

I. Ray McDermott Canada, Ltd.
Technical Report
Taylor Lake (Snake River), Yukon
632-6-6-68-1



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TITLE PAGE

Type of Report: Technical Report of a Reflection Seismograph Survey

Survey Area: Taylor Lake (Snake River), Yukon Territories

Year Done: August & September 1968

Name of Operator: J. Ray McDermott Canada Ltd.

Name of Contractor: Electronic Logging & Velocity Co., Ltd.

Permits over which work was done: 2448

Name of Author: F. F. Foster

Date of Report: 25 July 1972

Project Number: 632 - 6 - 6 - 68 - 1 *

* This is one portion of the project. (See report on "Norman - 1968")



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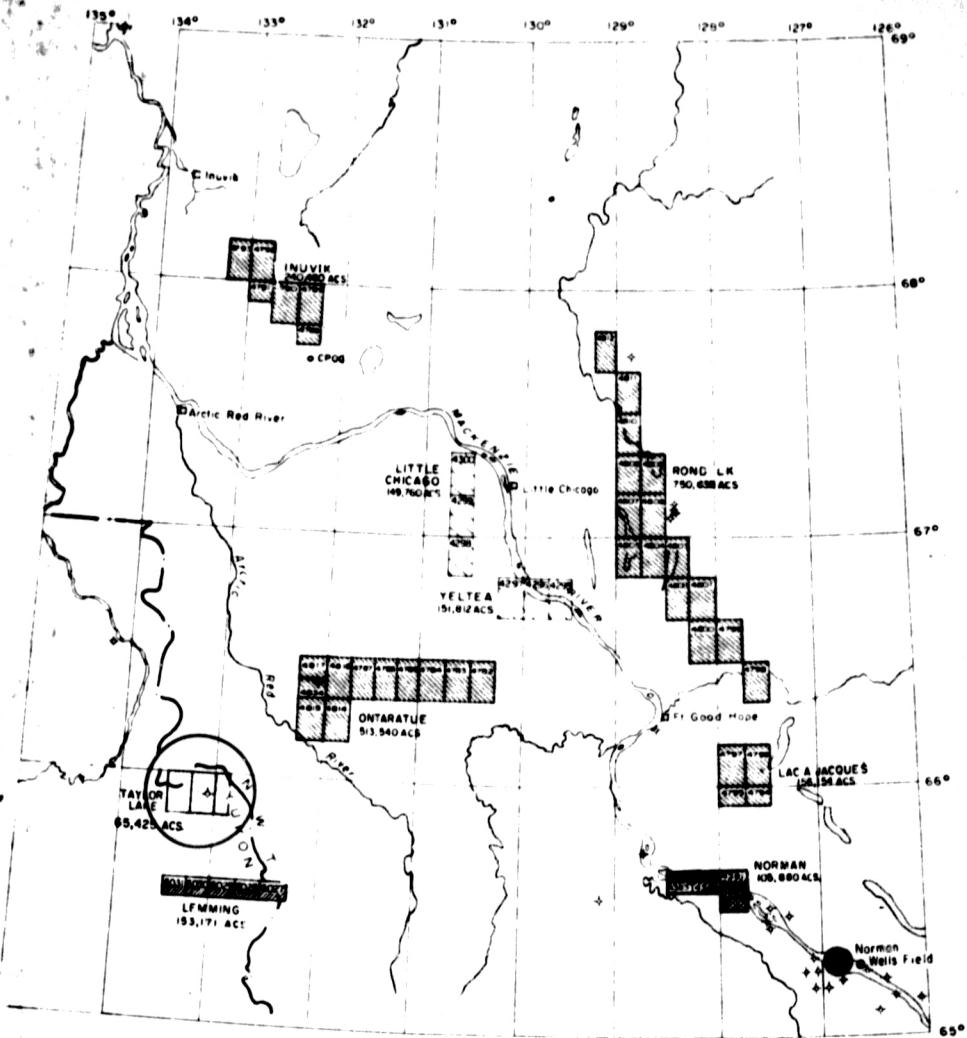
INTRODUCTION

This survey was conducted by Electronic Logging & Velocity Co. Ltd. for J. Ray McDermott Canada Ltd. as a fill of semi-detailed shooting to be integrated with third party data previously interpreted within the area.

