

**1995 NETLA**  
**SOUTHERN NORTHWEST TERRITORIES**  
**REFLECTION SEISMIC REPORT**

**SUBMISSION TO THE**  
**GOVERNMENT OF CANADA**  
**FOR WORK CONDUCTED**  
**IN 1995 BY**  
**SHELL CANADA LIMITED (OPERATOR)**

**NATIONAL ENERGY BOARD PROGRAM NUMBER N94B343**  
**(9229 - S6 - 9E)**

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**SHELL CANADA LIMITED**

**1995 NETLA 2D  
REFLECTION SEISMIC REPORT**

<b>NEB Program Number</b>	N94B343 (9229 - S6 - 9E)
<b>Exploration Agreement</b>	367
<b>Report Name:</b>	1995 NETLA 2D REFLECTION SEISMIC REPORT
<b>Survey Type:</b>	2D Reflection Seismic
<b>Survey Location</b>	Latitude 60°40' - 60°50' N Longitude 122°30' - 123°00' E
<b>Name of Program Operator</b>	Shell Canada Limited
<b>Name of Prime Contractor</b>	Geco - Prakla - a division of Schlumberger Canada Limited
<b>Specific Interests Involved</b>	100% Shell Canada Limited
<b>Author:</b>	A.D. Adrian, P. Geoph
<b>Signed</b>	_____
<b>Date</b>	May 14, 1996

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## 1.0 INTRODUCTION

Two 2D seismic reflection surveys were conducted for Shell Canada Limited in the Southern Northwest Territories (in the Ft. Liard area) in February and March of 1995 by Geco-Prakla (a division of Schlumberger Canada). Shell party 68, over Shell's exploration licences E.L. 367 and E.L. 369. The program acquired approximately 175 kilometers of 2D seismic reflection data. Figure 2 shows the location of the program in the Netla area and enclosure 1 shows the location of the new data in both the Netla and Bovie areas. In the logistical statistics, the seismic program around E.L. 369 are included as the two areas were shot by the same crew at the same time.

The program was designed to investigate the prospectivity of E.L. 367 in an area where trade lines could not be acquired. The topography around the Netla program consisted of tree-covered rolling hills with some muskeg areas in the west part of the program.

Weather conditions were very favorable during the acquisition of the program and zero days were lost due to weather.

The seismic data was processed in house by Shell Canada. The data, along with some older vintage seismic lines and recently and previously purchased trade lines, which were all reprocessed, were loaded into a Landmark workstation for interpretation. Location of the recently purchased trade lines and older vintage seismic which were also used is also shown on enclosure 2. Total kilometers shot and purchased are tabulated in Table 1.

A depth map of the top of the Middle Devonian Carbonate was made and the position of the Devonian Slave Point buildups were interpreted.

## **2.0 STATISTICAL SUMMARY**

### **2.1 Job History (EL 367 and EL 369)**

Feb 01	- Party Manager arrives onsite
Feb 08	- Bulldozing begins
Feb 20	- Surveyors begin
Feb 27	- Recording begins
Mar 18	- Bulldozing complete
Mar 27	- Surveyors complete
Mar 27	- Recording complete
Mar 28	- Demobilization

### **2.2 Weather / Terrain Conditions / Downtime Factors**

Weather conditions were very favorable during the acquisition of the program and zero days were lost due to weather

### **2.3 Production Statistics (EL 367 and EL 369)**

Number of Profiles Shot	5758
Number of Days Production	29
Number of Kilometers recorded	173.0
Number of Weather Days	0
Average Daily Production	6.0 km

## **2.4 Northern Benefits (EL 367 and EL 369)**

Shell Canada's policy is to utilize regional and local suppliers of goods, services and manpower, provided local businesses are competitive and manpower is available. Shell requires its contractors to operate while under Shell contract in the same manner and monitors its contractor performance in these areas. With the exception of the major seismic crew contract, Shell did not solicit bids but negotiated with local contractors to supply support services. Local manpower requirements were coordinated through the local employment representatives. A total of 22 local residents were employed with the seismic contractor, line clearing contractor and catering contractor and made up 36% of the manpower requirements. A total of 6 local businesses provided goods and services to the operations.

## **3.0 SAFETY PROGRAM**

All personnel were required to attend a safety orientation meeting prior to commencement of work. Safety meetings were held weekly for all personnel.

All new personnel and visitors were given safety orientation as well before going to the field. Copies of all of these meetings were forwarded to Shell.

