

27 (F)

COMPREHENSIVE SUMMARY OF WORK DONE
P. & N.G. PERMIT NOS. 580-586 INCLUSIVE
KAKISA RIVER AREA
NORTHWEST TERRITORIES.



37-1-4-6

Shell Oil Company is the holder of Northwest Territories petroleum and natural gas permits 580-586 inclusive in the Kakisa River Area, Northwest Territories. Shell Oil Company acquired these permits from Sun Oil Company under an agreement dated September 1, 1955.

As required under Section 25 of the Territorial Lands Act - Territorial Oil and Gas Regulations, we are submitting the following summary of the work done on the permits (which are being worked as a group) for the year November 7, 1955 to November 7, 1956.

Sun Oil Company conducted a reconnaissance seismic program during the winter of 1953-1954 during which time 168 miles of continuous seismic profiling was completed on the permits at a cost of \$179,713.00. Shell Oil Company continued the seismic program during the winter of 1955-1956 and completed 138 miles of continuous seismic profile (see attached map). Seismic work commenced in the Kakisa River area on January 2, 1956 and continued to March 11, 1956 when equipment was moved out of the area due to spring break-up.

Elevations in the Kakisa River area range from a high of 2655 feet above mean sea level in the northeastern part to a low of 1908 feet in the southwestern part. The terrain is covered mostly with scrub tamarac, spruce and poplar with considerable amounts of muskeg. Several lakes dot the area some of which are suitable for light plane operations.

Unusually severe weather prevailed during the first half of the survey with temperatures dropping to 50° to 55° below zero Fahrenheit. Blizzard

conditions were responsible for four days loss of working time and drifting conditions were troublesome during the entire period.

Surface Outcrops

The area is covered with glacial material which mantles the underlying Cretaceous formations.

Field Procedures

Drilling - Drilling over most of the area was difficult due to the presence of gravel and boulders. This unconsolidated material made drilling slow and, as many of the holes could not be loaded to a suitable depth, often necessitated a number of washouts or redrills. Heavy mud and mud conditioners were used extensively in an effort to solve this problem. A Sewell Wet Auger Drill using finger-type and 3-cone rock bits was successful for this type of drilling except for excessive auger stem repairs. Two truck-mounted 1000 Mayhew drills using finger-type and 3-cone rock bits were adequate for all drilling operations in the area although they were somewhat slower than the Sewell drill on holes drilled to a depth of 50 feet or less. The Mayhew drills were more effective in walling up the deeper holes with mud than the Sewell drill. A typical drill log shows up to 25 feet of muskeg, some gravel and clay with boulders. Bulldozers were required to assist the conventional drills over some of the steeper terrain. The average depth of the holes in the Kakisa River area were 58.5 feet.

Shooting - The average charge used was 15 pounds. Heavier than average charges were often required in areas covered by deep muskeg.

Recording - A 24 station, split continuous spread was used with a seismometer interval of 200 feet and six seismometers, spaced 15 feet apart, centred across

the seismometer station. Shot points were 2400 feet apart with the nearest seismometer station 100 feet on either side of the shot point.

In areas of deep muskeg, record quality was poor and larger charges and various filters did not appear to improve the record quality. Records were very poor on steep slopes of hills and were generally poorer at the higher elevations.

A total of 343 holes were drilled and 321 seismic profiles were obtained by the contractor, General Geophysical Company for Shell Oil Company during the course of the 1955-1956 survey. The location of the seismograph shot points and the occurrence of water, sand and gravel encountered in the shot holes is shown on the enclosed map.

Conclusion

We have not included a geological or geophysical map at the present time as our work is still considered in the reconnaissance stage, however, a map showing these data will be provided at a later date. A comprehensive review of the entire area is now in progress to attempt to interpret the poorer data.

The cost of the Shell Oil Company seismic program on the grouped permit Nos. 580-586 inclusive during the 1955-1956 winter was \$146,107.10 as shown on the attached statutory declaration and audited statement. The items included under the general headings on the cost statements are as follows:

Materials include explosives, drilling mud, bits and bit repairs and miscellaneous supplies and repairs.

