38.6.4.20

Geophysical Report To Govt. of Canada

Reflection Seismograph Survey

EAST CAMERON AREA

N.W.T.
1970

GEOPHYSICAL REPORT
TO
GOVERNMENT OF CANADA
ON
REFLECTION SEISMOGRAPH SURVEY

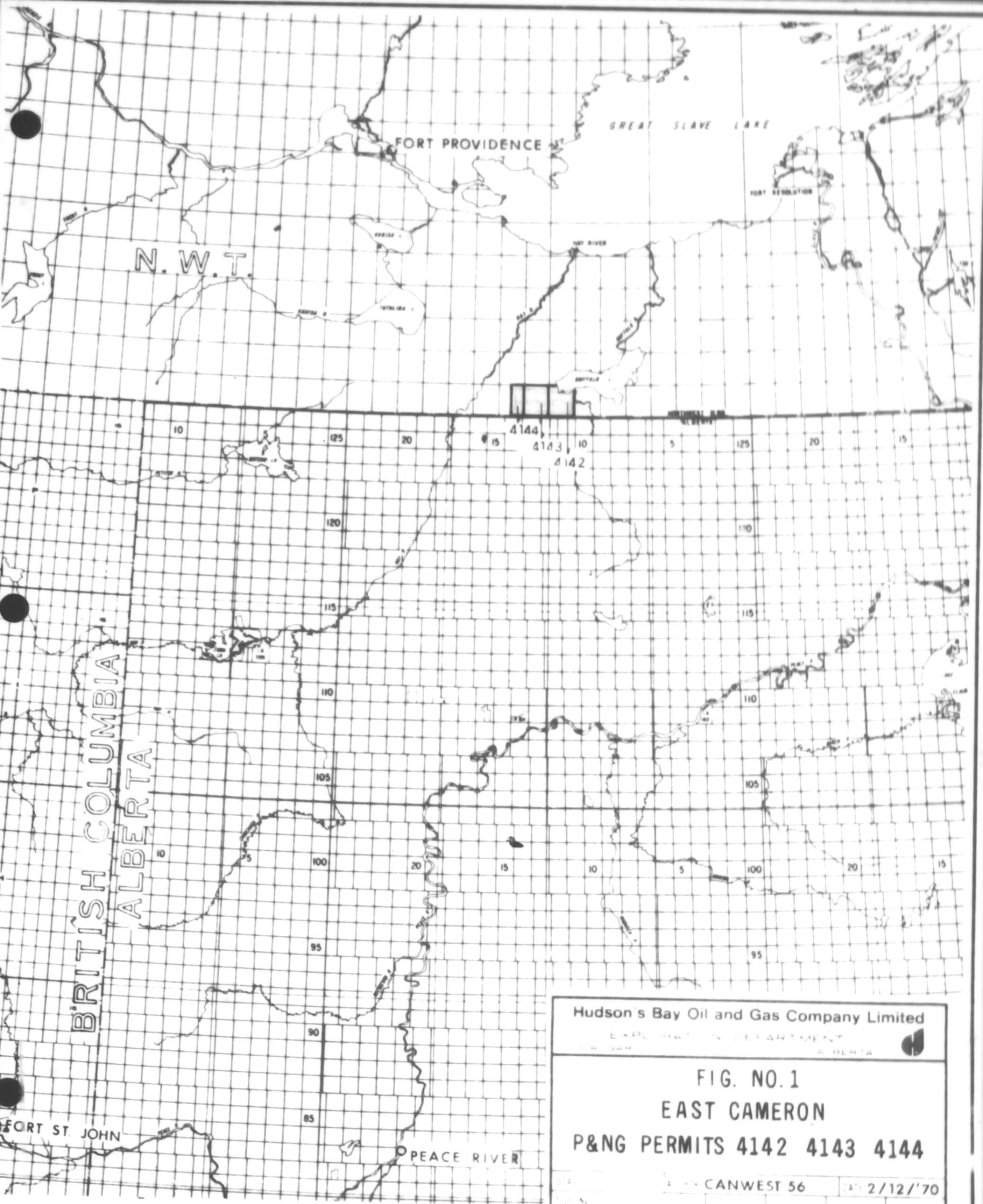
EAST CAMERON AREA
NORTHWEST TERRITORIES
1970

SHOT FOR
HUDSON'S BAY OIL AND GAS COMPANY LIMITED
BY
CANWEST GEOPHYSICAL LIMITED
ON
C.P.&N.G. PERMIT NO'S. 4142, 4143, 4144

PROJECT NUMBER 38-6-4-70-1
EXPLORATION LICENCE NO. 1690
TIMBER PERMIT 4277

OIL & GAS OPERATIONS UNIT
Oil and Mineral Division
DEC 7 1970
OTTAWA; CANADA
Dept. of Indian Affairs & Northern Development

