

# Mobil Oil Canada

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May 04, 1992

National Energy Board  
311 - 6th Avenue S.W.  
Calgary, Alberta  
T2P 3H2

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ATTENTION: MR. R. W. KLAUBERT

MAY - 5 1992

Dear Sir,

Re: Mobil Spear No. 1 Report  
9229-M3-2E

As requested in your letter of April 7th, please find enclosed the following information as it pertains to the subject seismic program:

1. Maps
  - a) Time Structure Tetcho
  - b) Time Structure MDC
  - c) Isochron Tetcho MDC
2. Further geophysical discussion *attached*
3. Further geological discussion *attached*
4. A copy of synthetic seismogram C-025-L 94-P-13 well
5. Prior to redisplaying sections at a higher horizontal trace setting, we are submitting three examples 20, (24) and 36 per inch on one line for your selection.

Yours very truly,

MOBIL OIL CANADA



E. L. Stanley  
Geophysical Operations

ELS/ss

Enclosures



**SPEAR PROJECT**  
**Generated Maps**

<b>Formation</b>	<b>Time Structure</b>	<b>Velocity</b>	<b>Depth Structure</b>	<b>Isochron</b>
KOTCHO	N/A	N/A	N/A	N/A
TETCHO	Mapped	N/A	N/A	Mapped
M.D.C.	Mapped	N/A	N/A	(M.D.C./TETCHO)

MAY 5 1992

## GEOPHYSICAL DISCUSSION

**OBJECTIVE:** The Petitot Seismic program conducted over the most northern part of the Presquile area was aimed at better defining the outline of the Middle Devonian Carbonate/M.D.C. platform edge along which lies the possibility of finding potential pools for hydrocarbon accumulation.

**COVERAGE:** Five seismic lines were shot. The total acquired coverage of the survey was 34 kms. The program was situated approximately 30 kms. west of the C-025-L/094-P-13 well, which was used for seismic correlation to the area of interpretation.

**WELL CORRELATION:** The wavelet display of synthetic of the above well was generated and correlation was made to the prominent horizons to be interpreted, i.e. M.D.C., Tetcho and Kotcho Fm. The seismic wavelet character of these horizons encompassing the well which was displayed on the reverse section fit with the normal display wavelet of the synthetic. This line was then used to tie to the 1991 data.

**INTERPRETATION:** Lines covering the area were loaded into the VAX based GeoQuest and interpretation of the M.D.C. level was carried out along the peak which marks the change of acoustic properties from Fort Simpson/Muskwa shales to Slave Point limestone. This reflection character is exhibited consistently in the platform area and less so in the basinal area due to the presence of less compacted basinal facies sediment.

**RESULTS:** Time maps over the Tetcho and Middle Devonian Carbonate/M.D.C. levels were generated. Additionally an isochron of the M.D.C. and Tetcho was mapped. The isochron map was used to estimate the Presquile edge platform as observable from the abrupt change in slope from gentle shelfal area in the northeast toward basinal area in the southwest of survey coverage. Thinning in the isochron might indicate the presence of carbonate build-ups which are potential for hydrocarbon pools. These thins may not visible clearly from the M.D.C. time structure map, if the build-up is situated on the slope of the platform edge.

No velocity maps, depth maps, seismic modeling in this particular area or attribute analysis resulted from this data set.

Overall the interpretation has established a better understanding of the Middle Devonian Carbonate edge limit and type of play necessary to isolate hydrocarbon in the area and the project objectives were met.

## GEOLOGICAL DISCUSSION

The area in which this seismic program was shot is immediately south of the Celibeta high. Typical exploration in this area has been for gas trapped by a variety of methods within the Devonian section.