Safety committees and emergency response plans were set up for the camp. Periodic inspections of the camp and equipment were made by the various committees and any findings were brought forward and discussed at safety meetings to correct any hazards.

All safety related events and statistics were administered by Shell Canada. They have been forwarded to the National Energy Board March 28, 1995.

## 4.0 SURVEY PROCEDURE

Positioning for the shot and receiver points employed the use of conventional survey techniques. Total Stations were used to obtain survey measurements of all grade breaks and shot/receiver points. Control for the survey was established using GPS receivers. GPS positions were established at the start and end points of all lines. Previously established Federal government control stations were used as the reference and three dimensional positioning (Northing, Easting and Height) were computed. All survey positions were transformed to NAD 27.

Absolute horizontal accuracy obtained was 3 metres radial at 2 sigma, with a relative accuracy between receiver points of 0.1%. Absolute vertical accuracy obtained was 1 metre with a relative accuracy between receiver points of 0.5 meters.

## 5.0 SEISMIC DATA ACQUISITION

Details of the seismic data acquisition parameters are outlined below. Refer to Figure 1 for the schematic of the acquisition geometry.

### **INSTRUMENT**

Model	IO System II
Number of channels	400
Sample Interval	2 ms
Record Length	4.0 sec
Low-cut Filter	3 Hz (-12 dB / octave)
High-cut Filter	188 Hz
60 Hz Notch	Out
Tape Format	SEGD

### **GEOPHONES**

Model	OYO Geospace 20DX
Frequency	14 Hz
Damping	70%
Pattern	12 inline, centered on station
Spacing	1.4 m deployed evenly over 15 m



## 5.0 (con't)

### **SOURCE:**

Non-linear sweep  
6 - 84 Hz

### **VIBROSEIS**

### **ACQUISITION GEOMETRY** (refer to figure 1)

receiver interval	15 m
source interval	30 m

## 6.0 SEISMIC DATA PROCESSING

Listed below is the data processing sequence as applied to the seismic data acquired or reprocessed.

- demultiplex, ident and calculate refraction statics. (C & C Systems)

Datum: 735 metres

Replacement Velocity: 2700 m/sec

- reformat to Shell format
- resample, anti-alias filter
- apply refraction statics
- gain recovery
- trace edits
- surface consistent residual statics
- KF Filter
- deabsorption
- surface consistent deconvolution
- surface consistent residual statics
- velocity analysis
- surface consistent residual statics
- dip moveout correction
- cmp stack
- Kirchhoff migration
- post stack whitening
- post stack frequency and phase filtering
- display        hor scale 1:20000  
                  vert scale 7.5 ips

## 7.0 INTERPRETATION

The newly acquired seismic data, along with some older vintage lines, recently and previously purchased (trade lines) which were all reprocessed) were loaded into a Landmark workstation for interpretation. The major horizons were transferred from nearby well synthetics to the seismic and then picked. The principal formation of interest was the Middle Devonian Carbonate.

A depth map of the top of the Middle Devonian Carbonate was produced using a layer stripping method of depth conversion. The velocities used for the depth conversion are in Table 2 and were derived from nearby wells. The depth values were matched exactly to the wells via back interpolation of the calculated depth values.

The position of the edge of the Slave Point buildup was interpreted using a number of criteria including difference in time thickness of the Middle Devonian carbonate section and the difference in time thickness of the Devonian Fort Simpson shales.

As of yet, no drilling locations have been identified.

**Table 1 Seismic Line Acquisition and Purchase for EL 367**

New seismic program shot in 1995, NEB program number 9229-S6-9F:

Seismic Line Number	Total kms shot	Allowable kms (within 3kms)
A006800093	12.5	11.4
A006800094	11.7	11.7
A006800095	12.3	12.2
A006800096	13.5	13.5
A006800097	11.8	11.8
<b>Total</b>	<b>61.8</b>	<b>60.6</b>

**Trade Lines Purchased for Reprocessing**

Seismic Line Number	Total kms shot	Allowable kms (within 3kms)
AT00101758	14.6	6.7
AT00101759	21.85	8.9
AT00101760	14.75	3.6
AT00101761	32.8	20.9
AT00101762	19.8	17.6
AT00101763	19.8	0.0
AT07801072	19.2	19.2
AT10001958	53.7	23.1
<b>Total</b>	<b>196.5</b>	<b>100.0</b>