Work Crews, Equipment Rentals and Drilling Costs include work crews and helpers salaries, equipment rental, camp rental, maintenance and operation, drilling charges and miscellaneous charges.

Transportation - includes moving camp and equipment.

Bulldozing - includes bulldozing roads and shot points and towing charges.

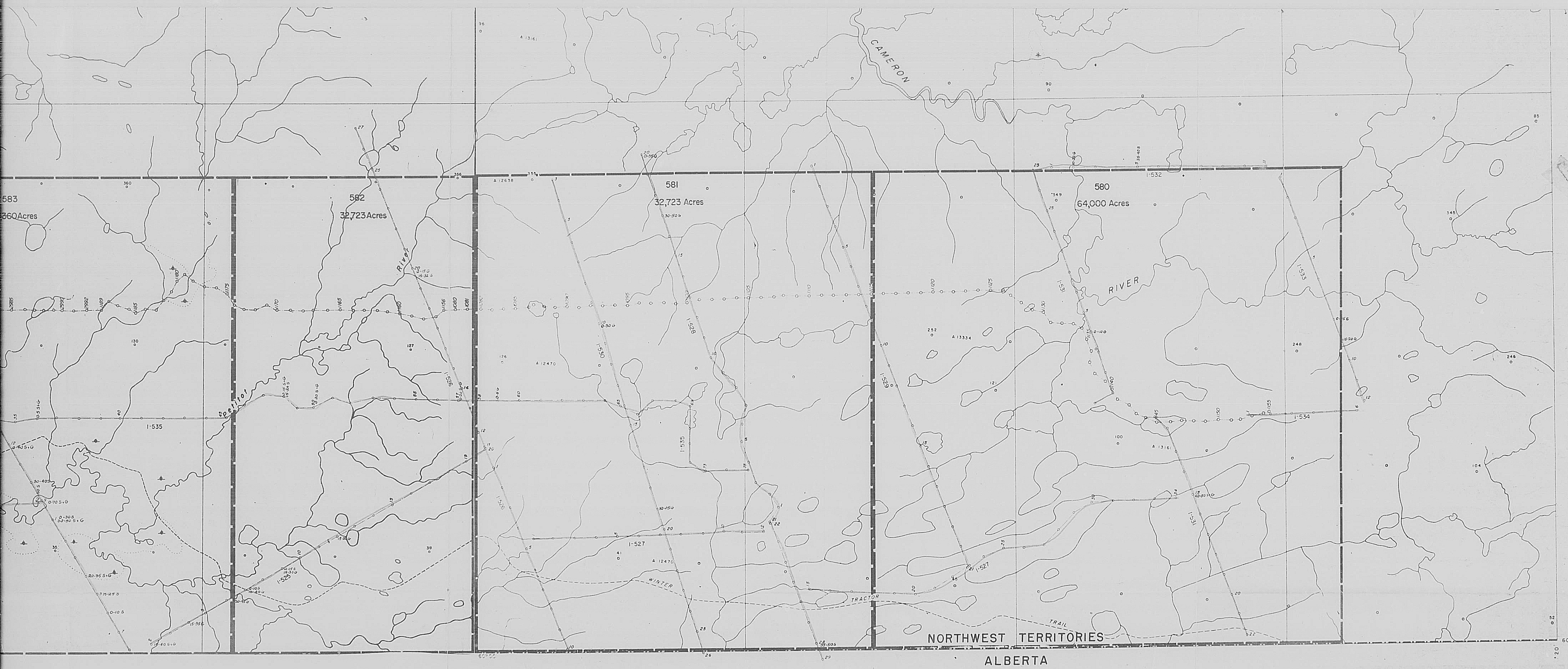
Part of the seismic work extended beyond the boundary of the permit block (see attached map) and the cost of the work within and outside the Kakisa River permit block has been shown on the audited statement and statutory declaration. Our work outside the permit is of value with regard to assisting in the interpretation of our work within the permit area.

