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Environmental Protection Technology Series

OIL SPILL AND OIL POLLUTION REPORTS November 1975 - January 1976

Industrial Environmental Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

RESEARCH REPORTING SERIES

Research reports of the Office of Research and Development, U.S. Environmental Protection Agency, have been grouped into five series. These five broad categories were established to facilitate further development and application of environmental technology. Elimination of traditional grouping was consciously planned to foster technology transfer and a maximum interface in related fields. The five series are:

1. Environmental Health Effects Research
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This report has been assigned to the ENVIRONMENTAL PROTECTION TECHNOLOGY series. This series describes research performed to develop and demonstrate instrumentation, equipment, and methodology to repair or prevent environmental degradation from point and non-point sources of pollution. This work provides the new or improved technology required for the control and treatment of pollution sources to meet environmental quality standards.

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OIL SPILL AND OIL POLLUTION REPORTS

November 1975 - January 1976

by

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FOREWORD

When energy and material resources are extracted, processed and used, changes are produced in the existing environment that in many instances are undesirable. These undesirable changes resulting from both substances and effects comprise what we define as pollution. Pollution of air, land and water may adversely affect our aesthetic and physical well being. Protection of our environment requires that we recognize and understand the complex interaction between our industrial society and our environment.

The Industrial Environmental Research Laboratory-Cincinnati (IERL-CI) assists in developing and demonstrating new and improved methodologies aimed at minimizing, abating and preventing pollution from industrial and energy-related activities.

This report cites current events, literature, research, patents, and other material relevant to the oil pollution abatement program and is published in an abstract format on a quarterly basis. As such, it serves as a basic reference document for all those interested in oil spill and oil pollution control. This project is part of the continuing program of the Oil & Hazardous Materials Spills Branch, IERL-CI to assess and mitigate the environmental impact of oil pollution.

David G. Stephan
Director
Industrial Environmental Research Laboratory
Cincinnati

A B S T R A C T

The November 1975 - January 1976 Oil Spill and Oil Pollution Reports is the sixth quarterly compilation of oil pollution report summaries.

The following topics are included in the report:

a) Bibliographic literature citations, article summaries, and tabulated information on polluting incidents in and around U.S. waters;

b) Current status of some of the research projects listed in previous reports;

c) Summaries of additional current research projects;

d) Patent summaries;

and,

e) Current oil-related conferences.

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INTRODUCTION

The purpose of the "Oil Spill and Oil Pollution Reports" series is to present a concise, comprehensive information source which provides a broad field of coverage of oil pollution events, current research, and oil pollution related publications. Included are bibliographic citations and summaries of articles from the scientific and technical literature (Section I), the status and results of current research project entries listed in previous reports (Section II), additional current research projects (Section III), oil pollution related patents (Section IV), and current oil-related conferences (Section V).

The sources of the bibliographic citations and summaries of articles presented in Section I are scientific, technical and abstract journals. All articles entered deal with subjects relating to aquatic or terrestrial oil pollution. A list of the periodicals reviewed is provided in the appendix. The summarized entries are grouped according to subject and then arranged alphabetically by senior author within each subject division. Included under the subject heading, REPORTING, is a special subsection containing tabulated information concerning discharges of oil reported to or discovered by Coast Guard personnel during the calendar year 1974. This information was obtained from the Pollution Incident Reporting System (PIRS), a part of the Marine Environmental Protection Program, U.S. Coast Guard.

Section II lists current research project entries appearing in previous reports and includes descriptive status information provided upon request by the principal investigators and/or performing organization. All reports and publications are entered in summary form. Most of the given status information refers to projects listed in Oil Spill and Oil Pollution Reports, August-October 1975. At the end of each entry, the name and address of the project information source are given.

Current research project summaries (Section III) are grouped according to subject and then arranged by serial number (R-1-76 to R-35-76) within each subject division. Some of the current research projects listed in previous Oil Pollution Reports have been recently renewed. These projects have been relisted and headed by the same serial number as originally reported, followed by the word (RENEWAL). Renewal entries will be listed at the beginning of each subject category. Research project information was obtained from the Smithsonian Science Information Exchange (SSIE), API Environmental Research, Annual Report for 1975, Maritime Information Research Service, and several granting agencies and individual researchers.

Patent summaries are divided into United States and foreign subsections and arranged alphabetically by inventor in each section. Each entry is also listed in the subject cross reference index. All patent information is obtained from abstract journals and illustrations of United States patented devices are obtained from the U.S. Patent Office Official Gazette.

The section, Current Oil-related Conferences, contains descriptive information on recent and future conferences relating to environmental oil pollution. Conference dates are listed; and, when information is available, titles, authors and abstracts of conference papers are included. All information for this section was obtained from the periodicals reviewed (Appendix A) and from responses to personal inquiries concerning the symposia.

All report entries are serialized. Each section has its own number series. The letters preceding the serial numbers designate the following sections: C, citations from the literature; R, research projects; P, patents. Many of the entries can be included under more than one subject heading. Following each summary are listed any other topics under which the entry can be categorized. The subject cross reference index is provided at the end of the report.

The following tables contain statistics from the USCG report "Pollution Incidents in and Around U.S. Waters." They provide an overview of the pollution situation. Specific data on sources and causes are on pages 7-13.

POLLUTION INCIDENTS BY AREA

	% of total number	% of total volume
Atlantic Coast	25.6	20.0
Gulf Coast	32.6	21.7
Pacific Coast	21.7	8.3
Great Lakes	3.5	3.4
Inland U.S.	16.6	46.6

POLLUTION INCIDENTS BY LOCATION

	% of total number	% of total volume
Rivers, Channels	24.1	33.6
Ports and Harbors	38.2	24.5
Beaches, Non-navigable Waters	9.5	33.9
Open Coastal Waters	12.3	5.0
Open Internal Waters	15.9	3.0

TYPE OF MATERIAL DISCHARGE

	Number of incidents	% of total	Volume in gallons	% of total
Crude oil	3,639	26.0	9,028,262	53.0
Gasoline	545	4.0	1,045,603	6.0
Other distillate fuel oil	322	2.0	1,824,130	11.0
Solvent	44	0.0	13,114	0.0
Diesel oil	1,833	13.0	1,120,862	7.0
Asphalt or residual fuel oil	1,127	8.0	1,908,752	11.0
Animal or vegetable oil	57	0.0	27,316	0.0
Waste oil	1,094	8.0	111,900	1.0
Other oil	2,774	21.0	728,497	4.0
Liquid chemical	222	2.0	913,027	5.0
Other pollutant (sewage, dredge, spoil, chemical wastes, etc.)	162	1.0	31,792	0.0
Natural substance	105	1.0	1,528	0.0
Other material	199	1.0	104,709	1.0
Unknown material	1,843	13.0	56,816	0.0
TOTAL	13,966	100.0	16,916,308	100.0

SECTION I. PUBLICATIONS AND REPORTS

A. OIL POLLUTION DETECTION AND EVALUATION

1. REPORTING

C-2-76
FLA. OFFICIALS SEEK CAUSES OF OIL SPILLS

Anon. 1975.
National Fisherman 56(6):25A.

Three oil spills, one of which stretched 100 miles and was about 60,000 gallons, occurred in July offshore Florida. Investigators believe the source of all three was tankers illegally cleaning their tanks or oily bilges offshore. Florida state law prescribes a maximum $50,000 per day for such polluters; and the "oil-fingerprint" method will help trap the culprit.

Source identification
State legislation

Citation Source: Citation Journal

C-1-76
CLOSER GOVERNMENT LIAISON COULD INCREASE SPILL REPORTS

Anon. 1975.
Canadian Petroleum 20(8):28-32.

Oil spill reporting is on the increase in Canada, from 113 events in 1972 to 662 in 1974. These figures may still represent only 10% of the total oil spillage accidents. Of the total number of gallons of oil spilled, about 18% comes from marine activities, 60% from pipelines and the remaining 22% from other sources.

Citation Source: Petroleum Abstracts 15(45):#212,832. 1975.

C-3-76
OIL AND HAZARDOUS MATERIALS SPILL INFORMATION RETRIEVAL SYSTEM. USER'S MANUAL (OHM-SIRS)

Anon. 1975.
EPA/DF-75/001a. 17 p.

The objective of this manual is to guide those who prepare spill reports for the Division of Oil and Special Materials Control, and who expect to use the system in preparing regional analytical studies. These data are needed not only for Congress, EPA, OMB and the public for information, but also to support the Spill Prevention Program.

Contingency planning

Citation Source: Government Reports Announcements 75(21): #PB-243662/4GA. 1975.

C-4-76
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NO. 20

Anon. 1974.
U.S. Joint Publication Research Service, JPRS-61579. 42 p.

Articles from the world press have been translated and combined in this publication. The subjects covered include ocean pollution, pollution of the Elbe, ozone treatment of sewage, and the hazards of oils, halogens, mercury and petrochemicals.

General effects of oil pollution

Citation Source: Industrial Wastes Information Bulletin 5(2): #HMS4373. 1975.

C-5-76
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NO. 62

Anon. 1974.
Translations of monographs from various journals, JPRS-63307. 49 p.

Included in these translations are the following topics as they relate to the USSR: Ukraine environment measures, water and air pollution problems, effect of man-made lakes on the environment, city industrial sewage apparatus, marine oil pollution prevention and reduction of air pollution in the petrochemical industry.

General effects of oil pollution

Citation Source: Pollution Abstracts 6(5):#75-05076. 1975.

C-6-76
UPDATING THE NAVY ENVIRONMENTAL PROTECTION DATA BASE TO INCORPORATE OIL SPILL CLEAN-UP PERFORMANCE

Antonelli, J. 1975.
Master's Thesis, Naval Postgraduate School, Report NPS-55T075061.
70 p.

Methods of reporting, collecting and distributing information to and from the Navy Environmental Protection Data Base are proposed. The reporting aspect consists of a contingency plan, an initial report and an after action report.

Contingency planning

Citation Source: Government Reports Announcements 75(19): #AD-A012 663/IGA. 1975.

C-7-76
CONTROL OF POLLUTION IN THE MEDITERRANEAN SEA

Bardin, D. J., and P. Mandelbaum. 1974.
Israel Prime Minister's Office, Environmental Protection Service, mimeographed papers. 14 p.

Israeli pollution of the Mediterranean is surveyed; the pollution sources include oil, urban and industrial sewage, chemical, thermal and radioactive pollution. The problem is discussed from legal, technical, economic, legislative and enforcement viewpoints. Possible solutions are reviewed.

Foreign legislation

Citation Source: Oceanic Abstracts 12(5):#75-04754. 1975.

C-8-76
WATER POLLUTION POTENTIAL OF MANUFACTURED PRODUCTS. CATALOG SECTION I THROUGH III

Berkowitz, J. B., C. R. Schimke, and V. R. Valeri. 1973.
U.S. Environmental Protection Agency Technology Series, EPA-R2-73-179b, c, d. 1,386 p.

This three volume series presents information in tabular form. A description of the product (name, number, uses, etc.), the toxic effect, oxygen demand, eutrophication, presence of oil or tars, and chemical composition are some of the characteristics listed. A bibliography of manufacturers is listed in Volume III.

Biological effects of oil pollution

Citation Source: Petroleum Abstracts 15(42):#211,754. 1975.

C-9-76
MEASUREMENT OF VOLATILE AND NONVOLATILE HYDROCARBONS IN SELECTED AREAS OF THE ATLANTIC OCEAN

Brown, R. A., T. D. Searl, and E. B. Prestridge. 1975.
Final Report, AID.20BA.75, EE.13TMR.75 MA-RD-920-75063, Contract C-5-3800. 45 p.

Selected areas of the Atlantic Ocean were sampled for total dispersed nonvolatile hydrocarbons and extractable organics. Data from surface and subsurface water agree with previous measurements. Previously unsampled South America waters had hydrocarbon concentrations at the same level as northern waters.

Sampling

Citation Source: Government Reports Announcements 75(22): #COM-75-11121OGA. 1975.

C-10-76
OIL SPILLS AND SPILLS OF HAZARDOUS SUBSTANCES

Environmental Protection Agency Oil and Special Materials Control Division. Office of Water Program Operations. 1975.

This document is an update of the "Oil Spills and Spills of Hazardous Substances" publication prepared in 1973. Some of the more significant spill incidents and the mechanisms, both managerial and technological, used to deal with them are described.

Citation Source: Citation Journal

C-11-76
CHARACTERIZATION OF VESSEL WASTES IN DULUTH-SUPERIOR HARBOR

Gumtz, G. D., D. M. Jordan, and R. Waller. 1974.
Report EPA-670/2-74-097. 51 p.

Bilge water, non-oily ballast water, sewage, garbage/refuse and dunnage from U.S., Canadian and foreign commercial vessels were wastes studied in the Duluth-Superior Harbor during 1973. Bilge water was found to be a substantial pollution problem: on the average about 40 liters of oil may be discharged during each day a vessel spends in the harbor.

Citation Source: Selected Water Resources Abstracts 8(15): #W75-07701. 1975.

C-12-76
OIL AND HAZARDOUS MATERIALS SPILL INFORMATION RETRIEVAL SYSTEM (OHM-SIRS), 1 JUL 72-31 DEC 74

Hess, R. E., and J. H. Wright. 1974.
Data file, 1 reel magnetic tape EPA/DF-75/001.

There are 10,600 records in this data file. Information provided includes: name of material spilled, location and date of spill occurrence; quantity spilled and quantity entering water, source of spill, cause of spill, damages caused by spill, actions taken and by whom, and comments.

Citation Source: Government Reports Announcements 75(21): #PB-243 661/6GA. 1975.

C-13-76
MASSIVE MITSUBISHI REFINERY OIL SPILL IN SETO INLAND SEA

Mitsubishi Oil Co. 1975.
Japan Environmental Summary 3(4):2-3.

The 43,000 kilolitre oil spill which occurred in December, 1974, is described. Approximately 9000 kilolitres escaped into the sea. Estimated damage is at least $50 million.

Economic effects of oil pollution

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4720. 1975.

C-14-76
INPUTS

Pearson, E. A. 1975.
Petroleum in the Marine Environment, a Workshop on Inputs, Fates, and the Effects of Petroleum in the Marine Environment, Airlie, Virginia, 1973. p. 1-18.

Worldwide inputs of petroleum hydrocarbons into the oceans are summarized. Statistical input information is given for natural seeps, offshore drilling and production operations, offshore accidents, losses during the course of marine transportation, coastal refineries, municipal and industrial wastes, urban runoff and river runoff.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(9): #5Q10170. 1975.

C-15-76
OIL TANKER RAMS OIL RIG OFF LOUISIANA; A VISION OF DISASTERS TO COME?

Schueler, D. G. 1975.
Audubon 77(6):118-119.

On August 15, 1975, the oil tanker, "Globtik Sun," rammed a Chevron rig nearly 100 miles off the Louisiana coast and burst into flames. Weather conditions were ideal, but the ship was not following one of the safety fairways recommended by the Coast Guard. The spill involved only a small part of the cargo, but the incident revealed the present confusing state of international law and the potential for disaster off Louisiana.

General effects of oil prospecting and production

Citation Source: Citation Journal

C-16-76
CHARACTERIZATION OF BALLAST WATER

Shewmaker, J. E., R. R. Goodrich, Jr., and R. J. Skocypec. 1974.
Exxon Research and Manufacturing Co., EE.3TMR.74. 83 p.

The concentration levels of oil, suspended solids, BOD sub 5, COD, pH, ammonia, phenols and sulphides were measured in ballast water from 9 tankers. Oil contents found in dirty ballast of clean oil product tankers were slightly higher than those found on crude oil carriers. BOD, COD and suspended solids levels were often greater in dirty ballast than those in the seawater taken on as ballast.

Citation Source: MRIS Abstracts 11 (June):#095137. 1975.

C-17-76
THE NORTH SEA

Weichart, G. 1974.
Environment 16(1):29-33.

This article contains a review of the sources of waste materials entering the North Sea. These pollutants, including oils, phosphorus and phosphates,and nitrogen compounds, make the North Sea one of the most heavily polluted sea areas in the world.

Source identification

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3290. 1975.

SOURCE AND CAUSE

Number of incidents / Volume in gallons

SOURCE	CAUSE: Hull/tank rupture/leak	CAUSE: Transportation pipeline rupture/leak	CAUSE: Other structural failure
VESSELS			
Dry cargo ships	17 / 63,964	2 / 11	5 / 150
Dry cargo barges	4 / 226	X	2 / 190
Tankships	154 / 957,790	2 / 451	18 / 3,123
Tank barges	332 / 2,289,120	4 / 300	16 / 676
Combatant vessels	11 / 15,118	1 / 25	2 / 51
Other vessels	194 / 125,530	1 / 150	86 / 16,400
LAND VEHICLES			
Rail vehicles	19 / 298,992	X	3 / 1,115
Highway vehicles	53 / 114,262	X	16 / 14,267
Other/unknown vehicles	3 / 2,025	X	2 / 6,505
NON-TRANSPORTATION-RELATED FACILITIES			
Onshore refinery	5 / 611,215	2 / 315	4 / 142
Onshore bulk storage	40 / 103,618	3 / 417	11 / 44,958
Onshore production facility	11 / 79,511	X	12 / 11,104
Offshore production facility	10 / 10,171	5 / 182	11 / 1,078
Other facilities	40 / 74,364	5 / 1,380	26 / 75,217
PIPELINES	2 / 600	241 / 4,509,806	1 / 2
MARINE FACILITIES			
Onshore/offshore bulk cargo transfer	7 / 20,014	11 / 4,295	9 / 440
Onshore/offshore fueling	7 / 26,181	3 / 160	5 / 31
Onshore/offshore non-bulk cargo transfer	2 / 55	1 / 5	3 / 71
Other transportation-related marine facility	5 / 357	3 / 1,550	6 / 99
LAND FACILITIES	14 / 35,648	1 / 25	10 / 12,833
MISC/UNKNOWN	19 / 32,643	1 / 30	21 / 8,065
TOTAL	952 / 4,861,431	286 / 4,519,102	269 / 196,517

These tables include data relating to oil discharges in the United States and contiguous waters during the calendar year 1974. The information was obtained from the U.S. Coast Guard pamphlet, "Pollution Incidents in and Around U.S. Waters," and is based on incidents reported to or discovered by Coast Guard personnel.

SOURCE AND CAUSE (cont.)

Number of incidents / Volume in gallons

SOURCE	CAUSE: Pipe rupture/leak	Hose rupture/leak	Valve failure
VESSELS			
Dry cargo ships	14 / 2,312	7 / 139	6 / 584
Dry cargo barges	X	1 / 3	X
Tankships	40 / 1,534	27 / 6,320	75 / 25,474
Tank barges	14 / 308	30 / 3,501	45 / 4,843
Combatant vessels	4 / 190	6 / 400	28 / 5,080
Other vessels	23 / 6,792	27 / 1,262	28 / 581
LAND VEHICLES			
Rail vehicles	2 / 100	X	2 / 23,000
Highway vehicles	3 / 38	22 / 3,701	4 / 1,161
Other/unknown vehicles	2 / 3,840	1 / 1	X
NON-TRANSPORTATION-RELATED FACILITIES			
Onshore refinery	19 / 111,096	5 / 890	6 / 594
Onshore bulk storage	30 / 78,368	5 / 121,004	13 / 25,761
Onshore production facility	141 / 421,950	8 / 528	41 / 159,997
Offshore production facility	756 / 51,068	29 / 286	186 / 45,124
Other facilities	88 / 189,857	20 / 8,037	17 / 8,028
PIPELINES	237 / 1,343,797	11 / 23,111	11 / 29,624
MARINE FACILITIES			
Onshore/offshore bulk cargo transfer	40 / 29,559	31 / 4,816	21 / 8,037
Onshore/offshore fueling	13 / 6,766	9 / 115	8 / 217
Onshore/offshore non-bulk cargo transfer	2 / 90	2 / 5	4 / 38
Other transportation-related marine facility	8 / 241	8 / 43	5 / 204
LAND FACILITIES	18 / 17,577	12 / 12,091	5 / 8,701
MISC/UNKNOWN	32 / 37,036	6 / 21,253	5 / 20,061
TOTAL	1,490 / 2,302,546	268 / 207,507	510 / 367,109

SOURCE AND CAUSE (cont.)

Number of incidents / Volume in gallons

SOURCE	CAUSE: Pump failure	CAUSE: Other rupture/leak	CAUSE: Other equipment failure
VESSELS			
Dry cargo ships	3 / 278	3 / 1,003	29 / 892
Dry cargo barges	X	X	5 / 182
Tankships	11 / 749	8 / 2,670	51 / 4,552
Tank barges	7 / 46	6 / 3,804	83 / 25,368
Combatant vessels	2 / 50	1 / 75	24 / 1,245
Other vessels	7 / 265	X	62 / 3,082
LAND VEHICLES			
Rail vehicles	X	X	6 / 37,105
Highway vehicles	2 / 52	X	23 / 17,606
Other/unknown vehicles	X	X	1 / 1
NON-TRANSPORTATION-RELATED FACILITIES			
Onshore refinery	3 / 5,201	1 / 3	25 / 12,488
Onshore bulk storage	6 / 3,622	2 / 1,010	28 / 204,946
Onshore production facility	9 / 11,345	2 / 2	97 / 93,725
Offshore production facility	107 / 1,971	5 / 126	697 / 25,938
Other facilities	8 / 4,052	X	121 / 20,647
PIPELINES	2 / 25,200	X	11 / 90,778
MARINE FACILITIES			
Onshore/offshore bulk cargo transfer	9 / 73,182	8 / 290	64 / 9,769
Onshore/offshore fueling	X	2 / 35	10 / 1,040
Onshore/offshore non-bulk cargo transfer	1 / 3	X	4 / 5,836
Other transportation-related marine facility	2 / 16	X	11 / 333
LAND FACILITIES	2 / 861	1 / 247	22 / 36,765
MISC/UNKNOWN	3 / 542	X	35 / 13,163
TOTAL	184 / 127,435	39 / 9,265	1,409 / 605,461

SOURCE AND CAUSE (cont.)

Number of incidents / Volume in gallons

SOURCE	CAUSE: Tank overflow	CAUSE: Improper valve operation	CAUSE: Improper hose handling
VESSELS			
Dry cargo ships	98 / 11,923	13 / 845	7 / 13
Dry cargo barges	8 / 253	X	X
Tankships	213 / 50,983	42 / 13,964	14 / 1,394
Tank barges	153 / 71,478	16 / 9,205	19 / 1,221
Combatant vessels	78 / 9,644	17 / 2,452	10 / 343
Other vessels	192 / 18,800	20 / 23,649	28 / 1,104
LAND VEHICLES			
Rail vehicles	1 / 100	1 / 1,870	X
Highway vehicles	40 / 12,543	3 / 1,700	18 / 4,768
Other/unknown vehicles	2 / 35	X	X
NON-TRANSPORTATION-RELATED FACILITIES			
Onshore refinery	18 / 8,194	3 / 455	3 / 13
Onshore bulk storage	49 / 248,320	11 / 82,855	5 / 105
Onshore production facility	8 / 32,135	4 / 556	X
Offshore production facility	62 / 8,480	2 / 230	1 / 5
Other facilities	74 / 45,856	14 / 40,895	8 / 55
PIPELINES	3 / 9,460	4 / 2,014	X
MARINE FACILITIES			
Onshore/offshore bulk cargo transfer	30 / 1,015,552	15 / 19,433	20 / 1,429
Onshore/offshore fueling	4 / 9	1 / 5	6 / 10
Onshore/offshore non-bulk cargo transfer	5 / 39	1 / 1	X
Other transportation-related marine facility	4 / 18	3 / 94	1 / 30
LAND FACILITIES	28 / 11,759	3 / 5,770	3 / 150
MISC/UNKNOWN	21 / 34,300	3 / 4,206	1 / 3
TOTAL	1,094 / 1,590,014	176 / 210,199	144 / 10,643

SOURCE AND CAUSE (cont.)

Number of incidents / Volume in gallons

SOURCE	CAUSE: Other improper equipment handling operation	CAUSE: Other personnel error	CAUSE: Bilge pumping
VESSELS			
Dry cargo ships	13 / 1,875	32 / 719	40 / 4,551
Dry cargo barges	X	7 / 315	1 / 0
Tankships	48 / 1,883	67 / 2,308	74 / 39,859
Tank barges	33 / 2,200	39 / 51,556	1 / 40
Combatant vessels	25 / 1,343	27 / 806	10 / 440
Other vessels	42 / 974	81 / 1,966	145 / 3,931
LAND VEHICLES			
Rail vehicles	4 / 1,562	7 / 27,251	1 / 300
Highway vehicles	20 / 30,857	56 / 86,970	X
Other/unknown vehicles	3 / 6	5 / 2,855	X
NON-TRANSPORTATION-RELATED FACILITIES			
Onshore refinery	7 / 504	9 / 5,795	X
Onshore bulk storage	16 / 2,916	9 / 2,143	1 / 0
Onshore production facility	9 / 14,485	11 / 13,183	X
Offshore production facility	4 / 28	10 / 139	X
Other facilities	52 / 28,713	91 / 31,220	X
PIPELINES	5 / 92	11 / 26,094	X
MARINE FACILITIES			
Onshore/offshore bulk cargo transfer	24 / 4,368	26 / 73,034	X
Onshore/offshore fueling	6 / 74	6 / 66	X
Onshore/offshore non-bulk cargo transfer	3 / 74	9 / 46	X
Other transportation-related marine facility	6 / 61	11 / 180	2 / 125
LAND FACILITIES	11 / 3,526	14 / 25,968	X
MISC/UNKNOWN	10 / 793	42 / 1,438	15 / 257
TOTAL	342 / 94,666	571 / 354,053	290 / 49,503

SOURCE AND CAUSE (cont.)

Number of incidents / Volume in gallons

SOURCE	CAUSE: Ballast pumping	CAUSE: Other intentional discharge	CAUSE: Natural or chronic phenomenon
VESSELS			
Dry cargo ships	9 / 180	8 / 21	X
Dry cargo barges	X	1 / 0	1 / 1
Tankships	15 / 1,734	17 / 794	1 / 0
Tank barges	X	5 / 237	3 / 3
Combatant vessels	1 / 200	6 / 22	2 / 6
Other vessels	5 / 225	37 / 29,129	8 / 227
LAND VEHICLES			
Rail vehicles	X	X	2 / 1,494
Highway vehicles	X	19 / 8,361	6 / 5,901
Other/unknown vehicles	X	5 / 2,356	1 / 2
NON-TRANSPORTATION-RELATED FACILITIES			
Onshore refinery	1 / 25	8 / 15,138	17 / 508
Onshore bulk storage	X	18 / 72,947	24 / 10,748
Onshore production facility	X	8 / 23,542	4 / 4,242
Offshore production facility	X	2 / 41	39 / 4,424
Other facilities	X	86 / 53,034	57 / 60,905
PIPELINES	X	5 / 19,122	5 / 122,550
MARINE FACILITIES			
Onshore/offshore bulk cargo transfer	X	6 / 3,047	22 / 17,626
Onshore/offshore fueling	X	2 / 1,052	2 / 70
Onshore/offshore non-bulk cargo transfer	X	2 / 256	1 / 50
Other transportation-related marine facility	X	7 / 27	3 / 23
LAND FACILITIES	X	21 / 61,377	11 / 165
MISC/UNKNOWN	X	53 / 1,690	171 / 12,465
TOTAL	31 / 2,364	316 / 292,193	380 / 241,410

SOURCE AND CAUSE (cont.)

Number of incidents / Volume in gallons

SOURCE	CAUSE: Unknown	CAUSE: Total
VESSELS		
Dry cargo ships	39 / 1,525	346 / 89,717
Dry cargo barges	1 / 100	31 / 1,270
Tankships	91 / 316,366	973 / 1,434,168
Tank barges	25 / 4,814	833 / 2,468,724
Combatant vessels	22 / 2,060	278 / 39,552
Other vessels	277 / 18,740	1,265 / 253,007
LAND VEHICLES		
Rail vehicles	3 / 61,075	51 / 453,964
Highway vehicles	8 / 5,576	294 / 313,943
Other/unknown vehicles	3 / 15	28 / 17,641
NON-TRANSPORTATION-RELATED FACILITIES		
Onshore refinery	19 / 58	155 / 772,634
Onshore bulk storage	10 / 7,805	281 / 1,011,543
Onshore production facility	18 / 10,705	383 / 877,010
Offshore production facility	80 / 4,480	2,006 / 153,771
Other facilities	105 / 5,212	819 / 653,148
PIPELINES	6 / 1,012	557 / 6,205,372
MARINE FACILITIES		
Onshore/offshore bulk cargo transfer	21 / 1,178	367 / 1,286,289
Onshore/offshore fueling	8 / 110	93 / 35,946
Onshore/offshore non-bulk cargo transfer	1 / 0	41 / 6,569
Other transportation-related marine facility	12 / 132	98 / 3,538
LAND FACILITIES	23 / 1,626	200 / 235,209
MISC/UNKNOWN	4,377 / 415,389	4,823 / 603,626
TOTAL	5,156 / 858,086	13,942 / 6,916,958

2. MONITORING

C-18-76
SAMPLING ERRORS IN THE QUANTITATION OF PETROLEUM IN BOSTON HARBOUR WATERS

Ahmed, A. M., M. D. Beasley, A. C. Efromson, and A. C. Hites. 1974.
Marine Pollution Monitoring (Petroleum). NBS Special Publication No. 409. p. 109-112.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1337. 1975.

C-19-76
DEVELOPMENT PROGRESS WITH SALWICO POLLUTION MONITORING SYSTEM

Anon. 1975.
Marine Week 2(5):26.

The Salwico oil pollution monitoring system monitors all normal black and white oils. The device concentrates the oil before scanning for discoloration and gas evaporation. The sample water is fed through a filter band and moved at a constant velocity. The oil density (discoloration) per unit area of the band is a direct function of the oil content in the water, and is measured by a photo cell. The design of the system is further described.

Design and engineering

Citation Source: Selected Water Resources Abstracts 8(20): #W75-10272. 1975.

C-20-76
INFRARED OIL FILM MONITOR

Anon. 1975.
Product Information.

A new infrared oil film monitor uses infrared reflectance to detect oil on water without water contact. The monitor is weatherproof and rugged, giving at least six months of continuous unattended service. FFI contact: Wright & Wright, Inc., 80 Winchester St., Newton, Mass. 02161.

Citation Source: The Oil and Gas Journal 73(46):90. 1975.

C-21-76
NOAA FLEET TO MONITOR OIL SLICKS

Anon. 1975.
Ocean Industry 10(11):70.

As part of the United Nations' program called Integrated Global Ocean Station System (IGOSS), NOAA's 25-ship fleet will monitor oil slicks and sample oil tar balls and dissolved petroleum hydrocarbons from the water surface in the Atlantic and Pacific Oceans, the Gulf of Mexico and the Bering Sea. The data will be exchanged among nations in order to assess ocean contamination.

Sampling

Citation Source: Citation Journal

C-22-76
OIL DETECTION SYSTEM

Anon.
Product Information.

The Spectrogram oil detection buoy operates on the principle that if oil is irradiated with a high energy emission, the sample will reradiate lower energy of a longer wavelength. This wavelength is a function of the molecular composition of the oil type. The present system of a land station, 3 buoys and the interconnecting cables is in operation in a large transfer slip on Long Island Sound.

Citation Source: Herbert R. Gram, President, Spectrogram Corporation, 385 State St., North Haven, Conn. 06473.

C-23-76
SEMINAR ON METHODOLOGY FOR MONITORING THE MARINE ENVIRONMENT

Anon. 1974.
EPA, Office of Monitoring Systems, EPA 600/4-74-004. 436 p.

Among the subjects covered in this seminar are: surface slick sampling and analysis; recent studies of crude oils and oil-dispersant mixtures in the Red Sea; comparison of species diversity and spatial homogeneity indices as criteria of change in biological communities; and microbiological methods for monitoring marine waters for possible health effects.

Citation Source: Government Reports Announcements 75(8): #PB-239 052/4GA. 1975.

C-24-76
No title given

Anon. 1975.
Product Information.

The Brill Oil Spill Sentry provides warnings of oil spills in time to minimize both the loss of spilled oil and expense of extensive cleanup. The system includes an automatic skimmer that collects spilled oil in storage tanks.

Cleanup and recovery
Design and engineering

Citation Source: Petroleum Engineer International 47(11):EM14. 1975.

C-25-76
A FLUORESCENCE TECHNIQUE FOR MONITORING OIL POLLUTION

Ball, J. E. 1975.
Physics Education 10(1):42-43.

When using this technique the sample is first irradiated with UV light, then the fluorescence is measured using a photomultiplier tube. If the oil concentration in the effluent is below 10 ppm, the oil is collected with a ptfe drum.

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3554. 1975.

C-26-76
EFFECT OF AN OIL SPILL ON BENTHIC ANIMALS IN THE LOWER YORK RIVER, VIRGINIA

Bender, M. E., J. L. Hyland, and T. K. Dincan. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 257-260.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1379. 1975.

C-27-76
MONITORING OIL IN TROUBLED WATER

Bond, A. 1975.
Process Engineering (February 1975):73.

Several companies offer oil pollution monitors for the continuous monitoring of oil in water at the 0 to 10 ppm level, usually in condensate returns to boiler feed water systems. Oil pollution detectors are also available for use in industrial effluents, rivers and seawater; the lowest detection level is 5 ppm.

Design and engineering

Citation Source: Citation Journal

C-28-76
U.S. COAST GUARD - FOCAL POINT IN MARINE POLLUTION CONTROL

Booda, L. A. 1975.
Sea Technology 16(10):16-17.

The Coast Guard is responsible for law and regulation enforcement in the marine environment and for marine pollution control. Three Strike Teams are one new addition to the program. Research and development is also making progress with cleanup and recovery problems, monitoring, and source identification. Tighter traffic control will also be necessary to reduce accidents.

Cleanup and recovery

Citation Source: Citation Journal

C-29-76
SAMPLING MARINE ORGANISMS AND SEDIMENTS FOR HIGH PRECISION GAS CHROMATOGRAPHIC ANALYSIS OF AROMATIC HYDROCARBONS

Bruce, H. E., and S. P. Cram. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 181-182.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1363. 1975.

C-30-76
QUANTITATIVE MONITORING AND AVAILABILITY OF PELAGIC TAR IN THE NORTH ATLANTIC

Butler, J. N., and B. F. Morris. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards Special Publication No. 409. p. 75-78.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1339. 1975.

C-31-76
MARITIME CONSIDERATION OF OIL TRANSPORTATION

Casey, H. F. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 33-40.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1345. 1975.

C-32-76
EVALUATION OF THIN FILM OIL SAMPLERS

Chang, W. J., and J. R. Jadamec. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 85-88.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1343. 1975.

C-33-76
METHODS FOR ESTABLISHING LEVELS OF PETROLEUM CONTAMINATION IN ORGANISMS AND SEDIMENT AS RELATED TO MARINE POLLUTION MONITORING

Clark, R. C., Jr. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 189-194.

A review with 15 references.

Citation Source: Chemical Abstracts 83(9):#72775t. 1975.

C-34-76
STUDYING THE SEA FROM THE AIR

Connelly, W. 1975.
Ocean Industry 10(11):72, 74.

Small aircrafts have uses in marine research in the areas of direct and remote sensing of data and sample collection. The possible tasks include: water current measurements and mass transport, surface water temperature, bottom topography, underwater acoustics, water samples (i.e., oil slick samples before weathering) and STD/sound velocity.

Citation Source: Citation Journal

C-35-76
MOVEMENT OF SPILLED OIL IN SAN FRANCISCO BAY AS PREDICTED BY ESTUARINE NONTIDAL DRIFT

Conomos, T. J. 1974.
Marine Pollution Monitoring (Petroleum). NBS Special Publication No. 409. p. 97-100.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1335. 1975.

C-36-76
POLLUTION CONTROL AT A LARGE CHEMICAL COMPLEX

Cox, A. P. 1974.
Chemical Engineer (London) 107:99-101.

The quality of the effluents flowing into the River Mersey from the Shell Chemical Plant at Carrington, Manchester, has been surveyed. The results are reported.

Reporting

Citation Source: Industrial Wastes Information Bulletin 4(2): #HMS 3111. 1975.

C-37-76
FLUORESCENCE MONITORING STUDY AT OCEAN WEATHER STATION 'P'

Cretney, W. J., and C. S. Wong. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 175-180.

Nine locations in the Pacific Ocean west of Victoria were monitored for fluorescent compounds. Using chrysene as the standard, an average concentration of 0.016 ppb of fluorescent compounds was found. These data will form the baseline for monitoring future petroleum pollution of the ocean.

Citation Source: Chemical Abstracts 83(14):#120543q. 1975.

C-38-76
OIL POLLUTION ALONG THE INDIAN COASTLINE

Divivedi, S. N., and A. H. Parulckar. 1974.
Marine Pollution Monitoring (Petroleum). NBS Special Publication No. 409. p. 101-108.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1336. 1975.

C-39-76
DEVELOPMENT OF AN OIL-WATER POLLUTION MONITORING SYSTEM

Douglas, B. 1975.
Master's Thesis, Naval Postgraduate School. 89 p.

The prototype of an oil-water pollution monitor was developed and tested. Using this monitoring system, it was possible to specify the concentration of any oil, independent of type, in a known water sample.

Design and engineering

Citation Source: Government Reports Announcements 75(19): #AD-A012 460/2GA. 1975.

C-40-76
ANALYSES OF HYDROCARBONS IN MARINE ORGANISMS RESULTS OF IDOE INTERCALIBRATION EXERCISES

Farrington, J. W., J. M. Teal, J. G. Quinn, P. L. Parker, J. K. Winters, T. L. Wade, and K. Burns. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 163-166.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1359. 1975.

C-41-76
MARINE ENVIRONMENTAL MONITORING: TRACE ELEMENTS IN PERSISTENT TAR BALL OIL RESIDUES

Feldman, M. H., and D. E. Cawlfield. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 237-242.

Neutron activation and trace element analyses were used to analyze tar balls and oil residues. In conjunction with a computer system, this methodology adds further compositional data to the information gained while monitoring tar balls. This information is useful in the evaluation of the ecological impact of oil films on marine waters.

Analysis

Citation Source: Chemical Abstracts 83(14):#12388t. 1975.

C-42-76
ANALYSIS STANDARDS AND INTERCOMPARISON OF DATA

Galler, S. R. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 29-32.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1344. 1975.

C-43-76
HYDROCARBON CONCENTRATIONS IN SEAWATER ALONG THE HALIFAX-BERMUDA SECTION: LESSONS REGARDING SAMPLING AND SOME RESULTS

Gordon, D. C., and P. D. Keizer. 1974.
Marine Pollution Monitoring (Petroleum). NBS Special Publication No. 409. p. 113-116.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1338. 1975.

C-44-76
METHODS FOR TRACE ORGANIC ANALYSIS IN SEDIMENTS AND MARINE ORGANISMS

Hertz, H. S., S. N. Chesler, W. E. May, B. H. Gump, D. P. Enagonic, and S. P. Cram. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 197-200.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1367. 1975.

C-45-76
THE USE OF CITIZEN-VOLUNTEER GROUPS FOR MARINE ENVIRONMENTAL MONITORING AND SURVEILLANCE

Herz, M. J. 1975.
Ocean 75, San Diego, California, 1975. New York, N. Y., Institute of Electrical and Electronics Engineers, Inc., 1975. p. 697-699.

The organization and operation of a citizen-volunteer group with the objective of protecting the marine environment is described. This previously untapped source needs basic training, but it then can effectively supplement agency activities in the areas of developing remote sensing techniques, offering logistic support, conducting water monitoring and assisting in the detection of illegal discharges.

Personnel training and education

Citation Source: Citation Monograph

C-46-76
SURVEY ANALYSES FOR PETROLEUM DERIVED HYDROCARBONS IN THE OCEAN

Hori, S. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 27-28.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1350. 1975.

C-47-76
DEVELOPMENT OF AN OIL-WATER POLLUTION MONITORING SYSTEM

Houlchan, T. M., and B. D. Tyler. 1975.
Annual Progress Report No. NPS-59HM 75071A. 87 p.

The progress in the development and testing of an automatic oil pollution monitoring system is documented. Oil concentrations are determined using a direct difference method of total organic carbon determination. Preliminary investigations on prototype improvements were begun, and concentrations of oil in bilge water samples were determined.

Design and engineering

Citation Source: Government Reports Announcements 75(22): #AD-A014 552/4GA. 1975.

C-48-76
OIL POLLUTION MONITORS

International Combustion Division - Riley Unit.
Product Information.

"Monitors detect and measure oil pollution of waters by fluorescence measurement." FFI contact: International Combustion Division - Riley Unit, Sinfui Lane, Derby DE29GJ.

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3536. 1975.

C-49-76
INSTRUMENTATION FOR OIL POLLUTION MEASUREMENT

Jeffery, P. G., J. Nightingale, and D. J. A. Woodley. 1973.
Pollution Monitor No. 13:32-33.

"A sea surface sampler, an oil-thickness gauge and an oil-thickness monitor, all developed by the Warren Spring Laboratory, are described."

Design and engineering

Citation Source: Industrial Wastes Information Bulletin 5(1): #HMS 4148. 1975.

C-50-76
PELAGIC TAR IN THE GULF OF MEXICO AND CARIBBEAN SEA

Jeffrey, L. M., W. E. Pequegnat, E. A. Kennedy, A. Vos, and B. J. James. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 233-236.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1373. 1975.

C-51-76
RECENT DEVELOPMENTS IN THE IDENTIFICATION OF ASPHALTS AND OTHER PETROLEUM PRODUCTS

Kawakara, F. K. 1974.
Marine Pollution Monitoring (Petroleum). NBS Special Publication No. 409. p. 145-148.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1334. 1975.

C-52-76
MONITORING ESTUARINE CIRCULATION AND OCEAN WASTE DISPERSION USING AN INTEGRATED SATELLITE-AIRCRAFT-DROGUE APPROACH

Klemas, V., G. Davis, and H. Wang. 1975.
E75-10317, NASA-CR-142919, Contract NA55-20983. 2 p.

An integrated satellite-aircraft-drogue approach utilizes remotely tracked expendable drogues together with satellite observations of oil slicks, waste plumes and natural tracers. Tests indicate that the system provides a cost-effective means of monitoring current circulation and verifying oil slicks and ocean waste dispersion models even under severe environmental conditions.

Remote sensing

Citation Source: Scientific and Technical Aerospace Reports 13(17):#N75-26461. 1975.

C-53-76
MONITORING THE QUALITY OF SURFACE WATER

Kroon, D. J., et al. 1974.
Phillips Technical Review 34(5/6):113-122.

A monitoring system should provide information about a number of physical and chemical parameters relating to oxygen balance and eutrophication, and to concentrations of toxic components such as mineral oils, phenols, certain trace elements and organic micro-pollutants. A description of a developed monitoring station is given.

Citation Source: Fuel Abstracts and Current Titles 16(5):#3464. 1975.

C-54-76
VALUE OF OIL POLLUTION MONITORING IN MARINE ORGANISMS

La Roche, G. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 249-250.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1376. 1975.

C-55-76
ENVIRONMENT AND POLLUTIONS: SOURCES, HEALTH EFFECTS, MONITORING, AND CONTROL

Leh, F. K. V., and R. K. C. Lak. 1974.
Springfield, Illinois, Bannerstone House, 1974. 288 p.

Aspects of global environmental problems discussed in this book include: air and water pollutant sources, health and economic effects of air and water pollution, monitoring methods and pollution control methods.

Biological effects of oil pollution
Economic effects of oil pollution
Cleanup and recovery

Citation Source: Journal Water Pollution Control Federation 49(9):560a. 1975.

C-56-76
DISPERSED AND PARTICULATE PETROLEUM RESIDUES IN THE GULF OF ST. LAWRENCE

Levy, E. M., and A. Walton. 1974.
Physical Processes Responsible for Dispersal of Pollutants in the Sea, Arhus, Denmark, 1972. Abstract. p. 76.

The concentrations of petroleum residues in the waters off the east coast of Canada were monitored on an annual basis, beginning in 1970. Fresh oil or tarry particles on surface waters were encountered at 50% of the stations observed. No firm evidence existed to indicate an appreciable change in the concentration of these residues between 1970 and 1971.

Citation Source: Rapports et Procés-Verbaux des Réunions 167:76. 1974.

C-57-76
AQUEOUS SOLUBILITY AND AIR-WATER EXCHANGE CHARACTERISTICS OF HYDROCARBONS UNDER ENVIRONMENTAL CONDITIONS

Mackay, D., and W.-Y. Shiu. 1975.
Chemistry and Physics of Aqueous Gas Solutions. W. A. Adams, G. Greer, and J. E. Desnoyers (eds.). Princeton, N. J., Electrochemical Society, Inc., 1975. p. 93-110.

A simple mathematical model on the process of hydrocarbon introduction and removal in the surface waters of the ocean is used to help select hydrocarbons for monitoring ocean oil pollution. The physical and biological factors in the process include solubility, vapor pressure, and air-water exchange rates.

Citation Source: Chemical Abstracts 83(14):#120383n. 1975.

C-58-76
MAIN ACTIVITIES OF THE COUNCIL FOR MUTUAL ECONOMIC ASSISTANCE IN THE FIELD OF WATER POLLUTION CONTROL

Máté, B. 1975.
Water Research 9(11):1013-1014.

The CMEA Conference of Heads of Water Services has agreed on certain programmes: (1) more effective methods for effluent treatment; (2) new analysis techniques (including those for petroleum); (3) monitoring; (4) evaluation of agricultural chemicals; (5) pollution control of surface and ground waters (oil is stressed); (6) prediction of the effects on water quality of effluent discharges; (7) effects of thermal discharges; and (8) standardization of equipment used in water management.

Analysis

Citation Source: Citation Journal.

C-59-76
OIL DETECTION OR REMOVAL RESEARCH - TASK FORCE STATUS REPORT

Matovich, M. A. 1975.
Annual API Production Division Meeting, Dallas, 1975. p. N-1 - N-4.

The Oil Detection and Removal (ODOR) Subcommittee of the API was formed to define and implement research and development programs in the areas of oil detection, measurement and removal from produced water and solids. Summaries of activities in each of these topic areas are given.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(39):#210,882. 1975.

C-60-76
TAR BALL SAMPLING IN THE WESTERN NORTH ATLANTIC

McGowan, W. E., W. A. Sauer, and G. L. Hufford. 1974.
Marine Pollution Monitoring (Petroleum). National Bureau of Standards Special Publication No. 409. p. 83-84.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1341. 1975.

C-61-76
DETECTION AND MEASUREMENT OF POLLUTANTS OF WATER SURFACES

McMullen, A. I., et al. 1975.
American Laboratory 7(2):87-92.

A new system for detecting insoluble pollutants on water surfaces is based on a method for recording indigenous film pressures on natural waters. It can detect oil polluted water in rivers, harbors, canals, reservoirs and irrigation catchments, and give a warning.

Analysis

Citation Source: Environment Abstracts 5(10):#75-06477. 1975.

C-62-76
DETECTION AND MEASUREMENT OF POLLUTANTS OF WATER SURFACES

McMullen, A. I., J. F. Monk, and M. J. Stuart. 1975.
International Laboratory (Jan. Feb.):54-61.

The principle and operation of a system which can detect oil polluted water are described. The basis of the system is a specially developed method for recording indigenous film pressures on natural bodies of water and the effects of weather, oil, surfactants, etc. The apparatus can be used in a wide variety of places. The principle could also be applied to detergent or sewage pollution.

Monitoring
Design and engineering

Citation Source: Environmental Health and Pollution Control 8(7): #1939. 1975.

C-63-76
IDOE-5 INTERCALIBRATION SAMPLE: RESULTS OF ANALYSIS OFFER SIXTEEN MONTHS STORAGE

Medeiros, G. C., and J. W. Farrington. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of

Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 167-70.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1360. 1975.

C-64-76
DEVELOPMENT AND TEST OF VIDEO SYSTEM FOR AIRBORNE SURVEILLANCE OF OIL SPILLS

Millard, J. P., J. C. Arvesen, and P. L. Lewis. 1975.
NASA-TM-X-62429, A-6047, CG-D-95-75. 25 p.

The development, testing and evaluation of five video systems potentially useful for airborne surveillance of oil spills are described. Greatly enhanced oil spill detection, relative to that possible with the unaided eye, was achieved. The most practical video system is a conventional TV camera with a silicon-diode-array image tube, Corning 7-54 filter and a polarizer with its principal axis oriented horizontally.

Remote sensing
Design and engineering

Citation Source: Scientific and Technical Aerospace Reports 13(18):#N75-27539. 1975.

C-65-76
BAILEY OIL CONTENT MONITOR

Moreau, J. O. 1975.
Final report on Task 7, January 73-December 74, EE.16TMR.75MA-RD-930-75068. 60 p.

Previous tests have shown the Bailey Oil Content Monitor (BOCM) to function as a trend indicator to monitor changes in oil concentration in tanker ballast water. This project's purpose was to improve the quantitative accuracy of the device. As a result of this work, techniques were developed to reduce some of the BOCM errors; however, several other potential sources of BOCM error were identified.

Design and engineering

Citation Source: Government Reports Announcements 75(19): #COM-75-10990/OGA. 1975.

C-66-76
MARINE POLLUTION DATA ARCHIVING AND EXCHANGE

Morse, R. M. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 41-44.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1346. 1975.

C-67-76
MARITIME CONSIDERATIONS

Nachtscheim, J. J. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 49-56.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1348. 1975.

C-68-76
EFFECTS OF OIL ON BALTIC LITTORAL COMMUNITY, AS STUDIED IN AN OUTDOOR MODEL TEST SYSTEM

Notini, M., and A. Hagstrom. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 251-254.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1377. 1975.

C-69-76
TAR BALL LOADINGS ON GOLDEN BEACH, FLORIDA

Sauer, W. A. 1974.
Marine Pollution Monitoring (Petroleum). National Bureau of Standards Special Publication No. 409. p. 79-82.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1340. 1975.

C-70-76
DISTRIBUTION OF TAR BALLS AND NEUSTON SAMPLING IN THE GULF STREAM SYSTEM

Shenman, K., J. B. Colton, R. L. Dryfoos, K. D. Knapp, and B. S. Kinnear. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 243-244.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1375. 1975.

C-71-76
SCIENTIFIC PROBLEMS OF THE SYSTEMS FOR GLOBAL MONITORING AND INVESTIGATION OF OIL POLLUTION IN THE WORLD OCEAN

Simonov, A. I. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 9-14.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1354. 1975.

C-72-76
BIOLOGICAL ENVIRONMENTAL EFFECTS

Stansby, M. E. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 45-48.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1347. 1975.

C-73-76
FIELD SAMPLING METHODS AND TECHNIQUES FOR MARINE ORGANISMS AND SEDIMENTS

Straughan, D. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of

Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 183-188.

Summary not available.

Citation Source: Underwater Information Bulletin 7(41):#7508/1364. 1975.

C-74-76
PILOT PROJECT ON MARINE POLLUTION MONITORING UNDER THE FRAMEWORK OF IGOSS

Tolkachev, A. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 21-26.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1351. 1975.

C-75-76
GEWAESSERUEBERWACHUNG AUS DER LUFT [English summary]

Traexler, G. 1974.
Wasserwirtschaft 64(7-8):222-224.

Police problems concerning water pollution and shore pollution and police control of the waterways are discussed. Tests to discover oil emissions at night and to detect special noxious materials using photography are described.

Citation Source: Pollution Abstracts 6(5):#75-04466. 1975.

C-76-76
SOURCES OF CONTAMINATION OF ARTESIAN WATERS BY CARCINOGENIC HYDROCARBONS [English summary]

Vindyukov, P. M., G. L. Sardarova, and K. V. Kutakov. 1973.
Gigiena i Sanitariya 38(11):98-99.

The content of benzo[a]pyrene in artesian waters in three regions was studied. One region was uncontaminated and used as a control, another was contaminated by petroleum products, and the third region was contaminated by industrial wastes containing phenols. The content of benzo[a]pyrene was directly related to pollution of the water source and especially its pollution by petroleum products.

Citation Source: Citation Journal

C-77-76
REGULATORY FUNCTIONS

Wastler, T. A. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 57-60.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1349. 1975.

C-78-76
UNITED NATIONS ENVIRONMENT PROGRAM EARTHWATCH AND MARINE POLLUTION

White, R. M. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 3-8.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1353. 1975.

C-79-76
ENVIRONMENTAL QUALITY

Willard, B. E. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 15-18.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1355. 1975.

C-80-76
LITERATURE REVIEW ISSUE

WPCF Research Committee. 1974.
Water Pollution Control Federation. Journal 46(6):1031-1643.

Literature reviews in water pollution control are presented on monitoring, analysis, and sampling methods; physical-chemical methods; sludge treatment, utilization and disposal; water reuse; industrial wastes from petroleum processing and other industries; marine and estuarine pollution; pollution effects on fish; economics and law.

Analysis
Waste oil and waste water treatment

Citation Source: Pollution Abstracts 6(5):#75-04449. 1975.

C-81-76
THE ROLE OF STANDARD REFERENCE MATERIALS IN ENVIRONMENTAL MONITORING

Yolkin, H. T. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 157-160.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1357. 1975.

C-82-76
OIL SPILLAGE MONITORING, SAMPLING AND RECOVERY SYSTEMS

Zahka, J. G. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 89-90.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1342. 1975.

C-83-76
DETERMINATION OF AROMATIC AND TOTAL HYDROCARBON CONTENT IN SUBMICROGRAM AND MICROGRAM QUANTITIES IN AQUEOUS SYSTEMS BY MEANS OF HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Zsolnay, A. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 119-120.

Procedures based on the use of high-performance liquid chromatography were developed to detect the hydrocarbon concentration in small water samples rapidly and simply. The method is more sensitive than IR techniques and is more specific than UV or fluorescence methods used without column chromatography.

Analysis

Citation Source: Chemical Abstracts 83(18):#152037u. 1975.

C-84-76
HYDROCARBON CONTENT AND CHLOROPHYLL CORRELATION IN THE WATERS BETWEEN NOVA SCOTIA AND THE GULF STREAM

Zsolnay, A. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 255-256.

Summary not available.

Citation Source: Underwater Information Bulletin 7(4):#7508/1378. 1975.

3. REMOTE SENSING

C-85-76
OCEAN POLLUTION AND THE OCEAN-ATMOSPHERE SYSTEM

Bolle, H.-J. 1973.
ESRO: The Implications for European Space Programmes of the Possibilities of Manned Missions 4. 22 p.

The effect of atmospheric constituents on the remote sensing of the ocean surface is discussed. Special topics such as oil slick detection and phytoplankton recognition are mentioned.

Citation Source: Pollution Abstracts 6(4):#75-03758. 1975.

C-86-76
DEVELOPMENT OF A LASER FLUOROSENSOR FOR AIRBORNE SURVEYING OF THE AQUATIC ENVIRONMENT

Bristow, M. P. F., W. R. Houston, and R. M. Measures. 1975.
The Use of Lasers for Hydrographic Studies. H. H. Kim and P. T. Ryan (eds.). Symposium held at NASA, Wallops Island, Va., 1973. p. 119-136.

Tests of a laser fluorosensor, which uses a pulsed nitrogen laser and telescope photomultiplier detector system, have shown that remotely sensed spectra and amplitude changes in the fluorescence emission of natural waters have potential as water quality indicators. Tests suggest that environmental aging of oil slicks does not significantly alter their fluorescence emission signature.

Citation Source: Scientific and Technical Aerospace Reports 13(21):#N75-30534. 1975.

C-87-76
AIRBORNE, REMOTE SENSING SYSTEM THAT USES REFLECTED POLARIZED SKYLIGHT TO DETECT THE PRESENCE OF OIL DISCHARGES INTO WATER

Burns, W. W. 1975.
Ocean 75, San Diego, California, 1975. New York, N. Y., Institute of Electrical and Electronics Engineers, Inc., 1975. p. 688-692.

A TV-camera with a special filter arrangement uses the principle that water can be observed in both polar planes whereas polarized light reflected from oil can only be observed in the horizontal plane to provide a remote means for detecting oil. Successive rapid changes between the vertical and horizontal plane views cause oil to appear as a flashing image against a relatively static background.

Design and engineering

Citation Source: Citation Monograph

C-88-76
THE USE OF ELECTRONIC IMAGERY (CCTV) TO VIEW WATER SURFACE REFLECTION OF POLARIZED LIGHT TO LOCATE SMALL OIL SPILLS

Burns, W. W. 1975.
Marine Technology Society Journal 9(7):4-5.

Details on this research were presented at the Ocean '75 conference held in San Diego, 1975. The remote sensing device uses rapidly alternately polarized planes of reflected light from water surfaces to cause oil to emerge from the background as a flashing image pattern on a CCTV camera monitor. The system was able to locate a spread of creosote oil that was slowly leaking from some newly installed pilings; this spread was not visible from the surface.

Monitoring

Citation Source: Citation Journal

C-89-76
REMOTE SENSING TECHNIQUES FOR DETECTING OIL SLICKS

Catoe, C. E. 1973.
Journal of Petroleum Technology 25(3):267-278.

The remote sensor properties necessary for oil detection are summarized in terms of wavelength, detection mechanism performance summary, sensor resolution and swathe width.

Citation Source: International Petroleum Abstracts 3(2):#571. 1975.

C-90-76
THE DEVELOPMENT OF AN EXPERIMENTAL AIRBORNE LASER REMOTE SENSOR FOR OIL DETECTION AND CLASSIFICATION IN SPILLS

Fantasia, J. F., and H. C. Ingrao. 1975.
Final report, TSC-USCG-74-5 USCG-D-86-75, Contract DOT-PPA-CG-03. 164 p.

Twenty-nine crude and refined oils were analyzed in the lab for API gravity, fluorescence and reflectance spectra, etc. Similar measurements were made with an N_2 laser oil spill remote sensor. The results indicate that, in certain instances, fluorescence can be used to detect and classify oil spills in the marine environment.

Design and engineering

Citation Source: Government Reports Announcements 75(21): #AD-A013 580/6GA. 1975.

C-91-76
OIL POLLUTION DETECTION AND MONITORING FROM SPACE

Goldman, G. C., and R. Horvath. 1975.
Ocean 75, San Diego, California, 1975. New York, N. Y., Institute of Electrical and Electronics Engineers, Inc., 1975. p. 787-793.

Three reported spills were investigated using ERTS-1 digital data to determine the feasibility of using this data to monitor and detect oil spills. In two cases, detection was not possible. ERTS-1 was not considered usable for oil pollution monitoring because of its 18 day overpass frequency, the few spectral channels, the extended band widths, and the long information retrieval time.

Citation Source: Citation Monograph

C-92-76
RECENT ADVANCES IN THE APPLICATION OF PULSED LASERS IN THE HYDROSPHERE

Hickman, G. D. 1975.
The Use of Lasers for Hydrographic Studies. H. H. Kim, and P. T. Ryan (eds.). Symposium held at NASA, Wallops Island, Va., 1973. p. 81-88.

The transmission/scattering characteristics of a pulsed neon laser as a function of water turbidity have been investigated. The results are being incorporated into the design of an airborne laser bathymetry system. In addition, this technique can be used to detect and identify algae and oils, and measure subsurface currents, temperature and salinity.

Citation Source: Scientific and Technical Aerospace Reports 13(21):#N75-30530. 1975.

C-93-76
OIL POLLUTION DETECTION AND MONITORING FROM SPACE USING ERTS-1

Horvath, R., and G. C. Goldman. 1975.
Final report, E75-10381, NASA-CR-143243, ERIM-193300-68-F, Contract NAS5-21783. 57 p.

Three reported spills (off Virginia, Oakland Bay, and off southern California) were studied using four digital computer compatible techniques on ERTS-1 data. There are severe restrictions on the usability of the ERTS-1 data for spill identification. Problems include its 18 day overpass frequency, few spectral channels, and the extended information retrieval time.

Monitoring

Citation Source: Scientific and Technical Aerospace Reports 13(20):#N75-29523. 1975.

C-94-76
LIFES: LASER INDUCED FLUORESCENCE AND ENVIRONMENTAL SENSING

Houston, W. R., D. G. Stephenson, and R. M. Measures. 1975.
The Use of Lasers for Hydrographic Studies. H. H. Kim, and P. T. Ryan (eds.). Symposium held at NASA, Wallops Island, Va., 1973. p. 153-169.

Laser induced fluorescence has been evaluated as a method to detect and identify parameters in the marine environment. Specific targets are crude oils, refined petroleum products, fish oils and algae. Different fluorescence parameters were evaluated in relation to the identification of the targets.

Citation Source: Scientific and Technical Aerospace Reports 13(21):#N75-30537. 1975.

C-95-76
AN AIRBORNE LASER FLUOROSENSOR FOR THE DETECTION OF OIL ON WATER

Kim, H. H., and G. D. Hickman. 1975.
The Use of Lasers for Hydrographic Studies. H. H. Kim, and P. T. Ryan (eds.). Symposium held at NASA, Wallops Island, Va., 1973. p. 197-202.

Daylight tests of this system were made over areas of controlled oil spills and over a 50 km stretch of the Delaware River to establish an ambient oil baseline in the river. Extremely low levels of oil that would ordinarily be missed can be monitored with this system.

Citation Source: Scientific and Technical Aerospace Reports 13(21):#N75-30539. 1975.

C-96-76
REMOTE DETECTION OF POLLUTION OF WATER RESERVOIRS AND PHYTO-PLANKTON BY OPTICAL METHODS

Kondratyev, K. A., A. A. Buznikov, and D. V. Pozdnyakov. 1974. NASA Technical Translation F-14,767. 19 p.

From the data reviewed it is shown that remote detection of oil films and phytoplankton can be conducted by optical methods, as the refractive index of oil is higher than that of water. Methods to measure various parameters for detecting oil deposits and shoals of fish indicated by increased phytoplankton concentration are discussed.

Citation Source: Selected Water Resources Abstracts 8(20): #W75-10098. 1975.

C-97-76
REMOTE ENVIRONMENTAL MONITORING

Koutsandreas, J. D., B. H. Manns, and S. H. Melfi. 1975. NAECON '75. National Aerospace and Electronics Conference, Dayton, Ohio, 1975. New York, Institute of Electrical and Electronics Engineers, Inc., 1975. p. 734-743. No. A75-37623 18-01.

Remote monitoring of air, water and land quality is discussed. Instruments to be used in water monitoring are described. Applications of remote environmental monitoring include: locating "hot spots" of pollution, responding quickly to pollution episodes and measuring pollutant dispersion, developing pollution models and evaluating degradation over large areas due to energy-related activities.

Citation Source: International Aerospace Abstracts 15(18): #A75-37715. 1975.

C-98-76
A REMOTE SENSING LASER FLUOROMETER

O'Neill, R. A., A. R. Davis, H. G. Gross, and J. Kruus. 1975. The Use of Lasers for Hydrographic Studies. H. H. Kim, and P. T. Ryan (eds.). Symposium held at NASA, Wallops Island, Va., 1973. p. 173-196.

This sensor measures the fluorescence spectra of water at ranges up to 75 m and is able to detect oil spills in water at altitudes of 300 m. All light, background, reflected laser light or the induced fluorescence is gathered by a small telescope. With the use of optical filters and a photomultiplier tube, the amplitude of the laser induced fluorescence in the selected wavelength is displayed.

Citation Source: Scientific and Technical Aerospace Reports 13(21):#N75-30538. 1975.

C-99-76
A METHOD FOR REMOTE DETECTION OF OIL SPILLS USING LASER-EXCITED RAMAN BACK SCATTERING AND BACKSCATTERED FLUORESCENCE

Sato, T., and H. Kashiwagi. 1975.
Ocean 75, San Diego, California, 1975. New York, N. Y., Institute of Electrical and Electronics Engineers, Inc., 1975. p. 681-683.

The scattering spectra of oils excited by a CW Ar ion laser were obtained with a laser Raman spectrometer. The theoretical analysis of a laser-Raman radar for the remote detection and backscattering spectra of oils in seawater obtained in this manner are described.

Citation Source: Citation Monograph

C-100-76
OCEANOGRAPHY, FISHERY

Struebing, K. 1973.
ESRO: The Implications for European Space Programmes of the Possibilities of Manned Missions, 4, 1973. 18 p.

The use of remote sensors for oceanographic and fisheries research is discussed. Various parameters can be measured, such as coastal zone processes, water pollution (oil slicks), organic matter, ocean color, temperature, salinity, icebergs, etc. Fisheries research utilizes both direct (IR imagery) and indirect (image intensities, and chlorophyll) methods.

