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PROGRESS REPORT
ON
R.G. BELFOI P & NG. PERMITS NO.
4541 - 4552 (inc) and 4598, 4599
HORN MOUNTAIN AREA, NWT
DECEMBER, 1966

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WESTERN  DECALTA

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ILLUSTRATIONS

Figure 1 Structure Contour Map, Top of Limestone
(Pine Point Formation) Horn Mountain Area
NWT. after text.

PROGRESS REPORT

R.G. Belfoi P & NG. Permits No.
4541 - 4552 (inc) and 4598, 4599

4698 4699

14

Horn Mountain Area, NWT

INTRODUCTION

In November and December 1966, Western Decalta Petroleum Limited and Selco Exploration Co. Ltd. undertook a structure test and stratigraphic program in the Horn Mountain Area. The program was under the supervision of D.L. Campbell of Western Decalta Petroleum Limited and V. Wierzbicki of Selco Exploration Co. Ltd.

A Heli-Drill developed and operated by Big Indian Drilling Co. Ltd. of Calgary, Alberta was used for drilling the shallow holes. Transportation in the field of rig, camp supplies and personnel was by a Bell 204B helicopter operated by Bullock Helicopter Company, Calgary, Alberta. A Cessna 180 aircraft operated by Carter Air Service, Hay River was used on a number of occasions.

The original program was to drill seven shallow (300' - 400') holes in the general area east and north of the Horn Mountains. Unforeseen problems such as mechanical failures, hole conditions and the expense of moving the drilling rig camp etc. from location to location resulted in restricting the program to three locations.

GENERAL GEOLOGY

A brief description of lithology and thickness of the formations penetrated by the drill is presented below.

Table of Formations

<u>Period</u>	<u>Formation</u> and <u>Thickness</u> (feet)	<u>Lithology</u>
Quaternary	Glacial drift (0 - 124)	Clay & sand.
Devonian	Horn River (79 - 160)	Shales, medium to dark grey, calcareous, bituminous and minor Limestone, finely crystalline, argillaceous.
	Pine Point 128 ±	Limestone medium brownish grey to dark brown, argillaceous, often bituminous, tight.
	Keg River 45 +	Dolomite, very finely granular, vuggy, oil stained in part, porous.

Geological Summary

Well:	R.G. Belfoi 1-66	
Location:	Long. 117° 40'	Lat. 62° 12'
Elevation:	655±	msl
Markers:	Horn River shale*	35'
	Pine Point limestone	180' (+475' msl)
	Total Depth	281'
Well:	R.G. Belfoi 2-66	
Location:	Long 117° 33'	Lat. 62° 14'
Elevation:	655±	
Markers:	Horn River shale*	#1 12'
	Pine Point limestone	109'
	Keg River dolomite	225' (+558' msl)
	Total Depth	270'
Well:	R.G. Belfoi 2B-66	
Location:	Long. 117° 33'	Lat. 62° 14'
Elevation:	655±	
Markers:	Horn River shale*	14'
	Pine Point limestone	104' (+551' msl)
	Total Depth	114'
Well:	R.G. Belfoi 3-66	
Location:	Long. 117° 55' 20"	Lat. 62° 17' 50"
Elevation:	710±	
Markers:	Horn River shale*	124'
	Pine Point limestone	284' (+426 msl)
	Total Depth	358'

* Top Bedrock

LITHOLOGICAL DESCRIPTION

Permit 4542
R.G. Belfoi 1-66

Long. 117° 40' Lat. 62° 12'

Grd. Elev. 655± msl

0 - 35	Glacial drift.
35 - 40	Shale, light grey, calcareous, hard.
40 - 50	Shale, dark grey, bituminous, hard, minor pyrite.
50 - 60	Shale as above.
60 - 70	Shale as above, some slickensiding.
70 - 80	Shale as above with some minor gilsonite and minor calcite stringers.
80 - 90	Shale as above becoming slightly calcareous.
90 - 100	Shale as above.
100 - 110	Shale as above.
110 - 120	Shale as above.
120 - 130	Shale as above with shale, medium brownish grey, very calcareous and Limestone, medium brownish grey, finely crystalline, bituminous, tight.
130 - 140	Limestone as above.
140 - 150	Shale, medium to dark grey slightly calcareous, bituminous, hard, minor pyrite (some well disseminated.)
150 - 160	Shale as above.
160 - 170	Shale as above
170 - 180	Shale as above.