The seismic maps included in this report can be interpreted in such a manner as to outline the edge of the Middle Devonian Presquile Barrier Reef Complex (Presquile Barrier represents the Slave Point, Watt Mountain and Keg River formations). Overlying the Presquile are the Upper Devonian shales of the

Otter Park, Muskwa and Fort Simpson Formations. These are in turn overlain by Upper Devonian Carbonates of the Kakisa-Redknife, Tetcho and Kotcho Formations. To the east of the report area the Jean Marie Formation is present and gas producing but it appears that it does not extend as far west as where this seismic was shot. There is a major unconformity at the top of the Devonian. Overlying the unconformity are Mississippian shales of the Exshaw and Banff Formations and the Carbonates of the Pekisko Shunda and Debolt Formations. The Debolt is in part missing due to erosion. The Cretaceous sands, shales and silt overlie the Mississippian and represent the youngest consolidated section in the area.

There has been no corresponding geological work (mapping, cross-sections, etc.) that has been done with regard to this seismic program.

# Mobil

PROGRAM NO. 9229-M3-2E

GEOPHYSICAL OPERATIONS REPORT  
SPEAR NO. 1 - N.W.T.  
PERMIT NUMBER N90B469

PREPARED BY: E. L. STANLEY  
MARCH, 1992

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MAR 24 1992

[CALGARY]

# Mobil Oil Canada

BOX 800  
CALGARY ALBERTA  
T2P 2J7  
TELEPHONE (403) 260-7910

March 19, 1992

National Energy Board  
311 - 6th Avenue S.W.  
Calgary, Alberta  
T2P 3H2

ATTENTION: MR. GRAHAM CAMPBELL

Dear Sir,

Re: Geophysical Operations Report  
Land Use Permit N90B469  
Speaker No. 1

We are forwarding herewith for your files, four (4) copies of the above referenced Geophysical Operations Report.

Please acknowledge receipt by signing one (1) copy of this letter and returning same for our files.

Yours very truly,

MOBIL OIL CANADA

*R. L. Kimmins*

R. L. Kimmins  
Manager, Geophysics

for RLK

RLK/ss

Enclosures

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Date Received

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Signature

  
Environmental  
Awareness

GEOPHYSICAL OPERATIONS REPORT

2-D LAND SEISMIC SURVEY

SPEAR NO. 1

LAND USE PERMIT # N90B468

OPERATOR: MOBIL OIL CANADA

PRIME CONTRACTOR: PIONEER EXPLORATION

YEAR: 1991

REPORT PREPARED BY: E. L. STANLEY

FEBRUARY/MARCH, 1992

  
E. L. Stanley  
Geophysical Operations

  
H. Andiurbowo  
Prof. Geophysicist

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March 19, 1992  
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The above named survey (reflection) on the N.W.T./B.C. border was recorded March 6 - 13, 1991, by Pioneer Exploration Ltd.

LIST OF ENCLOSURES AS FOLLOWS:

a. Locality Map

b. Mobilization - Dozers Jan. 23, 1991  
- Surveyors Mar. 02, 1991  
- Recording Mar. 06, 1991  
Demobilization - Recording Mar. 13, 1991

c. Recording crew consisted of 38 technical and non-technical personnel, 100% Canadian.

d. Total Production in N.W.T.: 11.8 km.  
Time Lost due to: River crossings  
Daily Production Average: 4.294 km.

e. Weather Conditions:

Temp. Max. Average	-17.25°
Temp. Min. Average	-13.37°
Wind	Nil to Light
Precipitation	Nil to Light Snow (2 days only)

f. Factors Causing Downtime

River crossings and dragouts (hand cut) down the river banks.  
Lines: 91-1347, 1348, 1349 & 1350.

g. Survey Control

The elevations and co-ordinates for this survey originated from a global positioning system (G.P.S.) survey control point established in March of 1991. The line survey was carried out by chain and E.D.M. traverse with a final processed accuracy of  $\pm 1$  meter in elevation and  $\pm 10$  meters in X-Y co-ordinates.

