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# Oil Spill Program Update

**The U.S. EPA's Oil Program Center Report**

**ABOUT THE UPDATE**

EPA's *Oil Spill Program Update* is produced quarterly, using information provided by EPA Regional staff, and in accordance with Regions' information needs. The goal of the Update is to provide straight-forward information to keep EPA Regional staff, other federal agencies and departments, industries and businesses, and the regulated community current with the latest developments. The Update is distributed in hard copy and is available on the Oil Program homepage at ***www.epa.gov/oilspill***.

## Activities in Region 10, Alaska Operations

### *EPA Representative Faces Inspection-Related Subpoena*

EPA Oil Program staff can sometimes be caught up in private litigation involving the facilities they inspect as part of EPA's Oil Pollution Prevention regulations. Just ask Don Marson, a Senior Environmental Employment (SEE) enrollee working in EPA's Alaska Operations Office. A local attorney contacted Marson in early June 1999 with some questions about a particular fuel storage facility's SPCC inspection history. During his discussion with the attorney, Marson noted that he had stopped at the facility to refuel his vehicle while on official EPA inspection business in 1997. From his cursory viewpoint of the installation at that time, it appeared that no navigable waters were present, so it was not likely that the facility was subject to EPA's Oil Pollution Prevention regulations. Therefore, no official site inspection was deemed essential at that time. Because routine follow-up inspections were scheduled in that general area for mid-June, 1999, however, Marson told the attorney that he would likely conduct an SPCC inspection there. The facility was inspected June 15, 1999.

In July, Marson received a telephone call from a different Anchorage attorney regarding SPCC issues at the same site. The lawyer, who was representing a plaintiff in a lawsuit, asked Marson to complete an affidavit relating to the SPCC inspection at the facility. The attorney faxed the affidavit to the EPA's office. Marson examined the document and forwarded it to EPA Region 10, Office of Regional Counsel (ORC) in Seattle for review and advice. Because he is not a federal employee, Marson also contacted the National Older Worker Career Center (NOWCC) in Washington, D.C. which administers SEE grant program, for guidance in handling this unusual situation. On recommendation of both the NOWCC and ORC's telephone communication to the Anchorage attorney, Marson contacted the attorney and declined to sign the affidavit, citing his adherence to NOWCC's confidential business information policy. The next day, Marson was served at his office with a subpoena requiring that he submit to a deposition and provide inspection records the following week.

Considerable internal legal discussions ensued the next several days prior to the deposition regarding EPA's position and Don

Beatriz Oliveira, Editor,
Oil Program Center
703/603-1229
David Lopez, Director,
Oil Program Center
703/603-8760
401 M Street SW
Mail Code 5203G
Washington, D.C. 20460

Marson's situation. NOWCC Headquarters not only provided him with outstanding support, but offered to pay for an attorney to represent him since the EPA's legal counsel could not. Of particular concern in the matter was that Marson was not authorized to release government inspection records to the attorney. ORC staff in Region 10's Seattle office decided to allow their criminal attorney to hand-carry the documents and to accompany Marson for the deposition since he was in Anchorage on other EPA business. The two met with the attorney, the deposition was given, and copies were made of the SPCC inspection without incident. This unusual occurrence highlights the fact that doing business with SEE staff can present some unique challenges, but that the support networks are there to help in a pinch. Should a similar experience occur with a federal EPA employee, the subpoena would have to be referred to the Agency's legal counsel instead.

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## *Rural Alaska Storage Tanks In Need of Upgrades*

Since 1991, EPA, the U.S. Coast Guard, and several State of Alaska agencies have worked cooperatively to address the problem of deteriorating and leaking aboveground oil storage tanks in rural Alaskan native villages throughout the state. Progress is slowly being made to upgrade the worst facilities. However, leaking tanks continue to be a widespread problem and a threat to human health and the environment.

