



# ISCO NEWSLETTER

The Newsletter of the International Spill Response Community

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## International news

### UNEP TEAM IN NIGERIA TO DISCUSS STEPS NEEDED TO IMPLEMENT Ogoniland REPORT



February 5 - UNEP representatives, led by Special Envoy Erik Solheim, will meet with top Government of Nigeria officials and other key partners this week in Abuja and Port Harcourt regarding the implementation of the environmental remediation proposed by UNEP in the [Environmental Assessment of Ogoniland](#).

The August 2011 study - the most comprehensive assessment of its kind ever undertaken in the Niger Delta - found that oil contamination in Ogoniland, as a result of oil industry operations in the area since the late 1950s, is extensive and

## International news (continued)

having a grave negative impact on the environment. The report called for establishing an "Ogoniland Environmental Restoration Authority" with initial funding of US\$ 1 billion, in addition to implementing emergency measures to mitigate the ongoing harm to communities from the oil pollution.

UNEP also highlighted that due to high rainfall in Ogoniland, any delay in cleaning up oil spills would worsen the current levels of contamination - rain would carry the oil across farmland and into creeks and the root zone, and subsequently kill crops and other plants.

In July 2012 the Government of Nigeria set up the Hydrocarbon Pollution Restoration Project (HYPREP) to implement the environmental clean-up in Ogoniland and conduct environmental assessments in other parts of Nigeria impacted by oil contamination.

Erik Solheim, with a core technical UNEP team, is meeting with key government officials, non-governmental organisations, and civil society representatives, in order to establish the next steps in assisting with the environmental clean-up. [UNEP Read more](#)

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## EUROPE: JUST PUBLISHED – TWO NEW REPORTS FROM EMSA



### Pollution Preparedness and Response – Report 2012

The European Maritime Safety Agency (EMSA) submits a report to the Commission and the Administrative Board, by 31 January each year, concerning the financial execution of the detailed plan (Action Plan) for the Agency's pollution preparedness and response activities and give an update of the status of all actions funded under that plan (Regulation 2038/2006/EC1, Article 7).

The activities of the Agency in the field of marine pollution preparedness and response are focussed on providing operational assistance and information to Member States. The main service pillars are:

- The Network of Stand-by Oil Spill Response Vessels distributed along the European coastline;
- CleanSeaNet, the satellite based oil spill and vessel detection and monitoring service covering European waters;
- The MAR-ICE (Marine-Intervention in Chemical Emergencies) Information Service in case of chemical spills at sea;
- Co-operation and Co-ordination with the European Commission, EU Member States, EFTA/EEA Coastal Countries, Candidate Countries, Acceding Countries, Regional Agreements, and other relevant international organisations such as the International Maritime Organization (IMO).
- The provision of information through publications and workshops.

[EMSA Download the report](#)



### Network of Stand-by Oil Spill Response Vessels: Drills and Exercises. Annual Report 2012

*Picture: AKTEA OSRV exercising at sea*

In order to provide additional support to the Member States' pollution response mechanisms in a cost efficient way, the European Maritime Safety Agency (EMSA) has built up, in European waters, a network of contracted Stand-by Oil Spill Response Vessels.

The vessels are ready to respond to oil spills at sea following the request of a coastal State or the European Commission. By the end of 2012, the Network comprised of 17 fully equipped vessels ready for immediate mobilisation, as well as one back-up vessel.

To achieve the performance for pollution response required by the Vessel Availability Contract (VAC), contractors together with the associated vessels and their crews participate regularly in training, drills and operational exercises. The VAC defines two types of drills: 1) Acceptance Drill and 2) Quarterly Oil Pollution Response Drill, and two types of exercises: 1) Operational Exercises and 2) Notification Exercises. Carrying out drills and exercises is an obligation for the contractor. The number of drills and exercises carried out annually has increased significantly over the years in line with the development of the Network. [EMSA Download the report](#)





## Incident reports

### USA: SPILL RESPONSE VESSEL HITS SAME REEF AS EXXON VALDEZ

February 3 - The Pathfinder tugboat, at 136-feet in length, hit the Bligh Reef on Wednesday December 23rd.

The accident resulted in a large diesel sheen being created in the Prince William Sound. An unknown amount of oil was spilled in Prince William Sound, however the tugboat contained about 33,500 gallons of diesel when it hit the reef.

*About my planet* [Read more](#)

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### USA: CLEANUP OPERATIONS FOR OIL SPILL ON LOWER MISSISSIPPI RIVER COMPLETE



February 7 - The Coast Guard completed cleanup operations of the oil spill near Vicksburg, Miss., Wednesday.

After extensive shoreline assessments and subsequent clean up actions the Louisiana Department of Environmental Quality, the Mississippi DEQ and the Coast Guard have deemed the cleanup complete.