The thought was to do a bob-tail operation with a completely portable crew, using no drills or heavy motorized equipment. Supplies and recording instruments and the like were trucked in to Mayo, from Calgary. The entire camp was tents. Two small boats were used for cartage during the operation. The observer used one to set up his instruments with a portable power source, and the shooter used the other to carry his dynamite and radio shooting equipment. All movement along the line was by foot, with no trucks whatsoever. The crew was restricted to just six men and a supervisor. The supervisor maintained a flow of supplies from outside the area by air.

The crew and equipment was flown in by float plane to Taylor Lake, all except the boats, which were taken in by helicopter sling. The demobilization was out to Norman Wells, again by float plane. The boats were left at the campsite on the lake, with the tent camp and cook stoves and heaters, since the cost to fly this out was more than the cost of the equipment. Later use was made of this when our drill crew entered the area. This crew went on to another project a Norman, and therefore was not demobilized back to the south.

In general this was an experiment to see if good data could be recorded in this portable manner, and the final analysis indicated that under certain conditions it was to be recommended.



40 20 0 40
Scale 1" = 40 MI

LOCALITY MAP

TAYLOR LAKE (SNAKE RIVER) AREA, YUKON TERRITORIES

6.375 MILES OF SEMI-DETAIL REFLECTION SEISMOGRAPH SHOOTING
COVERS PERMIT # 2448
PROJECT NUMBER: 632-6-6-68-1 (PARTIAL)

STATISTICAL DATA

Dates:

Crew left by truck from Calgary 10 Aug. 1968, and drove to Mayo, Y.T. Crew and equipment rigged for airlift and flew in to prospect landing on Taylor Lake with float plane. Boats slung by helicopter and flown in to lake. Great Northern, Northward, and Bullock were used on charters for flights. Camp moved in and set up 26 Aug. 1968.

Operations commenced 27 Aug. 1968. (First shot)
Operations completed 6 Sept. 1968 (Last shot)

Crew completed moveout to Norman Wells, NWT on 11 Sept. 1968, and released for new project.

Production:

Miles of Coverage-----	6.375
Number of Profiles Shot -----	51.000
Average miles per day recorded -----	.708
Average profiles per day recorded -----	5.666
Days worked -----	9.000
Down-days -----	2.000
Dynamite used -----	417 pounds
Caps used -----	417.000
Holes drilled -----	none

Equipment:

1 Recording boat/w outboard motor - Aluminum 14'
1 Shooting boat w/oars - 12 feet
1 Aircraft - Otter Float - Northward Aviation Ltd.
1 Aircraft - Helicopter - Bullock

Camp:

1 Cook tent, with butane stove and heater.
2 Sleeping tents w/bed rolls and heaters.
1 Utility/storage tent

Recording:

1 Analog portable recording system, using SIE P-100 portable amplifiers converted for use with the Fortune Techno Tap transport.
30 strings of geophones - each 9 geophones.
2 portable 12 trace recording cables w/chest reels
660 ft. long.
1 battery operated remote/radio shooting system
1 portable battery charger

<u>Personnel:</u>	<u>Name or Number</u>	<u>Position or Title</u>
	A.B. Barlow	Supervisor/Party Chief
1		Observer/Manager
1		Shooter
1		Cook/Camp Attendant
3		Observers Helpers

Surveying: The survey crew was non-existent. The original setup was shot in by transit by A.B. Barlow, using as a fixed point an indisputably recognizable feature from air photos. Horizontal control was then run to the Snake River bank. All shotpoint distances were then chained and plotted directly on the air photos of the river bank. Vertical control was assumed to be constant and at the same elevation as the river. All surface shotpoints plotted in the field were later moved back (south or west) 2 spreads to indicate the proper sub-surface location of the data. This was necessary since we shot incline/offset/single enders.

Conditions: The climatic conditions were generally fair, towards the last of the survey the temperature was getting quite low to be sleeping in tents. The vegetation had no import to the operations since our survey was along the Snake River bank. The camp was setup on Taylor Lake so that aircraft could use the lake as a strip in support of the portable crew.

The only major factor that became a problem was the presence of a thick layer of smoke that hung over the lake and other valleys. This was caused by a fire considerably north of our area towards Inuvik. This smoke delayed plane transport for quite a few days. Likewise, at the close of the prospect, the cloud cover became severe and low, and the logistics of either Inuvik or Norman Wells to Taylor Lake was such that by the time our crew radioed that it was clear at the lake the plane would start, but by the time it arrived over the lake the cloud cover would have set in. The range was such that the planes could not linger long there, since our fuel cache was depleted.

