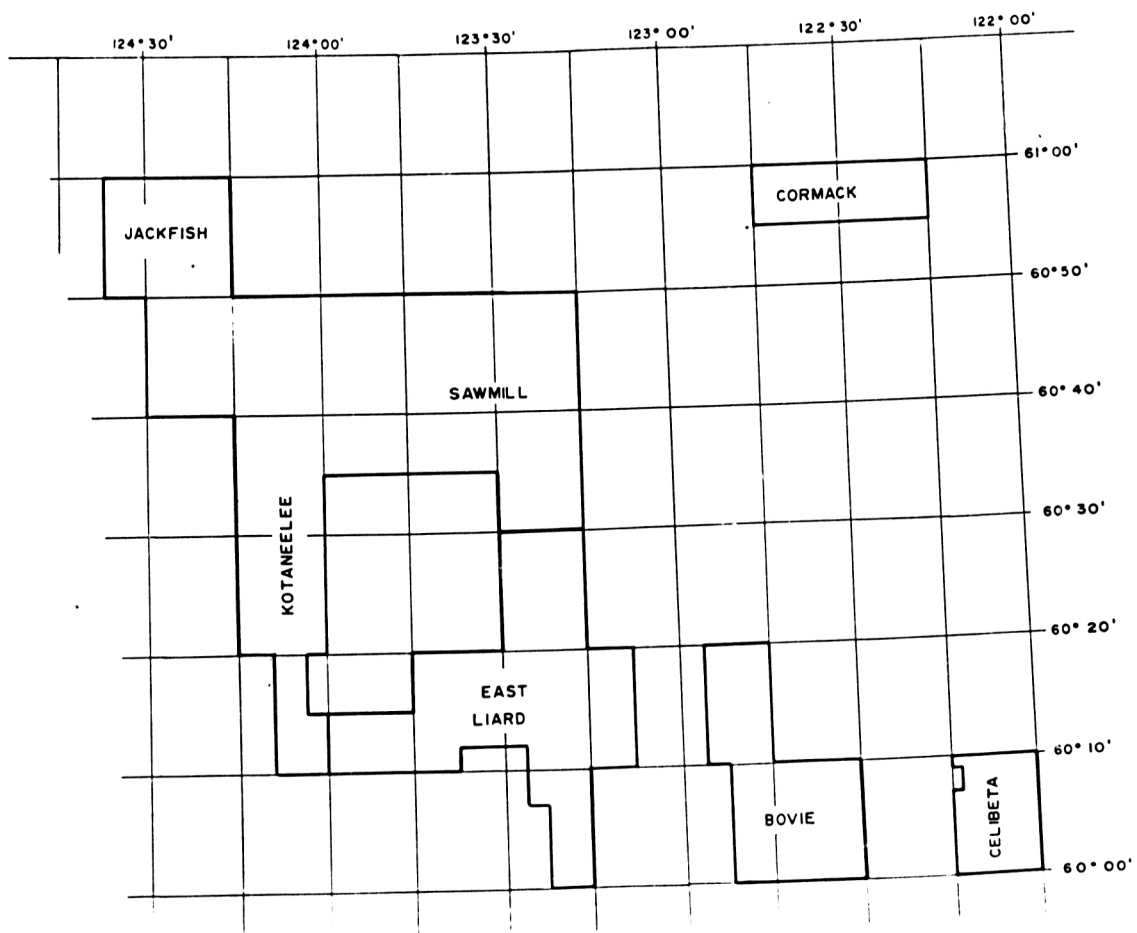
### INTRODUCTION

The Prospect lies immediately north of the southern boundary of the Northwest Territories , some 140 kilometers north of Fort Nelson B.C., and some 70 kilometers southeast of Fort Liard, N.W.T.

The survey was undertaken to study the geological section of the Area, primarily the attitude and nature of the Slave Point and to determine the presence of a Carbonate front. The association of the H-78 test to the general configuration of the Celibeta High was to be ascertained.