P. J. KEIRAN
DECEMBER 1, 1970



Hudson's Bay Oil and Gas Company Limited

EXPLORATION DEPARTMENT

CALGARY, ALBERTA

FIG. NO. 1

EAST CAMERON

P&NG PERMITS 4142 4143 4144

CANWEST 56

2/12/'70

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FIGURES

1.	AREAL LOCATION PLAT	Preceding Page 1
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ENCLOSURES

SHOT POINT LOCATION MAP

MAP OF APPROXIMATE TOP OF SLAVE POINT

MAP OF APPROXIMATE TOP OF PRECAMBRIAN

MAP OF SLAVE POINT TO PRECAMBRIAN ISOCHRON

SECTION OF TEMPLATE LINE 1

SECTION OF PORTION OF LINE 2

I. INTRODUCTION

This report covers a "VIBROSEIS" reflection seismograph survey with refraction weathering control conducted in the area bounded by 60°00' and 60°10' North Latitudes and 115°45' and 116°22'30" West Longitudes, an area immediately southwest of Buffalo Lake. The survey was run during January and February, 1970, by Canwest Geophysical Limited Party No. 56 under contract to Hudson's Bay Oil and Gas Company Limited and consisted of approximately 110 miles of reconnaissance Common Depth profiling control on Permits Numbers 4142, 4143 and 4144 held 100% by the permittee.

II. STATISTICAL DATA

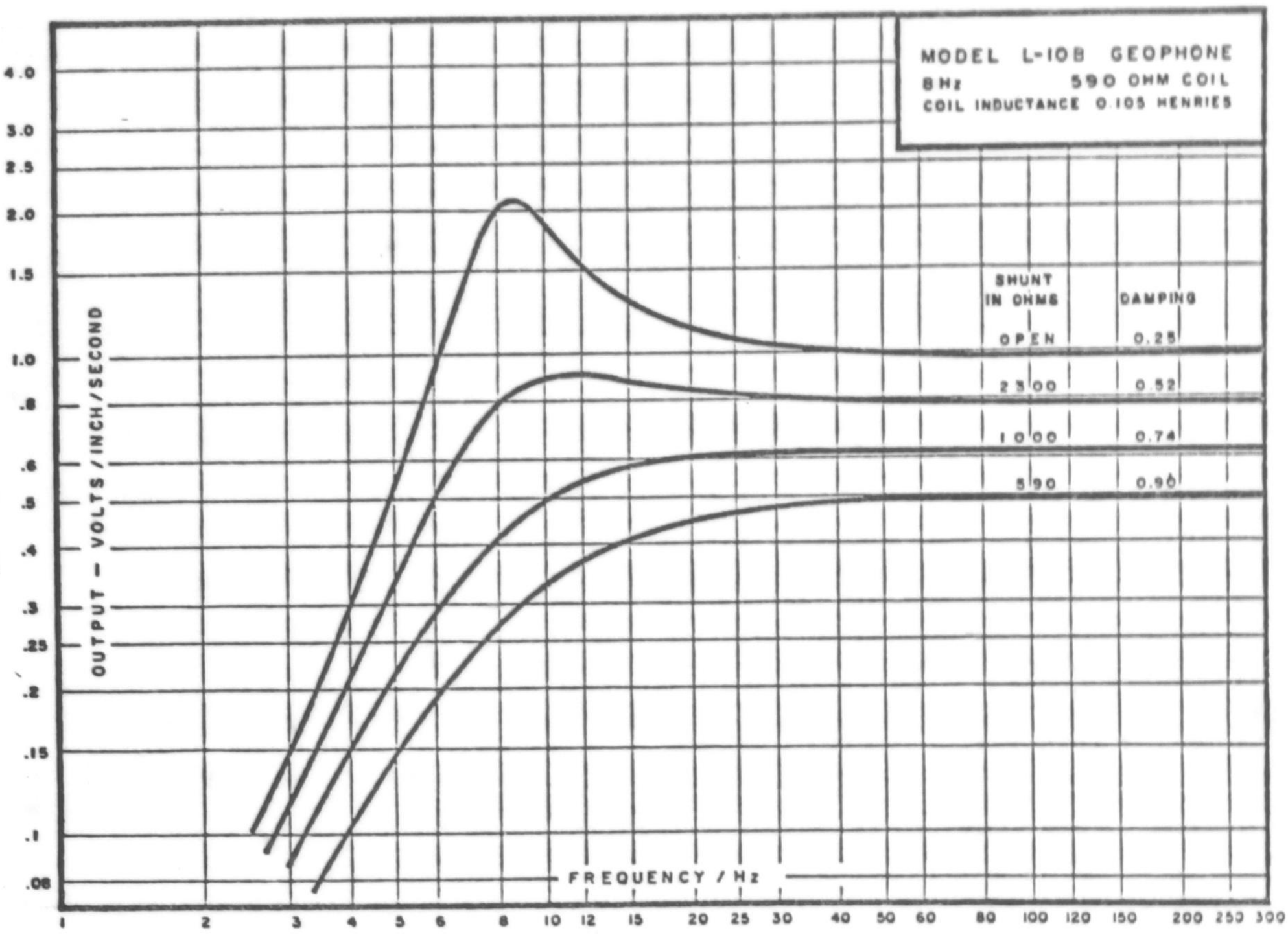
Mobilization Date	January 2, 1970
Recording Commenced	January 10, 1970
Recording Completed	February 21, 1970
Total Field REcording Time (hours)	467.0
Total Mobilization and Demobilization Time (hours)	102.0
Total Down Time (hours)	0
Total Mileage Recorded	111.5
Mileage per 10 Hour Day	2.39
Total Vibrator Points	1,656
Total Sweeps Recorded	147,925
Sweeps per 10 Hour Day	316
Number of Shots	464
Pounds of Explosives Used	1,108.75
Number of Caps Used	536
Number of Holes Drilled	420
Footage Drilled	11,173
Drill Hours	608.5