Top Limestone 180 (+475)

180 - 190	Limestone, buff to medium brown, finely crystalline, essentially tight.
190 - 200	Limestone as above with thin calcite stringers which are medium crystalline, some medium crystalline calcite intermixed with finely crystalline brown limestone present.

200 - 210 Limestone, medium brown, finely crystalline, tight.

210 - 220 Limestone as above, with some small brachiopods.

220 - 230 Limestone as above.

230 - 236 Limestone as above.

236 - 240 Limestone as above.

240 - 250 Limestone, buff to medium brown, finely granular tending to crystalline, fossiliferous, tight.

250 - 260 Limestone, light buff and dark brown, finely crystalline, essentially tight, fossil fragments, color of dark brown fragments may be due to oil staining.

260 - 270 Limestone as above with some light buff limestone with pin point porosity estimated at 5%.

270 - 280 Limestone as above, some porosity as above but minor, minor dark brown chert with pyrite present.

TOTAL DEPTH 281'

LITHOLOGICAL DESCRIPTION

Permit 4542
R.G. Belfoi 2-66

Long. $117^{\circ} 38'$ Lat. $62^{\circ} 14'$

Grd. Elev. 655^+ msl

0 - 12 Glacial Drift, light grey clay with shale and sand.

12 - 20 Shale, dark grey to black, slightly calcareous tending to blocky, hard.

20 - 30 Shale as above.

30 - 40 Shale as above with some dark brownish grey shale, hard, bituminous.

40 - 50 Shale as above and Limestone, dark brown, argillaceous, finely crystalline, probably bituminous, tight.

50 - 60 Limestone, dark brown, finely crystalline, bituminous, argillaceous, hard.

60 - 70 Shale, dark grey to black, slightly calcareous, hard, bituminous, containing elongate cutinized spores.

70 - 80 Shale, as above and Shale, medium grey, calcareous, hard, but softer than dark shale.

80 - 90 Shale, dark grey and dark brownish grey, hard, slightly calcareous, bituminous, fossiliferous, type unknown.

90 - 100 Shale as above.

Top Limestone 109' (+546⁺)

100 - 110 Shale as above with Limestone, very dark brown, finely crystalline, color probably due to bituminous material, argillaceous.

110 - 120 Limestone, medium brown, finely crystalline, slightly argillaceous, bituminous.

Lost Circulation

Skidded rig 60 yards in a northerly direction.

0 - 18 Glacial Drift.

18 - 97 Shale, not logged.

Top Limestone 97' (+558±)

97 - 102 Limestone, not logged.

Core #1

102 - 107 Limestone, medium brown, finely crystalline, argillaceous, bituminous, massive, styolitic in part, tight.
Rec. 4'

Core #2

107 - 112 Limestone, as above with large vugs at 108 - 109 partially infilled with coarse crystalline calcite, stained brown, crystalline development in vugs, vugs not connected - may Rec. 5'
be fossil voids.

Core #3

112 - 113'8" Limestone as in 102 - 107
Rec. 1'8"

113'8" - 120 Limestone, medium brown, finely crystalline, slightly argillaceous, bituminous, tight.

120 - 130 Limestone as above with Limestone, medium brownish grey, finely crystalline, very finely argillaceous, tight.

130 - 140 Limestone, medium brownish grey, finely crystalline, tight.

140 - 150 Limestone as above.

150 - 160 Limestone as above.

160 - 170 Limestone as above.

170 - 180) Limestone as above with some very light clear finely crystalline
180 - 190) calcite developed which is probably from vugs (fossil voids).

190 - 200 Limestone as above.

200 - 210 Limestone as above with some minor 5-10% intercrystalline porosity - some darker brown fragments which appear oil stained form a brittle brown residue when dissolved.

Top Dolomite 225 (+430±)

210 - 220 Limestone as above with dolomite, light brownish grey, slightly calcareous, granular, (silt size grains) with isolated medium

clear crystalline dolomite with black bituminous material (dead), porous, approximately 5%.

222 - 230 Dolomite and Limestone as above with clear crystalline calcite.

230 - 240 Dolomite.

240 - 250 Dolomite as above.

250 - 260 Dolomite as above.

Core #4

260 - 270 Dolomite, light brownish grey, vuggy, oil stained, water bearing,
Rec. 1' Porosity of matrix estimated at 15%+. This core was not studied
in detail.