Citation Source: Oceanic Abstracts 12(4):#75-03692. 1975.

4. SAMPLING

C-101-76
SAMPLING AND MONITORING

Anon. 1974.
Water Waste Treatment 17(10):20-38.

This article is an annual review of instruments and apparatus developed for the collection and monitoring of environmental samples (including oil-containing samples).

Monitoring

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4776. 1975.

C-102-76
SAMPLING OF REFINERY LIQUID EFFLUENTS

Blokker, P. C. 1975.
Stichting CONCAWE, Report No. 3/75. 49 p.

The methods of sampling oil refinery liquid effluent in open and closed channels are reviewed. The purpose of the report is to provide guidance in choosing an appropriate sampling method. Automatic proportional sampling and effluent flow measuring methods are emphasized.

Monitoring
Design and engineering

Citation Source: Aquatic Sciences and Fisheries Abstracts 5(8): #5Q8892. 1975.

C-103-76
EVALUATION OF BOAT DEPLOYABLE THIN FILM OIL SAMPLERS

Chang, W. J., and W. A. Saner. 1974.
Offshore Technology Conference, 6th, Houston, Texas, 1974. Vol. 1, OTC #1984, p. 467-486.

Sorbents were tested for use in an oil sampling system whose purpose is identification of the oil sampled. Operational characteristics of the sampler in soybean oil slicks are tabulated. Other tests covered the efficiency of the samplers on different types and thicknesses of oils, and the ability of the samplers to maintain the chemical integrity of the sample.

Source identification

Citation Source: MRIS Abstracts 11(June):#080023. 1975.

C-104-76
WATER RESOURCES INSTRUMENTATION, VOL. 2. DATA ACQUISITION AND ANALYSIS

Krizek, R. J., and E. F. Mozonyi (eds.). 1975.
International Seminar and Exposition on Water Resources Instrumentation, Chicago, Illinois, 1974. Champaign, Illinois, International Water Resources Association, 1975. xi + 593 p.

The second volume contains the sessions on data acquisition and analysis. Oil spill detection and prevention and systems management in environmental assessments are among the topics covered in the session on environmental impact assessment.

Analysis
General effects of oil prospecting and production

Citation Source: Biological Abstracts 60(7):#37300. 1975.

C-105-76
WORKSHOP ON SAMPLE PREPARATION TECHNIQUES FOR ORGANIC POLLUTANT ANALYSIS, DENVER, COLORADO, 1973

National Field Investigations Center, Denver. 1973.
NTIS Report PB-232 015. 40 p.

Discussed at the conference were various sampling methods and analytical techniques for industrial organic chemicals discharged into surface waters. The addition of sulfuric acid was suggested for preserving petroleum-containing samples.

Analysis

Citation Source: Selected Water Resources Abstracts 8(14): #W75-07295. 1975.

C-106-76
MINI NEUSTON SAMPLER SUITABLE FOR COLLECTION OF FLOATING OIL AT SEA

Wellman, A. M., and W. J. Wellman. 1975.
Laboratory Practice 24(1):31-32.

The Wellman mini neuston sampler can be used to skim the surface layers of the sea and collect floating oil and tar fragments for studies on oil pollution of the ocean. The maximum efficiency of the sampler is in Beaufort sea states 1-4. This sampler has been used successfully in the Atlantic.

Citation Source: Environmental Health and Pollution Control 8(7): #1931. 1975.

5. ANALYSIS

C-107-76
METHOD FOR THE SEPARATION OF OIL FROM AN AQUEOUS OIL-DETERGENT SOLUTION PRIOR TO IR ANALYSIS. II

Adams, C. E. 1974.
Final Report No. NOLTR-74-116. 13 p.

Further work is reported on the analysis of oil in water solutions in the presence of dissolved detergents using the CCl_4 extraction-IR spectrophotometric method. Testing and improving the analytical method and working out a standard procedure are dealt with.

Citation Source: Chemical Abstracts 83(18):#149862d. 1975.

C-108-76
APPLICATIONS TO WATER POLLUTION STUDIES

Anacreon, R. E. 1975.
Instrument News 24(2E):11-13.

The author reviews ten papers which deal with the application of fluorescence methods to the detection of oils, phenols and lignins in water. Fluorescence methods can also be used in the tracing of oil spills.

Citation Source: Industrial Wastes Information Bulletin 5(1): #HMS 4157. 1975.

C-109-76
PETROLEUM HYDROCARBONS

Anderson, J. W., R. C. Clark, and J. Stegemen. 1974.
Marine Bioassays. Washington, D. C., Marine Technology Society, 1974. p. 36-75.

The authors discuss the characteristic differences between biogenic and petroleum hydrocarbons. Petroleum and biogenic hydrocarbon levels in marine organisms are tabulated. Methods of analysis of petroleum hydrocarbons in marine organisms and the mechanisms of uptake, release and metabolism are discussed.

Biological effects of oil pollution

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(8): #5Q8899. 1975.

C-110-76
GAS AND WATER ANALYSERS

Anon.
Product Information.

The brochure provides information on a range of equipment for analyses of exhaust gas and flue gases, and for measuring oxygen, BOD and oil in water. FFI contact: Horiba International Corporation, 1021 Duryea Ave., Irvine Industrial Complex, Santa Ana, California 92705.

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4749. 1975.

C-111-76
MANUAL OF METHODS IN AQUATIC ENVIRONMENT RESEARCH. PART 1. METHODS FOR DETECTION, MEASUREMENT AND MONITORING OF WATER POLLUTION

Anon. 1975.
Food and Agriculture Organization, UN, FAO Fisheries Technical Paper No. 137. 238 p.

The manual is divided into theoretical and practical sections. The theoretical papers cover general aspects and problems of analyzing water and sediments. The practical section includes methods for measuring physical and chemical parameters and the various classes of pollutants in both the environment and organisms.

Monitoring

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(8): #5Q8515. 1975.

C-112-76
TLC FINDS HEXANE SOLUBLES

Atanus, H. 1974.
Water and Wastes Engineering 11(10):26, 28.

Thin layer chromatography (TLC) of hexane solubles is used to detect oil wastes in outfalls from plant discharges. Identification of specific hydrocarbon pollutants is made by TLC, an inexpensive, portable technique. Oil is then removed from industrial wastes by standard techniques before the wastes can be discharged.

Monitoring

Citation Source: Selected Water Resources Abstracts 8(18): #W75-08885. 1975.

C-113-76
METHODS FOR THE ABATEMENT OF WATER POLLUTION BY REFINERIES

Barbieri, A. 1974.
Rivista della Societa Italiana di Scienza dell'Alimentazione 3(3):67-80.

A review with no references.

Citation Source: Chemical Abstracts 83(10):#84290u. 1975.

C-114-76
SUSPENSIONS OF CRUDE OIL IN SEAWATER: RAPID METHODS OF CHARACTERIZING LIGHT HYDROCARBON SOLUTES

Bean, R. W. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 127-130.

A rapid gas chromatographic method has been developed to detect the light hydrocarbon components of oil-seawater mixtures. Interfering insoluble hydrocarbons were removed by a filtration technique before analysis. The gas chromatographic analyses were compared with infrared absorbance data in order to investigate the possibility of using infrared absorbance in routine monitoring.

Monitoring

Citation Source: Chemical Abstracts 83(14):#120372h. 1975.

C-115-76
ANALYSIS, STRUCTURE, AND OCCURRENCE OF BIOGENIC HYDROCARBONS. II. AROMATIC HYDROCARBONS

Berthold, I. 1975.
Compend 74/75, Vortr. Haupttag Dtsch. Ges. Mineraloelwiss. Kohlenchem., 24th, 1974. 2:940-951.

"Possibilities for analytical distinctions between biogenic hydrocarbons, mineral oil hydrocarbons and pyrolytic exhaust gas components are shown and discussed."

Citation Source: Chemical Abstracts 83(18):#149831t. 1975.

C-116-76
IDENTIFICATION OF HYDROCARBONS IN AN EXTRACT FROM ESTUARINE WATER ACCOMMODATED NO. 2 FUEL OIL

Bieri, R. H., A. L. Walker, B. W. Lewis, G. Losser, and R. J. Huggett. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 149-156.

Computerized gas chromatographic-mass spectra systems have the potential to solve the problem of analyzing complex mixtures of hydrocarbons. Three types of compounds (benzene compounds, naphthalene compounds, and indanes, biphenyls, and polyaromatic compounds) were isolated from a methylene chloride extract of estuarine water accommodated No. 2 fuel oil.

Monitoring

Citation Source: Chemical Abstracts 83(14):#120403u. 1975.

C-117-76
REVIEW OF RECENT ADVANCES IN THE APPLICATIONS OF SPARK SOURCE MASS SPECTROMETRY

Bingham, R. A., and P. G. T. Vossen. 1975.
Laboratory Practice 24(4):233-238.

Applications of spark source mass spectrometry are discussed in regard to the analysis of organic materials for inorganic constituents, surveillance of environments, analysis of meteorites, oils, air pollution, water pollution and food, and the determination of Hg and trace metals in fish and mussels.

Citation Source: Chemical Abstracts 83(10):#90202h. 1975.

C-118-76
DETERMINATION OF EXTRACTABLE ORGANIC MATERIAL AND ANALYSIS OF HYDROCARBON TYPES IN LAKE AND COASTAL SEDIMENTS

Blaylock, J. W., R. M. Bean, and R. E. Wilding. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 217-220.

The environmental impact of petroleum producing operations was studied using a method for extraction and gravimetric analysis of organic materials in drill core samples (B. Koons and P. H. Monaghan, 1969) which was adapted for fractionation of lake and coastal sediments. Analytical procedures are outlined.

General effects of oil prospecting and production

Citation Source: Chemical Abstracts 83(18):#151815j. 1975.

C-119-76
MEASUREMENT AND CHARACTERIZATION OF NON-VOLATILE HYDROCARBONS IN OCEAN WATER

Brown, R. A., J. J. Elliott, and T. D. Searl. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 131-134.

Nonvolatile hydrocarbons with more than 13 carbons are extracted with CCl_4. The sample volume is reduced by evaporation and by the addition of n-pentane; then the sample is passed through a silica gel column. The fractions are subjected to infrared and ultraviolet spectrophotometry, gas chromatography and mass spectrometry for characterization.

Source identification
Monitoring

Citation Source: Chemical Abstracts 83(14):#120542p. 1975.

C-120-76
HYDROCARBONS

Churacek, J. 1975.
Liquid Column Chromatography--A Survey of Modern Techniques and Applications. Z. Deyl, K. Macek, and J. Janak (eds.). Amsterdam, The Netherlands, Elsevier Scientific Publishing Co., 1975. p. 417-

Summary not available.

Citation Source: Current Contents, Physical and Chemical Sciences 15(32):19. 1975.

C-121-76
ANALYTICAL TECHNIQUES FOR ISOLATING AND QUANTIFYING PETROLEUM PARAFFIN HYDROCARBONS IN MARINE ORGANISMS

Clark, R. C., Jr., and J. S. Finley. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of

Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 209-212.

"Gas chromatographic analysis showed a 92.6, 92.6 and 99.9% extraction recovery of n-paraffins added to wet mussel tissue at concentrations of 0.357, 1.80 and 8.31 μg/g, respectively."

Monitoring

Citation Source: Chemical Abstracts 83(11):#91743x. 1975.

C-122-76
INFRARED DETERMINATION OF OILY MATTER EXTRACTED FROM WATER BY FREON 113

Coles, G. P., R. M. Dille, and D. L. Shull. 1975.
National American Chemical Society Meeting, 170th, Chicago, 1975. Abstracts of Papers. Paper No. PETR 13.

Summary not available.

Citation Source: Petroleum Abstracts 15(40):Appendix B. 1975.

C-123-76
THE DETERMINATION OF PHENOLS IN AQUEOUS EFFLUENTS

Cooper, R. L., and K. C. Wheatstone. 1973.
Water Research 7:1375-1384.

Phenols were extracted from the effluent using methyl isobutyl ketone; the trimethyl-silyl ethers were prepared, then separated by gas-liquid chromatography and quantified with a flame ionization detector. The lower limits of detection are 0.01 ppm for each phenol.

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3555. 1975.

C-124-76
ENVIRONMENTAL PROTECTION RESEARCH IN THE HUNGARIAN OIL AND GAS RESEARCH INSTITUTE

Csikos, R. 1974.
Hungarian Journal of Industrial Chemistry 2(Suppl. 2):293-304.

The publication describes the environmental protection research being conducted at the Oil and Gas Research Institute, Veszprem, and discusses the developments made in the rapid and secure determination of organic and some inorganic components that pollute the environment.

General effects of oil prospecting and production

Citation Source: The Engineering Index Monthly 13(8):#051737. 1975.

C-125-76
COMPOSITION AND ANALYSIS OF MARINE POLLUTANTS

Erskine, R. L., and E. V. Whitehead. 1975.
Iran Journal of Science and Technology 3(4):221-243.

The analytical methods used to establish a crude oil "fingerprint" to match with an authentic sample are reviewed. The biogenic origin of petroleum and its composition are discussed in relation to the biodegradation of fossil fuel pollutants found at sea.

Source identification
Biological degradation

Citation Source: The Engineering Index Monthly 13(8):#056424. 1975.

C-126-76
THE APPLICATION OF HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY TO THE ANALYSIS OF PETROLEUM MATERIALS. PART 1. QUALITATIVE HYDROCARBON-TYPE ANALYSIS

Fodor, G. E., and F. M. Newman. 1975.
Final report, AFLRL-62, Contract DAAK02-73-C-0221. 15 p.

Liquid chromatography was used to analyze for hydrocarbon type in petroleum, and related products and substances. "Elution volumes of normal, iso-, and cyclo-paraffins, mono- and diolefins, aromatic hydrocarbons and vic-dibromo alkanes were determined by high performance liquid chromatography in 10 micrometer and 37-75 micrometer silica gel."

Citation Source: Government Reports Announcements 75(23): #AD-A014 994/8GA. 1975.

C-127-76
THE APPLICATION OF HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY TO THE ANALYSIS OF PETROLEUM MATERIALS. PART 2. QUANTITATIVE HYDROCARBON TYPE ANALYSIS

Fodor, G. E., and F. M. Newman. 1975.
Final report, AFLRL-63, DAAK02-73-C-0221. 28 p.

Middle distillate petroleum products were quantitatively analyzed for hydrocarbon type using high performance liquid chromatography using silica gel absorbents. Olefin free diesel fuels were emphasized.

Citation Source: Government Reports Announcements 75(23): #AD-A014 995/5GA. 1975.

C-128-76
ISOLATION AND CHEMICAL AND BIOLOGICAL PROPERTIES OF MICROBIAL EMULSIFYING AGENTS FOR HYDROCARBONS

Friede, J. D. 1975.
NTIS Report AD/A No. 004248/IGA. 6 p.

The emulsifying agents produced by two Candida strains and one Pseudomonas strain were isolated using several chromatographic techniques. Repetition of growth studies yielded variable data.

Citation Source: Chemical Abstracts 83(9):#76957b. 1975.

C-129-76
SUPERCRITICAL FLUID CHROMATOGRAPHY OF POLYNUCLEAR AROMATIC HYDROCARBON [English summary]

Fujita, K., I. Shimokobe, and F. Nakazima. 1975.
Nippon Kagaku Kaishi 1975(8):1348-1351.

Supercritical fluid chromatography is utilized to separate polynuclear aromatic hydrocarbons such as benzene, naphthalene, phenathrene, pyrene and chrysene. Experimental conditions and mobile and stationary phase details are given.

Citation Source: Citation Journal

C-130-76
CHARACTERIZATION OF AROMATIC HYDROCARBONS

Giger, W., M. Reinard, and C. Schaffner. 1974.
Vom Wasser 43:343-358.

A review is given of the analytical methods for the evaluation of aromatic hydrocarbons, and a gas chromatographic-mass spectrometric method is described in detail. Three examples (domestic sewage, diesel fuel and oil-contaminated sediment) are presented to demonstrate the feasibility of this method.

Citation Source: Environmental Health and Pollution Control 8(2):#327. 1975.

C-131-76
THE USE OF BENTONE 34 COATED SUPPORTS IN COLUMN CHROMATOGRAPHY AND THEIR POTENTIAL APPLICATION IN THE FIELD OF ORGANIC POLLUTION ANALYSIS

Grant, D. W., R. B. Meiris, and M. G. Hollis. 1974.
Journal of Chromatography 99(1):721-729.

The monitoring of aqueous wastes from coal carbonization and tar refining operations poses analytical problems. Columns with Bentone 34 as a stationary phase in gas-solid chromatography and high-performance liquid chromatography are potentially useful in the separation of polynuclear hydrocarbons and of monohydric and dihydric phenols.

Monitoring

Citation Source: Citation Journal

C-132-76
OPTICAL EMISSION SPECTROSCOPY

Gray, A. L. 1974.
Modern Physical Techniques in Materials Technology. T. Mulvey and R. K. Webster (eds.). London, Oxford University Press, 1974. p. 232-246.

The theory and instrumentation of optical emission spectroscopy are reviewed; its applications to analysis of geological materials, used lubricating oils and pig iron are discussed.

Citation Source: Chemical Abstracts 83(10):#90208q. 1975.

C-133-76
DETERMINATION OF HYDROCARBONS IN MARINE ORGANISMS AND SEDIMENTS BY THIN LAYER CHROMATOGRAPHY

Hunter, L., H. E. Guard, and L. H. DiSalvo. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 213-216.

A study which determined the concentration of total hydrocarbons in marine organisms and sediments of San Francisco Bay by a thin-layer chromatographic method is described. With further standardization, the method could apparently be used to monitor pollution of waters by hydrocarbons in field labs. The specificity range is 1-1000 ppm (dry wt.) hydrocarbons.

Monitoring

Citation Source: Chemical Abstracts 83(9):#72828n. 1975.

C-134-76
BASELINE HYDROCARBON CONCENTRATIONS

Kinney, P. J. 1973.
Environmental Studies of Port Valdez. S. W. Hood, W. E. Shiels, and E. J. Kelley (eds.). University of Alaska, Institute of Marine Science Occasional Publication No. 3, 1973. p. 397-410.

Gas chromatographic signatures of Prudhoe Bay crude oil and of those from sediment in biological samples are distinct, indicating the potential validity of this method to discriminate between hydrocarbon pollution and natural background content. Hydrocarbon concentrations measured in Port Valdez are slightly lower than elsewhere.

Monitoring

Citation Source: Citation Monograph

C-135-76
MEASUREMENT OF THE TOTAL OIL CONTENT OF NATURAL WATERS

Lohasz, M., and G. Eppeldauer. 1974.
Measurement and Instrumentation. Congress of the International Measurement Confederation, 6th, Dresden, 1973. G. Striker (ed.). Amsterdam, Netherlands, North-Holland, 1974. Vol. 3:141-149.

Oil in natural waters can be automatically detected by luminescence intensity. The most effective wavelengths for excitation of luminescence of oils were 3600-4000 Å. Before the actual analysis, standard curves for the type of oil identified were prepared. The apparatus is stable and suited for detection of small amounts of mineral oils (~0.01 mg/l) in waters.

Monitoring
Source identification

Citation Source: Chemical Abstracts 83(14):#120370f. 1975.

C-136-76
THE DETERMINATION OF THE SOLUBILITY OF HYDROCARBONS IN AQUEOUS SODIUM CHLORIDE SOLUTIONS

Mackay, D., and W. Y. Shiu. 1975.
Canadian Journal of Chemical Engineering 53(2):239-242.

The method used a vapor-phase extraction technique with subsequent gas chromatographic analysis. It has the advantage that no calibration peak area vs. amount of hydrocarbon is needed and the preparation of truly saturated solutions for the solubility determination is not necessary.

Citation Source: Petroleum Abstracts 15(40):#211,278. 1975.

C-137-76
ANALYTICAL METHODS

McAuliffe, C. D. 1975.
Petroleum in the Marine Environment, a Workshop on Inputs, Fates, and the Effects of Petroleum in the Marine Environment, Airlie, Virginia, 1973. p. 19-41.

Analytical techniques used to differentiate petroleum hydrocarbons from biogenic hydrocarbons are given. The chemical analyses of separate-phase oil, hydrocarbons in water and hydrocarbons in biological materials and sediments are considered separately. Sample collection and preservation are described for each material. A separate section concerns the assessment of biological effects of oil.

Sampling
Biological effects of oil pollution

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(9): #5Q10257. 1975.

C-138-76
DETERMINATION OF C1-C10 HYDROCARBONS IN WATER

McAuliffe, C. D. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 121-126.

Hydrocarbon-free gas is repeatedly equilibrated with an aqueous sample containing dissolved hydrocarbons. Successive gas chromatographic analyses are then performed. Different classes of hydrocarbons partition differently between water and gas phases based on their solubilities and vapor pressures. This difference in partition coefficients allows the various hydrocarbon types to be separated.

Monitoring

Citation Source: Chemical Abstracts 83(14):#120402t. 1975.

C-139-76
MEASUREMENT AND INTERPRETATION OF NONVOLATILE HYDROCARBONS IN THE OCEAN. PART I. MEASUREMENTS IN ATLANTIC, MEDITERRANEAN, GULF OF MEXICO, AND PERSIAN GULF

Monaghan, P. H., D. E. Brandon, R. A. Brown, T. D. Searl, and J. J. Elliot. 1974.
Exxon Products Research Co., Paper No. AID.IDJB.74/EPR.4EX.74. 217 p.

Water samples taken from tanker routes in the Atlantic and from oceanographic vessels elsewhere were extracted with CCl_4 and the amount and composition of nonvolatile hydrocarbons were measured. The nonvolatile hydrocarbons were 10-40% of the total and consisted mainly of paraffins and 1-ring cycloparaffins. Concentrations in the top 10 m of the water column were 4 ppb, dropping to <1 ppb in deeper waters.

Reporting

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(8): #5Q8956. 1975.

C-140-76
A RAPID METHOD TO DETERMINE BUNKER C FUEL OIL IN MARINE ORGANISMS

Morgan, N. L. 1975.
Bulletin of Environmental Contamination and Toxicology 14(3): 309-312.

Bunker C fuel oil has been found at the 0.5 mg/kg tissue level using this new method. The tissue is subjected to a pentane-methanol extraction utilizing a blender, and then run through adsorption chromatography. After evaporation, the sample is quantitatively analyzed for fuel oil by gas chromatography.

Citation Source: Citation Journal

C-141-76
GAS CHROMATOGRAPHY IN THE STUDY OF POLLUTION

Muten, I. M. 1974.
Pollution Monitor (21):18-20.

The analysis of pesticides, flue gas and hydrocarbons using gas chromatography is reviewed. Future developments are discussed.

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4746. 1975.

C-142-76
FORENSIC CHEMICAL ANALYSIS OF FUEL OILS BY GAS CHROMATOGRAPHY [English summary]

Novikov, Y. A., A. V. Vikhlyantsev, and O. K. Porksheyan. 1974. Sudebno-Meditsinskaia Ekspertra 17(4):27-29.

Benzenes and petrols can be grouped using this method. It can identify small amounts of the liquid in traces on various carriers and biological matter. The use of the method, including techniques, environmental conditions, and reliability factors is discussed.

Citation Source: Citation Journal

C-143-76
LABORATORY SEMIAUTOMATIC INFRARED DEVICE FOR DETERMINING THE COMPOSITION OF PETROLEUM PRODUCTS IN SEWAGE [in Russian; English translation of journal available]

Osipov, U. M., V. Luchinskii, and A. S. Egorov. 1975. Khimiya i Tekhnologiya Topliv i Masel 6:59-60.

The electron-optical measurement system and the main technical characteristics of a laboratory infrared analyzer are described. The device determines the total content of petroleum products in sewage of refineries and other technological installations.

Citation Source: International Aerospace Abstracts 15(18): #A75-38648. 1975.

C-144-76
PETROLEUM TRITERPANE FINGERPRINTING OF CRUDE OILS

Pym, J. G., J. E. Ray, G. W. Smith, and E. V. Whitehead. 1975. Analytical Chemistry 47(9):1617-1622.

A liquid-elution chromatographic method has been developed which permits the isolation and analysis of triterpane concentrates from petroleum. The technique should supplement other methods of relating crude oil to source rocks and may also aid in the identification of individual crude oil pollutants.

Source identification

Citation Source: Citation Journal

C-145-76
TRACE ELEMENTS BY INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS FOR POLLUTION MONITORING

Sheibley, D. W. 1975.
Trace Elements in Fuel: Research Sponsored by the American Chemical Society. Washington, D.C. Advances in Chemistry Series, No. 141. p. 98-117.

Methods and technology were developed to analyze 1000 samples per year of pollution-related samples including coal, fly ash, bottom ash, crude oil, fuel oil, residual oil, gasoline, kerosene, river sediment and waters, and others. Precision of the method was $\pm$25%. Overall accuracy was estimated at 50%.

Citation Source: International Aerospace Abstracts 15(19): #A75-39335. 1975.

C-146-76
POSSIBILITY FOR THE GROUP IDENTIFICATION OF HYDROCARBONS BY GAS CHROMATOGRAPHY FROM TEMPERATURE COEFFICIENTS OF RETENTION INDEXES [English summary]

Shlyakhov, A. F., B. I. Anvaer, O. V. Zolotareva, N. N. Romina, N. V. Novikova, and R. I. Koreshkova. 1975.
Zhurnal Analiticheskoi Khimii 30(4):788-792.

Retention indexes of 52 high-boiling hydrocarbons of various types were plotted versus temperature. The temperature coefficients of the retention indexes increase with the number of rings in the hydrocarbon molecule and can be used to identify hydrocarbon type.

Source identification

Citation Source: Chemical Abstracts 83(14):#125832t. 1975.

C-147-76
TARS AS PRODUCTS OF POLYMERIZATION OF ORGANIC SUBSTANCES IN WATER

Sinel'nikov, V. Ye. 1973.
Hydrobiological Journal 9(3):17-23.

Tars can be of different origins. Analytical characteristics can be used to characterize tars as of natural, petroleum, sewage or phenolic origin. Tars of phenolic origin were created by adding phenol daily for 750 days at a concentration of 10 mg/liter; the mechanism of formation is discussed.

Source identification

Citation Source: Citation Journal

C-148-76
HYDROCARBON GROUP TYPES IN GASOLINE-RANGE MATERIALS BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Suatoni, J. C., H. R. Garber, and B. E. Davis. 1975.
Journal of Chromatographic Science 13(8):367-371.

This liquid chromatographic technique analyzes gasoline-range materials (60-215°C) for their group types: saturates, olefins and aromatics. A low polarity perfluorocarbon mobile phase and a small particle silica column are used. This method is more precise and accurate than the previous method.

Citation Source: Citation Journal

C-149-76
RAPID HYDROCARBON GROUP-TYPE ANALYSIS BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Suatoni, J. C., and R. E. Swab. 1975.
Journal of Chromatographic Science 13(8):361-366.

A rapid general technique for hydrocarbon group-type analysis which utilizes high performance liquid chromatography has been developed. Saturates, aromatics, polar compounds, and n-hexane insolubles in all types of liquid hydrocarbons (crudes, fuels, gasolines, kerosenes, etc.) can be analyzed.

Citation Source: Citation Journal

C-150-76
ANALYTICAL EQUIPMENT

Teledyne Analytical Instruments.
Product Information.

Teledyne carries a range of in-line process analyzers for gaseous and liquid streams. The instruments measure oxygen, flue gas, combustibles, oil-in-water, and hydrocarbons. FFI contact Teledyne Analytical Instruments, 333 West Mission Dr., San Gabriel, California 91776.

Monitoring

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4536. 1975.

C-151-76

THE INFRARED STUDIES OF SANTA BARBARA CHANNEL OIL SPILL

Tu-Ching, T. 1974.
Ph.D. Thesis (Available from University Microfilms, Inc., Ann Arbor, Michigan, Order no. 74-26,406). 136 p.

A twelve-month analytical investigation conducted to evaluate the effects of the Santa Barbara oil well spill which occurred January 28, 1969, is described. The study evaluated infrared analytical techniques for identification of oils and establishment of background levels of hydrocarbons in marine sediments, examined the movement and deposition of oil in relation to source, sediment size and natural current patterns, and correlated oil movement with sediment formation.

Source identification
General fate of oil in the environment

Citation Source: Selected Water Resources Abstracts 8(20): #W75-10237. 1975.

C-152-76

QUANTITATIVE DETERMINATION OF HYDROCARBONS IN MARINE ORGANISMS

Warner, J. S. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. J. C. Junghans (ed.). NBS Special Publication No. 409. p. 195-196.

The concentration of hydrocarbons in oyster tissue was determined by fractionating the extracted tissue on silica gel and using gas chromatography. Individual aromatic hydrocarbons were determined in clam tissue by chemical ionization mass spectrometry.

Monitoring

Citation Source: Chemical Abstracts 83(9):#72827m. 1975.

6. SOURCE IDENTIFICATION

C-153-76
IDENTIFICATION OF MINERAL OILS BY FIELD IONIZATION MASS SPECTROMETRY

Anbar, M., M. E. Scolnick, and A. C. Scott. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 229-232.

A new ionization source can produce arrays of hundreds of microcones on a porous substrate. A cathode with a radius of curvature of ~0.1 μ and an anode at a distance of 75 μ require more than 300 V to produce field ionization and a nonfragmented mass spectrum. Different crudes or fuel oils are separated using the relative abundance of the sum of the isomers for each mass. Only a small sample (100 μg) is needed for an analysis with 3% precision.

Analysis

Citation Source: Chemical Abstracts 83(14):#118136r. 1975.

C-154-76
OIL POLLUTION IDENTIFICATION SERVICE

Carroll, D. M. 1975.
Technology Ireland 6(11):28-29.

The Analytical Chemical Section, Institute for Industrial Research and Standards, Dublin, Ireland, offers an oil pollution source identification service. Identification of an oil source is made by comparing the analytical profile of an oil pollutant, based on its gas chromatographic patterns, spectroscopic properties and organic and inorganic constituent content, with published data for crude and refined oils. Problems encountered in identification, including weathering of oil, are discussed.

Citation Source: Pollution Abstracts 6(4):#75-03394. 1975.

C-155-76
ACTUAL POLLUTION IN THE STRAITS OF MESSINA

De Domenico, E., and M. De Domenico. 1974.
Revue Internationale Óceanographie Médicale 15-16:187-193.

The various pollution sources in the Straits of Messina are discussed and some results on microbiological and physico-chemical conditions of waters in the Straits during March 1972 to March 1973 are presented. The increased tanker traffic through these waters and the corresponding increase in the number of oil tanker accidents have created a dangerous pollution source for the Straits of Messina.

Citation Source: Citation Journal

C-156-76
SOURCE IDENTIFICATION OF OIL SPILLS BY PATTERN RECOGNITION ANALYSIS OF NATURAL ELEMENTAL COMPOSITION

Duewer, D. L., B. R. Kowalski, and T. F. Schatzki. 1975.
Analytical Chemistry 47(9):1573-1583. Also available as AD-A006471, ITR-7, NR Proj. 051-565, Contract N 00014-67-A-0103-0036. 42 p.

The use of pattern recognition techniques to determine the source of an oil spill after the oil has weathered is described. Procedures utilizing comparisons of the field sample to single known source samples and to multiple artificially weathered source samples are discussed. The latter technique was best for solution of the problem.

Citation Source: Chemical Abstracts 83(16):#134551c. 1975.

C-157-76
DEVELOPMENT OF METHODS FOR THE IDENTIFICATION OF OIL SPILLS

Green, D. M. 1975.
Chemistry and Industry (12):499.

Crudes can be differentiated using the peak height ratios for certain hydrocarbons, such as n-heptadecane/pristane, n-octadecane/phytane and pristane/phytane. Weathering causes these ratios to become unreliable. Then V, Ni, and S contents are valuable identification parameters. Methods for all determinations are given.

Citation Source: International Petroleum Abstracts 3(3):#904. 1975.

C-158-76
FOR BETTER OIL FINGERPRINTING: THE ME-TBP

Hodgson, R. L. 1975.
Ecolibrium 4(3):9-10.

Shell Oil developed a multielement true boiling point gas chromatograph (ME-TBP) which simultaneously generates carbon and sulfur boiling point profiles for compounds containing up to 42 carbon atoms. It also quantitative measures the non-volatile organic portion. ME-TBP can be used for source identification and for studies of oil weathering.

Analysis
Chemical changes of oil in the environment

Citation Source: Citation Journal

C-159-76
IDENTIFICATION, ESTIMATION AND MONITORING OF PETROLEUM IN MARINE WATERS BY LUMINESCENCE METHODS

Hornig, A. W. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 135-144.

The use of total luminescence spectra of oils to monitor and identify petroleum contaminants in marine waters is described.

Monitoring
Analysis

Citation Source: Chemical Abstracts 83(18):#151816k. 1975.

C-160-76
IDENTIFICATION OF THE ORIGIN OF THE SPILLED CRUDE OIL IN THE OCEAN

Ilardi, A. M. 1974.
Rivista dei Combustibili 28(10):367-371.

A description is given of the steps taken to identify two crude oils spilled in territorial waters. The procedures include gas chromatography of selected distillate fractions from the recovered oil and the quantitative determination of V and Ni in the distillation residue.

Analysis

Citation Source: Chemical Abstracts 83(10):#82321f. 1975.

C-161-76
CHARACTERIZATION OF AUSTRALIAN CRUDES AND CONDENSATES BY GAS CHROMATOGRAPHIC ANALYSIS

Jackson, B. W., R. W. Judges, and J. L. Powell. 1975.
Environmental Science and Technology 9(7):656-660.

A gas chromatographic technique has been developed and demonstrated to be directly applicable to the identification of the origin of oil pollution. This technique utilizes only the portion of crude petroleum between 232°C and 316°C. From the gas chromatographic profile of this fraction, parameters involving the ratio of n-paraffin and isoterpenoid components may be determined.

Analysis

Citation Source: The Engineering Index Monthly 13(8):#056426. 1975.

C-162-76
POLLUTED GROUNDWATER: ESTIMATING THE EFFECTS OF MAN'S ACTIVITIES

Karubian, J. F. 1974.
Report, EPA-680/4-74-002, EPA 68-01-9759. 99 p.

A method is given for estimating kinds, amounts and trends of man-induced groundwater pollution. Preliminary research on petroleum refinery pollution is one of the examples described.

Analysis

Citation Source: Selected Water Resources Abstracts 8(15): #W75-07698. 1975.

C-163-76
SOURCES AND CLASSIFICATION OF WATER POLLUTANTS

Krenkel, P. A. 1974.
Industrial Pollution. N. I. Sax (ed.). Wokingham, United Kingdom, Van Nostrand Reinhold Co. Ltd., 1974. p. 197-219.

The concept of water quality management is introduced. The natural quality of water, the classification of pollutants and their effects, special considerations of selected impurities found in water and some specific water pollution problems (such as oil pollution) are discussed.

General effects of oil pollution

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(8): #5Q8898. 1975.

C-164-76
OIL POLLUTION SOURCE IDENTIFICATION

Lieberman, M. 1973.
Environmental Protection Technology Series, EPA R2-73-102. 173 p.

This method of source identification depends on comparing certain stable chemical indices present in unweathered suspect pollution sources and the weathered pollution sample. In this study weathered and unweathered samples were analyzed with low voltage mass spectroscopy, high voltage mass spectroscopy, gas chromatography, emission spectroscopy, X-ray total sulfur and Kjeldahl total nitrogen techniques.

Citation Source: Government Reports Announcements 73(12): #PB-219 822/4GA. 1973.

C-165-76
CHARACTERIZING OIL SPILLS BY NEUTRON ACTIVATION ANALYSIS

Lukens, H. R. 1975.
Progress in Nuclear Energy, Analytical Chemistry 12(1):1-10.

In this process, a prepared sample of oil is irradiated in a sealed polyethylene vial and counted using an NaI (TI) detector after one minute and a Ge (Li) detector after one hour and one day. The trace element content of the sample is obtained by comparison and is characteristic for any particular oil. The concentration distribution is expressed as a "difference score," which identifies the oil in most cases.

Citation Source: Chemical Abstracts 83(16):#134547f. 1975.

C-166-76
APPLICATION OF CRYOGENIC INFRARED SPECTROMETRY TO THE IDENTIFICATION OF PETROLEUM

Lynch, P. F., S. Tang, and C. W. Brown. 1975.
Analytical Chemistry 47(9):1696-1698.

The feasibility of using infrared fingerprints obtained at 80 and 20 k to identify petroleum sources was investigated. Results indicated that low temperature infrared spectrometry could be used subsequent to room temperature infrared analysis for identifying petroleum pollution sources.

Analysis

Citation Source: Citation Journal

C-167-76
TRACING OIL AS A POLLUTANT IN WATER

Malueg, N. J., and D. F. Krawczyk. 1973.
Journal of Petroleum Technology 25(3):243-248.

The procedures for tracing the source of oil in water is outlined. The oil is separated from water and debris using a recovery solvent; recovery averages 60-90%. Comparisons with possible sources may be made by comparison of spot or strip chromatograms under long- and short-wave ultraviolet light, or by gas chromatography with a flame-ionization detector with an SE-30 column and an OV-1 column.

Citation Source: International Petroleum Abstracts 3(2):#596. 1975.

C-168-76
PETROLEUM IN THE MARINE ENVIRONMENT

National Academy of Sciences. 1975.
Workshop on Inputs, Fates and the Effects of Petroleum in the Marine Environment, Airlie, Virginia, 1973. 107 p.

Topics discussed at the workshop include: sources of oil entering the sea, petroleum inputs to the marine environment, analytical techniques to determine oil contamination in marine organisms and hydrocarbon biodegradation kinetics.

Biodegradation
Analysis
Biological effects of oil pollution

Citation Source: The Engineering Index Monthly 13(8):#056425. 1975.

C-169-76
ANALYSIS AND SURVEY OF MARINE FUELS AND POLLUTION SAMPLES

Rouen, R. A., and R. C. Reeve. 1974.
Journal of Forensic Science 19(3):607-617.

In this analysis, a combination of techniques including gas chromatographic analysis, refractive index measurements, ash residues, percentage ash composition and emission spectrographic analysis of the ashed residues were found to be valuable in localizing the source of oil spills. A listing of elemental compositions of oil samples received in oil pollution cases over a four year period is given. This information allows the analyst to evaluate analytical data for clues as to possible origin.

Analysis

Citation Source: Environmental Health and Pollution Control 8(2): #305. 1975.

C-170-76
CRUDE OIL SPILLS RESEARCH: AN INVESTIGATION AND EVALUATION OF ANALYTICAL TECHNIQUES

Wilson, C. A., E. P. Ferrero, and H. J. Coleman. 1975. American Chemical Society, Petroleum Chemistry Division, Preprints 20(3):613-634.

The article describes the program of the Energy Research and Development Administration to investigate and evaluate analytical techniques for the simple, rapid and reliable identification of crude oil spills. Analytical techniques studied include gas-liquid chromatography, atomic adsorption spectrophotometry, infrared spectroscopy, sulfur and nitrogen determinations, mass spectrometry, nuclear magnetic resonance spectroscopy and ultraviolet spectrophotometry.

Analysis

Citation Source: Petroleum Abstracts 15(40):#211,296. 1975.

B. OIL POLLUTION PREVENTION AND CONTROL

1. CONTAINMENT

C-171-76
No title given.

Anon. 1975.
Product Information.

An oil spill containment system called Bottom Tension Boom has been developed by IMODCO Inc. Part of the design is a below-surface towline that inclines into the current preventing oil from flowing under the barrier skirt. The BTB can survive 20-ft seas, 60-kt winds and 2-kt currents.

Design and engineering

Citation Source: Petroleum Engineer International 47(1):EM12. 1975.

C-172-76
No title given.

Anon. 1975.
Product Information.

The Expandi-Oil boom, marketed by Whittaker Corporation, is lightweight, has a small storage-volume and short-time deployment. It can be delivered by boat or helicopter and laid out at speeds up to 50 meters/minute. Offshore tests demonstrated that it only took 12 minutes to fly 100 meters of boom 4-1/2 miles offshore and deploy it.

Design and engineering

Citation Source: Petroleum Engineer International 47(5):EM19. 1975.

C-173-76
No title given.

Anon. 1975.
Product Information.

Slickbar booms are made of materials compatible with each other and the marine environment. Floats are hard skinned for durability and ease of cleanup; skirts are polyester with a vinyl coating. Stainless steel is used for cable and fastenings.

Design and engineering

Citation Source: Petroleum Engineer International 47(11):EM20. 1975.

C-174-76
ANTI-POLLUTION BOOMS

Anon.
Product Information.

This company supplies a variety of booms. The use of these booms in both permanent and emergency situations to remove floating pollutants, including oils and tars, provides solutions for a wide range of problems. FFI contact William Warne & Co. Ltd., Barking, Essex.

Citation Source: Industrial Wastes Information Bulletin 4(2): #HMS 3087. 1975.

C-175-76
BUBBLE BARRIER RETAINS SPILLS DURING UNLOADING OPERATIONS

Anon. 1975.
Sea Technology 16(10):11.

The Swedish Baltic port of Galve has recently installed a bubble barrier around its oil unloading pier. A vertical stream of air bubbles is deflected at the surface to form a horizontal surface current which will keep oil from spreading in the event of a spill.

Oil transfer and transport
Design and engineering

Citation Source: Citation Journal

C-176-76
CLEANUP EQUIPMENT FOR SPILLS IS ARRANGED FOR IMMEDIATE USE IN GULF OF MEXICO

Anon. 1973.
Offshore 33(10):61-62.

Clean Gulf Associates, a non-profit organization of 36 companies, has assembled a flotilla of the latest containment and cleanup equipment to be on 24-hr call. Technological advancements will be evaluated and included; at present four basic types of systems for different environmental conditions are available.

Cleanup and recovery
Contingency planning

Citation Source: MRIS Abstracts 11 (June):#072683. 1975.

C-177-76
DEVELOPMENT OF A STREAMING FIBER OIL SPILL CONTROL CONCEPT

Beach, R. L., and F. A. March. 1975.
Final report, USCG-D-35-75, Contract DOT-CG-40217-A. 95 p.

Seaward, Inc., has developed a new system using long continuous fibers to control oil spills in currents up to 10 knots. The fibers slow down and thicken spilled oil, creating a thick stable pool of oil. Losses beneath the system are negligible. Testing of the design was extensive, including a test at 6 knots.

Design and engineering

Citation Source: Government Reports Announcements 75(22): #AD-A014 494/9GA. 1975.

C-178-76
COAST GUARD'S ROLE IN SPILL CONTROL

Boersma, F. A., LCDR, and LCDR G. H. Brown III. 1975.
Petroleum Engineer International 47(4):10-13.

The "Torrey Canyon" oil spill disaster in 1967 provided the impetus for the development of the U.S. Coast Guard's oil spill program. The program has three major areas: reducing the amount of oil spilled by offloading cargo from a stricken vessel, controlling the oil on the water's surface by a physical barrier, and recovering the contained oil.

Cleanup and recovery

Citation Source: Citation Journal

C-179-76
WHICH BOOM? ASK THE COMPUTER

Cochran, R. A., and J. P. Fraser. 1975.
Ecolibrium 4(3):15-19.

The purchasers of oil spill control equipment need to know how much of what type of equipment will result in reasonable oil recovery under most conditions of spill size, location and weather. The choice can be approached logically through a computer simulation program which incorporates data on the probable size and location of spills and weather data for the probable locations.

Cleanup and recovery

Citation Source: Citation Journal

C-180-76
SOSOL ABSORPTION AND FLEXIBOLL EMERGENCY BOOMS

Euro-Matic, Ltd.
Product Information.

The Flexiboll boom surrounds an oil spill on water until Sosol can be used to absorb the oil. The Sosol is effective in the form of a boom or as small pieces. Once it is saturated, the Sosol is dumped or burned. FFI contact Euro-Matic, Ltd., Maycrete House, Boston Manor Rd., Brentford, Middlesex.

Cleanup and recovery

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3967. 1975.

C-181-76
OIL SPILLS CONTAINMENT AND RECOVERY SYSTEMS

Watts, D. H., and F. A. March. 1973.
APEA Journal 13(1):145-152.

A containment barrier system has been developed to withstand 20-ft seas, 3-knot currents and 60-mph winds, and to contain oil in 4-to 5-ft seas and 40-mph winds. A system for the recovery of petroleum from offshore spills has been designed and tested and is capable of recovering spilled oil at high efficiencies (<10% water in recovered oil) at the 2000-gpm rate under calm to low State 5 seas and up to 3 knots.

Cleanup and recovery
Design and engineering

Citation Source: International Petroleum Abstracts 3(2):#602. 1975.

2. CLEANUP AND RECOVERY

C-182-76
No title given.

Anon. 1975.
Product Information.

An oil skimming vessel developed by Seaward International Inc., features a ballasting capability that permits operations in seas up to 5 ft, and a sweep width that can extend to 400 feet. The Huskey offshore skimmer is simple, reliable and is designed for modular construction to permit easy transportation.

Design and engineering

Citation Source: Petroleum Engineer International 47(11):EM14. 1975.

C-183-76
BETZ DEMULSIFIERS FOR OIL WATER SEPARATION

Anon.
Product Information.

Betz Ltd. carries a range of demulsifiers that give good oil/water separation in normal and reverse emulsions. These demulsifiers can be used in such areas as oil refining desalting and recovering oil from wastes. FFI contact Betz Ltd., Nat Lane, Winsford, Cheshire.

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3211. 1975.

C-184-76
BP DETERGENTS AND WETTING AGENTS PROVIDE LOW-TOXICITY HIGH EFFICIENCY, WATER-DILUTABLE, CONCENTRATED OIL DISPERSANTS

Anon.
Product Information.

BP 1100WD disperses oil spills at sea efficiently. The advantages of this product are that it is only 10% as expensive to use and needs only 10% of the storage space as other dispersants. FFI contact B.P. Oil Ltd., 110 Euston Rd., London, NW1 2DP.

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3305. 1975.

C-185-76
COAST GUARD AWAITS OIL-SPILL SOS TO TEST UNIT

Anon. 1975.
National Petroleum News 67(11):54, 56.

A USCG pollution strike team is awaiting an oil spill to test their new highseas oil-recovery system machine, based on Lockheed's Clean Sweep concept. A disc drum turns in spilled oil, picking up oil as water runs off. Wipers against the drum direct the oil to a hollow axle.

Design and engineering

Citation Source: Citation Journal

C-186-76
CONWED PETROLEUM SORBENT PRODUCTS

Anon.
Product Information.

Reinforced vegetable fibre oil adsorbent is formed into blankets, pads, strips or booms and can absorb 22 times its own weight of fuel oil in 30 seconds. The material can be re-used after squeezing out the oil.

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4735. 1975.

C-187-76
COOPERATION COMBATS OIL SPILLS IN NORTH CAROLINA

Anon. 1975.
Fueloil and Oil Heat 34(2):24-25.

The oil pollution control program developed in Randolph County, North Carolina, is described. The oil dealers association decided to plan for protection against major oil spills and incorporated oil spill control into the Randolph County Rescue Squad operation.

Citation Source: Selected Water Resources Abstracts 8(20): #W75-10039. 1975.

C-188-76
DISKIMMERS AND FOAM BELT FOR OIL/WATER SEPARATION

Anon.
Product Information.

The equipment described utilizes plastic foam discs to remove oil from water. It is able to process 20-450 gal./hr. and is better suited for viscous oils. The foam belt device is suitable for low viscosity oils. FFI contact Lowe Engineering Co., 2 Station Rd., Lincoln Park, New Jersey 07035.

Design and engineering

Citation Source: Industrial Wastes Information Bulletin 4(2): #HMS 3004. 1975.

C-189-76
FCC ASSIGNS FREQUENCIES FOR OIL SPILL WORK

Anon. 1975.
National Petroleum News 67(10):84.

This note concerns the assignment by the Federal Communications Commission of a group of radio high frequencies for exclusive use in oil-spill containment and cleanup work. The decision resulted from a petition from the American Petroleum Institute to assign channels for these purposes.

Containment

Citation Source: Citation Journal

C-190-76
FLOATING OIL COLLECTION BOAT COMPLETED IN JAPAN

Anon. 1975.
Sea Technology 16(7):13.

The "Sokai" is a vessel built to collect floating oil. The catamaran-type hull allows the vessel to operate in conditions with waves up to one meter high. Oil and seawater are forced into the collection hold where the oil is first floated to the surface by a bubble-producing machine, and then sucked into storage tanks. The water is removed through the drain pumps.

Design and engineering

Citation Source: Citation Journal

C-191-76
FREE 130-PAGE BOOKLET COVERS SPILLS, EQUIPMENT

Anon. 1975.
Oil and Gas Journal 73(38):128.

Lawson Specialty Co., Inc. (8300 Sovereign Row, Dallas, Texas 75247) offers a free booklet on equipment for treating oil spills and salt water spills on land and water, treating and reclaiming waste oil from sludge pits and secondary recovery, plant maintenance, emulsion breakers and other items.

Waste oil and waste water treatment

Citation Source: Citation Journal

C-192-76
INFLATABLE STRUCTURES IN THE ANTIPOLLUTION CONTROL OF SEAS AND RIVERS

Anon. 1974.
Technique Moderne 66(10):45-46.

The capacities and range of use of several forms of inflatable and flexible dams and reservoirs designed to recover oil discharged at sea are described.

Design and engineering

Citation Source: Environmental Health and Pollution Control 8(5):#1431. 1975.

C-193-76
KIMBRO LOW TOXICITY OIL DISPERSANT FOR OIL SPILLS

Anon.
Product Information.

This dispersant is biodegradable, has a high flash point and is of low toxicity. It contains oil soluble emulsifiers to promote rapid dispersal of oil and is suitable for use on the ocean, in rivers, harbors and on beaches. FFI contact K & B Anti-Pollution, Ltd., Roath Dock, Cardiff CFI FLX.

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3335. 1975.

C-194-76
KOMARA MINISKIMMER

Anon.
Product Information.

A smaller version of the Seaskimmer has been designed and built for dealing with small oil spills in harbors, etc. This skimmer weighs 100 pounds, has a draught of 8 inches, and can recover all types of oil with a maximum rate of 10 tons per hour. FFI contact Vickers Ltd. Shipbuilding Group, Ings Lane, Kirbymoorside, York Y06 6EX.

Design and engineering

Citation Source: Industrial Wastes Information Bulletin 4(2): #HMS 3090. 1975.

C-195-76
MONOMOLECULAR FILMS - CONTROL OF OIL SPILLS ON THE SEA

Anon.
Product Information.

Shell Herder is used to control oil pollution on water and beaches. This material is biodegradable and non-toxic to marine life. FFI contact Shell International Chemical Co., Ltd., Shell Centre, London SEI 7PG.

Citation Source: Industrial Wastes Information Bulletin 4(2): #HMS 3092. 1975.

C-196-76
NEW CLEAN UP SYSTEM CHECKS SPILLS AT SEA

Anon. 1975.
Petroleum International, Filed NS2147.

British Petroleum has designed a spill control system, the Vikome system, which is claimed to be the first practical unit for open sea conditions. Its operation is described.

Design and engineering

Citation Source: Fuel Abstracts and Current Titles 16(7):#4523. 1975.

C-197-76
OIL POLLUTION CONTROL

Anon.
Product Information.

"Nontoxic oil dispersant, oil adsorbent foam and granules, and booms for containment of spills on land or water are offered by the firm." FFI contact Arrow Chemicals Ltd., P.O. Box No. 3, Stanhope Rd., Swadlincote, Nr. Burton-on-Trent, Staffs.

Containment

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4700. 1975.

C-198-76
OIL SPILL CONTROL AIDS

Anon.
Product Information.

Rapid biodeterioration is aided by Corexit oil dispersant concentrate which induces fine drop formation. Another product, the Corexit oil collector, contracts the oil film into small areas to facilitate collection. FFI contact Essochem Oil Field Chemicals, Mechelsestunweg 363, B-1950 Kraainen, Belgium.

Biological degradation

Citation Source: Industrial Wastes Information Bulletin 4(2): #HMS 3088. 1975.

C-199-76
OIL-SPILL RECOVERY

Anon. 1975.
Marine Pollution Bulletin 6(10):147-148.

The first of 24 aluminum catamaran-hull oil spill skimmers, being built by the Marine Construction and Design Company of Seattle, was due for delivery in late summer. The vessel is towed to a spill, then two booms channel the oil to the skimmer recovery system.

Design and engineering

Citation Source: Citation Journal

C-200-76
OIL SPILLS - RECOVERY AND RE-USE BY VESSEL

Anon. 1975.
Dock and Harbour Authority 55(652):415.

Two Hydrovac ships stationed in Rotterdam collect about 10,000 TPY of saleable oil from the harbor area. An oil sweeper boom takes the oil aboard and an oil-water separator, using gravity and surface tension, removes the oil. Small steel skimmers or light-weight reel-mounted Hydrovac oil screens are used in non-ideal conditions.

Waste oil and waste water treatment
Design and engineering

Citation Source: Oceanic Abstracts 12(5):#75-04820. 1975.

C-201-76
OVER 10,000 OIL AND HAZARDOUS MATERIALS SPILLS OCCUR YEARLY

Anon. 1975.
Solid Wastes Management/Refuse Removal Journal 18(1):28, 104, 106, 108.

The serious problem of oil and hazardous material spills in water courses is reviewed. Countermeasures currently in use or under development by the federal government to prevent or control spills in waterways are outlined.

U.S. legislation
Reporting

Citation Source: Citation Journal

C-202-76
PREPARE FOR OIL SPILLS WITH MINIATURE SEA AND AIRBORNE CONTAINMENT PLAN

Anon. 1974.
Solid Wastes Management/Refuse Removal Journal 17(11):8-9.

Two recently developed techniques for containing and retrieving oil slicks resulting from petroleum accidents on land and sea are described. The first system consists of 120,000-gallon flexible containers and pumping units which can be air dropped to contain an oil spill; the second development includes the construction by the EPA of a mini-sea test facility for the testing of oil pollution prevention equipment.

Design and engineering

Citation Source: Citation Journal

C-203-76
QUICK RESPONSE IS POSSIBLE IN OIL SPILL

Anon. 1975.
Offshore 35(10):138-142.

A new oil-spill recovery design requires no more than 200 sq. ft. of storage space on deck, and can be set up by two men in a lifeboat within 30 minutes. Oil retrieval begins at once with the use of a long loop of rope mop; oil is then wrung out into collection pans. Government responsibility for protection against marine pollution is shared by three bodies; the various responsibilities are explained.

Design and engineering

Citation Source: Citation Journal

C-204-76
SEMI-SUBMERSIBLE FOR POLLUTION CONTROL

Anon. 1975.
Marine Pollution Bulletin 6(9):131.

The semi-submersible design gives a more stable working platform which is desirable for work in the hostile North Sea. The vessel will be fitted out to control pollution and offshore fires. Storage space for 7500 gallons of dispersant concentrate is provided.

Design and engineering

Citation Source: Citation Journal

C-205-76
SKIMMER GIVES HIGH-SPEED RESPONSE TO OIL SPILLS

Anon. 1975.
Oil and Gas Journal 73(37):209.

The miniskimmer, developed by British Petroleum Co. Ltd. (Chertsey Rd., Sunbury-on-Thames, Middlesex, England), is capable of operating in up to 2-ft waves and removes almost all oils from the water surface with minimal water uptake. Maximum recovery rates of 3,000 gph have been achieved.

Design and engineering

Citation Source: Citation Journal

C-206-76
SKIMMING SYSTEM CLEARS OIL SLICKS

Anon. 1974.
Marine Engineers Review (December):38-39.

A new anti-pollution oil recovery system has a recovery rate of 100 tons/hour. The oil skimming unit, devised by BP, consists of rotating discs to which the oil adheres. As the discs rotate, oil is scraped off and then passed to an oil delivery hose for recovery.

Design and engineering

Citation Source: International Petroleum Abstracts 3(2):#567. 1975.

C-207-76
SLICKGONE L.T.2. FOR DISPERSING OIL SPILLS AND BEACH CLEANING

Anon.
Product Information.

Dasic International Ltd. markets a blend of biodegradable nonionic emulsifiers in a solvent of low aromaticity. This blend is low in toxicity and has a powerful dispersant action, i.e. one gallon disperses 50 square yards of oil slick. FFI contact Dasic International Ltd., Winchester Rd., Romsey, Hampshire 505 84D.

Restoration

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3304. 1975.

C-208-76
SOLVENT OIL SLICK DISPERSANT

Anon.
Product Information.

This dispersant is biodegraded in 2-6 days and does not hazard marine life at concentrations $\leq 3\%$. FFI contact R. K. B. Maintenance Chemicals Ltd., New Road, Sandy, Bedfordshire.

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4736. 1975.

C-209-76
10TH CANADIAN SYMPOSIUM ON WATER POLLUTION RESEARCH

Anon. 1975.
Toronto, Ontario, Canada, University of Toronto, Institute for Environmental Studies, 1975. 54 p.

Topics covered in these abstracts of papers on water quality deterioration and treatment include: bio-oxidation and activated carbon adsorption residuals, leachate treatment, N loss, oil spills, Hg transport, and heavy metal and insecticide residue effects on animal life and water quality

Waste oil and waste water treatment

Citation Source: Pollution Abstracts 6(5):#75-04740. 1975.

C-210-76
TRANSLATIONS OF ENVIRONMENTAL QUALITY. NO. 58.

Anon. 1974.
Translations of monographs from various journals, JPRS-63176. 31 p.

Oil pollution control equipment in Chuvashiya, USSR, is one of the topics discussed in these translations.

Citation Source: Pollution Abstracts 6(5):#75-05072. 1975.

C-211-76
TWIN-HULL FIREFIGHTERS FOR UKOOA?

Anon. 1974.
Offshore Services 7(4):39.

Fifteen ships will be stationed along the east coast of the United Kingdom for firefighting and other disaster duties in North Sea oil and gas fields. The offshore industry has a good record for pollution incidents (responsible for only 2% of the oil reaching the sea), and will equip the ships to fight oil pollution in any form.

Contingency planning

Citation Source: Oceanic Abstracts 12(4):#75-03985. 1975.

C-212-76
TWO OIL SPILL RECOVERY SYSTEMS BEING TESTED IN ARCTEC LAB

Anon. 1975.
Sea Technology 16(10):11.

The Lockheed Clean Sweep Model (disc-drum unit) and the Marco Class I Pollution Control Oil Recovery System (belt-type skimmer) will be tested by ARCTEC in model ice and at cold temperatures. The purpose of this program is to develop a system to control Arctic oil pollution.

Design and engineering

Citation Source: Citation Journal

C-213-76
WORLD ENVIRONMENT DIRECTORY

Anon. 1974.
World Environmental Directory 1(1):535 p.

A listing is provided of the name, address and descriptive information of pollution control product manufacturers in the areas of air, water and solid waste; professional services; government and independent environmental agencies; organizations; educational institutions; corporate environmental officials; and international environmental organizations.

Citation Source: Pollution Abstracts 6(4):#75-04121. 1975.

C-214-76
A ZERO-RELATIVE-VELOCITY BELT SKIMMER

Ayres, R. R., K. L. Bickham, J. P. Fraser, and P. E. Titus. 1975.
Final report, USCG-D-116-75, Contract DOT-CG-42229-A. 250 p.

A new approach to high speed oil recovery incorporates the concept of zero relative velocity between a moving belt and the oil layer. A sorbent belt made of Astroturf and Fuetron felt floats like a blanket on the water and absorbs oil. The belt is then withdrawn and the oil squeezed out. Full-scale simulations indicate that further development is warranted.

Design and engineering

Citation Source: Government Reports Announcements 75(22): #AD-A014 497/2GA. 1975.

C-215-76
GUIDE TO NRL CLEANING AND SALVAGING TECHNIQUES FOR RECLAIMING EQUIPMENT CONTAMINATED WITH SEAWATER, OIL AND SMOKE DEPOSITS

Baker, H. R., and R. N. Bolster. 1973.
NRL Report No. 7563. 14 p.

Information on the supplies necessary to reclaim equipment contaminated by oil, seawater, or fire is given. Additional information is included on the personnel and equipment needed for a shore cleaning facility, and the most satisfactory methods of salvage.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(8): #5Q8878. 1975.

C-216-76
OIL/WATER SEPARATORS

Butterworths Systems (U.K.), Ltd.
Product Information.

This oil/water separator has the advantages of being automatic, without filters, and needing no power. The design is based on gravity separation with the coalescence of oil aided by steel collector plates and turbulent flow. FFI contact Butterworth's Systems (U.K.), Ltd., 445 Brighton Rd., South Croyden, Surrey CR 2 6EU.

Design and engineering

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3503. 1975.

C-217-76
TESTS OF COAST GUARD DEVELOPED HIGH SEAS OIL RECOVERY SYSTEMS AT EPA OHMSETT

Chang, W. J. 1975.
Final report, USCG-D-101-75. 129 p.

The Lockheed High Seas Oil Recovery System and the Ocean Systems Oil Recovery System 1000 were tested in the Coast Guard's simulated environmental test tank for oil recovery rate, oil recovery efficiency and thruput efficiencies over a wide range of conditions. Descriptions of testing apparatus, plans and data analysis are included.

Design and engineering

Citation Source: Government Reports Announcements 75(22): #AD-A014 495/6GA. 1975.

C-218-76
HARBOUR CLEANUP IS CONTINUOUS AND VITAL

Cranfield, J. 1974.
Petroleum & Petrochemical International 14(9):46-47.

The Hydrovac cleanup system which recovers oil from Rotterdam harbour is described. The ship contains all the oil/water separation equipment and storage tanks for the recovered oil. The sweeper boom is towed at an angle. In small areas a small skimmer is used. The system separates up to 100 tons/hr of oil.

Design and engineering

Citation Source: International Petroleum Abstracts 3(1):#258. 1975.

C-219-76
TECHNOLOGY FOR MANAGING SPILLS ON LAND AND WATER

Dahm, D. B., R. J. Pilie, and J. P. Lafornara. 1974.
Environmental Science & Technology 8(13):1076-1079.

"Methods are described to control, treat, and monitor spills of hazardous materials during manufacture, transport, and storage on both land and water." Detection and monitoring equipment are discussed.

Monitoring

Citation Source: Pollution Abstracts 6(4):#75-04065. 1975.

C-220-76
EMKEM SPILLWASH LT DISPERSANT FOR OIL SPILL CLEANUP OPERATIONS

Emkem International, Ltd.
Product Information.

The Emkem product has low toxicity and has been approved by the Warren Spring Laboratory. It may be used in conditions ranging from large scale spills at sea to oil accumulation in drains, ships or industrial environments. FFI contact Emkem International, Ltd., The Point, Leigh Beck, Canvey Island, Essex SS8 7TJ.

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3966. 1975.

C-221-76
OIL SPILLS AT SEA AND ON SHORE

European Petroleum Technical Corporation. 1974.
Barking, Essex, England, Applied Science Publishers Ltd., 1974.
105 p.

Chapters are presented on oil spill factors to be taken into consideration, such as the location of the oil spill, the type of spilt oil and the quantity of spilt oil; recommended methods of cleanup for different environments and special conditions such as ice; and detailed consideration of cleanup methods, i.e. burning, sinking, dispersing or picking up.

Containment

Citation Source: International Petroleum Abstracts 3(1):v. 1975.

C-222-76
REMOVING HARMFUL GREASE AND OILS FROM WATER SYSTEMS

Goforth, J. L. 1974.
Air Force Civil Engineer 15(3):24-26.

Grease and oils are removed from the water surface of a settling basin by trapping the material in a trough at the tank periphery which is elevated at one end to allow the scum to drain out of the system. Skimmings can also be directed into troughs and removed by pipe to a sump for further handling.

Citation Source: The Engineering Index Monthly 13(8):#056423. 1975.

C-223-76
EXTRACTION DE MICROPOLLUANTS PAR LE CHARBON ACTIF [English summary]

Gomella, C. 1975.
Techniques et Sciences Municipales et Revue L'eau 70(5):195-203.

The adsorption of pollutants by activated carbon is discussed. For the adsorption of detergents, pesticides and hydrocarbons, activated carbon gives good results although O_3 is sometimes necessary.

Citation Source: Pollution Abstracts 6(5):#75-04532. 1975.

C-224-76
CLEAN-UP AFTER TERRITORIAL OIL SPILLS IN THE ARCTIC

Greene, G., D. Mackay, and J. Overall. 1975.
Arctic 28(2):140-142.

The purpose of this study was to show that problems of oil containment and cleanup in arctic and subarctic regions are different from those in the temperate south. Devices and techniques that can be employed to remove oil from contaminated arctic regions are described.

