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SEEP SURVEY
PROJECT GLACIER
NORTHWEST TERRITORIES

CANADA

*Abstracted for
Geo-Science Data Index.*

Date

The Atlantic Refining Company

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TABLE OF CONTENTS

	Page No.
<u>Introduction</u>	
Description of Project	1
Description of Glacier Area	1
Instrumentation and Transportation	1
<u>Seep Survey Operation</u>	2
Survey Log	3
Seep Survey Map	5

INTRODUCTION

Description of Project

The seep survey in the Glacier Area was conducted during June and July, 1959, by the Geological Section, Exploration Division of the Atlantic Refining Company.

The purpose of the seep survey was to examine water-covered areas in the Company's acreage for indications of gas seeps, thereby emphasizing these areas for further evaluation with other prospecting tools. The seep gas, principally methane, is detected by taking water samples which are degassed and the gas analyzed for methane with an infrared gas analyzer.

Description of Glacier Area

The Company's Glacier Block is located in the Mackenzie District of the Northwest Territories, Canada. The area lies between 129° 15' and 132° 15' longitude, and 66° 00' and 66° 50' latitude. The northeastern corner of the block is approximately the intersection of the Mackenzie River with the Arctic Circle, and the block lies west of the village of Fort Good Hope.

The acreage is in the Lower Mackenzie Plain physiographic province. The major rivers are the Mackenzie on the northern and eastern sides of the block, the Arctic Red on the western side, the Hume and Ramparts in the southern portion of our acreage, and the Ontario, which lies entirely within the Glacier Block area.

The country is muskeg covered, underlain by permafrost, and dotted with thousands of small, shallow lakes. Along the lake shores, rivers, and smaller drainages there are dense growths of spruce, willows, and birch trees. The lakes, mostly shallow, support an immense amount of vegetation, particularly in the late summer.

Instrumentation and Transportation

The marine seep equipment consisted of three skid-mounted units: a 1000 watt-115 VAC gasoline-driven generator, the infrared analyzer unit, and the gas breakout unit. These units were mounted in a 14-foot aluminum boat powered by a 10 HP outboard motor. The boat plus equipment was designed to be small enough and light enough that helicopter transport from one area to another would be possible. The weight of the entire system with two men was about 1100 pounds. A Sikorsky S-55 helicopter, leased from Kenting Helicopters, Ltd., was used to transport boat and crew.

SEEP SURVEY

The boat was trailer towed from Dallas, Texas to Calgary, Canada, and transported from Calgary to Fort Good Hope by helicopter. All other equipment and personnel proceeded by commercial air transportation. The units were mounted in the boat and initial testing on the Mackenzie River completed by June 18.

River Surveys

The survey began on June 21 at the mouth of the Ontario River. The methane reading was very high (800 ppm) at the mouth but dropped to 50 ppm as the boat moved up the river. Small gas bubbles were noticed near the bank at the location where the methane reading was high. After traveling 9 miles the survey up the Ontario River was terminated by rapids and shallow water.

During the periods July 16 to July 21 and July 23 to July 25 we surveyed 90 miles of the Ramparts River beginning at its mouth. Progress over the first 35 miles of the survey was impaired by swift, shallow water with many rapids. The survey up the Ramparts River was finally terminated due to shallow water. One anomalous reading was recorded near location #50. No gas bubbles were visible due to extreme water turbulence.

None of the other rivers in the block were navigable in the 14-foot boat.

Lake Surveys

A total of eight lakes was surveyed. In general these were shallow and wide in areal extent. One exception was Fossil Lake which is quite deep over most of its area. All the lakes had dense growths of vegetation which produced large amounts of methane and precluded obtaining any reliable seep data.

The seep survey was terminated on July 23, 1959. Several days were required to collect gear and break camp. All seep personnel had departed by August 10, 1959.

SEEP SURVEY DAILY LOG

June 8 to August 11, 1959

June 8 to June 11th	Traveling from Calgary to Norman Wells
11th to 16th	Moving into Fort Good Hope with crew and camping equipment, setting up camp, and waiting for arrival of seep equipment.
17th	Installed seep equipment in boat.
18th	Ran survey along eastern bank of Mackenzie River upstream from Fort Good Hope to beginning of Upper Ramparts outcrop -- no methane shows. Transported boat and equipment to site of known gas seep on Ontarate River.
19th and 20th	Adjusted equipment and ran up river over seep. Got small show below seep location. Transported boat to mouth of Ontarate River.
21st to 27th	Surveyed 9 miles up Ontarate River; found seep at mouth of river. Surveyed 6 lakes: #1482-55 and 65, 1482-14 and 4, 1481-2, Marion Lake, 1511-40 and 50, 1510-2 and 3.
27th to July 1st	Repaired equipment; surveyed lake #1511-41. Equipment trouble. Transported equipment back to Fort Good Hope.
July 1st to 9th	Repairing equipment, observing surface geology in Block, day off.
10th to 14th	Picked up Luehrmann, instrument specialist, in Norman Wells. Fixed equipment.
15th	Began survey up Mackenzie River from Fort Good Hope towards mouth of Ramparts River. Hit rapids, flooded boat.
16th	Fixed breakout switch shorted by water. Began surveying up Ramparts River. Surveyed 18 miles.
17th	Ramparts River survey; surveyed 13 miles.

July 18th	Trouble with outboard motor propellor. Surveyed 9 miles.
19th	Surveyed 22.5 miles up Ramparts River.
20th	Surveyed 29 miles up Ramparts River.
21st	Picked up boat, moved to lakes. Surveyed lakes #1275-77, #1274-25 and 35. Moved to Fossil Lake. Developed leak in breakout unit.
22nd	Reviewed survey records. Collected sample of gas at seep on Ontaratus River.
23rd	Picked up boat, returned to Ramparts River. Surveyed 6 miles.
24th	Ramparts River too shallow to navigate further. Returned equipment to Fort Good Hope.
25th	Day off; weather bad.
July 26th to August 9	Decided to end survey. Began camp breakup. Finished on 9th.
10th	Personnel departed for Norman Wells and Edmonton.
11th	Arrived Calgary.



SEEP SURVEY, GLACIER BLOCK
NORTHWEST TERRITORIES, CANADA

— = LEASE BOUNDARY

STATUTE MILES
0 10 0 10 20

THE ATLANTIC REFINING COMPANY