During the 1940's and 1950's, many bulk fuel storage facilities were built in rural Alaska. Although their intended service life was only 20 to 25 years, the majority of these facilities are still in use well beyond their projected life expectancy. In 1991, based upon field inspection findings of gross non-compliance, the U.S. Coast Guard began issuing orders to curtail fuel deliveries to many facilities in rural Alaska. However, the cruel reality of denying fuel to villages facing harsh Alaskan winters prompted the Coast Guard to soften its stance. In order to assess the scope of the problem, the State of Alaska's Department of Community and Regional Affairs conducted a survey of tank farms; the survey concluded that the cost to repair and upgrade the bulk systems would be at least $200 million. By fiscal year 1996 EPA had developed and budgeted a plan to spend $10 million over four years on demonstration projects to consolidate and repair deteriorating bulk fuel facilities in rural Alaskan villages.

On January 17, 1997, staff from EPA's Oil Program Center and Region 10 met with Jeff Stacer, an aide to Senator Ted Stevens (R-AK) to discuss the problem of leaking tanks, the infrastructure, and manpower necessary to support Alaska village assistance.

In response to this and other needs of rural Alaskan villages, Senator Stevens introduced the concept of the *Denali Commission* as a tool to address rural infrastructure and utility needs. The Commission is made up of representatives of five statewide organizations and is co-chaired by Alaska Governor Tony Knowles. The members are the Alaska Federation of Natives, the University of Alaska, the Alaska State AFL-CIO, the Associated General Contractors of Alaska and the Alaska Municipal League. In June 1999, the Denali Commission awarded $10 million to repair,

replace, and consolidate bulk fuel storage facilities in 13 of the state's rural communities. "These projects are an example of the kinds of things the Denali Commission was created to do," said Jeff Stacer, Federal Co-Chair of the Commission. "A safe and reliable fuel supply is essential in rural Alaska. These projects will enhance health and safety, protect the environment, provide rural employment, and reduce the cost of living in these communities over the long term. There is an enormous backlog of work to be done to put rural Alaskans on an even footing with the rest of the nation when it comes to the most basic infrastructure needs and economic opportunity," said Senator Stevens, "I am pleased that the Commission is putting its resources to work this summer to begin to address some of these needs."

Although the EPA demonstration projects and Denali Commission Grants will help address the most pressing needs, they are just a start at correcting the problem. Nearly 100 oil storage tank inspections were conducted during 1999 throughout Alaska. Approximately 97% of these facilities were found to be out of compliance with 40 CFR § 112 Oil Pollution Prevention regulations. It's encouraging to report, however, that the majority of these facilities are cooperating with the EPA's Alaska Operations Office towards meeting SPCC/FRP compliance.

*Thanks to Don Marson, of EPA's Alaska Operations Office for reporting on events there.*

# Bioremediation in Oil Spill Response

## *Summary*

Bioremediation is a technique that may be useful to remove spilled oil under certain geographic and climatic conditions. This article provides on-scene coordinators (OSCs) and other decision makers with the latest information on evolving technologies that may be applicable for use in responding to an oil spill. As used here, bio-remediation is defined to include the use of nutrients to enhance the activity of indigenous organisms and/or the addition of naturally-occurring non-indigenous microorganisms.

## *Background*

Many compounds in crude oil are environmentally benign, but significant fractions are toxigenic or mutagenic. The latter are the ones we are most interested in removing or destroying in an oil spill. Bioremediation is a technology that offers great promise in converting the toxigenic compounds to nontoxic products without further disruption to the local environment.

When microorganisms break down petroleum hydrocarbons, the first step usually is addition of a hydroxyl group to the end of an alkane chain or onto an unsaturated ring of a polycyclic aromatic hydrocarbon (PAH), forming an alcohol. Progressive oxidation to an aldehyde and then a carboxylic acid leads to chain length reduction and eventually to production of carbon dioxide, water, and biomass. In the case of the PAH, ring fission takes place, again leading eventually to mineralization. As oxygen is added to hydrocarbons, the compounds become more polar and thus more water soluble. These compounds are usually more easily bio-degradable and thus less toxic. Although the more polar compounds are more likely to enter the water column as biodegradation ensues, they are unlikely to cause environmental damage or toxic effects to nearby biota. Furthermore, the amount of dilution available from the tidal waters is so great that the amounts of benign polar constituents entering the food chain are likely to be negligible. Thus, the effect of biochemical end products from the easily metabolizable compounds in oil will be insignificant in the environment.

