

# OIL & HAZARDOUS MATERIALS RESEARCH NEWSLETTER

## WHERE? WHEN? HOW?

Chevron Platform C in Breton Sound, Louisiana; Kodiak, Alaska; Tampa, Florida; Chedabucto Bay, Nova Scotia; Grande Isle, Louisiana; Philadelphia, Pennsylvania; San Diego, California; Martha's Vineyard, Massachusetts; Jacksonville, Florida; Point Pleasant, New Jersey; Lake Champlain, Vermont — all these areas have experienced oil spills since January 1970. What area will be next? What methods and techniques will be available at that time to cope with the oil spill? The technology for controlling oil pollution is rapidly changing and we hope that by this Newsletter we can keep you informed as to what is happening in the field and where additional information can be obtained.

In this issue of the Newsletter, we feature the Federal Water Quality Administration's Research and Development program needs in the area of oil pollution control.

## **RESEARCH NEEDS    FWQA OIL POLLUTION PROGRAM**

A primary goal of the FWQA research program on the control of oil pollution has been the development of techniques for physically removing spilled oil from the environment. As explained below, and in the last Newsletter, we have initiated and are currently negotiating a number of projects directed toward this end. Physical removal still remains our highest priority, but we feel the time has come to await the results of activity underway before proceeding further.

Thus, we now direct our priorities to the several other problems listed below, and offer a brief description of each, with the hope of stimulating activity for their solution, as well as specific proposals for possible FWQA funding.

### **Recovery of Spilled Oil With Additives**

Dozens of floating oil sorbent materials are now on the market. Each week a new one seems to come by the Edison Lab. Each oil spill brings a deluge of vendors with their bags of "whiffle dust". But bags of products are not enough! How is the material to be distributed, mixed with the oil, recovered, and disposed of? The most suitable product may well be determined by the constraints of an effective system for its use. Our interest is now in the phased development and demonstration of a practical system for recovering spilled oil with oil sorbent materials.

### **Oil Slick Identification**

We are actively investigating methods for adding characteristic tags to oil cargoes which could be used for identifying oil when spilled. Preliminary studies indicate this approach may be feasible, and within several months we plan to issue an RFP for testing and demonstration of one or several active tagging methods. However, there seems to be a valuable role for identifying oil slicks by analysis of the endogenous

components — so-called "fingerprinting". This is obviously complicated by the rapid and profound weathering of spilled oil. But there is sufficient evidence that weathering is not an insuperable obstacle, to warrant an attempt to exploit the possibilities of "fingerprinting".

Different levels of analytical resolution are needed. In some cases, it will be sufficient to know merely whether or not a slick is from a certain grade of fuel oil. In other cases, resolution of different types or fields of crude oil may be necessary.

Basically, we need to know what analytical techniques can be applied to this problem and how each will be affected by changes resulting from weathering of the oil. Our current opinion is that no single analysis (e.g. such as for Va/Ni) will suffice, but a battery of complementary techniques will be required.

### **Fate and Effects of Dispersed Oil**

Chemical dispersion is a mechanism which has been proposed and used in the past to treat oil spills. However, to prescribe the proper use of dispersion, more information is needed as to the physical fate of oil which has been dispersed, both naturally and chemically; the toxic effects of dispersed oil; the fate of oil in subsurface — does it sink, enter into the sediments, resurface after a period of time — and the physical movement of oil in the water column.

### **Bilge and Ballast Control**

Bilge and ballast waters are a problem of immediate concern. Demonstration of existing pollution control equipment and devices, e.g. coalescing, filtration, etc., must be conducted. High capacity oil-water separators must be developed for ballast waters. In-line oil detection devices for bilge and ballast discharges must be developed or demonstrated. Existing separators developed by FWQA and others as auxiliary equipment for oil skimming systems should be considered for meeting this need.

### **Oil Pollution in the Arctic**

What are the fate and effects of spilled oil in arctic regions? Will the

physical and chemical characteristics of oil to be produced and transported present unique problems? Will oil pollution control techniques developed for temperate regions be applicable in the arctic, or will specialized techniques be required? Can we define specific research needs for this problem? (In-house research on the physical and chemical properties of oil at low temperatures is planned during the coming year, but supplemental work is needed to define the nature and scope of these problems.

### **Oil Slick Sampling**

Technology is currently lacking for direct measurements on oil slicks. Techniques are needed for obtaining representative samples of oil slicks for analysis, and for directly measuring the average thickness or quantity of oil per unit surface area.

