

GOVERNMENT INFORMATION REPORT

Subject No. 41-6-3-60-2

FORT NORMAL AREA, NWT

A REPORT OF THE
DINOSEIS SEISMOGRAPH SURVEY

OF THE
FORT NORMAN AREA SMG 70-1-1
GOV # 41-6-5-68-2

NORTHWEST TERRITORIES
LONGITUDE 124° 00' - 125° 00'
LATITUDE 65° 00' - 65° 45'

Abstracted for
Geo-Science Data Index

Date _____

FOR THE FORMER
SINCLAIR CANADA OIL COMPANY
EXPLORATION LICENSE NO. 1120

OVER
PERMITS 4989-4991, 4996-4999, 5003-5005, 5008-5010

SHOT BY
COMPAGNIE GENERALE DE GEOPHYSIQUE
IN AUGUST 1968

APPROVED BY

J. T. P. [Signature]

REPORT DATE

MARCH, 1970

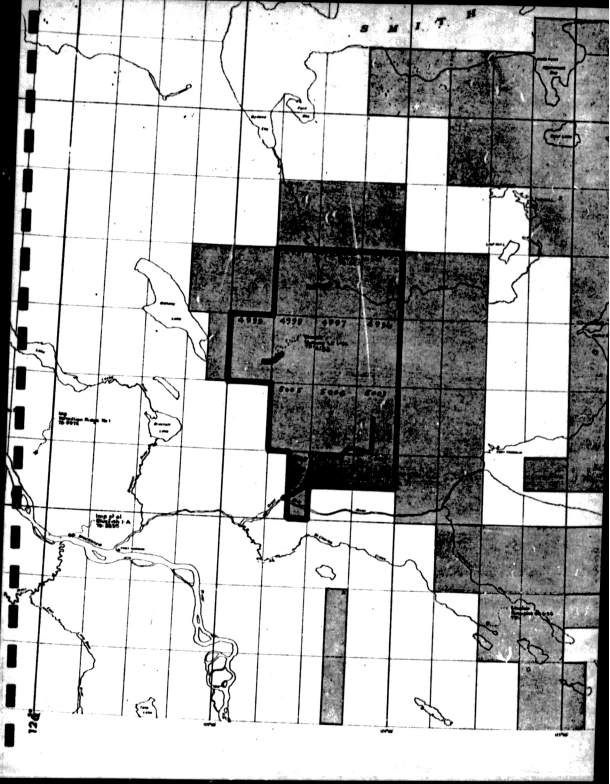


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S M I T H



SINCLAIR CANADA OIL COMPANY
DISTRICT OF MACKENZIE (N.W.T.)

STATISTICAL REPORT ON A HELIPORTABLE
DINOSEIS SURVEY
GREAT BEAR RIVER AREA

AUGUST 21 to SEPTEMBER 3, 1968
COMPAGNIE GENERALE DE GEOPHYSIQUE

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FOREWORD

Party S-909 of COMPAGNIE GENERALE DE GEOPHYSIQUE, on behalf of SINCLAIR CANADA OIL COMPANY, carried out a seismograph survey by the heliportable dinoseis method in the Great Bear River area of the Mackenzie district.

The survey was conducted between August 21st and September 3rd, 1968, according to the terms of the contract signed by SINCLAIR CANADA OIL COMPANY and COMPAGNIE GENERALE DE GEOPHYSIQUE on August 2nd, 1968.

The party was headed by Mr. J.C. Grosset, Party Chief, and Mr. J. Tarnowski, Party Manager.

The technical supervision was by the Research Department of SINCLAIR OIL AND GAS COMPANY.

This report is to present the statistical data.

ABSTRACT

Out of the 14 days of heliportable dinoseis survey in the Great Bear River area, 10 days were for recording.

Three lines were surveyed, representing a total of 79 shot points or 37,99 miles.

Eight dinoseis exploders were used on this survey.