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h. Spread/Receiver/Source/Instruments

i)	Fold	1200X
	Station Interval	25 m
	Shot Point Interval	125 m
	Spread	1 - 60 - 60 - 120
	Distance (m)	1550 - 75 x - 75 - 1550
ii)	Receiver	G.S.C. 20 D 14 Hz. 70% damping Number per Group - 18 Spacing 2 m inline
iii)	Source	Vibroseis Model IVT 2700 Array 4 at 12 meters Move Ups 3 - 0 m 11 times Sweep Frequency 8-80 Hz (7 db/oct/boost) Sweep Length 12 seconds
iv)	Instruments	DFS-V / FPGS Record Length 4 seconds Sample Rate 2 ms Notch Out Field Filter Out/128

i. Seismic Data Processing

The five acquired lines were processed by J.G.M. Enterprises of Calgary in April, 1991. For each line, the processing was completed through the migration stage.

Attached are two migrated copies and one film for both normal and reverse copies of Line 91-1347, 1348, 1349, 1350 & 1351.

The processing sequence applied is as follows:

- i. SEG-B FORMAT CONVERSION - Record Length - 4 seconds  
- Sample Rate - 2 msec
- ii. STRAIGHT LINE GEOMETRY
- iii. SPHERICAL DIVERGENCE AMPLITUDE RECOVERY

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i. Seismic Data Processing C'ont.

iv. EDITING

v. DECONVOLUTION

Type	Surface Consistent Spiking
Prewhitening:	0.1%
Operator Length:	80 ms
Spectral Balancing:	8 - 80 Hz.
Near Trace Window:	600-1800 ms (offset 75 m)
Far Trace Window:	1200-2000 ms (offset 1550 m)

vi. PHASE COMPENSATION

Vibroseis phase correction for spiking deconvolution.  
Complete geophone correction for spiking deconvolution.

vii. WEATHERING AND DATUM CORRECTIONS

- All shots interpreted
- Datum 500 m
- Weathering Velocity - 800 m/sec
- Replacement Velocity - 2000 m/sec

viii. CDP GATHERS

Fold 1200%

ix. VELOCITY ANALYSIS

Type: Constant velocity common offset stack

x. NMO APPLICATION REFERENCED FROM DATUM

xi. SURFACE CONSISTENT STATICS

- Window 1000 - 2300 ms
- Maximum Statics 20 ms

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i. Seismic Data Processing C'ont.

xii. RE-ITERATION OF STEPS 'VIII', 'IX' & 'X'.

xiii. TRIM STATICS

- Window	700 - 2400 ms
- Model Trace	8 traces
- Maximum Statics	11 ms

xiv. TRACE MUTING

Offset (m)	205	210	1000	1550
Time (ms)	0	150	1000	1300

xv. CDP STACK, STACKING FOLD - 1200%

xvi. MIGRATION

Type	Finite Difference
Velocities	100% of Stacking

xvii. FILTER APPLICATION

Type	Bandpass, 8/12 - 65/75
Application	0 - 2500 ms

xviii. TRACE EQUALIZATION

Windows:	0 - 200 ms	100 - 300 ms	200 - 400 ms
	300 - 500 ms	400 - 600 ms	500 - 1500 ms
	1500 - 2800 ms		

xix. FINAL DISPLAY

- Vertical Scale:	7.5 inches/seconds
- Horizontal Scale:	12 traces/inch

1 inch = 150 meters

j. Geophysical Discussion

The 1991 Petitot seismic program conducted over the most northern part of the Presquile area was aimed at better defining the outline of the Middle Devonian Carbonate/M.D.C. platform edge along which lies the possibility of finding potential pools for hydrocarbon accumulation.

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k. Geological Discussion

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There has been no corresponding geological work (mapping, cross-sections, etc.) that has been done with regard to this seismic program.

1. The following maps and sections are forwarded along with this report.

i.	Shot Point Map Seismic	1 mylar, 3 paper copies
ii.	Shot Point Map Isochron	1 mylar, 3 paper copies
iii.	Shot Point Map Mac Structure	1 mylar, 3 paper copies
iv.	Shot Point Map Structure	1 mylar, 3 paper copies
v.	Normal Polarity Migrated Stack (all lines)	5 mylars, 15 paper copies
vi.	Reverse Polarity Migrated Stack (all lines)	5 mylars, 15 paper copies



E. L. Stanley, Geoph Ops



H. Andiarbowo

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H. Andiarbowo, Prof. Geoph.