Agencies will continue to monitor for any environmental impacts from this spill.

During the course of the cleanup 5,300 feet of boom was deployed to contain the spill and 159 workers responded to the incident. *The Maritime Executive* [Read more](#)

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### UK: SEABIRD DEATHS - MYSTERY SUBSTANCE IDENTIFIED

*Picture: University staff identified the substance on a guillemot*

February 6 - A substance which has been covering birds on the south coast is an oil additive, a university has said.

The substance - found on seabirds off the south coast of Cornwall, Devon and Dorset, and up to West Sussex - has caused burning to birds.

Plymouth University said it was a form of polyisobutene (PIB), which was used as a lubricating additive in oils to improve performance.

It added it was informing the Maritime and Coastguard Agency and the RSPCA. *BBC News* [Read more](#)



### AUSTRALIA: TOXIC CANISTER WARNING FOR NSW COASTAL COMMUNITIES

February 5 - Fire & Rescue NSW (FRNSW) is urging residents along the NSW coast to avoid handling silver canisters or containers washed up on beaches following the recent storms and to immediately call Triple Zero (000) to report them to authorities.

The warning comes after a Batemans Bay resident found a container, suspected to contain a highly toxic poison, on a beach yesterday.

FRNSW and the Queanbeyan Environment Protection Authority were advised of the discovery and have removed the container.

It is believed the contents of the canister could be aluminium phosphide which is potentially fatal if inhaled or ingested.

*Fire and Rescue NSW* [Read more](#) [Thanks to Matt Daniels of Hazcom Pty Ltd. and Don Johnston of ISCO Industry Partner, DG & Hazmat Group]

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## ISCO MEMBER, MARINE RESPONSE ALLIANCE (MRA) PARTNERS COMPLETE DIVERSE, WIDESPREAD HURRICANE SANDY RELIEF PROJECTS

February 5 - [Crowley Maritime Corp.](#) and subsidiary [TITAN Salvage](#), based in Pompano, Fla., recently completed companywide, comprehensive emergency response efforts in support of the relief organizations working in the areas hardest hit by Hurricane Sandy. The storm devastated the U.S. Northeastern coast in late October 2012.



*Photo: TITAN and Marine Pollution Control mobilized high-capacity pumping systems at the site of the World Trade Center memorial and museum in NYC.*

The combined response efforts provided by Crowley and TITAN were extensive. Shortly after the storm, the S.S. Wright, a Crowley-managed, Maritime Administration (MARAD) Ready Reserve Force ship, along with fellow MARAD vessel Kennedy, relocated to Staten Island, NY, in support of the Federal Emergency Management Agency (FEMA) to provide cost-effective berthing and meals for more than 900 FEMA personnel and Red Cross relief workers, among others, daily. After being stationed in New York for more than a month, the S.S. Wright provided more than 4,000 overnight accommodations and over 15,000 meals. In honor of the S.S. Wright and Kennedy crewmembers' excellent efforts,

MARAD recently recognized them with Merchant Marine Medals for Outstanding Achievement.

Additionally, the Kennedy was a viable resource for this FEMA mission in part because Crowley's technical services team outfitted the vessel with additional accommodation and galley space several years ago.

The Crowley logistics team also tapped its capabilities by coordinating the land transportation of oversized pumps, generators and associated equipment in support of the Defense Logistics Agency (DLA) and the Army Corps of Engineers. Crowley's liner shipping services team, based in Pennsauken, NJ, provided additional support services by supplying necessary transportation equipment and truck drivers. The fleet of heavy haul trucks – nearly 150 in total from all over the U.S. and Canada – delivered the out-of-gauge equipment to Lakehurst, NJ, where the Crowley logistics team then arranged for the cargo to be unloaded quickly using heavy-lift cranes and transported to their final destinations throughout the tri-state area via cost-effective shuttles. In a single day up to 30 trucks made deliveries.

Simultaneously, TITAN and OPA 90 Marine Response Alliance partner, [Marine Pollution Control](#), the largest and most experienced US provider of emergency lightering services worked alongside TITAN personnel to mobilize their high-capacity pumping systems for industrial pumping services. The equipment was deployed at the site of the World Trade Center memorial and museum in New York City. Thanks to the team's fast and effective work, water was removed quickly, allowing tourism to commence prior to the Thanksgiving holiday rush, a critical time for the city's economy. *The Maritime Executive* [Read more](#)

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## CANADA IS NOT READY TO HANDLE A MAJOR SPILL, “NUMEROUS SHORTCOMINGS” FOUND

*Picture: Storm clouds over St. John's, Newfoundland. Image (c) Shutterstock/V. J. Matthew*

Canada's offshore petroleum boards are not equipped to cope with a major spill, the country's environmental watchdog warned on Tuesday in a report that also said the booming energy sector needed more oversight.