Containment

Citation Source: Petroleum Abstracts 15(40):#211,297. 1975.

C-225-76
PARTICULATE OIL SPILL RECOVERY - 1. OIL SORPTION PROPERTIES OF PLASTIC FOAMS

Gumtz, G. D. 1975.
International Journal of Mineral Processing 2(2):151-161.

A system of oil spill recovery that uses reusable, reticulated, polyurethane foams to absorb oil is modelled mathematically. The system appears to be practical. The factors involved in foam selection are oil viscosity, wave height, recovery ship speed, and system geometry.

Citation Source: The Engineering Index Monthly 13(10):#070706. 1975.

C-226-76
1974 REPORT OF THE INTERSTATE SANITATION COMMISSION

Interstate Sanitation Commission. 1975.
Annual report, Interstate Sanitation Commission. 98 p.

Special areas receiving attention in this report are pretreatment of industrial wastes, removal of oils from the district waters, compliance monitoring, thermal pollution, enforcement and combined sewers. A record of pollution activities is provided by the Commission to assist in coordinating approaches to regional problems in its activities for water pollution abatement.

Waste oil and waste water treatment
Monitoring

Citation Source: Pollution Abstracts 6(4):#75-04136. 1975.

C-227-76
PLUGGING THE FAST CURRENT GAP

Jensen, D. S., LCDR, and R. W. Ard, LT. 1975.
Ecolibrium 4(3):6-8.

The Coast Guard has a comprehensive program to develop fast current oil removal systems. At present most cleanup devices fail to perform effectively when the current velocity is above one knot. Five models designed for high velocity currents are being tested; then the data will be analyzed and evaluated.

Design and engineering

Citation Source: Citation Journal

C-228-76
FAST CURRENT OIL RESPONSE SYSTEM - STAGE 1, SVROS DEVELOPMENT

Lindenmuth, W. T., A. M. Sinnerwalla, and T. R. Sundaram. 1975.
Final report, TR-7501-1 USCG-D-36-75, Contract DOT-CG-40218-A.
96 p.

SVROS (Surface Velocity Retarder Oil Skimmer) is an energy absorbing device designed to recover thin oil slicks in high relative currents by gradually dissipating the kinetic energy of the oil/water inflow so the oil can be collected without entrainment losses. The effects of velocity, oil type, slick thickness and model geometry were tested.

Design and engineering

Citation Source: Government Reports Announcements 75(22):
#AD-A014 500/3GA. 1975.

C-229-76
WATER WITCH WATER POLLUTION CONTROL CRAFT

Liverpool Waterwitch and Marine Engineering Co., Ltd.
Product Information.

This company offers water-borne vehicles equipped with an oil skimming unit, detergent spraying facilities or weed dredging facilities. The vehicles can be used to remove oil, weeds and floating debris from rivers and harbors. FFI contact Liverpool Waterwitch and Marine Engineering Co., Ltd., 74 Winifred Lane, Aughton, Ormskirk, Lancashire.

Citation Source: Industrial Wastes Information Bulletin 5(1):
#HMS 4176. 1975.

C-230-76
FILTERBELT OIL SKIMMERS

Marco Pollution Control.
Product Information.

The oil-water mixture is drawn through a continuous filter belt. The oil is retained on the belt and later mechanically removed by rolling with pressure. Screens prevent debris from clogging the process. FFI contact Marco Pollution Control, 2300 West Commodore Way, Seattle, Washington 98199.

Design and engineering

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3951. 1975.

C-231-76
HYDROVAC OIL-WATER SEPARATOR AND SWEEPER SHIP

Marine Ventures, Ltd.
Product Information.

The separator has the capacity to process up to 1000 metric tons per hour and to reduce the oil concentration to less than 10 ppm. The sweeper can be installed in existing ships and has a capacity of 100 metric tons per hour. FFI contact Marine Ventures, Ltd., London Metropole, Edgware Rd., London W2 1JU.

Design and engineering

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3539. 1975.

C-232-76
DECONTAMINATE WATER BEFORE IT GETS INTO THE GROUND

Miller, D. W. 1974.
Water and Sewage Works 121(6):51-53.

Sources of groundwater pollution include industrial waste lagoons, oil leaks, pesticides and fertilizers, septic tanks and recharge wells. Problems encountered in monitoring groundwater quality and treating groundwater pollution are considered. Increased research in developing methods to correct groundwater contamination and new strategies for controlling potential future problems are suggested.

Monitoring

Citation Source: Pollution Abstracts 6(5):#75-04731. 1975.

C-233-76
OIL/WATER SEPARATOR EVALUATION

Mittleman, J. 1975.
Informal report, January-November 74, NCSL-252-75. 55 p.

A series of tests were conducted to evaluate a coalescing, plate-type, oil-water separator. The apparatus was successful in separating contaminated Navy Distillate from seawater, and produced a water effluent containing 200 ppm oil and an oil effluent containing <5% water. Experiments involving the separation of Navy Special Fuel Oil from seawater were not successful and required termination. The reliability of the separator's automatic mode was unsatisfactory.

Waste oil and waste water treatment

Citation Source: Government Reports Announcements 75(20): #AD-A013 210/0GA. 1975.

C-234-76
THE HYDRODYNAMICS OF POROUS BARRIER OIL RECOVERY SYSTEMS

Norton, D. J., and J. L. Rand. 1975.
Final report, USCG-D-146-75, Contract DOT-CG-42444A. 76 p.

The oil recovery system has a solid barrier with several upstream porous barriers which act to dissipate the energy of the flow through them. This allows a solid barrier to be used in currents well above the critical speed for a single solid barrier. Factors influencing success are the number, type, and placement of porous barriers.

Design and engineering
Containment

Citation Source: Government Reports Announcements 75(22): #AD-A014 501/1GA. 1975.

C-235-76
REMOVAL OF OIL FROM WATER SURFACES USING WOOD DUST - THE INFLUENCE OF DUST SIZE

Ponter, A. B. et al. 1974.
Institute of Petroleum Paper 1 P74-016. 6 p.

A range of petroleum products is used to test the absorbent capacity of cedar wood dust of a specific particle size. Oil uptake was minimal with particles of 0.1 in. Particles greater than 0.5 in. absorbed 2.7 (kerosine) to 4.2 (other oils) times their weight. A two-phase mechanism is suggested.

Citation Source: International Petroleum Abstracts 3(3):#911. 1975.

C-236-76
USE OF A PADDLE WHEEL IN THE RECOVERY OF FLOATING OIL

Reed, C., and J. C. Wambold. 1975.
ASME Paper 75-ENAs-48. 5 p.

Two pivoting booms are joined in a vee configuration by a driven paddle wheel. The paddle wheel action draws the surface water toward it, thus cleaning an area wider than itself. It may be operated at slow speeds or in a stationary position in confined areas of harbors and docks.

Design and engineering

Citation Source: The Engineering Index Monthly 13(9):#060784. 1975.

C-237-76
POLLUTION OF WATER BY OIL

Smith, J. W. 1973.
Environmental Problems and Their International Implications. Boulder, Colorado, Colorado Associated University Press, 1973. p. 111-125.

In order to select the optimal method for oil spill treatment and removal, many factors must be considered, such as quantity of polluted water, rapidity of oil-water mixing, and oil and dispersed chemical concentrations. Methods and their limitations are described for water surfaces and shores. The guidelines given aid in selecting the most satisfactory method with the least environmental damage.

Restoration

Citation Source: Petroleum Abstracts 15(46):#213,080. 1975.

C-238-76
DEVELOPMENT OF FAST CURRENT OIL RESPONSE SYSTEM

Trentacoste, N. P. 1975.
Final report, SAI-74-638-WA USCG-D-34-75, Contract DOT-CG-40216-A. 187 p.

The feasibility of a new system for oil recovery in fast currents was investigated. The system includes a vented hydrofoil to separate most of the water from the oil-water layer, and a rotating belt of polyurethane foam to adsorb the oil from the remaining mixture. Overall throughput efficiency (oil recovered/oil received) was 80%.

Design and engineering

Citation Source: Government Reports Announcements 75(22): #AD-A014 496/4GA. 1975.

C-239-76
SURFACE EFFECTS SKIMMER DEVELOPMENTS

Trentacoste, N. P. 1975.
Final report, EPA/670/2-75/066, Contract EPA-68-03-0327. 79 p.

The new skimmer uses a directed air jet to separate and lift spilled oil from water surfaces in the form of a spray consisting of oil and water droplets. The spray is directed toward a rotating polyurethane foam belt from which it is squeezed and pumped to a storage tank. The experimental program investigating the skimmer is described.

Design and engineering

Citation Source: Government Reports Announcements 75(18): #PB-242 391/1GA. 1975.

C-240-76
EFFECTIVENESS AND TOXICITY OF AN OIL DISPERSANT IN LARGE OUTDOOR SALT WATER TANKS

Wells, P. G., and P. D. Keizer. 1975.
Marine Pollution Bulletin 6(10):153-157.

A mixture of Venezuelan Guanipa crude oil and a dispersant, Oilsperse 43, was more homogeneous, less viscous and without the "crust" present in the tank containing only oil. A weathered crude plus dispersant mixture with 250 μg/l oil was lethal to over 50% of the test green urchins in four days. Crude oil alone caused no mortalities.

Biological effects of oil pollution

Citation Source: Citation Journal

3. RESTORATION

C-241-76
CLEANING OILED SEABIRDS

Baker, J. R. 1975.
The Veterinary Record 97(4):79.

The correspondence refers to the publication, "Recommended Treatment of Oiled Seabirds," by the Advisory Committee on Oil Pollution of the Sea, Research Unit on the Rehabilitation of Oiled Seabirds, University of Newcastle-upon-Tyne; the inquiry concerns how waterproof bird plumage was after a treatment described in a previous letter.

Citation Source: Citation Journal

C-242-76
TREATING OILED BIRDS

Croxall, J. P. 1975.
Marine Pollution Bulletin 6(10):147.

The first section of the report, "Review of current knowledge on reducing bird mortality associated with oil spills" compiled by LGL Ltd., Environmental Research Association, Toronto, reviews the information available on techniques and substances useful for cleaning oiled birds. The second deals with dispersing birds from the vicinity of an oil slick, and makes recommendations for further research.

Biological effects of oil pollution

Citation Source: Citation Journal

4. OIL TRANSFER AND TRANSPORT

C-243-76
DEEPWATER PORTS

Anon. 1975.
Chilton's Oil & Gas Energy 1(1):38-39.

Used in combination with promising accident prevention features, deepwater terminals are the soundest method for importing oil. The advantages of deepwater terminals are discussed, with attention directed toward present causes of tanker oil pollution.

General effects of oil prospecting and production

Citation Source: Citation Journal

C-244-76
GELLING TECHNIQUE MAY PREVENT OIL SPILLS FROM TANKERS

Anon. 1974.
Petroleum & Petrochemical International 14(3):49.

Esso Research is studying the possibility of gelling the crude oil cargo as a pollution control measure in the event of an emergency. The gelling method involves a chemical interaction between two organic liquid gelling agents dissolved in the oil to form a gelant compound which entraps the oil.

Design and engineering

Citation Source: Fuel Abstracts and Current Titles 16(9):#6178. 1975.

C-245-76
JOINT MARITIME ADMINISTRATION/U.S. COAST GUARD TANK BARGE STUDY

Anon. 1974.
U.S. Department of Transportation, Coast Guard. 107 p.

The U.S. Coast Guard proposed rules to make double walls and double ends mandatory for tank barges of 100 gross tons or more. This joint study by the Coast Guard and the Maritime Administration assesses the relative construction and life cycle costs of various barge designs and the performance of existing barges.

Design and engineering

Citation Source: MRIS Abstracts 11 (June):#084463. 1975.

C-246-76
OILBERGS

Anon. 1975.
Audubon 77(6):126.

A semisubmersible ice-breaking supertanker capable of breaking through 13-foot-thick ice to transport oil from Alaska's North Slope and Canada's Arctic islands has been developed. Statistics are given on the oil spilled into the ocean from normal tanker operations (1 million tons), spills (200,000 tons), and drydock leaks (250,000 tons). NOAA ships are monitoring sea slicks.

Design and engineering
Monitoring

Citation Source: Citation Journal

C-247-76
OIL TRANSPORTATION BY TANKERS: AN ANALYSIS OF MARINE POLLUTION AND SAFETY MEASURES

Anon. 1975.
Office of Technology Assessment, Washington, D.C. 305 p.

Background material and a discussion of issues related to tanker safety and pollution potential are presented. Technical alternatives in the design, construction and operation of tankers as related to pollution control are emphasized. The special problems of supertankers are discussed.

Design and engineering

Citation Source: Government Reports Announcements 75(23): #PB-244 457/8GA. 1975.

C-248-76
OTA ISSUES REPORT ON TANKERS AND MARINE POLLUTION

Anon. 1975.
Sea Technology 16(10):11.

The report of the Office of Technology Assessment is called Oil Transportation by Tankers: An Analysis of Marine Pollution and Safety Measures. Oil spillage from accidents accounts for about 20% of oil dumped in the oceans through routine tanker operations. The report also examines the effects of these 1.5 million tons of oil discharged into the oceans each year.

Reporting

Citation Source: Citation Journal

C-249-76
SUPER SHIPS - SUPER PROBLEMS

Anon. 1975.
Chilton's Oil & Gas Energy 1(3):56-59.

The ability to build big ships is increasing faster than the ability to regulate them, as Noel Mostert points out in his well-researched book, Supership. The case against the 'supers' is outlined, and the four immediate steps necessary to achieve safety are given.

Citation Source: Citation Journal

C-250-76
TANKER TRAFFIC II. INTERNATIONAL ACTIVITY WITH REGARD TO THE PREVENTION OF OIL POLLUTION OF THE SEA

Anon. 1974.
Ingenieur (The Hague) 86(51-52):1007-1009.

The measures taken by the Intergovernmental Maritime Consultative Organization (IMCO) to limit operational discharges of oily water into the sea, to control the release of oil after tanker accidents, and to prevent tanker accidents are summarized. Design requirements for both tankers and shore installations and new rules concerning navigation are included.

International legislation
Design and engineering

Citation Source: Environmental Health and Pollution Control 8(7): #1983. 1975.

C-251-76
FIRST SPAR STORAGE-LOADING BUOY PROJECT POSED COMPLEX DESIGN, CONSTRUCTION PROBLEM

Bax, J. D. 1974.
Oil and Gas Journal 72(23):53-57.

The SPAR offshore floating storage-loading facility consists of three cylindrical sections placed one on top of the other, with storage, pumping, and power generation and crew facilities housed separately. Design criteria and special anti-pollution features are described.

Design and engineering

Citation Source: MRIS Abstracts 11 (June):#072993. 1975.

C-252-76
A SAFETY TANKER OF THE FUTURE

Booth, D. 1974.
Commercial Motor 139(3546):38-47.

A glass reinforced plastic tanker for transporting petroleum products has been approved by the Home Office. The comparison test data with steel tankers and the safety features of the plastic tanker are discussed. The tanker complies with both EEC and ADR transport regulations.

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3296. 1975.

C-253-76
ICEBERGS AND OIL TANKERS: USCG GLACIOLOGISTS ARE CONCERNED

Carter, L. J. 1975.
Science 190(4215):641-643.

A recent U.S. Geological Survey report warns that icebergs from the Columbia Glacier near Valdez may menace supertankers that will soon call there daily to take on oil. The glacier may be on the verge of a "drastic retreat," which causes more icebergs. During the past two months icebergs have been seen in and around shipping lanes. Although safeguards will be used, the systems are not infallible.

Citation Source: Citation Journal

C-254-76
THE OIL INDUSTRY AND THE ENVIRONMENT. 3

Chandler, G. 1974.
Petroleum Review 28(327):151-158.

Among the problems considered are: pollution risks to ground and surface water arising from storage tanks, pipelines and transport, pollution from car exhaust emissions and waste oil disposal.

Waste oil and waste water treatment

Citation Source: Fuel Abstracts and Current Titles 16(9):#6175. 1975.

C-255-76
PREVENTION OF GROUND AND SURFACE WATER POLLUTION BY OIL FROM STORAGE TANKS AND DURING THE TRANSPORT OF OIL

European Petroleum Technical Cooperation. 1974.
Barking, Essex, England, Applied Science Publishers Ltd., 1974. 32 p.

This book contains information on general requirements for pollution prevention, corrosion protection, storage tanks, pipes and fittings, installations, operations, transportation and deliveries.

Citation Source: International Petroleum Abstracts 3(1):v. 1975.

C-256-76
LEAK DETECTION WITH SPHERES

Gagey, E. 1975.
Pipeline and Gas Journal 202(8):47-48.

The method of pipeline leak detection with spheres is illustrated. With a sphere installed in the line and flow stopped, one can observe the pressure declining in the leaking section while the pressure remains steady in the other section. When the pressure differential between the leaking and non-leaking sections of pipe reaches a certain level, the equilibrium point of the sphere changes and the sphere moves ahead.

Citation Source: Petroleum Abstracts 15(37):#210,525. 1975.

C-257-76
SUPERSHIPS

Mostert, N. 1974.
New York, N. Y., Knopf, 1974. 332 p.

The author maintains that YLCCs and VLCCs are "badly built, hard to handle, crucially overloaded, sloppily sailed, and sketchily regulated for safety." Big tankers have been suffering accidents at an alarming rate in the waters around Capetown. A large proportion of the up to 10 million tons of oil spilled per year ends up in the Southern Ocean.

Citation Source: Energy Review 08:9. 1975.

C-258-76
PROTECTIVE STRUCTURE FOR SUBMERGED WELLS

Texaco Development Corp. 1975.
U.S. Patent 3,866,676.

The hydrocarbon fluid producing well is buried in the ocean floor and surrounded by a metal casing to protect it against moving ice masses and other floating objects. If the casing is damaged, a trigger mechanism shuts off the flow to eliminate the dangers of pipeline damage and oil pollution.

Citation Source: Underwater Information Bulletin 7(4):#75/08/29. 1975.

C-259-76
DESIGN FOR DISASTER: OIL SPILLS

Zimmerman, M. D. 1975.
Machine Design 47 (May 1):16-21.

Over one-third of the oil spilled in the ocean each year comes from transportation and transfer of oil. The economies in design claimed necessary for supertankers are discussed. Available safeguards against oil spills and for cleaning up oil spills, and techniques for source identification are presented. The latter is important in the enforcement of anti-pollution laws.

Cleanup and recovery
Source identification
U.S. legislation

Citation Source: Citation Journal

5. DESIGN AND ENGINEERING

C-260-76
API SAFETY VALVE TEST FACILITY PUT INTO OPERATION BY SRI

Anon. 1975.
Sea Technology 16(9):36.

The Subsurface Safety Valve Test Facility gives the oil industry a means to test gas and oil well subsurface safety valves. Each valve model undergoes performance tests and results are recorded. Offshore safety and pollution control will be aided by this testing facility.

Citation Source: Citation Journal

6. WASTE OIL AND WASTE WATER TREATMENT

C-261-76
BESPOKE OIL AT A MASS PRODUCTION PRICE

Anon. 1974.
Reclamation Industries International #6:14-15.

Oil is being rerefined in Switzerland. The used oil is obtained on contract and the rerefined product is supplied on contract. The process utilizes settling, sulfuric acid treatment, filtration and additives. The rerefined oil costs 5-50% less than new oil.

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3411. 1975.

C-262-76
THE ENVIRONMENT - ONE YEAR OF COMMUNITY ACTION

Anon. 1974.
Industry & Society No. 28:1-11.

The EEC actions on environmental improvement are reported. Among the topics discussed are water standards, marine pollution, spent-oils and toxic wastes disposal and the environmental impact of the energy crisis. Proposals and discussions from June, 1970, to February, 1974, are included.

General effects of oil prospecting and production

Citation Source: Industrial Wastes Information Bulletin 4(1): #HMS 2845. 1975.

C-263-76
ENVIRONMENTAL SESSION COVERS WASTE, NOISE

Anon. 1975.
Oil and Gas Journal 73(43):135-138.

This article covers the question-and-answer session on environmental control held at the 1975 NPRA Refinery and Petrochemical Plant Maintenance Conference in Anaheim, California. The questions covered "at-sea" incineration of waste materials, reusing oil lost through the shaft-seal, and portable oil skimmers.

Cleanup and recovery

Citation Source: Citation Journal

C-264-76
GRAVITATOR, TM OIL-WATER-SOLIDS SEPARATOR

Anon.
Product Information.

This separator system has a toroidal flow pattern which gives a high solids separation and a floating oil removal rate better than 99%. Wastes can be treated at a rate of 150 gpm giving an effluent containing 10 ppm oil.

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4653. 1975.

C-265-76
INCINERATION DISPOSES OF REFINERY WASTES

Anon. 1975.
The Oil and Gas Journal 73(46):60-63.

Stricter controls and land scarcity are making refiners consider incineration as a means of disposing of oily refinery sludges and wastes. Types of oily wastes and incinerators are discussed. Incineration is expensive and needs considerable attention. Minimizing the amount of oily waste to be disposed of is considered worthwhile.

Citation Source: Citation Journal

C-266-76
INCINERATION OF REFINERY WASTES

Anon. 1975.
Stichting CONCAWE 2/75. 93 p.

Guidelines prepared by a CONCAWE special task force for the incineration of refinery oily sludges are listed. The suitability of the types of incinerators available on the market is discussed. The need to attempt the recovery of the oil from refinery sludges by other means is emphasized.

Citation Source: Environmental Health and Pollution Control 8(6): #1709. 1975.

C-267-76
INDUSTRIAL WASTEWATER POLLUTION ANSWERS OFFERED

Anon. 1975.
Product Information.

A free folder of specification sheets discusses and defines various industrial wastewater pollutants, including oil, and the AFL System approach to dealing with these pollutants. Data sheets are offered on various separators and skimmers. FFI contact AFL Industries, Inc., 1149 Howard Drive, West Chicago, Illinois 60185.

Citation Source: The Oil and Gas Journal 73(41):114. 1975.

C-268-76
INTERNATIONAL CONFERENCE ON WASTE OIL RECOVERY AND REUSE, 2ND

Anon. 1975.
Washington, D.C., Association of Petroleum Refiners. 1975.

The benefits resulting from waste oil recovery, re-refinement and reuse are explained in the proceedings of the conference, and industry case histories and problems involved are presented. The West German experience with oil reuse over a six year period is discussed.

Citation Source: Environmental Science and Technology 9(7):68b. 1975.

C-269-76
KEEPING OILY WASTES OUT OF CITY SEWERS

Anon. 1974.
Instrumentation 27(1):10-11.

Oil is removed from the effluent of a U.S. treatment plant by lowering the pH to 2-3, and skimming off the oil. The treatment plant handles 350,000 gallons per day; the effluent has less than 25 ppm oil.

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3156. 1975.

C-270-76
MAGNETIC SEPARATION CLEANS WATER TO UNDER 10 PPM OIL CONTENT

Anon. 1974.
Petroleum & Petrochemical International 14(1):31.

Oil is removed from water using the Magnetic Oil Separation Technique (MOST). A Ferro Fluid, consisting of a magnetic iron oxide powder in a kerosene base, is introduced into the waste water stream. The fluid captures the oil and is removed magnetically to a separator where it is reclaimed for recirculation.

Citation Source: Fuel Abstracts and Current Titles 16(9):#6176. 1975.

C-271-76
OIL REFINING - SOME METHODS AND APPLICATION

Anon. 1974.
Reclamation Industries International #8:16-17.

The present and potential methods for motor oil recovery and standard tests for the products have been reviewed and assessed by the U.S. Bureau of Mines. The U.S. rubber industry utilizes lightly reprocessed oils.

Citation Source: Industrial Wastes Information Bulletin 4(1): #HMS 2756. 1975.

C-272-76
OILS AND GREASE IN BATHS REMOVED BY ULTRAFILTRATION

Anon. 1974.
Metal Progress 105(6):99-101.

The Union Carbide Ucarsep system can handle process streams in a wide range of conditions. An inorganic ultrafiltration membrane is supported by porous carbon tubes.

Design and engineering

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3255. 1975.

C-273-76
POLLUTION LAB PAYS OFF - TWO WAYS

Anon. 1975.
World Ports 37(4):20-21.

The article describes the water pollution control system which has been established to monitor the operation of an oil ballast disposal plant at the Swan Island Ship Repair Yard, Portland, Oregon. Waste water is checked for emulsification and salt water content and is treated in a separator before being discharged to the municipal sewer system.

Monitoring

Citation Source: Selected Water Resources Abstracts 8(20): #W75-10243. 1975.

C-274-76
PROCESS TURNS LIQUID WASTE INTO A SOLID

Anon. 1974.
Petroleum & Petrochemical International 14(3):33.

A process for the treatment of toxic wastes and their conversion to a solid useable as landfill is described. The process can be applied to the treatment of waste from the chemical and petroleum industries.

Citation Source: Fuel Abstracts and Current Titles 16(9):#6179. 1975.

C-275-76
PROGRESS OF THE WAR ON WASTE. WASTE MANAGEMENT ADVISORY COUNCIL

Anon. 1975.
Solid Wastes 65(7):290-296.

A review is given of the Waste Management Advisory Council's progress and research into wastes reclamation including metals, packaging, paper, oil, tyres, farm and sewage wastes, fish, forestry and mining wastes.

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4626. 1975.

C-276-76
SWEDEN EXAMINES RANGE OF TREATMENT FACILITIES IN BASIC INDUSTRIAL SECTORS

Anon. 1974.
Solid Wastes Management/Refuse Removal Journal 17(4):58, 61, 130.

The 1971 statistics on wastes from 66 companies are reported. The industries include chemical, oil refinery, iron and steel. Proportions of wastes incinerated, recycled and disposed on land are given.

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3280. 1975.

C-277-76
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NO. 66

Anon. 1975.
Translations of monographs from various journals, JPRS-63526. 46 p.

The translated papers deal with environmental quality. Subject areas include: pollution in the Turizow area in Poland; pollution problems in Chile; biochemical purification of oil refining waste waters, and liquid phase oxidation for water purification in the USSR; and environmental protection in Hesse, West Germany.

Citation Source: Pollution Abstracts 6(4):#75-04014. 1975.

C-278-76
USED OIL; WHAT TO DO WITH IT?

Anon. 1975.
Pit and Quarry 67(8):79, 82.

Several disposal processes exist for use in an oil conservation program. The used oil can be rerefined or sent to a waste oil service, used for road oiling to control dust, or mixed with furnace oil or diesel fuel. Handling procedures and a list of equipment and information sources are included in the article.

Citation Source: Citation Journal

C-279-76
WASTE MANAGEMENT RESEARCH

Anon. 1975.
United Kingdom, Department of the Environment, Headquarters Library. 68 p.

This publication contains a comprehensive compilation of research projects in the United Kingdom from a survey in late 1974. There are 261 entries complete with the name and address of the organization and responsible individuals, the title and summary of the work, and the completion date. The petrochemical and oil industries were among those surveyed.

Citation Source: Industrial Wastes Information Bulletin 5(2): #HMS 4383. 1975.

C-280-76
WASTE OIL RECOVERY AND REUSE

Anon. 1974.
Waste Oil Recovery and Reuse. International Conference, Washington, D.C., 1974. 418 p.

Various methods for the recovery and re-use of waste oil are discussed. The characteristics of marine oily wastes, quality products from used oils, and the use of waste oil as fuel are among other topics discussed.

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3563. 1975.

C-281-76
WATER POLLUTION ABATEMENT TECHNOLOGY: COSTS AND CAPABILITIES PETROLEUM REFINING INDUSTRY

Anon. 1975.
NCWQ-75/02. 2 vol., 650 p.

Technologies available to the petroleum refining industry to meet water pollution abatement as required by the Federal Water Pollution Control Act Amendments of 1972 are examined. Six levels of pollution abatement are reviewed. Performance is stated in terms of resulting effluents.

U.S. legislation
Design and engineering

Citation Source: Government Reports Announcements 75(20): #PB-243 830/7GA. 1975.

C-282-76
WATER POLLUTION RESEARCH IN CANADA 1974, VOLUME 9

Anon. 1974.
Canadian Symposium on Water Pollution Research, 9th, 1974. London, Canada, University of West Ontario, 1974. 339 p.

Oil pollution related papers given at the symposium include: Flocculation of Waste Waters from Petroleum Refineries, A. Hade and A. Elcabetz; Testing, Treating and Disposal of Oil and Gas Well Waste Water Sumps, D. R. Shaw; Some Water Quality Studies in Petroleum Refineries, G. G. Tertipis and C. M. Pyburn; and Oil Removal from Refinery Wastes by Air Flotation, B. Volesky and S. Agathos.

Citation Source: The Engineering Index Monthly 13(8):#056403, #056404. 1975.

C-283-76
ELIMINATION OF OILY WASTES BY DISPERSED AIR FLOTATION

Balemans, M. C. M., and M. E. Brownjohn. 1975.
Externer Bericht, Kernforschungszentrum Karlsruhe 4(1):60-66.

The technique of dispersed air flotation used to eliminate oily wastes is described. Its application and limits, its operational results to date, and investment and operational costs are also outlined.

Citation Source: Environmental Health and Pollution Control 8(7):#2080. 1975.

C-284-76
MANAGEMENT OF TANK WASHINGS IN MARINE AND COASTAL COMMERCE

Ball, J., D. G. Adams, and C. A. Stryker. 1975.
TAMU-SG-74-221 NOAA-75072201, Grant NOAA-04-3-158-18. 85 p.

At this time ten commercial companies engage heavily in barge cleaning activities along the Texas Gulf Coast. A study was initiated to determine how to manage the 75 to 100 million gallons of waste water per year. Wastewater characteristics and present treatment methods are discussed, and a system is proposed to treat the waste water.

Citation Source: Government Reports Announcements 75(22): #COM-75-11087/4GA. 1975.

C-285-76
EFFECT OF PHENOL PITCH ON THE PERFORMANCE OF ACTIVATED SLUDGE IN REFINERY-PETROCHEMICAL WASTE WATER TREATMENT

Boszczyk, H., and R. Lesniewski. 1975.
Gaz, Woda i Technika Sanitarna 49(3):88-90.

When activated sludge was treated with waste water containing phenol pitch (50-5000 μg/l) under laboratory conditions, it was found that concentrations >750 μg/l inhibited purification and destroyed the activated sludge structure.

Citation Source: Chemical Abstracts 83(10):#84388g. 1975.

C-286-76
USING SLUDGE, OIL AND WATER SEPARATION FOR RECYCLING WATER

Burde, C., and P. Cheremisinoff. 1974.
Water and Sewage Works 121(11):41.

Vibratol, an automatically controlled waste water separator system developed by Endress & Hauser, can be buried in the ground. Influent is collected and solids, oil and retreatable water are separated, reclaimed, totalized and treated continuously.

Citation Source: Citation Journal

C-287-76
SEPARATION OF PHENOL FROM WASTE WATER BY THE LIQUID MEMBRANE TECHNIQUE

Cahn, R. P., and N. N. Li. 1974.
Separation Science 9(6):505-519.

The use of the liquid membrane emulsion technique in removing phenol and other weakly ionized acids and bases from waste water is described. Mathematical derivations for the theoretical distribution and rate of permeation of phenol into the emulsion are given.

Citation Source: Environmental Health and Pollution Control 8(4):#1123. 1975.

C-288-76
COMPLETE WATER REUSE. INDUSTRY'S OPPORTUNITY

Cecil, L. K. 1973.
National Conference on Complete Water Reuse, 1973. AIChE-EPA, 1973. 734 p.

The proceedings of the National Conference on Complete Water Reuse contains 94 papers covering the legal, technological and economic aspects of water reuse in the chemicals, food, electronic power, paper and petroleum industries.

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4547. 1975.

C-289-76
TREATMENT AND RECOVERY OF PHENOL-CONTAINING WASTE WATER [English table of contents]

Chang, F.-H. 1974.
Hua Hsueh Tung Pao (2):77-85.

A review with 93 references.

Citation Source: Chemical Abstracts 83(10):#84268t. 1975.

C-290-76
WASTE AUTOMOTIVE LUBRICATING OIL REUSE AS A FUEL

Chansky, S., J. Carroll, B. Kincannon, J. Sahagian, and N. Surprenant. 1974.
EPA 600/5-74-032, Contract EPA-68-01-1859. 218 p.

The technical, economic and environmental feasibility of using automotive waste oil as a fuel is evaluated. The physical and chemical properties of waste oil serve as the basis for choosing among the proposed uses for waste oil; blended fuel oil, supplement to coal combustion, etc. Treatment costs are assessed.

Citation Source: Government Reports Announcements 75(14): #PB-241 357/3GA. 1975.

C-291-76
DISPOSAL OF SALINE WASTES FROM PETROLEUM REFINERIES

Cherednichenko, G. I., G. I. Vilkov, V. I. Kostyuk, N. G. Yampol'skii, V. N. Koposov, V. M. Golubtsov, V. I. Tkach, S. N. Filippov, and N. A. Olefir. 1974.
Chemistry and Technology of Fuels and Oils 10(9-10):708-710.

This paper contains a report on a research program developed to select saline waste disposal methods for Soviet petroleum refineries. A thermal method was developed and tested. Scale deposition on the heating surface of the evaporators can be avoided by soda-lime softening of the waste streams and by introducing chalk inoculum into the evaporation loop.

Citation Source: The Engineering Index Monthly 13(9):#060992. 1975.

C-292-76
MODERN METHODS FOR DETERMINATION OF CONTAMINANTS IN REFINERY WASTE WATERS

Chernatskaya, A. N. 1974.
Chemistry and Technology of Fuels and Oils 10(9-10):692-693. (Translation of Khimiya Tekhnologiya Topliv i Masel, Report EPA-670/2-75-059, C-500-74)

Several instrumental techniques used for automated or semi-automated determination of various contaminants present in refinery effluent before, during and after treatment are reviewed. Contaminants include petroleum products, demulsifiers, and various organic substances accompanied by assorted cations and metals.

Analysis

Citation Source: The Engineering Index Monthly 13(9):#060987. 1975.

C-293-76
WASTE WATER TREATMENT OF UNION CARBIDE'S TROMBAY PLANT

Choudhury, D., and A. K. Awasthi. 1973.
Symposium on Environmental Pollution. R. K. Saraf (ed.). Nagpur, India, 1973. p. 78-87.

"Microorganisms resistant to chemical poisoning and capable of effective biodegradation of petrochemical waste water were developed from raw sewage and reduced influent BOD by 97% at variable organic loadings from 0.1 to 0.32 kg BOD/day kg. mixed liquor suspended solids."

Citation Source: Chemical Abstracts 83(10):#84320d. 1975.

C-294-76
STATE-OF-THE ART: URANIUM, MINING, MILLING, AND REFINING INDUSTRY

Clark, D. A. 1974.
Environmental Protection Technology Series, W74-11791, EPA-660/2-74-038. 123 p.

An overview is presented of these U.S. industries. Topics discussed include waste characteristics (potential pollutants), current treatment and disposal methods, effects of wastes on the environment, testing and monitoring programs, future problems, and recommended areas for further study.

Citation Source: Government Reports Announcements 74(23): #PB-235 557/6GA. 1974.

C-295-76
AN ECOLOGICAL APPROACH TO THE PROBLEM OF BIODEGRADATION PHENOLIC WASTES

Cobb, H. D., R. Atherton, and W. Olive. 1974.
AD-A004517, AFOSR-75-0070TR, Grant AF-AFOSR-2356062, AF Proj. 9777. 84 p.

Nineteen new strains of bacteria capable of degrading all three isomers of cresol at concentrations of 900 ppm have been isolated and characterized. At least one strain can thrive on cresol concentrations of 1450 ppm.

Biodegradation

Citation Source: Scientific and Technical Aerospace Reports 13(18):#N75-27597. 1975.

C-296-76
OIL/WATER EMULSIONS - A CRACKDOWN ON PROCESS WASTES

Cooke, B. 1974.
Process Engineering (April):64-67.

The methods of emulsion disposal required by local authorities' effluent restrictions are reviewed. Methods include chemical cracking with acids and flocculating agents, and the use of cationic salts which allows the oil to be recovered for reuse.

Citation Source: International Petroleum Abstracts 3(2):#572. 1975.

C-297-76
THE RECYCLING OF LUBRICATING OILS

Crocker, F. H. 1974.
Polymers, Paint and Colour Journal 164(3876):657.

The rerefining process is designed to remove all contaminants from used lubricating oils and recover pure hydrocarbon oil which can be used again. Less than 5% of the 1,250,000 tons of lubricating oils consumed in the UK is rerefined. Industry can help solve the oil waste problem and save money by rerefining used oil.

Citation Source: Environmental Health and Pollution Control 8(5): #1396. 1975.

C-298-76
EXTRACTION OF MINERALS: TODAY'S DILEMMAS

Deju, R. A. 1974.
Ann Arbor, Michigan, Ann Arbor Science Publishers, 1974. 294 p.

The present energy, mineral and water resource base, the development of waste disposal and resource extraction methods, and an evaluation of water and air pollution problems attributable to the extractive industries are discussed. A study is presented of the waste disposal and land reclamation problems caused by mining and petroleum industries, with an analysis of the economics of a pollution control program in this field.

General effects of oil prospecting and production
Economic effects of oil pollution
Restoration

Citation Source: Pollution Abstracts 6(5):#75-05144. 1975.

C-299-76
TYPE V - INDUSTRIAL OIL RECOVERY UNIT

Durham Associates, Inc,
Product Information.

The automatic oil recovery unit is used in plant catchment areas. Petroleum products on the surface of the water are collected and then pumped away when a volume of 500 ml is reached. The maximum capacity is 25 gallons per hour. FFI contact Durham Associates, Inc., 100 Elm St., Milford, New Hampshire 03055.

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4452. 1975.

C-300-76
PRIMARY TRENDS IN IMPROVEMENT OF WATER SUPPLY, SEWAGE, AND WASTE-WATER TREATING SYSTEMS IN REFINERIES

Eigenson, A. S., and E. G. Ioakimis. 1974.
Chemistry and Technology of Fuels and Oils 10(9-10):672-675.

The petroleum refining industry is one of the largest users of water. The majority of the USSR refineries are equipped with efficient treatment systems, but some waste waters contain up to 6000 mg phenol/liter. The treatment processes are discussed in detail, with the conclusion that refineries should be independent of water bodies and use biochemically treated sanitary sewage instead of using water and discharging wastes.

Citation Source: The Engineering Index Monthly 13(9):#060995. 1975.

C-301-76
PROSPECTS FOR DEVELOPMENT IN WATER USAGE AND WATER DISCHARGE IN PETROLEUM REFINERIES AND PETROCHEMICAL PLANTS

Eigenson, A. S., E. G. Ioakimis, R. Kh. Salimgareev, and N. T. Lukinskaya. 1974.
Chemistry and Technology of Fuels and Oils 10(9):665-667.

Factors concerning water resource utilization relevant to the Soviet petroleum industry are reviewed. Statistical data on industrial water consumption and industrial effluents from refineries are presented. Water pollution prevention is discussed in detail.

Citation Source: The Engineering Index Monthly 13(9):#060993. 1975.

C-302-76
EFFLUENT GUIDELINES - INDUSTRY'S POINT OF VIEW

Elkin, H. F., and W. K. Lorenz. 1974.
Industrial Wastes 20(6):18-21.

The design and construction of an effluent limitation system are outlined; and the conditions needed to develop a realistic and flexible system to permit some discharge are discussed. The advantages of the idealized effluent limitation system are demonstrated by the case history of a petroleum refining discharge.

Citation Source: Environment Abstracts 5(5/6):#75-04107. 1975.

C-303-76
CLEAN BREAK - GAMLEN'S UNIQUE CLEANING COMPOUND WHICH SEPARATES AND YIELDS NON-TOXIC WATER

Gamlen Chemical Sybron Corp.
Product Information.

This biodegradable, non-toxic compound is used for tank cleaning. Rapid separation of oil from effluent water is achieved by adding this compound which promotes coalescence of dispersed oil. FFI contact Gamlen Chemical Sybron Corp., Wallingford Rd., Uxbridge, Middlesex.

Cleanup and recovery

Citation Source: Industrial Wastes Information Bulletin 5(1): #HMS 4034. 1975.

C-304-76
PONTOON SYSTEM AUTOMATED FOR SLOP RECOVERY

Gantz, R. G., L. W. Cresswell, and J. F. Gauen. 1975.
Hydrocarbon Processing 54(3):93-96.

An improved pontoon floating cover system, operated in conjunction with API oil-water separators, reduces vapor emissions while automatically recovering oil from the separator. A study of a unit in operation has demonstrated that savings are made in operator costs and slop oil quality is improved. Recommendations for improvements are also made.

Citation Source: Citation Journal

C-305-76
STATUS AND PROSPECTS FOR IMPROVEMENT IN BIOCHEMICAL TREATING FACILITIES FOR REFINERY WASTE WATERS

Gerber, V. Ya. 1974.
Chemistry and Technology of Fuels and Oils 10(9-10):676-680. (Translation of Khimiya Tekhnologiya Topliv i Masel, Report EPA-670/2-75-059, C-674-74)

All waste waters in a refinery must be biochemically treated before being recirculated. A comprehensive review of methods and equipment used for biochemical treatment, aerotanks in particular, is presented. The use of sectionalized aerotanks and technical oxygen will increase the rate of biochemical oxidation, thus reducing costs.

Citation Source: The Engineering Index Monthly 13(9):#060986. 1975.

C-306-76
PRELIMINARY DESIGN OF A COMPREHENSIVE WASTE OIL PROCESSING FACILITY

Gumtz, G. D., and E. J. Martin. 1975.
Final report, EPA/670/2-75-056, Grant EPA-S-800650. 142 p.

The preliminary design for a comprehensive waste oil recovery and disposal facility for the State of Maryland is presented. Twenty-two million gallons of waste oil is generated from waste sources within the state.

Citation Source: Government Reports Announcements 75(17): #PB-242 461/2GA. 1975.

C-307-76
METHODS OF SPLITTING OIL EMULSIONS AND OIL CONTAINING EFFLUENTS [English summary]

Gutling, W. 1974.
Galvanotechnik 65(5):417-424.

"Review of physical and chemical treatment methods particularly 'Aquator' ultrafiltration method."

Cleanup and recovery

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3818. 1975.

C-308-76
DEVELOPMENT OF A CENTRIFUGAL SYSTEM FOR SEPARATION OF OIL AND SOLIDS FROM SHIPBOARD DISCHARGE WATER

Guzdar, A. R., A. C. Harvey, J. Potter, and W. M. Mack. 1975.
Final report, USCG-D-118-75, Contract DOT-CG-24287-A. 109 p.

The initial design and testing of an oil-solids-water separating system that is intended to process ships' bilge water at a rate of 50 gpm and provide water effluent containing less than 15 ppm of oil are described. Testing of some of the components, i.e. the separator, pump, and coalescer, is described in detail.

Design and engineering

Citation Source: Government Reports Announcements 75(21):
#AD-A014 045/9GA. 1975.

C-309-76
PELLETIZED WASTE OIL-COAL DUST MIXTURES AS A FUEL SOURCE

Haynes, C. D., D. C. Hagood, and G. S. Walker. 1974.
Mineral Waste Utilization, 4th, Chicago, 1974. p. 47-49.

Waste crankcase oil and coal mining dust can be combined to form a stable fuel of high energy value and low sulfur content. The cost is estimated to be $2/ton. The pelletizer has been designed to be mounted on a vehicle at the coal mine site.

Citation Source: Industrial Wastes Information Bulletin 4(2):
#HMS 2977. 1975.

C-310-76
RESEARCH, DEVELOPMENT AND APPLICATION OF NEW BIOLOGICAL METHODS FOR TOXIC WASTES DEGRADATION AND DISPOSAL

Howe, R. H. L. Date unknown.
Symposium on Hazardous Chemicals Handling and Disposal, 1st, 1970. Noyes Data Corp. p. 74-86.

This report presents the details of several new biological methods of toxic wastes degradation and disposal. The examples used are phenols, cyanides, hormones, herbicides and antibiotics.

Biological degradation

Citation Source: Industrial Wastes Information Bulletin 4(1):
#HMS 2735. 1975.

C-311-76
DISPOSAL OF PETROLEUM WASTES FORMED IN TREATING REFINERY EFFLUENTS

Ioakimis, E. G., G. A. Vorms, V. B. Volkov, G. I. Kuznetsov, A. D. Davietov, M. I. Akhmetshin, A. V. Popov, and F. M. Dautov. 1974.
Chemistry and Technology of Fuels and Oils 10(9-10):694-696.

The disposal of oily sludge from refinery wastes is a problem; recovery of all oil from the sludge is impossible, making dumping not feasible. The sludges can be eliminated by burning, either in rotary drum furnaces or in fireboxes of various kinds. Tests show that the fluidized bed technique is most suitable.

Citation Source: The Engineering Index Monthly 13(9):#060988. 1975.

C-312-76
A STUDY OF HAZARDOUS WASTE MATERIALS, HAZARDOUS EFFECTS AND DISPOSAL METHODS. VOLUME III

Johnson, H. 1973.
Final report, EPA-670/2-73-16. 460 p.

Volume III of this three volume inventory of hazardous wastes covers characteristics, disposal practices, hazardous effects and the impact on water quality of wastes from several industries including the petroleum industry. Economic statistics, growth patterns, production processes and other topics are also discussed.

Citation Source: Government Reports Announcements 73(17): #PB-221 467/4. 1973.

C-313-76
DEVELOPING A RECYCLING INDUSTRY

Jones, C. 1974.
Reclamation Industries International #7:25-26.

This short introductory article on developing new recycling industries discusses the problems involved. The recycled product needs to be exhaustively tested, market research needs to be done on the product and the problem of wastes from the recycling process needs to be solved.

Citation Source: Industrial Wastes Information Bulletin 4(1): #HMS 2780. 1975.

C-314-76
POLLUTION CONTROL IN THE PETROLEUM INDUSTRY

Jones, H. R. 1973.
Park Ridge, N. J., Noyes Data Corp., 1973. 322 p.

This review attempts to clarify the ways and means open to the alert petroleum refiner who must keep his polluting wastes down to a minimum. The book contains data condensed from government sources of information, including U.S. patents. Transport wastes, refinery water pollution, overall wastewater treatment practices and effectiveness of aqueous waste removal are covered.

Citation Source: Citation Journal

C-315-76
WASTE OIL RECOVERY AND DISPOSAL 1975

Kimball, V. S. 1975.
Park Ridge, N. J., Noyes Data Corp., 1975. 267 p.

The book deals with waste oil recovery and disposal from the standpoint of conservation of energy resources and the protection of the environment. Data from government reports and U.S. patent literature are used extensively.

Citation Source: Citation Journal

C-316-76
WASTE WATER TREATMENT. IV. WASTE WATER CONTAINING OIL
[English table of contents]

Kinoh, M. 1975.
Kagaku Sochi 17(3):57-63.

The review of the treatments covers 33 patents.

Citation Source: Chemical Abstracts 83(10):#84279x. 1975.

C-317-76
INCINERATION OF REFINERY WASTES

Klein, J. P., and H. J. Kuntze. 1975.
Stichting CONCAWE, Report No. 2/75. 93 p.

The report examines the suitability of various types of incinerators for refinery sludge disposal. Multiple hearth equipment is not recommended, but vortex, fluid bed and box incinerators all have applications.

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4657. 1975.

C-318-76
WASTE-WATER TREATMENT AT THE 24TH PARTY CONGRESS NOVO-GOR'KII PETROLEUM REFINERY

Klochkov, O. N., and M. A. Denisov. 1974.
Chemistry and Technology of Fuels and Oils 10(9-10):704-707.
(Translation of Khimiya Tekhnologiya Topliv i Masel, Report EPA-670/2-75-059, C-680-74)

Two separate drain systems were installed in the refinery in order to segregate industrial waste waters according to the type of contaminant. The waste waters contaminated with petroleum products are mechanically treated and then used in the return water supply system. The wastes with salts and sulfur compounds are treated and discharged to the Volga River. Details of both systems are given.

Citation Source: The Engineering Index Monthly 13(9):#060991. 1975.

C-319-76
WASTE TREATMENT METHODOLOGY

Krenkel, P. A. 1974.
Industrial Pollution. N. I. Sax (ed.). Wokingham, United Kingdom, Van Nostrand Reinhold Co. Ltd., 1974. p. 220-243.

The objectives of waste treatment, conventional waste treatment processes (i.e., separation of grease and oil), biological waste treatment processes, and advanced waste treatment processes (i.e., use of pure O_2, water re-use, and water reclamation) are discussed.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(8): #5Q8972. 1975.

C-320-76
TREATMENT OF OILY AND METAL-CONTAINING WASTEWATER

Lin, Y. H., and J. R. Lawson. 1973.
Pollution Engineering 5(11):45-48.

The composition and methods of recovery of typical waste water are detailed. Waste oil recovery has declined; the reasons for the decline are discussed.

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3195. 1975.

C-321-76
BREAKING EMULSIONS OF WATER IN NAVY FUEL OILS

Little, R. C. 1974.
Fuel 53:246-252.

The effects of several factors such as fuel content and demulsifying agent structure and concentration on the demulsifying process were studied. A common wetting agent, sodium di-2-ethylhexl sulphosuccinate, is a potent demulsifier of high molecular weight; also small amounts of alkaline salt aid separation in stubborn emulsions.

Cleanup and recovery

Citation Source: MRIS Abstracts 11 (June):#095138. 1975.

C-322-76
REFINERY EFFLUENT WATER TREATMENT PLANT USING ACTIVATED CARBON

Loop, G. C. 1975.
Report for 1971-1974, EPA/660/2-75-020. 102 p.

Activated carbon is used to reduce the Chemical Oxygen Demand of a petroleum refinery's effluent water in Carson, California. In two years the plant processed 172 million gallons of water, operating at a cost of 40 cents per 1000 gallons of water treated. At average feed and effluent COD concentrations, the carbon was loaded at 0.26 pounds of COD per pound of carbon.

Citation Source: Government Reports Announcements 75(23): #PB-244 389/3GA. 1975.

C-323-76
RECYCLING OF WASTE OILS

Maizus, S. 1975.
Final report, EPA-670/2-75-068. 283 p.

Crankcase and other waste oils were studied in the laboratory to develop techniques to recycle waste oils into useful products without producing undesirable wastes. The vacuum distillation/hydrogen treatment process for re-refining waste oils holds great promise. Additional laboratory and evaluation work is required.

Citation Source: Government Reports Announcements 75(19): #PB-243 222/7GA. 1975.

C-324-76
BIOCHEMICAL TREATMENT OF WASTE WATER IN GROZNYI GROUPS OF REFINERIES

Mantrov, V. P. 1974.
Chemistry and Technology Fuels and Oils 10(9-10):701-703.
(Translation of Khimiya Tekhnologiya Topliv i Masel, Report EPA-670/2-75-059, C-681-74)

Advantages of the biochemical system over mechanical treatment of refinery effluents are outlined. The biological treating facilities for the Groznyi refineries have improved the sanitary condition of the Sunzha River, i.e., reduced phenols by a factor of 150.

Citation Source: The Engineering Index Monthly 13(9):#060990. 1975.

C-325-76
REMOVAL OF EMULSIFIED OILS IN GRAPHITE ORE MEDIUM

Martinez-Pereda, P., and E. F. Gloyna. 1974.
Texas University at Austin, Center for Research in Water Resources, Technical report, CRWR-118. 217 p.

The performance of crushed-graphite-ore filter beds in removing three concentrations of emulsified oil was tested under laboratory conditions. The filter beds varied in depth from 6 to 36 inches. Graphite ore provided about the same oil removal efficiencies as typical filter sands. The removal efficiency of the medium increased with bed depth.

Citation Source: Pollution Abstracts 6(4):#75-03750. 1975.

C-326-76
TREATMENT OF HAZARDOUS MATERIAL SPILLS WITH FLOATING MASS TRANSFER MEDIA

Mercer, B. W., A. J. Shuckrow, and G. W. Dawson. 1973.
Report, W74-04043, EPA-670/2-73-078. 96 p.

A method for the treatment of spills of soluble hazardous polluting substances was developed and demonstrated on a static body of water. Floating sorbents and ion exchange resins were shown to be highly effective removal agents when applied as small particles beneath contaminated water surfaces.

Cleanup and recovery

Citation Source: Government Reports Announcements 74(9): #PB-228 050/1GA. 1974.

C-327-76
OIL POLLUTION TOTALIZER

Moreau, J. O., and R. A. Haeko. 1975.
U.S. Published Patent Application B 369,563.

An oil pollution totalizer accumulates all of the oil from a sample stream from a tanker or refinery. The oil is gathered at a rate proportional to the discharge rate. The totalizer also stores the oil for analysis by either a continuous oil monitoring device or standard laboratory techniques.

Citation Source: Selected Water Resources Abstracts 8(17): #5G-W75-08624. 1975.

C-328-76
DEVICES FOR ON-BOARD TREATMENT OF WASTE FROM VESSELS

O'Grady, T. J., and T. D. Lakomski. 1974.
Final report, EPA 670/2-74-091. 128 p.

A pleasure craft zero discharge system was demonstrated to be effective. A unique filter-incinerator device is used in the physical/chemical waste treatment system. Test data and data on manufacturing and installment costs are also presented.

Citation Source: Government Reports Announcements 75(13): #PB-240 993/6GA. 1975.

C-329-76
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME I. SUMMARY REPORT

Ottinger, R. S., J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. 1973.
Final report, TRW-21485-6013-RU-00-Vol-1, EPA-670/2-73-053-a. 210 p.

This is the first of a 16 volume report concerning the hazardous waste project. Volume I is a summary of the work performed.

Citation Source: Government Reports Announcements 73(24): #PB-224 580/1GA. 1973.

C-330-76
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME II. TOXICOLOGICAL SUMMARY

Ottinger, R. S., J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. 1973.

Final report, TRW-21485-6013-RU-00-Vol-2, EPA-670/2-73-053-b. 244 p.

This volume provides a summary of the toxicologic information and the recommended levels of exposure via the air, water and soil for over 500 hazardous waste stream constituents.

Citation Source: Government Reports Announcements 73(24): #PB-224 581/9GA. 1973.

C-331-76
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. III. DISPOSAL PROCESS DESCRIPTIONS. ULTIMATE DISPOSAL, INCINERATION, AND PYROLYSIS PROCESSES

Ottinger, R. S., J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. 1973.
Final report, TRW-21485-6013-RU-00-Vol-3, EPA 670/2-73-053-c. 251 p.

This volume describes these disposal processes for hazardous wastes and discusses their applicability to the various classes of waste materials.

Citation Source: Government Reports Announcements 73(24): #PB-224 582/7GA. 1973.

C-332-76
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUMES X AND XI. INDUSTRIAL AND MUNICIPAL DISPOSAL CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. ORGANIC COMPOUNDS

Ottinger, R. S., J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. 1973.
Final report, TRW-21485-6013-RU-00-Vol-10, EPA 670/2-73-053-j; TRW-21485-6013-RU-00-Vol-11, EPA 670/2-73-053-k. Vol. 10, 316 p. Vol. 11, 247 p.

The profile reports contain summary information and evaluations of waste management methods for organic compounds.

Citation Source: Government Reports Announcements 73(24): #PB-224 589/2GA and PB-224 590/0GA. 1973.

C-333-76
THE COANDA EFFECT OIL/WATER SEPARATOR: A DEVELOPMENT STUDY

Pal, D. 1975.
Technical Note, CEL-TN-1389. 45 p.

The new method for separating free oil from oil/water mixtures uses the fluid-dynamic phenomenon called the "wall attachment or Coanda effect." The development program of the separator from the original single stage separator through the 20 gpm multi-stage separator is described.

Citation Source: Government Reports Announcements 75(18): #AD-A011 806/7GA. 1975.

C-334-76
THE BIOLOGICAL TREATMENT OF WASTE WATERS IN OIL REFINERIES. IV. DEGRADATION OF THE PHENOLIC COMPOUNDS AND MERCAPTANS

Pop, V. I., and S. I. Ionescu-Homoriceanu. 1975.
Revue de Chimie (Bucharest) 26(1):56-58.

Although physical stripping and coagulation processes are used to remove most phenols, hydrogen sulfide and mercaptans from waste waters, remaining levels of pollutants are too high to be released into receiving waters. Activated sludge and a two-gradient purification method is used to reduce pollutant concentrations to permissible values.

Citation Source: Chemical Abstracts 83(18):#151780u. 1975.

C-335-76
RESIDUAL WATER AND ATMOSPHERIC POLLUTION
[English summary]

Popescu, F. 1974.
Ingineria Prelucrarii Hidrocarburilor 2:911-926.

Waste waters from refineries and petrochemical plants are itemized: cooling water, processing water, and atmospheric water. The various treatment procedures are reviewed. Included are gravimetric separation, stripping, flotation, filtration, pH adjusting, incineration and metabolization by microorganisms.

Citation Source: Chemical Abstracts 83(12):#100366f. 1975.

C-336-76
OIL MAKES SEPARATION SLICKER

Rosenblatt, T. M., and J. E. Smith, Jr. 1975.
Water Wastes Engineering 12(5):68, 70, 72, 76, 78.

Oil assisted flotation, settling and centrifugation is used to remove oil in the Esso Carver-Greenfield technique for sewage sludge separation.

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4689. 1975.

C-337-76
DEMETALLIZATION OF HEAVY RESIDUAL OILS

Rovesti, W. C., and R. H. Wolk. 1973.
Final report, EPA 650/2-73-041. 143 p.

An improved demetallization catalyst was developed to desulfurize high-sulfur and high-metals content residual oil economically. A 20 x 50 mesh granulated activated bauxite was impregnated with promotors to provide the necessary catalytic activity. Tia Juana, Bachaquero, and Gach Saran residua were demetallized to form fuel oil.

Citation Source: Government Reports Announcements 74(7): #7A-PB-227 568/3GA. 1974.

C-338-76
PROSPECTS FOR IMPROVEMENT OF REFINERY CIRCULATING WATER SYSTEMS

Saifutdinov, K. Z., E. G. Ioakimis, and A. K. Efimova. 1974.
Chemistry and Technology of Fuels and Oils 10(9-10):668-671.
(Translation of Khimiya Tekhnologiya Topliv i Masel, Report EPA-670/2-75-059, C-689-74)

Various systems used to reclaim water from industrial waste water for recycling applications in petroleum refining and petrochemical processes are discussed. Some improvements are recommended and then evaluated from technical and economic points of view. Biochemical treatment of refinery effluents is discussed.

Citation Source: The Engineering Index Monthly 13(9):#060994. 1975.

C-339-76
FEASIBILITY OF 5 GPM DYNACTOR/MAGNETIC SEPARATOR SYSTEM TO TREAT SPILLED HAZARDOUS MATERIALS

Sanders, R. G., S. R. Rich, and T. G. Pantazelos. 1975.
Final report, EPA/670/2-75-004. 41 p.

The dynactor is used as a continuous flow short-time contact reactor to effectively decontaminate water containing spilled hazardous materials (heavy metals, acids, bases, chlorine, pesticides, phenol, etc.). Decontamination is achieved by one or more processes involving oxidation, neutralization, precipitation or adsorption on powdered carbon. Design and operating details are given.

Citation Source: Government Reports Announcements 75(13): #PB-241 080/1GA. 1975.

C-340-76
PURIFICATION OF OILY INDUSTRIAL WATER EFFLUENTS

Schmitz, W. 1975.
Externer Bericht, Kernforschungszentrum Karlsruhe 4(1):34-44.

A discussion of the methods for treating industrial waste waters containing oils, greases and solvents is given. Listed are the respective toxic concentrations and degree of purification required for various components of industrial waste waters.

Citation Source: Environmental Health and Pollution Control
8(6):#1699. 1975.

C-341-76
EXPERIENCE IN BURNING WASTE ABOUNDS THROUGHOUT INDUSTRY

Schwieger, R. G. 1975.
Power (New York) 119(2):2-7.

Methods used by the petroleum, paper, and sugar industry to treat waste with significant fuel value are presented.

Citation Source: Environmental Health and Pollution Control
8(5):#1409. 1975.

C-342-76
METALLIC AND NON-METALLIC POLLUTANTS IN THE DISCHARGE WATER OF VARIETIES OF INDUSTRIES

Singh, N. P., and W. F. Pickup. 1975.
Bulletin of Environmental Contamination and Toxicology 14(2): 225-232.

Before means of reducing pollution from industries can be fully utilized, the nature and amounts of pollutants in the discharge water of industries must be known. Discharge waters were analyzed for most of the metallic and non-metallic pollutants (including oil) from a variety of industries.

Citation Source: Citation Journal

C-343-76
LIQUID CHEMICAL WASTE DESTRUCTION

Skinner, E. 1975.
Waste Management, Control, Recovery and Reuse. N. Y. Kirov (ed.). Ann Arbor, Michigan, Ann Arbor Science Publishers, 1975. p. 113-116.

Two incinerator designs, a unit for large quantities of waste and a vertical unit for factory or ship effluents,are described. The recovery of valuable waste constituents (i.e., oil) and the chemical pretreatment of inorganic waste are considered.

Citation Source: Pollution Abstracts 6(5):#75-04722. 1975.

C-344-76
PRELIMINARY REVIEW OF USED LUBRICATING OILS IN CANADA

Skinner, D. J. 1974.
Report EPS 3-WP-74-4. 112 p.

An overview of the problem of waste lubricating oil in the Canadian environment is presented. Topics include overall volumes, chemical compositions, current and end-uses and disposal methods, and a brief look at existing legislation.

Citation Source: Selected Water Resources Abstracts 8(14): #W75-07151. 1975.

C-345-76
SANITARY CHARACTERIZATION OF THE SARATOV RESERVOIR IN THE REGION OF AN OIL REFINERY [English summary]

Starodubtsev, E. D. 1974.
Gigiena i Sanitariya 7:113-114.

The hydraulic flow regime and water quality of the Saratov reservoir, which is the waste water discharge area for an oil refinery, were investigated before and after construction of biological treatment plants (1971-1972). The overall pollution of the reservoir has decreased significantly.

Citation Source: Biological Abstracts 60(7):#40106. 1975.

C-346-76
TWO METHODS OF BIOLOGICAL TREATMENT DESIGN

Stensel, H. D., and G. L. Shell. 1974.
Journal of the Water Pollution Control Federation 46(2):271-283.

Two methods of biological treatment design were compared using oil refinery effluent as the test pollutant. Both the food/microorganism design technique for activated sludge process and the solids retention time technique gave similar results.

Citation Source: Industrial Wastes Information Bulletin 4(5): #HMS 3641. 1975.

C-347-76
CASE HISTORIES OF TREATMENT OF OIL REFINERY AND FOOD PROCESSING WASTES

Strom, A. G. 1974.
Australian Water and Wastewater Association Federal Convention, 6th, 1974. p. 177-184.

Waste characteristics and treatment methods of an oil refinery, milk and vegetable waste treatment plants, and slaughterhouse waste installations are discussed. Treatment methods examined are the API oil separator, biological treatment and activated sludge, trickling filters and lagoon facilities.

Citation Source: Pollution Abstracts 6(4):#75-03571. 1975.

C-348-76
TURBIDITY AND TURBIDIMETERS [English summary]

Sudars, H., and O. Ueberbach. 1974.
GIT Fachzeitschrift fuer das Laboratorium 18(12):1257-1259.

The article contains a brief review of turbidity and its measurement by light absorption and scattering. Waste-water treatment control, and oil detection are among the practical aspects of turbidity measurement.

Analysis

Citation Source: Chemical Abstracts 83(12):#99714j. 1975.

C-349-76
HOW COSTS AND OPERATING FACTORS VARY FOR WASTE WATER TREATMENT

Thomson, S. J., et al. 1973.
Petroleum and Petrochemical International 13(5):28.

A procedure for the removal of oil from waste water, involving gravity oil-water separation followed by gas flotation, activated sludge, and carbon adsorption, is described. The cost of treating 1000 gpm of oily waste is $650,000 and the investment cost is $2,715,000.

Citation Source: Fuel Abstracts and Current Titles 16(5): #3671. 1975.

C-350-76
WET AIR OXIDATION AND ITS APPLICATION IN PETROCHEMICAL WASTE WATER TREATMENT [English table of contents]

Tsai, M.-C. 1975.
Hua Hsueh Tung Pao (2):82-89.

A review with 23 references.

Citation Source: Chemical Abstracts 83(10):#84292w. 1975.

C-351-76
OIL SEPARATOR

Umeki, K. 1975.
Nenryo Oyobi Nensho 42(2):144-150.