## **PROGRESS ON FWQA OIL POLLUTION R&D GRANTS AND CONTRACTS**

### **1. Cleaning Oil Contaminated Beaches:**

Equipment and hardware used for beach restoration has been evaluated through Phase I of a contract to URS Systems Corporation, 1811 Trousdale Drive, Burlingame, California 94010. A report entitled, "A Preliminary Manual for the Restoration of Oil Contaminated Beaches" has been prepared under the direction of the Agricultural and Marine Pollution Control Branch, FWQA, Washington, D. C. 20242. This manual was sent to all FWQA Regional Oil Spill Coordinators along with a 15-minute film demonstrating beach restoration techniques. Although this manual and film are presently classified for FWQA internal use only, the final report from URS Corporation, which is to be completed in July 1970, will be available to interested parties.

Additional work on cleaning oil containment beaches has also been accomplished. Aerojet General Corporation of El Monte, California has completed Phase I of a study for FWQA concerning the feasibility of incinerator systems for the restoration of oil contaminated beaches. Several alternative processes were studied and recommendations have been given concerning the technical and economic feasibility of each process. Technical personnel from FWQA are reviewing the final report on this project, which should be available to the public by June 1970.

Melpar Corporation of Falls Church, Virginia has completed Phase I of a study examining a froth flotation method to clean oil contaminated beaches. Laboratory results have been encouraging. Field testing of the froth flotation technique will be conducted this summer at Dam Neck, Virginia. A report will follow the demonstration phase of this study.

2. Hi-Capacity Oil Pick-up Devices:

Garrett Corporation, Airesearch Manufacturing Company of Los Angeles, California has developed a prototype oil skimming device under a FWQA contract. The oil skimmer is of weir-type design and has taken several configurations in the model testing phase. The skimmer concept and design have been released to the American Petroleum Institute, who, in turn, have issued a research contract to Garrett Corporation for development of a full-scale oil skimming system with a boom sweep design. The entire system has been given the name "Sea Dragon", and is scheduled for testing under actual environmental conditions in May 1970, off the coast of California.

3. Containment Barriers and Skimming Devices:

A FWQA research grant with the Maine Port Authority in Portland to test and evaluate mechanical and pneumatic barriers to contain spilled oil and the evaluation of skimming devices for removing the contained oil has completed the testing phase. A final report is in preparation. This project was extended so that the technology learned from this investigation could be used to aid in combating the oil spill at Chevron Platform C, in Breton Sound, Louisiana.

4. Oil Tagging Techniques:

In Falls Church, Virginia, the Melpar Corporation has just completed a research project for FWQA involving an oil tagging system for identifying oil. This study included consideration of the feasibility of utilizing oil identification methods of chemical tags, radiochemical tags, passive chemical/physical analytical techniques, and particle tags. The final report for this project will be available to interested parties by June 1, 1970.

5. Cleaning Oil Contaminated Waterfowl:

Dr. Lynn A. Griner of the University of California in San Diego has completed a research contract with FWQA on the treatment of waterfowl trapped in oil polluted waters. Methods were developed to manage the



cleansing of oiled birds to minimize mortality during their captivity. Proper feeding of the oil contaminated birds was found to be a major factor in their survival. The final report for this project is also under review and will be released to the public shortly.

-NEW YORKER Magazine-



*"This is the man who ate the steak that came from the steer that nibbled the grass that grew in the field where roamed the cat that caught the bird that ate the fish that fed on the bug that floated around in the oil slick."*

## NEW FWQA OIL POLLUTION PROJECTS:

Following is a list of grant and contract projects awarded by the Federal Water Quality Administration since January 1970 dealing with oil pollution control research and development:

<u>Grantee or Contractor</u>	<u>Subject</u>	<u>Project Director</u> <u>Expected Completion Date</u>
American Process Equipment Corp. 10826 Venice Boulevard Culver City, CA 90230	Design, construct and test an oil-water separator which employs a hydrocyclonic system to separate un-emulsified oil-water mixtures.	Robert Rod 8/15/70
Reynolds Submarine Services Corp. 615 Southwest Second Avenue Miami, FL 33130	Design, construct and test at pilot-scale a voraxial oil separation system for an oil-water mixture collected by mechanical oil slick harvesting devices.	Arthur L. Merkel 6/5/70
Woods Hole Oceanographic Institution Woods-Hole, MA 02543	Studies to document the biological effects of a large spill of fuel oil in Buzzards Bay, MA.	Howard L. Sanders 1/21/70
Ecological Research Corporation Hanover, NH 03755	A study on the washing of oil contaminated sands and the separation of the oil and sand and the washing fluid.	Robert C. Dean 12/15/70
Alpine Geophysical Associates, Inc. 65 Oak Street Norwood, NJ 07648	Documentation of the oil spill and cleanup efforts at Chevron Oil Platform C, Venice, LA.	Jules Hirshman 4/20/70
Battelle Memorial Institute Pacific Northwest Laboratory P. O. Box 999 Richland, Washington 99352	Critical review of available knowledge of causes, effects, and existing methods for controlling and mitigating the effects of spills of hazardous polluting substances.	Ward Swift 10/70

For further information on individual projects, please contact the Oil and Hazardous Materials Research Section, Federal Water Quality Administration, Edison, New Jersey 08817.

## **NEW LEGISLATION**

### **WATER QUALITY IMPROVEMENT ACT OF 1970 APPROVED:**

The Water Quality Improvement Act of 1970 became Public Law 91-224 on April 3, 1970. The main portions of this act directly applicable to oil and hazardous materials research are as follows:

1. The name of the Federal Water Pollution Control Administration is changed to the "Federal Water Quality Administration".
2. Control of pollution by oil:
  - a. The discharge of oil in harmful quantities into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone is prohibited, except:
    1. In the case of such discharges into the waters of the contiguous zone, where permitted under Article IV of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, as amended.
    2. Where permitted in quantities and at times and locations or under certain circumstances or conditions as the President may, by regulation, determine not to be harmful.
  - b. The President shall determine those quantities of oil the discharge of which, at such times, locations, circumstances, and conditions, will be harmful to the public health or welfare of the United States, including, but not limited to, fish, shellfish, wildlife, and public and private property, shorelines, and beaches.
  - c. Any person in charge of vessel or of an onshore facility or an offshore facility shall, as soon as he has knowledge of any discharge of oil from such vessel or facility in violation of the harmful quantities set by the President, immediately notify



the appropriate agency of the United States Government of such discharge. Any person who fails to notify immediately the appropriate agency of an oil discharge shall, upon conviction, be fined not more than \$10,000, or imprisoned for not more than one year, or both.

d. Except where an owner or operator can prove that a discharge was caused solely by:

1. An Act of God.
2. An Act of War.
3. Negligence on the part of the United States Government.
4. An act or omission of a third party without regard to whether any such act or omission was or was not negligent, or any combination of the foregoing clauses.

Such owner or operator of any vessel from which oil is discharged in violation of the harmful quantities set by the President, shall, notwithstanding any other provision of law, be liable to the United States Government for the actual costs incurred for removal of such oil in an amount not to exceed \$100 per gross ton of such vessel or \$14,000,000, whichever is lesser. Except where the United States can show that such discharge was the result of willful negligence or willful misconduct within the privity and knowledge of the owner, such owner or operator shall be liable to the U. S. Government for the full amount of such costs.

- e. Whenever any oil is discharged, into or upon the navigable waters of the U. S., adjoining shorelines or into or upon the waters of the contiguous zone, the President is authorized to act to remove or arrange for the removal of such oil at any time, unless he determines such removal will be done properly by the owner or operator of the vessel, on-shore facility, or offshore facility from which the discharge occurs.
- f. This law authorizes the appropriation of a revolving fund to be established in the Treasury not to exceed \$35,000,000 to carry out cleanup of spilled oil. Any other funds received by

the United States under this section shall also be deposited in said fund for such purposes. All sums appropriated to, or deposited in, said fund shall remain available until expended.

- g. Within sixty days after the effective date of this section, the President shall prepare and publish a National Contingency Plan for removal of oil pursuant to this subsection. Such National Contingency Plan shall provide for efficient, coordinated, and effective action to minimize damage from oil discharges, including containment, dispersal, and removal of oil.
  - h. The President is authorized to delegate the administration to the heads of those Federal departments, agencies, and instrumentalities which he determines to be appropriate.
3. Control of hazardous polluting substances:
- a. The President shall submit a report to the Congress, together with his recommendations, not later than November 1, 1970, on the need for, and desirability of, enacting legislation to impose liability for the cost of removal of hazardous substances discharged from vessels and onshore and offshore facilities, including financial responsibility requirements.