Environment Commissioner Scott Vaughan said in a report that unless Canada improved its record on environmental regulation, resource customers might be deterred.

His conclusions are sensitive for the ruling pro-business Conservatives, who expect some C\$650 billion (\$650 billion) of new investments in natural resource projects over the next decade and want more extraction of oil, gas and metals. [gCaptain](#) [Read more](#) [Thanks to ISCO Executive Committee Member, Dan Sheehan] [Another related report in the Vancouver Sun](#)



## CANADA: NORTHERN GATEWAY HEARINGS TO ADDRESS MARINE EMERGENCY RESPONSE



*Picture: Douglas Channel, the proposed termination point for an oil pipeline in the Enbridge Northern Gateway Project, is pictured in an aerial view in Kitimat, B.C., on January 10, 2012. Despite years of planning for the proposed Northern Gateway pipeline and myriad legislative changes that will affect the project, the regulations and best-practices from other jurisdictions where tankers tread have not been put in place for British Columbia, studies find. THE CANADIAN PRESS/Darryl Dyck*

February 3 - Despite years of planning for the proposed Northern Gateway pipeline and myriad legislative changes that will affect the project, the regulations and best practices from other jurisdictions where tankers tread have not been put in place for British Columbia, studies find.

One review of legislation in Washington state, Alaska, Norway and other jurisdictions that see the type of tanker traffic that the

West Coast can expect if the pipelines are approved found room for improvement.

"Canada has a good safety record. Having said that, there are important things we can learn from different jurisdictions," said Darryl Anderson, whose Wave Point Consulting has published several papers on the issues around the pipeline proposals in British Columbia.

The shipping industry is well-regulated in Canada, Anderson found, but the maritime sector too often makes improvements in response to a critical incident, he said.

Alaska, Washington and Norway "have a much more robust regulatory system and a much more robust assessment of risk prior to something happening, so you don't just have to rely on a marine incident to bring about change."

In particular, Anderson and his colleague, Joe Spears, recommend an independent agency responsible for conducting oil spill risk. *The Vancouver Sun* [Read more](#)

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## CANADA: NEWFOUNDLAND WILL BETTER PREPARE FOR OIL SPILLS

February 6 - The board responsible for regulating the province's offshore says it can, and will, do more to prepare for a major oil spill off the coast of Newfoundland. C-NLOPB Chair Max Ruelokke was responding to a federal commissioner's report on oil and gas activities in the Atlantic offshore that found the board has not obtained adequate assurance that oil operators are ready to respond effectively to a major spill.

The commissioner also recommends that the board should complete a review of the spill response capability of operators under its jurisdiction as soon as possible. Ruelokke says the Board has focused its efforts to date on spill prevention, and the statistics in the Newfoundland offshore bear that out. *VOCM* [Read more](#)

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## USA: APPLICATION PERIOD OPENS FOR FEMA INCIDENT MANAGEMENT PILOT PROGRAM

February 6 - FEMA is launching a pilot program to expand their Incident Management Assistance Teams (IMATs) and is seeking candidates for three new IMATs. IMATs are a component of the FEMA disaster workforce and are deployed within hours of a disaster to support local, tribal, territorial and state partners, according to FEMA.

IMATs are full-time, rapid-response teams with dedicated staff able to deploy within two hours and arrive at an incident within 12 hours. The teams support the initial establishment of a unified command and provide situational awareness for federal and state decision-makers to determine the level and type of immediate federal support required. Teams were developed from an expanded concept of the former emergency response teams at the national and regional levels. *Fire Chief* [Read more](#) [Thanks to Peter Gollnick, Environmental Response Supervisor, Casualty Investigator, and Instructor, Oil Spill Professionals Linked-in Group]

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## SOUTH KOREA: GOVERNMENT MOVES TO TIGHTEN OVERSIGHT AFTER STRING OF HYDROGEN FLUORIDE ACCIDENTS

February 7 - Hydrofluoric acid is commonly used by the electronics industry to etch patterns into silicon chips, and as South Korea has become one of the world's leading electronics exporters in recent years, annual consumption of HF has risen sharply.



## Other news (continued)

According to the Ministry of Environment, 26 businesses each handled around 10 tonnes of HF in 2001; by 2010, the number of these large-scale handlers had almost tripled, and in 2011, 545 companies were registered as producers or distributors of the gas.

On 27 September 2012, about eight tonnes of highly toxic hydrogen fluoride (HF) gas, which dissolves in the moisture in air to form droplets of corrosive hydrofluoric acid, burst from the Hube Global chemical plant in Gumi. The leak killed five workers and injured at least 18 others, including plant employees and emergency personnel.

