

Job Report

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Project Name: Pollution Abatement in Region V

Period Covered: September 1, 1960 to September 1, 1961 Job No. F-4

Investigation of Waste Flowing Through Petronilla Creek  
and Evaluation of Its Possible Effects on Marine Life in Baffin Bay

Objective: To detect, measure, and control toxic substances which may pollute waters in Baffin Bay via Petronilla Creek.

Procedure: Five stations were established in Petronilla Creek as accessible points downstream from three major oil fields. Samples of water were taken from the creek each month and checked for oil content and salinity. In addition, a mineral analysis, determined by Standard Methods, Tenth Edition, of a composite sample from three oil wells was compared with a composite of three samples from the creek. Separator pits were inspected to determine their efficiency in retaining oil wastes long enough to allow proper skimming.

Information pertaining to location of wells and to waste production was obtained from Railroad Commission personnel (Table 1).

Findings: Luby Field, Clara Driscoll Field, and Minnie Bock Field have a combined total of 159 wells disposing 64,380 barrels of bleedwater daily into Petronilla Creek which flows into Baffin Bay. Minnie Bock and Clara Driscoll Fields are located between Stations 1 and 2 (Figure 1). The creek meanders for approximately 15 miles before it receives the waste from Luby Field. The oil content in the creek between Stations 1 and 3 averaged 44.1 parts per million (Table 2). This was reduced to 31.8 parts per million at Station 4. However, excluding an oil spill at Station 3 in August 1961, the concentration for the three stations averaged 16.0 parts per million. Most of the oil from Clara Driscoll and Minnie Bock Fields is filtered by the creek banks and is, thus, reduced below the maximum allowable of 25.0 parts per million. The creek gets wider and meanders less between Stations 4 and 5, reducing the filtering effects by the creek bank. The oil content increased to 50.3 parts per million at Station 5. Since Luby Field lies between Stations 4 and 5, it is justifiable to say Luby Field contributes 70 percent of the oil which enters Baffin Bay.

A mineral analysis (Table 3) of the oil field waste compared to a mineral analysis of the creek water indicates the waste to be diluted sufficiently by rainfall and tidal influx so the increase in total dissolved solids is not enough to cause harm to marine life in Baffin Bay.

A monthly inspection of the skimming pits indicated approximately 30 percent of the pits were inefficient and could not skim waste oil properly. Operators of wells in violation were issued a pollution notice and given two weeks to reconstruct the pits. In the event the operator failed to remedy the complaint, the Railroad Commission issued a pipeline severance, thus stopping sale of oil from the tanks. The well was not released until the repairs were accepted by the Game and Fish Commission.

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Table 1

Saltwater Production for 24-hour Period

	<u>Luby</u>	<u>Driscoll</u>	<u>Minnie Bock</u>
Wells	57	46	56
Bleedwater (bbls)	11,044	15,472	37,864