Total Depth 270'

The drilling rig was skidded 350' south of the above well.

R.G. Belfoi 2B-66
Permit 4542
Grd. Elev. 655+

0 - 14 Glacial Drift

14 - 104 Shale

Top Limestone 104' (+551)

Core #1

104 - 114 Limestone, medium brown, finely crystalline, argillaceous,
Rec. 3' bituminous, tight. Recovery poor. Three attempts were made to
recover 3' of core with 1' recovered each time.

Total Depth 114'

LITHOLOGICAL DESCRIPTION

R.G. Belfoi 3-66

Permit 4543

Long. $117^{\circ} 55' 20''$ Lat. $62^{\circ} 18' 50''$

Grd. Elev. $710' +$ msl

0 - 124 Glacial drift.

124 - 130 Shale, medium grey, very slightly calcareous, hard.

130 - 140 Shale as above, probably bituminous.

140 - 150 Shale as above - with some medium brownish grey argillaceous limestone which are probably thin interbeds.

150 - 160 Shale, medium grey, calcareous, hard.

160 - 170 Shale as above with some bituminous dark grey shale and minor pyrite.

170 - 180 Shale, dark grey, bituminous, very slightly calcareous, bituminous material may be resisting acid, looks more calcareous than acid test indicates.

180 - 190 Shale as above with minor Limestone, dark brown, finely crystalline, bituminous and minor pyrite.

190 - 200 Shale as above.

200 - 210 Shale as above with minor pyrite.

210 - 220 Shale as above.

220 - 230 Shale as above.

230 - 240 Shale as above.

240 - 250 Limestone, medium to dark brown, finely crystalline, probably bituminous.

250 - 260 Shale, medium to dark brownish grey, bituminous, very slightly calcareous, tending to fissile.

260 - 270 Shale as above, fossiliferous, thin placated fragments of undetermined type.

270 - 280 Shale as above, very bituminous, calcareous, very fossiliferous,

type unknown with minor Limestone, very dark grey, finely crystalline, bituminous.

Top Limestone 284' (+426⁺)

280 - 290 Limestone, medium brownish grey, finely crystalline, argillaceous, bituminous in part.

290 - 300 Limestone as above.

300 - 310 Limestone as above.

310 - 320 Limestone as above.

320 - 358 Limestone as above. Samples are very poor mainly cavings.

TOTAL DEPTH 358'

CHRONOLOGICAL REPORT

Nov. 3 Truck with equipment and rig left Calgary for Fort Providence.

Nov. 4 The crew left Calgary 8:00 A.M. by Pacific Western Airlines arriving Hay River in early afternoon.

Nov. 5 Crew left Hay River for Fort Providence and established staging point at Myrhens Service Station on the south side of the Mackenzie River. The river ferry was no longer operating. Truck with equipment and rig arrived. The Bell 204B helicopter CF-CBK arrived late afternoon.

Nov. 6 Flew 8 barrels turbo fuel from Fort Providence to location of first hole (1-66). Helicopter flew test flights with cabins set up and folded.

Nov. 7 Flew 4 trips to 1-66 which included:
1. Bunkhouse unit.
2. 3 passengers and miscellaneous equipment.
3. 4 barrels gasoline, 4 barrels heating fuel and miscellaneous equipment.
4. Top of rig.

Nov. 8 Flew 2 trips to 1-66 which included:
1. Base of rig.
2. Miscellaneous equipment.

Nov. 9 Flew 2 trips to 1-66 and returned to Fort Providence. The loads included:
1. Bunkhouse unit.
2. Drill stem, casing, 5 passengers and miscellaneous equipment.

Nov. 10 Set up drill - warmed up equipment - started drilling 3 7/8" insert bit for 1 hour, froze up while changing swivel packing - thawed out, drilled 1 hour. Total drilling hours (2). Helicopter returned to 1-66 bringing in propane, lost circulation material and 3 barrels of turbo fuel.

Nov. 11 Drilled to 110' at 8:00 A.M. and to 200' at midnight. Changed to 3 7/8" tricone bit at 120'. Scouted by helicopter the next two locations, 2-66 and 3-66.

Nov. 12 Changed bit at 200'. Drilled at 236'. Rig shut down at 4:00 P.M. - head casket blown on pump motor. Helicopter trip to Fort Providence.

Nov. 13 Rig shut down. Waiting on repairs.