## *Requirements for Success*

Since the contaminants of concern in crude oil are readily biodegradable under appropriate conditions, the success of oil-spill bioremediation depends on our ability to establish those conditions in the contaminated environment. The most important requirement is that bacteria with appropriate metabolic capabilities must be present. If they are, their rates of growth and hydrocarbon biodegradation can be maximized by ensuring that adequate concentrations of nutrients and oxygen are present and that the pH is between about 6 and 9. The physical and chemical characteristics of the oil are also important determinants of bioremediation success. Heavy

crude oils that contain large amounts of resin and asphaltene compounds are less amenable to bioremediation than are light- or medium-weight crude oils that are rich in aliphatic components. Finally, the oil surface area is extremely important because growth of oil degraders occurs almost exclusively at the oil-water interface.

Obviously, some of these factors can be manipulated more easily than others. For example, nothing can be done about the chemical composition of the oil, and no adequate engineering approaches are currently available for providing oxygen to oil-contaminated surficial sediments in the intertidal zone. Therefore, the two main approaches to oil-spill bioremediation are: (1) *bioaugmentation*, in which oil-degrading bacteria are added to supplement the existing microbial population, and (2) *biostimulation*, in which nutrients or other growth-limiting co-substrates are added to stimulate the growth of indigenous oil degraders. Since oil-degrading bacteria usually grow at the expense of one or more components of crude oil, and these organisms are ubiquitous, there is usually no reason to add hydrocarbon degraders unless the indigenous bacteria are incapable of degrading one or more important contaminants. The size of the hydrocarbon-degrading bacterial population usually increases rapidly in response to oil contamination, and it is very difficult, if not impossible, to increase the microbial population over that which can be achieved by biostimulation alone. The carrying capacity of most environments is probably determined by factors such as predation by protozoans, the oil surface area, or scouring of attached biomass by wave activity that are not affected by bioaugmentation, and added bacteria seem to compete poorly with the indigenous population. Therefore, it is unlikely that they will persist in a contaminated beach even when they are added in high numbers. As a result, bioaugmentation has never been shown to have any long-term beneficial effects in shoreline cleanup operations.

Biostimulation involves the addition of rate-limiting nutrients to accelerate biodegradation by indigenous microorganisms. When an oil spill occurs, it results in a huge influx of carbon into the impacted environment. Carbon is the basic structural component of living matter, and in order for the indigenous microorganisms to be able to convert this carbon into more biomass, they need significantly more nitrogen and phosphorus than is normally present in the environment. Both of these elements are essential ingredients of protein and nucleic acids of living organisms. The main challenge associated with biostimulation in oil-contaminated coastal areas or tidally influenced freshwater rivers and streams is maintaining optimal nutrient concentrations in contact with the oil.

## *Nutrient Application*

Effective bioremediation requires nutrients to remain in contact with the oiled material, and the concentrations should be sufficient to support the maximal growth rate of the oil-degrading bacteria throughout the cleanup operation.

Marine Environments. With respect to the marine environment, contamination of coastal areas by oil from offshore spills usually occurs in the intertidal zone where the washout of dissolved nutrients can be extremely rapid. Oleophilic and slow-release formulations have been developed to maintain nutrients in contact with the oil, but most of these rely on dissolution of the nutrients into the aqueous phase before they can be used by hydrocarbon degraders. Therefore, design of effective oil bioremediation strategies and nutrient delivery systems requires an understanding of the transport of dissolved nutrients in the intertidal zone.

Transport through the porous matrix of a marine beach is driven by a combination of tides, waves, and flow of freshwater from coastal aquifers. Tidal influences cause the groundwater elevation in the beach and the resulting hydraulic gradients to fluctuate rapidly. Wave activity affects groundwater flow through two main mechanisms. First, when waves run up the beach face ahead of the tide, some of the water percolates vertically through the sand above the water line and flows horizontally when it reaches the water table. Waves can also affect groundwater movement in the submerged areas of beaches by a pumping mechanism that is driven by differences in head between wave crests and troughs.