III. EQUIPMENT

Recording equipment consisted of a Truck Mounted Recorder having a 24 channel SUM-IT "VIBROSEIS" system which had fixed-gain Fortune T-4 amplifiers and a 9 Track Mandrel format, digital output. A digital correlator used a 4 inch/second dry-write display electrostatic camera to produce field monitors.

Three phase-compensated Wabco Y-600 B Vibrators provided the energy source. These units are centre-mounted on 4-wheel drive trucks.

Mark Products sectional cables having 3 takeouts spaced at 220 feet per section were used to channel Mark Product L-10, 8 Hz digital grade geophones. The geophones were connected 12 per string in a series-parallel arrangement. Two such strings were used at each geophone station to yield the response diagrammed in Figure 2. Two cable trucks were used to lay out the spreads.



GEOPHONE RESPONSE CURVE

24 PHONES PER NEST

4-4-4 IN SERIES-PARALLEL

2 STRINGS PER NEST IN PARALLEL

FIG 2

FIG. 2

A Sewell Auger was used initially to drill shot holes for refraction weathering control. The Auger was subsequently replaced with a conventional rotary drill when gravel conditions became predominant. Refraction recording was done using the "VIBROSEIS" recorder wired for a direct output through a 24-trace, dry-write camera.

Additional equipment used on the contract was:

1 Shooting Truck
2 Survey Trucks
1 Water Truck
1 Supply Truck
4 D-6 Caterpillars with blades and winches
2 Camps comprised of 8 trailers

IV. SURVEY

All horizontal and vertical control was run with a Wilde T-1A theodolite and chain and was referenced to monuments along the Alberta-NWT border and to wells located as follows:

1. Lsd. 11, Sec. 1, Twp. 125, Rge. 14 W5Meridian
2. Lsd. 2, Sec. 32, Twp. 125, Rge. 13 W5Meridian

V. PERSONNEL

The following comprised the crew:

1 Party Manager
1 Observer
2 Surveyors
1 Shooter
3 Vibrator Technicians
1 Vibrator Mechanic
1 Driller
2 Cable Truck Drivers
4 Recorder Helpers
1 Driller's Helper/Water Truck Driver
1 Rodman
1 General Mechanic
1 Supplyman
1 Cat Foreman
8 Cat Operators
2 Cooks
1 Cook's Helper
1 Camp Attendant

VI. OPERATING CONDITIONS

Conditions were generally poor. Although temperatures ranged from 0° to -65°F., an early snow cover prevented the muskeg from freezing properly.

This considerably slowed line cutting and eventually resulted in abandonment of approximately half the original assignment and relocation of virtually all the remaining program to topographically higher areas.

Communications were as follows:

1. Radio liason through AGT - Indian Cabins
2. Bush road to Steen River, approximately 55 miles west-southwest
3. Periodic airplane calls

VII. FIELD PROCEDURES

1. Routine production recording was as follows: (see Figure 3)

Coverage:	600%(1) CDP
Spreads:	2860'-440' x 440'-2860' symmetrical split.
Geophone Station Interval:	220'
Geophone Density:	24 phones over 440' centered on the flag.
Vibrator Point Interval:	440'
Vibrator Drag Length:	96 sweeps (32 x 3 vibrators) over 440'
Sweep Frequency:	65-15Hz over 7 second duration

(1) In areas of surface muskeg cover, the following parameters were adopted:

Coverage:	1200% CDP
Spreads:	1540'-330' x 330'-1540' symmetrical split.
Geophone Station Interval:	110'
Geophone Density:	24 phones over 165' centered on the flag.
Vibrator Point Interval:	110'
Vibrator Drag Length:	96 sweeps (32 x 3 vibrators) over 220'
Sweep Frequency:	80-10 Hz over 7 second duration