**Table 2 Velocities used for Depth Conversion**

Geological Formation	Interval Velocity
Replacement velocity	2600 m/s
Cretaceous	2600 m/s
Permian/Mississippian Mattson	4900 m/s
Mississippian Flett	3750 m/s
Mississippian Banff	3200 m/s
Devonian Ft. Simpson shales	3400 m/s
Devonian Jean Marie	5860 m/s

## Figure 1 Seismic Line Acquisition Spread Geometry

200 x 200 Split Spread Geometry

Near Offsets: 7.5 m

Far Offsets: 2992.5 m

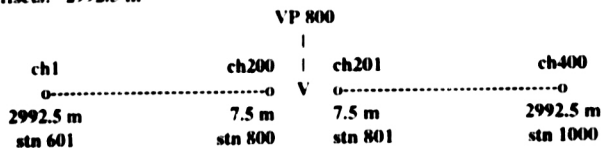
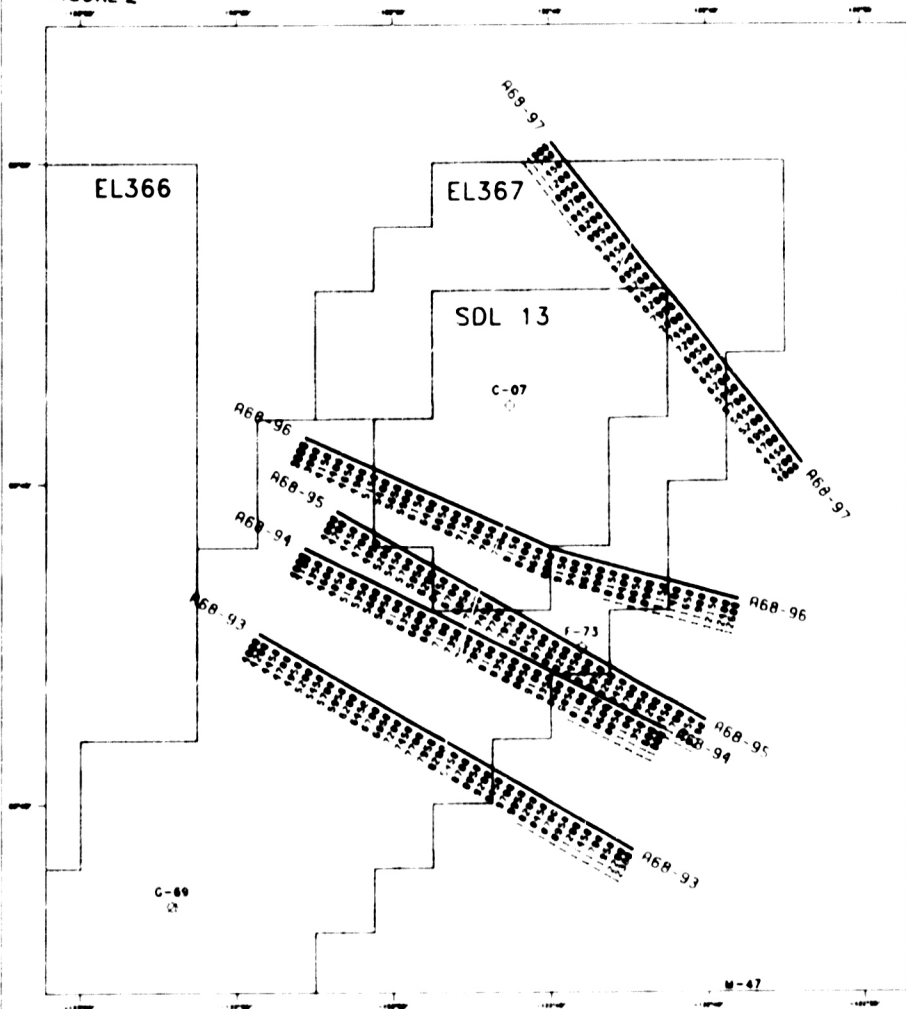


FIGURE 2



0 1 2 3 4 5 6 7 8 9 10  
KILOMETERS  
0 1 2 3 4 5 6 7 8 9 10  
STATUTE MILES

SHELL CANADA LIMITED	
CALGARY, ALBERTA	
E.L. 367 - AFTER (SOUTHERN UNIT)	
1995 2D SEISMIC SURVEY	
LOCATION MAP	