This may sound like a freak accident — but it was not. On 15 January, about 2,500 litres of hydrofluoric acid escaped at a factory in Cheongju, injuring one person. And on 28 January, a worker died during a hydrofluoric acid leak at a Samsung Electronics computer-chip plant in Hwaseong. In the wake of the incidents, experts are raising questions about safety in the country's research-intensive chemical and microelectronics industries, and the government is investigating what went wrong.

The response to the Gumi accident has already been the subject of a parliamentary inquiry, and South Korea's government has promised to establish a centre that will work with local branches of the environment ministry to oversee the use of dangerous chemicals. *Nature* [Read the complete article](#)

## People in the news

### USA: BUCKLEY MCALLISTER NAMED PRESIDENT OF MCALLISTER TOWING



Buckley McAllister has been promoted to the position of President. Captain Brian A. McAllister, President of the Company since 1984, will remain as Chairman.

Buckley McAllister joined McAllister Towing in 1998 and has served as the company's Vice President and General Counsel since that time. Prior to joining McAllister Towing, Buckley was an Associate at Hill, Betts and Nash LLP. He is a member of the bar in New York, California and a number of federal jurisdictions. In addition Buckley is also a Director of Steamship Mutual Underwriting Association Trustees (Bermuda) Limited, Director of the U.S. Coast Guard Foundation and Vice Chairman for the American Waterways Operators. Buckley is a member of the fifth generation of the McAllister family that has owned and operated McAllister Towing since 1864. *The Maritime Executive* [Read more](#) [McAllister Towing is a partner in the Marine Response

Alliance, which is a member of ISCO]

## ISCO news

### PROFESSIONAL RECOGNITION – NEW APPLICATIONS DEADLINE IS 28 FEBRUARY

All who have the relevant qualifications and the required level of experience can apply for Professional Membership of ISCO. The organization offers independent validation and integrity. Each grade of membership reflects an individual's professional training, experience and qualifications. Academic qualifications are not a requirement if applicants can demonstrate the necessary levels of competence through their experience, skills and professional development.

The key word is "professional" when applied to men and women who are making a success in their careers and have the necessary levels of knowledge and expertise. Professional recognition is a visible mark of quality, competence and commitment, and can offer a significant advantage in today's competitive environment.

The next deadline for submission of applications is 28 February, 2013 with the awards to be announced at the beginning of March.

Previous awards of FISCO, MISCO and AMISCO were announced in the ISCO Newsletter Issue 366 of 7 January 2013.

For more information about Professional Recognition, visit the ISCO website at <http://www.spillcontrol.org> click on "Membership" and select "Professional".

## Science & Technology

### STANDARD OIL-SPILL TESTS MIGHT MISS IMPORTANT CLASS OF CHEMICALS

February 4 - For decades, scientists studying oil spills have relied on the same methods to detect oil compounds. Unfortunately, these techniques miss an entire class of chemicals that have yet to be identified and that could account for about half of the total oil in some samples, according to research presented in January at the **Gulf of Mexico Oil Spill & Ecosystem Science Conference**, in New Orleans.

Studying these overlooked chemicals may improve scientists' understanding of oil toxicity and could explain the fate of some of the oil released in the 2010 Deepwater Horizon spill, the researchers say.

## Science & Technology (continued)

Since the 1980s, researchers have relied mostly on gas chromatography to hunt for about 150 different oil chemicals, mainly alkanes and aromatics. **Christopher M. Reddy** of **Woods Hole Oceanographic Institution** and colleagues ran an experiment to determine whether the method was missing anything.

First, the scientists measured the amount of all oil-related chemicals in sand samples collected during the Deepwater Horizon spill. Then they ran the samples through a gas chromatograph to measure the amount of the chemicals a spill scientist normally looks for.

Reddy's team found that the chemicals identified in the standard tests make up only about 50% of the total oil in the samples. Through elemental analysis, the researchers determined that the other substances are oxidized oil compounds. Reddy says that the standard tests don't catch these molecules because gas chromatography doesn't readily detect highly oxidized chemicals. *Chemical & Engineering News* [Read more](#)

## Cormack's Column



In this issue of the ISCO Newsletter we are printing No. 112 in a series of articles contributed by Dr Douglas Cormack.

