

PROGRAM NUMBER: 9229-S6-6E

YEAR: 1989

AREA: N.W.T. THINAHTEA

FILED UNDER: SAME

E.A.: N/A

OPERATIONS REPORTS:

NUMBER 1

-GEOPHYSICAL SURVEY REPORT ON THE THINAHTEA

INTERPRETATION REPORT

NUMBER 0

MAPS

SHOTPOINT MAPS

NUMBER 1

-SEISMIC BASE MAP ENCLOSURE # 1

INTERPRETATION MAPS

NUMBER 2

-TOP SLAVE POINT STRUCTURE

-TOP DEVONIAN KOTCHO TO TOP SLAVE POINT ISOCHEPON.

OTHER

NUMBER 1

-LINE A006600025

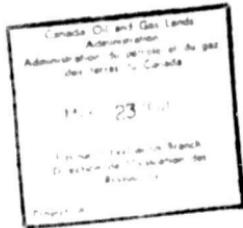
SEISMIC SECTIONS

NUMBER 6

MIGRATED STACK NORMAL POLARITY

A00660024
25
26
34
35
36

GEOPHYSICAL SURVEY REPORT
ON THE
THINAITEA PROGRAM, N.W.T.



LATITUDE : 60° - 60° 5' N
LONGITUDE : 119° 45' - 120° 15' W

9229-S6-6E

SUBMISSION TO THE
GOVERNMENT OF CANADA
FOR WORK CONDUCTED
IN 1989 BY
SHELL CANADA LIMITED

C.O.G.L.A. REPORT NUMBER 9229-S6-6E

SHELL CANADA LIMITED - EXPLORATION OPERATIONS
FEBRUARY 1990 D. L. LEAVY

GEOPHYSICAL SURVEY REPORT

C.O.G.L.A. REPORT NUMBER 9229 S6-7E

AREA NEAR THE INTERSECTION OF THE BORDERS OF
BRITISH COLUMBIA, ALBERTA and N.W.T.

YEAR OF WORK 1989

OPERATOR SHELL CANADA LIMITED

CONTRACTOR SONICS EXPLORATION LTD.

EXPLORATION AGREEMENT NONE

AUTHOR D. L. LEAVY

DATE FEBRUARY, 1990

APPROVED BY C. R. TIPPETT, P. GEOL.

C. R. Tippett

TABLE OF CONTENTS

I. INTRODUCTION	2
II. ACQUISITION	2
III. PROCESSING	3
IV. INTERPRETATION	3

TABLES

I. STATISTICAL SUMMARY.....	5
II. ACQUISITION	6
III. PROCESSING RUNSTREAM	7

FIGURE

I. LOCALITY MAP	1
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ENCLOSURES

I. SHOT POINT MAP	
II. STRUCTURE MAP ON THE TOP OF THE SLAVE POINT FORMATION	
III. ISOCRON BETWEEN THE TOP KOTCHO FORMATION AND THE TOP OF THE SLAVE POINT FORMATION	
IV. CORRELATED SEISMIC LINE A006600025	

