

An Oiled Arctic Shore

A portion of the fuel oil spilled into the harbour at Resolute, Northwest Territories, late in August 1970 went ashore there and, as yet, a firm arrangement concerning clean-up has not been made. The oiling occurred mainly on the upper portion of the intertidal zone, but not above high water, to the northeast of the Tide Gauge Jetty (Canadian Hydrographic Service Chart 7533) a distance of less than 1 mile (1.8 km.) on a shore composed mainly of a non-uniform gravel. The oil was believed to have been a mixture of diesel fuel and a heavier fuel, perhaps as heavy as a Bunker C type, but was generally "light" enough so that some penetration into the gravel occurred. According to Dr. A. Y. MacLean, Nova Scotia Technical College, who examined a sample, the oil did not contain any of the asphaltic material of Bunker C type residual fuels. On the basis of a casual sampling on 3 September the average penetration into the beach material was observed to be about 3 inches (7.6 cm.).

Apparently the spill occurred from a tanker with a cargo comprising a variety of fuel oils which, during a hose or tank cleaning operation, discharged an oil waste onto the water surface at a position just off the tank farm. At the time (believed to be late on 24 August or early on 25 August), the harbour contained a considerable amount of ice, apparently as much as 8 to 9 tenths ice cover in some places, which in turn contained the oil and limited its movement to the immediate shore to the north and east. A portion of the ice became quite heavily stained with oil and some of this ice eventually moved out of the harbour with the northerly winds of 1 September. However, ablation of a portion of the stained ice occurred while it was grounded on the intertidal zone causing somewhat heavier oiling there and patchiness in the distribution of oil which was visually quite evident on 3 September (Fig. 1). By 1 October the intertidal zone was covered with ice and only a light stain was visible at the high water line.

Recent experience and experiment^{1,2} have demonstrated that ice cover can provide effective control of spilled oil. It seems that the containment at Resolute was also quite effective and would have permitted consideration of a number of cleanup options. For example, the oil might have been pumped into containers ashore or into a ship or barge, or pumped in discrete amounts to other areas of ice cover in a direction away from the tank farm and burned (see cover picture).

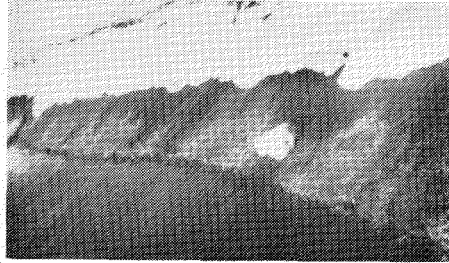


FIG. 1. A comparatively lightly oiled portion of the intertidal zone where the patchiness mentioned in the text was evident. The snow above the intertidal zone was due to a fall on 1 September. View to the west from a helicopter at about low water on 3 September.

The decision not to attempt an immediate cleanup was based on a number of considerations including the probability that the incident would provide the basis for some insight to the fate of oil on a sheltered shore at high latitude. The probability was considered significant even though adequate data concerning the spill were not available and even though there was a chance that a storm with southerly winds during the remainder of the open season could cause a major redistribution of the oil. As has been observed³, the latter probability was small and we now know that such an event did not occur. Thus, the oil on shore did not extend above high water by the end of the open season.

ACKNOWLEDGEMENTS

I am indebted to Captain W. J. H. Stuart, Ministry of Transport, who was in charge of the initial investigation of the incident, and to Dr. Harold Welch, Jr., a resident of Resolute, for the information they provided concerning the spill.

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