Dr Douglas Cormack is an Honorary Fellow of ISCO. As the former Chief Scientist at the British Government's Marine Pollution Control Unit and head of the UK's first government agency, the Warren Spring Laboratory, Douglas is a well known and highly respected figure in the spill response community. He is the Chairman and a founder member of the [International Spill Accreditation Association](#)

## CHAPTER 113: KNOWLEDGE OF THE SEA EMPRESS INCIDENT

In article 112, I reviewed my half-life method of determining the amounts of floating pollutant (oil and HNS) likely to come ashore as a function of elapsed time at sea (articles 31-46). I now present the first stage of my consideration of such times in relation to the individual oil releases from the *Sea Empress* and the winds and tides to which they were subject prior to stranding. Both the SEEEC and MPCU Reports provide data on wind velocities from 15 February to the end of the month, these being confirmed by Paragon Associates, of which I was one of three who obtained data from the St Govan ODAS marine weather buoy, reference 62303, located 4.7nm to the south of St Govan's Head (51.5°N, 4.9°W) about 12nm south east of the Milford Haven entrance and about 25nm south west of Pendine Sands, between and including which, the Pembrokeshire coast was affected by the releases in addition to the Haven shores themselves. In addition, we obtained data on tidal streams from the Admiralty Pilot for West Coast of England and Wales; the Admiralty Tidal Steam Atlas for Irish Sea and Bristol Channel; and the tidal diamonds on the Admiralty Charts of the whole area.

Meanwhile, reference to the available release data showed that from 15 - 18 February and from 22 - 27 February inclusive, individually quantified releases partially came onshore under onshore winds, while in the offshore winds of 19 - 21 February they largely remained un-stranded prior to stranding on the onshore winds of 22 - 27 February inclusive. Again, reference to the current and wind together shows that on the ebb tides of 15 - 18 February the floating pollutant would move out of the Haven and northwest along the coast from St Anne's Head towards the Skokholm and Skomer Islands with a tendency to strand on the adjacent mainland coast under the influence of onshore winds from the west northwest during this period; that pollutant released towards the end of the ebb and still non-stranded, would be caught on the ensuing flood and either re-enter the Haven or pass across its mouth under the west northwest wind towards St Govan's Head with some of it likely to strand in Freshwater West before reaching the intermediate Linney Head from whence some of it would move parallel to the coast before clearing it beyond Govan Head, this latter movement being advanced by the ensuing flood up the Bristol Channel by which time any pollutant in the vicinity of the Haven entrance would enter to strand on inner shorelines as dictated by the wind and lee-shore; and that all such stranding emulsion between 16 to 18 February inclusive would have been at sea for 1.5 days on average.

In contrast, we see that the offshore winds from the north northeast would have moved emulsion further offshore in the period 19 - 21 February to be subjected successively thereafter to winds from the northwest, southwest, west, south southeast, west, south, and east southeast causing it to approach shore again further to the east and to strand at Manorbier, Tenby, Amroth, Marros and Pendine Sands; that such releases would have been at sea for 3 days prior to the recurrence of onshore winds in the period 22-27 February during which these releases would strand after an average after another 3 days. Thus, we see, with reference to tidal ebb and flow and to the sequence of onshore and offshore winds, that oil released up to and including 18 February and which threatened the Haven itself, its western and eastern headlands, the outer beaches from Freshwater West to Gluck's Hole and towards St Govan's Head, would have been at sea for an average of 1.5 days before stranding; and that releases which stranded further to the east towards Tenby around Carmarthen Bay to Pendine Sands would have been at sea for an average of 6 days prior to stranding (article 112).

- 1 The *Rational Trinity: Imagination, Belief and Knowledge*, D.Cormack, Bright Pen 2010 available at [www.authorsonline.co.uk](http://www.authorsonline.co.uk)
- 2 *Response to Oil and Chemical Marine Pollution*, D. Cormack, Applied Science Publishers, 1983.
- 3 *Response to Marine Oil Pollution - Review and Assessment*, Douglas Cormack, Kluwer Academic Publishers, 1999.

## RESPONSE TO INLAND OIL SPILLS – PART 8



A short series of articles contributed by Mark Francis of Oil Spill Solutions.

Mark Francis has been involved with the oil industry since 1975. He attended his first oil spill in 1976, the Tanker Elaine V incident. He became head of response for inland spills within the UK for British Petroleum E & P in 1980 for 10 years responding to well, storage tank and pipeline spills throughout the UK. Over the next 20 years he continued to build his international operations experience and has also specialised in spill response training, delivering IMO and other courses in more than 20 countries. Mark's website is at <http://www.oilspillsolutions.org>

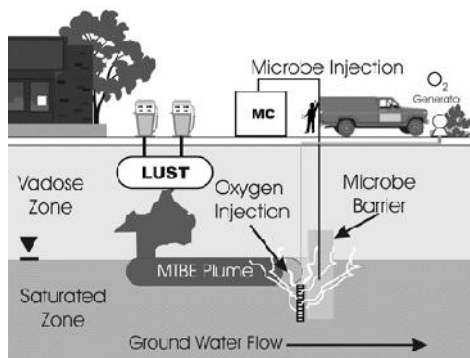
### Groundwater Treatment

[The following remediation techniques section was taken from [http://en.wikipedia.org/wiki/Groundwater\\_remediation](http://en.wikipedia.org/wiki/Groundwater_remediation)]

Ground water remediation techniques span biological, chemical, and physical treatment technologies. Most ground water treatment techniques utilize a combination of technologies. Some of the biological treatment techniques include bio-augmentation, bioventing, bio-sparging, bio-slurping, and phytoremediation.