Party 506 of Sefel Geophysical Ltd., under the direction of Empress Exploration Consultants, Calgary, Alberta, began recording operations March 10, 1984. A total of approximately twenty-one (thirteen recording) days were worked, during which time one hundred and seventy-two kilometers of twelve hundred percent CDP continuous sub-surface coverage were surveyed. Field work was completed March 22, 1984. The data were processed by Sefel Geophysical Ltd., Calgary, Alberta.

Reflection quality is good. The character, amplitude and definition of most events are correlative.



#### STATISTICAL SUMMARY

Tractors arrived at the program site March 2, 1984, drilling began immediately upon completion of the Bovie assignment and recording commenced March 10, 1984. The field survey was completed March 22, 1984 - a total of twenty-one days being worked, of which thirteen 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

One hundred and seventy-two kilometers of seismic coverage were obtained, the daily production averaging thirteen kilometers. No 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 200-1650 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 -  
(300-2000 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 - (400 - 2000 ms window)

## FIELD RECORDING

DATE SHOT	SEFEL GEOPHYSICAL LTD.
SHOT BY	PARTY NO. 506
SOURCE TYPE	DYNAMITE
SOURCE PATTERN	SINGLE HOLE
CHARGE	2 KG AT 11 M
GEOPHONE TYPE	GEOSPACE 10 HZ
GEOPHONE PATTERN	9 AT 3 M INTERVALS
DATA CHANNELS	96
GROUP INTERVAL	25 M
SHOT POINT INTERVAL	100 M
SPREAD GEOMETRY	1200-25-X-25-1200
INSTRUMENT TYPE	MDS-10
TAPE FORMAT	SEG B
FIELD FILTER	12/18 -125/72 HZ/DB
NOTCH	OUT
SAMPLE INTERVAL	2 MS
RECORD LENGTH	3 SEC

## DIGITAL PROCESSING

1 DEMULTIPLEX WITH GAIN REMOVAL	
PROCESSING SAMPLE RATE	2 MS
2 GEOMETRY	
3 AUTOMATIC GAIN CURVE APPLICATION	
4 INSTRUMENT PHASE COMPENSATION	
5 GEOPHONE PHASE COMPENSATION	
6 SPIKING DECONVOLUTION	
OPERATOR LENGTH	60 MS
OPERATOR DESIGN WINDOW	
MIN OFFSET	200-1650 MS
MAX OFFSET	850-2300 MS
PREWHITENING	1 PERCENT
7 EQUALIZATION	
8 WEATHERING CORRECTIONS	
DATUM ELEVATION	500 M ASL
DATUM VELOCITY	3700 M/SEC
WEATHERING VELOCITY	610 M/SEC
9 AUTOMATIC RESIDUAL STATICS	
WINDOW	500-1700 MS
MAX. CORRELATION LAG	+ 40 MS
10 VELOCITY ANALYSIS	
11 NORMAL MOVEOUT	
12 AUTOMATIC RESIDUAL STATICS	
WINDOW	300-2000 MS
MAX CORRELATION LAG	+ 20 MS
13 COMMON OFFSET STACK	
14 RESIDUAL NMO	
15 MUTE	
16 STACK	10/20-60/70 HZ
17 BANDPASS FILTER	
EQUALIZATION	400-2000 MS
WINDOW	
19 TIME DOMAIN WAVE EQUATION MIGRATION	16 TR/IN
20 FILM DISPLAY	7.5 IN/SEC
POLARITY ( ) NORMAL ( ) REVERSE	

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:

NCL-1	NCL-7
NCL-2	NCL-8
NCL-3	NCL-9
NCL-4	NCB-37
NCL-5	NCB-39
NCL-6	NCB-41

- j. BATHYMETRY not applicable

k. INTERPRETIVE MAPS

time structural maps:

- Near Top Devonian
- Tetcho
- Jean Marie
- Slave Point
- Chinchaga/Basal Sandstone

isochronal maps:

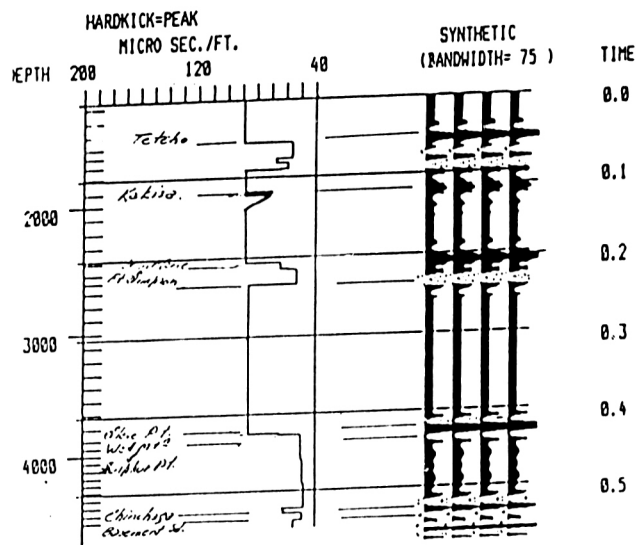
- Tetcho to Slave Point
- Slave Point to Chinchaga/Basal Sandstone

# 1. RELATED INTERPRETIVE INFORMATION

A synthetic seismogram for the Dome Pan Am CSP Celibeta C-77 well (Lat: 60 deg. 06 min. 12 sec. N, Long: 122 deg. 14 min. 29 sec. W) was prepared and is presented below:

## SONIC LOG AND SYNTHETIC

WELL NAME DOME PAN AM CSP **CELIBETA C-77**  
 LOCATION 60, 6, 12/ 122, 14, 29  
 PROV/ST NMT  
 1st DEPTH 1150  
 LST DEPTH 5000  
 KB 1581.5  
 SD 0



### DISCUSSION OF STUDY

The Celibeta anticline is the predominant feature - its relief diminishing slightly in the shallower horizons. An increase in the incidence of faulting is noted in that area between the Celibeta and Bovie Prospects.

The Slave Point structural map exhibits several narrow northeast trending features similar to and associated with that anomaly successfully tested by the H-78 well. A Slave Point Carbonate ledge is crossed at Shot Point 157 Line NCL-9 and at Shot Point 637 Line NCL-3; no further delineation is noted. Additional Celibeta-High flank anomalies are shown on Line NCB-39 Shot Points 697 to 737 and on Line NCB-37 Shot Points 933 to 1000.

The following Jean Marie anomalies exist:

- a) Line NCL-1 S.P. 229 to 313: a build-up at the top (rather than within) of the section - possibly porous  
S.P. 583 to 618
- b) Line NCL-2 S.P. 563 to 618: also indicating a "soft" Jean Marie top
- c) Line NCL-3 S.P. 483 to 575  
S.P. 600 to 644
- d) Line NCL-7 S.P. 130 to 197
- e) Line NCL-8 S.P. 443 to 489
- f) Line NCL-9 at S.P. 179 : an increase in section
- g) Line NCB-37 at S.P. 753: Jean Marie shaling out

#### COMMENTS AND CONCLUSIONS


The continuous Slave Point Carbonate front, extending northward from Petitot, does not traverse the Celibeta Block. The phenomena shown on Lines NCL-3 and NCL-9 represent localized Carbonate edges.

The increase in faulting in that area between the Celibeta and Bovie blocks, as shown by the relatively incompetent upper Devonian and later bedding, is a result of the growth of the anticline in Devonian times. Although the major feature frequently increased and decreased in relief, it is believed to have remained a positive.

The narrow Slave Point anomalies at the crest of the Celibeta anticline, in the vicinity of the H-78 test are considered good. Detailed seismic would be necessary to determine the structural axis and extent of each feature.

The Jean Marie anomalies described may be reefal or may be bar-type limestone accumulations. Their general characteristics suggest the latter explanation, but further geological studies are warranted.

The "Basement" in this Prospect is sedimentary - and therefore may consist of conformable Devonian clastics. Geologically it is difficult to differentiate the Chinchago from the Basal Sandstones.

  
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