In 1994 and later in 1995, tracer studies were conducted on the shorelines of Delaware and Maine to study the rate of nutrient transport in low and high energy, sandy beaches. The Delaware work showed that the rate of tracer

washout from the bioremediation zone (i.e., upper 25 cm below the beach surface) was more rapid when tracer was applied at spring tide than at neap tide, but the physical path taken by the tracer plume moved vertically into the beach subsurface and horizontally through the beach in a seaward direction. Vertical transport was driven by waves, whereas horizontal transport was driven by tides. The Maine work suggested that surface application of nutrients would be ineffective on high-energy beaches because most of the nutrients will be lost to dilution at high tide. On low energy beaches, however, this is an effective and economical bioremediation strategy. Nutrients that are released from slow-release or oleophilic formulations will probably behave similarly to the dissolved lithium tracer that was used in the study. Thus, they will not be effective on high-energy beaches unless the release rate is high enough to achieve adequate nutrient concentrations while the tide is out. Subsurface application of nutrients might be more effective on high-energy beaches. Since crude oil does not penetrate deeply into most beach matrices, however, nutrients must be present near the beach surface to effectively stimulate bioremediation. Since nutrients move downward and seaward during transport through the intertidal zone of sandy beaches, nutrient application strategies that rely on subsurface introduction must provide some mechanism for insuring that the nutrients reach the oil-contaminated area near the surface.

Freshwater Environments. With respect to freshwater shorelines, an oil spill is most likely to have the greatest impact on wetlands or marshes rather than a wide shoreline zone like a marine intertidal zone. Less research has been conducted in these types of environments, so it is not yet known how well bioremediation would enhance oil removal. By the year 2000, however, data will be available from an intentional oil spill study being conducted jointly by the U.S. EPA and Fisheries and Oceans-Canada on a freshwater shoreline of the St. Lawrence River in Quebec. This study is examining bioremediation with nitrate and ammonium in the presence and absence of wetland plant species (*Scirpis americanus)*. However, the same principles apply to this type of environment as a marine environment, namely, that nutrients must be maintained in contact with the degrading populations for a sufficient period of time to effect the enhanced treatment. There is an added complication in a wetland, however. Oil penetration is expected to be much lower than on a porous sandy marine beach. Below only a few centimeters of depth, the environment becomes anaerobic, and petroleum biodegradation is likely to be much slower even in the presence of an adequate supply of nitrogen and phosphorus. Technology for increasing the oxygen concentration in such an environment is still undeveloped, other than reliance on the wetland plants themselves to pump oxygen down to the rhizo-sphere through the root system.

Soil Environments. Land-farming techniques for treating oil spills on soil have been used extensively for years by petroleum companies and researchers. Again, the same principles apply: maintenance of an adequate supply of limiting nutrients and electron acceptors (nitrogen, phosphorus, and oxygen) in contact with the degrading populations throughout the entire treatment period. For surface contamination, maintenance of an adequate supply of oxygen is accomplished by tilling. The maximum tilling depth is limited to about 15 to 20 inches, however. If the contamination zone is deeper, other types of technologies would have to be used, such as bioventing, composting, or use of biopiles, all of which require addition of an external supply of forced air aeration.

## *Field Evidence for Bioremediation*

Demonstrating the effectiveness of oil spill bioremediation technologies in the field is difficult because the experimental conditions cannot be controlled as well as is possible in the lab. Nevertheless, well-designed field studies can provide strong evidence for the success of a particular technology if one can convincingly show that (1) oil disappears faster in treated areas than in untreated areas and (2) biodegradation is the main reason for the increased rate of disappearance. Convincing demonstration of an increased rate of oil degradation was provided from a field study conducted during the summer of 1994 on the shoreline of Delaware Bay. Although substantial hydrocarbon biodegradation occurred in the untreated plots, statistically significant differences between treated and untreated plots were observed in the biodegradation rates

of total alkane and total aromatic hydrocarbons. First order rate constants for disappearance of individual hopane-normalized alkanes and PAHs were computed, and the patterns of loss were typical of biodegradation. Significant differences were not observed between plots treated with nutrients alone and plots treated with nutrients and an indigenous inoculum of oil degraders from the site. The high rate of oil biodegradation that was observed in the untreated plots was attributed to the relatively high background nitrogen concentrations that were measured at the site.