Some chemical treatment techniques include ozone and oxygen gas injection, chemical precipitation, membrane separation, ion exchange, carbon absorption, aqueous chemical oxidation, and surfactant enhanced recovery. Physical treatment techniques include, but not limited to, pump and treat, air sparging, and dual phase extraction.

### Biological treatment technologies



[Diagram <http://www.clu-in.org>]

### Bio-augmentation and Bio-stimulation

If a treatability study shows no degradation (or an extended lab period before significant degradation is achieved) in contamination contained in the groundwater, then inoculation with strains known to be capable of degrading the contaminants may be helpful.

This process increases the reactive enzyme concentration within the bioremediation system and subsequently may increase contaminant degradation rates over the non-augmented rates, at least initially after inoculation.

Stimulating existing indigenous microbes with nutrients to increase the population can assist with the decomposition of contaminants.

### Bio-ventilation

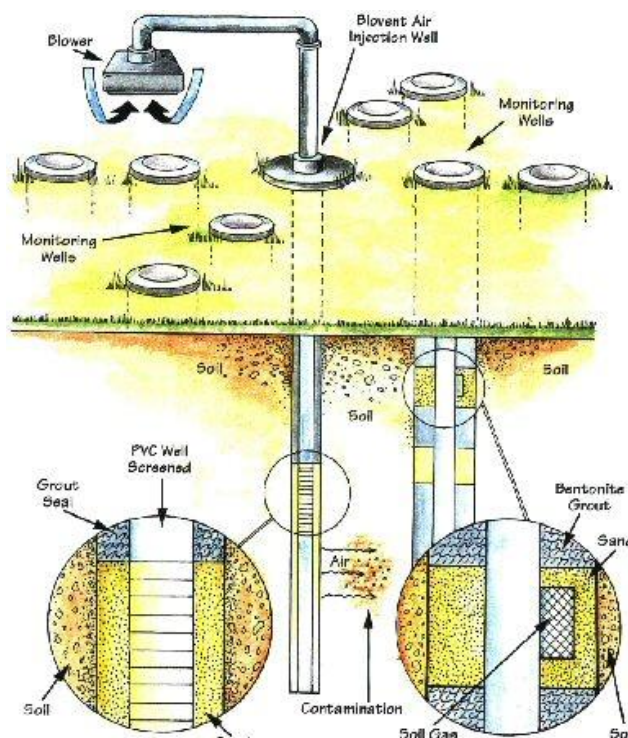
Bioventing is an in situ remediation technology that uses microorganisms to biodegrade organic constituents adsorbed in the groundwater.

Bioventing enhances the activity of indigenous bacteria and simulates the natural in situ biodegradation of hydrocarbons by inducing air or oxygen flow into the unsaturated zone and, if necessary, by adding nutrients.

During bioventing, oxygen may be supplied through direct air injection into residual contamination in soil.

Bioventing primarily assists in the degradation of adsorbed fuel residuals, but also assists in the degradation of volatile organic compounds (VOCs) as vapours move slowly through biologically active soil.

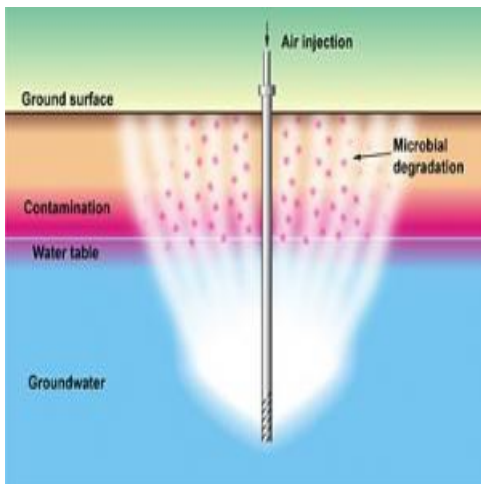
[Diagram <http://www.afce.af.mil>]





## Special feature - Inland spills (continued)

### Bio-sparging (scattering)



Bio-sparging is an in situ remediation technology that uses indigenous microorganisms to biodegrade organic constituents in the saturated zone.

In bio-sparging, air (or oxygen) and nutrients (if needed) are injected into the saturated zone to increase the biological activity of the indigenous microorganisms.

Bio-sparging can be used to reduce concentrations of petroleum constituents that are dissolved in groundwater, adsorbed to soil below the water table, and within the capillary fringe.

