Report On The

REFLECTION SEISMOGRAPH SURVEY

In The

TEDJI AREA, N.W.T.

66°30' to 68°00N, 125°00 to 128°W

9229 - F9 - 2E

For

Forward Resources Ltd.

By

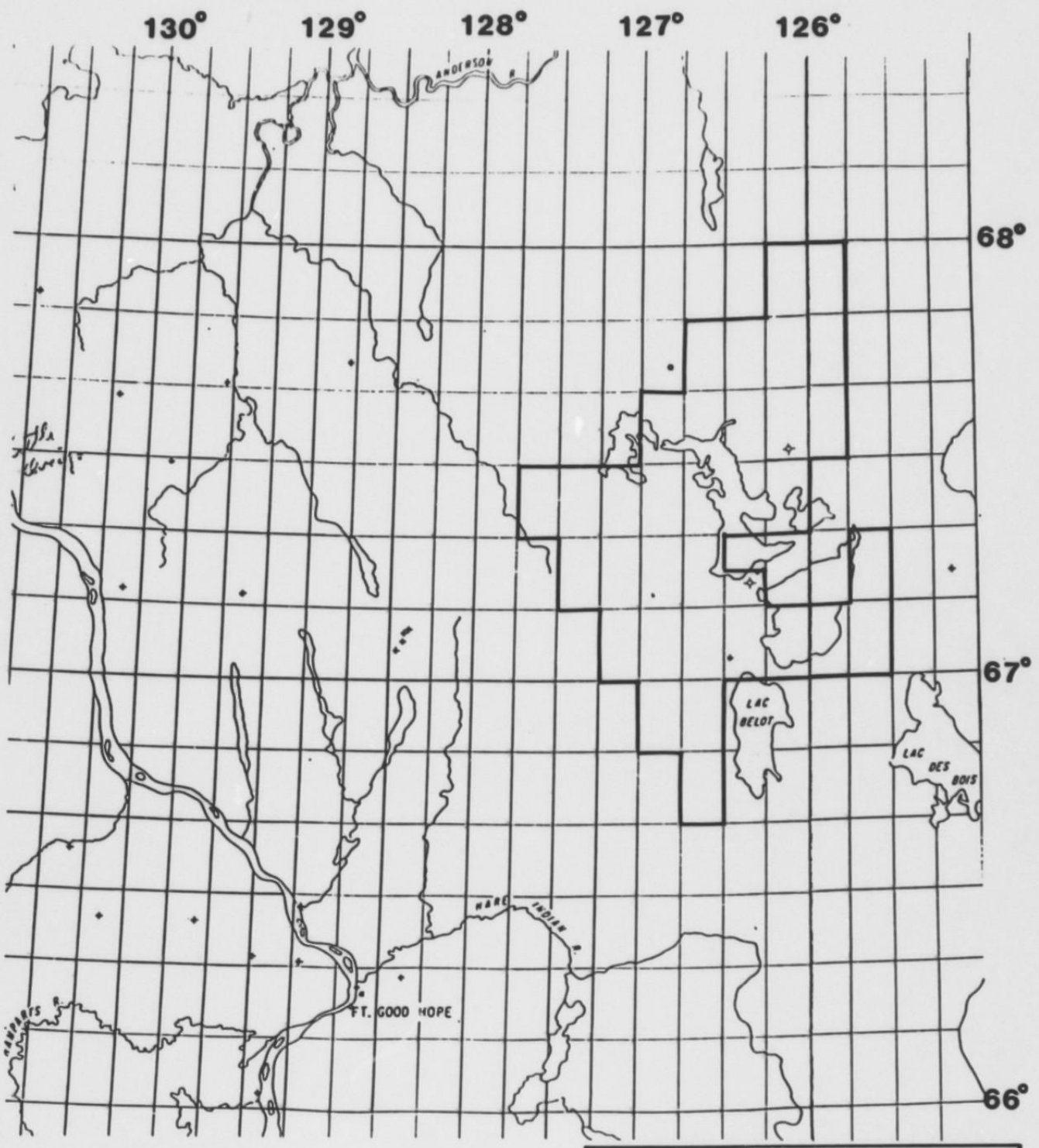
Petrel Consultants Ltd.