## *Other Research*

Research is ongoing to evaluate bioremediation and phytoremediation (plant-assisted enhancement of oil biodegradation) for their applicability to clean up oil spills contaminating salt marshes and freshwater wetlands. Data will be available in the year 2000 for the freshwater wetland study and 2001 for the salt marsh. By December of 2000, EPA is planning to produce a draft guidance document detailing the use of bioremediation for sandy marine beaches and freshwater wetlands. EPA is also studying the biodegradability of non-petroleum oils (vegetable oils and animal fats) and their impacts on the environment during biodegradation. Reports will be available some time in 2000.

## *Conclusion*

In conclusion, bioremediation is a proven alternative treatment tool that can be used to treat certain aerobic oil-contaminated environments. Typically, it is used as a polishing step after conventional mechanical cleanup options have been applied. It is a relatively slow process, requiring weeks to months to effect cleanup. If done properly, it can be very cost-effective, although an in-depth economic analysis has not been conducted to date. It has the advantage that the toxic hydrocarbon compounds are destroyed rather than simply moved to another environment. The biggest challenge facing the responder is maintaining the proper conditions for maximal biodegradation to take place, i.e., maintaining sufficient nitrogen and phosphorus concentrations in the pore water at all times (~5-10 mg N/L). Based on solid evidence from the literature, it appears that addition of exogenous cultures of microorganisms will not enhance the process more than simple nutrient addition. Bioremediation is not considered a primary response tool, although it could be so used if the spilled oil does not exist as free product and if the area is remote enough not to require immediate cleanup to satisfy a tourism industry. If the affected environment is a high energy shoreline, bioremediation will likely be less effective than on a lower energy shoreline. Application of dry granular fertilizer to the impact zone is probably the most cost-effective way to control nutrient concentrations.

For more information, please contact Dr. Albert D. Venosa
U.S. EPA
26 West Martin Luther King Drive
Cincinnati, OH 45268
E-mail: ***venosa.albert@epa.gov***

# Whatcom Creek Spill and Explosion Update

As a result of the recent gasoline spill and explosion in Bellingham, Washington, the Office of Pipeline Safety (OPS) ordered the Olympic Pipe Line Company to excavate and visually inspect all of the known defects on the top half of a 400-mile pipeline in Washington. The order, issued on June 18 and amended on August 10, 1999, requires Olympic Pipe Line Company to complete all of its inspections before restarting the pipeline at a reduced pressure. Other ordered safety improvements include testing of all main pipeline valves in populated or environmentally sensitive areas, installation of a check valve, and repairs to Olympic Pipe Line Company's computer systems.

Olympic Pipe Line Company has come under increasing scrutiny from Congress and the OPS following the June 10, 1999, fuel spill and explosion at Whatcom Creek in Bellingham, Washington. Investigations by the National Transportation Safety Board (NTSB) are underway to determine the cause of the spill, which released 277,000 gallons of fuel into the creek and surrounding areas. The fuel generated a thick cloud of vapor that traveled along the creek and then exploded. Two boys who were playing with the fireplace lighter that sparked the explosion were killed by the fire. A third victim drowned after

succumbing to the vapors while fishing in the creek.

Testing using "smart pigs" in 1996 and 1997 identified 297 defects in the pipeline, including one that was in the vicinity of the rupture. Smart pigs are devices outfitted with electronic sensors that can travel through a pipeline to collect data on its condition. Olympic Pipe Line Company deemed that only 10 percent of the defects discovered during the tests merited further investigation. Records indicate that the defect near the rupture site was not investigated after its initial discovery.

NTSB is also investigating Olympic Pipe Line Company's control room operations during the leak. Control room computers crashed as a valve that diverts surges in pressure failed and allowed abnormally high pressures to surge down the pipeline until it ruptured. Fuel continued to surge through the pipeline for nearly an hour after the initial leak. In a Pipeline Safety Advisory Bulletin, OPS investigators attributed the delay in shutting off the pipeline to an internal database error that drew computer system resources away from critical control operations.