[Diagram <http://www.sciencedaily.com>]

**To be continued**

## Special feature – In situ burning

### IN SITU BURNING: CHAPTER 5



A short series of articles on In Situ Burning contributed by Dr Merv Fingas of Spill Science, Edmonton, Alberta, Canada T6W 1J6 [fingasmerv@shaw.ca](mailto:fingasmerv@shaw.ca)

Merv Fingas MSc PhD worked for more than 35 years in the field of oil spill technology at Environment Canada's Environmental Technology Center in Ottawa, Ontario. As head of the Emergencies Science Division at the Centre, he conducted and managed research and development projects. He is currently working independently in Alberta. Dr Fingas is the Member of ISCO Council for Canada.

### Summary of the Serial

This is the fifth of a series of articles on in-situ burning of oil spills. This series will cover in-situ burning step-by-step and will present the latest in knowledge on the topic.

### 5. The History of Burning

The first reference in the literature to the burning of oil on water was the use of a log boom to burn oil on the Mackenzie River in 1958.<sup>1,26</sup> Failed attempts to ignite the oil spilled from the *Torrey Canyon* in 1968 were widely known.<sup>1</sup> Extensive research on in-situ burning of oil spills began in the late 1970s and was carried out in North America by Environment Canada, the U.S. Coast Guard (USCG), the U.S. Minerals Management Service (USMMS), and the U.S. National Institute of Standards and Technology (NIST).

Over the years, research into in-situ burning has included laboratory-, tank-, and full-scale test burns. In the late 1970s several burn tests and studies were carried out in Canada by a consortium of government and industry agencies. Some tests in the early 1980s were performed by ABSORB (now Alaska Clean Seas) to evaluate the burning of oil in ice-covered areas. This research covered environmental and oil conditions such as sea state, wind velocities, air and water temperatures, ice coverage, oil type, slick thickness, and degree of oil weathering and emulsification.<sup>1</sup> Several tests have also been performed in an oil spill test tank at the USMMS OHMSETT Facility in New Jersey. Since the early 1990s, several meso-scale burns have been performed at the USCG Fire and Safety Detachment in Mobile, Alabama. Table 2 summarizes some of the tests and burns since the first recorded use of oil spill burning on water.<sup>1</sup>

The largest and most extensive offshore test burn took place off the coast of Newfoundland, Canada in August 1993.<sup>1,27</sup> The Newfoundland Offshore Burn Experiment (NOBE) involved 25 agencies from Canada and the United States. Two 50,000 L batches of oil were released and burned within a fire-resistant boom. During this test, more than 2,000 parameters were evaluated using various sampling methods. The major findings were that all emission and pollutant levels measured 150 m away from the burn were below health concern levels and that at 500 m from the burn, these levels were difficult to detect. In many cases, pollutants in the smoke plume were less than detected in the original unburned oil. The results also showed that the emission levels from this large burn were lower than found during the meso-scale burns.

A test of emissions from fires were carried out by a consortium of industry and government agencies at a test facility in Calgary Alberta.<sup>28</sup> Tests of various aspects of burning were conducted at the USCG facility in Mobile Bay, Alabama in 1991, 1992, and

## Special feature – In situ burning (continued)

1994. More than 35 burns were conducted using crude oil and diesel fuel.<sup>1</sup> Physical parameters were measured as well as emission data.

There are more tests – to be described in the next part of this serial. The many successful burns at the Deepwater Horizon certainly capped the history of in-situ burning.

**Table 2 Summary of Burns or Tests (condensed)**

Year	Country	Location/Incident	Description
1958	Canada	Mackenzie River, NWT	First recorded use of in-situ burning, on river using log booms
1967	Britain	TORREY CANYON	Cargo tanks difficult to ignite with military devices
1969	HOLLAND	Series of experiments	Igniter KONTAX tested, many slicks burned
1970	Canada	ARROW	Limited success burning in confined pools
1970	SWEDEN	OTHELLO/KATELYSIA	Oil burned among ice and in pools
1970	Canada	Deception Bay	Oil burned among ice and in pools
1973	Canada	Rimouski—experiment	Several burns of various oils on mud flats
1975	Canada	Balaena Bay—experiment	Multiple slicks from underice oil ignited
1976	U.S.A.	ARGO MERCHANT	Tried to ignite thin slicks at sea
1978-82	Canada	Series of experiments	Studied many parameters of burning
1979	Mid-Atlantic	ATLANTIC EMPRESS/ AEGEAN CAPTAIN	Uncontained oil burned at sea after accident
1979	Canada	IMPERIAL ST. CLAIR	Burned oil in ice conditions
1980-1	Canada	McKinley Bay—experiment	Several tests involving igniters, different thicknesses
1983	Canada	EDGAR JORDAIN	Vessel containing fuels and nearby fuel ignited
1983-4	Canada	series of experiments	Tested the burning of uncontained slicks
1984	U.S.A.	Beaufort Sea—experiment	Burning with various ice coverages tested
1984-5	U.S.A.	OHMSETT—experiments	Oil burned among ice but not with high water content Ice concentration not important, Emulsions don't burn
1984-6	Canada	Offshore Atlantic—experiment	Oil among ice burned after physical experiment
1985-1986	Canada - USA	several experiments in various locations	tests plus analyzed residues
1989	U.S.A.	EXXON VALDEZ	Test burn performed using a fire-proof boom
1989-1993	U.S.A.	Mobile experiments	Several test burns in newly-constructed pan
1993	Canada	Newfoundland Offshore burn	Successful burn on full scale off shore
1994, 96, 2001	U.S.A.	North Slope burns	Large scale burn to measure smoke
1994	Norway	Series of Spitzbergen burns	Large scale burns of crude and emulsions
1994	Britain	Burn test	First containment burn test in Britain
1996-97	U.S.A.	Mobile burns	Small scale diesel burns to test booms
1997	U.S.A.	North Slope tank tests	Conducted several tests on waves/burning
2002-3	Canada	Small scale tests on heavy oils	Tested procedures to burn heavy and emulsified fuels
2004	Svalbard, Norway	Burns in ice	Tested burning in frazil and brash ice
2010	U.S.A.	Deepwater Horizon Spill	successful 401 burns