Figure 1

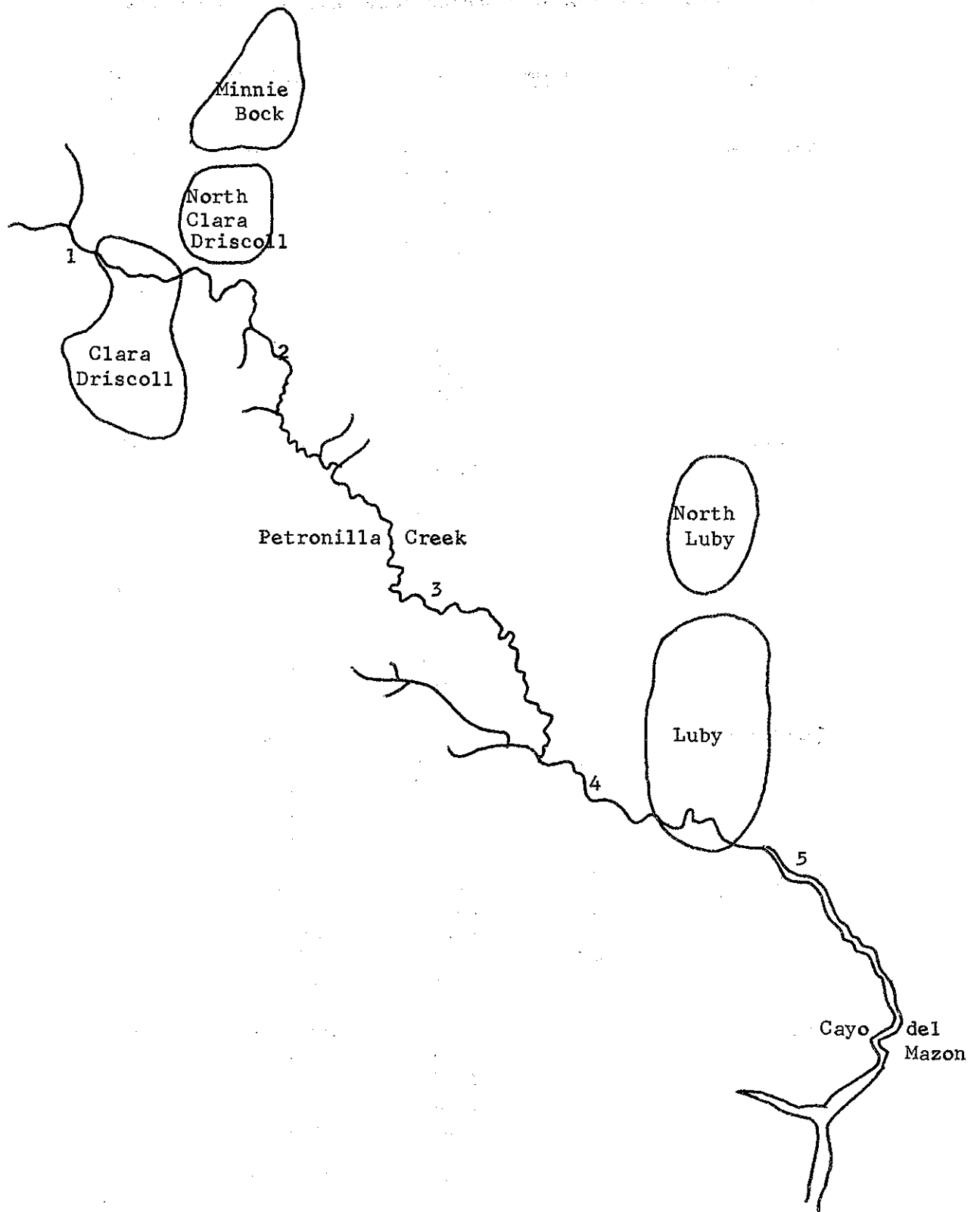


Table 2

## Monthly Averages of Oil and Salinity Content and Rainfall

<u>DATE</u>	<u>STATION</u>	<u>OIL*</u>	<u>SALINITY**</u>	<u>RAIN</u> inches
September 60	1	0.0	No Flow	2.81
	2	42.5	66.4	
	3	21.0	66.3	
	4	9.0	66.6	
	5	36.0	53.5	
October	1	0.0	.8	9.59
	2	14.0	3.2	
	3	6.0	3.2	
	4	5.0	3.2	
	5	12.0	5.8	
November	1	0.0	No Flow	1.98
	2	61.2	66.2	
	3	35.0	66.4	
	4	26.8	65.3	
	5	73.2	59.2	
December	1	0.0	0.0	6.49
	2	29.7	18.4	
	3	24.2	15.2	
	4	14.6	10.1	
	5	23.2	15.6	
January 61	1	0.0	No Flow	1.78
	2	38.9	66.2	
	3	31.5	66.5	
	4	19.6	66.3	
	5	52.6	58.4	
February	1	0.0	0.0	3.60
	2	25.6	58.7	
	3	19.3	58.2	
	4	9.2	55.3	
	5	49.3	46.1	
March	1	0.0	No Flow	-----
	2	62.0	65.5	
	3	34.5	64.5	
	4	11.3	65.6	
	5	32.5	56.3	
April	1	0.0	No Flow	1.71
	2	29.3	63.4	
	3	21.2	59.6	
	4	14.6	59.6	
	5	39.5	57.5	

Table 2 Cont'd.

<u>DATE</u>	<u>STATION</u>	<u>OIL*</u>	<u>SALINITY**</u>	<u>RAIN</u> inches
May	1	0.0	No Flow	0.0
	2	92.3	68.7	
	3	65.3	66.2	
	4	29.4	66.9	
	5	105.3	54.2	
June	1	0.0	0.0	4.66
	2	83.5	46.1	
	3	91.2	33.1	
	4	36.4	25.2	
	5	73.2	24.8	
July	1	0.0	0.0	8.15
	2	18.5	0.0	
	3	15.3	0.0	
	4	9.6	0.0	
	5	21.5	0.0	
August	1	0.0	No Flow	1.87
	2	31.6	65.2	
	3	523.0	66.3	
	4	196.0	64.2	
	5	85.3	53.9	

\* in parts per million

\*\* in parts per thousand

Table 3

Analytical Summary of Chemical Analysis of Bleedwater

	<u>OILFIELD *</u>	<u>STATION 5 X</u>
Bicarbonates	262 ppm	148.0 ppm
Sulfates	921	637.0
Chlorides	38,563	26,225.0
Calcium	592	192.0
Magnesium	71	140.0
Sodium	23,909	17,231.0
Silica	67	70.0
Aluminum Oxide	19	9.0
Iron	110	42.0
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Total Solids	64,614 ppm	44,704.0 ppm

\* A composite sample from three wells  
X A composite of three samples