FIELD PROCEDURES

Method Employed: Reflection seismograph surveying.

Charge size: Seven 1# charges seperated but fired as a common shot.

Hole depth: No holes drilled. All shot set off in the river. Average water depth 2 - 5 feet. Individual 1 pound charges spaced 25ft. apart, and attached by separate caps to common firing line. (See diagram below)

Filters: Tape recorded 20-92 cps
Field playback 30-64

Geophone Spread: SP - 1320' - 2640' in-line offset single
enders. Cable 1320'/24 groups

Group interval = 60 feet
9 geophones per group, spaced 7.5 ft. apart

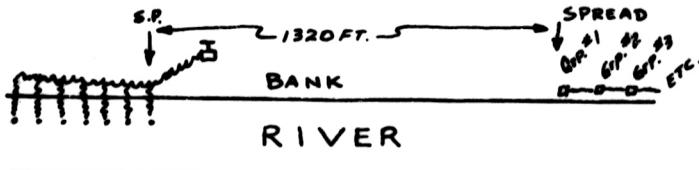
Shots in river, spread on bank. Negligible perpendicular offset.

Percentage Stack: 100%

Shothole Spacing: 660 feet

Recording: All data was recorded using a analog portable battery operated recording system. The SIE P-100 amplifiers were modified for use with a Fortune tape transport. All data was stored on Techno tapes. Field playbacks were made for immediate quality check and some limited field interpretation.

Diagram: Plan View



DATA PROCESSING

Initially the new work was picked and evaluated on the field playback paper records, and indeed even after processing into record sections these paper records were continual used as a check.

Computing: The near surface velocity was in the range of 11000 ft/sec, and the offset and data correction to the +540 ft. plane was based on this velocity. With the spread layout as it was, we were able to check the near surface refractions for velocity .

Digital Processing:

1. Normal Moveout Analysis
2. Static corrections
3. Digital Filter: BP 16/50
4. No mix
5. Galvo: 4.5
6. Early Gain: 55
7. Final Gain: 55
8. Trip Delay: 0
9. AGC: Off
10. Analog variable area/ wiggletrace record section.
Structurally hung, 12 traces per inch, total reflection time 4.0 seconds.

Name of Processing Agency: Geophysical Data Processing Center, Inc.

RESULTS AND INTERPRETATION

The following maps are included in this report, and represent the interpretation as of the date shown:

1. Shotpoint Location Map
2. Structure Map - Approximate Top Bear Rock Carbonate

As you can see by the map the Snake River line is only a small portion of the coverage we used in this interpretation. The remaining data was taken from a review of various third party seismic lines (all 100%), and was integrated to datum with our own limited shooting. As noted in earlier paragraphs our data was all of the same elevation and therefore we have no elevation data to post for use.

Structure Map - Approx. Top Bear Rock Carbonate

The main feature of the map is a large anticline, or possibly a horst block, trending generally east/west thru the permit area. The highest point at this Bear Rock horizon seems to be indicated at or close to SP 20 of Shell's line #5-642. The new data had excellent correlation on the top of the Carbonate from SP-1 thru SP-24. The down-to-the-south fault between SP 25 and 24 is reliable and apparently has some roll which we previously did not show. In reviewing all of the lines, we do observe possible roll into the fault on the 5-609 line, the GP-1 line, and the new data. The 5-644 line is somewhat questionable at this fault and more data extending to the south might prove that it also had roll. Data from SP-25 to SP 32 on the new line has somewhat less character but is still correlative. From SP-32 to SP-40 the river was rough and necessitated changing from one bank to the other to get proper recording. As a result, this data has been phantomed and is of lesser quality. The down-to-the-north fault in and around SP-41 is of lower reliability than the southern fault, but does seem indicated by the data.

In reference to some extreme dips that might be noticed at this level on the record section, we have analised them as refractions emanating from the upper beds in the Cretaceous. They are not to be considered to have geologic dip significance.

CONCLUSIONS

The most consistent interpretation of both this new data and the older third party data indicates that there is a major anticlinal fold or horst block trending east/west thru the permit. The highest measured point appears to be in and around SP-20 of the #5-642 line. As limited by the present seismic control, this would be the optimum location for drilling.