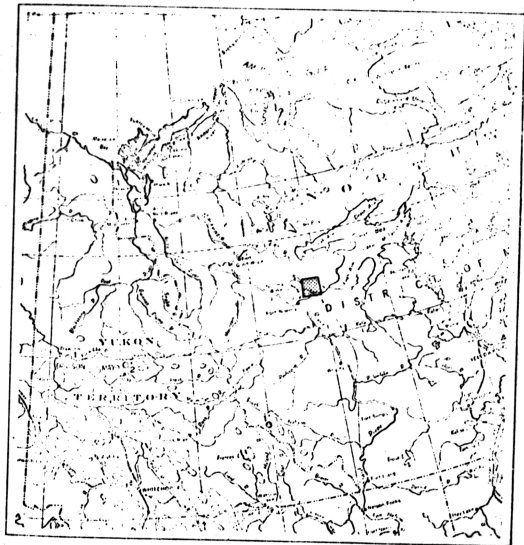
The recording instruments comprised AS 626X amplifiers working in conjunction with a GSC AM 280 microtrack magnetic recorder.

The two Bell 204B helicopters flew a total of 114:30 hours. The seismic portion of the 1:26 hour per new shot point average was :50 minutes. This compares favourably with what is considered normal for dynamite shooting.

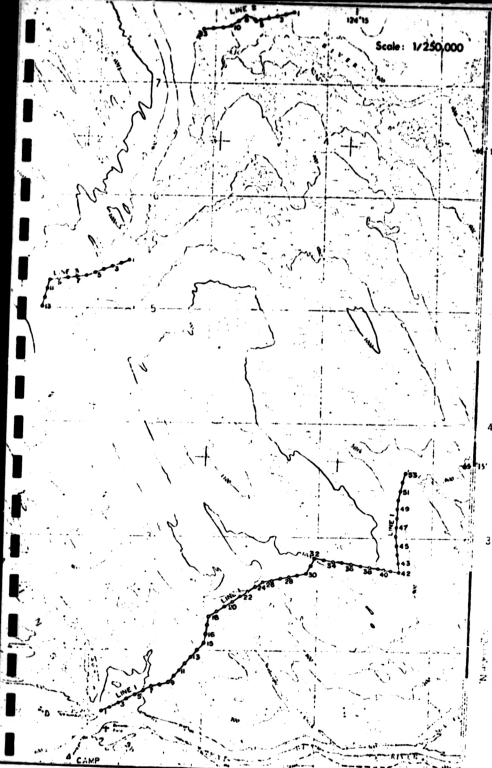
The seismic crew spent an average of 1:20 hour in the field per new shot point. This average could be substantially reduced by working with several sets of dinoseis exploders and a larger line crew.

Fig. 1

SCHEMATIC
LOCATION MAP



Scale: 1/250,000



I GENERAL INFORMATION

1.1 Project location (figure 1)

The project was located in the Mackenzie district, north of the Great Bear River and east of the Franklin Mountains.

1.2 Program

The program comprised 3 lines representing 38 miles to be surveyed on permits held by Sinclair Canada Oil Company.

1.3 Surface conditions

The entire area was covered with timbers up to 40 feet tall except for a few patches of muskeg with few or no trees.

The top soil was spongelike, mainly consisting of moss in the treed areas and of grass and light mud in the muskeg patches.

The depth of the permafrost was very uneven. It was usually more than 2 or 3 feet deep except in some patches of muskeg, where ice or permafrost was sometimes encountered at about one foot depths.

1.4 Weather conditions

Fog and rain showers occurred frequently during the survey. At times the wind proved to be a problem for the helicopter pilots while maneuvering loads on approaching or leaving the clearings.

However, weather disturbances were not persistent and only one day was lost due to weather.

1.5 Personnel (figure 2)

The Research Department of Sinclair Oil and Gas Company was in charge of the technical supervision during the whole survey and also provided the technical personnel for operating the dinoseis.

The seismic, helicopter and catering personnel were provided by Compagnie Generale de Geophysique or its subcontractors: Bullock Helicopter Company and Foothills Catering Ltd.

The line cutters were hired in Norman Wells and Fort Norman by the surveyor and the party manager. Their number often proved to be insufficient and the line crew was used as a reinforcement when necessary.

1.6 Equipment (figure 2)

1.61 Dinoseis

The eight heliportable dinoseis exploders and the two heliportable control modules were provided by Sinclair Oil and Gas Company. This represented a total of ten helicopter loads, each weighing less than 3000 pounds.

1.62 Recording equipment

The recording equipment was mounted inside a heliportable cabin which had previously been used for conventional shooting. A GSC AM 280 microtrack recorder was added for the dinoseis operation. This recording cabin weighed less than 2000 pounds thus allowing extra loads to be carried inside the helicopter while moving along the seismic line.

