PROGRAM NUMBER: **9229-86-6E**

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 ISOCHRON.

OTHER **NUMBER 1**

-LINE A006600025

SEISMIC SECTIONS **NUMBER 6**

MIGRATED STACK NORMAL POLARITY

A00660024
25
26
34
35
36

GEOPHYSICAL SURVEY REPORT
ON THE
THINAHTEA 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.

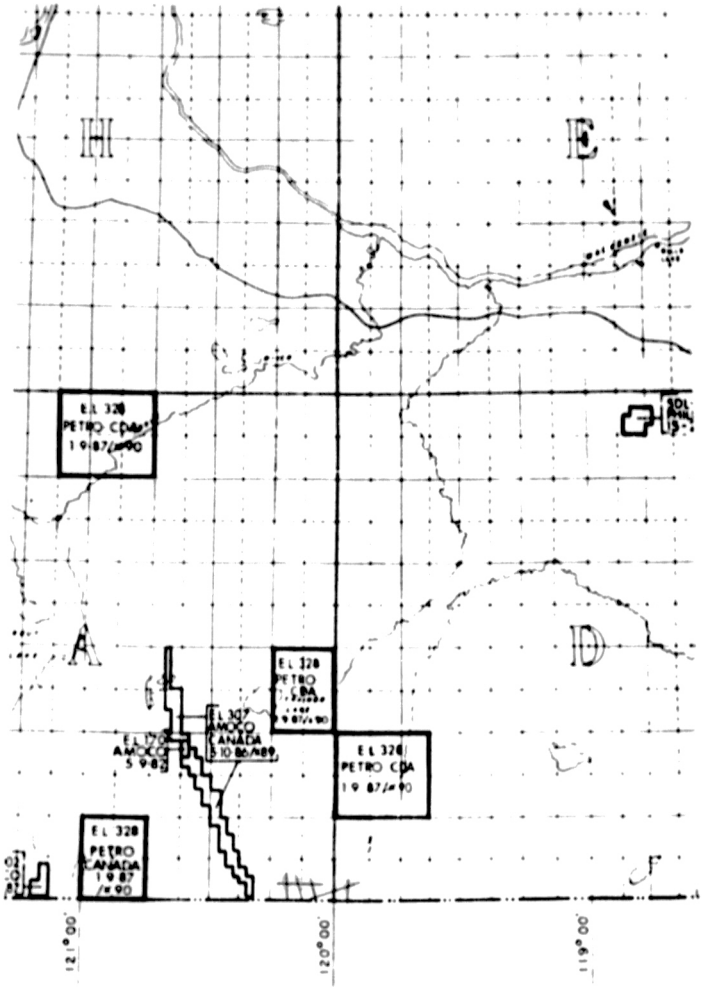
Clifton R. Tippett

TABLE OF CONTENTS

TABLES

FIGURE

ENCLOSURES



THINAHTEA PROGRAM

LOCALITY MAP

SCALE: 1:1 000 000

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 km 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.

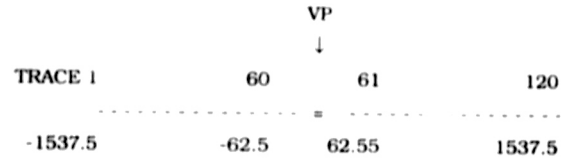
TABLE 1 STATISTICAL SUMMARY

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 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 3 PROCESSING RUNSTREAM

DEMULTIPLEX			
IDENTING AND REFRACTION STATICS DONE BY VERITAS			
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 e xx 1.1 t)	
KF FILTER	:	ON SHOTS with velocity ± 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
MULTIPLE 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

Veff	TIME
2231	132
2540	240
2615	272
2800	364
3024	488
3524	664
3601	1004
3754	1112

SSP 5200

Veff	TIME
2242	108
2485	244
2726	356
3079	488
3406	580
3649	664
3603	992
3819	1100

SSP 6050

Veff	TIME
2095	51
2629	283
2739	375
2955	475
3585	663
3600	998
3781	1055
3981	1101

SSP 6900

Veff	TIME
2006	88
2576	352
2783	432
2897	468
3414	570
3419	640
3603	895
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