A separator containing conical plates, a coagulator and an adsorption element is reviewed. The apparatus is used for the removal of oil from seawater before discharge from tankers and for petroleum removal from waste water.

Design and engineering

Citation Source: Chemical Abstracts 83(16):#133874y. 1975.

C-352-76
ACTIVATED CARBON ADSORPTION IN THE PURIFICATION TREATMENT OF POLLUTED WATERS. 2. APPLICATIONS

Urbini, G. 1974.
Ingegneria Ambientale 3(2):157-188.

The review includes applications for this process in the treatment of potable waters, food industry wastes, sewage wastes, pesticide removal from waters, petroleum refinery effluents, and industrial discharges containing phenols and other waste waters.

Citation Source: Chemical Abstracts 83(10):#84265q. 1975.

C-353-76
SEPARATION OF EMULSIFIED OIL FROM WATER

Wang, L. K., J. Y. Yang, and D. B. Dahm. 1975.
Chemistry and Industry (13):562-564.

The state-of-the-art development of alternative commercial techniques for separating emulsified oil from water is reviewed. Treatments described include chemical, physiochemical, mechanical, electrical, magnetic, biological and thermal techniques.

Citation Source: Citation Journal

C-354-76
WASTE LUBRICATING OIL RESEARCH. AN INVESTIGATION OF SEVERAL RE-REFINING METHODS

Whisman, M. L., J. W. Goetzinger, and F. O. Cotton. 1974.
U.S. Department of Interior, Bureau of Mines, RI 7884. 30 p.

Several commercial patented processes were duplicated on a bench-scale. They involved chemical pretreatment (including the acid-clay technique), followed by batch and continuous wiped-wall vacuum distillation and solvent extraction. Included are the detailed data on the analytical checks.

Citation Source: Industrial Wastes Information Bulletin 4(6):
#HMS 3846. 1975.

C-355-76
ARE YOU CONTRIBUTING TO A MAJOR OIL SPILL?

White, J. 1975.
Outdoor California 36(5):15.

Waste automobile crankcase oil is often improperly disposed of; about 450 million gallons a year pollute the environment. Old oil can be taken to service stations (some sell used crankcase oil to re-refining companies) or to a re-refinery.

Citation Source: Citation Journal

C-356-76
OREGON SURVEYS ITS HAZARDOUS WASTES

Wicks, P. H., and M. Synak. 1974.
Environmental Science & Technology 8(13):#1080-1084.

Hazardous waste, waste automotive oils and pesticide container surveys were conducted as a part of a waste management program. Oil terminals and the re-refining industry were among the industries surveyed. Current disposal methods of waste oils include re-refining, commercial road oiling, and combustion for heat.

Citation Source: Pollution Abstracts 6(4):#75-04066. 1975.

C-357-76
EVALUATION OF WASTEWATER TREATMENT TECHNOLOGY FOR OFFSHORE OIL PRODUCTION FACILITIES

Wyer, R. H., H. D. VanCleave, and K. E. Biglane. 1975.
Offshore Technology Conference, 7th, Houston, Texas, 1975.
Vol. 1, paper OTC 2232. p. 829-842.

Oil production waste treatment systems were studied to discover current technology, exemplary systems, and effluent limitations. The Gulf of Mexico and Cook Inlet, Alaska, use physical/chemical brine treatment systems. Physical/chemical treatment is followed by reinjection of produced waters on the California coast.

Citation Source: The Engineering Index Monthly 13(10):#068124. 1975.

C-358-76
CONSERVATION OF PETROLEUM WASTES AT RED RIVER ARMY DEPOT

Yoast, K. L. 1974.
Final report, USAMC-ITC-02-08-73-023. 64 p.

The objective of this study was to determine the sources of waste oils and to determine ways of minimizing the wastes and optimally disposing of the waste oils. Two recommendations were made: one, that reuse of oil in the engine test shop could save 40,000 gallons of oil a year ($37,670); and two, that the remainder of the waste oil be burned in the depot's boilers, saving $30,000 a year.

Citation Source: Government Reports Announcements 75(23): #AD-A015 030/OGA. 1975.

C-359-76
WASTE OIL RECLAMATION PROVIDES NEW FUEL SOURCE

Young, R. A., and P. N. Cheremisinoff. 1975.
Pollution Engineering 7(2):44-45.

The Broconing-Ferris Industries (US) processes spent oils by heating them with a flocculating agent, settling and separating. The plant processes seven million gallons per year, and produces a product suitable for blending with fuel oil.

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3842. 1975.

7. CONTINGENCY PLANNING

C-360-76
AERIAL SURVEILLANCE USED FOR OIL SPILL CLEANUP

Anon. 1975.
Sea Technology 16(8):33.

EPA uses the "Las Vegas Air Force," a group of planes under contract, to survey a spill once it has occurred. The photographs are used to assess the impact of the spills and to help plan and direct clean-ups. The photographs supply information on size and location of the spill, and thickness of the oil.

Remote sensing

Citation Source: Citation Journal

C-361-76
NATIONAL ENERGY DATA WORKSHOP, PROCEEDINGS, PURDUE UNIVERSITY, 1974.

Anon. 1975.
FEA/C-75/211R. 261 p.

Presentations given at the conference include: petroleum information systems, information for contingency planning, long range data programs, FEA data programs in relation to the states, and discussion of whether the states should be in the energy information business.

Citation Source: Government Reports Announcements 75(18): #PB-241 665/9GA. 1975.

C-362-76
PROGRAMME OF ACTION OF THE EUROPEAN COMMUNITIES ON THE ENVIRONMENT

Anon. 1973.
Official Journal of the European Communities No. C112. 51 p.

The objectives and principles of a European community environmental policy are outlined. Priorities, a time table, and details of actions to be taken from November, 1973, to November, 1975, are discussed.

Citation Source: Industrial Wastes Information Bulletin 4(5): #HMS 3745. 1975.

C-363-76
NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN

CEQ. 1975.
Federal Register 40(28):6281-6302.

The contingency plan contains guidelines for controlling and minimizing oil pollution, outlines federal, state and local agencies' responsibilities and duties, and classifies and explains equipment, strike forces, procedures and techniques used to control and remove oil pollution. State funding and reimbursement procedures for discharge removal operations are discussed.

Cleanup and recovery

Citation Source: Oceanic Abstracts 12(5):#75-05028. 1975.

C-364-76
CONTROL OF HAZARDOUS MATERIAL SPILLS

Environmental Protection Agency. 1974.
U.S. Environmental Protection Agency, 1974. Conference held in Houston, 1972. 204 p.

The papers presented at this conference cover such topics as prevention of industrial spills, response planning, spill containment, detection and identification, treatment systems, environmental effects, and ecology restoration.

Cleanup and recovery
General effects of oil pollution
Restoration

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3962. 1975.

C-365-76
CONTINGENCY PLANNING OF OFFSHORE OIL SPILLS

Keith, G. N. 1973.
APEA Journal 13(1):140-144.

Two recommendations are given to operators on preparation for an oil spill emergency: one, prepare a comprehensive inhouse contingency plan before commencing operations at sea; and two, prepare to participate in the Oil Industry's National Oil Spills Action Plan. This plan is designed to ensure the availability and coordination of industry resources in combatting an oil spill on the coast of Australia.

Citation Source: International Petroleum Abstracts 3(2):#592. 1975.

C-366-76
LOGISTIC REQUIREMENTS AND CAPABILITIES FOR RESPONSE TO OIL POLLUTION IN ALASKA

Peterson, P. L., M. M. Orgill, W. H. Swift, and W. V. Loscutoff. 1975.
Final report, USCG-D-97-75, Contract DOT-CG-23223-A. 375 p.

Present and projected logistic support requirements for response to oil spills in the arctic and subarctic regions of Alaska are identified. The response requirements under various environmental conditions such as moving pack ice, open water or tundra were assessed. Guidelines include the number of personnel and amount of equipment to be transported.

Citation Source: Government Reports Announcements 75(21): #AD-A014 044/2GA. 1975.

C-367-76
PREVENTING AND DEALING WITH IN-PLANT HAZARDOUS SPILLS

Wirth, G. F. 1975.
Chemical Engineering 82(17):82-85.

Chemical-spill-handling plans should be developed to provide information on alternate actions in responding to chemical spill situations. This report examines devices that can be used as defense against spill problems and examines how the spill-handling plan can be improved.

Citation Source: Petroleum Abstracts 15(41):#211,566. 1975.

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

C-368-76
HEALTH GUIDE TO BP PETROLEUM PRODUCTS

Anon. 1974.
British Petroleum Trading, Ltd. 16 p.

The toxicities of various petroleum products, such as gases, solvents, lubricating oils and aromatics, are outlined. The listing includes TLV, LD50, symptoms, treatments of product poisoning and locations of United Kingdom poison units.

Citation Source: Industrial Wastes Information Bulletin 5(1): #HMS 4129. 1975.

C-369-76
EFFECTS OF PETROLEUM AND RELATED POLLUTANTS ON ARCTIC MICROORGANISMS

Atlas, R. M., A. Sexstone, and M. Busdosh. 1975.
Annual Meeting of the American Society for Microbiology, 75th, New York, 1975. Abstracts. p. 208, #Q22.

Arctic microorganisms were exposed to various concentrations of crude oil, natural gas and SO_2, and the pollutant effects on nitrogen fixation, photosynthesis and respiration were examined. Sulfur dioxide and crude oil reduced photosynthetic activity up to 90%; respiration of mixed and isolated organisms capable of hydrocarbon metabolism increased with the addition of crude oil. Greater than 90% inhibition of nitrogen fixation of algae and lichens was measured when exposed to petroleum hydrocarbons.

Biological degradation

Citation Source: Citation Journal

C-370-71
EVALUATION OF ECOLOGICAL CONSEQUENCES OF MARINE POLLUTION

Aubert, M., and B. Donnier. 1973.
Progress Water Technology 3:337-349.

The effect of low level chemical pollutants on the biological balance in marine systems has been subjected to an in-depth study. Recommendations are made on an approach to detailed toxicological studies.

Citation Source: Industrial Wastes Pollution Bulletin 4(3): #HMS 3301. 1975.

C-371-76
TOXICITY TESTS FOR PREDICTING THE ECOLOGICAL EFFECTS OF OIL AND EMULSIFIER POLLUTION ON LITTORAL COMMUNITIES

Baker, J. M., and G. B. Crapp. 1974.
Ecological Aspects of Toxicity Testing of Oils and Dispersants. L. R. Beynon, and E. B. Cowell (eds.). New York, Halsted Press, 1974. p. 23-40.

The purpose of toxicity testing is to predict the effects of a toxic substance on natural communities. The authors describe two cases in which acquisition of laboratory data and the prediction of ecological effects are integrated. Case 1 is the assessment of the ecological effects of oil pollution on salt-marshes; Case 2, emulsifier pollution on rocky shores.

Cleanup and recovery

Citation Source: Citation Journal

C-372-76
WARREN SPRINGS LABORATORY CAUSE FIRST NORTH SEA OIL POLLUTION INCIDENT

Bourne, W. R. P. 1975.
Marine Pollution Bulletin 6(9):132-133.

The British Department of Industry's Warren Springs Laboratory arranged for some trials in the North Sea to determine whether or not oil slicks could be controlled. Consultation with ornithologists and the Faeroise did not take place until forced by the public outcry, due to the fact that two species of auks fledge at that time. The experiments were curtailed. Improved communication is suggested.

General effects of oil prospecting and production

Citation Source: Citation Journal

C-373-76
ENVIRONMENTAL CONTAMINATION AND THE INDUCTION OF MICROSOMAL MIXED FUNCTION OXIDASES IN AN ESTUARINE FISH, FUNDULUS HETEROCLITUS

Burns, K. A., and D. Sabo. 1975.
Federation Proceedings 34(3):810. Federation of American Societies for Experimental Biology, 59th, Atlantic City, N.J., 1975. Abstracts.

The hepatic microsomal mixed function oxidase (MFO) system of Fundulus heteroclitus is described. Rates of aldrin epoxidation in fish living in salt marshes contaminated with petroleum-derived and chlorinated hydrocarbons were twice those of fish living in a clean environment. These results provide support for the hypothesis that environmental contamination induces high levels of MFO in fish.

Citation Source: Citation Journal

C-374-76
A COMPARISON OF BACTERIAL POPULATIONS IN CHESAPEAKE BAY

Carney, J. F., V. D. L. Yang, C. E. Carty, and R. R. Colwell. 1975.
Annual Meeting of the American Society for Microbiology, 75th, New York, 1975. Abstracts. P. 185, #N6.

The aerobic heterotrophic bacteria and standard indicator organisms from four sites in a tributary embayment of the Chesapeake Bay were enumerated. More than 1500 strains were isolated and identified with Pseudomonas sp. and Vibrio sp. predominating. Comparison with other Chesapeake Bay sites indicated that the greatest amount of labelled substrate was taken up by bacteria collected in water samples from sites near populated areas or areas polluted by oil.

Monitoring

Citation Source: Citation Journal

C-375-76
STRESS INDUCED ATTACK OF CORALS BY MARINE BACTERIA

Chet, I., and R. Mitchell. 1975.
Annual Meeting of the American Society for Microbiology, 75th, New York, 1975. Abstracts. p. 138, #I130.

A model describing the effect of petroleum hydrocarbon- and heavy metal-induced stress on the interaction between a Red Sea coral, Platigyra, and the marine microflora is presented. The pollutants stimulated extracellular polymer production by the coral; large numbers of motile gram-negative pseudomonads utilized the polymer as a substrate and then became predatory on the coral tissue. The final phase of destruction of coral tissue was associated with the growth of Beggiotoa.

Citation Source: Citation Journal

C-376-76
RECENT ADVANCES IN THE ASSESSMENT OF THE HEALTH EFFECTS OF ENVIRONMENTAL POLLUTION, PARIS, 1974

Clarke, R. H. 1974.
CEC/EPA/WHO Symposium, Paris, 1974. C.E.G.B. Berkeley Nuclear Laboratories, RD/B/M3190. 30 p.

This symposium included sessions on population; human effects; toxicological, experimental and health effects; indicators of exposure; monitoring needs; and tissue measurement studies. The pollutants discussed included gases, petrochemicals, heavy metals, etc.

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4513. 1975.

C-377-76
MARINE BIOASSAYS. PROCEEDINGS OF A WORKSHOP ON MARINE BIOASSAYS

Cox, G. (ed.). 1974.
Washington, D.C., Marine Technology Society, 1974. 326 p.

The purpose of the workshop on marine bioassays was to assess pollutant effects on the ability of marine organisms to seek food, mate, or resist disease. Individual papers are placed in one of four sections: behavioral bioassays, contaminant bioassays, pathological bioassays and synergistic bioassays.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(8): #5Q8974. 1975.

C-378-76
COMPARATIVE TOXICITY OF INDIVIDUAL COMPONENTS OF KIRISHI REFINERY WASTE WATER AFTER BIOLOGICAL TREATMENT

Donchenko, N. A., and N. M. Arshanits. 1974.
Chemistry and Technology of Fuels and Oils 10(9-10):697-700. (Translation of Khimiya Tekhnologiya Topliv i Masel, Report EPA-670/2-75-059, C-672-74)

The toxicity of the following components of the influent to the biochemical treatment area was investigated: sanitary sewage, chlorides, petroleum hydrocarbons, sour caustic streams, and OZhK demulsifier. Experiments show that sour caustic material was the most toxic. The aromatic hydrocarbon and demulsifier mixture was less toxic.

Waste oil and waste water treatment

Citation Source: The Engineering Index Monthly 13(9):#060989. 1975.

C-379-76
STIMULATION AND INHIBITION OF PHYTOPLANKTON GROWTH BY LOW MOLECULAR WEIGHT HYDROCARBONS

Dunstan, W. M., L. P. Atkinson, and J. Natoli. 1975.
Marine Biology 31(4):305-310.

The results are presented of growth response experiments on four different phytoplankton species exposed in culture to various concentrations of benzene, toluene and xylene. When the phytoplankton were exposed to mixtures of No. 2 fuel oil, the volatile fraction was the most biologically reactive, and was the source of growth enhancement at low levels and a major growth inhibitor at high concentrations.

Citation Source: Citation Journal

C-380-76
IMPACT OF CHEMICAL POLLUTION ON ATLANTIC SALMON IN NORTH AMERICA

Elson, P. F., A. L. Meister, J. W. Saunders, R. L. Saunders, J. B. Sprague, and V. Zitko. 1973.
International Atlantic Salmon Foundation, Special Publication Series 4(1, International Atlantic Salmon Symposium, 1972):83-110.

The effects of pesticides, industrial and agricultural chemical wastes, oils, heavy metals and industrial and municipal effluents on Atlantic salmon are discussed in this review.

Citation Source: Chemical Abstracts 83(17):#142565a. 1975.

C-381-76
IMPACT OF POLLUTANTS ON PLANKTON COMMUNITIES

Fisher, N. S., and C. F. Wurster. 1974.
Environmental Conservation 1(3):189-190.

The applicability of laboratory toxicity tests to natural environments, where organisms are neither isolated nor in ideal conditions, is questioned. The responses of whole communities and ecosystems to pollutants such as crude oil must be evaluated. The cause-effect relationship between gradual ecosystem deterioration and the alteration of phytoplankton community structure is not obvious.

Citation Source: Environmental Health and Pollution Control 8(7):#1878. 1975.

C-382-76
THE SANTA BARBARA OIL SPILL: A REVIEW OF DAMAGE DONE TO MARINE ORGANISMS

Foster, M. S. 1974.
California, Department of Justice, Final Report, Contract No. 455. 38 p.

The purpose of the report is to assess the biological damage which occurred on all state lands as a result of an oil blowout on an offshore platform in the Santa Barbara Channel, January 28, 1969. The evaluation is based on a review of all available reports and papers. A discussion of the monetary value of the damage is included.

Citation Source: Citation Journal

C-383-76
CHANGES IN THE SURFACE STRUCTURE OF YEAST CELLS IN ASSOCIATION WITH THE UTILIZATION OF HYDROCARBON

Fukuzumi, F., M. Osumi, M. Saito, T. Nagatani, and S. Fukui. 1974.
Journal of Electron Microscopy 23(3):228. Abstract.

Warty projections have been observed on the cell surface of some n-alkane-utilizing yeasts. These are not observed on the cells of non-hydrocarbon-utilizing yeasts or of hydrocarbon-utilizing yeasts grown on glucose. Electron micrographs show channels connecting the outside outgrowth with the cell membrane across the cell wall.

Biological degradation

Citation Source: Citation Journal

C-384-76
TEMPORAL CHANGES IN THE PLANKTON OF AN INDUSTRIALIZED ESTUARY

Gabriel, P. L., N. S. Dias, and S. Nelson-Smith. 1975.
Estuarine and Coastal Marine Science 3(2):145-152.

The distribution and seasonal succession of plankton in Milford Haven (Pembrokeshire, England) was studied to detect changes which may have resulted from the establishment of a major oil port in the estuary. Several species have disappeared, although replacement species have appeared, and the abundance of plankton has not diminished.

Citation Source: Biological Abstracts 60(7):#36498. 1975.

C-385-76
EFFECT OF HYDROCARBON SUBSTRATE ON COMPETITIVE CAPACITY OF *CANDIDA GUILLIERMONDII* YEAST

Gradova, N. B., S. V. Chepigo, G. S. Rodionova, V. V. Mikhaleva, R. N. Bravicheva, and R. N. Sustina. 1973.
Metabolism and Regulation of Cellular Processes, Part 1. International Specialized Symposium on Yeasts, 3rd, Otaniencii, Helsinki, Finland, 1973. Abstracts. p. 154.

Summary not available.

Biological degradation

Citation Source: Bioresearch Index 11(5):#35444. 1975.

C-386-76
THE EFFECTS OF PETROLEUM HYDROCARBONS ON ORGANISMS OF THE CONTINENTAL SHELF

Green, K. A. 1974.
Biologist 56(4):165-179.

Chemical analysis of crude oils and investigations of the physical behavior of oil at sea are necessary considerations in the biological impact of petroleum pollution. Available knowledge of the long- and short-term impact of oil spills on various environments and on different life stages and life styles of organisms are reviewed. Oil pollution may result in a reduction of exploitable food resources.

General fate of oil in the environment

Citation Source: Citation Journal

C-387-76
CONTROLLED ECOSYSTEM POLLUTION EXPERIMENT

Grice, G. D. 1974.
Oceanus 18(1):29-31.

Transparent plastic cylinders, termed Controlled Experimental Ecosystems (CEEs), contain natural populations and are excellent for large scale pollution experiments. The first series of experiments dealt with long term effects of copper; the second, on petroleum effects, is in progress.

Citation Source: Citation Journal

C-388-76
IDENTIFICATION AND POTENTIAL BIOLOGICAL EFFECTS OF THE MAJOR COMPONENTS IN THE SEAWATER EXTRACT OF A BUNKER FUEL

Guard, H. E., L. Hunter, and L. H. DiSalvo. 1975.
Bulletin of Environmental Contamination and Toxicology 14(4): 395-400.

The authors report the composition of the seawater extract of a bunker fuel, comment on previous methodology for obtaining the seawater-soluble fraction of bunker fuels, and examine the possible effects of the dissolved oil on a local crab species. The shore crab, Pachygrapsus crassipes, was decimated over a large portion of the reef near San Francisco where a spill of Bunker C fuel occurred in 1971; water-soluble components are the potential lethal compounds.

Citation Source: Citation Journal

C-389-76
TOXICITY TESTING AT THE BIOLOGISCHE ANSTALT HELGOLAND WEST GERMANY

Gunkel, W. 1974.
Ecological Aspects of Toxicity Testing of Oils and Dispersants. L. R. Beynon, and E. B. Cowell (eds.). New York, Halsted Press, 1974. p. 75-85.

Among the various experimental series described are two on the influences of three different emulsifiers on a pure culture of the marine bacterium Serratia marinorubra, and one on the influence of a mixture of Iraq crude oil with an emulsifier upon herring larvae 20-26 mm long.

Cleanup and recovery

Citation Source: Citation Journal

C-390-76
OIL ON THE CARPET

Hudson, R. 1975.
British Birds 68(8):343.

The Warren Spring Laboratory planned a series of oil slick release experiments on the North Sea east of Shetland at the time when auks leave their cliffs and begin their northward migration to the Norwegian coast. Due to the resulting outcry, the amount of oil released was reduced, and no bird casualties have been reported.

Citation Source: Citation Journal

C-391-76
THE EFFECTS OF WATER-SOLUBLE PETROLEUM COMPONENTS ON THE GROWTH OF CHLORELLA VULGARIS Beijerinck

Kauss, P. B., and T. C. Hutchinson. 1975.
Environmental Pollution 9(3):157-174.

The toxicities of aqueous extracts of seven different crude oils and one refined product to Chlorella vulgaris were different; but all were short lived and normal growth resumed in 48 hours. Lower concentrations of benzene and toluene also caused a similar growth inhibition pattern, higher concentrations caused total inhibition. Three of the oil extracts stimulated growth after their toxic compounds had evaporated.

Citation Source: Citation Journal

C-392-76
TOXIC RESPONSES IN AQUATIC ORGANISMS

LaRoche, G. 1974.
Industrial Pollution. N. I. Sax (ed.). Wokingham, United Kingdom, Van Nostrand Reinhold Co. Ltd., 1974. p. 529-561.

Various aspects of acute and chronic bioassays are discussed. Topics covering acute bioassays include procedures, assay species, test toxicants, oil-dispersant mixtures, reference toxicants and acute toxicities. Types of water systems (recirculating and flow-through) are discussed in relation to chronic bioassays.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(8): #5Q8871. 1975.

C-393-76
TOXIC RESPONSES IN AQUATIC ORGANISMS

LaRoche, G. 1974.
Industrial Pollution (1974):101-117.

The various methods of measuring toxic responses of aquatic organisms to pollutants (including oil) are reviewed and discussed. References are given.

Citation Source: Chemical Abstracts 83(13):#109294p. 1975.

C-394-76
ACUTE EFFECTS OF OIL AND OIL/DISPERSANT MIXTURE ON LARVAE OF BALTIC HERRING

Linden, O. 1975.
Ambio 4(3):130-133.

A study measured the acute effects of a crude oil and a mixture of the oil and two commonly used oil spill dispersants on newly hatched larvae of Baltic herring, Clupea harengus. It was shown that the larvae are 50-100 times more sensitive to an oil dispersion that contains a dispersant with the oil than to a natural oil dispersion.

Cleanup and recovery

Citation Source: The Engineering Index Monthly 13(8):#056427. 1975.

C-395-76
SYNERGISM AND MODIFYING EFFECTS: INTERACTING FACTORS IN BIOASSAY AND FIELD RESEARCH

Livingston, R. J. 1974.
Marine Bioassays. Washington, D.C., Marine Technology Society, 1974. p. 226-304.

The present state of knowledge about the interaction of toxic agents and other factors and suitability of present techniques for studying these interactions are reviewed. Factors surveyed include pesticides and PCB's, sewage, petrochemicals, dredge and fill operations, etc.; various interaction possibilities are considered.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(8): #5Q8981. 1975.

C-396-76
THE EFFECTS OF CRUDE OILS AND THE DISPERSANT COREXIT 8666 ON SEA URCHIN GAMETES AND EMBRYOS

Lönning, S., and B. E. Hagström. 1975.
Norwegian Journal of Zoology 23(2):121-129.

Kuwait or Ekofisk crude oil and/or oil dispersant Corexit 8666 were added to gametes and embryos of sea urchins. The substances were usually present throughout development. Harmful influences were more apparent in the late development than in fertilization and early development of the embryo. Only Corexit 8666 caused morphological changes in the cytoplasm.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(9): #5Q10244. 1975.

C-397-76
FORMULATING A BOATING CAPACITY PLANNING SYSTEM FOR CHESAPEAKE AND CHINCOTEAGUE BAYS

Mann, R., and H. Ris, Jr. 1975.
Ocean 75, San Diego, California, 1975. New York, N.Y., Institute of Electrical and Electronics Engineers, Inc., 1975. p. 188-193.

The biological impacts of boating activity are not yet well known. Much of the testing has been done under laboratory conditions or in confined basins. But, exhaust emissions do produce unpleasant tastes and odors in receiving waters and fish, and extremely high levels do produce toxic effects on benthic and algal life. Other effects of boating activity can immediately be integrated into a boating capacity planning system.

Citation Source: Citation Monograph

C-398-76
FOOD INSPECTION AND ENVIRONMENTAL POLLUTION [English summary]

Matthey, E. 1975.
Sozial- und Praeventivmedizin 20(2):79-81.

This article contains a review of acceptable daily intakes (ADI) and allowable concentrations of certain pollutants in food or water. The ADI have been or are in the process of being established for pesticides, petroleum, Pb, Hg, and Sr^{90}.

Citation Source: Chemical Abstracts 83(15):#130038t. 1975.

C-399-76
STANDARD DISPERSANT EFFECTIVENESS AND TOXICITY TESTS

McCarthy, L. T., Jr., I. Wilder, and J. S. Dorrler. 1973.
Environmental Protection Agency, EPA-R2-73-201. 57 p.

The Standard EPA Dispersant Effectiveness and Toxicity tests are presented and discussed. Three species are exposed to dispersant and oil/dispersant mixtures. Curves relating organism survival to material concentrations are developed to determine median tolerance limits. Statistical analyses of reproducibility are also presented.

Cleanup and recovery

Citation Source: MRIS Abstracts 11 (June):#072735. 1975.

C-400-76
AN OVERVIEW OF THE PETROLEUM INDUSTRIES MARINE ENVIRONMENTAL RESEARCH

Mertens, E. W. 1974.
Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico. R. E. Smith (ed.). St. Petersburg, Florida, State University System of Florida, Institute of Oceanography, 1974. p. 53-60.

API supported research is described. The program under the sponsorship of the Fate of Oil Task Force includes studies of oil and phytoplankton, development of new bioassays and improved chemical analysis for oil, effects of oil on oysters, fate of oil in the water, and spill surveys.

Reporting
Analysis
General fate of oil in the environment

Citation Source: Oceanic Abstracts 12(3):#75-02960. 1975.

C-401-76
THE EFFECT OF A FUEL OIL SPILL ON BENTHIC INVERTEBRATES AND WATER QUALITY ON THE ALASKAN ARCTIC SLOPE, HAPPY VALLEY CREEK NEAR SAGWON, ALASKA

Nauman, J. W., and D. R. Kernodle. 1975.
Journal of Research of the U.S. Geological Society 3(3):495-500.

Arctic diesel fuel oil has been spilled and leaked into Happy Valley Creek near Sagwon, Alaska, since December 1970. All groups of benthic invertebrates were reduced in numbers downstream of the spill site; whereas invertebrates at an upstream site were unaffected.

Citation Source: Citation Journal

C-402-76
ACCUMULATION AND RELEASE OF PETROLEUM-DERIVED AROMATIC HYDRO-CARBONS BY MARINE ANIMALS

Neff, J. M. 1975.
American Chemical Society, Petroleum Chemistry Division, Preprints 20(4):839-850.

Marine animals exposed to oil-contaminated seawater accumulate and retain the aromatic hydrocarbons to a greater extent than the alkanes. Accumulation of aromatic hydrocarbons appears to be a passive process dependent on a partitioning of the hydrocarbons between the exposure water and the tissue lipids.

Citation Source: Petroleum Abstracts 15(39):#210,880. 1975.

C-403-76
NEWT TEST FOR STUDYING CERTAIN CATEGORIES OF CARCINOGENIC SUBSTANCES

Neukomm, S. 1974.
European Society for the Study of Drug Toxicity, Proceedings, 15:228-235. Experimental Model Systems in Toxicology and Their Significance in Man, Proceedings of the Meeting, 1973.

Carcinogens can be screened by injecting them subcutaneously into the tails of newts. Ten polycyclic hydrocarbons and 84 urethane derivatives were tested in this manner; the results showed the newt test to be comparable with mammal tests.

Citation Source: Chemical Abstracts 83(13):#109317y. 1975.

C-404-76
EFFECTS

Patrick, R. 1975.
Petroleum in the Marine Environment, A Workshop on Inputs, Fates, and the Effects of Petroleum in the Marine Environment, Airlie, Virginia, 1973. p. 73-103.

The effects of oil on the metabolic characteristics of aquatic organisms and on aquatic populations and communities are discussed. Several major oil spills and their effects are summarized. Sublethal effects of various petroleum products and factors influencing the biological impact of oil spills, including cleanup and recovery procedures, are discussed.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(9): #5Q10220. 1975.

C-405-76

EFFECTS OF CRUDE OIL ON THE FEEDING BEHAVIOR OF THE ZOOANTHID PALYTHOA VARIABILIS

Reimer, A. A. 1975.
Environmental Physiology and Biochemistry 5(4):258-266.

Marine Diesel and Bunker C oils can elicit feeding behavior and eventually ingestion in this zoanthid. The ability of the polyps to discriminate between inert and chemically active particles is decreased for 3 to 5 days after exposure to oil. For several days following exposure, oil is retained in the coelenteron and periodically released as tiny droplets.

Chemical effects of oil pollution

Citation Source: Citation Journal

C-406-76

SPIN-LABELING OF LIVING TISSUE. METHOD FOR INVESTIGATING POLLUTANT-HOST INTERACTION

Roubal, W. T. 1974.
Pollution and Physiology of Marine Organisms. F. J. Vernberg, and W. B. Vernberg (eds.). New York, N.Y., Academic Press, 1974. p. 367-379.

Radioactive and spin-labeling methods were used to study the uptake, transport, retention and interaction of hydrocarbons with lipoproteins, albumins, and membranes of fish. Carriers in the blood transported hydrocarbons to regions of low viscosity where they were able to penetrate. Aromatics altered membrane surfaces.

Citation Source: Chemical Abstracts 83(15):#127047q. 1975.

C-407-76

PETROLEUM HYDROCARBON POLLUTION AND HEPATIC LIPOGENESIS IN THE MARINE FISH FUNDULUS HETEROCLITUS

Sabo, D. J., J. J. Stegeman, and L. S. Gottlieb. 1975.
Federation Proceedings 34(3):810. Federation of American Societies for Experimental Biology, 59th, Atlantic City, N.J., 1975. Abstracts.

Livers from fish living in oil contaminated waters synthesized about six times more lipid from glucose-1-C^{14} than control animals; they also showed decreased glycogen and lipid stores and an increase in free ribosomes. The results suggest that environmental petroleum hydrocarbon stimulate lipolysis through aerobic glycolysis, depress anaerobic glycolysis and increase utilization of energy stores.

Citation Source: Citation Journal

C-408-76
CRUDE OIL PHYTOTOXICITY STUDIES

Shiels, W. E., J. J. Goering, and D. W. Hood. 1973.
Environmental Studies of Port Valdez. D. W. Hood, W. E. Shiels, and E. J. Kelley (eds.). University of Alaska, Institute of Marine Science Occasional Publication No. 3, 1973. p. 413-446.

Oil toxicity to photosynthesis by indigenous phytoplankton and important seaweed species was investigated. The effects of oil concentration, season, temperature, and light intensity were examined. Relative species composition can be affected. Responses to crude-oil contamination are complex interactions that can be either advantageous or disadvantageous.

Citation Source: Citation Monograph

C-409-76
THE EFFECTS OF CRUDE OIL ON THE COLONIZATION OF ARTIFICIAL SUBSTRATES BY ZOOBENTHOS ORGANISMS

Snow, N. B., and D. M. Rosenberg. 1975.
Canada. Fisheries and Marine Service, Research and Development Directorate, Technical Report No. 551. 35 p.

Rock-filled wire baskets were placed in flowing water habitats in the Northwest Territories and Yukon Territory to act as artificial substrate samplers. Half of the samplers were dipped in oil prior to placement. Dominance and diversity patterns were the same on control and oil-treated samplers; abundance was greater on the control.

Citation Source: Citation Journal

C-410-76
THE EFFECTS OF NORMAN WELLS CRUDE OIL ON THE ZOOBENTHOS OF A NORTHERN YUKON STREAM, ONE YEAR AFTER AN EXPERIMENTAL SPILL

Snow, N. B., D. M. Rosenberg, and J. Moenig. 1975.
Canada. Fisheries and Marine Service, Research and Development Directorate, Technical Report No. 550. 8 p.

The oil spill initially reduced the zoobenthos by 33%. The flowing water system (a tributary of Caribou Bar Creek) is fairly "self-cleansing," with the result that no significant changes were noted in the physical and chemical characteristics of the creek, and zoobenthos abundance and diversity recovered within a year.

Chemical effects of oil pollution
Physical effects of oil pollution

Citation Source: Citation Journal

C-411-76
INVESTIGATION OF OVICELL HYPERPLASIA IN BRYOZOANS CHRONICALLY EXPOSED TO NATURAL OIL SEEPAGE

Straughan, D., and D. M. Lawrence. 1975.
Water, Air, and Soil Pollution 5(1):39-46.

Field studies of bryozoans from surface, subsurface and benthic kelp fronds in an area chronically exposed to natural oil seepage revealed no instances of ovicell hyperplasia. These findings contrast with previous reports of ovicell hyperplasia in other species exposed to creosote and petroleum hydrocarbons; reasons are presented.

Citation Source: Citation Journal

C-412-76
EFFECTS OF BENZENE (A WATER-SOLUBLE COMPONENT OF CRUDE OIL) ON EGGS AND LARVAE OF PACIFIC HERRING AND NORTHERN ANCHOVY

Struhsaker, J. W., M. B. Eldridge, and T. Echeverria. 1974.
Pollution and Physiology of Marine Organisms. F. J. Vernberg, and W. B. Vernberg (eds.), New York, N.Y., Academic Press, 1974. p. 253-284.

Eggs and larvae of herring and anchovy were exposed to benzene for longer than 24 hours and up to seven days. Egg survival decreased, the number of abnormal larvae increased, and larval respiration increased. In the herring, larval development decreased; but anchovy development accelerated. The LC_{50} value of benzene for the anchovy eggs was 20-25 ppm.

Citation Source: Chemical Abstracts 83(13):#109385u. 1975.

C-413-76
COASTAL MARINE POLLUTION AND FISH

Waldichuk, M. 1974.
Ocean Management 2(1):1-60.

This article contains an extensive review of all kinds of coastal pollution and its effects. Pollution sources include pulp mill effluents, mining, food, chemical, petroleum, and radioactive wastes. Alterations in ecosystems due to pollution, and potential uses of polluted systems for aquaculture are also discussed.

Citation Source: Industrial Wastes Information Bulletin 5(1): #HMS 4139. 1975.

C-414-76
EFFECT OF SOUTH LOUISIANA CRUDE OIL AND NO. 2 FUEL OIL ON GROWTH OF HETEROTROPHIC MICROORGANISMS, INCLUDING PROTEOLYTIC, LIPOLYTIC, CHITINOLYTIC AND CELLULOLYTIC BACTERIA

Walker, J. W., P. A. Seesman, and R. R. Colwell. 1975.
Environmental Pollution 9(1):13-33.

The susceptibility of autochthonous microorganisms from Muddy Creek (Chesapeake Bay) to South Louisiana crude oil and No. 2 fuel oil was tested. The sediment from the creek was free of oil. The yeast and fungi populations did not react to either the crude or fuel oil. But both crude and fuel oil were toxic to bacteria of all types.

Citation Source: Citation Journal

C-415-76
A STUDY OF THE INTERTIDAL MACROFAUNA AROUND THE BP REFINERY (KENT) LIMITED

Wharfe, J. R. 1975.
Environmental Pollution 9(1):1-12.

An ecological study of the intertidal invertebrate fauna of the Medway estuary was extended to include the foreshore of the BP Refinery. Data on species composition and seasonal quantitative estimates of the mud flat fauna show the complete absence of bivalves and a reduction in the number of annelids around the foreshore. The effects of the refinery effluent are limited to 1-1/2 km in either direction. Possible causes of the effects are discussed.

Citation Source: Citation Journal

C-416-76
THE TOXICITY TESTING OF OILS AND DISPERSANTS: A EUROPEAN VIEW

Wilson, K. W., E. B. Cowell, and L. R. Beynon. 1974.
Ecological Aspects of Toxicity Testing of Oils and Dispersants.
L. R. Beynon, and S. B. Cowell (eds.). New York, Halsted Press,
1974. p. 129-141.

The principles and basic tenets of toxicity experiments are outlined. Work at the community level and correlation of field studies to laboratory studies are lacking. Experimental design should conform to statistical practices and international codes.

Cleanup and recovery

Citation Source: Citation Journal

2. PHYSICAL EFFECTS

C-417-76
ADSORPTION OF CRUDE OIL ON ARCTIC TERRAIN

Moore, J. P., and C. R. Phillips. 1975.
Chemosphere 4(4):215-220.

Norman Wells crude oil was used to contaminate each of three layers of Arctic terrain (moss, detritus and clay). With increasing organic content, the layer had an increasing adsorption capacity. High molecular weight n-alkanes were adsorbed better than n-alkanes of low molecular weight. All three layers adsorbed p-xylene better than benzene (both aromatics). From these experiments it is predicted that in the event of an oil spill, higher molecular weight components will be preferentially adsorbed, and adsorption will be greatest near the surface of the terrain.

Citation Source: Citation Journal

3. CHEMICAL EFFECTS

C-418-76
STUDY OF RIVER POLLUTION CAUSED BY MICROPOLLUTANTS

Literáthy, P. 1975.
Water Research 9(11):1001-1004.

The water quality in different sections of the Danube upstream of Budapest was investigated. Among the micropollutants present are petroleum and phenol derivatives. Petroleum derivatives form precipitants and sink to the bottom, causing the "disappearance" phenomena observed in water analyses programs. These investigations are important for determining possible drinking water sources.

Physical changes of oil in the environment

Citation Source: Citation Journal

C-419-76
NEW PRIORITIES FOR GROUND-WATER QUALITY PROTECTION

Miller, D. W., and M. R. Scalf. 1974.
Ground Water 12(6):335-347.

Four regions of the U.S. were surveyed for sources of ground-water contamination. Among the sources discussed are septic tanks, brine-pollution, landfills, irrigation return flows, surface impoundments, and spills.

Biological effects of oil pollution

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3897. 1975.

4. ECONOMIC EFFECTS

C-420-76
THE EFFECTS OF POLLUTION ABATEMENT ON INTERNATIONAL TRADE - III

Anon. 1975.
Report of the Secretary of Commerce to the President and Congress in Compliance with Section 6 of the Federal Water Pollution Control Act Amendments of 1972. 523 p.

This is the third report of the Secretary of Commerce to the President and Congress regarding pollution abatement. "Portions of this document are not fully legible."

Citation Source: Government Reports Announcements 75(22): #COM-75-11159/1GA. 1975.

C-421-76
M. & G. POLLUTION AND INSURANCE

Anon. 1974.
Mercantile and General Reinsurance Co. Ltd. 32 p.

This article reviews the impact of pollution on various categories of insurance. The UK position and other foreign insurance positions are outlined. Suitable definitions, exclusion clauses and policies are proposed.

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3965. 1975.

C-422-76
POLLUTION

Anon. 1974.
Bulletin of Legal Developments No. 10:2.

The Mellbye Committee on Pollution has made several recommendations. A levy on oil should be assessed to finance cleanup and recovery in severe cases of pollution. Dangerous goods should be transported only over fixed established routes. Harbor facilities for fighting pollution need to be improved. And new regulations on liability for pollution arising from seabed exploitation activities need to be passed.

Oil transfer and transport

Citation Source: Oceanic Abstracts 12(4):#75-04108. 1975.

C-423-76
THE ECONOMICS OF ACCIDENTAL OIL POLLUTION BY TANKERS IN COASTAL WATERS

Burrows, P., C. Rowley, and D. Owen. 1974.
Journal of Public Economics 3:251-268.

The 1967 Torrey Canyon grounding was subjected to a detailed economic study. Based upon this information, a theoretical analysis of alternative solutions and a critical evaluation of ongoing policy developments were made.

Oil transfer and transport

Citation Source: Industrial Wastes Information Bulletin 4(5): #HMS 3781. 1975.

C-424-76
COMPENSATION FOR OIL POLLUTION DAMAGE RESULTING FROM EXPLORATION AND EXPLOITATION OF HYDROCARBONS IN THE SEABED

Dubais, B. A. 1975.
Journal of Maritime Law and Commerce 6(4):549-573.

The author discusses the basis of responsibility of the offshore operator in case of an accident, and recent initiatives of the petroleum industry to assure financial compensation for damages. From the perspectives of an international legal regime, direct damage, preventive measures and available financial guarantees are discussed.

General effects of oil prospecting and production

Citation Source: Oceanic Abstracts 12(5):#75-05063. 1975.

C-425-76
ECONOMICS OF MARINE POLLUTION

Smith, L. J. 1974.
Oceanus 18(1):55-60.

One problem encountered in evaluating the economic impact of pollution is the attachment of dollar values to the social costs - swimming, shellfishing and tourism losses, for example. Estimates of U.S. pollution damage to commercial fishing ($63 million), recreation ($30 million), and navigation ($17.4 million) are discussed.

Citation Source: Citation Journal

5. GENERAL EFFECTS

C-426-76
CONTROL OF HAZARDOUS MATERIAL SPILLS

Anon. 1974.
National Conference on Control of Hazardous Material Spills, San Francisco, 1974. 377 p.

The following topics are included in the 60 papers and 22 abstracts contained in the proceedings: legislative implications, contingency and response, prevention, economics, airborne problems, containment, detection, disposal practices, and environmental damage.

Cleanup and recovery
U.S. legislation
Containment
Contingency planning

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4756. 1975.

C-427-76
ENVIRONMENTAL PROTECTION BUDGET FOR FISCAL 1974

Anon. 1974.
Japan Environment Summary 2(4):1-3.

Details of work areas (mercury, oils, treatment methods, halogenated hydrocarbons, etc.) and investment in pollution control research in Japan for 1974 are given. The funding for the Environment Agency in 1974 is a 41.5% increase over that of 1973.

Citation Source: Industrial Wastes Information Bulletin 4(1): #HMS 2850. 1975.

C-428-76
HAZARDOUS SPILLS

Anon. 1974.
Chemical Engineering Progress 70(10):12-16.

The 1974 Conference on the Control of Hazardous Material Spills, San Francisco, is reviewed.

Cleanup and recovery

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4764. 1975.

C-429-76
PRESERVATION OF THE PURITY OF THE SEA

Anon. 1974.
GWF Wasser Abwasser 115(10):435-436.

The following types of marine pollution are listed and briefly explained: pollution by mineral oils, pesticides, heavy metals, domestic sewage, inorganic wastes, bulky solid wastes, radioactive wastes and thermal pollution. The aims of measures for protecting the sea are defined and some international agreements concerning the fight against marine pollution are mentioned.

International legislation

Citation Source: Environmental Health and Pollution Control 8(3):#553. 1975.

C-430-76
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NO. 19

Anon. 1974.
U.S. Joint Publications Research Service, JPRS 61561. 59 p.

This publication contains translations of seventeen articles concerned with environmental quality. "Oils" and "water pollution" are among the keywords cited.

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3992. 1975.

C-431-76
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NO. 67

Anon. 1975.
Translations of monographs from various journals, JPRS 63544. 26 p.

Environmental protection planning in the German Democratic Republic, a Baku conference on chemical waste treatment and a conference on oil-related pollution are some of the topics covered by these papers.

Citation Source: Pollution Abstracts 6(4):#75-04015. 1975.

C-432-76
POLLUTION AND ENVIRONMENT

Boughey, A. S. (ed.). 1973.
Readings in Man, the Environment, and Human Ecology. New York, MacMillan Publishing Co., 1973. p. 309-488.

Urban ecosystems and technological effects on pollution are discussed. Among the subjects presented in the articles are auto exhaust, industrial pollution, water pollution, monitoring methods and oil effects.

Monitoring

Citation Source: Pollution Abstracts 6(4):#75-04134. 1975.

C-433-76
NEW DIRECTIONS IN THE LAW OF THE SEA, COLLECTED PAPERS - VOLUME III

Churchill, R., K. R. Simmonds, and J. Welch (eds.). 1973.
Dobbs Ferry, New York, Oceana Publications, Inc., 1973. 358 p.

This volume contains a selection from the working papers which were prepared by leading participants in an international conference, New Directions in the Law of the Sea, London, February 2-4, 1973, organized by the British Institute of International and Comparative Law. Conference sessions were devoted to three main themes: fisheries, pollution (including oil pollution), and jurisdictional problems.

International legislation

Citation Source: Citation Monograph

C-434-76
ANTHROPOGENIC EFFECT ON CONTINENTAL, MARINE, AND OCEANIC BIOHYDROCOENOSES

Deksbakh, N. K., 1973. [in Russian, translation of journal available]
Gidrobiologicheskii Zhurnal 9(4):111-117.

The author reviews the literature on man's effect on freshwater biohydrocoenoses (reservoirs, lakes, streams) and saltwater biohydrocoenoses through oil pollution and industrial effluents. The anthropogenic effect disturbs the dynamic equilibriums present on the planet and can lead to the destruction of some biohydrocoenoses.

Biological effects of oil pollution

Citation Source: Biological Abstracts 60(10):#53684. 1975.

C-435-76
A STUDY OF THE POLLUTANTS OF THE RHINE BASIN

E.E.C. 1974.
Commission of the European Communities, EUR 5133f. 139 p.

Pollution in the Rhine basin has been studied; the pollutants surveyed include fertilizers, pesticides, organics, hydrocarbons, navigation materials, odiferous and non-organic materials. Their origin, quantities and environmental consequences were observed.

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4508. 1975.

C-436-76
POLLUTION RESEARCH ON YUGOSLAV COASTAL WATERS

Keckes, S. 1974.
Revue Internationale Océanographie Médicale 15-16:115-120.

The research efforts of a 5-year UN-assisted project on the "Protection of the Human Environment in the Yugoslav Adriatic Region" include studies on air, freshwater, seawater and soil pollution. One of the baseline studies concerns the occurrence and concentration of persistent biocides and other organic substances (fluorides, phenols, mineral oil, chlorinated hydrocarbons, anionic detergents, and surfactants).

Citation Source: Citation Journal

C-437-76
T.C.U. ENVIRONMENTAL STUDIES, MARINE POLLUTION

Lakey, J. R. A. Date unknown.
Royal Naval College, Department of Nuclear Science and Technology. 14 p.

Sewage, oil spills and discharges, thermal waste, pesticides and insecticides, and heavy metals are sources of marine pollution. The effects of these pollutants are discussed.

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4520. 1975.

C-438-76
OCEAN SCIENCE

Lighthill, J. 1974.
Journal of Navigation 27(1):91-110.

The author explores the interactions between different branches of ocean science and the humanitarian aspects of ocean science. Topics of discussion include marine pollution (oil), fish farming, the ocean as a protein source, global geophysics and ocean-borne trade.

Citation Source: Oceanic Abstracts 12(4):#75-03534. 1975.

C-439-76
NO LASTING DAMAGE FROM JAPANESE OIL SPILL

McAbee, M. K. 1975.
Chemical and Engineering News 53(42):13-14.

The first environmental impact report on the oil spill into Japan's Inland Sea, December, 1974, indicated that the water quality generally returned to acceptable levels within three months and no adverse effects on marine life were found. Plankton suffered from the 54,000 bbl fuel oil spill; but by March, no significant differences in their distribution were observed. Fish, benthic organisms and algae were not adversely affected, though there were some ill effects on rock barnacles and other tidal-flat dwellers.

Biological effects of oil pollution

Citation Source: Citation Journal

C-440-76
THE ENVIRONMENTAL IMPACT OF OIL SPILLS

McIlvaine, P. M. 1974.
Pollution Control in the Maritime Industries, 4. International Conference, 4th, 1974. p. 235-245.

A combination of field ecology techniques and gas chromatographic analysis is used to determine the environmental impact of an oil spill. Areas beyond the visible slick are affected; the oil eventually accumulates in marine sediments and tissues. Behavioral effects and long-term impacts are discussed.

Biological effects of oil pollution
Physical effects of oil pollution

Citation Source: MRIS Abstracts 11 (June):#072645. 1975.

C-441-76
RESEARCH NEEDED TO DETERMINE CHRONIC EFFECTS OF OIL ON THE MARINE ENVIRONMENT

Monaghan, P. H., and C. B. Koons. 1975.
Marine Pollution Bulletin 6(10):157-159.

The workshop participants agree that more research is needed to define chronic effects of oil. Recommendations include: feasibility studies to determine suitable geographical study areas; a combination of lab, field and experimental ecosystem studies; and teams of biological, chemical, physical and geological oceanographers to collect data and interpret results.

Biological effects of oil pollution

Citation Source: Citation Journal

C-442-76
SOURCES OF POLLUTION IN THE MEDITERRANEAN AND ITS EFFECTS ON LIVING RESOURCES AND FISHING

Naeve, E. 1974.
Revue Internationale d'Océanographie Médicale 15-16:5-20.

One of the severe sources of pollution in the Mediterranean is oil, particularly in connection with tank washings and release of ballast water into the sea. Oil pollution of the beaches, inshore waters and even the open sea is due to the heavy oil transport in the Mediterranean and to the facts that there are still some areas in which the discharge of oil is allowed, and that only 5 out of 14 oil harbors have facilities for receiving tanker residues.

Oil transfer and transport

Citation Source: Citation Journal

C-443-76
REPORT TO CONGRESS ON OCEAN POLLUTION, OVERFISHING, AND OFFSHORE DEVELOPMENT; JULY 1973 THROUGH JUNE 1974

National Oceanic and Atmospheric Administration. 1975.
NOAA 75040305, PL 92-532. 77 p.

The U.S. marine research efforts directed at effects of pollution, overfishing and other man-induced changes of ocean ecosystems are described. Research concerning marine pollution by petroleum hydrocarbons, offshore development of oil and gas resources and deepwater ports is reviewed.

General effects of oil prospecting and production

Citation Source: Selected Water Resources Abstracts 8(15): #W75-07405. 1975.

C-444-76
CONTROLLED ECOSYSTEM POLLUTION EXPERIMENT (CEPEX)

Parsons, T. R. 1974.
Environmental Conservation 1(3);224.

CEPEX is an international program (involving scientists from the U.S., U.K., and Canada) whose purpose is to obtain an understanding of the chronic low level effects of pollutants on the marine environment. Experiments have been conducted on isolated bodies of water to observe pollutant effects on the whole food chain in the sea. Further experiments measuring the effects of 10 ppb copper and ≤ 1 ppm petroleum hydrocarbons on marine ecosystems are planned.

Biological effects of oil pollution

Citation Source: Environmental Health and Pollution Control 8(5):#1270. 1975.

C-445-76
EXPERIMENTAL OIL SPILLS ON MACKENZIE DELTA LAKES. I. EFFECT OF NORMAN WELLS CRUDE OIL ON LAKE 4.

Snow, N. B., and D. M. Rosenberg. 1975.
Canada. Fisheries and Marine Service, Research and Development Directorate, Technical Report No. 548. 44 p.

The effects of an experimental crude oil spill on selected physical, chemical and biotic parameters in a small floodplain lake were monitored for 15 months following the spill. The effects on phytoplankton were inconclusive; the effects on the water were non-existent; and sediment oil was removed by the spring flood. The sub-littoral zoobenthic community was unaffected, but several groups were eliminated from the littoral invertebrate community.

Biological effects of oil pollution
Chemical effects of oil pollution
Physical effects of oil pollution

Citation Source: Citation Journal

C-446-76
EXPERIMENTAL OIL SPILLS ON MACKENZIE DELTA LAKES. II. EFFECT OF TWO TYPES OF CRUDE OIL ON LAKES 4C and 8

Snow, N. B., and D. M. Rosenberg. 1975.
Canada. Fisheries and Marine Services, Research and Development Directorate, Technical Report No. 549. 19 p.

Two types of oil were spilled in partitioned lakes; and selected physical and chemical water parameters, periphyton, littoral zoobenthos and surface invertebrates were sampled in the control and spill contaminated areas of the lakes. Pembina crude was more toxic than Norman Wells crude. Blue-green algae increased, with attendant increases in total nitrogen. The three phases of oil pollution are acute toxicity, a physically deleterious phase, and chronic eutrophication.

Biological effects of oil pollution
Physical effects of oil pollution
Chemical effects of oil pollution

Citation Source: Citation Journal

C-447-76
MARINE POLLUTION

Ui, U. 1973.
Ecologia 3(11):29-31.

The quantities and effects of pollution on the Japanese coast are reviewed. Results of research conducted by students at the University of Tokyo are presented and are divided into areas of industrial, urban and oil pollutants; general organic wastes; and wastes from the mining industry.

Citation Source: Environmental Health and Pollution Control
8(3):#552. 1975.

D. EFFECTS OF OIL PROSPECTING AND PRODUCTION

1. BIOLOGICAL EFFECTS

C-448-76
FISHERMEN/OILMEN PROBLEMS - ALASKA

Anon. 1975.
Marine Pollution Bulletin 6(9):132.

A controversy exists between fishermen and oilmen over the sale of oil and gas leases in Kachemak Bay. The Bay is highly productive due to an unusual circular current system which concentrates food. The fishermen are trying to invalidate the lease, claiming they were misled about inclusion of the Bay.

Economic effects of oil prospecting and production

Citation Source: Citation Journal

C-449-76
THE PETROLEUM IMPERATIVE (CONTINUED)

Anon. 1975.
Audubon 77(6):104-105.

Five letters in reply to a May article on the "Perils of the petroleum imperative" are presented. Views range from outright anger and subscription cancellation to contradiction of previous statements. Both the oil industry and conservationists are represented.

Biological effects of oil pollution

Citation Source: Citation Journal

C-450-76
UNDERWATER NOISE AT AN OFFSHORE DRILLING OPERATION IN THE BAY OF FUNDY

Buerkle, U. 1975.
Canada. Fisheries and Marine Service, Research Development Directorate, Technical Report No. 563. 18 p.

Recordings of underwater noise were made at an oil drilling site in the Bay of Fundy. The recordings were analyzed in 24 third-octave frequency bands with centre frequencies from 3.15 to 630 Hz. Four different types of noise were detected, and the range at which fish can detect them calculated.

Citation Source: Citation Journal

C-451-76
THE NEED FOR STUDIES OF MARINE MAMMALS IN THE EASTERN GULF OF MEXICO

Caldwell, D. K., and M. C. Caldwell. 1974.
Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico. R. E. Smith (ed.). St. Petersburg, Florida, State University System of Florida, Institute of Oceanography, 1974. p. 339-343.

In general the marine mammals of the Gulf of Mexico are not endangered by man's activities (proposed or current); but more distribution data is needed. In addition, the food habits and reproductive biology need further investigation in order to be able to predict long-term effects of offshore drilling.

Citation Source: Oceanic Abstracts 12(3):#75-02367. 1975.

C-452-76
THE DISTRIBUTION AND ABUNDANCE OF ANIMALS AND PLANTS ON THE ROCKY SHORES OF BANTRY BAY

Crapp, G. B. 1973.
Irish Fisheries Investigations, Series B (Marine), 9. 35 p.

An oil tanker terminal began operations in 1968 in Bantry Bay, Ireland. There have been one moderately large oil spill and three small oil spills since then. A biological survey, initially of the fauna and flora of the rocky shores in the bay, has been undertaken to aid in detecting pollution effects.

Reporting

Citation Source: Ecological Abstracts 1975(3):#75L/1896. 1975.

C-453-76
OIL SPILL EFFECTS

Karinen, J. F. 1975.
Science 190(4211):216-219.

The author comments on the validity of several statements in a recent article, "Offshore drilling: Fishermen and oilmen clash in Alaska." Speculative statements include those on finding LD_{50} values at depth and determining actual LD_{50} values. Comments on shrimp production are further explained, and statements on the physical oceanography of Kachemak Bay are corroborated by data.

Economic effects of oil prospecting and production

Citation Source: Citation Journal

C-454-76
MARICULTURE POTENTIALS IN ESTUARINE OIL PIPELINE CANALS

Kilgen, R. H., and A. H. Harris. 1974.
Gulf and Caribbean Fisheries Institute, 26th, New Orleans, La., 1973. J. B. Higman (ed.). Miami, Florida, University of Miami, 1974. p. 75-80.

Canals excavated for oil exploration, drilling and transportation alter thousands of acres of wetland, causing a decrease in the fisheries. However, these brackish canals support their own fauna of finfish (133-369 kg/hectare), blue crabs, and white, pink and brown shrimp. Mariculture experiments in Louisiana canals are discussed. Polyculture of fish, oysters, shrimp, and cage-culture of catfish and pompano are feasible. Problems of disease, predation, flooding, adequate food ration, etc., are discussed.

Economic effects of oil prospecting and production

Citation Source: Citation Journal

C-455-76
A BRIEF IN SUPPORT OF QUANTITATIVE STUDIES OF THE SUBSTRATE AND BENTHIC ORGANISM COMMUNITIES AS A BASELINE FOR EVALUATING EFFECTS OF OIL PRODUCTION ON THE MARINE ENVIRONMENT

Kritzler, H. 1974.
Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico. R. E. Smith (ed.). St. Petersburg, Florida, State University System of Florida, Institute of Oceanography, 1974. p. 363-367.

Long-term consequences of petroleum production can be evaluated by coordinating a cooperative sampling program for the sea bottom and its flora and fauna. The importance of dominant taxonomic groups, and the argument for emphasizing polychaetes are major topics.

Citation Source: Oceanic Abstracts 12(3):#75-02369. 1975.

C-456-76
BEHAVIORAL RESPONSES OF WHITEFISH AND RAINBOW TROUT TO DRILLING FLUIDS

Lawrence, M., and E. Scherer. 1974.
Canada. Fisheries and Marine Service, Technical Report No. 502. 47 p.

White fish and rainbow trout were offered the choice between pure water and water contaminated by drilling fluids. Changes in swimming speed, turning rate, and frequency of movement across the centerline were measured. The response of both species shifted from no response to preference to avoidance with increasing concentration.

Citation Source: Citation Journal

C-457-76
ALASKAN WATERS: FOR SALE TO THE HIGHEST BIDDER

Panitch, M. 1975.
Environmental Action 7(10):3-6.

The controversy between Alaskan fishermen and the oil companies over 5,000 acres of Kachemak Bay, an area in Alaska which was leased in 1973 for oil and gas exploration, is explained. Kachemak Bay is acknowledged to be one of the most biologically productive bodies of water in the nation. Fishermen have gone to court seeking to overturn the 1973 decision.

Citation Source: Citation Journal

C-458-76
HOW DO YOU PRICE A SWAMP?

Schueler, D. G. 1975.
Audubon 77(2):16-27.

The Atchafaloya Swamp is still rich in oil; the oil company channels have turned large tracts into stagnant reservoirs. But some areas of the swamp are still worth preserving, containing the only bit of wilderness in the southeastern U.S. The major threat comes from the channelization plans of the Army Corps of Engineers, not the oil companies.

Citation Source: Citation Journal

C-459-76
MENSTRUAL FUNCTIONS IN FEMALE WORKERS AT PETROLEUM REFINERIES AND IN PATIENTS WITH CHRONIC INTOXICATION BY PETROLEUM PRODUCTS [English summary]

Sukhanova, V. A., and V. V. Mel'nikova. 1974.
Gigiena Truda i Professional'nye Zabolevaniya 4:39-41.

The effect of sulfurous petroleum products was investigated through the study of 408 female workers at petroleum refineries, and of 36 patients with chronic petroleum intoxication. The sulfur products produce menstrual dysfunction due to ovarian hypofunction.

Citation Source: Abstracts on Health Effects of Environmental Pollutants 4(10):#10321. 1975.

2. SOCIAL EFFECTS

C-460-76
THE SOCIAL IMPACT OF NORTH SEA OIL DEVELOPMENTS IN SCOTLAND

Anon. 1975.
London, Social Science Research Council, 1975.

"This is an in-depth study of how oil has affected the social structure of Scotland."

Citation Source: Oil and Gas Journal 73(43):176. 1975.

C-461-76
COMMENTS ON PROPOSED ENVIRONMENTAL STUDIES OF THE IMPACT OF OCS OIL DRILLING ON THE GULF OF MEXICO

Bell, F. 1974.
Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico. R. E. Smith (ed.). St. Petersburg, Florida, State University System of Florida, Institute of Oceanography, 1974. p. 335-337.

Social science components must be included in the program of environmental studies to indicate the interconnections between the biological and physical data and to provide a link to the policy questions about the net social benefits of oil production. Several analogous studies are discussed.

Citation Source: Oceanic Abstracts 12(3):#75-02965. 1975.

C-462-76
NORTH SEA OIL AND GAS: IMPLICATIONS FOR FUTURE UNITED STATES DEVELOPMENT

White, I. L., D. E. Kash, M. A. Chartock, M. D. Devine, and R. L. Leonard. 1973.
Norman, University of Oklahoma Press, 1973. xiii + 176 p.

"Thirty-six pages on social impacts including impact on marine environment."

General effects of oil prospecting and production

Citation Source: American Fisheries Society, Transactions 104(2):437. 1975.

3. ECONOMIC EFFECTS

C-463-76
N. ENGLAND FISHERMAN EVALUATES NORTH SEA OFFSHORE OIL PROBLEMS

Allen, R. B. 1975.
National Fisherman 56(6):1B, 13B, 16B.

The problems created for fishermen by offshore oil production are evaluated. Shortage of labor, debris on the ocean floor which damages nets, and compensation funds for damage and lost time are mentioned. Oilmen do not feel much debris is deliberately discharged. Ocean surface maneuvering also generates conflicts, as does the question of submarine pipelines. Loss of fishing grounds due to rigs, platforms, wellheads and associated equipment is a major problem.

General effects of oil prospecting and production

Citation Source: Citation Journal

C-464-76
£0.25M SHETLAND OIL COMPENSATION

Anon. 1975.
Marine Pollution Bulletin 6(9):133.

The Shetland Fishermen's Association wants at least £250,000 in compensation for disturbance to the fishing grounds; so far £70,000 has been paid. In addition, it is proposed that the government buy up excess boats in order to help the fishermen start other business ventures.

Social effects of oil prospecting and production

Citation Source: Citation Journal

C-465-76
ENVIRONMENTAL ACTION

Anon. 1975.
Petroleum Engineer International 47(11):EM8. 1975.

This update on environmental action in the petroleum industry details the costs of environmental protection for air and water. In addition, the development of a new "super-microbe" by

Dr. A. M. Chakrabarty of General Electric was cited. This microbe is about to be field tested, and could be the first result of genetic engineering of bacteria.

General effects of oil prospecting and production
Biological degradation

Citation Source: Citation Journal

C-466-76
FISHERIES/OIL REPORT

Anon. 1975.
Marine Pollution Bulletin 6(10):149.