Bellingham officials are calling for immediate safety improvements to be made in addition to those required by OPS. These improvements include a pressure relief valve and storage tanks to reduce pressure in the pipeline in emergency situations. The system would open a valve hydraulically if the pressure in the pipeline exceeded a certain level. Fuel would then be released from the pipeline into storage tanks to reduce the pressure in the line. According to Bellingham Mayor Mark Asmundson, these improvements would cost Olympic Pipe Line Company an estimated $100,000 but would provide backup emergency controls if computer and electrical systems fail. If Olympic Pipe Line Company fails to meet the city's safety standards before September 18, 1999, the city may terminate the franchise agreement that allows the pipeline to operate on city-owned land.

*Workers help to clean up spill near Whatcom Creek.*

Cleanup and restoration efforts supported by Olympic Pipe Line Company have involved stabilizing barren hillsides and soil mixing to allow pockets of fuel to evaporate. Pockets of fuel that were not consumed by the fire were removed with sorbent pads, booms, and sweeps. Scattered pockets of fuel still exist under rocks and tree roots, or where fuel has been absorbed down to the bedrock. Experts point out that, although the timeframe for recovery is not known, the first signs have been observed that vegetation and insect life are returning to the creek.

Prior to the spill, Whatcom Creek was home to chum, coho, steelhead and cutthroat trout, and even lamprey. Several groups within the community were nurturing increasingly large runs of salmon, and a park dedicated to preserving the salmon runs was to be dedicated in late August. The spill and fire essentially killed every living thing in the creek, including 30,000 fish and countless numbers of their insect prey.

The spill has also forced Olympic Pipe Line Company to withdraw its bid to build a new pipeline to transport fuel from refineries on Puget Sound to markets in eastern Washington. Proponents of the plan hoped that the pipeline would reduce congestion from tanker truck traffic and cut fuel costs to consumers. Environmental groups are celebrating the abandonment of the plan, as it would have involved operating a pipeline through three

parks with environmentally sensitive areas.

Consumers are feeling the impact of the incident at the gas pump where they have had to pay up to $1.50 per gallon for regular unleaded gasoline due to the limited supply of fuel following the Whatcom Creek incident. Some stations in the Puget Sound area have been without premium gasoline for days at a time. Because of the spill the remaining pipeline supplying fuel to northern Oregon and western Washington is only operating at 45 percent of its normal capacity. Tanker trucks and barges are scrambling to make up the difference.

# Recent Enforcement Actions

## *Newark Company Pays Fine for Inadequate Spill Prevention*

A Newark facility that did not adequately prepare and implement a Spill Prevention Countermeasure and Control (SPCC) Plan was caught by EPA and will pay penalties. Hudson Tank Terminals, Corp., of Port Newark, was issued a complaint in March 1999 and has agreed to pay a $38,000 fine for the violations.

"Every year, thousands of gallons of oil spilled from large oil storage facilities foul our waters," said Jeanne M. Fox, EPA Regional Administrator. "SPCC plans are critical to efforts to prevent these spills. Make no mistake, EPA is out there checking, and facilities without spill prevention will be fined."

According to a complaint, issued to Hudson Tank in March, the company did not have an adequate SPCC plan. An inspection of the property also revealed that there was not adequate secondary containment (a barrier that would contain spills before they can could reach the water) around oil storage tanks and loading and unloading areas at the facility. Hudson Tank, which has a total oil storage capacity of approximately 35 million gallons, has settled this complaint by installing proper spill prevention structures, updating its plan, and paying a $38,000 fine.

Since December 1998, facilities across the region have been issued or paid fines for a total of $210,000 for violations of the SPCC requirements of the Clean Water Act. Any facility that stores more than 1320 gallons of oil or oil derivatives in aboveground storage tanks must develop plans to prevent spills from occurring, and must implement these plans by installing secondary containment around storage tanks and other areas where oil could be spilled. These plans must be certified by a professional engineer and must be reviewed at least once every three years.