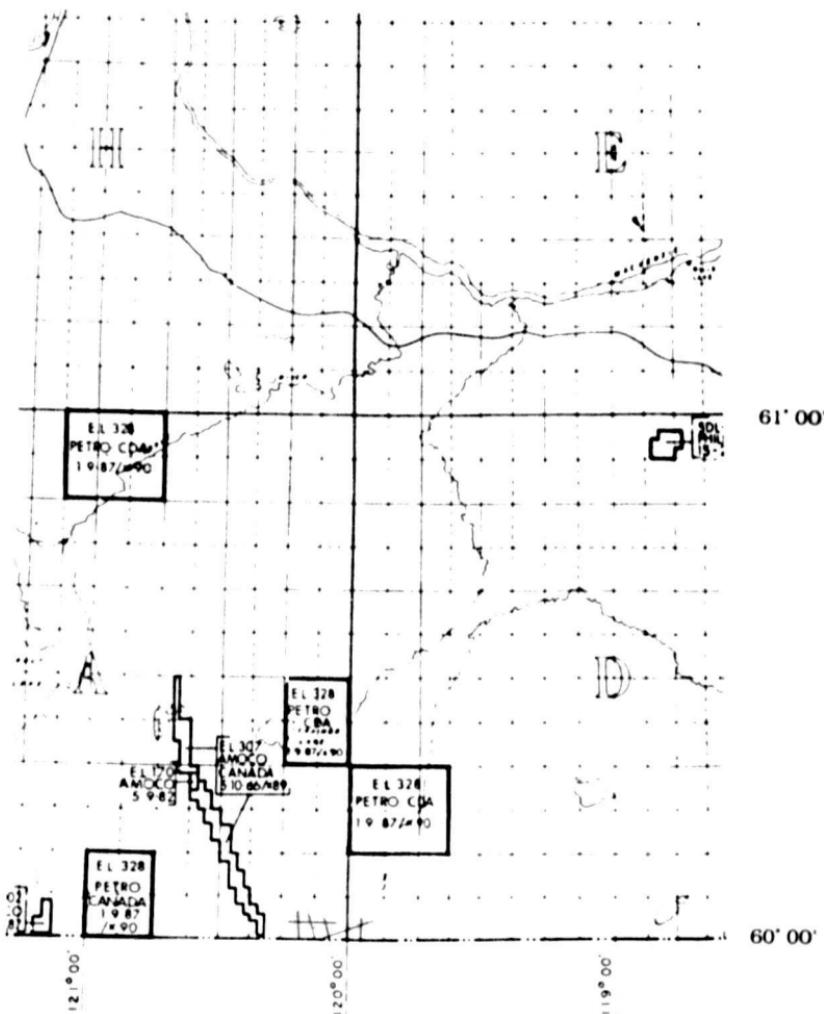


FIGURE 1

INTRODUCTION

This report describes the acquisition, processing and interpretation of seismic data shot during January to March 1989 by Sonics Exploration Ltd. for Shell Canada Limited (Shell), near the B.C., Alberta and N.W.T. border (see Figure 1). A total of 79.5 km² of 60 fold VIBROSEIS data were acquired by Shell in this area on Crown land as part of a regional study. A statistical summary of the program is shown in Table 1.

ACQUISITION

The acquisition parameters are summarized in Table 2. A split spread geometry was used with 60 channels on each side of the vibration point and a maximum offset distance of 1537 m. This distance corresponds approximately to the depth of the Slave Point Formation in this area. The VIBROSEIS records were correlated in the field and analyzed by Veritas Ltd. in Calgary to extract a refraction static solution.

The survey was done with a Sokkisha TM-20C theodolite with a Red 11 E.D.M. The relative accuracy maintained was 1:500 for horizontal measurements, and 1:2500 for vertical measurements. Controls used were Trig. Stations "Cordova" and "Vampire", B.C./Alberta border monuments #126-1 and #126-3 and A.S.C.M. 59118.20 AND 59118.280.

PROCESSING

The processing runstream is detailed in Table 3. Some comments to supplement Table 3 follow:

- KF filters were applied to remove strong direct and back scattered ground roll energy.
- A bad data zone was encountered on A006600026 between the subsurface points 11700 and 12900. On this portion of the line, statics had to be picked by hand in addition to the refraction and surface-consistent residual static work.
- The velocity analysis consisted of semblance measurements on common-velocity stacks of adjacent CDP's.
- The automatic statics routines employed cross-correlation in the CDP domain.
- To bring out high frequencies in the zone of interest, pre-stack and post-stack zero phase whitening filters were applied.

INTERPRETATION

The main targets in this area are various carbonate units of the Middle Devonian section as well as the Jean Marie carbonate units. On line A006600025 (see Enclosure IV) the tops of the Mississippian Banff Formation, Devonian Kotcho Formation, Devonian Jean Marie Formation, and Devonian Slave Point Formation together with the base of the "alpha

"marker" have been coloured. A structure map on the top of the Slave Point Formation (Enclosure II), was derived from a regional map on the top of the Kotcho Formation, the time interval from the top of the Slave Point Formation to the top of the Kotcho Formation (from the seismic data) and a velocity of 3875 m/sec for that interval. This interval velocity is consistent with well information in this area.

The structure on the top of the Slave Point Formation and the isochron to the top of the Slave Point Formation (Enclosure II and III) both show some minor anomalies in this area. We believe that this data indicates that there are no major reefal buildups in the Jean Marie Formation along these seismic lines. Thin zones of porosity in the Jean Marie Formation cannot, however, be ruled out.