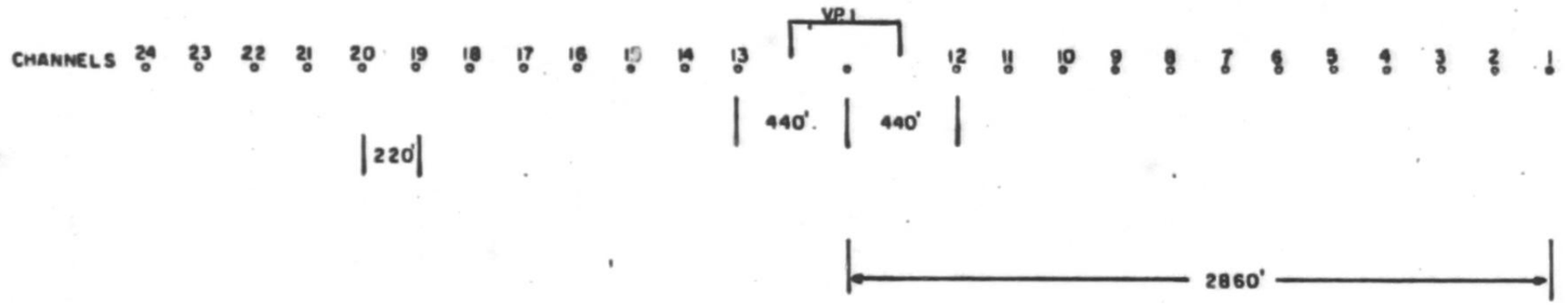
2. Refraction Control

Coverage:	300%
Spreads:	2640'-220' x 220'-2640'
Station Interval:	220'
Shot Point Interval:	1760' (single holes)
Charge Size:	2 1/2 and 5 pounds
Shot Depth:	40' average
Geophone Spacing and Density Parameters:	as for "VIBROSEIS"

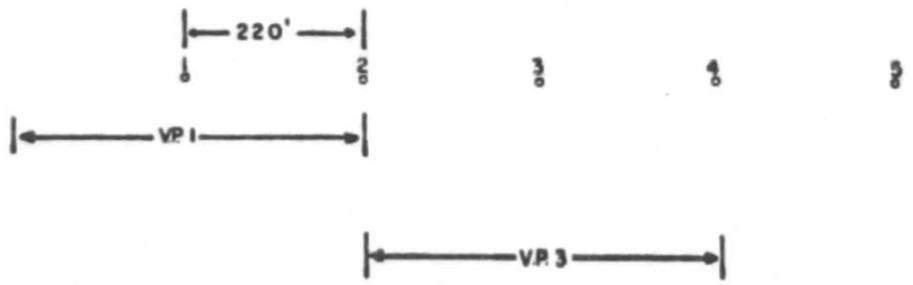
Since the refraction control was shot to determine weathering patterns only, these data were not recorded on tape.

EAST CAMERON

PRODUCTION PARAMETERS



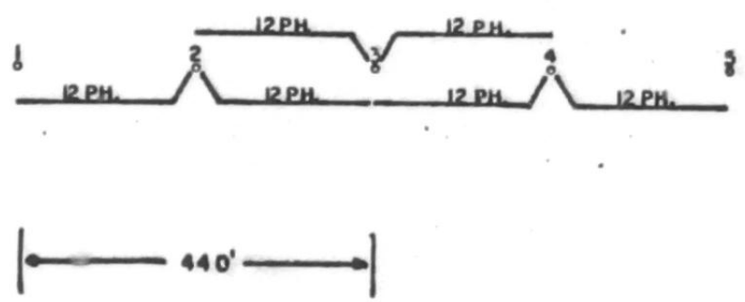
VIBRATOR LAYOUT



32 SWEEPS PER 440'

65-13 SWEEP FREQUENCY BAND

GEOPHONE LAYOUT



24 TYPE L10-B 8 Hz GEOPHONES

SPACED APP. 19' APART

FIG. 3

VIII. DATA PROCESSING

Elevation and weathering corrections were computed by Canwest Geophysical Limited from the refraction control. The computed values were compiled for application on a trace by trace basis to the "VIBROSEIS" data. Corrections were supplied to Continental Oil Company of Ponca City, Oklahoma, who did the data processing using a SDS Sigma 7 computer with associated hardware. Digital processing was applied sequentially as follows:

1. "VIBROSEIS" correlation
2. Deconvolution: Design gate 0.60 to 1.500 second
   Filter 15-65 or 10-80 Hz (depending on sweep)
   Operator Length 0.150 seconds
3. Normal Moveout
4. Trace Equalization
5. Static Correction
6. Trace Equalization
7. Adjusted Trace Correction
8. Stack

The following data were used:

1. Reference Datum: 1000' A.M.S.L.
2. Displacement Velocity: 12,500'/sec. On the Alberta template lines, a near surface layer of 6000'/sec. material was encountered. This material was absent to the north.
3. Velocity Source: Chevron Teepee 2-32-125-13 W5M

IX. RESULTS AND INTERPRETATION

1. Submitted with this report are the following maps:

   Shot Point Location
   Approximate Top of Slave Point
   Approximate Top of Precambrian
   Slave Point to Precambrian Isochron

2. Sections submitted with this report are:

   Line 1 and Line 8

Record quality ranged from very poor to good. Despite extra effort made in areas of surface muskeg, the resultant data were primarily NR. Good

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Record quality ranged from very poor to good. Despite extra effort made in areas of surface muskeg, the resultant data were primarily NR. Good

resolution was obtained on the template line recorded between the 11-1-125-14 W5M and 2-32-125-13 W5M wells but because of the poor data between this template line and the data within the survey block, identification of the horizons to the north is subjective.

P. J. KEIRAN
Senior Geophysicist
Northern Districts

PJK/fep

116°15'

116°00'

115°45'

60°10'

60°00'

(192-744)

(192-744)

4144

4143

4142

YATES RIVER

Yates River

YATES RIVER ← → WOOD BUFFALO

R.14W.5.M.

R.13W.5.M.