August 1983

Land Use Number N82B773

Cogla Program Number 9229-F9-2E

J.D.T. Crane



FORWARD RESOURCES LTD.

TEDJI AREA

OCTOBER 24, 1983

PETREL CONSULTANTS LTD.

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List of Enclosures

Maps - Base of Franklin Mountain Structure in time.
- Lower Mt. Cap Structure in time.
- Middle Mt. Cap to Proterozoic isochron.

Section

- Stratigraphic cross section C-D.

INTRODUCTION

The Tedji prospect of the N.W.T. lies between 66°30' and 68°00 latitude and 125°00 and 128°00' longtitude. Existing seismic data obtained from Dome Petroleum Limited and Petro-Canada Exploration Inc. were interpreted and maps dated January 1983 were completed by Petrel Consultants Ltd. The 375 mile (603.9 km) seismic program shot during 1983 by Forward Resources Ltd. was incorporated and an interpretation prepared as outlined below.

Data Base

Data shot by Forward consisting of 603.9 km of 1200% dynamite shooting was incorporated with the following existing data to form the data base.

(i) KGHA lines - shot in 1975* for Ashland Oil
(ii) 75 PF/MG W lines - shot in 1975* for Petrofina
(iii) FN lines - shot in 1973 for Canadian Fina
(iv) KGG lines - vibroseis data recorded in 1972 for Sigma Exploration
(v) KGF lines - shot in 1975* for Ashland Oil
(vi) FR lines - shot in 1983 for Forward Resources

*sections are dated 1975 but may have been recorded earlier.

The 1983 data is clearly superior to the older work in terms of resolution, processing and display. The KGG vibroseis data was difficult to incorporate because of a lack of proper static corrections, different time scale, and the usual character difficulties encountered in incorporating vibroseis with dynamite shooting. This data was not incorporated into the structural interpretation except in limited areas. The remaining data is of comparable quality and is generally quite good although lacking the quality and potential of the 1983 shooting.

There is some concern regarding the structural relationships between the data sets and within some data sets as well. Various adjustments were necessary in order to tie the data although a similar reference elevation was used. This is probably due primarily to different methods of structural static computations used in the processing of the different data sets. The structural picture over particular features is reliable to within ±10 ms and over the area many errors have been smoothed out over a number of kilometres. The only area of concern would be in going from the west to east side of Aubrey Lake where corrections of ±20 to ±25 ms were required to tie the data on the east side.

Regional Geology

The geologic section in the area consists of Proterozoic sands and shales, Cambrian sands, shales and evaporites overlain by Ordovician and Silurian limestones and dolomites. In some parts of the area some limestones of Devonian age are present while Cretaceous sands and shales rest unconformably on the Paleozoic surface. Several unconformities occur within the section; between Lower and Upper Ordovician and between Ordovician and Devonian. The area has experienced considerable block and strike-slip faulting which is felt to be basement controlled. Many of these faults were probably active at various times throughout geologic history.

The main target is the basal Cambrian sand identified as Mount Cap (Old Fort) in the Tedji well but Mount Clark in areas to the east. Oil staining is noted throughout the area.

Interpretation

Reflections were identified at the Ashland Tedji K-24 and at the Pex-Gulf-Fina Colville L-21 wells. Four reflectors were interpreted in the area.

1. Base of Franklin Mountain Carbonate (red on sections) - This event is the first strong event encountered. It was carried over the entire area and was consistent in character with the exception of a questionable area north of Tedji Lake

2. Base of Salt (orange on sections) - The Colville L-21 well provided a tie to this event. Although 166 feet of salt is present at Tedji K-24 no reflection is present at the Base of Salt. This may be due to a thinner salt section than at other parts of the area and thereby a distortion of the reflection as well as a lack of good quality data over the structure. This event is quite strong in places while in others it is not noted.