TABLE 1 STATISTICAL SUMMARY

MOBILIZATION	JANUARY 9, 1989
COMMENCEMENT	JANUARY 10, 1989
TERMINATION	MARCH 1, 1989
DEMOBILIZATION	MARCH 1, 1989
# TECHNICAL PERSONNEL	2 (ALBERTA residents)
# NON-TECHNICAL PERSONNEL	34 (24 from BRITISH COLUMBIA 1 ALBERTA and 9 N.W.T. residents)
DISTANCE SURVEYED	79.5 km
TIME LOST	NONE
WEATHER	NORMAL FOR TIME OF YEAR

TABLE 1, STATISTICAL SUMMARY

TABLE 2 ACQUISITION PARAMETERS

INSTRUMENT	DFSV - 828
INSTRUMENT FILTER	180 HZ, 72 db/oct, NO LOW CUT
RECORD LENGTH	3 sec
SAMPLE INTERVAL	2 ms
STATION SPACING	25 m
GEOPHONES	LRS 1011, 14 HZ
GEOPHONE ARRAY	12 phones over 25 m
TYPICAL SPREAD	

	VP		
	↓		
TRACE 1	60	61	120
	-----	-----	-----
-1537.5	-62.5	62.55	1537.5

VP spacing	25 m
VIBE ELECTRONICS	PELTON ADVANCE 1 MODEL V
CORRELATOR	CALDER FCSSA
VIBRATOR	MERTZ 18 BUGGIES
# OF VIBRATORS	3
SWEEPS PER VP	4
SWEEP LENGTH	16 sec
SWEEP FREQUENCIES	6-67 HZ
TAPER	0.2 sec up and down taper
LISTEN TIME	3 sec
HIGH - FREQ. EMPHASIS	6 db/oct
SOURCE ARRAY	27 m CENTERED at VP

TABLE 2 ACQUISITION PARAMETERS

TABLE 3 PROCESSING RUNSTREAM

DEMULITPLEX

IDENTING AND REFRACTION STATICS DONE BY VERTAS

DESPIKE

RESAMPLE TO 4 ms

APPLY ZERO PHASE ANTI ALIAS FILTER, 3 db down at 95 HZ

EDIT BAD TRACES

GAIN RECOVERY : $G(t) = (t \cdot e^{xx} 1.1) t$ KF FILTER : ON SHOTS with velocity \pm 1500 m/sec

DEABSORPTION

DECONVOLUTION : ZERO PHASE WIENER DECONVOLUTION

DERIVE GATE : 400-1500 ms

APPLY GATE : 400-3000 ms

FILTER LENGTH : 120 ms

SURFACE CONSISTENT RESIDUAL STATIC CORRECTIONS:

: gate : 500-1300 ms

: max. shift : 28 ms

MULTIPI! E MODELLING AND REMOVAL

: MODEL WINDOWS : 600-1700 m/sec

SECOND PASS SURFACE CONSISTENT STATICS

: gate : 500-1300 ms

: max. shift : 20 ms

APPLY RESIDUAL STATICS, NMO CORRECTIONS, and MUTE PATTERN

MIGRATION: : WAVE EQUATION (KIRCHOFF)

100% STACKING VELOCITIES

POST STACK WHITENING

: ZERO PHASE WIENER DECONVOLUTION
with 0.01% noise.

FILTERED: : 15 to 65 HZ

DISPLAY SCALE: : HORIZONTAL SCALE: 12 traces/in

: VERTICAL SCALE: 7.5 in/sec

TABLE 3 PROCESSING RUNSTREAM (Continued)

MUTE PATTERN

X 1	=	200 m	T1	=	0 ms
X 2	=	201 m	T2	=	200 ms
X 3	=	1550 m	T3	=	900 ms
DATUM:	550 m	CORRECTION VELOCITY		3050 m/sec	

STACKING VELOCITIES : LINE A006600025

SSP 4350		SSP 5200	
Veff	TIME	Veff	TIME
2231	132	2242	108
2540	240	2485	244
2615	272	2726	356
2800	364	3079	488
3024	488	3406	580
3524	664	3649	664
3	1004	3603	992
3754	1112	3819	1100

SSP 6050

SSP 6050		SSP 6900	
Veff	TIME	Veff	TIME
2095	51	2006	88
2629	283	2576	352
2739	375	2783	432
2955	475	2897	468
3585	663	3414	570
3600	998	3419	640
3781	1055	3603	895
3981	1101	3622	991
		3865	1084

TABLE 3 PROCESSING RUNSTREAM (Continued)

SSP 7750		SSP 8600	
Veff	TIME	Veff	TIME
2000	72	1880	94
2612	264	2560	262
2831	316	2611	318
3047	476	2951	486
3231	532	3179	549
3499	584	3508	602
3593	948	3584	634
3866	1072	3734	946
		3954	1074
SSP 9450		SSP 10 300	
Veff	TIME	Veff	TIME
1925	85	2051	114
2432	253	2453	271
2586	357	2585	379
2800	437	2840	475
3442	625	3461	607
3550	885	3583	659
3581	957	3593	967
3866	1073	3769	1099

TABLE 3 PROCESSING RUNSTREAM