The first annual report of the Fisheries and Offshore Oil Consultative Group (Department of Agriculture and Fisheries for Scotland, Room H635, Argyle House, 3 Lady Lawson Street, Edinburgh EH3 9DR) has been issued. The problems discussed include the notification of hazards such as the siting of drilling rigs and the laying of buoys, the amount of debris on the seabed, and the risk of damage to submarine pipelines by bottom trawl gear.

General effects of oil prospecting and production

Citation Source: Citation Journal

C-467-76
FISHERMEN/OILMEN PROBLEMS - UK

Anon. 1975.
Marine Pollution Bulletin 6(9):131-132.

Fishermen in the North Sea complain of fishing gear damage and the problems caused by supply vessels which foul their fishing nets through ignorance of fishing methods. Hazards include abandoned well-heads, now marked pipelines, and unburied pipelines. Compensation claims have not yet been accepted as valid by either the government or the oil industry.

Social effects of oil prospecting and production

Citation Source: Citation Journal

4. GENERAL EFFECTS

C-468-76
CRUDE OIL AND NATURAL GAS PRODUCTION AND OTHER MINING OPERATIONS IN NAVIGABLE WATERS ALONG THE LOUISIANA COAST (FINAL ENVIRONMENTAL IMPACT STATEMENT)

Anon. 1973.
Army Engineer District, New Orleans, Louisiana, EIS-LA-73-1897-F. 403 p.

Permits to explore for oil or gas or to develop oil production and storage facilities in navigable waterways result in obstructions to navigation and fishing, altered salinity and circulation of marsh areas, possible damage to ecosystems, and disposal of wastes. The permit system provides regulations and surveillance systems which, combined with increased industry awareness, help minimize these impacts. The alternative is to delay resource development until all environmental problems are solved.

Citation Source: Selected Water Resources Abstracts 8(19): #W75-09823. 1975.

C-469-76
DEEPWATER PORT REGULATIONS

Anon. 1975.
Sea Technology 16(8):23.

Federal regulations are being issued to assure that the construction and separation of deepwater ports are in the national interest and provide protection of the marine and coastal environment. The highlights of these regulations are given. In-depth detail is demanded of an applicant company about itself and the proposed offshore port.

U.S. legislation

Citation Source: Citation Journal

C-470-76
FINAL ENVIRONMENTAL STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM. VOL. VI

Anon. 1973.
U.S. Government Printing Office. 456 p.

Volumes I and II considered the regional and cumulative aspects of a mature oil shale industry; Volume III considered the specific action of issuing two prototype leases in Colorado, Utah, and Wyoming; Volume IV describes the consultation involved with preparing the final statement; Volume V contains letters received; and Volume VI contains the oral testimony. If the oil shale leasing program is expanded, a review of the prototype leases and their impact will be done.

Citation Source: Environmental Health and Pollution Control 8(7):#1871. 1975.

C-471-76
FISHERMEN AND OIL

Anon. 1975.
Alaska Seas and Coasts 3(1):4.

The dilemma between fishermen and the State of Alaska over the leasing of lands under Kachemak Bay for oil exploration is briefly reviewed. The hearings scheduled on February 4, 1975, by the U.S. Department of Interior to receive public and private comments evaluating the potential effects of OCS leasing on the environment are also mentioned.

Biological effects of oil prospecting and production
Economic effects of oil prospecting and production

Citation Source: Citation Journal

C-472-76
GALVESTON'S SUPERPORT PLAN

Anon. 1974.
World Dredging and Marine Construction 10(3):22-25.

The Port of Galveston, Texas, proposes to dredge a multipurpose port with the ability to handle both oil and dry bulk goods. The cost is estimated at $440 million and the completion time at 5 years. This project offers less pollution hazard than an offshore site because of its protected location and the ability to use effective spill booms. Electronic devices will reduce collision risks.

Citation Source: Oceanic Abstracts 12(4):#75-03891. 1975.

C-473-76
GULF OF ALASKA STUDIES SHOW DRILLING SAFE FOR ENVIRONMENT

Anon. 1975.
Offshore 35(11):136-137.

J. H. Silicox, vice-president of Standard Oil, spoke at a hearing on the draft environmental impact statement on OCS operations in the Gulf of Alaska. He criticized the report as being "neither complete nor objective," citing ignorance of 25 years of successful offshore oil operations and successful North Sea operations as examples.

Citation Source: Citation Journal

C-474-76
HAZARDS OF THE OIL INDUSTRY

Anon. 1975.
British Medical Journal 3(5983):556.

Summary not available.

Biological effects of oil prospecting and production

Citation Source: Current Contents, Life Sciences 18(39):C-3. 1975.

C-475-76
HIGH OIL PRICES WILL SPUR ATLANTIC OCS ACTIVITY

Anon. 1975.
Ocean Industry 10(11):63-64.

A team of Sea Grant economists at Cornell University predicts the economic incentives necessary to develop the Atlantic OCS. A study by University of Delaware scientists explored the economics of exploiting the oil and gas of the Atlantic OCS and also analyzed any landward impact on ecology and economics in Delaware. Available from Sea Grant programs at the universities: Atlantic Outer Continental Shelf Energy Resources: An Economic Analysis; Decisions for Delaware: Sea Grant looks at OCS Development.

Economic effects of oil prospecting and production

Citation Source: Citation Journal

C-476-76
IMPACT OF OFFSHORE OIL OPERATIONS

Anon. 1974.
Petroleum Review 28(331):448-450.

Summaries of papers presented at the IP conference in Aviemore, Scotland, June, 1974, are given. The papers covered subjects such as technology, planning and development, education and training, implications for the economy and for the Scottish manufacturing industry, environmental problems, and the role of central and local authorities.

Citation Source: International Petroleum Abstracts 3(1):#276. 1975.

C-477-76
LOUISIANA SUPERPORT

Anon. 1974.
World Dredging and Marine Construction 10(3):30-31.

The proposed offshore superport off Louisiana will be in 100 to 120 ft. of water and 17 miles off Lafourche Parish. Five single-point mooring buoys will be connected to a single platform and three underwater pipelines will deliver the crude oil to shore. This is the only way foreign crude can reach the mid-West refineries.

Citation Source: Oceanic Abstracts 12(4):#75-03893. 1975.

C-478-76
NEW PUBLICATION LOOKS AT PETROLEUM INDUSTRY AND THE ENVIRONMENT

Anon. 1975.
Journal of Petroleum Technology September:1113.

The Environmental Quality Committee has published a book titled <u>Petroleum Production and the Environment</u>. The publication deals with environmental quality as it pertains to petroleum engineering technology. Orders may be sent to the Society of Petroleum Engineers of AIME.

General effects of oil pollution

Citation Source: Citation Journal

C-479-76
OCS OIL, GAS HEARINGS INDICATE NEED FOR STATE PARTICIPATION

Anon. 1975.
Sea Technology 16(8):39-40.

After the series of hearings held by the Ad Hoc Select Committee on the Outer Continental Shelf, it was decided to broaden baseline study programs, increase state participation in the preparation of Environmental Impact Statements, impose more regulations on bidders and perhaps start an OCS revenue sharing plan.

U.S. legislation

Citation Source: Citation Journal

C-480-76
PROPOSED 1973 OUTER CONTINENTAL SHELF OIL AND GAS GENERAL LEASE-SALE, OFFSHORE MISSISSIPPI, ALABAMA, AND FLORIDA. VOL. 2, POTENTIAL ENVIRONMENTAL IMPACTS ETC. (ENVIRONMENTAL IMPACT STATEMENT)

Anon. 1973.
Bureau of Land Management, EIS-MS-73-1651-F-2. 242 p.

This volume considers the environmental impacts of OCS activity; for example, impacts on the living components, air and water quality, commercial fishing, and conflicts with the recreational, historical and aesthetic features of the area. Unavoidable adverse effects as well as potential mitigating measures, such as oil spill regulations, contingency action and construction of protective structures and pipelines, are discussed.

Citation Source: Selected Water Resources Abstracts 8(18): #W75-09820. 1975.

C-481-76
REFINERY FOR NIGG?

Anon. 1974.
Offshore Services 7(1):22.

The circumstances surrounding the planning of a £100 million oil refinery in Nigg on the Cromarty Firth of Scotland are discussed. Area residents are against the refinery because of the danger of air and sea pollution, traffic congestion and noise.

Citation Source: Oceanic Abstracts 12(2):#75-01907. 1975.

C-482-76
REVISED 5-YEAR OCS LEASE SCHEDULE PROPOSED BY INTERIOR

Anon. 1973.
World Oil 177(6):81.

Although 15 Outer Continental Shelf oil and gas lease sales are tentatively scheduled for the next five years by the USDI, no sale will be held until environmental, technical and economic studies have been made and public hearings held. Pending legislation concerning the proposed sale of Cook Inlet of Alaska is discussed.

Citation Source: Oceanic Abstracts 12(2):#75-01913. 1975.

C-483-76
UK OFFSHORE OIL AND GAS YEARBOOK

Anon. 1974.
London, Kogan Page Limited, 1974. 291 p.

The following topics on British oil and gas operations are included: effects of offshore operations on coastal regions; legal aspects of offshore operations; and manpower, training and education. Organizations and companies related to the oil industry are listed.

Citation Source: Oceanic Abstracts 12(2):#75-01866. 1975.

C-484-76
WORLD'S TALLEST OIL PLATFORM SET FOR U.S.

Anon. 1974.
Engineering News Record (Oct. 24):14.

Exxon plans to build a 945-ft oil production platform in the federal waters of the Santa Barbara Channel. The platform is designed to withstand earthquakes of 8.5 on the Richter scale, 44-ft waves and 100-mph winds. Oil and gas will be separated at the platform and then piped to an onshore facility for treatment and storage.

Citation Source: Energy Review 07:8. 1975.

C-485-76
No title given

Anon. 1975.
Ocean Oil Weekly Report 10(7):1.

The proposed sale of oil and gas lease tracts off Southern California will probably occur December 10, 1975. The

Department of Interior has withdrawn certain tracts and added an additional 3/4 mile buffer zone in an effort to accommodate environmentalists. The Environmental Impact Statement, although well researched, will probably be questioned.

Citation Source: Citation Journal

C-486-76
OFFSHORE OIL TERMINAL DESIGN CONSIDERATIONS FOR UNITED STATES WATERS

Black, R. W. 1974.
U.S. Department of Commerce, Marine Administration Report (special). 23 p.

The design concepts for offshore terminals are reviewed; and all major costs and risks are evaluated. The need for deepwater oil (and other bulk commodity) terminals is contrasted with the environmental consequences of a potential spill. The high cost of building a terminal rules out the plan for some of the bulk commodities considered.

Citation Source: Environment Abstracts 5(10):#75-06341. 1975.

C-487-76
FRAGILE STRUCTURES: A STORY OF OIL REFINERIES, THE NATIONAL SECURITY, AND THE COAST OF MAINE

Bradford, P. A. 1975.
New York, Harper's Magazine Press, 1975.

The roots of the impasse concerning the possibility of a foreign trade zone and oil refinery in Maine include Maine coastal history, national oil policy, environmentalism, economic growth, and supertankers. The proposal was first presented in 1968, and stopped by U.S. oil companies who feared foreign oil competition.

Citation Source: Citation Monograph

C-488-76
THE CHALLENGE OF DEEPWATER TERMINALS

Bragaw, L. K., Mardis, Raffaele, and Townley. 1975.
Lexington, Mass., D. C. Heath & Co., 1975. 162 p.

The objective of this study is to present the needs, demands, salient issues and alternative solutions for transportation of crude oil and petroleum products. The major portion of the book is a discussion of the location of deepwater terminals, their economics, environmental factors and onshore impacts.

Citation Source: Ocean Industry 10(11):5. 1975.

C-489-76
ALBERTA'S ATHABASCA OIL SANDS: A CANADIAN PERSPECTIVE

Bresee, P., and S. Tyler. 1975.
Alternatives/Perspectives on Society and Environment 4(2):21-33.

Canadian public ownership of the Athabasca oil sands is the only method of considering Canadian and Alberta economic, social and environmental needs. The potential extent of environmental damage, particularly from the mining process already in use, is tremendous. Costs of environmental damage as opposed to costs of protective and preventive measures must be determined.

Social effects of oil prospecting and production

Citation Source: Citation Journal

C-490-76
ENERGY, ENVIRONMENT AND CONSERVATION - AUSTRALIAN CASE HISTORIES AND THEIR IMPLICATIONS FOR THE FUTURE

Brown, G. A. 1973.
APEA Journal 13(1):132-139.

Proposed hydrocarbon exploration offshore Queensland by the Great Barrier Reef Royal Commission is one of the five case histories reviewed. Social and legal implications are discussed along with the possibility of enacting future laws to conserve Australian resources and environment.

Citation Source: International Petroleum Abstracts 3(2):#605. 1975.

C-491-76
PROPOSED 1973 OUTER CONTINENTAL SHELF OIL AND GAS GENERAL LEASE SALE, OFFSHORE MISSISSIPPI, ALABAMA AND FLORIDA (FINAL ENVIRONMENTAL IMPACT STATEMENT)

Bureau of Land Management. 1973.
NTIS USDC, EIS-MS-73-1651-F-1. Volume 1. 327 p.

Volume 1 gives a description of the proposed oil and gas lease sale on the outer continental shelf of the Gulf of Mexico.

The 147 tracts of OCS lands all pose some degree of pollution risk to the environment and adjacent shoreline. Each tract is analyzed at this stage in order to evaluate significant environmental impacts should leasing and subsequent development ensue.

Citation Source: Selected Water Resources Abstracts 8(16): #W75-08018. 1975.

C-492-76
PROPOSED 1973 OUTER CONTINENTAL SHELF OIL AND GAS GENERAL LEASE-SALE, OFFSHORE MISSISSIPPI, ALABAMA, AND FLORIDA, VOLUME 3. ALTERNATIVES TO THE PROPOSED ACTION (FINAL ENVIRONMENTAL IMPACT STATEMENT)

Bureau of Land Management. 1973.
USDC, EIS-MS-73-1651-F-3. 354 p.

The three main alternatives to the proposed action, as listed in the environmental impact statement, are to hold the sale in modified form, withdraw the sale or delay the sale.

Citation Source: Selected Water Resources Abstracts 8(20): #W75-10291. 1975.

C-493-76
FLOTTA OIL HANDLING TERMINAL: ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURES

Cairns, W. J. 1975.
Petroleum Review 29(342):384-389.

This is the first of three articles which review environmental impact assessment and protection procedures used by the Occidental Group for the planning and construction of their Flotta Oil Handling Terminal, Orkney. The advantages of an integrated environmental and engineering approach to oil terminal construction and management are demonstrated.

Design and engineering

Citation Source: Petroleum Abstracts 15(40):#211,269. 1975.

C-494-76
OUTER CONTINENTAL SHELF: CONGRESS WEIGHS OIL NEEDS AND ENVIRONMENT

Carter, L. J. 1975.
Science 189(4206):865.

The scheduled offshore oil leasing program for the United States is considered. The actions taken by Congress regarding current OCS leasing procedures and coastal zone management are discussed.

Citation Source: Citation Journal

C-495-76
THE ENVIRONMENT OF OFFSHORE AND ESTUARINE ALABAMA

Chermock, R. L., P. A. Boone, and R. L. Lipp. 1974.
University, Geological Survey of Alabama, Environmental Division, Information Series No. 51. 135 p.

Coastal Alabama resources include an important port, food and recreation for its people, and an important seafood industry. New developments such as exploration for oil and gas and the construction of Ameraport will influence the coast. Available environmental information about Alabama's salt and brackish waters was summarized to provide a baseline for future environmental studies.

Citation Source: Selected Water Resources Abstracts 8(18): #W75-08961. 1975.

C-496-76
THE COAST GUARD BEEFS UP OFFSHORE

Colburn, D. 1975.
Chilton's Oil Gas Energy 1(6):22-26.

Safety and pollution are the two major concerns of the Coast Guard in offshore oil and gas development. The Coast Guard now spends an increasing portion of its resources cleaning up oil spills, planning deep-water ports and monitoring tanker routes and offshore drilling operations.

Economic effects of oil prospecting and production
Cleanup and recovery
Monitoring

Citation Source: Petroleum Abstracts 15(39):#210,883. 1975.

C-497-76
PETROLEUM AND THE CONTINENTAL SHELF OF NORTH WEST EUROPE. VOLUME II: ENVIRONMENTAL PROTECTION

Cole, H. A. (ed.). 1975.
Barking, Essex, England, Applied Science Publishers Ltd., 1975. 133 p.

The contents of this volume include chapters on offshore production practices to protect the environment; industry oil spill plans and programmes; the behavior of oil spills; the effects of oil on fisheries, shore life, and birds; the effects of long-term, low-level exposure to oil, and monitoring requirements.

Contingency planning
General fate of oil in the environment
Biological effects of oil pollution
Monitoring

Citation Source: International Petroleum Abstracts 3(3):xvii. 1975.

C-498-76
THE OIL EXPLORATION INDUSTRY'S ROLE IN THE ROYAL COMMISSIONS INTO OIL DRILLING ON THE GREAT BARRIER REEF

Horler, K. M. 1974.
International Symposium on Coral Reefs, 2, 1973. A. M. Cameron, et al. (eds.). Vol. 2:703-714.

Background information on oil exploration and on conservation of the reefs is discussed from the oil explorers' point of view, with reference to the announcement of the Royal Commissions. The Royal Commissions investigated the environmental and economic impact of drilling on the reefs. Industry presented the case that modern oil exploration and production will not harm the Great Barrier Reef.

Citation Source: Citation Journal

C-499-76
WEBSEC-71-72, AN ECOLOGICAL SURVEY IN THE BEAUFORT SEA

Hufford, G. L., S. H. Fortier, D. E. Wolfe, J. F. Doster, and D. L. Noble. 1974.
Oceanographic Report, No. 64, USCG-373-64. 282 p.

A collection of scientific papers from two ecological baseline cruises to the Western Beaufort Sea (August-September, 1971 and 1972) is included. The physical, chemical, biological and geological data presented should provide a base for assessing the effects of pollution from future development, especially from petroleum.

Citation Source: Government Reports Announcements 75(18): #AD-A012 351/3GA. 1975.

C-500-76
IMPACTS OF OFFSHORE OIL ON NORTH EAST SCOTLAND

Hutton, J. 1975.
MITSG-75-15 NOAA-75070804. 33 p.

The purpose of this lecture by a member of the North East Scotland Development Authority was to acquaint New England with northeast Scotland's experiences and problems in coping with the onshore impacts of offshore oil development.

Economic effects of oil prospecting and production
Social effects of oil prospecting and production

Citation Source: Government Reports Announcements 75(21): #COM-75-11026/2GA. 1975.

C-501-76
EFFECTS OF OFFSHORE CRUDE OIL UNLOADING TERMINAL ON THE MARINE ENVIRONMENT

James, W. P., et al. 1975.
Marine Technology Society Journal 9(1):27-31.

The effects of an offshore terminal, designed to handle large crude oil carriers, on the marine environment is being monitored. The offshore complex will reduce the potential for oil spills in nearby estuaries. Its location is well chosen from an environmental standpoint.

Citation Source: Environment Abstracts 5(9):#75-05489. 1975.

C-502-76
U.S. MUDDLES COASTAL WATERS

LaMotte, C. 1975.
Ocean Industry 10(1):29-30.

A recently published report by the staff of the National Ocean Policy Study Group on the development of OCS oil and gas resources emphasized the "uncertainties," such as the lack of information about the environmental, social, and economic impacts of development. Specific recommendations are given for pre-leasing actions.

Social effects of oil prospecting and production
Economic effects of oil prospecting and production

Citation Source: Citation Journal

C-503-76
POLLUTION FROM OFFSHORE OIL WELLS

Lay, S. H. 1973.
New Directions in the Law of the Sea, Collected Papers - Volume III. R. Churchill, K. R. Simmonds, and J. Welch (eds.). Dobbs Ferry, New York, Oceana Publications, Inc., 1973. p. 103-105.

This paper contains comments and recommendations on the present legal status of offshore oil drilling activities. Legislation relating to marine oil pollution is included.

International legislation

Citation Source: Citation Monograph

C-504-76
CONTEMPORARY RESEARCH IN MARINE AFFAIRS

Mangone, G. J., and J. L. Pedrick, Jr. 1974.
Sea Grant Project, Report Del-SG-10-74. 54 p.

The data baseline for this survey of research in marine affairs was gathered from a questionnaire, several research institutions, directors of institutional Sea Grant programs, and marine researchers with Sea Grant project support. Offshore drilling, marine pollution and port operations are some of the research areas.

General effects of oil pollution

Citation Source: Oceanic Abstracts 12(3):#75-03110. 1975.

C-505-76
REFINING OF RAW MATERIAL AND ENERGY REQUIREMENTS IN ITALY

Manzone, G. 1974.
Acqua Aria Ecol. 7(34):42-48.

A criticism of petroleum refinery activities in Italy includes such problems as the uncontrolled and destructive proliferation of refineries, exploitation of workers, use of land and water necessary for agriculture, and the pollution of the vegetation and fishing regions of Italy.

Citation Source: Environmental Health and Pollution Control
8(3):#791. 1975.

C-506-76
ENVIRONMENTAL PROTECTION AGENCY'S ROLE, INTEREST AND RESPONSIBILITIES WITH RESPECT TO THE OUTER CONTINENTAL SHELF DEVELOPMENT

McErlean, A. 1974.
Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico. R. E. Smith (ed.). St. Petersburg, Florida, State University System of Florida, Institute of Oceanography, 1974. p. 33-35.

EPA is interested in drilling platforms and any attendant pollution, their advisory role with respect to spills, and establishment of marine and estuarine water quality standards. Areas of concern are protection of benthic organisms from drilling mud, ability to predict spill movement and oil pollution control methods.

U.S. legislation

Citation Source: Oceanic Abstracts 12(3):#75-03103. 1975.

C-507-76
THE PETROLEUM INDUSTRY IN JAPAN (GENERAL)

Miyamori, K. 1975.
World Petroleum Congress, 9th, Tokyo, 1975. Review Paper No. RP 1(A). 6 p.

The following problems as related to Japan are studied: expansion of the petroleum refining industry in the 1960's, environmental pollution from the refining industry, soaring crude prices, oil exploration and development, present situation of the petrochemical industry, forecast of long-term energy requirements and securing a stable oil supply.

Citation Source: Petroleum Abstracts 15(40):#211,333. 1975.

C-508-76
OCS DEVELOPMENT - WHAT IT MEANS

Munro, N. 1975.
Alaska Seas and Coasts 3(2):1-5.

A discussion is given of the potential impacts of oil development off Alaska's coastline and the political controversy surrounding the current push to explore and develop petroleum resources. Such topics as short- and long-term biological impacts of oil pollution (oil spills), effects of increased activity, and social and economic changes are elaborated.

Biological effects of oil pollution

Citation Source: Citation Journal

C-509-76
THE COASTAL PLAINS DEEPWATER TERMINAL STUDY. VOLUME I. EXECUTIVE SUMMARY STUDY REPORT. VOLUME II. TECHNICAL APPENDIXES

Nathan Associates, Inc. 1975.
344 p. (Vol. I). 320 p. (Vol. II).

The feasibility of locating refineries, petrochemical factories, and auxiliary deepwater terminals in the Coastal Plains Region of North Carolina, South Carolina and Georgia is examined. The main objective of this two volume report is to analyze economic and environmental factors.

Citation Source: Government Reports Announcements 75(18): #COM-75-10772/2GA. #COM-75-10773/0GA. 1975.

C-510-76
FISHERY RESOURCES OF WATERS ALONG THE ROUTE OF THE TRANS-ALASKA PIPELINE BETWEEN YUKON RIVER AND ATIGUN PASS IN NORTH CENTRAL ALASKA

Netsch, N. F. 1975.
U.S. Fish and Wildlife Service, Resource Publication 124. 49 p.

A description is given of the fishery resources along a 185-mile segment of the trans-Alaska pipeline route. Of 209 waters surveyed in 1971, 110 supported fish. Common species and tagging studies conducted in selected areas are described. The government must impose restrictions on construction activities to minimize potential adverse impacts on aquatic resources.

Economic effects of oil prospecting and production
Oil transfer and transport

Citation Source: Pollution Abstracts 6(5):#75-04751. 1975.

C-511-76
ENVIRONMENTAL DECAY AND INTERNATIONAL POLITICS: THE USE OF SOVEREIGNTY

Ott, M. C., and L. P. Shields. 1974.
Environmental Affairs 3(4):743-767.

The article is divided into sections entitled: the problem, the sources and symptoms of environmental decline, the consequences of environmental impairment to international politics, functionalist and related remedies, an alternate approach, and conclusions. Petroleum, as a diminishing resource, is part of the problem.

Citation Source: Citation Journal

C-512-76
LONDON REPORT

Patterson, W. C. 1975.
Environment 17(2):34-36.

Construction of concrete oil production platforms in the Scottish Highlands coastal area has been subjected to considerable debate. Various government laws have been passed to give the government the power to requisition even "inalienable" land. Much bitterness exists among the people affected.

Social effects of oil prospecting and production

Citation Source: Citation Journal

C-513-76
FUEL AND THE ENVIRONMENT

Payne, C. (ed.) 1973.
London, Ann Arbor Science Publishers, 1973. 172 p.

Modern fuels (oil, gas, coal, electricity, nuclear energy) and fuel technologies are examined in relation to environmental needs. Attention is given to environmental monitoring, pollutants and their medical and ecological effects.

Monitoring
General effects of oil pollution

Citation Source: Pollution Abstracts 6(4):#75-04117. 1975.

C-514-76
CHLORIDE CONTAMINATION IN ALUM CREEK, CENTRAL OHIO

Pettyjohn, W. A. 1975.
Ground Water 13(4):332-339.

Excess chloride is not removed during the water treatment process and may produce a salty taste in the water. Most of the chloride contamination in Alum Creek is due to the discharge of oil-field brines into the mainstream or its tributaries in the upper reaches of the basin. The contaminated ground water may have been polluted ten years ago.

Citation Source: Biological Abstracts 60(11):#63497. 1975.

C-515-76
THE MARINE ENVIRONMENT - USE AND ABUSE, ORDER OR CONFLICT

Ranken, M. B. F. 1974.
Society of Environmental Engineers. Journal 13(1):3-11.

Offshore oil and gas recovery is one of the several ocean activities examined which are sources of abuse to the marine environment. The contributions of domestic sewage and waste, water supplies, industrial and agricultural waste, coastal development and offshore mineral exploitation to marine pollution are examined.

Citation Source: Oceanic Abstracts 12(2):#75-01674. 1975.

C-516-76
THE COAST AND SHELF OF THE BEAUFORT SEA

Reed, J. C., J. E. Sater, and W. W. Gunn (eds.). 1974.
Proceedings of symposium, San Francisco, January, 1974.
Arlington, Virginia. 750 p.

The results of a symposium dealing with the present environmental conditions on the coast and continental shelf of the Beaufort Sea are presented in this volume. The meeting was convened to provide basic information to determine the ecological impacts of petroleum development, and to provide a critical awareness so that these impacts will be minimized.

Citation Source: Science 189(4208):1081. 1975.

C-517-76
THE TRANS-ALASKA PIPELINE AND THE ENVIRONMENT. A BIBLIOGRAPHY

Schoepf, R. W. 1974.
Bibliographic series (final), INT-BIB-76-01, Bib-30. 31 p.

The bibliography contains 152 citations to English language research reports on the environmental problems to be encountered in the construction of the trans-Alaska pipeline. The marine and terrestrial environments are emphasized; environmental engineering problems are secondary. The period of the search is from 1970 to mid 1973.

Citation Source: Government Reports Announcements 75(22): #PB-244 299/4GA. 1975.

C-518-76
POLLUTION CONTROL IN THE ORGANIC CHEMICAL INDUSTRY

Sittig, M. 1974.
Pollution Technology Review No. 9. Noyes Data Corporation. 315 p.

Some petrochemical and coal tar products create pollution problems. These problems are reviewed, and data from various sources (including patents) are condensed and presented. Effluent treatment technology is covered in detail.

Waste oil and waste water treatment

Citation Source: Industrial Wastes Information Bulletin 5(1): #HMS 4166. 1975.

C-519-76
RESEARCH IN THE OCEANOGRAPHY DEPARTMENT AT TEXAS A & M UNIVERSITY

Treadwell, T. K. 1975.
Marine Technology Society, Journal 9(1):12-14.

The major research programs of Texas A & M are described. The researchers are involved in a Gulf-wide cooperative environmental program investigating the effects of petroleum activities on the marine environment and are also looking at natural hydrocarbon seepage in the Gulf of Mexico shelf area.

Citation Source: Oceanic Abstracts 12(5):#75-04570. 1975.

C-520-76
PROPOSAL TO INTERACT IN THE DETERMINATION OF THE ENVIRONMENTAL IMPACT OF OFFSHORE OIL DRILLING IN THE NORTHEASTERN GULF OF MEXICO: 1 FEB. 1974

U.S. Naval Coastal Systems Lab. 1974.
Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico. R. E. Smith (ed.). St Petersburg, Florida, State University Systems of Florida, Institute of Oceanography, 1974. p. 371-384.

The Naval Coastal Systems Laboratory's (NCSL) research is described, and facilities of interest to the Gulf of Mexico environmental impact study are reviewed. The NCSL proposes to measure the offshore dynamic forces (wave energy, currents, internal flowfields, and meteorological forces) and develop models to predict the interaction of the marine environment and offshore drilling.

Citation Source: Oceanic Abstracts 12(3):#75-03063. 1975.

C-521-76
THE ENVIRONMENTAL PRICE OF ENERGY

Van Tassel, A. J. 1975.
Lexington, Massachusetts, O. C. Heath and Company, Lexington Books, 1975. 324 p.

Energy savings through the use of by-products from stack gases and solid wastes and waste heat are discussed. The environmental costs of obtaining energy from nuclear fission, geothermal energy, and offshore oil and gas resources are evaluated.

Citation Source: Pollution Abstracts 6(5):#75-05065. 1975.

C-522-76
ARTIFICIAL ISLANDS: INFORMATION NEEDS AND IMPACT CRITERIA

Watling, L. 1975.
Marine Pollution Bulletin 6(9):139-142.

The effects of manmade structures in the sea, ranging from oil platforms to large anchored floating structures and reclaimed land in shallower water, cannot be realistically evaluated until new information is gathered. Information needs include: effects of low levels of chemicals, effects of turbidity and resuspension of fine particles, time relationships of mixing of effluents, and perturbation threshholds.

Citation Source: Citation Journal

E. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

C-523-76
BACTERIA USED AGAINST OIL SPILLAGE

Anon. 1975.
Ocean Industry 10(10):86.

PETROBAC is a free-flowing dry powdery material that can completely degrade unwanted petroleum and its by-products. To treat an oil spillage area, PETROBAC, a complex of man-made bacteria, is mixed in water to form a homogeneous suspension and then sprayed where needed. One pound per acre can be effective.

Cleanup and recovery

Citation Source: Citation Journal

C-524-76
MANMADE BACTERIA EATS SPILLED OIL

Anon. 1975.
Western Fisheries 90(6):12.

PETROBAC, a complex of specially mutated nonpathogenic bacteria, can help clean up oil spills in drilling and pumping operations, harbors and lagoons, beaches and open waterways. PETROBAC can degrade all kinds of crude oils and their intermediate products. The dry powdery material is mixed with water and then sprayed where needed. FFI contact Dr. Howard E. Worne, Worne Biochemicals, Inc., Lyon Industrial Park, Berlin, NJ 08009.

Cleanup and recovery

Citation Source: Citation Journal

C-525-76
NEW MICROBE DESIGNED FOR OIL SPILL CLEANUP

Anon. 1975.
Chemical and Engineering News 53(38):#8.

A new hybrid bacterium has been developed by General Electric research and development laboratories, Schenectady, New York, which is believed to more efficiently digest oil spilled on waterways. The *Pseudomonas* strain, incorporating the genetic makeup of four different strains of bacteria, can digest two thirds of crude oil at a rate several times that of other oil-consuming bacteria.

Citation Source: Citation Journal

C-526-76
EFFECTS OF TEMPERATURE AND CRUDE OIL COMPOSITION ON PETROLEUM DEGRADATION

Atlas, R. M. 1975.
Applied Microbiology 30(3):396-403.

Light crude oils have toxic volatile components which evaporate slowly at 10°C; therefore, these components can inhibit microbial degradation. At 20°C, lighter oils had higher rates of mineralization and microbial degradation than the heavier oils. Particularly at low temperatures the paraffin fraction was preferentially degraded. After 42 days of incubation the most degraded oil still had a 20% residue.

Citation Source: Citation Journal

C-527-76
FATE AND EFFECTS OF OIL POLLUTANTS IN EXTREMELY COLD MARINE ENVIRONMENTS

Atlas, R. N. 1974.
Annual report, AD-A003554, Contract N00014-74-A-0180-0001. 39 p.

The biodegradation of different crude oils was dependent on their composition and temperature. Degradation of Prudhoe crude oil could be stimulated by fertilization and microbial seeding. Success of stimulated biodegradation depended on providing sufficient nutrients for extensive metabolism. Petroleum was found to inhibit microbial photosynthesis and nitrogen fixation, but not respiration.

Biological effects of oil pollution

Citation Source: Scientific and Technical Aerospace Reports 13(17):#N75-26530. 1975.

C-528-76
ROLE OF MYTILUS EDULIS LINNE IN THE PURIFICATION OF SEA WATER OF PETROLEUM PRODUCTS (IN EXPERIMENT) [English summary]

Boiko, E. V. 1975.
Gidrobiologicheskii Zhurnal 11(2):28-33.

The rate of water purification in aquaria with *M. edulis* is twice that of aquaria without these organisms. After three weeks the remaining oil (7% of the original amount) was distributed in this way: 1.4% settled by hydrobionts into the vessel bottom, 5.6% remained in the surface film, and 2% dissolved in the water.

General fate of oil in the environment

Citation Source: Oceanic Abstracts 12(5):#75-04728. 1975.

C-529-76
HYDROCARBON UTILIZING POTENTIAL OF ESTUARINE MICROBIAL COMMUNITIES

Buckley, E. N., III, and F. K. Pfaender. 1975.
Annual Meeting of the American Society for Microbiology, 75th, New York, 1975. Abstracts. p. 127, #I66.

Water samples were collected from 12 sites within the Neuse River Estuary, North Carolina, in order to relate the presence of a hydrocarbon degrading microbial community to the concentration of hydrocarbons in the water. A large proportion of isolates had the ability to grow on hydrocarbons, indicating exposure to chronic hydrocarbon pollution. The correlation between the presence of hydrocarbon-degrading microorganisms and hydrocarbons was indicated by fluorescence spectroscopy.

Biological effects of oil pollution

Citation Source: Citation Journal

C-530-76
ARCTIC OIL BIODEGRADATION

Button, D. K. 1974.
Final report, USCG-D-114-75, Contract DOT-CG-24722-A. 43 p.

The abundance and oxidation rates of microbial hydrocarbon oxidizers were measured from three widely distributed marine systems in the far north. Data presented support the assumption that direct dissolved phase organic material metabolism is a normal ubiquitous marine process that probably produces steady state hydrocarbon concentrations of submicrograms per liter.

Citation Source: Government Reports Announcements 75(22): #AD-A014 096/2GA. 1975.

C-531-76
RADIOISOTOPE ASSAY FOR THE QUANTIFICATION OF HYDROCARBON BIODEGRADATION POTENTIAL IN ENVIRONMENTAL SAMPLES

Caparello, D. M., and P. A. Larock. 1975.
Microbial Ecology 2(1):28-42.

The activity of hydrocarbon oxidizing bacteria can be quantified using an enrichment culture method. The factors that influence the hydrocarbon oxidizing potential of an environment are: the hydrocarbon burden of the area; and the ability of the microflora to use the hydrocarbons. Lakes with large aquatic plant communities have communities of hydrocarbon bacteria similar to those found in oil polluted environments.

Citation Source: Chemical Abstracts 83(13):#111056f. 1975.

C-532-76
MICROBIAL ECOLOGY AND THE PROBLEM OF PETROLEUM DEGRADATION IN CHESAPEAKE BAY

Colwell, R. R., J. D. Walker, and J. D. Nelson, Jr. 1975.
Office of Naval Research, Technical Report AD/A-005 246/4SL.
13 p.

Studies on the seasonal fluctuation of petroleum-degrading microorganisms in Chesapeake Bay are being done. Water and sediments from an oil polluted and control area were collected and analyzed. The numbers and yields of petroleum degrading organisms were greater in the oil polluted areas. Dominant species are discussed.

Citation Source: MRIS Abstracts 11(June):#084446. 1975.

C-533-76
HINDGUT MICROFLORA FROM OIL-POLLUTED SOFT-SHELL CLAMS

Cundell, A. M., and R. R. Young. 1975.
Marine Pollution 6(9):134-135.

Preferential degradation of aliphatic hydrocarbons by micro-organisms in the digestive tracts of shellfish has been postulated. However, a preliminary investigation failed to show that hindgut microflora of soft-shell clams collected from oil-polluted sediment have any role in petroleum hydrocarbon degradation. Hydrocarbon type and distribution in the tissues remain to be explained.

Biological effects of oil pollution

Citation Source: Citation Journal

C-534-76
GROWTH IN CULTURES WITH TWO LIQUID PHASES. HYDROCARBON UPTAKE AND TRANSPORT

Erickson, L. E., and T. Nakahara. 1975.
Process Biochemistry 10(5):9-13.

This is a review with 60 references on hydrocarbon dispersion, transport and assimilation by microbial cells. Important factors involved in these processes are identified.

Citation Source: Chemical Abstracts 83(17):#144132f. 1975.

C-535-76
THE MICROBIAL DEGRADATION OF AROMATIC PETROLEUM PRODUCTS

Gibson, D. T. 1975.
Annual report, No. 2, 16-1938-2. 55 p.

The purpose of this contract is to investigate mechanisms used by soil bacteria to oxidize ortho-, meta- and para-xylene and related aromatic compounds. The microbial degradation of the sulfur-containing constituents of crude petroleum is discussed.

Citation Source: Government Reports Announcements 75(19): #AD-A012 486/7GA. 1975.

C-536-76
IDENTIFICATION AND CONTROL OF PETROCHEMICAL POLLUTANTS INHIBITORY TO ANAEROBIC PROCESSES

Hovious, J. C., G. T. Waggy, and R. A. Conway. 1973.
U.S. Environmental Protection Agency, EPA R2 73 194. 112 p.

The rate of bioconversion of acetate to methane was followed. The concentrations of twelve pollutants at which the rate of bioconversion was halved were determined. Among the twelve were aldehydes, amines, and chlorinated hydrocarbons.

Waste oil and waste water treatment

Citation Source: Industrial Wastes Information Bulletin 4(5): #HMS 3655. 1975.

C-537-76
HYDROCARBON-UTILIZING MUTANTS OF SACCHAROMYCETE YEAST: II. MARKING AND HYBRIDIZATION OF ORIGINAL STRAINS [English summary]

Inge-Vechtomov, S. G., B. V. Simarov, and E. G. Rabinovich. 1974.
Genetika 10(9):106-115.

Auxotrophic mutants, isolated from two homothallic strains of Saccharomyces cerevisiae (41 and 768), were able to produce mutants capable of hydrocarbon utilization. Hybrids and mutants and their monogenic differences were observed.

Citation Source: Biological Abstracts 60(9):#49129. 1975.

C-538-76
LIPID COMPONENTS OF THE HYDROCARBON ASSIMILATING YEAST CANDIDA LIPOLYTICA (STRAIN 10)

Jwanny, E. W. 1975.
Zeitschrift für Allgemeine Mikrobiologie 15(6):423.

The lipid content and phospholipid and fatty acid profiles of Candida lipolytica at various growth times were measured to study the utilization of n-hexadecane. Fatty acids of the same length as that of the substrate were the most abundant component, demonstrating an intact incorporation mechanism. C_2 addition and β-oxidation of the fatty acids also occurred, producing fatty acids with longer chain lengths.

Citation Source: Citation Journal

C-539-76
IMPROVING MICROBIAL DEGRADATION OF OIL IN SOIL

Lehtomäki, M., and S. Niemelä. 1975.
Ambio IV(3):126-129.

In an effort to develop methods to accelerate oil decomposition, some common agricultural practices--irrigation, fertilization, and aeration--were tried. The possibility of adding microbes (bacteria, yeast) to soils to influence the rate of oil degradation was also studied. Results indicated that none of the methods tested proved to be as effective in accelerating oil decomposition as the addition of brewery waste yeast.

Citation Source: Citation Journal

C-540-76
TAXONOMY AND PHYSIOLOGY OF BACTERIA UTILIZING HYDROCARBONS IN THE SEA [English summary]

Le Petit, J., J. C. Bertrand, M. H. N'Guyen, and S. Tagger. 1975.
Annales de Microbiologie (Paris) 126A(3):367-380.

Five strains of bacteria isolated from the Marseille coastal area were grown and respired on hexadecane and acetate. The respiration rate of strains cultured on acetate was studied while in hexadecane. Chloramphenicol either maintained or suppressed respiration activity, depending on the species.

Biological effects of oil pollution

Citation Source: Chemical Abstracts 83(15):#128530d. 1975.

C-541-76
IMPLICATIONS OF YEASTS AND YEAST-LIKE FUNGI IN MARINE PROCESSES

Meyers, S. P., and D. G. Ahearn. 1974.
Marine Mycology. A. Gaertner (ed.). International Symposium, 2nd, Bremerhaven, Germany, 1972. Bremen, West Germany, Kommissionsverlag Franz Leuwer, 1974. p. 321-338.

Yeasts and yeast-like fungi are active in such processes as nutrient recycling, biodegradation of oil and parasitism. Data on biomass and colonization of marine yeasts support the contention that this portion of the marine mycota is important in oceanic production and energy transformation.

Citation Source: Citation Journal

C-542-76
DEGRADATION OF AROMATIC HYDROCARBONS BY MICROORGANISMS. DISCOVERY OF NEW DEGRADATION SEQUENCES

Ohmori, T., and Y. Jigami. 1974.
Kagaku to Seibutsu 12(11):745-747.

A review with five references.

Citation Source: Chemical Abstracts 83(11):#93415r. 1975.

C-543-76
ISOLATION, IDENTIFICATION AND SUBSTRATE ASSIMILATION SPECIFICITY OF SOME AROMATIC HYDROCARBON UTILIZING BACTERIA

Omori, T., Y. Jigami, and Y. Minoda. 1975.
Agricultural and Biological Chemistry 39(9):1775-1779.

The paper presents the results of a study which screened for microorganisms which assimilated isoalkyl or isoalkenyl substituted aromatic hydrocarbons, and identified isopropylbenzene assimilating bacteria. Substrate assimilation specificity was examined and formed the basis for classifying aromatic hydrocarbon assimilating bacteria into two groups.

Citation Source: Citation Journal

C-544-76
THE MICROBIAL DEGRADATION OF OIL IN CONTINUOUS CULTURE

Pritchard, P. H., and T. J. Starr. 1975.
Annual report, No. 2, 1 September 73-31 August 74. 81 p.

An experimental continuous culture system was developed to study the microbial degradation of oil in aquatic ecosystems. It was shown that bacterial attack follows a consistent pattern of slow emulsification, dispersion and chemical alteration of the oil. Degradation resulted in the transformation of hydrocarbons into various end products which may be more recalcitrant and toxic than the original oil.

Citation Source: Government Reports Announcements 75(20): #AD-A013 322/3GA. 1975.

C-545-76
THE MICROBIAL DEGRADATION OF OIL IN CONTINUOUS CULTURE

Pritchard, P. H., and T. J. Starr. 1975.
Final report, Contract N00014-73-C-0074. 15 p.

Oil biodegradation studies carried out in continuous culture systems by the authors are briefly summarized. Chemical analysis of the oil during degradation has shown a complete removal of the n-alkane fraction, an alteration in the branched alkane and aromatic fractions and a synthesis of recalcitrant metabolic end products.

Citation Source: Government Reports Announcements 75(20): #AD-A013 310/8GA. 1975.

C-546-76
METABOLISM OF ALKYL NAPHTHALENES BY BACTERIA FROM A POLLUTED ESTUARY

Raymond, D. D., and R. Bartha. 1974.
Annual Meeting of the Society for Microbiology, 74th, Chicago, 1974. Abstracts. p. 161, #P100.

Observed patterns in the biodegradation of aromatic hydrocarbon pollutants were studied using gas-liquid and thin layer chromatography, mass- and infrared spectrometry. All six bacterial strains isolated from oil polluted estuarine water grew well on naphthalene, 2-methylnaphthalene, or 2-ethylnaphthalene as their sole sources of carbon and energy.

Analysis

Citation Source: Citation Journal

C-547-76
HYDROCARBON BIODEGRADATION

Robertson, B. R., S. D. Arhelger, R. A. T. Law, and D. K. Button. 1973.
Environmental Studies of Port Valdez. D. W. Hood, W. E. Shiels, and E. J. Kelley (eds.). University of Alaska, Institute of Marine Science Occasional Publication No. 3, 1973. p. 449-479.

The Valdez area contains enough microflora per cm^3 of water in the spring to initiate hydrocarbon biodegradation. Populations were lower in the fall. ATP assays on populations developed from a sterile seawater-oil mixture which was inoculated with Valdez area seawater suggest many organisms grew at the expense of oil. Their effects on slicks were substantial.

Citation Source: Citation Monograph

C-548-76
BIODEGRADATION OF OIL

Sedita, S. J. 1973.
Houston Research Inc., Technical Report No. 7150. 49 p.

Those microorganisms capable of oxidatively degrading at least one fraction of Bunker C residual fuel oil were isolated. Mixtures of organisms were not as effective at removing the oil as single species.

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3300. 1975.

C-549-76
HYDROCARBON OXIDATION BY CLADOSPORIUM RESINAE IN THE PRESENCE OF ALTERNATE SUBSTRATES

Siporin, C., and J. J. Cooney. 1975.
Annual Meeting of the American Society for Microbiology, 75th, New York, 1975. Abstracts. P. 173, #K157.

A series of experiments on the utilization of n-hexadecane and glucose by *Cladosporium resinae* cells is described. Results indicate that intracellular hydrocarbon may inhibit the activity of enzymes involved in glucose metabolism.

Citation Source: Citation Journal

C-550-76
DEGRADATION OF OIL IN CONTINUOUS CULTURE

Ventullo, R. M., J. M. Sulflita, and P. H. Pritchard. 1975.
Annual Meeting of the American Society for Microbiology, 75th, New York, 1975. Abstracts. p. 127, #I64.

Continuous flow systems were developed in the laboratory to simulate oil slick conditions in a freshwater environment, using topped diesel oil placed on 150 µl of fresh Lake Ontario water. The oil layer eventually became impregnated with bacteria and was slowly removed. Complete removal occurred generally within 120 days. Gas chromatographic analysis of the oil indicated degradation of the n-alkanes.

Citation Source: Citation Journal

C-551-76
SOME ASPECTS OF THE BIODEGRADATION OF HYDROCARBONS IN THE SOIL

Voets, J. P., R. Vanloocke, and W. Verstraete. 1975.
Externer Bericht, Kernforschungszentrum Karlsruhe 4(1):10-19.

The oxygen consumption, carbon dioxide release and extraction and quantitative dosage of hydrocarbons in soil are examined. Biodegradation by soil microorganisms can be carried out by direct metabolism, cometabolism or by the phenomenon of polyauxie. The presence of oxygen is necessary for the initial attack on hydrocarbons; humidity content of the soil and temperature are also important factors.

Citation Source: Environmental Health and Pollution Control 8(4):#900. 1975.

C-552-76
BACTERIAL DEGRADATION OF MOTOR OIL

Walker, J. D., R. R. Colwell, and L. Petrakis. 1975.
Journal of the Water Pollution Control Federation 47(8):2058-2066.

Natural populations of bacteria were used to attempt to degrade petroleum under both optimum and real-world conditions. Oil discharged from wastewater treatment plants can be biodegraded. Microorganisms in the water column have more potential for biodegradation of oils than those in the sediment.

Citation Source: Petroleum Abstracts 15(44):#212,573. 1975.

C-553-76
ENVIRONMENTAL LIMITATIONS ON THE MICROBIAL DEGRADATION OF HYDROCARBONS IN TEMPERATE LAKES

Ward, D. M., and T. D. Brock. 1975.
WIS-WRC-75-04 W75-10407, OWRT-A-054-WIS(2), Contracts DI-14-31-0001-4050, DI-14-31-0001-5050. 112 p.

Naturally-occurring oil-degrading microorganisms respond to environmental conditions such as temperature and nutrient concentrations. For example, in Lake Mendota, degradation was optimal for only one month of the year due to temperature limitation in spring and fall and nutrient limitation in mid-summer. Limitations to hexadecane, acetate and glucose oxidation were explored.

Citation Source: Government Reports Announcements 75(22):
#PB-244 094/9GA. 1975.

C-554-76
OIL BIODEGRADATION IN LAKE MENDOTA, WISCONSIN--LIMITATION BY OXYGEN AND ORGANIC MATTER

Ward, D. M., and T. D. Brock. 1975.
Annual Meeting of the American Society for Microbiology, 75th, New York, 1975. Abstracts. p. 127, #I65.

Hexadecane metabolism by microorganisms indigenous to Lake Mendota was rapid under aerobic conditions, but was severely limited in a N_2 atmosphere. Enrichment of surface water with acetate or glucose limited the rate of hexadecane breakdown. Non-hydrocarbon degrading bacteria probably limit hexadecane metabolism by competitive removal of an essential nutrient (i.e. O_2, N_2 or P).

Citation Source: Citation Journal

2. PHYSICAL CHANGES

C-555-76
FATES

Butler, J. N. 1975.
Petroleum in the Marine Environment, a Workshop on Inputs, Fates, and the Effects of Petroleum in the Marine Environment, Airlie, Virginia, 1973. p. 42-72.

Evidence is reviewed for the quantitative evaluation of the effect of various physical, chemical, and biological processes that change petroleum. Spreading, evaporation, solution, emulsification, direct sea-air exchange, photochemical oxidation, tar lump formation, sedimentation, microbial degradation, uptake by organisms, metabolism, storage, discharge and food web magnification are all considered.

Chemical changes of oil in the environment
Biological degradation
General fate of oil in the environment

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(9): #5Q10186. 1975.

C-556-76
PHOTOCHEMICAL DEGRADATION OF PETROLEUM HYDROCARBON SURFACE FILMS ON SEAWATER

Hansen, H. P. 1975.
Marine Chemistry 3(3):183-195.

Surface films of a crude-oil fraction were exposed to irradiation from different light sources. The physical behavior and degradation products were observed and identified. The amount of CO-infrared absorption indicated the amount of oxidation products in the surface film. The natural decomposition rate was estimated by comparing the original crude-oil fraction and the degradation products.

Citation Source: Citation Journal

C-557-76
ANALYSIS OF THE PHOTOCHEMICAL OXIDATION OF FLOATING OIL FILMS [English summary]

Hellmann, H. 1975.
Zeitschrift fuer Analytische Chemie 275(3):193-200.

The photochemical oxidation of oil films from about 1-100 μm thickness is indicated by an increase in carbonyl band extinction and a decrease in the concentration of the aromatic fraction. The formation of polar reaction products is also observed. The photochemical changes taking place in the oil film develop exponentially as a function of its age.

Citation Source: Citation Journal

C-558-76
EVAPORATION OF OIL FROM SLICKS

Nagy, E. 1973.
Oil and the Canadian Environment. D. Mackay, and W. Harrison (eds.). Toronto, Canada, University of Toronto, 1973. p. 112-117.

"Weight loss of oil films is given by the equation $L = AT^m W^n D^b$ where L = weight loss (g/cm^2hr), a and b are constants characteristic of the oil, T = temperature (°F), W = wind velocity (mph), D = oil thickness (microns), m = 1, and n = 1/3."

Citation Source: Chemical Abstracts 83(16):#134549h. 1975.

C-559-76
SEPARATION OF MULTICOMPONENT HYDROCARBON MIXTURES SPREADING ON A WATER SURFACE

Phillips, C. R., and V. M. Groseva. 1975.
Separation Science 10(2):111-118.

Separation is related to the difference in spreading coefficients of the hydrocarbons, taking into account relative volatilities and solubilities. A table and curves demonstrate the process.

Citation Source: The Engineering Index Monthly 13(8):#052539. 1975.

C-560-76
THE RATE OF SPREAD OF FUEL OIL NO. 1

Sellberg, B. 1975.
Nordic Hydrology 6(1):63-72.

The spreading of fuel oil No. 1 was observed in some common unconsolidated sediments in Sweden, such as esker material, bottom varves of glacial clay and sand on clay. In reasonably homogeneous medium sand with good ground water flow, the fuel moved at 1.0-1.6 m/day, but in most other cases the velocity was as low as 0.1-0.2 m/day.

Citation Source: Biological Abstracts 60(10):#57622. 1975.

C-561-76
SOLUBILITY OF AROMATIC HYDROCARBONS AND THE GEOCHEMISTRY OF HYDROCARBONS IN THE EASTERN GULF OF MEXICO

Sutton, C. 1975.
Dissertation Abstracts International, B 35(9):4566-4567.

In part one of this study the solubilities of pure hydrocarbons and mixtures of hydrocarbons were determined in distilled water and artificial seawater. Parameters most important in the dissolution process were indicated. Part two was an investigation of the geochemistry of hydrocarbons in the eastern Gulf of Mexico. Differences in fingerprint parameters between northeastern and southeastern Gulf hydrocarbons indicated zooplankton and petroleum origins.

Analysis
Source identification

Citation Source: Citation Journal

C-562-76
PETROLEUM HYDROCARBONS IN BALTIMORE HARBOUR OF CHESAPEAKE BAY: DISTRIBUTION IN SEDIMENT CORES

Walker, J. D., R. R. Colwell, M. C. Hamming, and H. T. Ford. 1975.
Environmental Pollution 9(3):231-238.

Gas-liquid chromatography was used to detect hydrocarbons at different depths in the sediment. Paraffins, cycloparaffins, aromatics and polynuclear aromatics were measured at various depths using mass spectrometry. The concentrations of both total and saturated hydrocarbons decreased with depth; however, some aromatics increased with depth.

Analysis
Sampling

Citation Source: Citation Journal

3. CHEMICAL CHANGES

C-563-76
BENTHAL DECOMPOSITION OF ADSORBED OCTADECANE

Allen, H. L. 1974.
Ph.D. Thesis (available from University Microfilms, Inc., Ann Arbor, Michigan, Order no. 74-27-578). 351 p.

Research on the behavior of octadecane containing deposits and the factors controlling decomposition rates was conducted. Among the results are: decomposition of suspended octadecane proceeds at a rate about 1.10 that of sewage; benthal oxygen uptake rate is a function of initial seed volatile concentration at the deposit surface; and the effect of flow rate on benthic deposit behavior is partly due to the base activity of the deposits and partly to the adsorbed octadecane on the deposit-water interface.

Chemical effects of oil pollution

Citation Source: Selected Water Resources Abstracts 8(20): #W75-10260. 1975.

C-564-76
LONGTERM WEATHERING CHARACTERISTICS OF IRANIAN CRUDE OIL: THE WRECK OF THE 'NORTHERN' GULF

Mayo, D. W., D. J. Donovan, J. Jiang, R. L. Dow, and J. W. Hurst. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 201-208.

An oil spill area in Maine, although subjected to 10 years of weathering, still contained isoprenoid hydrocarbons. Pristane was the predominant hydrocarbon there; C_{16} hydrocarbons were predominant in non-weathered oil spill areas. Fucus and soft clams had hydrocarbon distributions similar to the sediments. This high hydrocarbon level stinted growth and increased mortality by a factor of 8 or 9.

General fate of oil in the environment
Biological effects of oil pollution

Citation Source: Chemical Abstracts 83(13):#109363k. 1975.

C-565-76
ANAEROBIC DECOMPOSITION OF OIL IN BOTTOM SEDIMENTS

Shelton, T. B., and J. V. Hunter. 1975.
Journal Water Pollution Control Federation 47(9):2256-2270.

The decomposition process in natural sediments containing oil pollutants was followed for 30 weeks under anaerobic conditions. Oils were lost more rapidly with time than other organic matter present. There was a steady release of organic carbon with time.

Citation Source: Citation Journal

4. GENERAL FATE OF OIL

C-566-76
MODEL TESTS ON THE INFILTRATION OF PETROL FROM A SURFACE WATER INTO A POROUS AQUIFER

Bertsch, W., W. Schloz, and F. Schwille. 1975.
Deutsche Gewaesserkundliche Mitteilungen 19(1):11-16.

Results are described from tests examining the infiltration (under the influence of a gradient toward the land side) of EL fuel from surface water into the groundwater in the bank vicinity. Oil as a phase only infiltrates in the zone of the capillary fringe of the groundwater surface; however, water soluble components infiltrate the entire permeable range of the bed.

Citation Source: Environmental Health and Pollution Control 8(6):#1567. 1975.

C-567-76
PELAGIC TAR

Butler, J. N. 1975.
Scientific American 232(6):90-97.

Tarry residues of petroleum, probably formed mainly by the discharge of waste from oil tankers, are picked up by fine nets everywhere in the ocean. The weathering of these lumps and the organisms associated with them are being studied. The effect of petroleum wastes on marine organisms is still not well known.

Biological effects of oil pollution

Citation Source: Citation Journal

C-568-76
DISAPPEARANCE OF AROMATIC AND ALIPHATIC COMPONENTS FROM SMALL SEA-SURFACE SLICKS

Harrison, W., M. A. Winnik, P. T. Y. Kwong, and D. Mackay. 1975.
Environmental Science and Technology 9(3):231-234.

Information on the weathering of five small ocean spills of South Louisiana crude oil is provided. The rates of loss of cumene and n-nonane are compared to quantify the relative rates of evaporation and dissolution.

Physical changes of oil in the environment

Citation Source: Environment Abstracts 5(9):#75-05494. 1975.

C-569-76
THE PETROLEUM PROBLEM

Hunt, J. M. 1974.
Oceanus 18(1):4-5.

The author comments on a few of the results from a workshop on the inputs, fates, and effects of petroleum in the marine environment. Although oil contains carcinogens, the quantities ingested with oil-contaminated fish differ little from those in many foods. To prevent continued oil pollution, offshore production should be encouraged over importation of oil, and tighter control of coastal pollution inputs should be instituted.

General effects of oil pollution

Citation Source: Citation Journal

C-570-76
THE AREA AFFECTED BY OIL SPILLS ON LAND

Mackay, D. 1975.
Canadian Journal of Chemical Engineering 53(2):140-143.

Data have been compiled and analyzed on the volume and area of 53 inland oil spills in Alberta and of experimental spills in the Mackenzie Valley, North West Territories. An equation is derived from these data and consideration of flow characteristics of oil on Mackenzie Valley terrain, to predict the likely area affected by an oil spill from the proposed Mackenzie Valley Oil Pipeline.

Physical changes of oil in the environment

Citation Source: Petroleum Abstracts 15(40):#211,298. 1975.

C-571-76
WIND AND CURRENT EFFECTS ON LARGE-SCALE OIL SLICKS

Murray, S. P. 1975.
Technical report, TR-193. 14 p. Annual Offshore Technology Conference, 7th, Houston, 1975. Preprints, Paper no. OTC-2389. p. 523-533.

The effects of local winds and near-surface currents on the movement of oil slicks in coastal and shelf waters were determined from 39 helicopter surveys during the Main Pass 41C spill off Mississippi (1970). Orientation of oil slicks is closely controlled by local wind direction; slicks usually form 10-40° to the right of the wind. Density fronts also are important in determining slick movement and size.

Physical changes of oil in the environment

Citation Source: Government Reports Announcements 75(19): #AD-A012 582/3GA. 1975.

C-572-76
THE MOVEMENT OF OIL SLICKS

Murty, T. S. 1974.
Physical Processes Responsible for Dispersal of Pollutants in the Sea, Århus, Denmark, 1972. p. 66-74.

A numerical approach to the problem of oil slick movement is discussed. Analysis of data from two major oil spills showed surprisingly large values of vorticity and divergence. The vertical velocity in the water below a slick was calculated and a region of significant vertical motion below the leading edge of the slick was indicated.

Citation Source: Rapports et Procés-Verbaux des Réunions 167:66-74. 1974.

C-573-76
STANDARD AND INTERCOMPARISON CRITERIA; TAR BALLS AND PARTICULATE MATTER

Traxler, R. W., and R. H. Pierce, Jr. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 161-162.

In order to determine the fate of petroleum in the marine environment, certain standard analytical procedures must be followed. The sample must be compared with a standard petroleum fraction mixed with a recently biosynthesized oil; the particulate matter must be analyzed; each sample must have an internal standard; and blanks must be run with each sample set.

Analysis

Citation Source: Chemical Abstracts 18(14):#120587g. 1975.

C-574-76
PETROLEUM IN THE MARINE ENVIRONMENT

Walker, J. D. 1975.
BioScience 25(10):674.

The author reviews the book, Workshop on Inputs, Fates, and the Effects of Petroleum in the Marine Environment, edited by E. B. Bright. Topics covered at the Workshop held May 21-25, 1973, in Airlie, Virginia, include: estimates of petroleum hydrocarbons released into the ocean and the sources, useful techniques to analyze petroleum hydrocarbons, biological effects and fate of petroleum, and the effects of weathering of oil in the marine environment.

General effects of oil pollution
Analysis
Source identification

Citation Source: Citation Journal

F. OIL POLLUTION REGULATIONS

1. STATE LEGISLATION

C-575-76
FEDERAL MARITIME JURISDICTION AND STATE MARINE POLLUTION LEGISLATION: THE FLORIDA ACT NOT PREEMPTED PER SE

Adelman, G. L. 1973.
University of Miami Law Review 28:209-218.

A lower court found the Florida Oil Spill Prevention and Pollution Control Act null and void due to intrusion into an exclusive federal domain. The Supreme Court found no direct conflict between state and federal laws since the latter did not cover the liability of the polluter or recovery by the state of oil cleanup costs. Thus the state may legislate with respect to damage caused by a vessel on navigable waters but consummated on land.

U.S. legislation

Citation Source: Selected Water Resources Abstracts 8(19): #W75-09845. 1975.

C-576-76
ADMIRALTY'S POWER IN RE OIL POLLUTION: THE ABILITY OF THE STATE TO SET MORE STRINGENT PENALTIES THAN THOSE OF THE FEDERAL GOVERNMENT

Scherr, J. H. 1974.
Natural Resources Lawyer 7(4):635(19).

By a Supreme Court decision Florida has been allowed to enact a more stringent oil pollution prevention law than the federal government. The court did leave several questions unresolved, however, as to the legality of states enacting stricter laws than the federal government in other cases.

Citation Source: Environment Abstracts 5(5/6):#75-03850. 1975.

2. U.S. LEGISLATION

C-577-76
INDUSTRY VIEWPOINT (WATER QUALITY CONTROL)

Aitkins, A. R. 1974.
Natural Resources Lawyer 7(2):241-247.

The problems arising from two sections of the Federal Water Pollution Control Act are mentioned. Section 311 defines a harmful discharge to include that which causes a film or sheen upon the water surface. But under Section 402, industrial users can get a National Pollutant Discharge Elimination System permit allowing oil discharges if the permittee is using the best control technology and is working within the permit limits. The constitutionality of Section 311 is questioned.

Citation Source: Selected Water Resources Abstracts 8(20): #W75-09885. 1975.

C-578-76
CLEAN WATER: REPORT TO CONGRESS - 1974

Anon. 1974.
Clean Water; Report to Congress. 88 p.

The roles of industry, the public and state and federal government in water pollution control are reviewed. Water quality standards, effluent guidelines, monitoring, planning and regulation of water pollution (including pollution by oil) are covered.

State legislation
Industry standards and guidelines

Citation Source: Pollution Abstracts 6(5):#75-04460. 1975.

C-579-76
EPA WASTE-WATER RULE COST SET AT $6 BILLION

Anon. 1975.
Oil and Gas Journal 73(38):63.

The EPA has decided to issue regulations which will prohibit offshore oil and gas wells from discharging waste water into navigable waters. The cost to producers could exceed $6 billion.

Subsurface disposal technologies will be needed to handle the wastes.

Waste oil and waste water treatment

Citation Source: Citation Journal

C-580-76
OCEAN POLLUTION

Anon. 1973.
Hearings--Subcommittee on Oceans and Atmosphere--Committee on Commerce, U.S. Senate, 93rd Congress, 1st Session. 393 p.