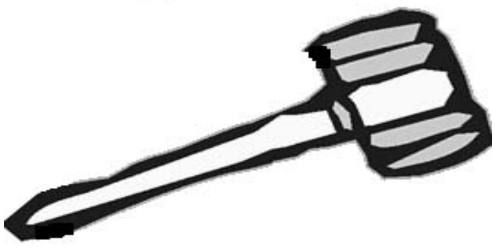
For more information, contact Rich Cahill at (212) 637-3666 or at EPA, Region 2, 290 Broadway, New York, NY, 10007-1866.

## *EPA Settles With Oil Facilities on Navajo Lands*

In August 1999, EPA fined Speedy's Convenience, Inc. $68,600 and Giant Industries Arizona, Inc. $13,000 for failure to prepare and implement oil spill prevention plans for their facilities on Navajo Nation lands. EPA filed administrative complaints against the facilities in September 1998.

EPA inspected 19 facilities in June 1997 at the request of the Navajo Nation Environmental Protection Agency to assess whether they were complying with the Clean Water Act's oil spill prevention regulations. During the inspections, EPA officials walked through the facilities and gave information, including sample Spill Prevention Control and Countermeasure Plans, on how to comply with oil spill prevention guidelines.

Both facilities had failed to prepare and implement Spill Prevention Control and Countermeasure Plans. Oil Spills from Speedy Convenience's 720,000 gallon oil storage facility near Lupton, Arizona could impact the Puerco River. Giant Industries Arizona's 195,000 gallon aboveground crude storage facility and tanker transfer facility in Montezuma Creek, Utah has the potential to impact Montezuma Creek and the San Juan River.



# Oil Spill in Hagerman National Wildlife Refuge

On May 28, 1999, the Laguna Oil Company discovered a spill of a crude oil and saltwater mixture from one of its active wells in Grayson County, Texas. The spill site is located in a heavily vegetated rural area, 10 miles northwest of Sherman Texas and within the Hagerman National Wildlife Refuge. Oil was spilled onto soils adjacent to a failed pump jack, and flowed into an intermittent stream, and from there into Myers Branch Creek. The creek empties into Lake Texoma; however, no oil from this spill is believed to have reached the lake. The incident released approximately 60 barrels of the oily mixture.

The Laguna Oil Company, the responsible party, did not report the spill to the National Response Center (NRC) until June 2, 1999, five days after discovering it. The EPA received notification of the spill from the NRC June 2, and responded on-site June 9, 1999.

Upon arrival at the site, EPA and U.S. Fish and Wildlife Service (USFWS) officials observed oil pools, sheens, and oil staining on banks and vegetation in the intermittent stream and Myers Branch Creek. The Laguna Oil Company led cleanup efforts through deployment of booms, oil skimming, and use of sorbents on the creek. Although the spill occurred in a wildlife refuge, no affected fish or wildlife were found during cleanup. However, the delay in notification coupled with limited access to the site made determination of the spill's full impact difficult.

A follow-up investigation was conducted by EPA, USFWS, and Laguna on June 16, 1999. No oil was observed downstream of final boom placement, though sheen and oil-soaked debris were noted in Myers Branch Creek. Investigators found that soil in the vicinity of the pump jack and on the spillway had been tilled and that some product remained along the intermittent creek. EPA plans to continue coordination with USFWS regarding sampling results and further cleanup activities by Laguna.

*Booms were deployed on Myers Branch Creek. No affected fish or wildlife was discovered.*

# Accidents Draw Attention to Pipeline Safety

Recent tragedies caused by leaking oil and gas pipelines have brought the pipeline industry and the Department of Transportation's Office of Pipeline Safety (OPS) under increasing public scrutiny. In June 1999 three people were killed in Bellingham, Washington when a pipeline rupture leaked gasoline into a local stream, leading to a massive explosion and fire. A propane gas pipeline leak in San Juan, Puerto Rico in 1996 resulted in an explosion that killed 33 people and injured 69 others.