Our program on the Kakisa River permit block during the 1956-1957 winter plans for the drilling of a Precambrian stratigraphic test to an estimated total depth of 5500 feet. Operations to prepare access roads to the location are in progress at the present time.

ORIGINAL SIGNED BY
R. F. STORY

R. F. Story
Manager, Edmonton
Division Exploration
SHELL OIL COMPANY

January 29, 1957



LEGEND
 1-526 Seismic Line Number
 — Shot Point Number
 2'-0" 3' Depth of Sand Deposit
 S - Sand, G - Gravel, C - Coal, W - Water
 — Shell Seismic Lines

SHELL OIL COMPANY	
CALGARY AREA	
EDMONTON DIVISION	EXPLORATION DEPARTMENT
KAKISA RIVER	
GOVERNMENT LICENSE REPORT MAP	
Party:	Datum:
Interpreter:	Elevation Corr. Velocity:
Supervisor:	Filter Base (Corr. 0):
Date: Dec. 14, 1956	Shot Depths (Ds):
Maps:	Wx Comp:
Contour Interval:	
Waveform Title:	Load Factor Corr.:
B Function:	Grade Key:
Map Scale: 1" = 4000'	4935
Enclosure No.:	
TO ACCOMPANY PROGRESS REPORT ON NORTHWEST TERRITORIES DEC. 14, 1956	

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GEOPHYSICAL REPORT ON THE KAKISA RIVER AREA

NORTHWEST TERRITORIES

The following report is a summary of the geophysical work done on Northwest Territories Petroleum and Natural Gas Permit Nos. 580 to 586 inclusive (Kakisa River Area). Accompanying this report are the Surface Topography (Enclosure No. 4) and the Top Devonian (Enclosure No. 3) maps. ✓

Reconnaissance reflection seismograph surveys were conducted on Northwest Territories Petroleum and Natural Gas Permits Nos. 580 to 586 inclusive, totalling 397,523 acres, by the Sun Oil Company in the winter of 1953-1954 and by the Shell Oil Company in January and February 1956. A total of 168 miles of continuous seismic profiling was obtained by Sun Oil Company and 126 miles of similar coverage was obtained by Shell Oil Company.

The Kakisa River Area is located in the Northwest Territories between the 117°27' and 119°23' west longitudes and the 60°00' and 60°07' north latitudes. The area was reached by various bulldozed trails extending to the north from a winter trail which runs to the west-northwest from mile 280 on the Mackenzie Highway in Alberta.