R.12W.5.M.

R.11W.5.M.

T.126.

T.125.

Hudson's Bay Oil and Gas Company Limited

EXPLORATION DEPARTMENT

CALGARY ALBERTA

EAST CAMERON

GEOPHYSICAL MAP

SHOT POINT LOCATIONS

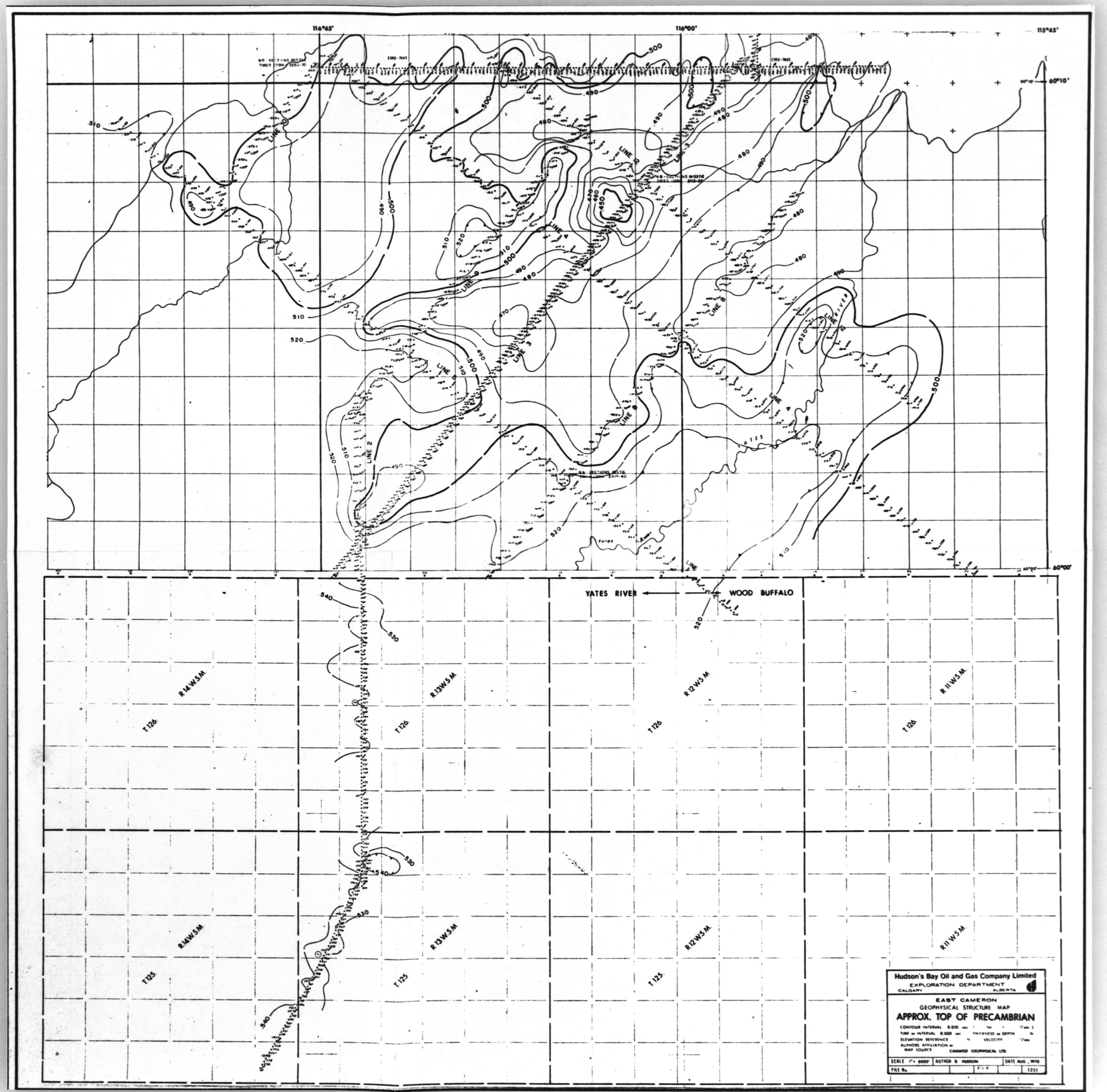
CONTOUR INTERVAL sec (ft/sec)

TIME or INTERVAL sec THICKNESS or DEPTH ft

ELEVATION REFERENCE ft VELOCITY ft/sec

AUTHORS AFFILIATION or MAP SOURCE

SCALE 1"=8000'	AUTHOR		DATE
FILE No.		P-1-P	1251


116°45'
116°00'
115°45'
60°10'
60°00'
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
LINE 6
LINE 7
LINE 8
LINE 9
YATES
YATES RIVER
WOOD BUFFALO
R.14W.5M.
R.13W.5M.
R.12W.5M.
R.11W.5M.
T.126
T.125
Hudson's Bay Oil and Gas Company Limited
EXPLORATION DEPARTMENT
CALGARY ALBERTA
EAST CAMERON
GEOPHYSICAL STRUCTURE MAP
APPROX. TOP OF PRECAMBRIAN
CONTOUR INTERVAL 0.010 sec
TIME or INTERVAL 0.500 sec
ELEVATION REFERENCE
AUTHORS AFFILIATION or MAP SOURCE CANWEST GEOPHYSICAL LTD.
SCALE 1" = 8000'
AUTHOR B. HUDSON
DATE AUG., 1970
FILE No.
1251

116°15'

116°00'

115°45'

60°10'

60°00'

YATES RIVER

WOOD BUFFALO

R.14.W.5.M.