The following Senate bills were introduced at the hearings: S.1067 which provided for the amending of the Oil Pollution Act, 1961, to implement the 1969 and 1971 amendments to the International Convention for the Prevention of the Pollution of the Sea by Oil; S.1071 which provided for the implementation of the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969; and S.1351 which provided for the amendment to the Marine Protection, Research and Sanctuaries Act of 1972. Various topics were discussed.

Citation Source: Selected Water Resources Abstracts 8(20): #W75-10318. 1975.

C-581-76
POLLUTION

Anon. 1975.
Alaska Seas and Coasts 3(3):4.

The discharge of harmful amounts of oil in U.S. navigable waters is subject to a fine of up to $5,000. Under the Federal Water Pollution Control Act, dumping oil over the side of a commercial fishing vessel or from a crankcase or fuel strainer is prohibited and fines will be assessed against the owner of the vessel or facility which caused the pollution.

Citation Source: Citation Journal

C-582-76
PROPOSAL IS DANGEROUS, SAYS OIL SPOKESMAN

Anon. 1975.
Offshore 35(10):186.

A proposal to divorce exploration from the production cycle in petroleum development is included in pending federal legislation. An oil spokesman claims this idea is technically impossible, financially unworkable, and would perhaps imply that production should be limited to the largest offshore pools.

General effects of oil prospecting and production

Citation Source: Citation Journal

C-583-76
THE PORTS AND WATERWAYS SAFETY ACT OF 1972: AN EXPANSION OF THE FEDERAL APPROACH TO OIL POLLUTION

Davis, M. S. 1975.
Journal of Maritime Law and Commerce 6(2):249-257.

The Ports and Waterways Safety Act of 1972 deals with the problem of oil spills in areas around ports, waterfronts and the navigable waters of the U.S. in a new way. Instead of emphasizing the deterrence of willful oil pollution, it focuses on factors such as lax construction standards and poor vessel traffic control that cause accidental oil pollution.

Citation Source: Oceanic Abstracts 12(4):#75-04128. 1975.

C-584-76
DEEPWATER PORT DEVELOPMENT IN NORTH CAROLINA: THE LEGAL CONTEXT

Dawson, A. C. 1975.
Report, UNC-SG-75-08 NOAA-04-3-158-40. 43 p.

The existing laws which apply to the planning and establishment of deepwater or offshore ports are studied. The problem of balancing the forces of energy development against the forces of ecological conservation is discussed. The interaction between state and federal laws concerning offshore development is pointed out by this study.

State legislation
General effects of oil prospecting and production

Citation Source: Government Reports Announcements 75(19): #COM-75-10952/OGA. 1975.

C-585-76
PETROLEUM REFINING POINT SOURCE CATEGORY: PROPOSED APPLICATION OF EFFLUENT LIMITATIONS GUIDELINES FOR EXISTING SOURCES TO PRETREATMENT STANDARDS FOR INCOMPATIBLE POLLUTANTS

Environmental Protection Agency. 1974.
Federal Register 39(91):16574-16575.

"The proposal will amend 40 CFR (Code of Federal Regulations) Part 419-Petroleum Refining Point Source Category, establishing for each subcategory therein the extent of application of effluent limitations guidelines to existing sources which discharge to publicly owned treatment works rather than to navigable waters."

Citation Source: Pollution Abstracts 6(5):#75-04477. 1975.

C-586-76
POLLUTION-RIGHT OF SHIPOWNER TO CONTRIBUTION FROM UNITED STATES WHERE NEGLIGENCE OF COAST GUARD WAS A CAUSE OF CASUALTY AND ENSUING SPILL. BURGESS V. THE TAMANO, 373 F. Supp. 839 (D. Me. 1974)

Kimball, J. D. 1975.
Journal of Maritime Law and Commerce 6(4):665-667.

Despite the fact that the USCG mispositioned a buoy and was negligent in cleanup operations following the spill, the "Tamano" was not allowed contribution and indemnity from the U.S., because it could not prove it was induced to rely on the government. Private citizens, however, could sue the U.S. to recover for damages produced by its negligence.

Economic effects of oil pollution

Citation Source: Oceanic Abstracts 12(5):#75-05071. 1975.

C-587-76
POLLUTION-SHIPOWNER'S LIABILITY NOT LIMITED BY LIMITATION OF LIABILITY ACT. THE OCEAN EAGLE, 1974. A.M.C. 1629 (D.P.R. 1974)

Kimball, J. D. 1975.
Journal of Maritime Law and Commerce 6(4):661-664.

The question left open concerns the relationship of the Limitation of Liability Act and liability for pollution damages under federal or state statutes. In a recent case, the court stated that a vessel which had violated three U.S. acts, including the Oil Pollution Act, would not be subject to the limitation of liability statute.

Economic effects of oil pollution

Citation Source: Oceanic Abstracts 12(5):#75-05070. 1975.

C-588-76
FEDERAL DECISIONMAKING AND THE TRANS-ALASKA PIPELINE

Myers, H. R. 1975.
Ecology Law Quarterly 4(4):915-961.

A comprehensive legal analysis of the trans-Alaska pipeline controversy is given. Included are: the events leading to the issuance of permits in 1974 for construction of the proposed pipeline; the major issues involved in the Environmental Impact Statement; the merits of the trans-Alaska vis-a-vis the trans-Alaska-Canada route; and conclusions.

General effects of oil prospecting and production

Citation Source: Citation Journal

C-589-76
MARINE TRAFFIC REQUIREMENTS: ADVANCE NOTICE OF PROPOSED RULE MAKING

USCG. 1974.
Federal Register 39(126):24157-24159.

The Coast Guard is considering the addition of certain regulations concerning the operation of all major U.S. and foreign vessels in U.S. navigable waters. The objective of these regulations is to prevent maritime casualties and the resulting oil pollution. The proposed operating requirements are discussed.

Oil transfer and transport

Citation Source: Oceanic Abstracts 12(5):#75-05026. 1975.

C-590-76
TANK VESSELS IN DOMESTIC TRADE: PROTECTION OF MARINE ENVIRONMENT: NOTICE OF PROPOSED RULE MAKING

USCG. 1974.
Federal Register 39(126):24149-24157.

The USCG is considering adding certain regulations governing the design and operation of tank ships and barges certified to carry oil. Design requirements will cover segregated ballast tanks, pumping, piping and discharge arrangements, etc. Vessel operation regulations will deal with discharges, ballast arrangements and bilges.

Oil transfer and transport

Citation Source: Oceanic Abstracts 12(5):#75-05025. 1975.

3. INTERNATIONAL LEGISLATION

C-591-76
LAW OF THE SEA AT THE END OF THE DECADE - A PREDICTION

Alexander, L. M. 1974.
Marine Technology Society, Journal 8(6):60-65.

Among the issues that are of concern to the 3rd UN Law of the Sea Conference are the territorial sea, restrictions to navigation, and pollution control and abatement (including oil). The most likely result of the conference will be agreement on some issues and continued study of others. The possible consequences are discussed.

Citation Source: Oceanic Abstracts 12(5):#75-05057. 1975.

C-592-76
1973 IMCO CONFERENCE ON MARINE POLLUTION FROM SHIPS

Anon. 1973.
U.S. Senate Committee on Commerce. Hearings. 93rd Congress, Session 1, Series 93-52, November 14, 1973. 180 p.

Hearings were begun on the 1973 IMCO Conference which was aimed at completely eliminating willful and intentional marine pollution by oil and other noxious substances, and minimizing accidental spills. Witnesses included representatives from EPA, USCG and the USSR. Other marine pollution related statements are included.

U.S. legislation

Citation Source: Environment Abstracts 5(10):#75-06348. 1975.

C-593-76
INTERNATIONAL CONFERENCE ON MARINE POLLUTION 1973

Anon. 1974.
London, Inter-governmental Maritime Consultative Organization, 1974. 172 p.

This document is the final act of the conference and includes regulations for the prevention and control of pollution by oil and other noxious substances carried by sea, freight containers, railroad wagons, etc.; and regulations for the prevention of pollution of the seas by ships.

Oil transfer and transport

Citation Source: MRIS Abstracts 11(June):#084465. 1975.

C-594-76
OIL POLLUTION ACT AMENDMENTS OF 1973

Anon. 1974.
Law and Policy in International Business 6(4):1251-1261.

The rigorous standards of the 1973 amendments refer to discharge of oil at sea and new tanker construction requirements which are designed to minimize outflow in case of an accident. The effects of these amendments on legislation, standards, construction, and ultimately, costs to the consumer are analyzed.

Citation Source: Selected Water Resources Abstracts 8(18): #W75-09264. 1975.

C-595-76
POLLUTION

Anon. 1974.
Bulletin of Legal Developments No. 1:4.

The 1971 Amendments to the International Convention for the Prevention of Pollution of the Sea by Oil concerned tank size requirements. These amendments have been incorporated into the Oil Pollution Prevention Regulations and became effective January 1, 1974.

Citation Source: Oceanic Abstracts 12(4):#75-04114. 1975.

C-596-76
POLLUTION

Anon. 1974.
Bulletin of Legal Developments No. 1:9.

"The International Convention for the Prevention of Pollution from Ships and the Protocol Relating to Intervention on the High Seas in Cases of Marine Pollution by Substances other than Oil were opened for signature Jan. 15, 1974."

Citation Source: Oceanic Abstracts 12(4):#75-04115. 1975.

C-597-76
POLLUTION

Anon. 1974.
Bulletin of Legal Developments No. 7:9.

A comprehensive Baltic pollution convention was signed by all 7 Baltic States on March 22, 1974. Sources of pollution that are covered by the convention include shipping, rivers and outfalls, air pollution and pollution from seabed activities. A permanent commission will oversee implementation of the convention.

Citation Source: Oceanic Abstracts 12(4):#75-04106. 1975.

C-598-76
UNITED NATIONS ENVIRONMENTAL PROGRAMME: THE MARINE ENVIRONMENT

Birnie, P. W. 1974.
Marine Pollution Bulletin 5(6):100-103.

The bulk of the UNEP is an overview of on-going activity in marine pollution, conservation and management of aquatic resources in existing national and international institutions. UNEP is particularly supportive of the 1972 and 1973 oil pollution conventions. Non-governmental organizations, like the Sierra Club, are encouraged to participate in formulating measures and programmes for the protection of the marine environment.

Citation Source: Citation Journal

C-599-76
INTERNATIONAL ENVIRONMENTAL GUIDE

Bureau of National Affairs, Inc. 1974.
Washington, D.C., Bureau of National Affairs, Inc., 1974.

This book is a guide to legislation on environmental pollution, including oils, gases, effluents, etc. National and international laws, conventions and treaties are cited, including those sponsored by the United Nations or other international organizations. Eastern Bloc countries are not included.

Foreign legislation

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4546. 1975.

C-600-76
NEW DIRECTIONS IN THE LAW OF THE SEA, DOCUMENTS - VOLUME IV

Churchill, R., and M. Nordquist. 1975.
Dobbs Ferry, New York, Oceana Publications, 1975. 544 p.

The fourth volume in this series presents a representative selection of documents on the international law of the sea.

These documents illustrate current trends of development in this area and focus on issues before the Third United Nations Conference on the Law of the Sea. International legislation dealing with oil pollution prevention between 1954 and 1974 and protection of the marine environment is included.

Citation Source: Citation Monograph

C-601-76
POLLUTION FROM SEABORNE SOURCES

Fleischer, C. 1973.
New Directions in the Law of the Sea, Collected Papers - Volume III. R. Churchill, K. R. Simmonds, and J. Welch (eds.). Dobbs Ferry, New York, Oceana Publications, Inc., 1973. p. 78-102.

Discussed is pollution which has its source in actions at sea which are often outside the limits of national jurisdiction. General viewpoints and existing international legislation on this form of marine pollution are reviewed. The sections on shipping and liability and compensation discuss oil pollution and related legislation.

Economic effects of oil pollution

Citation Source: Citation Monograph

C-602-76
DEFINITION AND FORMS OF MARINE POLLUTION

Hardy, M. 1973.
New Directions in the Law of the Sea, Collected Papers - Volume III. R. Churchill, K. R. Simmonds, and J. Welch (eds.). Dobbs Ferry, New York, Oceana Publications Inc., 1973. p. 73-77.

The principal causes of marine pollution are listed and discussed. Land based sources of all kinds (including petroleum sources) provide the largest amounts of pollutants to the marine environment. Under the heading of ship-borne pollutants, emphasis is placed on the loss of oil. Past oil pollution legislation and the 1973 IMCO conference, International Convention for the Prevention of Pollution from Ships, 1973, are mentioned.

Citation Source: Citation Monograph

C-603-76
CANADA, THE UNITED STATES, AND THE THIRD LAW OF THE SEA CONFERENCE

Logan, R. M. 1974.
Washington, D.C., Canadian-American Committee, 1974. 122 p.

This study provides a background survey of the major issues at the Third Conference on the Law of the Sea, the Canadian and U.S. positions on these issues, and bilateral Canada-U.S. offshore concerns. A chapter on marine pollution includes a review of the international treaties and conferences for the prevention of oil pollution, oil tanker route issues, and oil-spill contingency agreements.

Contingency planning

Citation Source: Citation Monograph

C-604-76
ENVIRONMENTAL STANDARDS AND PRACTICES IN THE EUROPEAN ECONOMIC COMMUNITY

Mandl, V. 1974.
Public Health Engineer (9):78-81.

The goals of the Communities Environmental Program include reduction of environmental pollution, improvement of the environment and quality of life, and provision for joint action of member states to deal with environmental problems. Pollutants having highest priority are Pb, organic halogen compounds, S compounds, dusts, nitrogen oxides, CO, Hg, phenols and hydrocarbons.

General effects of oil pollution

Citation Source: Pollution Abstracts 6(4):#75-04024. 1975.

C-605-76
ENFORCING INTERNATIONAL LAW: US AGENCIES AND THE REGULATION OF OIL POLLUTION IN AMERICAN WATERS

Milsten, D. E. 1975.
Journal of Maritime Law and Commerce 6(2):273-283.

Nations that agree to enforce the international laws concerning oil pollution must develop and implement national rules to give effect to the international agreements. Since larger maritime powers are not willing to enforce these regulations, the world must depend on each sea-using nation to do so within its own jurisdiction. The history of U.S. law on oil pollution and its enforcement is reviewed.

U.S. legislation

Citation Source: Oceanic Abstracts 12(4):#75-04130. 1975.

C-606-76
THE LAW OF THE SEA OF THE ARCTIC WITH SPECIAL REFERENCE TO CANADA

Pharand, D. 1973.
Ottawa, University of Ottawa Press, 1973. 367 p.

The book concerns the problems of the Arctic, the contemporary laws of the Arctic, and the international law of the sea. One section deals with oil pollution control in the Arctic and is subdivided into the following areas: the problems of oil pollution control in the Arctic; oil pollution control in international conventions up to 1970; oil pollution control legislation for the Canadian Arctic (1970); and the future of oil pollution control in this region.

General effects of oil pollution

Citation Source: Citation Monograph

C-607-76
ATTACK SET ON POLLUTION OF THE MEDITERRANEAN

Seltzer, R. J. 1975.
Chemical and Engineering News 53(38):#20.

The article deals with the international action plan developed by several of the Mediterranean countries to protect their environment. Baseline studies and monitoring of oil and petroleum hydrocarbons in the sea are to be incorporated in the central part of the action plan.

Citation Source: Citation Journal

C-608-76
ENVIRONMENTAL PROTECTION BY COASTAL STATES: THE PARADIGM FROM MARINE TRANSPORT OF PETROLEUM

Sweeney, J. C. 1974.
Georgia Journal of International and Comparative Law 4(2):278-306.

The principle of absolute freedom of the high seas as applied to oil pollution is archaic. A multilateral solution to the environmental problems caused by oil pollution is preferred by the world order, although unilateral solutions by endangered coastal states are not condemned as interim actions. Ocean transport of petroleum is one controllable source of environmental damage.

Citation Source: Selected Water Resources Abstracts 8(19): #W75-09848. 1975.

C-609-76
FINAL ACT OF THE INTERNATIONAL CONFERENCE ON MARINE POLLUTION 1973

United Kingdom Parliament. 1974.
Great Britain Parliament, Command Paper No. 5748. 138 p.

The final act passed at the Inter-Governmental Maritime Consultative Organization (IMCO) Conference is included. The rules and regulations have the objectives of eliminating marine pollution and minimizing the accidental discharges of pollutants such as oil.

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3517. 1975.

C-610-76
CONVENTION FOR THE PREVENTION OF MARINE POLLUTION FROM LAND-BASED SOURCES

United Kingdom Parliament. 1975.
H.M.S.O. Command No. 5803. 18 p.

A Paris convention of European Countries attempts to eliminate pollution in a specified geographical area from oils, radioactive wastes, heavy metals and other toxic compounds. Factors considered include persistence, toxicity and bio-accumulation of these toxins.

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4501. 1975.

C-611-76
INTERNATIONAL APPROACH TO THE MARINE POLLUTION PROBLEM

Waldichuk, M. 1973.
Ocean Management 1(3):211-261.

Various international attempts to control marine pollution are described, beginning with the 1926 failure. GESAMP (Joint Group of Experts on the Scientific Aspects of Marine Pollution) is coordinating a global approach to studying the problems. A pilot monitoring project has developed.

Monitoring

Citation Source: Ecological Abstracts 1975(3):#75L/1891. 1975.

4. FOREIGN LEGISLATION

C-612-76
No title given

Anon. 1975.
Ocean Oil Weekly Report 10(1):1.

New regulations in Norway covering offshore oil and gas operations in the North Sea went into effect October 1, 1975. The rules pertain to control of blow-outs, and require an operation to prepare a contingency plan for blow-outs or other accidents. Requirements concerning drilling equipment and abandoned holes in seabeds are also included.

Citation Source: Citation Journal

C-613-76
ENVIRONMENTAL LAWS AND REGULATIONS IN JAPAN

Anon. 1974.
321 p.

This article contains a compilation of the major current environmental laws and cabinet orders in Japan. The text of the Marine Pollution Prevention Law is included. This law covers oil and waste discharges from ships and offshore facilities, the waste oil business, and oil removal methods.

Waste oil and waste water treatment

Citation Source: Oceanic Abstracts 12(3):#75-03109. 1975.

C-614-76
EXISTING ENVIRONMENTAL REGULATIONS OF CONCERN TO THE OIL INDUSTRY IN WESTERN EUROPE

Anon. 1975.
Stichting CONCAWE, Report No. 6/75.

The following environmental regulations are included in this third up-dated report: standard specifications and legal limits on sulfur content of fuel oils, gasoline composition/quality and environmental noise control; engine vehicle emission regulations; reference list for design, construction and operation of oil pipelines in Western Europe; and regulations on refinery effluents in France.

Citation Source: Water Research 9(10):928. 1975.

C-615-76
SHIPPING

Anon. 1974.
Bulletin of Legal Developments No. 11:6.

The Merchant Shipping Bill of the United Kingdom includes regulations concerning oil pollution, and gives the power to protect shipping and trading interests against foreign action. It also amends the 1970 Act with respect to crimes committed by seamen.

Citation Source: Oceanic Abstracts 12(4):#75-04121. 1975.

C-616-76
ENVIRONMENT LAWS AND REGULATIONS IN JAPAN

Japan Environment Agency. 1974.
Japan Environment Agency, 1974. 317 p.

This book contains a compilation of major environmental laws and Cabinet orders currently in existence in Japan. The statement of the legal texts is introduced by a comment on the fundamental policies and financial measures of the Japanese Environment Agency.

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3978. 1975.

C-617-76
A COMPILATION OF ISRAELI LAWS FOR THE PREVENTION OF POLLUTION OF THE SEA

Laster, R., and Y. Koojman. 1974.
Israel, Prime Minister's Office, Environmental Protection Service, mimeographed papers. 42 p.

"Laws are given concerning public beach safety, permits for construction affecting territorial waters, the licensing of businesses that might contribute to water pollution, and control of oil pollution."

Citation Source: Oceanic Abstracts 12(5):#75-04752. 1975.

C-618-76
TIME TO BREATHE AS NEW POLLUTION LAW IS SHELVED

McLain, L. 1975.
Engineer 240(6205):52-62.

The current United Kingdom legislation on pollution control is discussed. The technology available and implemented by industry includes incineration, solvent recovery, waste oil refining, sedimentation, and flotation.

Waste oil and waste water treatment

Citation Source: Industrial Wastes Information Bulletin 4(5): #HMS 3648. 1975.

C-619-76
LEGAL NOTES

Poole, F. T. 1974.
Dock and Harbour Authority 55(644):63-64.

The British House of Lords' decision in the case of the Federal Steam Navigation Company vs. the Department of Trade and Industry was that both the shipowner and the master may be legally liable for causing oil pollution.

Citation Source: Oceanic Abstracts 12(4):#75-04140. 1975.

5. INDUSTRY STANDARDS AND GUIDELINES

C-620-76
EUROPEAN MODEL CODE OF SAFE PRACTICE FOR THE PREVENTION OF GROUND AND SURFACE WATER POLLUTION OF OIL FROM STORAGE TANKS AND DURING THE TRANSPORT OF OIL

Anon. 1974.
Barking, England, Applied Science Publishers, Ltd., 1974.

This code of practice is a guide for drawing up new provisions in European countries where oil pollution prevention regulations do not exist or where these regulations are under review. The book deals with the general requirements for pollution prevention, corrosion protection of tanks, storage tanks, pipes and fittings, installations, operations, transportation and delivery.

Citation Source: Water Pollution Control 74(4):#491. 1975.

G. BIBLIOGRAPHIES

C-621-76
OCEAN LAW (A BIBLIOGRAPHY WITH ABSTRACTS)

Brown, R. J. 1975.
Report for 1964-Sept. 75. 168 p.

"The bibliography cites national and international laws on fishing, undersea mining, shipping, dredging, territorial waters, navigation regulations, seafloor minerals, offshore drilling, and water pollution [oil spills]."

International legislation
U.S. legislation

Citation Source: Government Reports Announcements 75(22): #NTIS/PS-75/712/OGA. 1975.

C-622-76
ENVIRONMENTAL PLANNING RESEARCH

Anon. 1974.
United Kingdom, Department of the Environment, Headquarters Library, Information Series No. 15. 278 p.

Approximately 30 of the listed projects concern pollution, i.e., oil, air, land, and heavy metals. The aims, the staff, the funding and published papers are given for each project.

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3579. 1975.

C-623-76
NORTH AMERICA. INTERNATIONAL ENVIRONMENTAL BIBLIOGRAPHIES. ENVIRONMENTAL LEGISLATION

Environmental Protection Agency. 1974.
U.S. Environmental Protection Agency, PB227 146. 42 p.

This report consists of a bibliography of North American national environmental laws, pollution control regulations and reports on experiences of the authorities charged with implementing the legislation.

U.S. legislation
Foreign legislation

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3516. 1975.

C-624-76
OFFSHORE STRUCTURES (A BIBLIOGRAPHY WITH ABSTRACTS)

Habercom, G. E., Jr. 1975.
Report for 1964-August 1975. 115 p.

This bibliography contains government-sponsored research reports (110) on offshore structures, their feasibility, design, construction, marine environments, and environmental impact.

General effects of oil prospecting and production

Citation Source: Government Reports Announcements 75(21): #NTIS/PS-75/684/1GA. 1975.

C-625-76
OCEANS OF THE WORLD: THE LAST FRONTIER: AN ANNOTATED INTRODUCTORY BIBLIOGRAPHY ON THE LAW OF THE SEA

Hurd, B., and B. Passero. 1974.
Massachusetts Institute of Technology, Sea Grant Project Office, Report MITSG 74-17. 12 p.

An annotated bibliography on the law of the sea is presented. Topics include pollution problems of the sea, regional interests and law of the sea, and research and ocean law.

International legislation

Citation Source: Oceanic Abstracts 12(3):#75-03111. 1975.

C-626-76
WASTE PROCESSING AND POLLUTION IN THE CHEMICAL AND PETROCHEMICAL INDUSTRIES - A BIBLIOGRAPHY WITH ABSTRACTS

Lehmann, E. J. 1975.
Report for 1964-October 1974, NTIS/PS-74/118. 188 p.

One hundred seventy-two abstracts of research reports are provided which cover control processes, pollution effects, economic factors, emissions and abatement strategies for the chemical and petrochemical industries. Air, water and solid waste controls are included.

Waste oil and waste water treatment

Citation Source: Pollution Abstracts 6(5):#75-05079. 1975.

C-627-76
OIL POLLUTION DETECTION AND SENSING (A BIBLIOGRAPHY WITH ABSTRACTS)

Smith, M. F. 1975.
Report for 1964-July 1975. 181 p.

One hundred seventy-six abstracts of research on oil and hydrocarbon detection, sampling, monitoring and instrumentation are presented. Various analytical techniques related to characterization and remote sensing of oil spills and oil wastes are included.

Monitoring
Sampling
Analysis
Remote sensing

Citation Source: Government Reports Announcements 75(19): #NTIS/PS-75/595/9GA. 1975.

C-628-76
OIL WATER SEPARATORS (A BIBLIOGRAPHY WITH ABSTRACTS)

Smith, M. F. 1975.
Report for 1964-August 1975. 94 p.

This NTIS search covers federally sponsored research on oil water separators used primarily for pollution control. Included are centrifuge separators, coalescers, filters, oil spill recovery, and ballast and bilge water treatment.

Cleanup and recovery
Waste oil and waste water treatment

Citation Source: Government Reports Announcements 75(22): #NTIS/PS-75/710/4GA. 1975.

C-629-76
BIBLIOGRAPHY ON OPTICAL AND PHOTOGRAPHIC TECHNIQUES USED IN THE STUDY OF POLLUTION

Turner, P. 1973.
Royal Aircraft Establishment, CUSP Bibliography No. 71. 87 p.

This bibliography consists of 321 references and abstracts on 25 different techniques that may be used to identify and quantify pollution. Infrared and aerial techniques are among those covered.

Analysis
Remote sensing

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4533. 1975.

SECTION II. CURRENT STATUS OF SOME OF THE RESEARCH PROJECTS LISTED IN PREVIOUS REPORTS

The research project entries in this section are grouped according to subject and then arranged by serial number within each subject division. The serial number indicates the original report in which the project is listed:

R-001-74 to R-165-74	EPA-670/2-75-003 July 74 to October 74
R-166-74 to R-244-74	EPA-670/2-75-004 November 74 to February 75
R-269-74 to R-342-74	May 75 to July 75 (in press)
R-269-75 to R-304-75	August 75 to October 75 (in press)

A. OIL POLLUTION DETECTION AND EVALUATION

1. MONITORING

R-270-75
OIL DETECTOR BUOY

Principal Investigator: Unknown
Performing Organization: Spectrogram Corporation, 385 State St., North Haven, Connecticut 06473
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

The work done on this buoy under contract with the U.S. Coast Guard has been completed and a copy of the final report can be obtained from NTIS, Document No. AD 787 717/LK.

Work is continuing on an additional contract, with the objective of developing a buoy system capable of operation in remote unattended areas and able to derive its power from a solar charged battery. Alarm and status conditions will be sent via telemetry.

Information Source: H. R. Gram, Spectrogram Corporation, 385 State St., North Haven, Connecticut 06473

2. REMOTE SENSING

R-275-74
HIGH RESOLUTION ENVIRONMENTAL SENSORS

Principal Investigator: Kim, H. H.
Performing Organization: U.S. National Aeronautics and Space Administration, Wallops Station, Chincoteague, Virginia 23337
Supporting Agency: U.S. National Aeronautics and Space Administration, Space Science Office, Wallops Station, No. 506-18-15, 7570288
Period: 7/74 to 6/75 Funds: Unknown

Reports

DEVELOPMENT OF AN AIRBORNE LASER BATHYMETER

Kim, H. H., P. O. Cervenka, and C. B. Lankford. 1975. Nasa Technical Note, No. NASA TN D-8079. 39 p.

An airborne laser depth sounding system has been built and taken through a series of field tests. The system promises great savings in time and expense over the usual sounding methods. The results of the 15-month development and testing period for the bathymeter are compiled.

Information Source: H. H. Kim, National Aeronautics and Space Administration, Washington, D.C.

R-271-75
REMOTE SENSING SERVICES FOR EMERGENCY OIL AND HAZARDOUS SPILLS

Principal Investigators: Ziegler, R. C., D. B. Dahm, R. J. Pilie, and A. B. Adler
Performing Organization: Calspan Corporation, 4455 Genesee St., Buffalo, New York 14221
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, Contract 68-01-1856
Period: 7/73 to 6/74 Funds: Unknown

The contract covered a basic ordering agreement arrangement under which services were to be provided only in response to specific requests from the Environmental Protection Agency. This contract became effective on 1 June 1973, and expired on 1 June 1975. No papers or reports were prepared.

Information Source: R. C. Ziegler, Environmental & Energy Systems Department, Calspan Corporation, P.O. Box 235, Buffalo, New York 14221

3. ANALYSIS

R-026-74
THE FEASIBILITY OF IDENTIFYING MYSTERY OIL SPILLS

Principal Investigator: Hunt, G. S.
Performing Organization: State Department of Environmental Protection, Augusta, Maine
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 801006
Period: 7/74 to 6/75 Funds: Unknown

Publications

ENFORCEMENT OF MAINE'S OIL CONVEYANCE LAW BY PASSIVE TAGGING TECHNIQUES

Hunt, G., D. Horton, J. Levine, D. Mayo, D. Donovan, W. Shelley, L. Jiang, R. Crane, and R. Johnson. 1974. No citation given.

Several "off-the-shelf" passive tagging techniques were used to determine the origin of mystery oil spills in order to evaluate the viability of Maine's Oil Conveyance Law. Several crude oils collected from crude shipments were subjected to weathering under outdoor ambient conditions. Sub-samples were taken periodically and attempts were made to correctly match the weathered "unknown" to one of the collection of ships' samples by passive tagging. Techniques employed, and successes and limitations are described.

Information Source: G. S. Hunt, State Department of Environmental Protection, Augusta, Maine

R-167-74
PASSIVE TAGGING OF OILS BY FLUORESCENCE SPECTROPHOTOMETRY

Principal Investigator: Gruenfeld, M.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Cincinnati, Ohio
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development
Period: 7/74 to 6/75 Funds: Unknown

For Reports and Publications, see R-185-74, p. 227.

R-168-74
PASSIVE TAGGING OF WATER DISPERSED OILS

Principal Investigator: Gruenfeld, M.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Cincinnati, Ohio
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 AOE 07, Contract 72P17899
Period: 7/74 to 6/75 Funds: Unknown

For Reports and Publications, see R-185-75.

R-184-74
EXTRACTION OF OIL FROM SEDIMENT FOR QUANTITATION SPECTROSCOPIC ANALYSIS

Principal Investigator: Gruenfeld, M.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Cincinnati, Ohio
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development
Period: 7/74 to 6/75 Funds: Unknown

For Reports and Publications, see R-185-75.

R-185-74
QUANTITATIVE ANALYSIS OF OIL BY INFRARED SPECTROPHOTOMETRY

Principal Investigator: Gruenfeld, M.
Performing Organization: U.S. Environmental Protection Agency, Edison Water Quality Research Laboratory, Cincinnati, Ohio
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 AOE 02, Contract 72P17896
Period: 7/74 to 6/75 Funds: Unknown

Reports and Publications

EXTRACTION OF DISPERSED OILS FROM WATER FOR QUANTITATIVE ANALYSIS BY INFRARED SPECTROPHOTOMETRY

Gruenfeld, M. 1973.
Environmental Science and Technology 7(7):636-639.

Some factors that optimize the extraction of dispersed oils from water for analysis by infrared spectrophotometry are examined. An improved extraction procedure is recommended.

IDENTIFICATION OF OIL POLLUTANTS: A REVIEW OF SOME RECENT METHODS

Gruenfeld, M. 1973.
Joint Conference on Prevention and Control of Oil Spills, Washington, D.C., 1973. p. 179.

Passive tagging of oils can be done using indices such as Va, Ni, S and N_2 content, gas chromatographic profile appearance and C and S isotope ratios. The indices are determined using a wide spectrum of instruments and techniques.

QUANTITATIVE ANALYSIS OF PETROLEUM OIL POLLUTANTS BY INFRARED SPECTROPHOTOMETRY

Gruenfeld, M. 1975.
Water Quality Parameters, American Society for Testing and Materials, STP 573. p. 290-308.

"The accuracy and sensitivity of infrared spectrophotometry are evaluated for the quantitative analysis of water dispersed oils, by single point analysis."

Information Source: M. Gruenfeld, U.S. Environmental Protection Agency, Edison Water Quality Research Laboratory, Cincinnati, Ohio

R-273-75
ANALYTICAL METHODS FOR POLYNUCLEAR AROMATICS

Principal Investigator: Unknown
Performing Organization: Exxon Research and Engineering Company
Supporting Agency: American Petroleum Institute, No. 207-75
Period: Unknown Funds: Unknown

The project is in progress. Reports have been published in the open literature (ACS Petroleum Division).

Information Source: J. R. Gould, American Petroleum Institute, 2101 L St., N.W., Washington, D.C. 20037

R-274-75
CHEMICAL ANALYSIS IN HOUSE

Principal Investigator: Unknown
Performing Organization: Member Company Laboratories

Supporting Agency: American Petroleum Institute, No. 204-75
Period: Unknown Funds: Unknown

This study is in progress. No reports are available.

Information Source: J. R. Gould, American Petroleum Institute, 2101 L St., N.W., Washington, D.C. 20037

B. OIL POLLUTION PREVENTION AND CONTROL

1. CLEANUP AND RECOVERY

R-275-75
POLLUTION CONTROL EQUIPMENT

Principal Investigator: Unknown
Performing Organization: U.S. Navy, Coastal Systems Laboratory, Panama City, Florida 32401
Supporting Agency: U.S. Department of Transportation, Coast Guard, No. Z-70099-4-42734
Period: 7/74 to 6/75 Funds: Unknown

<u>Reports</u>

OIL/WATER SEPARATOR EVALUATION

Mittleman, J. 1975.
Informal report, NCSL 252-75.

A coalescing, plate-type, oil-water separator was evaluated. Tests involving the separation of Navy Special Fuel Oil (NSFO) from seawater resulted in the formation of a permanent emulsion of seawater in NSFO in the closed-loop experimental setup, and the termination of these tests. The apparatus was successful in separating contaminated Navy Distillate from seawater, and produced a water effluent containing 200 ppm oil and an oil effluent containing <5% water.

Information Source: U.S. Navy, Naval Coastal Systems Laboratory, Panama City, Florida 32401

R-277-75
HIGH CAPACITY OIL-WATER SEPARATOR SYSTEM

Principal Investigator: Markel, A. L.
Performing Organization: Reynolds Submarine Service Corporation, Richmond, Virginia 23213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 58-01-0834, Contract 72P19394
Period: 7/74 to 6/75 Funds: Unknown

Reynolds International's oil pollution projects have been completed and the company is no longer involved in this field.

Information Source: A. L. Markel, Reynolds International, Inc., P.O. Box 27002, Richmond, Virginia 23261

R-278-75
MANAGEMENT, MAINTENANCE AND OPERATION OF THE US EPA OHMSETT FACILITY

Principal Investigators: Ackerman, R. A., W. E. McCracken, and G. Smith
Performing Organization: Mason & Hanger-Silas Mason Co., P.O. Box 156, Leonardo, New Jersey 07737
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, Contract 68-03-0490
Period: 7/73 to 6/74 Funds: $287,913

Mason & Hanger-Silas Mason Co., Inc. has a three year contract to manage, maintain and operate the U.S. Environmental Protection Agency's Oil and Hazardous Materials Simulated Environmental Test Tank (OHMSETT), located in Leonardo, New Jersey. The facility consists of a tank in which evaluation and development work can be conducted on oil and hazardous materials containment and cleanup devices. The EPA and other government agencies are the prime users of OHMSETT. Mason & Hanger prepares all reports for EPA equipment tested.

Mason & Hanger is into the second year of operation. No reports have been published to date. Three major reports are expected to be prepared during winter 1975-1976.

Information Source: R. A. Ackerman, Manager, Mason & Hanger-Silas Mason Co., Inc., P.O. Box 156, Leonardo, New Jersey 07737

R-285-75
SHORELINE PROTECTION AND RESTORATION

Principal Investigator: Unknown
Performing Organization: Exxon Research and Engineering Company
Supporting Agency: American Petroleum Institute, No. 305-75
Period: Unknown Funds: Unknown

The project has been completed. Two API publications, Nos. 4254 and 4258, are available.

Information Source: J. R. Gould, American Petroleum Institute, 2101 L St., N.W., Washington, D.C. 20037

R-286-75
SHORELINE PROTECTION AND RESTORATION

Principal Investigator: Unknown
Performing Organization: Shell Pipeline Research and Development Laboratory

Supporting Agency: American Petroleum Institute, No. 305-75
Period: Unknown Funds: Unknown

The project has been completed. API publication, No. 4248, is available.

Information Source: J. R. Gould, American Petroleum Institute, 2101 L St., N.W., Washington, D.C. 20037

2. RESTORATION

R-279-75
OILED WATERFOWL REHABILITATION

Principal Investigator: Stanton, P. B.
Performing Organization: Wildlife Rehabilitation Center, Framingham, Massachusetts
Supporting Agency: American Petroleum Institute, No. 302-75
Period: Unknown Funds: Unknown

The project is a continuing one. No reports have been published at this time.

Information Source: J. R. Gould, American Petroleum Institute, 2101 L St., N.W., Washington, D.C. 20037

3. WASTE OIL AND WASTE WATER TREATMENT

R-281-75
TREATMENT OF EMULSIFIED OIL BY COALESCENCE

Principal Investigators: Gloyna, E. F., J. Chieu, and N. Patel
Performing Organization: University of Texas, School of Engineering, 200 W. 21st St., Austin, Texas 78712
Supporting Agency: University of Texas
Period: 7/74 to 6/75 Funds: Unknown

The program is ongoing.

Reports and Publications

DEVICE FOR EVALUATING COALESCENCE OF OIL EMULSIONS

Chieu, J. N., and E. F. Gloyna. 1975.
ASCE Meeting, Texas Section, El Paso, September 25-27, 1975.

Pilot studies can provide useful information on the design and operation of coalescers to break stable oil-water emulsions. Treatability results from the experiments reported in this paper show that this can be accomplished by using media preferentially wetted by the dispersed phase, a minimum oil saturation of 10-15%, and a bed depth of 0.4 centimeters. Increased filter velocity and decreased interfacial tension decrease coalescence.

COALESCENCE OF EMULSIFIED OILY WASTE WATER BY FIBROUS BEDS

Chieu, J. N., E. F. Gloyna, and R. S. Schechter. 1975.
Annual Purdue Industrial Waste Conference, 30th, 1975.

The feasibility of separating emulsified oil from industrial waste streams using fibrous bed coalescers was investigated while varying influent oil concentration, flow rate and bed depth. Three coalescing media and four types of oil were used. The results of these experiments permit the conclusion that fibers preferentially wetted by the dispersed phase are best, a minimum oil saturation of 10-15% of the bed is necessary for complete coalescence, and a minimum coalescer depth is required.

Information Source: E. F. Gloyna, Dean of College of Engineering, University of Texas, 200 W. 21st St., Austin, Texas 78712

R-282-75
IDENTIFICATION OF MARGINAL NON-TRANSPORTATION PETROLEUM FACILITIES

Principal Investigators: Trentacoste, N., J. Cunningham, G. Bierman, and R. Isom
Performing Organization: Science Applications Inc., 1651 Old Meadow Rd., Suite 620, McLean, Virginia 22101
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, Contract 68-02-2032
Period: 7/73 to 6/74 Funds: $182,000

This project is currently in progress and will not be completed for several months. No reports have been published.

Information Source: N. P. Trentacoste, Science Applications, Inc., 1600 Anderson Rd., McLean, Virginia 22101

4. PERSONNEL TRAINING AND EDUCATION

R-284-75
PREVENTION OF OIL SPILLS

Principal Investigator: Unknown
Performing Organization: Educational Systems and Designs, Inc., National Photographic Laboratories
Supporting Agency: American Petroleum Institute, No. 306-75
Period: Unknown Funds: Unknown

The study is in progress. No other information is available.

Information Source: J. R. Gould, American Petroleum Institute, 2101 L St., N.W., Washington, D.C. 20037

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

R-085-74
THE SEDIMENT ENVIRONMENT OF PORT VALDEZ AND GALENA BAY, ALASKA AND THE EFFECT OF OIL ON THIS ECOSYSTEM

Principal Investigator: Feder, H. M.
Performing Organization: University of Alaska, School of Biological Sciences, College, Alaska 99701
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 800944
Period: 7/74 to 6/75   Funds: Unknown

The final report for this project is presently being prepared.

Reports

THE SEDIMENT ENVIRONMENT OF PORT VALDEZ AND GALENA BAY, ALASKA AND THE EFFECT OF OIL ON THIS ECOSYSTEM

Feder, H. M. 1974.
Interim progress report, 1973-1974, No. R800944.

The program for the second year of investigation includes the continuation of meiofaunal sampling in oil-free and oil-contaminated beach sediments, bacteriological sampling at study sites, initiation of sediment chemistry studies, and oil-additive experiments in a sandy-mud area. Studies of the bacteria of the sediment on Port Valdez beaches have suggested that small additions of oil, as a one-time event or even as an intermittent addition, do not effect the bacterial population size. Continuous addition of organics in an organic-poor environment may result in increased bacterial numbers.

Information Source: C. McClintock, Administrative Assistant, U.S. Environmental Protection Agency, Arctic Environmental Research Laboratory, College, Alaska 99701

R-287-75
HORMONE AND ELECTROLYTE THERAPY FOR OILED WATERFOWL

Principal Investigator: Unknown
Performing Organization: Unknown

Supporting Agency: American Petroleum Institute, No. 303-75
Period: 1/74 to 12/74 Funds: Unknown

The planned date of completion for this project was December, 1975.

Information Source: J. R. Gould, American Petroleum Institute, 2101 L St., N.W., Washington, D.C. 20037

R-288-75
A STUDY OF THE CHEMICAL FATE AND THE BIOLOGICAL CONSEQUENCES OF NO. 2 FUEL OIL SPILLS IN SEMI-NATURAL ECOSYSTEMS

Principal Investigators: Bieri, R. H., and R. J. Huggett
Performing Organization: Virginia Institute of Marine Science, Gloucester Point, Virginia 23062
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, Contract No. 68-03-0423
Period: 7/73 to ? Funds: $4,980

Chemical analyses including solvent extractions, chromatographic separations and group and compound identifications by gas chromatography and mass spectrometry are presently being performed. A report will be written upon completion of the analyses in the first quarter of 1976.

Publications

IDENTIFICATION OF HYDROCARBONS IN AN EXTRACT FROM ESTUARINE WATER ACCOMMODATED NO. 2 FUEL OIL

Bieri, R. H., A. L. Walker, B. W. Lewis, G. Losser, and R. J. Huggett. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Maryland, 1974. R. C. Junghans (ed.). NBS Special Publication No. 409. p. 149-156.

Computerized gas chromatographic - mass spectra systems have the potential to solve the problem of analyzing complex mixtures of hydrocarbons. Three types of compounds (benzene compounds, naphthalene compounds, and indanes, biphenyls, and polyaromatic compounds) were isolated from a methylene chloride extract of estuarine water accommodated No. 2 fuel oil.

HYDROCARBONS IDENTIFIED IN EXTRACTS FROM ESTUARINE WATER ACCOMMODATED NO. 2 FUEL OIL BY GAS CHROMATOGRAPHY - MASS SPECTROMETRY

Lewis, B. W., A. L. Walker, and R. H. Bieri. 1974.
NASA-TM-X-72009. 12 p.

The analytical method and results of a gas chromatography - mass spectrometer analysis of methylene chloride and n-heptane extracts of a No. 2 fuel oil accommodated estuarine water sample are described.

Information Source: P. F. Holloway, Director for Space, National Aeronautics and Space Administration, Langley Research Center, Hampton, Virginia 23665

R-291-75
BIOLOGICAL EFFECTS OF PELAGIC OIL

Principal Investigators: Gebelein, D. C., and N. E. Maynard
Performing Organization: Bermuda Biological Station
Supporting Agency: American Petroleum Institute, No. 209-75
Period: Unknown Funds: Unknown

The study is continuing. No reports have been published at this time.

Information Source: J. R. Gould, American Petroleum Institute, 2101 L St., N.W., Washington, D.C. 20037

R-292-75
PHYSIOLOGY AND BIOASSAY STUDIES, ALASKA

Principal Investigators: Karinen, J. R., S. D. Rice, M. B. Bonnett, J. W. Short, and D. A. Moles
Performing Organization: U.S. Department of Commerce, Auke Bay Fisheries Laboratory, P.O.Box 155, Auke Bay, Alaska 99821
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. ABL-07-75, Contract FB 1700/8818-U2
Period: 7/74 to 6/75 Funds: $160,100

This contract (FB 1700/8818-U2) was for February, 1975, and has been renewed as contract FB 1700/88CU26 for February, 1976.

Publications

EFFECTS OF OIL ON MARINE ECOSYSTEMS: A REVIEW FOR ADMINISTRATORS AND POLICY MAKERS

Evans, D. R., and S. D. Rice. 1974.
NOAA Fishery Bulletin 72(3):625-638.

A review of recent literature concerning the effects of oil on marine ecosystems is given to provide an information source for administrators and policy makers. Characteristics of crude oil and the danger of chronic low-level pollution are included.

EFFECTS OF PRUDHOE BAY CRUDE OIL ON MOLTING TANNER CRABS, CHIONOCETES BAIRDI

Karinen, J. F., and S. D. Rice. 1974.
Marine Fisheries Review 36(7):31-37.

From laboratory studies in which premolt and postmolt juvenile male Tanner crabs from Alaskan waters were exposed to Prudhoe Bay crude oil, crabs were similarly affected by oil, and the molting success was found to decrease with increasing oil exposure. Results suggest that oil spilled in Alaskan waters would harm the Tanner crab resources.

TOXICITY AND AVOIDANCE TESTS WITH PRUDHOE BAY OIL AND PINK SALMON FRY

Rice, S. D. 1973.
Joint Conference on Prevention and Control of Oil Spills, Washington, D.C., 1973. p. 667-670.

Acute toxicity concentration levels were determined for Prudhoe Bay crude oil on pink salmon fry in fresh and salt water. The observed 96 hr TLM values were lower in freshwater fry than in saltwater animals (88 mg oil/liter vs 213 mg/liter in June). Older fry were more susceptible to oil toxicity and more sensitive in detecting and avoiding oil than were the younger fry.

THE EFFECT OF PRUDHOE BAY CRUDE OIL ON SURVIVAL AND GROWTH OF EGGS, ALEVINS, AND FRY OF PINK SALMON, ONCORHYNCHUS GORBUSCHA

Rice, S. D., D. A. Moles, and J. W. Short. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 503-507.

The 96-hour median tolerance limit of fry was 0.4 ml/liter of freshwater and 0.04 ml/liter of seawater. Growth in alevins was affected by 10-day sublethal exposures of the water-soluble fraction, and was affected most severely if exposure was later in development. Susceptibility of the early life stages of pink salmon is greatest at the time of emergence and of fry migration.

Information Source: J. F. Karinen, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821

2. PHYSICAL EFFECTS

R-144-74
FLAME SPREAD OVER LIQUID FUEL

Principal Investigator: Torrance, K. E.
Performing Organization: Cornell University, School of Engineering, Ithaca, New York 14850
Supporting Agency: U.S. National Science Foundation, Division of Advanced Technol. Appl., No. GI-31894X1
Period: 11/72 to ? Funds: Unknown

The Fire Research Program of the RANN Division of the National Science Foundation is supporting work by K. E. Torrance and R. L. Mahajan on fire spread over liquid fuels and the influencing factors.

Publications

FIRE SPREAD OVER LIQUID FUELS: LIQUID PHASE PARAMETERS

Torrance, K. E., and R. L. Mahajan. 1974.
Symposium (International) on Combustion, 15th, Tokyo, Japan, 1974. p. 281-287.

The spread of fire over liquid fuels is controlled by flows in the liquid. These flows are driven by surface tension and buoyancy forces. The effect of these parameters has been obtained from numerical solutions of the liquid phase equations, and the results reported and summarized. They compare favorably with experimental flame spread rates for hydrocarbon and alcohol fuels.

SURFACE TENSION FLOWS INDUCED BY A MOVING THERMAL SOURCE

Torrance, K. E., and R. L. Mahajan. 1975.
Combustion Science and Technology 10:125-136.

A thermal source can induce surface tension flows which in turn help spread fire over flammable liquids. The flow structure and parameter dependence were investigated. The induced flow is in the form of a captured eddy just below the surface. Rate of circulation depends on the surface tension and the layer depth.

Information Source: K. E. Torrance, Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, New York 14850

3. GENERAL EFFECTS

R-294-75
ENVIRONMENTAL IMPACTS OF PETROLEUM INDUSTRY IN THE DELAWARE ESTUARY

Principal Investigator: Whipple, W.
Performing Organization: Rutgers The State University, Water Resources Research Institute, Old Queens Bldg., New Brunswick, New Jersey 08903
Supporting Agency: U.S. National Science Foundation, Division of Advanced Environmental Research and Technology, No. AEN74-14810 AOZ
Period: 6/75 to 5/76 Funds: $450,000

The project on environmental impacts of the petroleum industry in the Delaware estuary is just getting underway. The analysis of petroleum in urban runoff indicates that it is a large source of petroleum in this estuary. Estuary waters and refinery effluents are in the beginning stages of analysis. The bioassay work on manufactured petroleum products has gone well, verifying that different stages in the life cycles of the organisms have different vulnerabilities. A research approach to the economic, political and social aspects has been outlined.

Publications

MEASUREMENT OF URBAN RUNOFF PETROLEUM

Hunter, J. V., S. L. Yu, and W. Whipple, Jr. 1975.
Paper given, summer 1975.

Stormwater runoff samples and secondary treated refinery effluent samples in the Philadelphia area were analyzed and compared. For both sets of samples, the hydrocarbons were associated with the particulates and were aliphatic. It is estimated that the Philadelphia metropolitan area may contribute about four times as much oil and grease as the refinery effluents do.

Information Source: W. Whipple, Jr., Water Resources Research Institute, P.O. Box 231, Rutgers University, New Brunswick, New Jersey 08903

R-295-75
WEST FALMOUTH FOLLOW-UP STUDIES

Principal Investigator: Michael, A. D.
Performing Organization: Marine Biological Laboratory, Woods Hole, Massachusetts

Supporting Agency: American Petroleum Institute, No. OS-20L
Period: Unknown Funds: Unknown

Completion of this project was planned for December, 1975. A final report is expected to be completed in March or April, 1976.

Publications

LONG-TERM EFFECTS OF AN OIL SPILL AT WEST FALMOUTH, MASSACHUSETTS

Michael, A. D., C. R. Van Raalte, and L. S. Brown. 1975. Joint Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 573-582.

The status of the benthic fauna in the fourth and fifth year after a small spill of fuel oil is documented in this paper. Hydrocarbons typical of weathered fuel oil were found in the sediments of the marsh, boat basin and two offshore stations. Recovery for the total benthos has plateaued but individual areas and species are still in the process of recovering.

Information Source: L. S. Brown, Marine Biological Laboratory, Woods Hole, Massachusetts 02543

D. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

R-299-75
GENETICALLY ENGINEERED MICROORGANISMS FOR ENHANCED PRODUCTION OF PROTEIN

Principal Investigator: Chakrabarty, A. M.
Performing Organization: General Electric Company, 1 River Rd., Schenectady, New York 12305
Supporting Agency: U.S. National Science Foundation, Division of Biological and Medical Sciences, No. BMS75-10978
Period: 6/75 to 5/76 Funds: $30,000

The NSF-sponsored project will terminate around July, 1977. One paper has resulted from the study and is now in press.

Publications

USE OF GENETICALLY-ENGINEERED MULTI-PLASMID MICROORGANISMS FOR RAPID DEGRADATION OF FUEL HYDROCARBONS

Friello, D. A., J. R. Mylroie, and A. M. Chakrabarty. (in press) International Biodegradation Symposium, 3rd, Kingston, Rhode Island, 1975. J. M. Sharply (ed.).

Transmissible plasmids in different strains of *Pseudomonas putida* carry the genes specifying enzymes involved in the biodegradation of a number of hydrocarbons. Transfer of these plasmids into one strain can create a multi-plasmid strain capable of growing faster with crude oil than any of the naturally-occurring mono-plasmid parents.

Information Source: A. M. Chakrabarty, Physical Chemistry Lab, General Electric Co., Research and Development Center, P.O. Box 8, Schenectady, New York 12301

R-300-75
BIODEGRADATION OF OIL IN SOIL

Principal Investigator: Unknown
Performing Organization: Sun Ventures, Inc.
Supporting Agency: American Petroleum Institute, No. OS-21.3
Period: Unknown Funds: Unknown

This project was completed. There are no publications; final reports are available from the American Petroleum Institute Library.

Information Source: J. R. Gould, American Petroleum Institute, 2101 L St., N.W., Washington, D.C. 20037

2. GENERAL FATE OF OIL IN THE ENVIRONMENT

R-303-75
FATES AND EFFECTS OF OIL AND OIL COMPOUNDS ON MARINE COASTAL ECOSYSTEMS

Principal Investigators: Templeton, W. L., C. I. Gibson, J. R. Vanderhorst, and R. M. Bean
Performing Organization: Battelle Memorial Institute, P.O. Box 999, Richland, Washington 99352
Supporting Agency: U.S. Energy Research and Development Administration, Biomedical and Environmental Research Division, Contract AT(45-1)-1830
Period: 7/74 to 6/75 Funds: Unknown

This program is continuing. Annual reports for February, 1973 and 1974 have been completed. Recent oil pollution programs are listed below.

1. Long-term Effects of Hydrocarbons on Selected Ecosystems and Associated Organisms (U.S. ERDA Contract AT(45-1)1830).

2. Study to Define the Effects of Refinery Wastes and Oil Transfer Facilities on Pacific Northwest Marine Coastal Ecosystems (U.S. ERDA Contract AT(45-1)1830). Initiated in May, 1975.

3. Regional Survey of Marine Biota for Bioassay Standardization of Oil and Oil Dispersant Chemicals. API Publication 4167 (April, 1973).

4. Determination of Acute and Chronic Effects of Treated Ballast Water on Selected Aquatic Biota from Port Valdez, Alaska. Alyeska Pipeline Service Company (April, 1973).

5. Effects of Oil and Chemically Dispersed Oil on Selected Marine Biota--A Laboratory Study. API Publication 4191 (November, 1973).

6. Interdisciplinary Study of the Toxicity of Petroleum to Marine Organisms. Battelle Memorial Institute (March, 1974).

7. Summary Report on Effects of Oil Discharges, Domestic and Industrial Wastewaters on the Fisheries of Lake Maracaibo, Venezuela. Creole Petroleum Corporation, Caracas, Venezuela (June, 1974).

8. Study of Effects of Oil Discharges and Domestic and Industrial Wastewaters on the Fisheries of Lake Maracaibo, Venezuela. I. Ecological Characterization and Domestic and Industrial Wastes. Creole Petroleum Corporation, Caracas, Venezuela (October, 1974).

9. Study of Effects of Oil Discharges and Domestic and Industrial Wastewaters on the Fisheries of Lake Maracaibo, Venezuela. II. Fate and Effects of Oil. Creole Petroleum Corporation, Caracas, Venezuela (October, 1974).

10. Studies on the Effects of Two Oil Collecting Agents on Aquatic Organisms of Lake Maracaibo. Venezuelan Oil Intercompany Committee (July, 1974).

11. The Ecology of Lake Maracaibo: A Battelle Program of Study. Venezuelan Oil Intercompany Committee (November, 1974).

12. Field and Laboratory Studies to Obtain a Comparative Baseline for Assessing the Impact of Refinery Discharge and Potential Oil Spillage on the Cherry Point Environs. Part I. Physical and Chemical Oceanographic Characterization of the Cherry Point Site and Vicinity. Atlantic Richfield Company, Cherry Point Refinery, Ferndale, Washington (April, 1974).

13. Field and Laboratory Studies to Obtain a Comparative Baseline for Assessing the Impact of Refinery Discharge and Potential Oil Spillage on the Cherry Point Environs, Part II. Refinery Impact Studies. Atlantic Richfield Company, Cherry Point Refinery, Ferndale, Washington (June, 1974).

14. Field and Laboratory Studies to Obtain a Comparative Baseline for Assessing the Impact of Refinery Discharge and Potential Oil Spillage on the Cherry Point Environs. Part III. Biological Baseline (200 square miles). Atlantic Richfield Company, Cherry Point Refinery, Ferndale, Washington (January, 1974).

15. Field and Laboratory Studies to Obtain a Comparative Baseline for Assessing the Impact of Refinery Discharge and Potential Studies. Atlantic Richfield Company, Cherry Point Refinery, Ferndale, Washington (January, 1974).

Publications

CHARACTERIZATION OF PETROLEUM HYDROCARBONS IN THE MARINE ENVIRONMENT

Bean, R. M. 1974.
Pacific Northwest Laboratory, Annual Report for 1974 to the USAEC Division of Biomedical and Environmental Research. Part 2. p. 113-116.

New techniques are being developed to handle the complexities involved in determining the toxicity of petroleum to marine organisms. Differences in source, manufacturing processes, etc., affect oil toxicity. Filtration removes insoluble oil droplets, and extraction with He gas instead of a solvent increases gas chromatographic sensitivity to saturated hydrocarbons. Both processes increase analytical ability.

SUSPENSION OF CRUDE OILS IN SEA WATER: RAPID METHODS OF CHARACTERIZING LIGHT HYDROCARBON SOLUTES

Bean, R. M. 1974.
Marine Pollution Monitoring Petroleum Symposium and Workshop, National Bureau of Standards, Gaithersburg, Maryland, 1974. p. 43-46.

DETERMINATION OF SOLUBLE AROMATIC HYDROCARBONS IN SUSPENSIONS OF PETROLEUM IN SEAWATER

Bean, R. M., and J. W. Blaylock. 1974.
Pacific Northwest Laboratory, Annual Report for 1973 to the USAEC Division of Biomedical and Environmental Research. Part 2. Ecological Sciences. p. 35-37.

The light aromatic hydrocarbon composition of filtered and unfiltered water from bioassay systems was examined using gas chromatography. The aromatic composition was then compared with infrared measurements to determine the potential of the IR technique for routine analysis.

CHARACTERIZATION SEDIMENTS VICINITY OFFSHORE PETROLEUM PRODUCTION

Bean, R. M., J. W. Blaylock, E. A. Sutton, and R. E. Wildung. 1974.
Symposium on Chemistry of Marine Sediments at Atlantic City, September, 1974.

ANALYSIS EXTRACTABLE ORGANIC MATERIAL AND IDENTIFICATION SATURATE AND AROMATIC COMPOUND TYPES IN LAKE MARACAIBO SEDIMENTS

Bean, R. M., J. W. Blaylock, E. A. Sutton, and R. E. Wildung. 1975.
Paper given at Conference on Prevention and Control of Oil Pollution, San Francisco, 1975.

A RESEARCH REPORT ON ECOLOGY OF LAKE MARACAIBO, A BATTELLE PROGRAM OF STUDY

Bean, R. M., and E. A. Sutton. 1974.
23120/02303.

ASSESSMENT OF OIL SPILL TREATING AGENT TEST METHODS

Blaklaw, J. R., J. A. Strand, and P. C. Walkup. 1971.
Prevention and Control of Oil Spills. Environmental Petroleum Institute, Washington, D.C., 1971. p. 253-261.

DETERMINATION OF EXTRACTABLE ORGANIC MATERIAL AND ANALYSIS OF HYDROCARBON TYPES IN LAKE AND COASTAL SEDIMENTS

Blaylock, J. W., R. M. Bean, and R. E. Wildung. 1974.
Marine Pollution Monitoring Petroleum Symposium and Workshop, National Bureau of Standards, Gaithersburg, Maryland, 1974. p. 123-125.

DEVELOPMENT OF METHODOLOGY AND APPARATUS FOR THE BIOASSAY OF OIL

Lichatowich, J. A., P. W. O'Keefe, J. A. Strand, and W. L. Templeton. 1973.
Joint Conference with American Petroleum Institute, EPA, and U.S. Coast Guard, Environmental Petroleum Institute, Washington, D.C., 1973.

DEVELOPMENT OF TOXICITY TEST PROCEDURES FOR MARINE ZOOPLANKTON

Lichatowich, J. A., J. A. Strand, and W. L. Templeton. 1972.
Symposium Pollution of the Sea by Oil: Problems and Technology. Annual Meeting American Institute of Chemical Engineers, 6th, New York, New York, 1972.

DEVELOPMENT OF TOXICITY TEST PROCEDURES FOR MARINE PHYTOPLANKTON

Strand, J. A., W. L. Templeton, J. A. Lichatowich, and C. W. Apts. 1971.
Prevention and Control of Oil Spills, Environmental Petroleum Institute, Washington, D.C., 1971. p. 279-286.

ECOLOGICAL EFFECTS OF OIL POLLUTION

Templeton, W. L. 1971.
Journal of the Water Pollution Control Federation 43(6):1081-1088.

ECOLOGICAL EFFECTS OF OIL POLLUTION

Templeton, W. L. 1972.
Journal of the Water Pollution Control Federation 44(6):1128-1134.

OIL POLLUTION STUDIES ON LAKE MARACAIBO

Templeton, W. L., E. A. Sutton, R. M. Bean, R. C. Arnett, J. W. Blaylock, and R. E. Wildung. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975.

Low concentrations of oil in the lake water, no detectable accumulation of petroleum-derived hydrocarbons in muscle tissue, and the occurrence of bituminous materials in the sediment indicate that volatilization, biodegradation, and sedimentation are the major oil removal mechanisms. The rapid loss of light hydrocarbons decreases the oil's toxicity significantly.

TECHNICAL SERVICES TO ASSESS THE BIOLOGICAL IMPACT OF OIL SPILL AT CHERRY POINT ON 4 JUNE 1972, AND IDENTIFY SPECIFIC PROBLEM AREAS IN THE EVENT OF FUTURE OIL SPILLAGE

Vanderhorst, J. R. 1973.
Final Report, Contract 212B01291 to Atlantic Richfield Company, Cherry Point Refinery, Ferndale, Washington.

INTERDISCIPLINARY STUDY OF TOXICITY OF PETROLEUM TO MARINE ORGANISMS

Vanderhorst, J. R. 1975.
Paper given at Conference on Prevention and Control of Oil Pollution, San Francisco, 1975.

NONNUCLEAR EFFLUENTS: EFFECTS OF CRUDE OIL ON MARINE INTERTIDAL COMMUNITIES

Vanderhorst, J. R., R. M. Bean, and R. Y. Ting. 1974.
Pacific Northwest Laboratory, Annual Report for 1973 to the USAEC Division of Biomedical and Environmental Research. Part 2. Ecological Sciences. p. 105-107.

Because of petroleum's complexity, this study is a combined chemical/biological approach to environmental assessment. The biological effort concentrates on the development of satisfactory community level endpoints using 100 concrete block communities. Chemical characterization work is concentrating on definitions and developing new techniques for work on low-level chronic oil pollution.

EFFECTS OF PETROLEUM ON MARINE INTERTIDAL COMMUNITIES

Vanderhorst, J. R., C. I. Gibson, L. J. Moore, and P. Wilkinson. 1974.
Pacific Northwest Laboratory, Annual Report for 1974 to the USAEC Division of Biomedical and Environmental Research. Part 2. Ecological Sciences. p. 110-113.

The development of intertidal communities on oil-treated and control substrate units has been monitored to determine if the effects of petroleum contamination can be measured in terms of community development. A coonstripe shrimp was also exposed to oil in acute bioassays. Mortality and oil-in-water concentrations were determined as a function of mixing.

PRELIMINARY STUDY INTO ACCEPTABILITY OF DIVERSITY INDICES AND OTHER PARAMETERS OF BIOLOGICAL COMMUNITY RESPONSES BY RESEARCHERS, REGULATORS, AND INDUSTRIAL PERSONNEL

Vanderhorst, J. R., and P. Wilkinson. 1975.
Final Report to Environmental Protection Agency, NERC, Corvallis. Contract 300A00747.