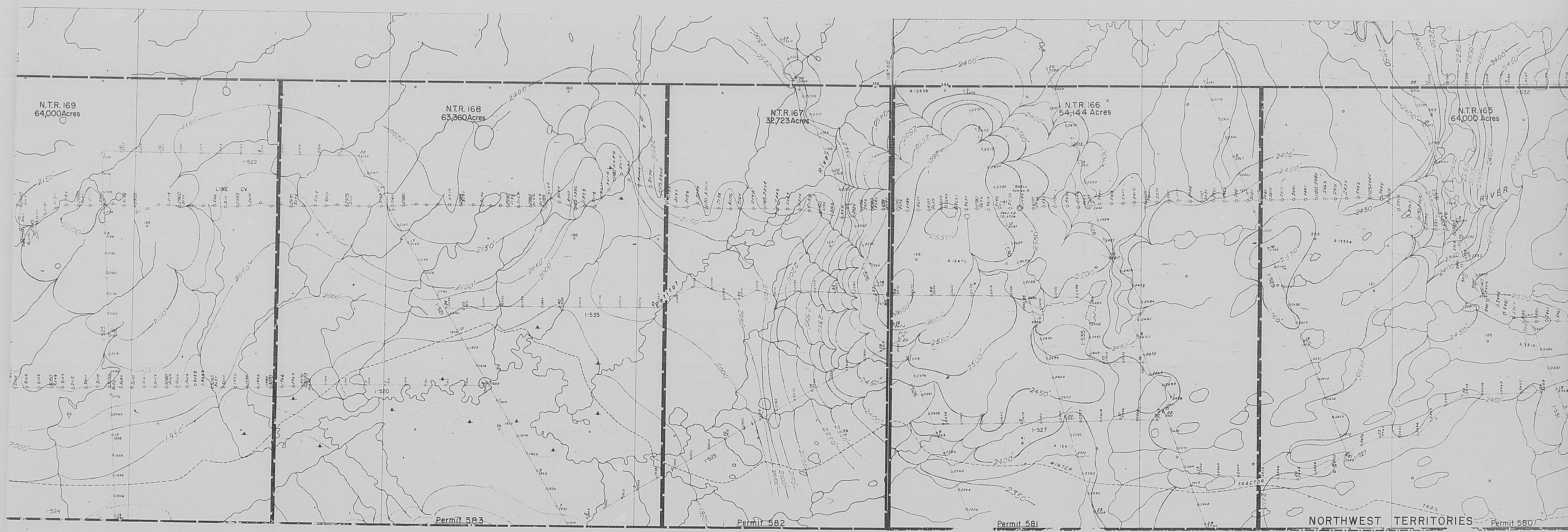
All the seismic lines in the Kakisa River Area were bulldozed over topography which varied from gently rolling hills in the west to the more violent topography of the Cameron Hills in the eastern part of the area. The surface elevation ranges from 1855 feet ASL in the northwest corner, to 2670 feet ASL in the eastern part of the permit area (refer Enclosure No. 4).

Record quality was found to vary considerably in the prospect area. Generally, poor records were obtained in muskeg areas and at the

higher elevations of the Cameron Hills. The Mississippian reflection is good west of the erosional edge of the Mississippian which underlies the central part of the block. The Top Devonian reflection, good in the west, is poor in the eastern half of the survey. Events originating from within the Hay River Shales are poor and discontinuous. The Slave Point and Precambrian events were considered unreliable throughout the area as they were distorted by multiple reflections. The multiple reflections are caused by energy returning from the Top Devonian horizon being reflected from the surface to produce an entirely new set of events from the various reflecting horizons. These multiple reflections usually interfere with or completely mask the events originating from reflecting horizons below the top of the Devonian.