The above statements, of course, are not all the law in conclusive detail, but rather some of the highlights of the law. Copies of the law can be obtained by writing to the 91st Congress, Washington, D. C. and asking for Public Law 91-224.

## **SIGNIFICANT STATE LEGISLATION:**

Landmark oil handling legislation went into effect in Maine, on May 9, 1970. The Environmental Improvement Commission has been charged with the responsibility of supervising oil storage in quantities over 500 barrels and all transfer of oil in Maine ports; policing Maine's 2800 miles of coast, and administering a \$4 million fund to be raised from a 1/2 cent per barrel fee levied on transferred oil. Costs of clean-up will be paid by the fund and reimbursed by the guilty party if he can be identified. The administrative, logistic, and technical problems to be overcome in making the law a working reality present a great challenge to the Commission, and should provide a useful demonstration of oil pollution control for other states.

## **NEWS ITEMS**

### **INDUSTRY/GOVERNMENT CONFERENCE ON**

#### **OIL SPILL TREATING AGENTS, APRIL 8-9, 1970**

The primary objective of this conference was for the Oil Spills Cleanup Subcommittee of the American Petroleum Institute to provide the Department of the Interior with all available information and expert opinions on oil spill treating agents. For this purpose, thirteen papers and prepared commentaries were presented by experts from industry, universities, consulting firms, and government. Although formal topics ranged over all types of treating agents, the primary focus in both the prepared presentations and the ensuing open discussion was on chemical dispersants. Little new information was presented on these products. Most evident was the sharp polarization between positions of the FWQA and industry on the use of dispersants. It was apparent that sufficient information still does not exist for rational decisions on the use of these oil dispersing chemicals.

The most useful results of the conference were the clarification of the issues on the use of dispersants, the identification of specific research needs, and the initiation of a frank and direct dialogue between government and industry on this controversial subject.

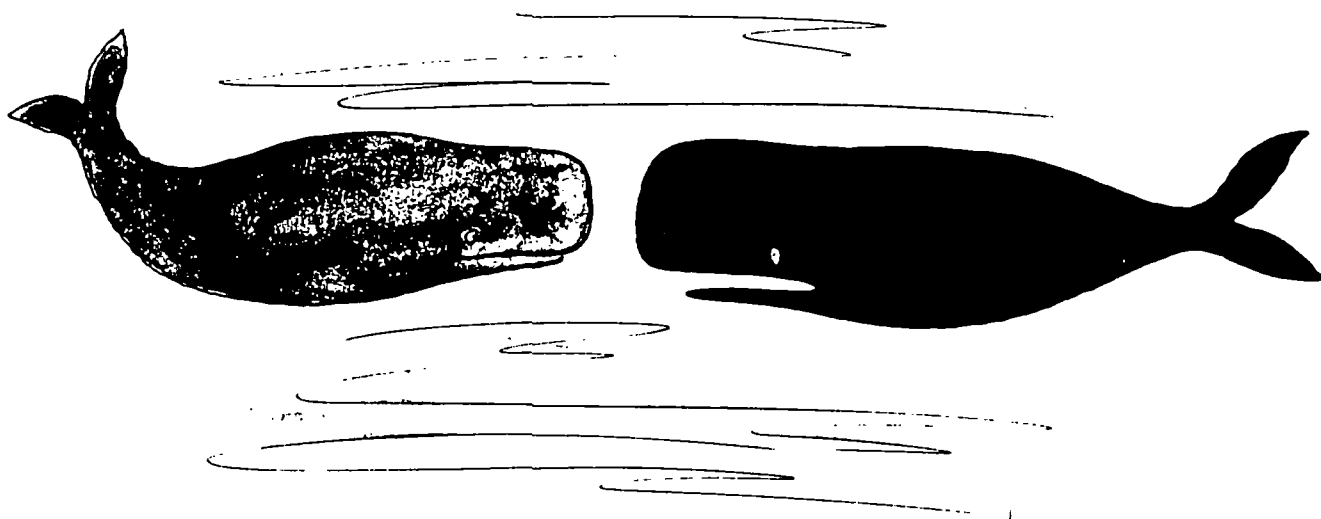
### **LANDMARK LEGAL PROCEEDINGS AGAINST OIL POLLUTION VIOLATORS:**

With the lack of other effective legal remedies, there has been a recent flurry of interest and activity in applying the criminal sanctions of the Rivers and Harbors Act of 1899 to oil polluters. This Act makes discharge of any oil into navigable waters illegal and provides for fines up to \$2,500 and jail terms up to one year. However, it does not provide for corrective action by the polluter.