R.13W.5.M.

R.12.W.5.M.

R.11.W.5.M.

T.126.

T.125.

LINE 10

LINE 9

LINE 8

LINE 7

LINE 6

LINE 5

LINE 2

LINE B

YATES RIVER

Hudson's Bay Oil and Gas Company Limited

EXPLORATION DEPARTMENT

CALGARY, ALBERTA

EAST CAMERON

GEOPHYSICAL STRUCTURE MAP

APPROX. TOP OF SLAVE POINT

CONTOUR INTERVAL 0.010 sec. | 'Ise = | 'Vave =

TIME or INTERVAL 0.350 sec. | THICKNESS or DEPTH = ft.

ELEVATION REFERENCE ft. | VELOCITY 'Vave

AUTHORS AFFILIATION or MAP SOURCE CANADIAN GEOPHYSICAL LTD.

SCALE 1" = 5000' | AUTHOR B. HUDSON | DATE

FILE No. 1230

116°45'

116°00'

115°45'

60°10'

60°00'

YATES RIVER

WOOD BUFFALO

R.14W.5.M.

R.13W.5.M.

R.12W.5.M.

R.11W.5.M.

T.126.

T.125.

LINE 1

LINE 2

LINE 3

LINE 4

LINE 5

LINE 6

LINE 7

LINE 8

LINE 9

LINE 10

LINE 11

LINE 12

LINE 13

LINE 14

LINE 15

LINE 16

THICK

THIN

Yates

YATES

Hudson's Bay Oil and Gas Company Limited

EXPLORATION DEPARTMENT

CALGARY ALBERTA

EAST CAMERON

GEOPHYSICAL ISOCHRON MAP

PRECAMBRIAN - SLAVE POINT

CONTOUR INTERVAL 0.010 sec (for ' '/sec)

TIME or INTERVAL 0.150 sec THICKNESS or DEPTH ft

ELEVATION REFERENCE ft VELOCITY '/sec

AUTHORS AFFILIATION or MAP SOURCE CANWEST GEOPHYSICAL LTD.

SCALE 1" = 8000'	AUTHOR B. HUDSON	DATE AUG., 1970
FILE No.	P-1-P	1251

HUDSON'S BAY OIL & GAS CO., LTD.

Micro. No. ②

PROJECT YATES RIVER
LINE 1 Ext.
DATE 7-13-70

FIELD DATA

SHOT BY C-56 TYPE RECORDING CDP 10
OFFSETS 440' TO 2860'
BASEMENT INTERVAL/TRACE 55
SOURCE: SAMPLES ____ DIMENSIONS ____
RECEPTORS: SAMPLES ____ DIMENSIONS ____
SWEEP 80 N 10 NO. OF VIBRATORS ____

DIGITAL PROCESSING

JOB NO 8767-A REEL NO 94730 ORDER
"VIBROSEIS" CORRELATION 1
NORMAL MOVEOUT AND STATICS 3
VELOCITY SOURCE HUD-169C
REFERENCE 1000' Ve 8000 ft
ADJUSTED TRACE CORRECTION 7
WINDOW .40 - .65 SEC
CORRELATION COEFFICIENT .30 .020 SHIFT
STACK 6
DECONVOLUTION ☒ ..... NORMALIZATION ☐ 2
WINDOW .06 - 1.5 SEC
OPERATOR LENGTH .150 SEC
FREQUENCY 15-65 CYCLES
SAILE .....
FREQUENCY FILTER ☐ TIME VARIANT FILTER ☐
____ SEC. ____ CYCLES
____ SEC. ____ CYCLES
____ SEC. ____ CYCLES

OTHER PROCESSES

TC 4
HAND STATICS 6

PLAYBACK

PLAYBACK FILTER 6.3-100 MIXING 25 G

SW NE

670 665 660 655 650 645 640 635 630 625 620 615 610 605 600 595 590 585 580 575 570 565 560 555 550 545 540 535 530 525 520 515 510 505

SLAVE POINT

PRECAMBRIAN

HUDSON'S BAY OIL & GAS CO., LTD.