## Special feature – In situ burning (continued)

### References

- 1 Fingas, M., "In-situ Burning", Chapter 23, in *Oil Spill Science and Technology*, M. Fingas, Editor, Gulf Publishing Company, NY, NY, pp. 737-903, 2011
- 21 N. Mabille: *Controlled in-situ burning: transition from alternative technology to conventional spill response option*, AMOP, 584, 2012
- 26 McLeod, W.R. and D.L. McLeod, *Measures to Combat Offshore Arctic Oil Spills*, Preprints of the 1972 Offshore Technology Conference, 141, 1972
- 27 Fingas, M.F., F. Ackerman, K. Li, P. Lambert, Z. Wang, M.C. Bissonnette, et al., *The Newfoundland Offshore Burn Experiment - NOBE - Preliminary Results of Emissions Measurement*, AMOP, 1099, 1994
- 28 Booher, L.E. and B. Janke, *Air Emissions from Petroleum Hydrocarbon Fires during Controlled Burning*, Amer. Indus. Hyg. Assoc. J., 359, 1997

*To be continued*

## Publications

### FOR YOUR INTEREST – LINKS FOR RECENT ISSUES OF PERIODICALS

<a href="#">The Essential HazMat News</a>	Alliance of Hazardous Materials Professionals	February 4 issue
<a href="#">IMO News Magazine</a>	Recent IMO activities	Q4 2012 issue
<a href="#">ASME EED HSE Newsletter</a>	News and commentary on HSE issues from George Holliday	February 4 issue
<a href="#">IMO Publishing Newsletter</a>	Info on new IMO publications	January 2013 issue
<a href="#">CEDRE Newsletter</a>	News round-up from CEDRE in Brest, France	Issue 209, 2013
<a href="#">Bow Wave</a>	News for the maritime community & to make you smile	February 5 issue
<a href="#">Intertanko Weekly News</a>	International news for the oil tanker community	No 6, 2013
<a href="#">US EPA Tech Direct</a>	Info on soil, sediment and groundwater remediation	February 1 issue
<a href="#">Soil &amp; Groundwater Newsletter</a>	Compiled by Environmental Expert	February 7 issue

### EMERGENCY RESPONSE CHART

ISCO Member, Brian O'Connor of Australia's Canberra and Regions Oil Industry Emergency Response Group writes to tell us about the availability of the new Emergency Response Chart –

"In the February CROIERG Web News we mentioned the Emergency Response Chart we have had made and that we can now provide copies to members (at cost).

This chart uses Canadian material provided by our Canadian industry friends and this specific approach to emergency response is widely used in North America (Canada/USA)

This is the best, and most simplistic, quick-reference material I have ever seen in regard to Oil Industry Transport Emergency Response. Price (at cost): - Printing plus Postage \$54.78 The ER Chart is 600mm x 385mm) and is in Colour with a protective coating on corflute (very light)": -

"A DISCIPLINED APPROACH TO EMERGENCY RESPONSE" - The Chart is a data gathering and decision making process to aid responders in handling emergencies in a logical, methodical manner, outlining: -

SITUATION ANALYSIS PHASE – Problems, Modifying Conditions, Potential Losses and Control Measures

STRATEGY & TACTIC SELECTION PHASE - Response Strategies and Restoration Strategies [More info](#)

### CEDRE: LOCAL AUTHORITIES' GUIDE: WHAT TO DO IN THE EVENT OF A SPILL

The French version of the "[Local Authorities' Guide: What to do in the event of a spill](#)" is now available in printed format. [More info](#)

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