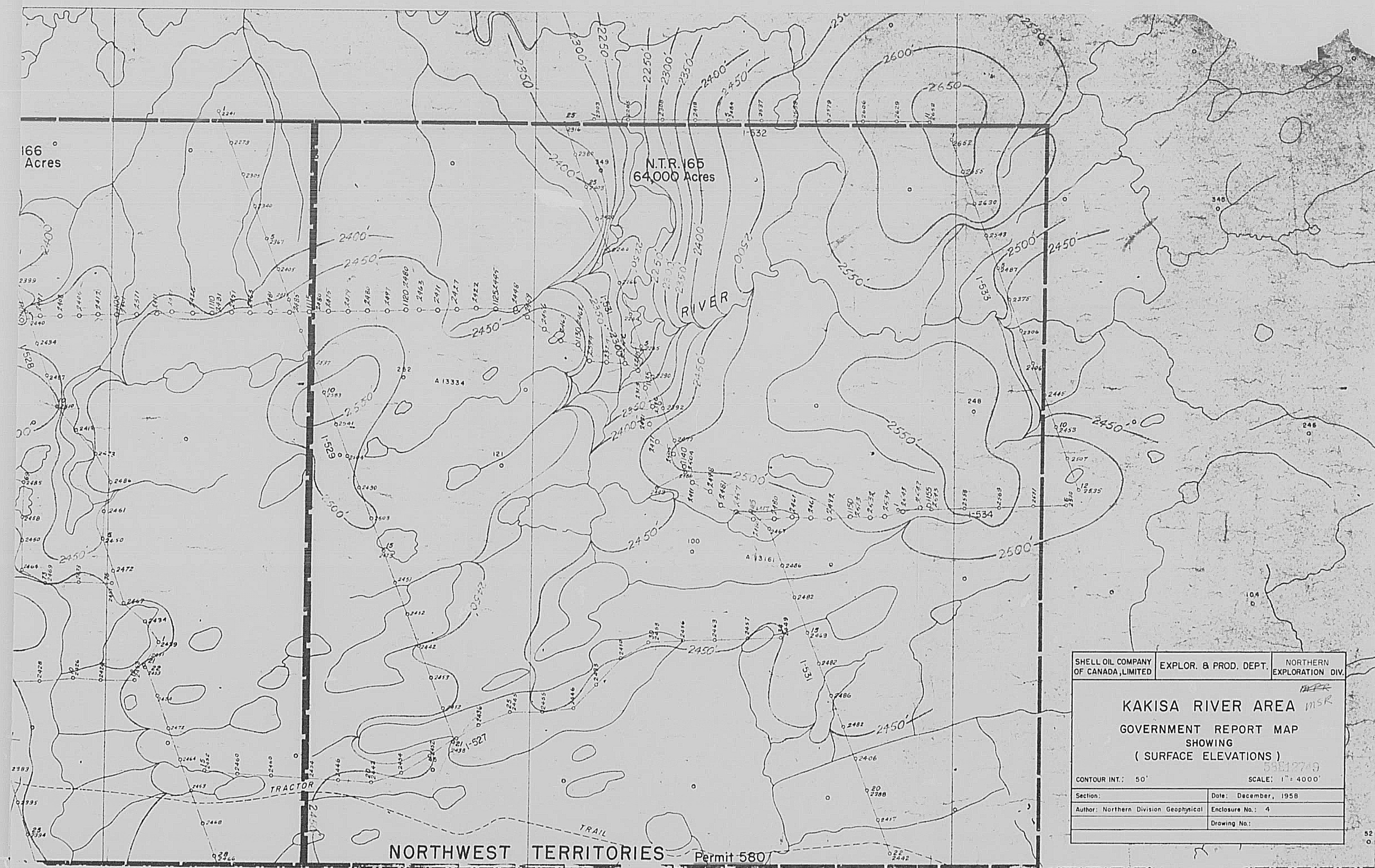
See also, enclosed. aeromagnetic. maps
Permits 580 - 586, KARISA RIVER,
DEC 12/58 - Enclosure 2.

December 18, 1958



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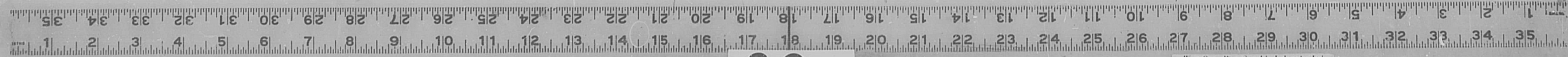
I-526 Seismic Line Number