PROJECT YATE'S RIVER
LINE 1
DATE 8-17-70

FIELD DATA

SHOT BY C-56 TYPE RECORDING CDP 12
OFFSETS 330' TO 1540'
BASEMENT INTERVAL/TRACE 55'
SOURCE: SAMPLES 32 DIMENSIONS 165'
RECEPTORS: SAMPLES 24 DIMENSIONS 165'
SWEEP 80 @ 10 NO. OF VIBRATORS

DIGITAL PROCESSING

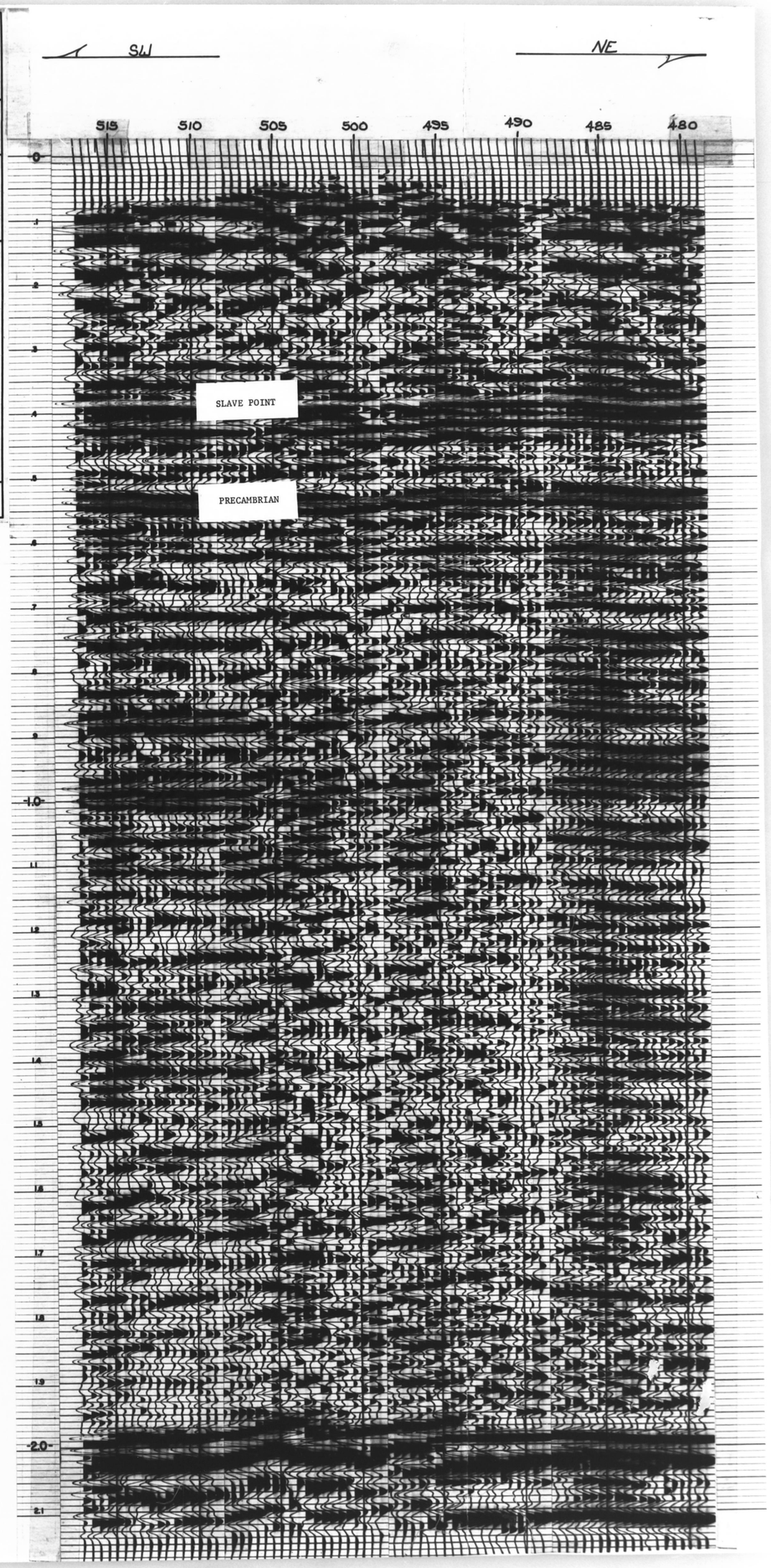
JOB NO 8767-U REEL NO 94928 ORDER
"VIBROSEIS" CORRELATION 1
NORMAL MOVEOUT AND STATICS 3
VELOCITY SOURCE HUD-1690
REFERENCE 1000' Ve 8000 ½
ADJUSTED TRACE CORRECTION 7
WINDOW .40 - .65 SEC
CORRELATION COEFFICIENT .30 .020 SHIFT
STACK 6
DECONVOLUTION ☒ NORMALIZATION ☐ 2
WINDOW .06 - 1.5 SEC
OPERATOR LENGTH .150 SEC
FREQUENCY 15-80 CYCLES
SAILE
FREQUENCY FILTER ☐ TIME VARIANT FILTER ☐
SEC. CYCLES
SEC. CYCLES
SEC. CYCLES

OTHER PROCESSES

TE 4
STATICS 5

PLAYBACK

PLAYBACK FILTER 6.3-100 MIXING 25G



HUDSON'S BAY OIL & GAS CO., LTD.