3. Upper Mount Cap (green on sections) - This event is generally continuous throughout the area. Its source is within the upper portion of the Mount Cap, probably from a carbonate member. It is generally conformable with the Base of Salt pick although there are some areas where thickening and thinning between the two occurs (See FR-18).

4. Lower Mount Cap (blue on sections) - This event, in addition to ties at the Tedji K-24 and Colville L-21 wells, is well defined by being the first continous horizon unaffected by the Post-Proterozoic Unconformity which is quite angular over much of the Tedji area. The upper peak (above the trough coloured blue) is very continuous over the area and its continuity is generally not disrupted by the unconformity.

5. Proterozoic (yellow peak on sections) - This reflector is quite variable in character and continuity but is important in that it illustrates basal paleo-topography.

The following maps were prepared:

a) Base of Franklin Mountain Carbonate Structure Map,

b) Lower Mount Cap Structure Map,

c) Middle Mount Cap to Proterozoic isochron.

Prominent structural features which appear on both the Base of Franklin Mountain Structure and Lower Mount Cap Structure maps include the Tedji structure with its two separated areas of closure; the structure drilled by the Colville L-21 well and the high trend across the southwestern part of the area which apparently culminates at the Mobil Belot Hills M-63 well. In general, the Base of Franklin Mountain is somewhat smoother, the Lower Mount Cap being more affected by older faulting and variations due to its proximity to the unconformity (See FR-20).

Regarding the structure maps, the qualifications noted earlier regarding the static correction difficulties must be kept in mind as well as the fact that considerable velocity variations are to be expected in the area due to differences in drift accumulation and in salt thickness.

The Base of Franklin Mountain Carbonate to Lower Mount Cap Isochron as noted on sections illustrates the marked thinning in this section and is indicative of salt thickness changes.

The large regional ridge mapped by previous geologists and called the "Tedji" ridge is noted especially on the isochron map (Middle Mt. Cap to Proterozoic) as an area delineated by values between 020 and 030 seconds. Essentially this extends across the eastern part of the block and includes all 4 wells previously drilled. In areas thicker than .030 seconds we feel that a thicker basal sand (Mount Cap or Old Fort) would exist. The most prospective areas are those marked (.050 seconds) which coincide with high structures. In efforts to age date the structuring an examination of the Base of Salt to mid-Mount Cap isochron on the sections was made. Individual values vary but generally where this interval is less than .050 seconds (green to blue) we consider the structure to be "old". The relief on this interval is less than .005 seconds and the interval has not been mapped.

Three areas of interest are noted:

1. Ewakka, N-20 in Block 67˘40'N, 126˘30'W (67˘39'55'N, 126˘33', 30") on SP 303 on line FR-26.

This is a recommended drilling location. The feature is shown as a fault bounded structural high closure on all horizons offsetting to the southeast the Tedji producer. A slight increase in basal sand thickness is postulated.

2. Aubry, J-13 in Block 67˘20'N, 126˘45'W (67˘12'30'N, 126˘47'50'W) SP 645 on line FR-20.

This location is noted on one line only (line FR20) and additional seismic program is proposed for this area. The area lies within a thicker Mr. Clark basal sand prospect on a structural high.

3. South half of Block 67˘40'N, 126˘15'W.

This area appears to have a thicker sand unit as shown on the middle Mt. Cap to Proterozoic isochron map. As well, a coincident high structure is noted. A detail seismic program is proposed for this area.