Information Source: W. L. Templeton, Ecosystems Department, Battelle Northwest Laboratories, Battelle Blvd., Richland, Washington 99352

SECTION III. CURRENT RESEARCH PROJECTS

In subsequent Oil Spill and Oil Pollution Reports, sections II (Status of Some Research Projects Listed in Previous Reports) and III (Current Research Projects) will be combined into a single section containing research project information. Each contract will be described and summarized according to the standard arrangement, followed by available up-to-date status information, reports and publications. Because of this transition in format, some research projects listed in the following section include both project description and status material. Entries are grouped according to subject and then arranged by serial number within each subject division. Renewed project entries are listed at the beginning of each subject category.

A. OIL POLLUTION DETECTION AND EVALUATION

1. REPORTING

R-1-76
POLLUTION CONTROL EQUIPMENT AND PROCEDURES

Principal Investigator: Schleckser, C. E.
Performing Organization: Exxon International, Tanker Dept., 1251 Avenue of the Americas, N.Y., N.Y.
Supporting Agency: U.S. Department of Commerce, Maritime Administration
Period: 1/74 to 12/74 Funds: Unknown

The project will quantify and characterize pollutant discharges from tankers, and then "evaluate equipment and operating procedures designed to reduce such discharges."

Analysis
Waste oil and wastewater treatment

Information Source: MRIS Abstracts 11 (June):#080146. 1975.

2. MONITORING

R-008-74 (Renewal)
SHIPBOARD WASTEWATER OIL DETECTOR

Principal Investigator: Unknown
Department: Reentry and Environment Systems Division
Performing Organization: General Electric Company, 3198 Chestnut St., Philadelphia, Pennsylvania 19101
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 038987
Period: 7/75 to 6/76 Funds: Unknown

Several phases are included in this project: laboratory development program, optical discrimination development testing, centrifugal separation development resting, laboratory testing program, and conceptual design.

Waste oil and wastewater treatment
Design and engineering

SSIE No.: GZ-38987-3

R-272-74 (Renewal)
SHIPBOARD WASTE-WATER OIL DETECTOR

Principal Investigator: Unknown
Performing Organization: Enviro Control Incorporated, 960 Thompson Ave., Rockville, Maryland 20852
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 045014
Period: 7/75 to 6/76 Funds: Unknown

The contract for a shipboard waste-water oil detector covers system and electrical design, modifications, testing and refinements, final assembly, an operating manual, and reports.

Design and engineering

SSIE No.: GZF-69-2

R-2-76
HYDROCARBON STUDIES IN PUGET SOUND AND OFF THE WASHINGTON COAST

Principal Investigators: Carpenter, R., and A. W. Fairhill
Performing Organization: Department of Oceanography, WB-10, University of Washington, Seattle, Washington 98195

Supporting Agency: Energy Research and Development Administration
Period: 6/76 to 5/76 Funds: Unknown

The objectives of the research are to increase the understanding of: the present distribution of aliphatic, aromatic and sulfur-containing molecules in organisms, sediments and water, while the distribution is still primarily due to natural processes; the composition and importance of the transfer of land-derived hydrocarbons to this area by river input, sewage discharges, and atmospheric rainout, compared to biosynthesis by marine organisms; and the transfer of certain of these hydrocarbons between some parts of the food web.

Biological effects of oil pollution
Source identification

Status: No reports or papers have been published at the present time.

Information Source: R. Carpenter, Department of Oceanography, WB-10, University of Washington, Seattle, Washington 98195

R-3-76
TRANSFER AND DISPERSION OF ORGANIC POLLUTANTS FROM AN OIL REFINERY THROUGH COASTAL WATERS

Principal Investigator: Koo, F. S.
Performing Organization: Puerto Rico Nuclear Center, College Station, Mayaguez, Puerto Rico 00708
Supporting Agency: Energy Research and Development Administration
Period: 7/75 to 7/76 Funds: Unknown

The project is concerned with the identification of organic pollutants from offshore oil extraction facilities and shore-based oil refineries in near-shore marine waters, their distribution in a bay receiving refinery and industry effluent, and the incorporation of pollutants into selected marine organisms.

Biological effects of oil pollution

Status: Hydrocarbon levels have been determined and identified in all components of the study system and have been compared with those in unpolluted areas. The environmental burden caused by the petrochemical complex has been evaluated. No papers or reports have been prepared at the present time.

Information Source: K. W. Watters, Marine Ecology Division, Puerto Rico Nuclear Center, College Station, Mayaguez, Puerto Rico 00708

3. REMOTE SENSING

R-012-74 (Renewal)
AIRBORNE OIL SURVEILLANCE SYSTEM/AOSS

Principal Investigator: Unknown
Performing Organization: Aerojet General Corporation, 9200 E. Flair Dr., El Monte, California 91734
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 036083
Period: 7/75 to 6/76 Funds: Unknown

"The detailed design, fabrication, installation, and flight test evaluation of a prototype airborne oil surveillance system/AOSS."

Design and engineering

SSIE No.: GZF-20-3

R-279-74 (Renewal)
AIRBORNE OIL SURVEILLANCE SYSTEM

Principal Investigator: Unknown
Performing Organization: U.S. Navy, Research Laboratory, Washington, D.C. 20390
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 048954
Period: 7/75 to 6/76 Funds: Unknown

The contract provides for the development of a real-time microwave radiometric sensor to make onboard computation of oil slick thickness or slick volume feasible. The investigators will also assist the Coast Guard in evaluating microwave data from flight tests of the airborne oil surveillance system and other microwave systems.

Design and engineering

SSIE No.: GZ-48954-2

R-280-74 (Renewal)
DEVELOPMENT OF A LIDAR POLARIMETER SENSOR FOR REMOTE DETECTION AND MONITORING OF OIL AND OTHER HAZARDOUS MATERIAL

Principal Investigator: Unknown
Performing Organization: Texas A & M University System, Graduate School, College Station, Texas 77843

Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 045017
Period: 7/75 to 6/76 Funds: Unknown

The contract covers the design, construction and testing of the optical subsystem, the electronic system concept development, design of the signal conditioner and data processor, and the testing and evaluation of all components and the total design.

Design and engineering

SSIE No.: GZF-70-2

R-4-76
ASSESSMENT AND DOCUMENTATION OF OIL AND HAZARDOUS SUBSTANCES SPILLS

Principal Investigators: Lambou, V. W., and A. E. Pressman
Department: Water Monitoring Branch
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, P.O. Box 15027, Las Vegas, Nevada 89114
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 1HA325
Period: 7/74 to 6/75 Funds: $214,000

The objectives of this study are to develop standard operating procedures and manuals to assess spills, and to develop airborne remote sensing devices for detection and assessment. At present, data are being collected on hazardous substances' characteristics and effects; a spectral scanning remote sensor is in the initial stages.

General effects of oil pollution
Design and engineering

SSIE No.: GMA-2209

4. SOURCE IDENTIFICATION

R-5-76
QUALITY OF CRUDE OILS AND PRODUCTS - OIL SPILL IDENTIFICATION

Principal Investigator: Unknown
Performing Organization: Bartlesville Energy Research Center, Bartlesville, Oklahoma
Supporting Agency: U.S. Energy Research and Development Administration
Period: 2/72 to 6/80 (approx.) Funds: Unknown

The objective of this research is to determine, measure and computerize distinctive properties and related data on crude oils and crude oil residues, and establish reliable definitive spill "fingerprinting" and identification with a high degree of confidence and applicability.

Analysis

Information Source: W. E. Mott, Division of Environmental Control Technology, U.S. Energy Research and Development Administration, Washington, D.C. 20545

B. OIL POLLUTION PREVENTION AND CONTROL

1. CONTAINMENT

R-043-74 (Renewal)
FAST CURRENT OIL CONTROL SYSTEM PROJECT

Principal Investigator: Unknown
Performing Organization: University of Michigan, Graduate School, Rackham Building, Ann Arbor, Michigan 48104
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 038885
Period: 7/75 to 6/76 Funds: Unknown

The objective of this project is to design, produce and test barrier models to reach certain specifications. The trajectories of entrained oil droplets will be determined in order to design devices to direct droplet flow. The role of water turbulence in oil-water stability and the flow characteristics when the barrier is used to herd oil will also be established.

Design and engineering

SSIE No.: GZ-38885-3

R-6-76
EXPERIMENT IN OIL BARRIERS

Principal Investigator: Howard, A. H.
Performing Organization: Rhode Island University, 80 Lower College Road, Kingston, Rhode Island 02881
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 7/73 to 3/74 (est.) Funds: Unknown

The experiments included in this contract will determine the load and barrier shape of oil barriers as a function of current, wave action and gap opening.

MIRS Abstracts 11 (June):#038991. 1975.

R-7-76
DEVELOPMENT OF METHODS AND TECHNIQUES TO RAPIDLY TRENCH SEA-ICE FOR THE CONTAINMENT OF OIL

Principal Investigator: Unknown
Performing Organization: Mining Resources Engineering Ltd., Kingston, Ontario, Canada

Supporting Agency: Canada, Department of the Environment, No. SS01 KE204-4-EP14
Period: 1/75 to 12/75 Funds: $25,214

No summary provided to SSIE.

SSIE No.: BJ-184

Status: The research project was conducted for the Environmental Protection Service, Environment Canada, as part of the Beaufort Sea Study. It was completed in May, 1975 and consisted of three parts:

Phase I - Selection and Development of Trenching Techniques
Phase II - Oil Spill Containment Feasibility Study
Phase III - Testing and Evaluation Technical and Cost Proposal

Abstracts for these 3 parts are given below.

Reports

Phase I - Selection and Development of Trenching Techniques
This report presents a detailed review of the existing methods and techniques for rapid trenching of the sea ice to the water surface. A new technique is developed to rapidly trench Beaufort Sea ice. This is a cratering technique using drilled TNT and standard explosive accessories in conjunction with a gasoline-powered, track-mounted, 12-inch diameter ice auger to produce explosively excavated trenches.

Phase II - Oil Spill Containment Feasibility Study
This report presents a feasibility study on the containment of a crude oil spill from a well on an offshore oil lease in the Beaufort Sea. Emphasis is placed on the effectiveness, logistics, and cost of the trenching technique developed in Phase I as a means for containing this spill in various types of sea ice and locations in the Beaufort Sea.

Phase III - Testing and Evaluation Technical and Cost Proposal
A technical and cost proposal for the testing and evaluation of the trenching method developed in Phase I is presented. This proposal also contains test work considered essential for full-scale evaluation of trenching as an oil containment method in shore fast ice.

Information Source: W. A. Crosby, Mining Resource Engineering Ltd., 24A Chatham St., Kingston, Ontario K7K 4G5

2. CLEANUP AND RECOVERY

R-032-74 (Renewal)
HIGH SEAS, EPA POOL, AND SPILL OF OPPORTUNITY TESTING

Principal Investigator: Unknown
Performing Organization: Lockheed Missiles and Space Co., 1111 Lockheed Way, Sunnyvale, California 94088
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 045388
Period: 7/75 to 6/76 Funds: Unknown

"High seas testing, preparation of special test equipment, test operations, and final report."

SSIE No.: GZ-45388-2

R-154-74 (Renewal)
PROTOTYPE OIL RECOVERY SYSTEM FOR USE ON THE HIGH SEAS, PHASE II/LOCKHEED

Principal Investigator: Unknown
Performing Organization: Lockheed Missiles and Space Co., 1111 Lockheed Way, Sunnyvale, California 94088
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 025418
Period: 7/74 to 6/75 Funds: $91,487

A comprehensive loads analysis and a loads analysis for the internal pressure of the inflation system will be combined to form the basis of the structural criteria to be used in designing the pontoons. More loads analyses of localized areas may be required as the design progresses.

Design and engineering

SSIE No.: GZF-18-2

R-293-74 (Renewal)
HYDRODYNAMIC STUDY OF POROUS BARRIERS AND THE DISC DRUM OIL RECOVERY MECHANISM

Principal Investigator: Unknown
Performing Organization: Texas A & M University System, Graduate School, College Station, Texas 77843

Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 055593
Period: 7/75 to 6/76 Funds: Unknown

A computer analysis of single and multiple barrier designs will be made. Factors such as oil thickness, water and oil viscosity, and oil type will be evaluated; k, the pressure drop coefficient, will be determined. A closed loop pressure drop rig will be designed and fabricated.

Design and engineering

SSIE No.: GZ-55593-1

R-299-74 (Renewal)
FAST CURRENT OIL RESPONSE SYSTEM

Principal Investigator: Unknown
Performing Organization: Seaward Incorporated, 6269 Leesburg Pike, Falls Church, Virginia 22044
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 055588
Period: 7/75 to 6/76 Funds: Unknown

A system capable of performing effectively in a variety of oil spill conditions and in current velocities of 4-10 knots will be developed in order to minimize the technical risks associated with the control of oil slicks in fast currents.

Design and engineering

SSIE No.: GZ-55588-1

R-8-76
FLAME SPREADING ACROSS LIQUID FUELS

Principal Investigators: Glassman, I., W. A. Sirignano, and F. L. Dryer
Department: Aerospace and Mechanical Science
Performing Organization: Princeton University, School of Engineering and Applied Science, Box 430, Princeton, N.J. 08540
Supporting Agency: U.S. National Science Foundation, Division of Advances in Energy Research and Technology
Period: 3/75 to 2/76 Funds: 1975 - $73,000

The study of the spread of flames across liquid fuels can add to the understanding of many problems, including combustion techniques for the removal of oil spills. A complete analytical solution, which combines both the gas and liquid phenomena, is being developed to answer some of the questions.

Bibliographic references: FLAME SPREADING ACROSS LIQUID FUELS. Dryer, F. L., H. J. Herring, A. Helmstetter, W. A. Sirignano and I. Glassman. 1973. Princeton University Aerospace and Mechanical Sciences, Technical Report No. 1140.

SSIE No.: GSQ-150-3

R-9-76
FAST CURRENT OIL RESPONSE SYSTEM

Principal Investigator: Unknown
Performing Organization: Hydronautics, Inc., 7210 Pindel School Road, Laurel, Maryland 20810
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 7/74 to 4/75 (est.) Funds: Unknown

This fast current oil response system will be designed to be effective in currents of 4 to 10 knots and a variety of oil spill conditions. The system will be designed in order to minimize the technical risks associated with fast current control and recovery of oil slicks.

Design and engineering

MRIS Abstracts 11 (June):#055589. 1975.

Status: The final report has been prepared and is available through NTIS, USCG-D-36-75, Contract DOT-CG-40218-A. Hydronautics' involvement in this Coast Guard project has been discontinued.

Reports and Publications

FAST CURRENT OIL RESPONSE SYSTEM - STAGE I, SVROS DEVELOPMENT

Lindenmuth, W. T., T. R. Sundaram, and A. M. Sinnerwalla. 1975. Final report, TR 7501-1 USCG-D-36-75, Contract DOT-CG-40218-A.

The Surface Velocity Retarder Oil Skimmer (SVROS) is an energy absorbing device designed to recover thin oil slicks in high relative currents. An array of closely spaced flat plates gradually dissipates the kinetic energy of the oil/water inflow so that the oil can be collected without entrainment losses. In model tests, the effects of velocity, oil type, slick thickness and model geometry were tested. Optimal model configurations for different environmental conditions were discovered.

Information Source: W. T. Lindenmuth, Hydronautics, Inc., 7210 Pindell School Road, Howard County, Laurel, Maryland 20810

R-10-76
LITERATURE ON PENETRATING SEA-ICE, AND RECOVERY, TRANSFERRAL, SEPARATION AND DISPOSAL OF OIL SPILLED UNDER ARCTIC ICE (ABBREV)

Principal Investigator: Unknown
Performing Organization: Montreal Engineering Company Ltd., Montreal, Quebec, Canada
Supporting Agency: Canada, Department of the Environment, No. SS01 KE204-4-EP10/12/13
Period: 11/74 to 10/75 Funds: $116,112

No summary provided to SSIE.

SSIE No.: BJ-183

R-11-76
POLLUTION CONTROL EQUIPMENT

Principal Investigator: Unknown
Performing Organization: Naval Coastal Systems Laboratory, Panama City, Florida 32401
Supporting Agency: U.S. Department of Transportation, Coast Guard, Z-70099-4-42734
Period: 6/74 to 2/76 Funds: Unknown

The objective of this project is "to design, fabricate, test and evaluate a developmental model of a Fast Surface Delivery System (FSD) for Pollution Control Equipment."

Design and engineering

Information Source: MRIS Abstracts 11 (June):#055596. 1975.

R-12-76
STORAGE AND ULTIMATE DISPOSAL OF OIL RECOVERED FROM SPILLS

Principal Investigator: Unknown
Performing Organization: Battelle Columbus Laboratories, 505 King Avenue, Columbus, Ohio 43201

Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 7/74 to 2/75 (est.) Funds: Unknown

Battelle's investigation concerns methods for temporary storage and ultimate disposal of oil recovered from spills in Alaska.

Information Source: MRIS Abstracts 11 (June):#055585. 1975.

3. WASTE OIL AND WASTE WATER TREATMENT

R-211-74 (Renewal)
BILGE AND BALLAST WATER OIL POLLUTION CONTROL TECHNOLOGY FOR NAVAL SHIPS

Principal Investigators: Yu, T. S., and J. I. Schwartz
Performing Organization: U.S. Navy, Ship Research and Development Center, Annapolis, Maryland 21402
Supporting Agency: U.S. Department of Defense, Navy, No. DN710112
Period: 7/75 to 6/76 Funds: Unknown

No summary provided to SSIE.

SSIE No.: ZQN-710112-5

R-325-74 (Renewal)
CHARACTERIZATION AND TREATMENT OF SHIPBOARD OILY WASTE STREAMS

Principal Investigators: Schmitt, R. F., and J. W. Harden
Performing Organization: U.S. Navy, Ship Research and Development Center, Annapolis, Maryland 21402
Supporting Agency: U.S. Department of Defense, Navy, No. DN578168
Period: 7/75 to 6/76 Funds: Unknown

No summary provided to SSIE. Title of previous grant was "Particulate removal in oil/water separation processes."

Analysis

SSIE No.: ZQN-578168-1

4. PERSONNEL TRAINING AND EDUCATION

R-13-76
NATIONAL OIL SPILL TRAINING PROGRAM

Principal Investigator: Franklin, H. L.
Performing Organization: Texas A & I University, Corpus Christi, P.O. Box 6010, Corpus Christi, Texas 78411
Supporting Agency: U.S. Energy Research and Development Administration
Period: 10/75 to ? Funds: Unknown

The course to be developed would focus on cleanup of oil spills from terminals, barge and tanker accidents, pipeline ruptures, and spills associated with exploration and production facilities that could affect the aquatic environment. As a part of the curriculum, the University will produce motion pictures and slides for use in course instruction. The curriculum will be broad enough to include personnel from private cleanup services, corporations, governmental agencies and other individuals.

Cleanup and recovery

Information Source: W. E. Mott, Division of Environmental Control Technology, U.S. Energy, Research and Development Administration, Washington, D.C. 20545

5. CONTINGENCY PLANNING

R-14-76
OIL SPILLS - THE POLICY OF PREVENTION AND THE STRATEGY OF RECOVERY

Principal Investigator: Conrad, J. M.
Specialty: Agricultural and Food Economics
Performing Organization: University of Massachusetts, School of Food and Natural Research, Amherst, Massachusetts 01002
Supporting Agency: U.S. Department of the Interior, Office of Water Research and Technology, No. A-087-MASS
Period: 7/75 to 7/76 Funds: $5,000,multiple support

The objectives of this study are: (1) survey state and national legislation designed to prevent spills and assess its effectiveness; and (2) survey the oil spills recovery technology and construct a model for the allocation of recovery resources so as to be in "the best state of preparedness" in the event of a spill.

State legislation
Foreign legislation

SSIE No.: GUY-365

Status: This project deals only with oil recovery strategy for coastal Massachusetts. Research to construct indices of sensitivity of coastal zone resources is underway and will be completed by 2/29/79. Review and incorporation of existing oil spill statistics into the proposed location model is underway with completion expected by 2/29/79. Nearshore oil recovery technology will be assessed to determine probable recovery rates for resources (vessels, booms, barges, skimmers, and material adsorbents) located at several harbors along this coastline. This origin-destination recovery efficiency will be completed by 4/30/76. All information obtained from these studies will be introduced into a spatial model seeking to minimize the cost of unrecovered oil. A report to the Water Resources Center, University of Massachusetts, is expected by 6/30/76.

Information Source: J. M. Conrad, Food and Resource Economics, 304 Draper Hall, University of Massachusetts, Amherst, Massachusetts 01002

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

R-088-74 (Renewal)
FUNDAMENTAL ANALYSIS TO ENABLE DETERMINING EFFECTS OF OIL POLLUTION

Principal Investigators: Glynn, P. W., C. Birkeland, A. A. Reimer, and J. R. Young
Performing Organization: U.S. Environmental Protection Agency, 401 M St., S.W., Washington, D.C. 20460
Supporting Agency: Smithsonian Institution Tropical Research Institute, No. 14-12-874
Period: 7/74 to 6/75 Funds: Multiple support, unknown

In late 1968, a tanker broke up 2 to 3 miles from the STRI marine laboratory at Galeta Island. Since little quantitative data were available on the organisms of the reefs and mangroves nearby, the "biological costs" of the oil pollution could not be assessed. STRI proposes to establish the necessary baselines, and to explore several natural agents of oil pollution abatement.

SSIE No.: GTA-64-3

R-232-74 (Renewal)
PROCESSING OF BUNKER C OIL PARTICLES BY ZOOPLANKTON

Principal Investigator: Strickler, J. R.
Specialty: Earth and Planetary Sciences
Performing Organization: John Hopkins University, School of Arts and Sciences, Charles and 34th Sts., Baltimore, Maryland 21218
Supporting Agency: American Chemical Society, No. 2740GI
Period: 9/74 to 8/75 Funds: $2,000

No summary provided to SSIE.

Biological degradation

SSIE No.: PCS-1856-2

P-15-76
STUDIES ON HYDROCARBON AND HEAVY METAL POLLUTANTS IN THE MARINE ENVIRONMENT

Principal Investigator: Di Salvo, L. H.
Performing Organization: Naval Biomedical Research Laboratory, School of Public Health, University of California, Oakland, Ca. 94625

Supporting Agency: Department of the Navy, Office of Naval Research
Period: 11/71 to continuing Funds: Unknown

The purpose of this research is to determine pollutant induced levels of selected hydrocarbons and heavy metals in environmental samples; and to determine their potential effects on the natural functions of organisms and microsystems in which they occur. A number of studies have been conducted which have defined pollutant hydrocarbon and copper levels within selected organisms from San Francisco Bay and unpolluted background environments.

Status: Final studies on the presence and identification of petroleum residues in organisms of San Francisco Bay are continuing. A study is in progress to compare hydrocarbon burdens between Dungeness crabs from the San Francisco and Eureka fishing grounds in an attempt to demonstrate any differences which may explain population declines near this area. Research is beginning on a project for the U.S. Army Corps of Engineers Waterways Experiment Station. This work concerns the potential for the release of oil and grease residues from dredging which may enter and affect organisms in or near the dredging areas. It is a literature and preliminary laboratory program.

Publications

HYDROCARBONS ASSOCIATED WITH SUSPENDED PARTICULATE MATTER IN SAN FRANCISCO BAY WATERS

Di Salvo, L. H., and H. E. Guard. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975.

A double settling tube called the "biosampler" was used to collect suspended sediments; bay mussels in one of the tubes were used to actively entrap the particles. Thin-layer chromatography was used to analyze for total alkane and total aromatic hydrocarbons in the sediments. Using the minimum values, it was calculated that 13.5 metric tons of presumably pollutant hydrocarbons were associated with the suspended particulates in the bay.

TISSUE HYDROCARBON BURDEN OF MUSSELS AS POTENTIAL OF ENVIRONMENTAL HYDROCARBON INSULT

Di Salvo, L. H., H. E. Guard, and L. Hunter. 1975.
Environmental Science and Technology 9(3):247-251.

Data are presented on the hydrocarbon content of mussels collected from stations in San Francisco Bay and clean water, on hydrocarbon loss when polluted mussels are transferred and the result of placing these transplants back in their home waters.

Information Source: L. H. Di Salvo, Naval Biomedical Research Laboratory, Naval Supply Center, Oakland, California 94625

R-16-76

LIABILITY OF AROMATIC HYDROCARBONS AND THEIR NON-LETHAL EFFECTS ON MARINE ORGANISMS

Principal Investigators: Reichardt, P. B., and D. K. Button
Specialty: Chemistry
Performing Organization: University of Alaska, School of Mathematics, Physical Sciences and Engineering, Fairbanks, Alaska 99735
Supporting Agency: U.S. National Science Foundation, Division of National and International Programs, No. ID075-03677A01
Period: 8/75 to 11/75 Funds: $21,400

The metabolism of substituted aromatic hydrocarbons by marine microorganisms will be studied. The compounds tested will come from laboratory synthesis, purchased from outside sources and collected from oil polluted water. Chemostat techniques will be used to test the effect of low concentrations of these compounds on organisms.

Biological degradation

SSIE No.: GSN-2038-1

R-17-76

Unknown

Principal Investigator: Rice, S. D.
Performing Organization: U.S. Department of Commerce, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821
Supporting Agency: U.S. Fish and Wildlife Service, Aleyeska Pipeline Service Co.
Period: 1975 to ? Funds: $65,000

Research being conducted involves oil bioassays and avoidance behavior of salmon fry to oil in freshwater.

Status: The above research is for the current year.

Information Source: J. F. Karinen, U.S. Department of Commerce, NOAA, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821

R-18-76
ACUTE AND CHRONIC TOXICITY, UPTAKE AND DEPURATION AND SUBLETHAL METABOLIC RESPONSES OF ALASKAN MARINE ORGANISMS TO PETROLEUM HYDROCARBONS

Principal Investigators: Rice, S. D., and J. F. Karinen
Performing Organization: U.S. Department of Commerce, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821
Supporting Agency: U.S. Department of Commerce, NOAA, Environmental Research Laboratories, Outer Continental Shelf Energy Assessment Program
Period: 7/75 to 10/76 Funds: $227,800

General research objectives are: to determine the acute and chronic effects of crude oil, its component fractions, and other petroleum-associated chemicals on physiological and behavioral mechanisms of selected arctic organisms; and to conduct laboratory and field studies to determine recovery rates of organisms and ecosystems from disturbances associated with petroleum development.

Status: This contract is initially for 15 months, but it is expected to be renewed annually for several years.

Information Source: J. F. Karinen, U.S. Department of Commerce, NOAA, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821

R-19-76
EFFECTS OF COOK INLET CRUDE OIL ON MARINE ORGANISMS/KACHEMAK BAY MARINE STUDIES PROJECT

Principal Investigators: Rice, S. D., and J. F. Karinen
Performing Organization: U.S. Department of Commerce, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821
Supporting Agency: Shell Oil Company, Union Oil Company of California, Standard Oil Company of California, Marathon Oil Company, Phillips Petroleum Company, Texaco, Inc.
Period: 6/74 to 11/75 Funds: $175,000

The purpose of the study was to conduct acute bioassays with Cook Inlet crude oil on Alaskan organisms.

Status: The contract is in its final stages of completion - all research is completed and a final report is in preparation. The final report is expected to be submitted to the funding organization about January, 1976, and should be available shortly after this date.

Information Source: J. F. Karinen, U.S. Department of Commerce, NOAA, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821

R-20-76
EFFECTS OF PETROLEUM ON COMMERCIALLY IMPORTANT MARINE SPECIES OF SOUTHERN ALASKA

Principal Investigator: Unknown
Performing Organization: National Marine Fisheries Service, Auke Bay, Alaska
Supporting Agency: Standard Oil Company of California, Union Oil Company of California, Shell Oil Company and Texaco
Period: 1974 to 1976 Funds: $200,000

The acute and chronic effects of petroleum on various life stages of commercially important species indigenous to Southern Alaska are being studied. Crude oils from Cook Inlet and Prudhoe Bay are being used.

Economic effects of oil pollution

Status: The experimental work is completed and a report is being prepared. Results will be published in technical journals by individual co-investigators.

Information Source: T. Smith, Standard Oil Company, P.O. Box 3495, San Francisco, California 94119

R-21-76
MUTAGENIC POTENTIAL OF PETROLEUM BY PRODUCTS IN CHESAPEAKE BAY WATERS

Principal Investigator: Voll, M. J.
Specialty: Microbiology
Performing Organization: University of Maryland, Graduate School, College Park, Maryland 20740
Supporting Agency: U.S. Department of the Interior, Office of Water Research and Technology, No. A-034-MD
Period: 7/75 to 6/76 Funds: Unknown

The ability of oil polluted water and sediments and oil degradation products to induce mutation will be tested in a bacterial assay system designed to detect compounds which induce point mutations in DNA. Rat liver homogenate will be used to detect compounds which can be converted to mutagenic derivatives by mammalian enzyme systems.

SSIE No.: GUY-445

Status: The project is currently in progress. No resultant papers or reports have been prepared.

Information Source: M. J. Voll, Department of Microbiology, University of Maryland, College Park, Maryland 20742

2. GENERAL EFFECTS

R-22-76
MARINE ECOSYSTEM ANALYSIS PROGRAM (MESA)

Principal Investigator: Gunnerson, C. G.
Performing Organization: U.S. Department of Commerce, Environmental Research Laboratories, Boulder, Colorado 80302
Supporting Agency: U.S. Department of Commerce, NOAA, Environmental Research Laboratories, No. 84121405
Period: 7/75 to 6/76 Funds: $500

Projects under MESA now include New York Bight and Puget Sound Projects and the Deep Ocean Mining Environmental Study. The director of MESA coordinates and directs the numerous interrelated elements in each project. Further on-site investigations of the "Metula" oil spill will be added.

SSIE No.: ZBP-978-1

Status: The project is continuing.

Reports

THE METULA OIL SPILL

Gunnerson, C. G. 1975.
Summary of the National Oceanic and Atmospheric Administration Workshop, Boulder, Colorado, June 24-26, 1975.

The fate and effects of the Metula Oil Spill, the research needed to provide transferrable information for use in other areas, and the roles of U.S., Chilean and international agencies in future research in this area were reviewed at the workshop. Initial obvious economic impacts of this extremely large spill on the environment were not large. Long-term effects are yet to be measured and a unique opportunity exists to develop valuable and transferrable environmental information for use in planning and predicting impacts and remedial measures elsewhere.

Information Source: C. G. Gunnerson, Marine Ecosystems Analysis Program Office, U.S. Department of Commerce, NOAA, Environmental Research Laboratories, Boulder, Colorado 80302

R-23-76
A BASELINE STUDY OF THE MOSS LANDING ELKHORN SLOUGH ENVIRONMENT

Principal Investigator: Nybakken, J.
Performing Organization: California State University and Colleges, Graduate School, Washington Square, San Jose, California 95114
Supporting Agency: Pacific Gas and Electric Company
Period: 7/74 to 6/75 Funds: 1974, $10,000; 1975, $90,000

A resolution by the Central Coast Region California Coastal Zone Conservation Commission has provided the impetus for an objective, systematic baseline study of the Moss Landing - Elkhorn Slough environment. The investigators propose to study benthic macro-invertebrates and fishes inhabiting Elkhorn Slough to determine natural variability and dependence on the slough.

Biological effects of oil prospecting and production

SSIE No.: BG-960

R-24-76
MARINE BIOLOGY PROGRAM

Principal Investigator: Watters, K.
Performing Organization: Puerto Rico Nuclear Center, College Station, Mayaguez, Puerto Rico 00708
Supporting Agency: Energy Research and Development Administration
Period: 7/75 to ? Funds: Unknown

The purposes of this study are: to determine the types of energy related pollutants; their levels and effects in the air, water, soil sediments, natural ecosystems, cultivated crops and human beings. The total impact of energy related pollutants in Guayanilla-Tallaboa area, where the largest petrochemical and fossil fuel power plant complex is located, will be assessed.

Status: About 80% of the research effort in February, 1976, will focus on the effects of petrochemical refineries and related industries on the nearshore tropical marine communities in Guayanilla-Tallaboa bays. No reports or papers have been prepared at the present time.

Information Source: K. W. Watters, Marine Ecology Division, Puerto Rico Nuclear Center, College Station, Mayaguez, Puerto Rico 00708

D. EFFECTS OF OIL PROSPECTING AND PRODUCTION

1. GENERAL EFFECTS

R-25-76
ATLANTIC/ALASKAN OCS PETROLEUM STUDY

Principal Investigators: Moore, S. F., J. W. Devanney, and J. B. Lassiter
Specialty: Civil Engineering
Performing Organization: Massachusetts Institute of Technology, School of Engineering, Cambridge, Massachusetts 02139
Supporting Agency: U.S. Department of Health, Education and Welfare, Social and Rehabilitation Service, Community Services Administration
Period: 7/75 to 6/76 Funds: Unknown

This study concerns potential effects of oil prospecting and production on the OCS of the Atlantic and the Gulf of Alaska. Oil spill tracking, weathering and effects will be investigated. From the analysis of hypothetical oil discharges, high risk areas will be identified.

Bibliographic references:

POTENTIAL BIOLOGICAL EFFECTS OF HYPOTHETICAL OIL DISCHARGES IN THE ATLANTIC COAST AND GULF OF ALASKA. Moore, S. F., G. R. Chirlin, B. P. Schrader, and C. J. Puccia. M.I.T. Sea Grant Project Office, MIRSG-74-19, 1974.

ECOLOGICAL ASPECTS OF OFFSHORE EXPLORATION AND EXPLOITATION ACTIVITIES. Moore, S. F., G. R. Chirlin, B. P. Schrader, and C. J. Puccia. ONS Technology Conference, Stavenger, Norway, 1974.

General fate of oil in the environment

SSIE No.: GTB-1464

R-26-76
LOUISIANA SUPERPORT FEASIBILITY STUDIES

Principal Investigators: Stone, J. H., Whitehurst, Moeller, G. Johnson, and Gagliano
Performing Organization: Louisiana State University, Baton Rouge, Louisiana 70803
Supporting Agency: National Oceanic and Atmospheric Administration, Sea Grant Office, R/PHT-1
Period: 2/73 to 7/74 (est.) Funds: Unknown

The feasibility studies will include economic justification, legal problems, engineering data needs, and environmental constraints. To date, the first-phase report has been completed; it includes preliminary recommendations to the State Deep Draft Harbor and Terminal Authority on topics such as law and environment.

Information Source: MRIS Abstracts 11 (June):#050007. 1975.

E. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

R-27-76
EFFECTS OF TEMPERATURE AND CRUDE OIL COMPOSITION ON PETROLEUM BIODEGRADATION

Principal Investigator: Atlas, R. M.
Performing Organization: University of Louisville, Louisville, Kentucky
Supporting Agency: Department of the Navy, Office of Naval Research
Period: 9/73 to 12/76 Funds: Unknown

This research is to further increase knowledge in the field of Arctic and Antarctic marine microbiology. The work is designed to study the intersection of microbial communities of coastal waters with Alaskan crude oil.

Status: Summer field work concerned with monitoring changes in microbial populations of Alaskan coastal waters exposed to petroleum hydrocarbons was carried out in collaboration with the Naval Arctic Research Laboratory. The effects of the oil on essential microbial processes are being determined to learn if oil is degradable when the sea is frozen.

Information Source: P. E. Toops, Naval Biology, Department of the Navy, Office of Naval Research, Arlington, Virginia 22217

R-28-76
MICROBIAL METABOLISM OF HYDROCARBONS UNDER LOW TEMPERATURE MARINE CONDITIONS

Principal Investigator: Cundell, A. M.
Performing Organization: Rhode Island University, Department of Plant Pathology-Entomology, Kingston, Rhode Island 02881
Supporting Agency: Office of Naval Research
Period: 3/73 to ? Funds: Unknown

The information on marine microbiology in cold regions will be extended. Microbial metabolism of hydrocarbons under low temperature marine conditions will be investigated.

Information Source: MRIS Abstracts 11 (June):#044215. 1975.

R-29-76
ARCTIC OIL BIODEGRADATION

Principal Investigator: Unknown
Performing Organization: Alaska University, College, Institute of Marine Sciences, College, Alaska 99701
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 6/72 to 6/74 (est.) Funds: Unknown

The question of the importance of biodegradation in the eventual elimination or reduction of hydrocarbons in arctic waters is addressed.

Information Source: MRIS Abstracts 11 (June):#036326. 1975.

R-30-76
BIODEGRADATION OF HYDROCARBONS

Principal Investigator: Unknown
Performing Organization: Bureau de Recherches Geol. et Min., 74 Rue de la Federation, Paris 15E, France
Supporting Agency: France, Bureau of Recherches Geol. et Min., No. RS200
Period: 1/74 to 12/74 Funds: Unknown

The biodegradation of different types of hydrocarbons by microorganisms "in vitro," and the ability of different media to increase the rate of biodegradation have been tested. A mixed culture of microorganisms isolated from a hydrocarbon polluted soil is more effective at biodegradation than a mono-specific culture. Nutrients are essential.

SSIE No.: BJ-655

2. PHYSICAL CHANGES

R-31-76
EVAPORATION OF OIL SPILLS ON WATER

Principal Investigators: Palmer, L. L., and H. S. Fogler
Performing Organization: Chevron Oil Field Research Co., La Habra, Ca., University of Michigan, Ann Arbor, Michigan
Supporting Agency: Standard Oil Company of California
Period: 1974 to 1976 Funds: Unknown

A theoretical and laboratory experimental study is being conducted to develop a single mathematical model for the evaporation of oil spills on water. The model is based on information available in the literature.

Information Source: T. Smith, Standard Oil Company of California, P.O. Box 3495, San Francisco, California 94119

R-32-76
AN EVALUATION OF THE STATE OF KNOWLEDGE OF THE DISPERSION OF OIL SPILLS--SPREADING, RETENTION AND CLEAN-UP

Principal Investigator: Wilson, M. P., Jr.
Performing Organization: University of Rhode Island, Kingston, Rhode Island 02881
Supporting Agency: U.S. Energy Research and Development Administration
Period: 6/75 to 6/76 Funds: Unknown

The study will analyze the current state-of-the-art in the categories of oil spreading, retention and cleanup. No report is available.

Cleanup and recovery

Information Source: W. E. Mott, Division of Environmental Control Technology, U.S. Energy, Research and Development Administration, Washington, D.C. 20545

3. GENERAL FATE OF OIL

R-33-76
CIRCULATION PATTERNS AND SEDIMENT TRANSPORT IN SAN FRANCISCO BAY AND ADJACENT OCEAN

Principal Investigator: Conomos, T. J.
Department: Water Resources Division
Performing Organization: U.S. Department of the Interior, Geological Survey, 345 Middlefield Rd., Menlo Park, California 94025
Supporting Agency: U.S. Department of the Interior, Geological Survey, Water Resources Division, No. WR00-060
Period: 7/74 to 6/75 Funds: $134,200

The investigators plan to acquire detailed knowledge of the pertinent natural factors operating in any river-ocean mixing system in order to better understand present conditions and to predict the results of any changes. Monthly hydrographic surveys and measurements of surface and near-bottom water movements using drifters are the research approaches that will be used.

Status: This research project is a broad one, with only incidental information generated on oil pollution research. During the course of the ongoing studies on circulation patterns, the researchers became involved in the San Francisco Bay oil spill. They do not expect to do any future work on oil spills.

Reports

MOVEMENT OF SPILLED OIL AS PREDICTED BY ESTUARINE NONTIDAL DRIFT

Conomos, T. J. 1975.
Limnology and Oceanography 20(2):159-173.

Release of surface and seabed drifters was used to understand major processes controlling oil dispersal after an oil spill in San Francisco Bay, January, 1971. Most oil moved seaward, but some oil globules sank to near-bottom waters and were carried landward. Seasonal phenomena must be considered in predicting the drift of future spills.

Information Source: T. J. Conomos, Water Resources Division, 345 Middlefield Road, Menlo Park, California 94025

R-34-76

FATE OF OIL REFINERY EFFLUENTS IN LAKE MICHIGAN

Principal Investigator: Harrison, W.
Performing Organization: Argonne National Laboratory, 9700 South Cass Ave., Argonne, Illinois 60439
Supporting Agency: Energy Research and Development Administration
Period: 1/76 to ? Funds: Unknown

The project concerns the fate of oil refinery wastes in this freshwater system. A report should be available on this effort in June, 1976.

General effects of oil pollution

Information Source: W. Harrison, Director, Water Resources Research Program, Argonne National Laboratory, 9700 So. Cass Ave., Argonne, Illinois 60439

R-35-76

QUANTITIES AND FORMS OF POLLUTANTS CARRIED BY THE MISSISSIPPI RIVER AND THEIR FATE IN THE GULF OF MEXICO

Principal Investigator: Presley, B. J.
Specialty: Oceanography
Performing Organization: Texas A & M University System, School of Science, College Station, Texas 77843
Supporting Agency: U.S. National Science Foundation, Division of National and International Programs, No. GX-42576
Period: 4/75 to 3/76 Funds: $49,900

The form, quantity and fate of heavy metals,chlorinated hydrocarbons and petroleum hydrocarbons carried by the Mississippi River into the Gulf of Mexico will be studied. The mechanism of transfer of pollutants from land to ocean via rivers will be elucidated.

General fate of oil in the environment

SSIE No.: GSN-1512-1

Status: The NSF (IDOE) sponsored project is concerned mainly with heavy metals, but some hydrocarbon studies have been done. The results of the first two years of work were recently presented at the Skidway Institution of Oceanography, and will be included in a symposium volume to be edited by H. Windom of this institution.

Information Source: B. J. Presley, Texas A & M University, Department of Oceanography, College Station, Texas 77843

SECTION IV. PATENTS

A. UNITED STATES PATENTS

P-1-76
FLOATING BOOM WITH DEMOUNTABLE FLOATS

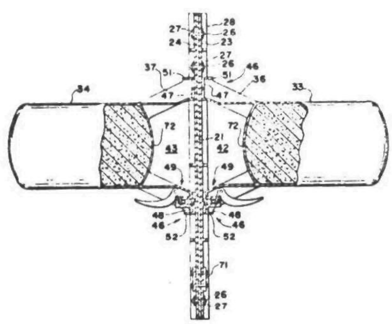
Appelblom, H. R., and F. E. de Bourguilgnon. 1975.
U.S. Patent 3,882,682

An elongated sheet-like partition member and a number of floats comprise a boom apparatus for containment of floating pollutants. The demountable float elements are secured to the partition member in spaced apart positions and are designed for rapid and easy attachment to frame members of the floats.

Containment

Citation Source: Petroleum Abstracts 15(38):#210,730. 1975.

3,882,682
FLOATING BOOM WITH DEMOUNTABLE FLOATS
Harold R. Appelblom, 2310 Carlmont Dr., Belmont, Calif. 94002, and Francois Emile de Bourguignon, 1269 Ridgeley Dr., Campbell, Calif. 95008
Filed Apr. 16, 1973, Ser. No. 351,519
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **7 Claims**



P-2-76
OIL FENCE HAVING A LIMITED FLEXIBILITY

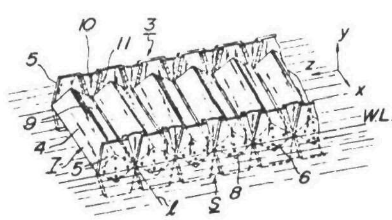
Aramaki, K., Y. Kawaguchi, and H. Kawakami. 1975.
U.S. Patent 3,867,817

A number of rigid floats are arranged side by side to form a fence. Each float has coffin-shaped, fixed plates attached to the ends. When the floats are lined up, a V-shaped gap is left between each plate; this gap is filled with a flexible membrane to allow the floats to flex with wave movement.

Containment

Citation Source: Underwater Information Bulletin 7(4):#75/08/32. 1975.

3,867,817
OIL FENCE HAVING A LIMITED FLEXIBILITY
Kuninori Aramaki; Yasuharu Kawaguchi, both of Yokohama, and Hiroshi Kawakami, Kamakura, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed June 25, 1973, Ser. No. 373,222
Claims priority, application Japan, June 29, 1972, 47-64431
Int. Cl. E02b 15/04
U.S. Cl. 61—1 F 5 Claims



P-3-76
OIL CONTAINMENT APPARATUS

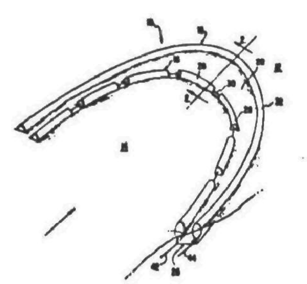
Ayers, R. R., and E. V. Seymour. 1975.
U.S. Patent 3,886,750

A barrier and an elongated float upstream of the barrier define a capture area where the flow velocity is locally reduced. Oil enters the capture area and accumulates because of the inability of the low current velocity to remove it. Oil may then be skimmed or removed.

Containment

Citation Source: Petroleum Abstracts 15(38):#210,729. 1975.

3,886,750
OIL CONTAINMENT APPARATUS
Ray R. Ayers, and Errol V. Seymour, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Continuation-in-part of Ser. No. 81,305, Oct. 16, 1970, abandoned. This application Apr. 24, 1972, Ser. No. 247,079
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F   15 Claims



P-4-76
MICROBIAL DEGRADATION OF PETROLEUM

Azarowicz, E. N. 1974.
U.S. Patent 3,856,667

Petroleum or oil waste materials are degraded by treating with a strain of Candida lipolytica. This microorganism has a broad spectrum of degradation capabilities and is non-toxic. The process can be used to remove oil spillage or oily wastes discharged from industrial plants.

Biological degradation
Waste oil and waste water treatment
Cleanup and recovery

Citation Source: Selected Water Resources Abstracts 8(20): #W75-09862. 1975.

P-5-76
PETROLEUM IDENTIFICATION

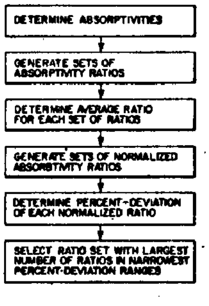
Brown, C. W., M. Ahmadjian, and P. F. Lynch. 1975.
U.S. Patent 3,896,312

Oil samples collected from surface water can be identified by comparing the infrared spectrum of the unidentified oil sample to the infrared spectra of a number of identified oil samples. Methods for allowing for sodium chloride cell interference and methods using aluminum foil strips to separate oil from the water environment are also described.

Source identification
Sampling

Citation Source: Petroleum Abstracts 15(45):#212,825. 1975.

3,896,312
PETROLEUM IDENTIFICATION
Christopher W. Brown, R. R. 1, Box S-12, Saunderstown, R.I. 02874; Mark Ahmadjian, 10 Blackamore Ave., Cranston, R.I. 02910, and Patricia F. Lynch, 320 Boston Neck Rd., Narragansett, R.I. 02882
Filed June 7, 1974, Ser. No. 477,414
Int. Cl. G01n *21/26*
U.S. Cl. 250—343 **11 Claims**



P-6-76
ENVIRONMENTALLY SAFE DISPOSAL OF ORGANIC POLLUTANTS

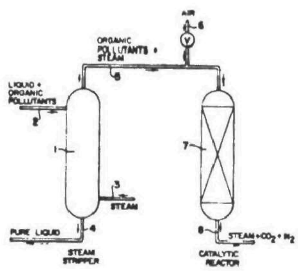
Callahan, J. L., H. F. Hardman, and R. K. Grasselli. 1974.
U.S. Patent 3,804,756

A disposal method for toxic hydrocarbons, amines, acrylonitrile wastes, etc. consists of entrainment in 90% steam and passage over a catalyst (i.e., copper oxide) at 250-700°C to convert wastes to N, H_2O, and CO_2.

Waste oil and waste water treatment

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4696. 1975.

3,804,756
ENVIRONMENTALLY SAFE DISPOSAL OF ORGANIC POLLUTANTS
James L. Callahan, Bedford Heights, Harley F. Hardman, Lyndhurst, and Robert K. Grasselli, Chagrin Falls, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Filed June 22, 1972, Ser. No. 265,162
Int. Cl. C02b *1/18*
U.S. Cl. 210—59 8 Claims



P-7-76
INSTALLATION FOR SEPARATION ON THE SEABED OF THE EFFLUENTS FROM UNDERWATER OIL WELLS

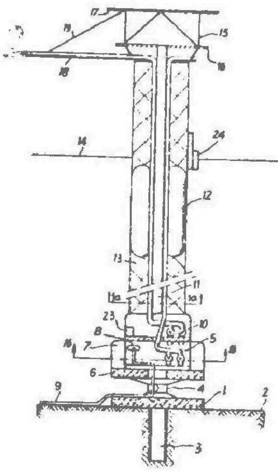
Charpentier, P. 1975.
U.S. Patent 3,875,998

The system for underwater separation of effluents consists of a base anchored to the seabed and containing at least one gas/liquid separator. The separator is attached to the underwater well and leads to either a burner or a pipe to draw off the liquid phase. A column is attached to the base and ends at the water surface in a working platform.

Waste oil and waste water treatment
Design and engineering

Citation Source: Selected Water Resources Abstracts 8(17): #5G-W75-08629. 1975.

3,875,998
INSTALLATION FOR SEPARATION ON THE SEABED OF THE EFFLUENTS FROM UNDERWATER OIL WELLS
Pierre Charpentier, Louveciennes, France, assignor to Entreprise de Recherches et D'Activities Petrolieres (Elf), Paris, France
Filed Oct. 27, 1972, Ser. No. 301,279
Int. Cl. E21b 7/12
U.S. Cl. 166—.5 **7 Claims**



P-8-76
OIL AND DEBRIS REMOVAL UNIT

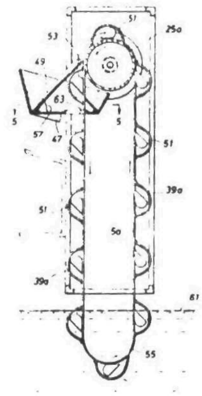
Condit, P., Jr. 1975.
U.S. Patent 3,891,558

An endless belt, which is oil attracting, is mounted on a pair of rotating drums. The drums maintain tension on the belt and are used to mount wipers to clean oil from the belt. Scoops with fluid release slots are mounted on the outside of the belt and remove solid debris.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(43):#212,076. 1975.

3,891,558
OIL AND DEBRIS REMOVAL UNIT
Paul Condit, Jr., 11327 Sage Park, Houston, Tex. 77034
Filed Dec. 6, 1972, Ser. No. 312,605
Int. Cl. B01d *43/00*
U.S. Cl. 210—526 **8 Claims**



P-9-76
OIL INTERCEPTORS FOR SEPARATING OIL FROM WATER BY GRAVITY

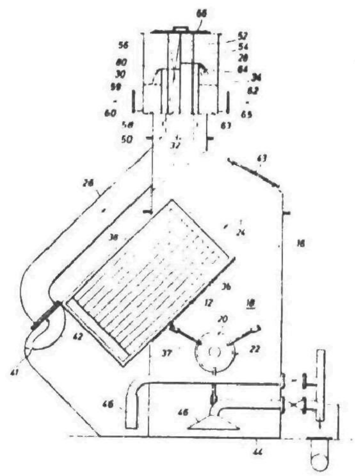
Cornelissen, J. 1975.
U.S. Patent 3,884,815

Separate oil outlet and water outlet weirs are connected to an oil outlet and water outlet of the separator device, which is used on board ship. The weirs are mounted close to one another on board ship (the edge of the oil weir being at a higher level than that of the water weir) and are located where the pitching of the ship causes minimum disturbance to the oil skimming process.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(36):#210,321. 1975.

3,884,815
OIL INTERCEPTORS FOR SEPARATING OIL FROM WATER BY GRAVITY
Jan Cornelissen, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 26, 1973, Ser. No. 410,279
Claims priority, application United Kingdom, Oct. 27, 1972, 49593/72; July, 1973, 34471/73
Int. Cl. B01d *21/00*
U.S. Cl. 210—521 7 Claims



P-10-76
OIL SORPTION MATERIAL

De Young, W. J. 1975.
U.S. Patent 3,888,766

Material for absorbing oil from water surfaces consists of cellular materials impregnated with a hydrophobic and oleophilic sealant in an amount sufficient to coat the surfaces of the cells or capillary domains. The substance is relatively inactive in water but becomes activated by oil, so that rapid absorption of large amounts of oil occurs.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(38):#210,731. 1975.

P-11-76
APPARATUS FOR IMPROVED SHIPPING OF CRUDE OIL RELATIVE TO ENVIRONMENTAL DAMAGE AND ECOLOGICAL PROBLEMS

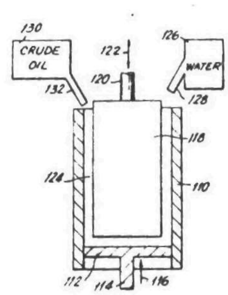
Elson, J. M. 1975.
U.S. Patent 3,864,935

In order to avoid oil spills, oil is frozen into molds in shapes useful for transportation. The units of oil are transported through a tube. Means for pouring the oil into the containers and for closing the containers are described.

Oil transfer and transport

Citation Source: Selected Water Resources Abstracts 8(18): #W75-09319. 1975.

3,864,935
APPARATUS FOR IMPROVED SHIPPING OF CRUDE OIL RELATIVE TO ENVIRONMENT DAMAGE AND ECOLOGICAL PROBLEMS
Jesse M. Elson, 138 E. Washington Ave., Pearl River, N.Y. 10965
Filed Mar. 22, 1973, Ser. No. 343,925
Int. Cl. F25c 1/04
U.S. Cl. 62—356 2 Claims



P-12-76
OIL SEPARATION AND RECOVERY DEVICE

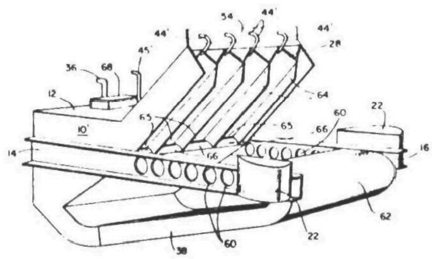
Galicia, F. 1975.
U.S. Patent 3,890,234

The device may be towed, propelled or left stationary on an oil-polluted water surface. The liquid surface comes into contact with inverted V-shaped troughs which cause the oil-polluted water to flow into an inner chamber due to the vacuum. Depolluted discharging water is used to induce a surface current of the oil-polluted water to flow toward the troughs.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(38):#210,727. 1975.

3,890,234
OIL SEPARATION AND RECOVERY DEVICE
Frank Galicia, 5043 Catherine St., Philadelphia, Pa. 19143
Filed Apr. 18, 1973, Ser. No. 352,209
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **1 Claim**



P-13-76
METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF AN OIL SLICK ON A WATER SURFACE

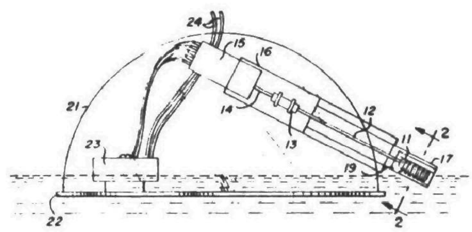
Kriebel, A. R. 1975.
U.S. Patent 3,885,418

An oil slick detector consists of a spinner located in a shroud with a radial gap between the spinner and shroud. The device is located in the water such that water and any oil will enter the radial gap. The motor, which drives the spinner, will have a higher torque if oil is present in the incoming waters and the difference in torque will result in a measurable change in the motor drive current.

Monitoring

Citation Source: Petroleum Abstracts 15(38):#210,728. 1975.

3,885,418
METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF AN OIL SLICK ON A WATER SURFACE
Anthony R. Kriebel, 340 La Mesa Dr., Menlo Park, Calif. 94025
Filed Oct. 17, 1973, Ser. No. 407,170
Int. Cl. G01n *11/14*
U.S. Cl. 73—61.1 R **18 Claims**



P-14-76
COLLECTION AND RECOVERY SYSTEM FOR OIL SPILLS

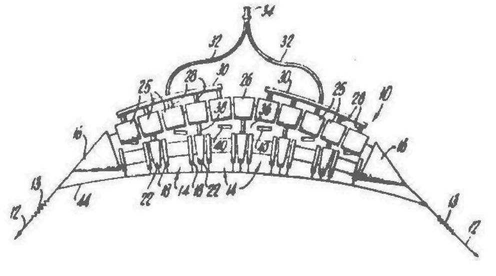
March, F. A., and L. S. Brown. 1975.
U.S. Patent 3,883,433

The oil recovery system consists of a primary weir, with many secondary weirs attached, which can be towed through the water. The weirs conform to wave motion so oil escape is minimal and oil is reclaimed in an essentially useable state. The lip of each secondary weir is positioned to admit oil from the upper layer without air entrainment.

Cleanup and recovery

Citation Source: Selected Water Resources Abstracts 8(19): #5G-W75-09660. 1975.

3,883,433
COLLECTION AND RECOVERY SYSTEM FOR OIL SPILLS
Frank Adams March, and Louis Stanislaus Brown, both of Reston, Va., assignors to Ocean Systems, Inc., Reston, Va.
Continuation-in-part of Ser. No. 269,725, July 7, 1972, abandoned. This application Sept. 20, 1973, Ser. No. 399,339
Claims priority, application Netherlands, July 4, 1973, 7309366
Int. Cl. E02b ***15/04***
U.S. Cl. 210—242 **11 Claims**



P-15-76
ASHLESS LUBRICATING OIL DISPERSANT

Miller, E. F., and W. W. Hellmuth. 1975.
U.S. Patent 3,869,514

Ashless lubricating oil dispersants of the general formula $RNHCH_2CH_2F'NCH_2CH_2OH$ (where R and R' are H or polyisobutenyl radicals of molecular weights from 600-5000),are formed by the reaction between chlorinated polyisobutylene and N-(2-aminoethyl)ethanolamine in the presence of Na_2CO_3 or NaOH at 350-400°.

Cleanup and recovery

Citation Source: Chemical Abstracts 83(14):#118450p. 1975.

P-16-76
APPARATUS FOR SEPARATING FINE OIL DROPLETS AND SLUDGE SUSPENDED IN LIQUID

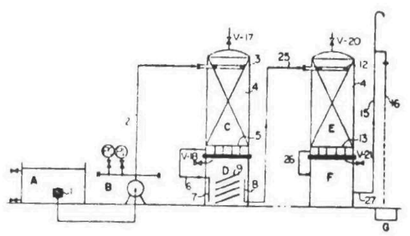
Nakanishi, T., J. Matsui, S. Yonehara, M. Aoki, K. Ishiguro, T. Satake, and S. Azuma. 1974.
U.S. Patent 3,797,666

A chamber packed with fibre web pieces is used both to filter out sludge and also to coalesce oil particles. The oil is separated by settling. Periodic backwashing cleans the filter chamber.

Waste oil and waste water treatment

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4481. 1975.

3,797,666
APPARATUS FOR SEPARATING FINE OIL DROPLETS AND SLUDGE SUSPENDED IN LIQUID
Toru Nakanishi; Junichi Matsui; Setsuji Yonehara; Masahiro Aoki; Kiyonori Ishiguro, all of Otsu; Tatsuo Satake, Nishinomiya, and Shingi Azuma, Osaka, all of Japan, assignors to Toray Industries, Inc., Tokyo and Toray Engineering Co., Ltd., Osaka, both of, Japan
Filed Aug. 10, 1971, Ser. No. 170,470
Claims priority, application Japan, Aug. 15, 1970, 45-71147
Int. Cl. B01d *17/04, 39/04*
U.S. Cl. 210—265 **4 Claims**



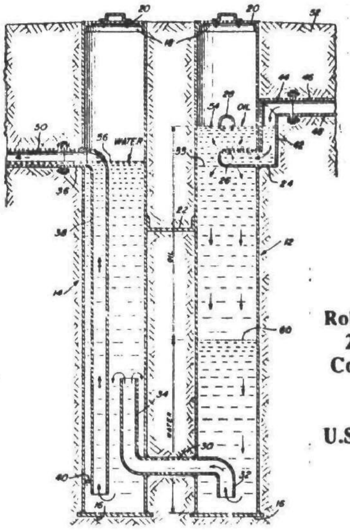
P-17-76
GRAVITY OIL-WATER SEPARATOR WITH TWO INTERCONNECTED SINGULAR CELLS HAVING AUTOMATIC FREE OIL DISCHARGE

Summers, R. L. 1975.
U.S. Patent 3,862,039

Water enters the first tank, falls to the bottom, and moves upward through the inlet pipe, transfer pipe and into the second tank through the vertical outlet-portion of the transfer pipe. Virtually no oil will be left in the liquid which is discharged from the second tank via a lift pipe.

Cleanup and recovery

Citation Source: Selected Water Resources Abstracts 8(17): #5D-W75-08735. 1975.



3,862,039
GRAVITY OIL-WATER SEPARATOR WITH TWO INTERCONNECTED SINGULAR CELLS HAVING AUTOMATIC FREE OIL DISCHARGE
Robert L. Summers, 5541 Twilight Rd., N.W., Roanoke, Va. 24019
Continuation-in-part of Ser. No. 345,696, March 28, 1973,. This application Sept. 17, 1973, Ser. No. 397,579
Int. Cl. B01d *17/02*
U.S. Cl. 210—252 **2 Claims**

P-18-76
PROTECTIVE STRUCTURE FOR SUBMERGED WELLS

Texaco Development Corp. 1975.
U.S. Patent 3,866,676

The hydrocarbon fluid producing well is buried in the ocean floor and surrounded by a metal casing to protect it against moving ice masses and other floating objects. If the casing is damaged, a trigger mechanism shuts off the flow to eliminate the dangers of pipeline damage and oil pollution.

Oil transfer and transport

Citation Source: Underwater Information Bulletin 7(4):#75/08/29. 1975.

P-19-76
TREATING MUDDY-LIKE WASTE OILY MATERIAL

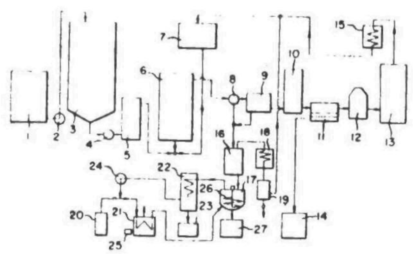
Watanabe, S. 1975.
U.S. Patent 3,864,242

Industrial waste oil can be recycled as a low-S fuel oil. Solid material is removed by settling, then the pH is adjusted to break the emulsion, and a paraffin-base saturation hydrocarbon is added. The asphaltic sludge separates out at 5-25°; the solution remaining is distilled to separate the paraffinic solvent from the low-S fuel oil.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(12):#100692j. 1975.

3,864,242
TREATING MUDDY-LIKE WASTE OILY MATERIAL
Shichie Watanabe, Fukuoka, Japan, assignor to Kabushiki Kaisha Imamura Seisakusho, Wakamatsu-Ku, Kitakyushu, Japan
Filed Dec. 13, 1973, Ser. No. 426,725
Int. Cl. C10g *27/100*
U.S. Cl. 208—180 5 Claims



B. FOREIGN PATENTS

P-20-76
COALESCENCE OF SMALL SUSPENDED DROPS E.G. OIL FROM WATER

Anon. 1974.
Netherlands Patent 73745V/42

Contaminated liquid is passed through a bed containing floating plastic balls which are 1-10 mm in diameter. The balls will be wetted by the oil, then the oil drops will collide with each other and the balls and coalesce. The time of operation without blocking is longer for this bed than conventional equipment.

Citation Source: Selected Water Resources Abstracts 8(18): #W75-09325. 1975.

P-21-76
ACTIVATED SLUDGE AS ADSORBENT IN WASTE WATER TREATMENT

Araki, H., O. Mitsui, H. Kojima, and M. Saito. 1975.
Japanese Kokai (unexamined patent application) 75 47,455

Pollutants in petroleum waste waters, which interfere with microbial activity in the activated sludge process, are adsorbed onto activated sludge and the treated waste waters are then subjected to the activated sludge process.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(18):#151888k. 1975.

P-22-76
IMPROVED APPARATUS FOR THE RECOVERY OF FLOATING MATTER

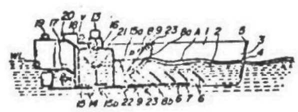
Aramaki, K., H. Kawakami, and M. Suzuki. 1975.
French Patent 2,237,011

The apparatus consists of a belt moving over two rollers and sagging in its lower part so that it recovers floating matter (spilled hydrocarbons) on a body of water. The recovered matter is sent to a separator which is equipped with a propeller to impart a cyclone-type movement to its contents.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(41):#211,572. 1975.