— Shot Point Number

0'-10' Depth of Sand Deposit

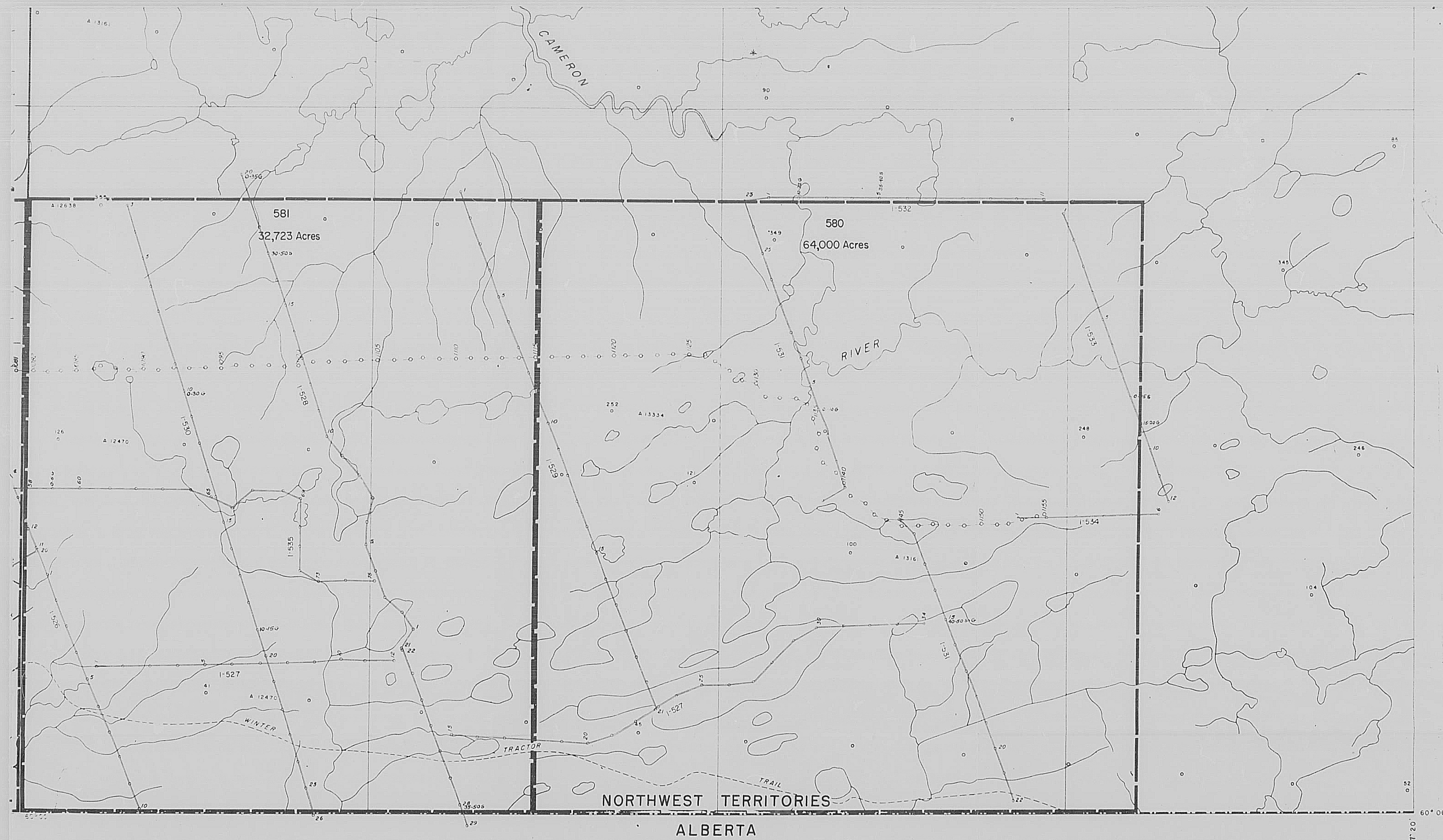
S - Sand, G - Gravel, C - Coal, W - Water

— Shell Seismic Lines



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West Canadian Graphic Industries Ltd.



LEGEND
 1-526 Seismic Line Number
 Shot Point Number
 Depth of Sand Deposit
 S - Sand, G - Gravel, C - Coal, W - Water
 Shell Seismic Lines

SHELL OIL COMPANY	
CALGARY AREA	
EDMONTON DIVISION	EXPLORATION DEPARTMENT
KAKISA RIVER	
GOVERNMENT LICENSE REPORT MAP	
Party :	Datum :
Interpreter :	Elevation Corr. Velocity :
Supervisor :	Filter Base (Corr. = 0) :
Date : Dec. 14, 1956	Shot Depths (Ds) :
Maps :	Wx Comp. :
Contour Interval :	
Wavefront Title :	
B Function :	Load Factor Corr. :
Map Scale : 1" = 4000'	Grade Key : 8255
Enclosure No. :	
TO ACCOMPANY STATUTORY DECLARATION OF EXPLORATIONS, JAN. 29, 1957	