Fig: 2

PARTY COMPOSITION

	Seismic	Dinoseis	Helicopters	Camp
PERSONNEL	1 Party Chief 1 Party Manager 1 Surveyor 1 Rodman 2 Observers 7 Helpers Extra: 3 Helpers 6 to 14 line cutters	1 Supervisor 3 Technicians	1 Chief Pilot, 204B 1 Pilot, 204B 2 Engineers 1 Pilot, Alouette II 1 Engineer	1 Cook 2 Helpers
EQUIPMENT	1 Heliportable recording cabin AS 626X Amplifiers 1 AM 280 Recorder 1 VRO 6D Camera 568 Geophones, HJ 14-Hz-L2 16 Reflection cables 14 pairs 3 Extension cables 14 pairs 12 Reflection cables 28 pairs 1 Roll-along switch 1 Patch panel 3 VHF radios 2 Transits, DKM 2U 2 Altimeters Extra : 648 geophones, HJ 14 Hz-L1	8 Heliportable dinoseis units 2 Heliportable control units	2 Bell 204 B helicopters Maximum capacity: 10 passengers Maximum sling load: 3600 pounds Cruising speed: 90 to 100 Knots Consumption in operation: 72 gal/Hr 1 Alouette II Astazou Maximum capacity: 4 passengers Cruising speed: 80 Knots Consumption in operation: 29 gal/H	Tent camp

1.63 Helicopters

The Sud Aviation Alouette II "Astazou" helicopter has an endurance of up to 5½ hours carrying 2 passengers and 2½ hours carrying 4 passengers. Combined with a cruising speed of 80 knots, this makes it an ideal machine for reconnaissance and surveying purposes.

On this particular survey the Alouette II was also extensively used as a liaison vehicle for the surveyors and line cutters during the field hours.

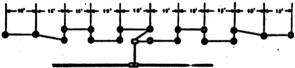
The two Bell model 204B helicopters were not used to their full capacity during this dinoseis operation. However, as can be seen from the statistics, both machines flew more than the minimum guaranteed by contract. While only one machine was used to move the personnel and the equipment along the seismic lines, both machines were used to move the personnel from the camp to the field and back, as well as for moving the equipment from line to line.

1.64 Camp

The tent camp used for this survey was of a light type without double roofs or floors. It had been modified and improved during the survey at Shingle Point so as to be more suitable for subarctic conditions, and also for the size of a seismic crew.

Fig: 3

FIELD TECHNIQUES

Recording System	SERCEL AS 626X Amplifiers, GSC AM 280 recorder, SIE VRO 6D camera
Geophones	HSJ 14 Hz-L1 in groups of 9
Cables	16 reflection cables 14 pairs
Spread	Distance between SP : 2640 feet Station spacing : 200 feet Distance between SP and first station : 220 feet Noise spread : distance between station : 25 feet
Geophone arrangement	18 geophones per trace according to diagram  Noise arrangement : 9 geophones grouped
Dinoseis pattern	8 in line, approximately 25 foot spacing
Correction and Processing	SINCLAIR CANADA OIL COMPANY

II CHRONOLOGY AND STATISTICS

2.1 Positioning

The combination of a general shortage of empty turbofuel drums and the limited time in which to make fuel available in the field, made it necessary to fly a Hercules with 200 empty drums from Edmonton to Norman Wells. These drums were then filled in Norman Wells and barged to the Northern Transportation Company Ltd.'s Bear River Rapids camp, close to which the seismic camp was to be located.

The surveyor and the first line cutters arrived at the Bear River Rapids camp on August 12th with the Alouette II "Astazou" and started the line cutting the next day.

Most of the equipment, including the recording cabin, was moved from Shingle Point, some 425 miles to the North-west, to the Bear River Rapids airstrip: Bennett field, by Bristol freighter in 4 trips on August 18th and 19th.

Personnel, camp gear and some light equipment were moved in 4 DC3 trips between August 18th and 22nd.

The two Bell 204B helicopters arrived at Bear River Rapids on August 20th.

2.2 Operation

The line cutters started with the surveyor on August 13th. During the initial period, while the seismic crew was still operating at Shingle Point, they were accommodated at the Northern Transportation Company Ltd.'s camp near the Bear River Rapids.

On August 21st and 22nd, while the dinoseis and recording equipment were being reassembled and tested, the line crew was used for reinforcing the line cutters.

The first recording was made on August 23rd and the last, on September the 2nd.

During the operation the supplies were flown from Norman Wells by Beaver and Otter aircraft.

The field techniques are summarized on figure 3.

