

GRAVITY SURVEY

DETAILING THE NORTH CHEZACUT AREA

AND

RECONNAISSANCE OF AN AREA NORTH OF THE WEST ROAD RIVER

Latitude - $52^{\circ} - 30'$ North to $53^{\circ} - 40'$ North

Longitude - $123^{\circ} - 30'$ West to $125^{\circ} - 30'$ West

OF THE

NECHAKO BASIN

PROJECT NUMBER 80-246

FOR

CANADIAN HUNTER EXPLORATION LTD.

RECEIVED
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PETROLEUM RESOURCES
DIVISION

BY

OVERLAND EXPLORATION SERVICES (1969) LTD.

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ASSESSMENT REPORT

Field Work Conducted - October 14, 1980 to March 23, 1981

Report by W.T. Salt - June, 1981

NO. 2396 ENCLOSURES NIL

INTRODUCTION

Between October 14, 1980, and March 23, 1981, Overland Exploration Services (1969) Ltd. conducted a gravity survey for Canadian Hunter Exploration Ltd. in the North Chezacut area. Seven of the lines are a detail survey follow-up to the summer reconnaissance lines done with Project Number 80-216. These lines about the Davidson Mountain project which lies to the northwest.

Included in this 80-246 project are two lines surveyed along logging roads, north of the West Road River. These two lines represent the northernmost work done by Canadian Hunter Exploration Ltd. during the Nechako survey.

Two campsites were used; one located north of Chezacut on the Chezacut road, and one located north of the West Road River on the Euchiniko Road. Access to the south camp was from Williams Lake, through Alexis Creek and north to Chezacut. The north camp was supplied from Quesnel via the Blackwater Road and north along the Euchiniko logging road.

In all, 560 kilometers of cut line and logging roads were surveyed in this portion of the project. The Davidson Mountain survey which is a separate report, is also part of Project 80-216, but is not part of the 560 kilometers concerning this report. With the exception of the two logging roads, all transportation was conducted by helicopter. The logging roads were surveyed with 4 x 4 trucks. The snow conditions were light enough in the winter of 1980-81 that plowing did not have to be done.

The North Chezacut survey has been fully integrated with the earlier

reconnaissance work and with the Davidson Mountain survey. The work has also been integrated with the 1979 survey that reached as far north as Chezacut. In this way a composite map can be presented containing all of the collected data.

DISCUSSION OF TECHNICAL METHODS EMPLOYED IN CORRECTIONS AND INTERPRETATION

Surface Density

The surface density used for the Nechako Survey of 2.35 gm/cc was derived from the density profile method. Three density profiles taken across prominent topographic features (one being the Nazko River), indicated that a surface density of 2.35 was generally applicable throughout the area.

Station Spacing

Stations for the Nechako Survey were located at 200m. intervals along the survey lines.

Bouguer Free-Air Correction

A combined Bouguer Free-Air Correction using a density factor of 2.35 gm/cc was applied to the interval between the surface elevation and a datum of sea level.

Latitude Correction

Latitude corrections were made to coincide with the 1967 Ellipsoid standard.

Residual Gravity Calculations

The residual gravity map is derived from profile analysis of the area. A regional gravity datum was applied to the Bouguer profiles that generally filtered out contrast sources emanating from deeper than 20,000' below surface. Broad anomalies were investigated for depth source and where calculations showed a depth to causative mass greater than 20,000', the resulting wave form was incorporated into the regional. These contrasts from shallower depths were then expressed as being positive or negative to the

regional background. It is these residual positives and negatives that have been mapped on the Profile Residual Map.

EQUIPMENT AND SERVICES USED DURING THE NECHAKO GRAVITY SURVEY .

Gravity Survey	- Overland Exploration Services Calgary, Alberta
Topographic Survey	- Horkoff Surveys Calgary, Alberta
Hand-Cutting (gravity lines)	- Roga Contracting (Pat Young) Williams Lake, B.C.
Camp & Catering	- Roga Contracting (Pat Young) Williams Lake, B.C.
First Aid	- Mulder & Associates
Helicopter	- Highland Helicopters

TECHNICAL DATA

Density	- 2.35 (.064075)
Latitude Correction	- 4170.10 feet per milligal
Meters	- LaCoste & Romberg Model G-148 G-211 G-239
Meter Constants	- #148 = 1.0565 #211 = 1.04947 #239 = 1.06481
Terrain Corrections	- Done in the field to the "D" ring - Picked from topographic maps to the "I" ring.

SURVEY & FIELD PROCEDURE

Most of the survey was conducted on hand-cut lines. Lines were cut approximately four feet (4') wide, affording a skyline opening for each line, thus facilitating the line of site. Electronic Distance Measuring systems were used for the physical survey of each cut line. Ties for both elevation and horizontal control were made to a network of Geodetic Bench Marks scattered throughout the Nechako area. All closures across these somewhat vast distances were made under one meter vertical closure and eighty meter horizontal closure. Intermediate sun shots were taken along each line for the exact determination of bearing.