IMPROVED APPARATUS FOR THE RECOVERY OF FLOATING MATTER-- Fr. 2,237,011, c. 2/7/75, f. 7/9/74 (pr. Japan 7/10/73, Appl. 81,597); K. Aramaki, H. Kawakami and M. Suzuki, asrs.; (Bridgestone Tire Co Ltd); Abstr., BULL. OFFIC. PROPRIETE IND. (FR.) v. 16, No. 11, Pt. 2 (No. 6), p 3378, 3/14/75 (In French)



P-23-76
PROCEDURE AND INSTALLATION TO DETECT THE PRESENCE OF OIL FLOATING ON WATER

Brill, E. L. 1974.
Netherlands Application 7,414,744

This apparatus takes a continuous liquid sample through a hydrophobic assembly which has a higher attraction for oil than water. Each sample is tested for parameters such as weight and volume. If a sample in a certain time cycle contains oil, an alarm system goes into operation.

Monitoring

Citation Source: Petroleum Abstracts 15(44):#212,577. 1975.

P-24-76
OIL SKIMMER WITH OSCILLATABLE CIRCULAR LOOP

Brill, E. L., and B. M. Brill. 1975.
Canadian Patent 963,398

The oil skimmer consists of an endless substantially rigid loop which is rotated by a pair of rolls that grip the loop's upper edge. As the loop passes in and out of the hydrophilic liquid (water), it attracts hydrophobic material (oil) which is then lifted and squeezed out as it goes through the rolls.

Cleanup and recovery

Citation Source: Selected Water Resources Abstracts 8(19): #5G-W75-09568. 1975.

P-25-76
SEALING LEAKING PIPELINE CONNECTIONS

BTR Industries, Ltd. 1975.
French Patent 2,236,137

Leaks are sealed at the joints of piping using this invention. A chamber-like form is placed around the leaky connection and a sealing compound is injected into it. A pressure higher than that prevailing in the pipeline is applied to the compound until it solidifies.

Oil transfer and transport

Citation Source: Petroleum Abstracts 15(37):#210,534. 1975.

P-26-76
PROCESS FOR DETECTING LEAKS IN LONG DISTANCE PIPELINES FOR THE TRANSPORTATION OF LIQUIDS, AND APPARATUS FOR ITS APPLICATION

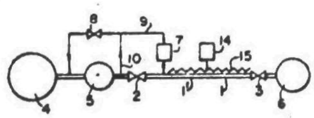
Chisso Corp. 1975.
French Patent 2,238,114

This invention can detect leaks in an oil pipeline which is divided into sections by at least one valve. The device consists of an auxiliary line through which liquid can be pumped into the isolated segment at a predetermined pressure. The pumping is maintained so as to maintain a constant pressure in the segment.

Oil transfer and transport

Citation Source: Petroleum Abstracts 15(41):#211,555. 1975.

PROCESS FOR DETECTING LEAKS IN LONG DISTANCE PIPELINES FOR THE TRANSPORTATION OF LIQUIDS, AND APPARATUS FOR ITS APPLICATION-- Fr. 2,238,114, c. 2/14/75, f. 7/19/74 (pr. Japan 7/19/73, Appl. 82,283); (Chisso Corp); Abstr., BULL. OFFIC. PROPRIETE IND. (FR.) v. 16, No. 12, Pt. 2 (No. 7), p 3781, 3/21/75 (In French)



P-27-76
OIL DISPERSING COMPOSITION AND ITS USE

Dulaney, C. L., and D. J. Hagney. 1975.
Canadian Patent 969,445

The preparation of a composition used to disperse oil in aqueous mediums is described. The composition basically consists of a mixture of an alcohol and a product prepared by reacting a compound with at least 1,2 ethylenediamine moiety and an aliphatic carboxylic acid having from 10 to 20 carbon atoms.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(41):#211,570. 1975.

P-28-76
SEPARATING OILY FLUIDS FROM WATER

Ernst, A. 1975.
British Patent 1,396,397

A rectangular container has a waterproof base and sidewalls which are made of sponge or fibrous material that has been pretreated with oil to make it oil-wettable and water repellent. The container floats on water, and the fibers selectively absorb oil from the surface. As the oil fills the vessel, it sinks and new surfaces are exposed to the oil/water interface.

Cleanup and recovery

Citation Source: Chemical Abstracts 83(14):#120618t. 1975.

P-29-76
OIL ABSORBING MATERIALS

Fujiwara, K. 1974.
Japanese Kokai (unexamined patent application) 74 86,287

Oil absorbents are prepared from mixtures of polypropylene and/or polyethylene, poly(vinyl) alcohol, and thermoplastic resin, then formed in the molten state and followed by fiber formation.

Cleanup and recovery

Citation Source: Chemical Abstracts 83(10):#84467g. 1975.

P-30-76
TRANSPORTING HYDROCARBON OILS

Grantley Company. 1974.
Netherlands Application 73 06,815

Hydrocarbon oils in oil slicks on water surfaces are removed by a polystyrene foam divided into small bell-like particles. The foam is able to absorb 19 times its weight in oil.

Cleanup and recovery

Citation Source: Chemical Abstracts 83(10):#82488r. 1975.

P-31-76
LINE BREAK CONTROL

Gulick, R. A. 1975.
Canadian Patent 970,650

Reduced pressure in a flow line is communicated to one side of a diaphragm. A similar reduction is imposed much more slowly to the other side by a series of connected oil reservoirs. The pressure difference on opposite sides of the diaphragm causes valve closure.

Oil transfer and transport

Citation Source: Petroleum Abstracts 15(41):#211,554. 1975.

P-32-76
METHOD AND APPARATUS FOR REMOVING A LAYER OF COMBUSTIBLE LIQUID FROM THE SURFACE OF A BODY OF WATER

Heagler, R. B. 1975.
Canadian Patent 972,692

A U-shaped vessel floats partially submerged in a water body and has a longitudinal channel portion with a front opening. An open bottom portion is situated beneath the channel. As the vessel advances, a band of water with a combustible liquid layer floating on it enters the channel and is subsequently removed by burning in a combustion chamber.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(41):#211,571. 1975.

P-33-76
TREATMENT OF WASTE WATER CONTAINING PHENOL AND FORMALDEHYDE

Honda, K., Y. Aimi, Y. Akatsu, T. Iwanami, and T. Sugitani. 1975.
Japanese Kokai (unexamined patent application) 75 06,158

The waste water is treated by adding a basic substance, i.e., NaOH, in an amount of 0.01-1.0 mole/mole HCHO to remove the HCHO. The resulting waste water is evaporated after further addition of a basic substance.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(18):#151856y. 1975.

P-34-76
APPARATUS AND METHOD FOR THE DETERMINATION OF AN IMPURITY IN A LIQUID STREAM

Hubby, L. M. 1975.
German Offenlegungsschriften (unexamined patent application) 2,340,807

The apparatus is used to detect oil in water draining from an offshore drilling rig. Water is led through the deck into a vertical container that forms part of a theoretical U-tube. The outlet leg contains liquid at a constant height and the inlet leg is the liquid in the container. When liquid of different density enters, its level will be higher than that in the outlet leg and an alarm will sound.

Monitoring
Design and engineering

Citation Source: Chemical Abstracts 83(10):#82490k. 1975.

P-35-76
TREATMENT OF OIL-CONTAINING WASTE WATER

Inoue, T., O. Yanagida, and Y. Sokuma. 1975.
Japanese Kokai (unexamined patent application) 75 42,671

Rubber latex is added to waste water which contains oil; acidic conditions will solidify the latex and remove the oil. Treated in this manner, 1000-ppm oil waste water was reduced to 8-ppm oil.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(12):#102932m. 1975.

P-36-76
METHOD AND DEVICE FOR RECOVERING OIL POLLUTANTS ON THE SURFACE OF WATER

Institut Francais du Petrole des Carburants et Lubrifiants. 1974.
British Patent 1,356,089

The oil film is covered by a flexible impervious sheet. The edges of the sheet are depressed with weights. Thus the oil is trapped in a small hemisphere from which the oil can be pumped out, either immediately or when the seas are calmer.

Cleanup and recovery

Citation Source: Industrial Wastes Information Bulletin 4(5): #HMS 3767. 1975.

P-37-76
ABSORBER FOR SOLVENT AND OIL

Itano, Y., A. Omori, and Y. Ota. 1974.
Japanese Kokai (unexamined patent application) 74,134,583

A polymer containing a foaming agent is extruded, cooled, pulled to form lengthwise cracks, piled, pulled perpendicularly and crimped to form an oil-absorbing agent.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84471d. 1975.

P-38-76
RECLAIMING OF FUEL OIL FROM WASTE OILS BY CHEMICAL NEUTRALIZATION AT HIGH TEMPERATURES

Iwamoto, T. 1974.
Japanese Kokai (unexamined patent application) 74 88,905

Fuel oils are formed by first heating, then neutralizing waste oils. Waste oil is fed into a covered steam heated (100-130°) reactor, then NaOH (0.1-2% of the waste oil) is mixed into the oil. The NaOH deoxygenates, desulferizes, and desalts all foreign materials and helps separate the sludge with all the decomposition products from the oil. This oil is further purified by centrifugation.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(14):#118495g. 1975.

P-39-76
POWDERED SYNTHETIC RESIN AS AN OIL ADSORBENT

Iwatsubo, H., T. Norita, and K. Tamagawa. 1974.
Japanese Kokai (unexamined patent application) 74,117,385

A surfactant (0.01-1 wt. %) is added to powdered polyethylene, polypropylene, and/or polystyrene (10-80 mesh) to obtain an oil adsorbent.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84490j. 1975.

P-40-76
OIL-WATER SEPARATION APPARATUS

Jacob, G. 1974.
French Demande 2,204,439

In a de-oiling vessel an expansion chamber, or de-oiling chamber and a fine separation compartment are placed in series. The oil-collecting vessel is at the top and fed by tubes from the separation walls just before the fine separation chamber.

Cleanup and recovery
Design and engineering

Citation Source: Chemical Abstracts 83(14):#120417b. 1975.

P-41-76
APPARATUS AND METHOD FOR THE TREATMENT OF DISPERSIONS

Jeffreys, G. V., C. J. Mumford, F. E. G. Ravault, and C. Washbourne. 1975.
German Patent 2,452,386

Fine droplets of oil-in-water or oil-in-steam dispersions are coagulated by pressing the dispersions through a porous disk which contains gradually increasing interconnected pores. The resulting enlarged oil drops are separated from the water phase by gravity.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(16):#133975g. 1975.

P-42-76
OIL SEPARATOR WITH COALESCING MEDIA

Jones, L. W. 1975.
Canadian Patent 970,287

An apparatus removes dispersed oil from water by contacting the oily water with sulfur which causes the oil to coalesce or agglomerate.

Cleanup and recovery
Waste oil and waste water treatment

Citation Source: Petroleum Abstracts 15(37):#210,544. 1975.

P-43-76
REMOVING FLOATING OIL FROM WATER WITH A SULFUR COALESCING BED

Jones, L. W. 1975.
Canadian Patent 970,286

When water containing dispersed oil is forced to flow through a container provided with a bed of sulfur, the oil is coalesced and removed by the sulfur, leaving clean water flowing from the container.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(37):#210,543. 1975.

P-44-76
EMULSION FUEL FROM WASTE OIL

Kawai, N., H. Noda, T. Nishida, and K. Fukada. 1974.
Japanese Kokai (unexamined patent application) 74 66,705

A procedure for producing oil-in-water-type emulsion fuels from waste hydrocarbon oils containing <80 wt. % water is described. The method includes adjusting the oil/water ratio of the waste oil to (20-75):(25-80), adding surfactants at 0.01-5.0 wt. %, based on water content, and emulsifying.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(16):#134941e. 1975.

P-45-76
REMOVAL OF WASTE OIL

Kayford Manufacturing Company, Ltd. 1974.
Netherlands Application 73 08,939

A method of removing waste oil consists of burning with the aid of a fire-starting material, i.e. a liquid hydrocarbon, and using a solid-particle polymer resin matrix made of easily burnable thermoplastic materials to make contact between the oil and fire-starter.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84496r. 1975.

P-46-76
TRAP TO CLEANSE OIL-POLLUTED WATER

Kharchenko, M. S. 1974.
Soviet Patent 410,998

Each oil trap consists of a flotation chamber, a foam-forming chamber, a foam pumping out chamber and an ejection chamber. Oil-polluted water flows through a protective grid and is saturated with air in the flotation chamber; the foam is formed and sucked into a pollutant collecting chamber while the cleansed fluid is ejected.

Cleanup and recovery

Citation Source: Selected Water Resources Abstracts 8(18): #W75-09373. 1975.

P-47-76
TREATMENT OF WASTE WATER CONTAINING PHENOLS AND CYANIDES

Kurosawa, K., and Y. Hirotani. 1975.
Japanese Kokai (unexamined patent application) 75 08,369

Hydrogen sulfide, ammonia, phenols and cyanides are removed from petroleum processing plant wastewaters by stream stripping or aeration (to remove H_2S and NH_3), and extraction with hydrocarbon solvents containing aromatics (to remove phenols). The phenols and cyanides remaining after extraction are decomposed with HCHO and H_2O_2 at pH 9-12.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(18):#151845u. 1975.

P-48-76
WATER-REPELLENT OIL-ABSORBER FROM CALCINED AND SWOLLEN MATERIAL OF ROCK AND VOLCANIC ASH

Manago, T., and Y. Hirano. 1975.
Japanese Kokai (unexamined patent application) 75 07,790

Volcanic ash is covered with >0.1% solid paraffin by stirring the paraffin above its melting point or by stirring with the emulsion and drying.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84484k. 1975.

P-49-76
REMOVAL OF OIL FROM WASTEWATER

Matsuda, H., K. Shinoda, M. Yasuhara, and T. Sumiyoshi. 1975.
Japanese Kokai (unexamined patent application) 75 06,580

Oil-containing waste water is mixed with attapulgite or an attapulgite-containing clay mineral and a coagulant; the resulting solid materials are removed by filtration. Water containing 100,700 ppm machine oil as an emulsion was subjected to this treatment; the oil content was decreased to 80 ppm.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(14):#120428f. 1975.

P-50-76
REGENERATION OF USED OILS

Ministerul Transporturilor Telecomunicatiilor, Bukarest. 1974.
German Patent 2,338,463

A mechanized plant has been designed to regenerate or recondition used oils. The techniques used are filtration, adsorption, and flash evaporation. The plant produces oils with the same physico-chemical characteristics as unused oil.

Waste oil and waste water treatment

Citation Source: Industrial Wastes Information Bulletin 5(3): #HMS 4440. 1975.

P-51-76
REMOVAL OF OILS FROM WASTE WATER

Miyata, K. 1974.
Japanese Kokai (unexamined patent application) 74,126,164

Lignosulfonate and an inorganic coagulant are added to oil-containing waste water. Then 100 ml of air-containing pressurized water is injected into the waste water; flocs are formed, float to the surface and are removed. Water containing 830 ppm oil and treated in this way was reduced to 11 ppm oil.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(12):#102901a. 1975.

P-52-76
OIL ADSORBANTS

Mohri, Y., and H. Ito. 1974.
Japanese Kokai (unexamined patent application) 74 72,187

Wet granules of silica or zeolite are heated at low temperatures to form porous parts at the surface; then the granules are treated with a water-repelling reagent, dried and heated to form oil adsorbents. An alternate procedure covers wet granules with porous dry silica or zeolite and then treats with water-repelling reagent; more water-repelling reagent is required for the alternate procedure.

Cleanup and recovery

Citation Source: Chemical Abstracts 83(14):#121267q. 1975.

P-53-76
OIL ADSORBENT

Naruse, K. 1975.
Japanese Kokai (unexamined patent application) 75 37,688

Oils are removed from waste water or seawater by treating with granular or powdery polypropylene (average diameter <3 mm).

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(18):#151884f. 1975.

P-54-76
OIL BINDING AGENT FROM FIBROUS MATERIAL OF SCRAP TYRES

Nittan Co. Ltd. 1974.
German Patent 2,351,372

Sheets or mats constructed of powdered tyres are an inexpensive method of cleaning up oil spills on rivers and waterways.

Cleanup and recovery

Citation Source: Industrial Wastes Information Bulletin 4(4): #HMS 3443. 1975.

P-55-76
REMOVAL OF OILS FROM INDUSTRIAL WASTE WATER

Noguchi, K. 1974.
Japanese Patent 74 29,868

Oil-containing waste water is successively passed through a series of filtering tanks packed with sand, porous polyolefin resin and activated carbon, in that order.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84519a. 1975.

P-56-76
REMOVAL OF OIL FLOATED ON WATER

Ono, H., and T. Saida. 1974.
Japanese Kokai (unexamined patent application) 74,128,891

Oleophilic porous materials are used for the removal of floated oils. The true density is greater than 1.1 g/cm^3, the apparent density is less than 1 g/cm^3, but the density actually becomes greater than that of water when the materials absorb oil. Overnight settling of a mixture of these materials and oily seawater removes all visible oil.

Cleanup and recovery

Citation Source: Chemical Abstracts 83(14):#120449p. 1975.

P-57-76
OIL TANKER BALLAST WATER TREATMENT

Ramot, University Authority for Applied Research and Industrial Development, Ltd. 1974.
Netherlands Application 74 04,548

Hydrocarbons are removed from the ballast water by aerobic biodegradation after the addition of N and P as nutrients. Arthrobacter are suitable microorganisms.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84487p. 1975.

P-58-76
METHOD AND COMPOSITION FOR THE EMULSIFICATION AND THE DEGRADATION OF PETROLEUM PRODUCTS AND FERTILIZERS THUS OBTAINED

Salomone, G. H. 1974.
British Patent 1,353,945

In order to convert oil sludges into a biodegradable product, the sludges are first emulsified, then enriched with molasses or some other nutrient and treated with a surface tension reducer. After 3-6 weeks, biodegradation produces a usable fertilizer.

Waste oil and waste water treatment
Biological degradation

Citation Source: Industrial Wastes Information Bulletin 4(6): #HMS 3823. 1975.

P-59-76
APPARATUS AND METHOD FOR PRODUCING AIR BUBBLES IN A BODY OF LIQUID

Schramm, H. J., and J. R. McCullough. 1975.
Canadian Patent 974,671

The uniformity of air pressure in a perforated bubbling hose can be improved by using an auxiliary distributing conductor carrying air under high pressure and then dropping to a relatively low level in the bubbling hose. The air barrier produced by this system is more efficient in confining surface-water pollutants.

Containment

Citation Source: Petroleum Abstracts 15(46):#213,078. 1975.

P-60-76
IMPROVEMENTS IN OR RELATING TO DISPERSAL OF FLOATING OIL

Secretary of State for Trade and Industry. 1974.
British Patent 1,358,042

Slatted wooden rafts or other variations are towed on a boom to cause turbulence. These mixing devices disperse floating oil after it has been treated with an emulsifying agent.

Design and engineering

Citation Source: Industrial Wastes Information Bulletin 4(1): #HMS 2906. 1975.

P-61-76
FIBROUS ADSORBENT

Segawa, H., Y. Hirano, and Y. Ueda. 1975.
Japanese Kokai (unexamined patent application) 75 29,483

A fibrous adsorbent useful for removing oils from waste water is prepared by mixing synthetic fibrils from hydrophobic polymers with activated carbon and then heating or treating with adhesive.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84511s. 1975.

P-62-76
OIL COLLECTOR

Segawa, H., Y. Hirano, and Y. Ueda. 1975.
Japanese Kokai (unexamined patent application) 74 29,478

Oils are removed from waste water with nonwoven fabrics of density 0.02 to 0.15 g/cm^3. The fabrics are made from fibers consisting of polyolefin resin (5-50 wt. %) and polystyrene resin (50-95 wt. %) containing 5-50 wt. % oil-soluble hydrophilic materials.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84512t. 1975.

P-63-76
FIBROUS OIL ABSORBER FOR SEPARATION OIL FROM WATER

Segawa, H., Y. Ueda, Y. Hirano, S. Ikemoto, J. Okita, K. Kajitani, and T. Mochizuki. 1975.
Japanese Kokai (unexamined patent application) 75 01,986

Synthetic fibrils from hydrophobic polymers are uniformly mixed with cellulose materials to make an oil adsorbent. The oil adsorbent has a density of .05-0.2 g/cm^3 and a strength of 5-1000 gm/cm^2. A column packed with adsorbent will cut oil concentrations from 100 ppm to 0.3 ppm in one hour.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(12):#102968c. 1975.

P-64-76
A METHOD OF TREATING A USED OIL-WATER EMULSION

SKF Industrial Trading and Development Co. B.V. 1975.
British Patent 1,383,345

This is a simple, inexpensive and easily maintained method of oil recovery. The emulsion descends the walls of a wiped-film evaporator; water is evaporated, condensed and then discharged.

Waste oil and waste water treatment

Citation Source: Industrial Wastes Information Bulletin 5(4): #HMS 4633. 1975.

P-65-76
PACKING MATERIALS FOR APPARATUS FOR SEPARATING OIL FROM WATER CONTAINING EMULSIFIED OIL

Takenada, Y., T. Morishita, H. Hirate, and T. Sano. 1975.
Japanese Kokai (unexamined patent application) 75 27,164

Oil adsorbents are prepared by heating two or more thermoplastic resins with different melting points to a temperature greater than the lowest melting point but less than the highest melting point. These composite fibers are then packed into the column at a density of 0.09 g/cm^3. The oil content of water passed through this column is decreased from 200-1000 ppm to 1-2 ppm.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(14):#120430a. 1975.

P-66-76
OIL EMULSION WASTE WATER TREATMENT

Tamayama, M., K. Tanaka, Y. Takahata, N. Gomyo, and K. Usui. 1975.
Japanse Kokai (unexamined patent application) 75 69,848

The treatment of oil emulsion waste waters containing anionic surfactants consists of adding polyvalent metallic salts and/or polymers and agitating the mixture with a porous stirring plate moved vertically.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(18):#151921r. 1975.

P-67-76
PURIFICATION OF REFINERY DEPOSITS

Texaco Development Corporation. 1974.
Netherlands Application 72 15,658

The recovery of oil and wax from oil-tank and tanker bottoms is described. The method involves pretreatment with a light, aliphatic-type hydrocarbon fraction, followed by solubilizing the waxy material with an aromatic compound such as benzene or toluene.

Waste oil and waste water treatment
Cleanup and recovery

Citation Source: Chemical Abstracts 83(10):#82537f. 1975.

P-68-76
IMPROVED APPARATUS AND PROCESS FOR SEPARATING FINE OIL DROPLETS AND SLUDGE FROM A LIQUID IN WHICH THEY ARE SUSPENDED

Toray Industries Inc. & Toray Engineering Co. Ltd. 1974.
British Patent 1,359,199

Oil containing effluent flows through a complex of pipes and settling tanks which contain cubic polyolefin fibre pieces to adsorb sludge and oil. In the settling tank, the coalesced droplets separate out; backwashing is possible to clean the fibre pieces.

Waste oil and waste water treatment
Cleanup and recovery

Citation Source: Industrial Wastes Information Bulletin 4(3): #HMS 3174. 1975.

P-69-76
GAS CHROMATOGRAPHIC ANALYSES

Tourres, D. 1975.
German Offenlegungsschriften (unexamined patent application) 2,459,945

A gas chromatographic method suitable for determining hydrocarbon pollutants in fresh- and seawater is described. Two flow paths are given; the first path traps the material to be analyzed and the remaining material is removed over the second path. A programmed temperature rise is used to achieve accuracy.

Analysis

Citation Source: Chemical Abstracts 83(18):#151934x. 1975.

P-70-76
CLEANING OF PETROLEUM-INDUSTRY EFFLUENT

Tronov, V. P., R. G. Narutdinov, and A. D. Li. 1975.
Soviet Patent SU432106

A treatment technique is given for a petroleum processing waste water stream. The petroleum is diluted by a stratum flooding system in an amount corresponding to a ratio of 0.4 between the total water flow and the emulsion flow.

Waste oil and waste water treatment

Citation Source: Selected Water Resources Abstracts 8(20): #W75-10200. 1975.

P-71-76
SURFACE TENSION METHOD OF APPARATUS FOR SEPARATING IMMISCIBLE LIQUIDS

T.R.W. Inc. 1974.
British Patent 1,357,138

This device is used primarily for removing and recovering floating oil. At a suitable pressure differential, oil passes through a porous screen but water is retained. The type of oil and the temperature determine the screen and pressure parameters.

Cleanup and recovery

Citation Source: Industrial Wastes Information Bulletin 4(1): #HMS 2875. 1975.

P-72-76
APPARATUS FOR PREVENTING OIL POLLUTION

Tuggle, R., R. H. Graves, and R. J. DeRouen. 1975.
Canadian Patent 964,475

An oil pollution control device isolates most of a large column of water. For example, a vertical caisson extends into the bottom of the body of water and above the surface, but has openings just above the bottom to permit water circulation. Oil can then be released inside this container.

Containment

Citation Source: Selected Water Resources Abstracts 8(18): #W75-09314. 1975.

P-73-76
COMPOSITE FOR TREATMENT OF OIL IN THE PRESENCE OF WATER

Uchiyama, H., J. Sugi, and H. Takahashi. 1975.
Japanese Kokai (unexamined patent application) 75 46,583

The preparation of a composite for treating oil in water is described. A condensation product of a mixture of benzaldehyde and its hydroxy derivative is mixed with polyhydric alcohol, water-soluble polar organic solvent of the condensation product, and water-insoluble organic liquid solvent in the polar solvent.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84534b. 1975.

P-74-76
OIL ADSORBENT

Umemura, K., and T. Tate. 1975.
Japanese Kokai (unexamined patent application) 75 25,489

An organic compound-modified clay mineral is used to remove oils from waste water. It is formed by treating NH_2 compounds and/or NH_4 salts with clay minerals having base-exchanging capability and (optionally) non-cationic organic compounds. Water with an oil content of 12,000 ppm was treated in this manner, with a resulting oil content of 4 ppm.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(14):#120432c. 1975.

P-75-76
IMPROVEMENTS IN FLOATING BARRIERS TO CONFINE SPILLS OF POLLUTING LIQUIDS

Vidilles, J. 1975.
French Patent 2,241,203

The barrier for containing oil spills consists of a flexible suspended skirt with a continuous flotation element in the upper section and a ballasting element in the lower section. The screen is a horizontal bag with each end connected to a towing means.

Containment
Design and engineering

Citation Source: Petroleum Abstracts 15(37):#210,545. 1975.

P-76-76
AGENT FOR SEPARATING EMULSIFIED OIL FROM WASTE WATER

Wakabayashi, Y., and H. Takado. 1975.
Japanese Kokai (unexamined patent application) 75 54,581

$CaCl_2$-impregnated pozzolan is mixed with $Al_2(SO_4)_3$-impregnated pozzolan; a high-molecular weight coagulant is added to the mixture to form an agent capable of separating emulsified oil from waste water.

Waste oil and waste water treatment

Citation Source: Chemical Abstracts 83(10):#84529d. 1975.

P-77-76
OIL-SOLUBLE TUBE COMPOSITION FOR USE IN LEAK-DETECTION OF PIPELINE

Watanabe, K., and K. Shibata. 1975.
Japanese Patent 75 04,031

Oil-soluble tubes, which contain thermoplastic butadiene-styrene block polymer as the major component, are used to detect oil leaks from underground pipeline. The tubes are filled under pressure, placed close to pipeline joints and are monitored for pressure losses due to oil leaks.

Oil transfer and transport
Design and engineering

Citation Source: Chemical Abstracts 83(14):#116386y. 1975.

P-78-76
OIL ADSORBENT

Yamakoshi, T. 1974.
Japanese Patent 74 45,467

An agent for absorbing oil from an oil spill is prepared by heating solid polypropylene above its melting point and mixing with lightweight aggregate (perlite). The resulting coated perlite granules have oleophilic-hydrophobic properties.

Cleanup and recovery

Citation Source: Chemical Abstracts 83(10):#84549k. 1975.

SECTION V. CURRENT CONFERENCES

Sept. 1-3 International Environmental Law Conference, 1975.

Group Meetings

INTERNATIONAL STANDARDS GOVERNING OIL POLLUTION IN COASTAL WATERS AND HARBOURS
Busha, T.

DIVERGENT STANDARDS OF NATIONAL OIL POLLUTION LEGISLATION
Rüster, B.

THE IMPACT OF NORTH SEA OIL
Brackley, P. G.

FFI contact British Institute of International and Comparative Law, 32 Furnival St., London EC4 A1JN

Nov. 2-5 Annual Canadian Chemical Engineering Conference, 25th, Montreal, 1975.

Oil Pollution Related Papers

Session: POLLUTION CONTROL AND ABATEMENT DESIGN

THE INFLUENCE OF ULTRAVIOLET LIGHT ON THE WEATHERING OF OIL
Collins, D. J., and E. A. Townshend

Experiments on the mechanism of skin formation in shorebound oil at low temperatures and in the presence of ultraviolet light were performed. Samples were analyzed by visual observations, liquid chromatography and infrared chromatography. Ultraviolet radiation appears to catalyze a free radical oxidation process that forms the skin.

Session: WASTE RECYCLING BENEFITS IN TODAY'S ECONOMY
Chairman of session: A. Boily

The first part of the session concerns the recycling of paper, plastics, glass, waste oil, etc., to recover values from various types of municipal and industrial wastes. The second part is devoted to a panel with representatives of industry, government, and the public discussing waste recycling under current legislative and economic conditions. North American waste recycling activities were summarized.

FFI contact W. D. Croft, Program Chairman, Office of Industrial Research, McGill University, P.O. Box 6070, Station A, Montreal, Quebec H3C 3G1, Canada

Nov. 16-20 AIChE 68th Annual Meeting, Hilton Hotel, Los Angeles, California, 1975.

Oil Pollution Related Papers

OZONATION OF HIGH LEVELS OF PHENOL IN WATER
Anderson, G. L.
Fiche No. 12, Paper No. 113e.

Coal gasification and shale ore recovery can produce high levels of phenolic material. Ozone can effectively oxidize phenol over a wide range of temperatures. The reaction rate is greater at a pH of 10 or higher. An equation describing the rate of reduction of ozone is given.

ULTRAFILTRATION OF OILY WASTES FROM PROCESS INDUSTRIES
Bansal, I. K.
Fiche No. 19, Paper No. 17b

Ultrafiltration modules with inorganic membranes are used for concentrating different types of oily wastes. The operating data of laboratory and small pilot-scale installations is presented, including a comparison of the costs of the ultrafiltration system and disposal costs. Significant savings result.

FLUID BED INCINERATION OF PETROLEUM REFINERY WASTE
Becker, K. P., and C. J. Wall
Fiche No. 63, Paper No. 33d

The fluid bed incinerator was first applied in Germany in the 1930s. The development and selection of fluid bed incinerators is described. They are now common devices.

LAND DISPOSAL OF BIOLOGICAL AND OILY SLUDGE--SOME SITE CONSIDERATIONS
Chatham, R. L., and J. A. Scher
Fiche No. 62, Paper No. 33a

Land farming of biological and oily sludge from chemical plants and refinery waste treating units can be advantageous. The sludge can be plowed into land surrounding the plant site, either in buffer zones, flare ground areas or land set aside for future development. The special aspects of oil sludge are discussed.

ENVIRONMENTAL ASSESSMENT STUDIES FOR OIL SHALE DEVELOPMENT IN WESTERN COLORADO
Martin, S. G., and R. J. McGuire
Symposium: Predicting Environmental Impacts of Oil Shale Developments, Paper No. 75d

The scope of the environmental studies in northwestern Colorado is described as they fulfill federal requirements.

Ecological investigations underway are used to illustrate the detail of information necessary to satisfy lease requirements. This information is used to develop EIS and effective land restoration programs.

AN EVALUATION OF THE POLLUTION ABATEMENT TECHNOLOGIES AVAILABLE FOR TREATMENT OF WASTEWATER FROM OIL SHALE PROCESSING
Neal, L. G., J. Cotter, and R. D. Sung
Fiche No. 78, Paper No. 75e

A study being conducted by TRW Environmental Services to evaluate all environmentally acceptable waste water control technologies for mining and processing of oil shale is summarized. Pertinent literature on pollution control and performance data is reviewed.

CHARACTERISTICS AND PERFORMANCE OF A PETROLEUM REFINERY ACTIVATED SLUDGE PLANT
Powell, R. W., and R. R. Lessard
Symposium: Industrial Wastewater Treatment with Activated Sludge, Paper No. 52e

Benchscale activated sludge plants are compared with large prototypes. Operating data are reproducible and compare well. Actual wastewater from one of Exxon's refineries was used for these laboratory and field studies.

FFI contact Meeting Program Chairman, E. R. H. McDowell, P.O. Box 446, La Habra, California

Nov. 17-23 Seminar on the Protection of Coastal Waters Against Pollution, Lisbon, Portugal, 1975.

FFI contact Economic Commission for Europe, United Nations, Palais des Nations, CH-1211 Genève 10, Switzerland

Nov. 30-Dec. 5 Winter Annual Meeting of ASME, 96th, Houston, Texas, 1975.

FFI contact P. Drummond, Director of Meetings and Conferences, ASME, 345 E. 47th St., New York, New York 10017

Nov. 30-Dec. 5 Analytical Chemistry--A Means to Environmental Quality Management, Mexico City, 1975.

No. 39
MONITORING OF TOTAL OIL IN NATURAL WATERS
Lysyf, I., P. R. Newton, and E. C. Russell

Previous methods for analysis of oil in water depended on extraction of the oil with nonpolar solvents. These methods are not uniform, however, because of selectivity of extraction. A method recently developed is dependable and simple. The continuous oil monitor subjects the water stream to an elevated temperature, which volatizes and partially pyrolyzes petroleum derived organics. The stream is then directed into a flame ionization detector, and a signal proportional to the petroleum content of the water is produced. The selected temperature regime does not affect biologically derived matter.

No. 40
STATE OF THE ART CHROMATOGRAPHIC TECHNIQUES APPLIED TO μG/KG (PPB) LEVEL ENVIRONMENTAL ASSESSMENT
Hertz, H. S., B. H. Gump, W. E. May, and S. N. Chesler

The capability for low level pollutant analysis has been achieved by elimination of classical solvent extraction and column chromatographic techniques. A headspace sampling technique extracts C_7 through C_{20} aliphatic and 1- through 3-membered ring aromatic hydrocarbons. The complementary liquid chromatographic technique analyzes for 3- through 6-membered aromatic hydrocarbons. Special handling of tissue samples is discussed.

No. 42
ANALYSE DETAILLEE DES ACIDES GRAS ET DES HYDROCARBURES DU FILM DE SURFACE DES OCEANS PAR RAPPORT A L'EAU SOUS-JACENTE
Marty, J. C.

The results of analyses of coastal waters and Atlantic and Mediterranean waters has demonstrated the accumulation of dissolved and particulate fatty acids and n-alcanes in the surface film. Also certain differences in composition between the surface and the water immediately below were observed.

No. 43
MASS SPECTROMETRIC AND CHROMATOGRAPHIC ASSESSMENT OF THE BIODEGRADATION OF PETROLEUM IN THE MARINE ENVIRONMENT
Petrakis, L., J. D. Walker, and R. R. Colwell

An analytical scheme is presented for the detailed characterization of oil prior to and following biodegradation for various lengths of time. Column chromatographic separations, and characterization by mass spectrometry and gas chromatography are involved. The importance of "weathering" relative to biodegradation can be assessed using this scheme. Results of biodegradation experiments in Chesapeake Bay are discussed.

No. 44
THE DETERMINATION AND IDENTIFICATION OF POLYAROMATIC HYDROCARBONS IN OYSTERS FROM THE GULF OF MEXICO
Onuska, F. I., A. W. Wolkoff, M. E. Comba, R. H. Larose, M. Novotny, and M. L. Lee

The determination and structural confirmation of PAH in oysters as a suitable indicator of estuarine pollution in the Gulf of Mexico is discussed. Problems in methodology are reviewed.

No. 45
THE QUANTITATIVE ANALYSIS OF FUEL OILS AND GASOLINE IN DRINKING WATER BY GAS CHROMATOGRAPHY
Nicholson, A. A., R. L. Gutteridge, and J. Singh

The methodology involved in quantifying fuel oils with a boiling range of 170 to 350°C and gasolines was investigated. A method involving low column temperature, reversing the column flow after the solvents are vented, and measuring the components of the fuel oil at a single peak was developed. Traces of petroleum distillates in water can be accurately quantified using this method.

No. 49
ANALYTICAL CHEMISTRY FOR REGULATING ENVIRONMENTAL POLLUTION IN FOODS
Roy, B. R.

Analytical chemistry methods have been developed to analyze for such pollutants in food as ergot, urea, fusel oil, lead, copper, arsenic, mineral oil, chemicals migrating to food from containers, and pesticide residues.

No. 61
POSSIBLE IMPACT OF DEEP-WELL INJECTION OF FLUID INDUSTRIAL WASTES ON ENVIRONMENTAL QUALITY IN CANADA
Simpson, F.

The types of fluid industrial wastes that are injected into deep, subsurface aquifers include brines produced during oil production and a variety of inorganic and organic wastes from chemical plants and oil refineries. Possible environmental impacts of this procedure on two areas are reviewed. Monitoring, even after abandonment of disposal wells, is needed.

FFI contact S. Barabas, Canada Centre for Inland Waters, Box 5050, Burlington, Ontario L7R 4A6 Canada

Dec. 11-12 Annual Conference on Marine Resources of the Coastal Plains States, DeSoto Hilton Hotel, Savannah, Georgia, 1975.

A 90-minute session with several speakers on "Offshore Impacts of OCS Development" was given. At a later date the Center will publish a report of the conference.

FFI contact Coastal Plains Marine Center, 1518 Harbour Drive, Wilmington, North Carolina 28401

Jan. 12-13 Mid Atlantic Industrial Waste Conference, 8th, John M. Clayton Hall, University of Delaware, 1976.
Sponsored by universities and pollution control agencies in the Mid-Atlantic region.

Oil Pollution Related Papers

OILY WASTE WATER TREATMENT - OPPORTUNITIES FOR ENERGY CONSERVATION
Fowler, W. J., Jr., and L. C. Hale

FACTORS INFLUENCING THE ADSORPTION OF PHENOLS FROM AQUEOUS SOLUTION BY ACTIVATED CARBON
Zogorski, J. S., and S. D. Faust

FFI contact Dr. R. I. Dick, Department of Civil Engineering, University of Delaware, Newark, Delaware 19711

Jan. 12-14 Conference on Health and Environmental Effects of Energy Use, Sheraton Park Hotel, Washington, D.C., 1976.

The conference described the coordinated federal program conducted by 17 agencies. On the agenda were descriptions of the health, ecological, transportation, fate, and control technology programs in these areas: increased fossil fuel combustion, fuels from coal and oil shale, western energy resource development, energy conservation through recycling waste products, and increased coal and offshore oil production.

FFI contact Harold Bernard, Conference Manager, Information Transfer, Inc., 1160 Rockville Pike, Suite 202, Rockville, Maryland 20852

Jan. 14-16 NPRA Refinery and Petrochemical Plant Maintenance Conference, Marriott Hotel, New Orleans, 1976.

The conference is divided into three sections: maintenance management, maintenance engineering, and a general question and answer session. Under the sub-section "environmental control," the panel will answer the question: "How are expended lubricating oils being utilized or disposed of when they cannot be put into the oily sewer any longer?"

FFI contact National Petroleum Refiners Association, 1725 De Sales St., N.W., Suite 802, Washington, D.C. 20036

Jan. 26-29 Symposium on Management of Petroleum Refinery Waste Water, Camelot Inn, Tulsa, Oklahoma, 1976.

The sponsors are EPA, API, and Tulsa University.

Feb. 4-5 Symposium on Water Pollution Research in Canada, Centre for Inland Waters, Burlington, Ontario, 1976.

The topics to be discussed at the symposium include: advanced waste treatment, biological/chemical treatment methods, nitrification and denitrification of organic wastes, phosphorus control, and land application of sludge.

FFI contact Dr. C. P. Fisher, Wastewater Technology Centre, Box 5050, Burlington, Ontario, Canada

Feb. 5-7 Environmental Law-VI, San Francisco, California, 1976. Cosponsored by the Environmental Law Institute and the Smithsonian Institute.

Second Plenary Session, Feb. 6, 1976, 9:30 am

Federal Water Pollution Controls: Developments under the Water Pollution Control Act of 1972

NEPA: Current Developments under National Environmental Policy Act and under Comparable State and Municipal Programs

FFI contact P. A. Wolkin, Director, ALI-ABA Committee on Continuing Professional Education, 4025 Chestnut St., Philadelphia, Pennsylvania 19104

Feb. 17-20 Offshore Southeast Asia Conference and Exhibition, Singapore, 1976.

Mar. 1-5 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, 27th, Cleveland Convention Center, Ohio, 1976.

There will be three sessions on environmental analysis and two on oil identification.

FFI contact H. Sweeney, Koppers Co., 440 College Park Drive, Monroeville, Pennsylvania 15146

Mar. 7-9 Annual Meeting of the National Ocean Industries Association, 4th, Washington, D.C., 1976.

FFI contact T. Reynolds, National Ocean Industries Association, Suite 410, 1100 17th St., N.W., Washington, D.C. 20036

Mar. 22-31 Technical Symposium on Prevention of Marine Pollution from Ships, Acapulco, Mexico, 1976.

Oil Pollution Related Papers

SYMP I/1
INTERNATIONAL MEASURES FOR THE PREVENTION AND CONTROL OF POLLUTION FROM SHIPS
Sasamura, Y.

Developments in the field of marine pollution from ships since oil was first carried as a cargo in the late 1800s are reviewed. The growth in the transport of oil by sea and the awareness of oil pollution as a problem are described with reference to international legislation. Background information used in writing and enforcing pollution control measures, in particular the International Convention for the Prevention of Marine Pollution, 1973, is given.

SYMP I/2
A REVIEW OF THE 1973 MARINE POLLUTION CONVENTION
Price, R. I., and F. P. Schubert

The shortcomings of the 1954 Oil Pollution Convention are described. This overview of the 1973 Convention includes descriptions of general obligations, measures to minimize accidental pollution by oil, the control of intentional oil pollution, and measures to control other types of pollution. The 1954 and 1973 Conventions are compared.

SYMP I/3
IMPACT OF THE 1973 CONVENTION, PARTICULARLY FROM THE POINT OF VIEW OF DEVELOPING COUNTRIES [in Spanish]
An author to be designated (Mexico)

The main problem facing developing countries is the expenditures necessary to implement the Convention. These include the construction of installations and reception facilities at ports, equipment on board ships, the training of technical staff for inspection purposes, the modernization of many shipyards in the developing countries in order to properly equip ships, and provision of offices and posts for specialists in the various aspects of pollution control. A secondary, but important problem, is making the contents of the Convention generally known and drawing attention to the obligations it imposes on contracting governments. Patrolling the seas to ensure compliance with the Convention is an example.

SYMP I/4
VIEWS OF SHIPPING AND OIL INDUSTRIES ON THE 1973 CONVENTION
Walder, C. A., and J. C. S. Horrocks

The shipping and oil industries strongly support the 1973 Convention and are in favor of immediate passage of the necessary legislation to bring the Convention into force. The practical problems that arise in complying with the Convention annexes are described. Relevant technological developments are reviewed.

SYMP II/1
POLLUTION PROBLEMS OF A COASTAL AND MARITIME STATE
Archer, J. N.

The United Kingdom believes that minimizing pollution from ships is important to the country. Existing services and facilities have been used to tackle the problem as cost effectively as possible. This paper can be read with advantage with a revised version of "The battle against oil pollution at sea."

SYMP II/2
MARINE POLLUTION OFF BARBADOS' COASTS
Archer, A. B.

Barbados is vulnerable to marine pollution from ships, as pollutants are carried in the South Equatorial current from the Atlantic. The crude oil is harming the reef corals which surround the island. Barbados needs oil spill cleanup facilities to protect its thriving tourist industry. Its geographical location also makes it an ideal place for monitoring oil pollution from the Atlantic.

SYMP II/3
PREPARATION FOR THE IMPLEMENTATION OF THE CONVENTION IN THE BALTIC SEA AS A SPECIAL AREA, ON THE EXAMPLE OF POLAND
Grzywaczewski, Z.

The Helsinki Convention 1974 is an act of good will of seven Baltic states. The implementation of the Helsinki Convention and the IMCO Convention 1973 to a special area, the Baltic, is described. The practical details of shipping and transfer have created some unanswered questions. The requirements for effectiveness of the Convention were stated.

SYMP IV/1
SEGREGATED BALLAST TANKER ARRANGEMENTS FOR POLLUTION ABATEMENT DUE TO ACCIDENTS
Gray, W. O., R. K. Kiss, and R. A. Sutherland

A study group of operating and technical professionals was formed to determine if there were preferable positions for placement of segregated ballast tanks which would prevent accidental pollution. This paper presents the primary findings of an evaluation of twelve possible locations as compared to a typical nonsegregated-ballast conventional tanker. The group feels, however, that personnel training and navigational improvements are the most effective ways of preventing accidents.

SYMP IV/2
SEGREGATED BALLAST AND RELATED ASPECTS OF TANKER DESIGN
Gray, W. O.

The segregated ballast tanker concept is reviewed with particular reference to the operating and design data forming the foundation for Regulation 13(2), which establishes acceptable ballast draughts; and to various segregated ballast design variations and their interrelationships with other tanker design requirements. A review of the economic and operational considerations that led to the Conference regulations on segregated ballast is included.

SYMP IV/3
GUIDELINES FOR OPERATING AT IMCO SEGREGATED BALLAST LEVELS
Cruikshank, J. M., and A. C. Landsburg

The results of ship motion prediction computer runs at IMCO minimim ballast levels in extreme sea spectra are reported and correlated with model test runs. Motion predictions are then used to evaluate the master's possible alternatives in heavy seas. The effects of each alternative are evaluated and presented in a form useful to ship masters so they can operate safely at IMCO minimum ballast levels.

SYMP V/1
OIL-WATER SEPARATION AND OIL-IN-WATER MONITORING
Cormack, D.

An up-to-date review of the fields of oil-water separation and monitoring are given. Reference is made to the theoretical background of each method, the types of equipment available, performance data and the direction of future development. Both ship-board and land-based reception facility applications are discussed.

SYMP V/2
OIL-IN-WATER MONITORING ABOARD TANKERS
Berto, F. J.

The Oil Companies International Marine Forum (OCIMF) has had a task group working to accelerate development of simple, reliable shipboard oil-in-water monitors since early 1973. Companies in OCIMF have sponsored monitor development in addition to the surveys and information dissemination of the total group. The problems of a shipboard oil-in-water analyzer are the difficult environment, limited maintenance capability and variability in oil types.

SYMP V/3
SYSTEMS FOR MONITORING AND CONTROL OF DISCHARGED OIL - OIL CONTENT METERS [in French]
Guigues, F.

The Ultra-Rapid Response Detector meets the ten specifications for equipment measuring the oil content of waste water discharge at sea. The paper gives an outline description of these conditions, and of certain apparatuses in wide use. Laboratory tests on the URRD are now being confirmed by tankers in service.

SYMP VI/1
IMCO AND THE "LOAD ON TOP" SYSTEM
Victory, G.

The development of the Load on Top system, whereby the majority of the oil residues are retained on board in slop tanks and then discharged to the refinery with the next oil cargo, is discussed. The optimal arrangements, monitoring devices, improved methods of oil-water separation in the tanks, and arrangements to comply with the 1973 Convention are described.

SYMP VI/2
LOAD-ON-TOP SYSTEM WITH DUAL SLOP TANKS OF IMPROVED DESIGN
Hasegawa, S., S. Fukuda, Y. Seike, and M. Nakashima

A dual-slop-tank arrangement is a refinement of the Load on Top system. The primary slop tank separates oil and sludge; the secondary separates oil and water. Using this system the oil content of the water can be reduced to 50 ppm or less in a 20-hour period. This procedure completely satisfies the 1973 Convention.

SYMP VI/3
CRUDE OIL WASHING
Maybourn, R.

For crude oil tankers, crude oil itself is a theoretically better washing agent. The background to the research program on crude oil washing conducted by BP Tanker Company, and that company's experience with the system are reviewed. The environmental and commercial benefits of crude oil washing and technical information on safety and other operational considerations are reviewed.

SYMP VI/4
IMPROVEMENTS OF "CLEAN SEAS GUIDE FOR OIL TANKERS," PARTICULARLY FOR PRODUCT TANKERS
Lecocq, I. E., and J. C. S. Horrocks

In 1973, OCIMF (Oil Companies International Marine Forum) and ICS (International Chamber of Shipping) produced the "Clean Seas Guide for Oil Tankers." This has been reviewed to see whether it can be adapted to cover the handling of oils as defined in the 1973 Convention. A revised version of the Guide now includes procedures for the retention on board of non-persistent oil residues.

SYMP VI/5
TECHNIQUES FOR CONTROLLING OIL DISCHARGE FROM PRODUCT OIL TANKERS
Van Cleave, H. D., H. P. Santiago, and W. B. Chappel

The impact of the 1973 Marine Pollution Convention on product oil tankers is outlined. The EPA study, which was submitted to IMCO in October, 1973, and other studies have revealed some operational techniques which may be suitable procedures for complying with the new Convention.

SYMP VI/6
FUEL FROM SLOP OIL
Lockwood, W. H., Jr.

Slop oil derived from tank washing can be separated from ballast water through gravitation, demulsifying chemicals and fresh water washes. The slop oil is then an acceptable fuel for the ships' main propulsion boilers. Special piping and safety features are necessary; but this method of onboard disposal benefits the vessel owner as well as the environment.

SYMP VI/7
HYDRAULIC TRANSPORTATION OF CARGO-TANK SLUDGE
Hasegawa, S., S. Fukuda, Y. Seike, and Y. Matsuo

A hydraulic sludge hauling device is five times faster than conventional methods, and also eliminates the need to wash a ship deck fouled with sludge. The sludge in the tank bottom is fluidized with water or cargo oil and pumped to a sludge separator in a cargo tank.

SYMP VII/1
THE NEW DEBALLASTING AND WASHING STATION AT FOS/MARSEILLES [in French]
Graujeman, J., and P. Theobald

The 1973 Convention introduced regulations for special areas, such as the Mediterranean, which prohibit any discharge of oil, effective 1 January 1977. Ports will have to be equipped with reception and treatment facilities for the oily residues. The Port of Marseille will have to install such facilities, which will represent a considerable innovation. Berth capacity for supertankers will be available.

SYMP VII/2
METHODOLOGY FOR DETERMINING ADEQUACY OF RECEPTION FACILITIES IN PORT FOR TREATMENT OF SHIP-GENERATED OILY WASTES
Steinman, G. C., K. J. Randall, and C. F. Propp

Two regulations of the 1973 Convention require each government to undertake means to insure the provisions of adequate reception facilities in ports. The determination of adequacy depends upon the quantity of oily wastes anticipated by a particular port, taking into account the effects of segregated ballast, offshore loading facilities, and on-board oil-water separators. The state-of-the-art of the present shipboard waste technology is included.

SYMP VII/5
THE DESIGN OF A SYSTEM FOR THE RECEPTION OF BALLAST WATER FROM OIL TANKERS [in Spanish]
González, R. S. N., and M. A. G. Lara

The design and operation of a reception facility for simultaneously handling ballast water from three ships engaged in the transport of oil are discussed. A large pit is used to allow the oily water sufficient time for settling. The oil floating on the surface is skimmed off; an oil separator separates oil from the flow of water coming from the skimmer collectors.

SYMP VII/6
RECEPTION FACILITIES AND TREATMENT OF BALLAST WATER - EXAMPLE OF CALCULATION OF THE SIZE [in French]
Franco, M.

The data used in computer simulation of the size, design and engineering of onshore reception facilities for oily residues are real. They include information on unloading ballast to onshore facilities and onshore treating plants, and statistics on the amount of crude handled, average ballast percentage, average pumping time, inoperative days because of bad weather, and data on the routes of tankers which load at the terminal.

SYMP IX/1
SWEDISH EXPERIENCES ON ORGANIZATION, MEANS AND MEASURES FOR COMBATING SPILLS AT SEA OF OIL AND OTHER HARMFUL SUBSTANCES
Engdahl, R.

The Swedish Coast Guard is responsible for dealing with spills of harmful substances at sea. One special interest has been the development of methods and techniques for removing spilt oil from the surface by mechanical means. The Swedish organization has a wide assortment of equipment for all conditions, and a fleet of 30 specialized oil ships and workboats.

SYMP IX/2
DEVELOPMENT OF CONTINGENCY PLANNING TO DEAL WITH OIL POLLUTION
Smith, J. W., and M. J. Garnett

The plan recommends coordination, by one government authority, of all oil pollution activities and the necessary delegation of control at the scene of the spill to a suitable cleanup organization. The paper is a guide to what should be covered by an Oil Pollution Contingency Plan and contains considerable organizational detail.

SYMP IX/3
A MAJOR GULF OF MEXICO OIL SPILL CLEANUP ASSOCIATION - AN OVERVIEW
Berry, W. L., and J. W. Wolfe

Clean Gulf Associates was established in 1972 by the petroleum operators in the Gulf of Mexico to provide the capability for fast, effective cleanup of oil spills in both coastal and offshore waters. Equipment stockpiles are tailored specifically for spills resulting from exploration and production activities, but are still generally applicable.

SYMP IX/4
PREVENTION AND COMBATING OF OIL POLLUTION IN THE NEIGHBORHOOD OF OIL PORTS OF LE HAVRE-ANTIFER AND OF LE VERDON [in French]
Ailleret, J. C., and D. Velut

Large-scale spills caused by collision or grounding can be averted by allowing generous dimensions of the various features of the fairway giving access to the terminal, installing effective aids to navigation, and systematic inspection of the ship's gear, radar and VHF equipment. In the event of grounding, immediate dispatch of tugs and lighters, and commencement of counter-measures against pollution are necessary. The techniques used in two French ports are analyzed. The conclusions are that prevention is important, and techniques and equipment must be adapted to the local area and improved upon.

SYMP IX/5
EMERGENCY PLAN IN CASE OF ACCIDENTAL POLLUTION [in French]
An author to be designated (Italy)

The purpose, scope and organization of a plan to be used in case of accidental pollution are outlined. The operational program is discussed in terms of spill control, oil transfer by lighters and salvage of the ship, booms, mechanical means of recovery, dispersants, shore protection measures, equipment for ports, and naval and air force assistance.

SYMP X/1
LOADING PORT INSPECTION OF CARGO RESIDUE RETENTION BY TANKERS IN BALLAST
Holdsworth, M. P.

In 1970/71, inspection of tankers revealed that Load-on-Top was not being used as widely or efficiently as it could be. A 1973 booklet, "Clean Seas Guide for Oil Tankers," informed those concerned of the proper procedures. Monitoring of Load-on-Top performance increased the number of tankers using the method and led to the ICS/OCIMF Guide "Monitoring of Load-on-Top." Intergovernmentally supported loading port inspection will provide a large degree of control and enforcement.

SYMP X/2
METHODS AND TECHNIQUES FOR DETECTION OF OIL POLLUTION
Andresen, I.

Several methods are applied to compare physical and chemical properties of samples taken from oil spills and from suspected ships. Demonstrated differences in physical and chemical properties constitute "negative production of evidence." Methods include gas chromatography, infrared spectrophotometry, ultraviolet spectrophotometry, the concentrations of Ni and V, and liquid chromatography. The Danish National Institute for Testing of Materials is presently compiling an index of the various types of crude oil, which will be used in demonstrating the origin of a given pollution incident. This would eliminate the need to take a reference sample from "suspected ships."

SYMP X/3
IN-SITU DETECTION OF OIL ON WATER
Flanagan, D. B., and G. P. White, Jr.

The state-of-the-art of sensing methods and available equipment for the in-situ detection of oil spills in the marine environment is reviewed. Equipment such as vapor detectors, mechanical devices and radiation sensors are discussed. References to available test data are given.

SYMP X/4
AIRBORNE REMOTE SENSING OF OIL SPILLS IN THE MARINE ENVIRONMENT
Flanagan, D. B.

The status of airborne remote oil slick sensing in the U.S.A. is reviewed. Examples of applications, cost, weight and volume are given. Test data is referenced.

SYMP X/5
TELEDETECTION OF OIL DISCHARGES [in French]
Mourlon, J. C.

Techniques used to detect various pollutants must be effective at all times and under all visibility conditions. Scanning for oil has been applied over a wide range of the electromagnetic spectrum. Remote sensing can also be used to monitor a developing slick in order to select the most suitable counter-measures. Experiments carried out in France are reported.

SYMP X/6
OIL SPILLS FROM TANKERS
Garnett, M. J., and J. W. Smith

The International Tanker Owners Pollution Federation includes almost 100% of all the owners of seagoing tankers in the world. It is in a favorable position to collect statistics on spills. The data is fed into a computer and analyzed. Some interesting findings have emerged; for instance, 30% of the spills take place while discharging, and only 3.5% are due to stranding or collision. These statistics will help evaluate factors contributing to spillage, and to advise methods for containment and possible elimination.

SYMP X/7
SWEDISH METHOD FOR IDENTIFICATION OF THE SOURCE OF DISCHARGED OIL BY TAGGING OIL RESIDUES IN TANKERS
Agnedal, P. O.

Experiments in Sweden have shown that the most suitable substance for tagging individual ships is metal particles. Combinations of alloys of different metals form many tagging materials. The composition is analyzed by the use of an electron probe microanalysis. Advantages, disadvantages and costs of the tagging are given.

SYMP X/8
THE IMPLEMENTATION AND INTERNATIONAL APPLICATIONS OF A NATIONAL INFORMATION SYSTEM ON MARINE POLLUTION
Baisuck, A., J. Harrald, J. Leotta, and W. A. Wallace

The U.S. Pollution Incident Reporting System (PIRS) was designed to collect and process data on incidents involving harmful substances and comprehensive penalty data. The design, development, and implementation of the system are described. Sample reports indicate causes and economic costs associated with discharges of oil from vessels in U.S. waters. The 1973 Convention recommended reports of this type.

SYMP XI/1
RESOURCES USED IN FRANCE TO COMBAT MARINE POLLUTION BY OIL [in French]
Pichon, J.

French policy in the field of pollution control has led to the design and production of the BALEAR floating booms, the dynamic CYCLONET and static VORTEX recovering equipment, and the flexible CAIMAN towable tanks. All can be used in combination and adapted to various situations. The equipment is neither infallible nor perfect, but it is realistically designed.

SYMP XI/2
OIL CLEARING TECHNIQUES AND EQUIPMENT
Cormack, D.

Cleanup and recovery techniques and equipment for use at sea and on beaches are discussed. The properties of oil that are relevant to the question of cleanup are examined. The various approaches to cleanup are assessed; and the use of dispersants, especially new concentrate dispersants, are discussed in detail. Warren Springs Laboratory equipment, which was designed for applying dispersants, is reviewed. Solutions to the problems concerning storage and transport of recovered oil are suggested.

SYMP XI/3
RESPONSE TO OIL SPILLS
Boersma, F. A.

The oil spill response and control equipment currently in use in the United States is described. The locations and situations where a type of equipment is used and its limitations are discussed. The organization of the actual response and the cooperation among the Coast Guard, industry and foreign governments are demonstrated by examples.

SYMP XI/4
COMPLEX APPLICATION OF PORT TECHNICAL MEANS FOR PREVENTING MARINE POLLUTION AND COMBATING OIL SPILLAGES
Nunuparov, S. M.

The USSR oil pollution prevention plan calls for each port to be equipped with a complex of engineering facilities. High capacity shore reception facilities and floating port cleaning stations are being constructed; and a new universal ship has been designed for collection of pollutants from ships in ports. Contingency plans are being developed for each port. This combination of equipment and planning is capable of controlling an oil spill of 200-250 tons. For major operations and problems at sea, a marine emergency/salvage complex is being designed. Other prevention measures include improved navigation procedures, personnel training, and industry regulations.

SYMP XI/5
DISPERSION VERSUS REMOVAL
Dorrler, J. S.

Criteria of ecological effects, aesthetic effects, property damage, commercial damage and health effects were used to decide whether dispersion or physical removal techniques should have been used in five actual U.S. spills. In four out of five cases physical removal was preferred. Adverse ecological and health impacts are the undesirable side effects of dispersants. Each spill, however, must be evaluated separately.

SYMP XI/6
ENVIRONMENTAL DAMAGE ASSESSMENT OF SPILLS OF HARMFUL SUBSTANCES AND RESTORATION STEPS
Thompson, C. H., and A. L. Jennings

Guidelines are provided to aid in determining the type and extent of damage to the environment caused by oil spills. Environmental priorities will be determined so that cleanup efforts will be directed to the most vulnerable parts of the environment first. Alternative techniques of restoration are included.

SYMP XI/7
PLAN AND CONSTRUCTION OF A MOORING CRAFT EQUIPPED FOR DISPERSAL OF OIL SPILLAGES [in Spanish]
Gaxiola, M.

A mooring craft for offshore terminal service has been designed; it is equipped for chemical dispersal of oil spillages at sea.

FFI Contact IMCO Secretariat, B. Okamura, Marine Environment Division, 101-104 Piccadilly, London W1V OAE

Mar. 28-30 National Petroleum Refiners Association Annual Meeting, San Antonio, Texas, 1976.

Refinery Process Session #2

GOVERNMENT REGULATIONS FOR HAZARDOUS WASTES
Environmental Protection Agency

DISPOSAL OF LIQUID AND SOLID WASTES
Shell Oil Company, Houston, Texas

FUNDAMENTAL ISSUES IN HEALTH STANDARDS
Brooks, W. T.

FFI contact NPRA, Suite 802, 1725 DeSales St., N.W., Washington, D.C. 20036

Mar. 30-April 1 Water and Wastewater Equipment Manufacturer Association, Shamrock Hilton Hotel, Houston, Texas, 1976.

"Industrial Pollution Conference and Exposition"

Apr. 7-13 Scientific Workshop on Marine Pollution in East Asian Waters, Penang, Malaysia, 1976.

This workshop was originally scheduled for September 1, 1975. The workshop will consist of <u>ad hoc</u> working groups set up to deal with the specific subjects of physical pollution, organic and biological pollution, pesticides and inorganic pollution, and oil pollution. A short plenary section will be held on arrangements for data exchange, in the context of developing global systems such as ASFIS, ISODE, and IRS. Plenary sessions will also be held on regional or subregional (Sea of Japan, South China Seas, Malacca Straits) cooperation in research.

The main documents for the Workshop will consist of national reports on the present marine pollution situation in each country. The reports will be prepared by individuals and not necessarily endorsed by their respective governmental authorities. FAO consultants will evaluate the questionnaires from the individuals. These will form the basis of a draft review of marine pollution in East Asian waters. Two specially prepared bibliographies will be available: one on regional marine pollution and one on regional oceanography.

FFI contact R. C. Griffiths, Assistant Secretary, Intergovernmental Oceanographic Commission, UNESCO, Place de Fontenoy, 75700 Paris, France.

SUBJECT CROSS REFERENCE

A. OIL POLLUTION DETECTION AND EVALUATION

1. REPORTING

C-36-76, C-139-76, C-155-76, C-201-76, C-248-76, C-400-76, C-435-76, C-452-76

2. MONITORING

C-62-76, C-71-76, C-88-76, C-93-76, C-101-76, C-102-76, C-111-76, C-112-76, C-114-76, C-116-76, C-119-76, C-121-76, C-131-76, C-133-76, C-134-76, C-135-76, C-138-76, C-150-76, C-152-76, C-159-76, C-219-76, C-226-76, C-232-76, C-246-76, C-273-76, C-374-76, C-432-76, C-496-76, C-497-76, C-513-76, C-607-76, C-611-76, C-627-76, P-13-76, P-23-76, P-34-76

3. REMOTE SENSING

C-52-76, C-64-76, C-360-76, C-627-76, C-629-76

4. SAMPLING

C-9-76, C-21-76, C-23-76, C-137-76, C-562-76, C-627-76, P-5-76

5. ANALYSIS

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6. SOURCE IDENTIFICATION

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C-393-76, C-517-76

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Journals Scanned

Abstracts on Health Effects of Environmental Pollutants
Alaska Seas and Coasts
Ambio
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Water Research
Water Resources Research: A Journal of the Sciences of Water
Western Fisheries

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16. ABSTRACT

The November 1975 - January 1976 Oil Spill and Oil Pollution Reports is the sixth quarterly compilation of oil spill events and oil pollution report summaries. Presented in the report are: (a) summaries of oil spill events; (b) summaries and bibliographic literature citations; (c) summaries of current research projects; and (d) patent summaries. This report is submitted in partial fulfillment of EPA Grant No. R-803992 by the Marine Science Institute, University of California, Santa Barbara, under the sponsorship of the Environmental Protection Agency.

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