Nov. 14 Helicopter returned with parts for motor and 7 barrels rig fuel, 3-100 lb. bottles of propane and miscellaneous supplies at 12:45 P.M. Rig drilling at 3:00 P.M. Drilled to 240' and attempted coring. Coring unsuccessful due to impurities in mud. Water supply limited as source frozen to bottom. Drilled to 245' by 11:30 P.M. when rig shut down. (Hole in piston of pump motor.)

Nov. 15 Rig shut down. Waiting on repairs.

Nov. 16 Rig shut down. Mechanic and parts arrived in afternoon. Unable to repair motor on location.

Nov. 17 Helicopter trip into Fort Providence with mechanic and parts of motor. Returned with the above and 7 barrels gasoline. Drilling resumed at 7:00 P.M. for 3 hours when kelly chain broke twice and pull down gear broke. Rig shut down at 10:00 P.M.

Nov. 18 Rig shut down. Waiting on repairs.

Nov. 19 Parts arrived by Cessna 180 in morning. Rig repaired. Resumed drilling 2:30 P.M. Drilled to 280' and twisted off at 30' below surface. Began fishing at 11:00 P.M.

Nov. 20 Fished till midnight. 250' of pipe left in hole.

Nov. 21 Moved rig and camp to Location No. 2-66. Set up drill 1:00 P.M. Began drilling 6 1/4" hole at 8:00 P.M. Depth at midnight 20'. Helicopter moved drill, camp men and supplies in 9 trips.

Nov. 22 Set surface casing and began drilling at 2:00 P.M. Drilled for 8 1/2 hrs. Hole caving in. Rig shut down at midnight.

Nov. 23 Helicopter moved rig in morning. Began drilling 6 1/4" hole at 12:30 P.M. Set 27' of surface casing. Drilled with 3 7/8" insert bit to 70' and then replaced with 3 7/8" tricone bit. Depth 102' at midnight.

Nov. 24 Circulated and began coring. Cored 102' - 113'8". Rotary table broke down 2:30 P.M. Rig shut down.

Nov. 25 Cessna arrived with parts. Rig operational at 8:00 P.M. Lost circulation. Added 3' more surface casing. Depth at midnight 113'8". Helicopter flew to Fort

Providence and returned with groceries, 7-100 lb. bottles of propane, 3 barrels heating fuel.

Nov. 26 Began drilling 12:01 A.M. Drilled to 250' at midnight.

Nov. 27 Drilled to 260'. Cored 260' - 270'. Recovered 1'. Shut down rig at 12:00 noon. Helicopter flew to Fort Providence. Scouted Horn Mountains - For Providence access road. Returned with 8 barrels of turbo fuel which was set down at Location 3-66.

Nov. 28 Helicopter moved rig to 2B-66. Began drilling 11:30 A.M. Drilled to 104'. Cored 104' - 114'. Recovery 3'.

Nov. 29 Laid rig down at 1:00 A.M. Helicopter moved rig, camp in 8 trips to Location 3-66. Rig set up. Began drilling 6:00 P.M. Drilled 40'. Lost circulation. Rig laid down to skid.

Nov. 30 Rig skidded approximately 50' north. Began drilling, 12:00 noon, 6 1/4" hole to 20'. Set 20' surface casing. Drilled to 120' by midnight.

Dec. 1 Drilled till 9:30 A.M. Motor trouble. Resumed drilling 12:30 P.M. Drilled to 290' by midnight.

Dec. 2 Drilled to 310' by 6:00 A.M. Repaired rig for 2 hours. Resumed drilling at 8:00 A.M. Drilled to 358' when hole caved in and circulation lost. Pipe stuck in hole. Twisted off 150' below surface. Rig shut down due to lack of motor oil, bit sub and pump valve springs at 4:30 P.M.

Dec. 3 Began reaming out hole at 4:00 P.M. Reamed to 90' by midnight.

Dec. 4 Reamed to 150'. Fished with spear and open end. No success. Laid rig down at 12:00 noon. Helicopter flew rig to Imperial Davidson Creek well location on the Horn Mountains.

Dec. 5 Helicopter flew remainder of camp to the above and flew 6 passengers and their equipment to Hay River. Cessna 180 came in and picked up two passengers and equipment and returned to Hay River.

BIT RECORD

Well..... Horn Mountain Project

Drilling Contractor.

Date Drilling Started November 10, 1966

Date Completed:

December 4, 1966.