GRAVITY

All gravity readings were taken with LaCoste & Romberg Model G. gravity meters. The meters and meter constants are listed in the Data Index of this report. There are no Geodetic network gravity bases in the Nechako Basin so all observed gravity is related to a theoretical Base value of 500 milligals positive. The diurnal drift control for the walked work along the hand-cut lines was regulated by the use of sub-base stations. Each morning the operator occupied a gravity base station prior to his commencement of work along the walking lines. The day's metering was then performed with sub-bases being recorded in the meter notes every three-hour interval during the day. The Base station was then re-occupied at the end of the working day. Later, a helicopter was employed to run ties from a known base to the sub-bases, thereby giving an accurate account of the diurnal movement of tide and meter during each working day. Appropriate drift corrections were then applied to the line from the sub-base readings.

INTERPRETATION

The North Chezacut detail program (Project 80-246) was run to confirm and define several large gravity lows that appeared to indicate a very deep sedimentary section. The survey was successful in defining these areas of mass deficiency as well as giving a detailed outline of a possible major Horst block, that was first crossed by line 80-14 in the earlier reconnaissance work. The Horst block is flanked by a vertical fault on the west side that extends from north of the West Road River at the north end, due south to the Chezacut Road, a distance of approximately 50 miles. The north end of the fault appears to terminate on a high gravity platform which is probably exhibiting a shallow Basement along the north side of the West Road River. The fault block thus formed, dips to the south until it fades at depth in the deepest part of the Basement. Just south of the West Road River, the fault has a throw of 30 milligals over a distance of 5 miles indicating a great depth of lighter material lying to the west of the Horst block. It is our estimate that there is possibly in excess of 20,000 feet of sediments or fill situated in this gravity low. The east side of the Horst block does not have as steep a gradient which indicates that block may be tilted with the vertical face lying to the west. The east gravity low has a total mass deficiency equal to that of the west which indicates a similar depth of light material.

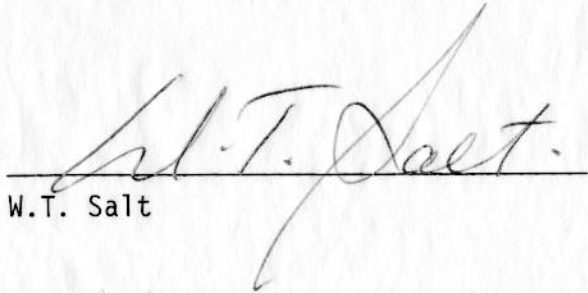
The east end of the Chezacut lines gradually increase in density and end on the same gravity high platform that is located to the north of the work. We feel this high area represents the northern edge of the Nechako Basin.

The lines situated north of the West Road River also remain relatively high with the exception of the extreme northwest corner where there is an

indication that there is a ten to twelve mile channel of light material striking to the northwest from the deep low situated west of the central Horst block.

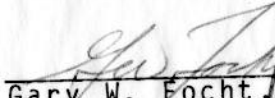
Once again it is advisable to follow this work with some seismic shooting across the low density areas to verify the depths of possible sediments.

OVERLAND EXPLORATION SERVICES (1969) LTD.


W.T. Salt

September 1982

Submitted by:


Gary W. Focht, Geophysicist

Date:


October 29 1982
Canadian Exploration

B.C. Project #80-246

Chilcotin-Caribou Detailed Gravity
AFE # 20180

LINE #	WORK BONUS KM
80-13A	45.0
80-13B	55.0
80-14B(SP's 101-171, 338-625)	61.4
80-14C	43.0
80-15C(SP's 101-255)	30.8
80-15D	63.2
80-15DN	13.0
80-15ES(SP's 208-251, 309-401)	27.0
80-10F(SP's 101-486, 500-554)	87.8
80-10G	27
80-10E	39
80-25A	27.4
81-25B	37.6
	<u>557.2</u>

Davidson Mountain Gravity
AFE # 20061

LINE #	WORK BONUS KM	NON WORK BONUS KM	TOTAL KM
80-14A	-	53.5	53.5
80-14B(SP's 625-694)	-	13.8	13.8
80-15B	-	25	25.0
80-15C(SP's 255-290)	-	7.0	7.0
80-15D	-	15.0	15.0
80-15EN	-	26.4	26.4
80-15ES(SP's 178-208)	-	6.0	6.0
80-10F(SP's 554-935)	-	76.2	76.2
MER-53	-	31.0	31.0
		<u>253.9</u>	<u>253.9</u>