Micro. No (20)

PROJECT YATES RIVER
LINE 1
DATE 2-27-70

FIELD DATA

SHOT BY C-56 TYPE RECORDING CDP 12
OFFSETS 330' TO 1540'
BASEMENT INTERVAL/TRACE 55'
SOURCE SAMPLES 32 DIMENSIONS 165'
RECEPTORS SAMPLES 24 DIMENSIONS 165'
SWEEP 80 ~ 10 NO. OF VIBRATORS

DIGITAL PROCESSING

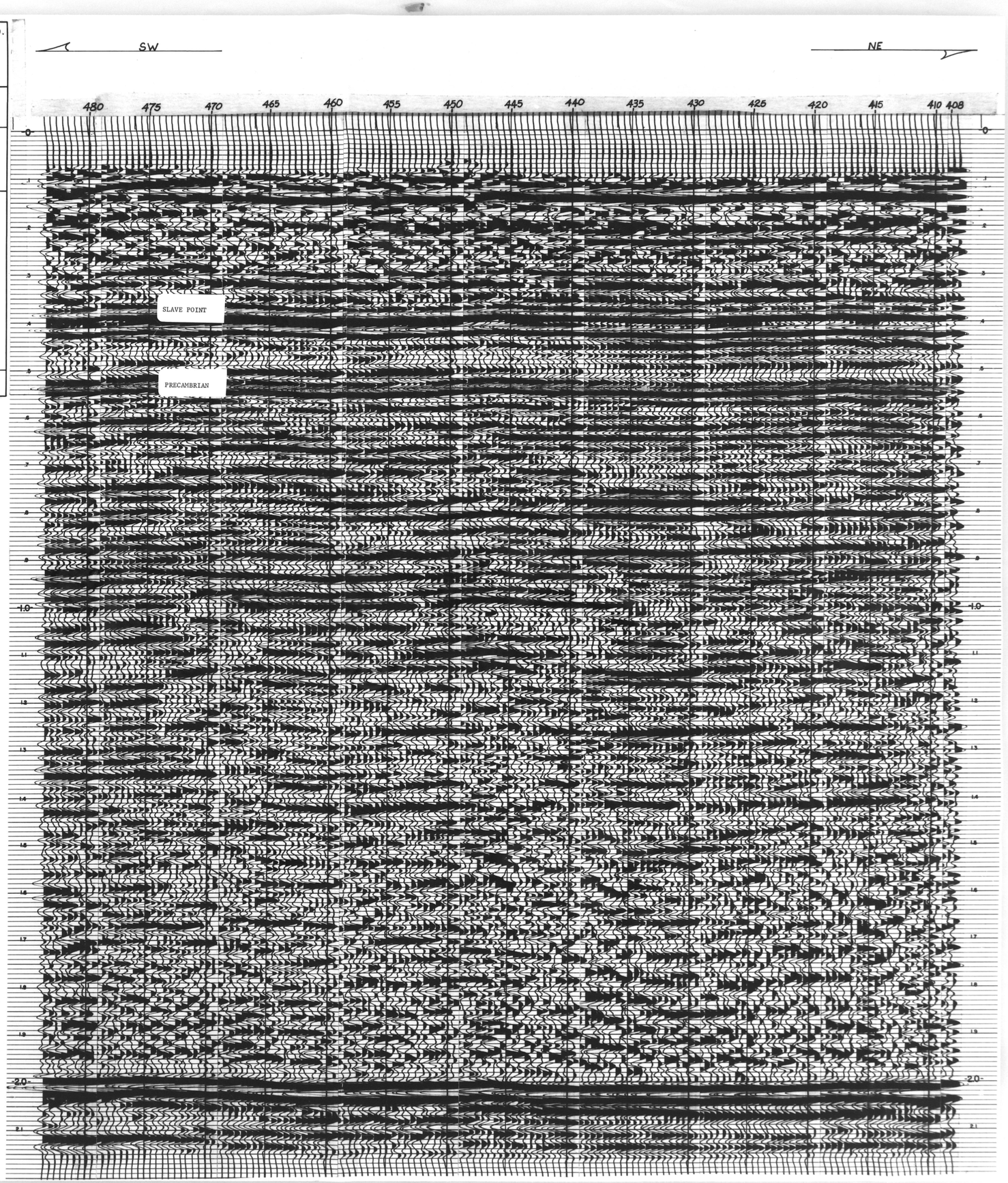
JOB NO 8767-I REEL NO 92642 ORDER
'VIBROSEIS' CORRELATION 1
NORMAL MOVEOUT AND STATICS 3
VELOCITY SOURCE HUD-169-C
REFERENCE 1000' Vo 8000 ½
ADJUSTED TRACE CORRECTION 7
WINDOW .40 - .65 SEC
CORRELATION COEFFICIENT .31 .020 SHIFT
STACK 6
DECONVOLUTION [X] NORMALIZATION [ ] 2
WINDOW .05 - 1.5 SEC
OPERATOR LENGTH .180 SEC
FREQUENCY 15 - 80 CYCLES
SAILE
FREQUENCY FILTER [ ] TIME VARIANT FILTER [ ]
SEC CYCLES
SEC CYCLES
SEC CYCLES

OTHER PROCESSES

TE 4
HAND STATICS 5

PLAYBACK

PLAYBACK FILTER 6.3-100 MIXING 25G



LINE 8

LINE 8

2495 2500 2505 2510 2515 2520 2525 2530 2535 2540 2545 2550 2555 2560 2565 2570 2575 2580 2585 2590