Conclusions and Recommendations

The Tedji area has been tested by 4 wells all having been drilled on the Tedji ridge. An extensive area of thicker Cambrian Mt. Clark sand is postulated to the west and south of the ridge as shown by the Middle Mt. Cap to Proterozoic isochron map by contours greater than .030 seconds. This in conjunction with high structural anomalies constitute a valid exploration play. It was recognised that older structures (ie. Cambrian in age) would

be more prospective in that hydrocarbon migration may have occurred prior to Laramide structuring. Efforts to illustrate older structures were made by using thin isochron intervals but these were non-conclusive. Paleotopography on the Proterozoic was used in predicting basal sand thickness.

A test well is recommended at Ewakka N-20 while additional seismic shooting is proposed over the leads developed in the study. This program is shown on the enclosed map.

APPENDIX A
FIELD PARAMETERS
TEDJI

Recording

Sample Rate	2 milli seconds
Record Length	3 seconds
Recording Filter	9/18 - 125 Hz
Sub-surface Coverage	1200%
Number of Groups	96 trace
Group Interval	33.5 metres
Geophone Array	9 at 3.7 metres
Seismometers per Group	9
Shot Point Location	134 metres
Spread	1608-33.5-0-33.5-1608m
Holes per Location	1
Hole Depth	10 metres
Dynamite Charge	2 kg
Instruments	MDS-10

APPENDIX B

STATISTICAL DATA

Dates

Mobilization Date.....January 28/83

Start of Recording.....February 6/83

Completion of Recording.....March 31/83

Demobilization Date.....April 1/83

PRODUCTION

Recording

Total operating days.....59

Total recording days.....41

Total moving days..... 5

Total weather days..... Ø

Total testing days..... Ø

Total down days..... 1

Kilometres shot.....603.971

Kilometres per production day.....13.13 km average

Total days moving mob/demob..... 7

Drills started February 1/83.

APPENDIX C
EQUIPMENT AND PERSONNEL

Vehicles

Number	Use
1	Party Manager
1	Party Manager/Rec. Shift
1	Recorder
1	Shooting
4	Cable Trucks

Number	Use	Type
1	Survey Truck	
1	Drilling Rig	
5	Drilling Rigs	
1	Drilling Rig	
2	Camp Water Trucks	
1	Drill Water Truck	
2	Mobile Shops	
1	Expediter Truck	
1	Supply Truck	
3	Survey Snowmachines	
1	3000 Gallon Fuel Truck	

Camp - Drilling

1	Kitchen - Diner
1	Utility
1	Office-Sleeper
2	Sleepers
1	Power-Shop-Storage
2	Fuel Sloops (6000 gallon)
1	Powder Magazine
1	Incinerator

Camp - Recording

1	Kitchen - Diner	Sleigh mounted
1	Power-Shop-Storage	Sleigh mounted
1	Utility-Sleeper	Sleigh mounted
2	Sleepers	Sleigh mounted
2	Fuel Sloops (6000 gallon)	Sleigh mounted

DOZER CREWS

5	D7F Caterpillar Tractors	c/w hydraulic blades
1	D6D Caterpillar Tractor	winch and mushroom shoes
1	Bombardier	Foreman's vehicle
1	FN-60 Nodwell	Cat Push's vehicle
1	Evinrude Snowmachine	Cat Push's vehicle

Camp

1	Kitchen-Diner-Utility	Sleigh mounted
1	Sleeper	Sleigh mounted
1	Shop-Power Unit	Sleigh mounted
2	Fuel Sloops (6000 gallon)	Sleigh mounted

Fuel Haul Camp

1	Kitchen-Diner-Sleeper-Power Unit	Sleigh mounted

APPENDIX D

The processing sequence used by Geo-X Systems Ltd. for the FR series of lines is as follows:

1. Digital conversion - .002 sec.
2. Amplitude recovery
3. Time variant deconvolution
4. Structural corrections
5. Moveout
6. Scaling
7. Statics - surface stack
8. Display
9. Trace kills
10. Statics analysis
11. Final moveout
12. Cross correlation statics
13. Mute
14. 1200% gather
15. Stack
16. Filter 18/25 - 85/100
17. Equalization
18. Amplitude coherency enhancement
19. Final display