Seeking such a corrective remedy, the U. S. Attorney of the Southern District of New York recently brought a civil action against a polluter in New York Harbor whose storage tanks had been leaking fuel oil into the East River for several months. Expert testimony for the hearing was provided by the Edison Water Quality Laboratory and the Sandy Hook Marine Laboratory. On March 30, 1970 a Federal District Judge issued an injunction against the polluter, on the basis that he was causing irreparable damage to the environment, and requiring him to take all necessary and possible steps to halt the oil discharge. Edison Lab personnel are continuing to provide

consultation for the U. S. Attorney on technical requirements for this corrective action.

This is apparently the first time such a civil action had been successfully brought to prevent irreparable environmental harm from oil pollution.



***"It's me—  
Moby Dick! I just  
came through  
the Santa Barbara  
Channel."***

-LOOK Magazine-

## RECENT PUBLICATIONS:

1. Combating Pollution Created by Oil Spills, Volume One: Methods, by Arthur D. Little, Inc., for the U. S. Coast Guard, Department of Transportation, under Contract DOT-CG-93, 374-A, June 30, 1969.
2. Oil Pollution: Problems and Policies, Degler, S. E., Edit., Bureau of National Affairs, Inc., Washington, D. C., 1969.
3. The Oil Spill Problem, First Report of the President's Panel on Oil Spills, Executive Office of the President, Office of Science and Technology, 1969.
4. Offshore Mineral Resources - A Challenge and an Opportunity, Second Report of the President's Panel on Oil Spills, Executive Office of the President, Office of Science and Technology, 1969.
5. Oil Pollution Report No. 1, by D. P. Hoult, Dept. Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts, on "Containment of Oil Spills by Physical and Air Barriers", from FWQA Research and Development Grant 15080ESL.
6. The Use of Booms as Barriers to Oil Pollution in Tidal Estuaries and Sheltered Waters, Hydraulics Research Station, Ministry of Technology, Wallingford, Berkshire, England, November 1969.

A good text, if you do not already have it, which gives an in-depth view of a specific oil spill and its effect is:

Torrey Canyon Pollution and Marine Life, Smith, J. E., Cambridge University Press, New York City, 1968.

Continuing reports on oil spills and control methods can be found in the:

Marine Pollution Bulletin, published monthly by Macmillan (Journals) Ltd., Little Essex Street, London WC 2, England.

## FWQA REPORTS ON OIL POLLUTION

Several reports concerning oil pollution which have been completed since January 1970 under the direction of the Edison Water Quality Laboratory are now available to interested parties. These reports are:

1. "Cleaning Oil Contaminated Beaches", DAST-27.
2. "Oil Sampling Techniques", DAST-12.
3. "Report on the Sinking of the Tanker, ARROW", Edison Water Quality Laboratory, Edison, New Jersey, February 1970.
4. "Oil Skimming Equipment", Edison Water Quality Laboratory (available in June 1970).
5. "Oil Containment Devices", Edison Water Quality Laboratory (available in June 1970).

Requests for Reports #1 and #2 should be made to:

Planning and Resources Office  
Office of Research and Development  
Federal Water Quality Administration  
U. S. Department of the Interior  
Washington, D. C. 20242

Reports #3 through #5 can be obtained by writing to:

Oil & Hazardous Materials Research Section  
Federal Water Quality Administration  
Edison, New Jersey 08817

In recent months, we have been deluged with requests for certain reports and consequently our supplies have been depleted. Therefore, we have reprinted the following reports which will first be sent to previous requestors and available to other interested parties in May 1970:

1. "Chemical Treatment of Oil Slicks", DAST-18.
2. "Oil Dispersing Chemicals", ORD-3.



3. "Oil and Hazardous Materials - Emergency Procedures in the Water Environment", CWR 10-1.

## **CAN YOU HELP US?**

We wish to keep our information system current. Please let us know of any new products, systems or reports you feel may be pertinent to the oil pollution problem and we will spread the word.

Address all correspondence to:

Oil and Hazardous Materials Research Section  
Federal Water Quality Administration  
U. S. Department of the Interior  
Edison, New Jersey 08817

Our commercial telephone number: (201) 548-3347, Ext. 25

Our FTS telephone number : (201) 846-4625

## **THANKS!!!**

Thank you for expressing your interest in the oil pollution and hazardous materials research problem, and especially for your enthusiastic response to our Newsletter.