2.3 Depositioning

After the Bear River survey the crew and the equipment were to be brought back to Calgary.

A LC4 charter flew the crew and most of the recording equipment back to Calgary on the night of September 4th.

The dinoseis equipment was barged to Hay River and then trucked to Calgary.

The helicopters were released at the end of the survey and left at Bullock Helicopter Company disposal.

2.4 Statistics

The survey lasted 14 days comprising 2 days for positioning, 10 days of recording, 1 day for depositioning and 1 weather day.

The surveyor and the line cutters started 10 days ahead of the recorder. In spite of that early start, it was extremely difficult for the crew of 6 to 14 line cutters to keep ahead of the seismic crew.

Quite often the clearings were barely sufficient for the helicopters and the seismic crew had to help in the line cutting. A minimum of 18 line cutters would probably be required permanently to open the lines.

The seismic field hours are the hours the seismic crew and the dinoseis personnel actually spent in the field during the program. These hours, when averaged over the number of new shot points, are in excess of what is normally obtained by the helicopter crew on a conventional program.

All of the eight exploders were used at each shot point. Consequently, the minimum time required between two shots was increased by the time it would take the helicopter to move the ten loads of dinoseis equipment and set it up.

If enough exploders were available, one, or better still, two shot points could be prepared ahead of the recorders. This would result in a production comparable to that achieved by a conventional crew. The size of the line crew would then need to be the same as for a conventional crew.

The seismic hours for the Bell 204B helicopters are the hours flown by the helicopters moving equipment and personnel along the lines, and also in bringing the personnel from the camp to the field and back.

The seismic flying time will vary with the production and the type of work. The average of 50 minutes per new shot point indicates only the maximum to be expected. From our previous experience we note that this is about 20% lower than for conventional dynamite shooting. (drilling included)

The moving hours for the Bell 204B helicopters are the hours flown in transporting the equipment from one line to another during the operation, also the hours flown in transporting the equipment from the lines to camp and back for maintenance and repairs.

This flying time is not related to the production, or the type of work, but only to the amount of equipment used and to what extent the program is scattered.

Twenty hours of flying is a reasonable estimate of what would be required to move a crew, comprising 8 dinoseis exploders, 2 control modules and the recording equipment, over a 50 mile distance using Bell 204B helicopters.

It is of interest to note that the seismic field hours and the seismic helicopter hours, when averaged over the number of new shot points, give exactly the same figures as on the Shingle Point survey.

The surveying and cutting of 38 miles of lines required 40:50 hours of Alouette II and 18:45 hours of Bell 204B. These hours were mainly flown in servicing and transporting the line cutters. This is far in excess of the 20:25 hours flown by the Alouette II at Shingle Point for surveying 33 miles of line with no line cutting.

Calgary, October 25, 1968



J.C. GROSSET
Party Chief



L.R. PRION
Canadian Branch Manager

IV Results

The three line Dinoseis survey conducted by C.G.G. for Sinclair in the Great Bear Lake Area was experimental. Information gained from this survey was not subsurface in nature. The seismic sections are considered "No data"; however, we do believe that much was learned relative to operational techniques and some modifications have already been made to the Dinoseis guns to make them more functional under similar surface conditions.

COMPAGNIE GENERALE de GEOPHYSIQUE

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CANADIAN ALBERTA

CANADIAN ALBERTA

MANAGING OFFICE 6204 - 2ND STREET S.E. CALGARY, ALBERTA

C.G.G. PERSONNEL - SINCLAIR - DINOSEIS EXPERIMENT

Great Bear River - August 21 - September 3, 1968

October	J. Grosset - Party Chief	August 21 - September 3
	J. Tarnowski - Party Manager	August 21 - September 3
	H. Schwarz - Shooter	August 21 - September 3
	F. Grisi - Surveyor	August 21 - September 3
	J. Roy - Surveyor	August 21 - September 3
Atlantic	A. Bidou - Observer	August 21 - September 3
600 Guinness House,		
Calgary, Alberta		
	T. Battles	
Atlantic	R. Snow	
	G. Beiswanger	
	J. Ohlsen	
Dear Sir	H. Pech - Helpers	August 21 - September 3
	T. Phillips	
As requested	T. Bullock	
personnel	J. Brindle	
program	W. Watson	
	W. Watson	
	W. Klanten	
We hope	M. O'Donnell	

Yours very truly,

COMPAGNIE GENERALE DE GEOPHYSIQUE

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