Accidents like these have called into question the safety of pipelines that carry petroleum products and gas, and have raised doubts about how the federal government is performing regulatory oversight of pipeline companies. The Office of Pipeline Safety is the branch of the federal government responsible for regulating pipelines. It is a small office however, with only 105 employees and an annual budget of $34 million. Until fiscal year 1995 it had only half that level of staff and funding. Despite its small size the scope of its task is enormous. With just 55 inspectors nationwide,

the agency oversees more than 2 million miles of underground pipeline. Between 1992 to 1994, OPS spent 50 percent more time inspecting pipelines even though staffing levels had only increased 19 percent.

Although it contends that its safety record is good and has not changed significantly over the past ten years, OPS is working with its state partners and the pipeline industry to continually improve pipeline safety. An example of this is the OPS risk management initiative. Under the initiative, pipeline operators design and implement risk management plans that are subject to regulatory approval. The review and approval process for risk management plans will be based on the spill response plan review systems that was established under the Oil Pollution Act of 1990. OPS continues to update its regulations to reflect best industry practices by making them more performance-based and less prescriptive.

Although OPS continues to work for safer pipelines, tighter safeguards have been slow in coming. Although it is an isolated incident, to some the explosion in San Juan suggests problems in federal oversight. An investigation of the explosion found that local regulators had an ineffective pipeline safety program, and the local utility was using poorly trained employees who mishandled the complaints of gas odors. According to the National Transportation Safety Board (NTSB), the accident might have been prevented if OPS had more effectively monitored the local regulators. Since that explosion, federal spending on pipeline safety has doubled, the number of federal pipeline inspectors has dramatically increased, fines against the industry are rising, and a new administration has set a goal of making sharp reductions in the number of pipeline accidents.

Proponents of tighter regulations point to several trends that suggest a need for better safety measures. According to OPS, the number of fatalities related to gas transmission systems is on the rise. Figures offered by the Environmental Defense Fund (but which are disputed by the pipeline industry) contend that the total amount of oil and hazardous liquids spilled each year is also increasing. Suburban sprawl means that people are increasingly likely to live, work, or play above buried pipelines originally located far from human development. Regulators are also concerned about underground gridlock, in which different kinds of utility conduits, such as telephone lines and gas lines, run so close to one another that they increase the risk of an excavation accident.

Improving safety is a difficult task because the science of detecting pipeline flaws is inexact, and even the latest technologies have only a limited ability to identify certain kinds of external pipeline problems, such as dents. OPS is becoming increasingly aggressive in the pursuit of pipeline problems. The agency also recently brought its first criminal case for violations of pipeline safety acts, and says it will consider filing more such actions.

NTSB wants to require training for pipeline workers, regular inspections of pipelines, and automatic shutoff devices for pipelines. New regulations go into effect this month that require pipeline operators to develop and maintain written qualifications programs for selected pipeline workers. With regard to inspections and shutoff devices, OPS states that the frequency of inspections should be based on the amount of risk associated with a particular stretch of pipeline, and that the possibility of requiring automatic shutoff valves is still being studied.

Congress has required special plans for protecting environmentally sensitive areas; OPS will have a

pilot program to do so this year. Congress and the White House are looking for more ways to get the private sector to pay for federal activities, and it seems unlikely that taxpayers will wind up footing the bill for pipeline safety programs now supported by industry. Congress, which just three years ago was relaxing the federal role in favor of allowing industry greater discretion to self-regulate, may now be changing its position.

# Upcoming Events

## *1999 Fuels Management Workshop*

The 1999 Fuels Management Workshop, sponsored by EPA Region 9 and the California Department of Fish and Game's Office of Spill Prevention and Response (OSPR), will be held October 12-13 in Oakland, California. The intent of the workshop is to encourage stronger interagency coordination by providing a forum to share information with other state and local regulatory agencies on key problem areas, and discussing options for resolving these problems.

The workshop will provide technical training, explore specific fuels issues through case studies, and offer demonstrations of state-of-the-art equipment. A panel discussion on inland response coordination will also be held. Examples of case studies that will be reviewed are emergency response under inclement weather conditions, future prevention of pipeline explosions, and a study of the Sparks, Nevada solvent/fuel site. Equipment demonstrations will include use of the geoprobe, cone penetronometer, and real-time monitoring instruments.

Participation in the workshop is free. To register, call (415) 217-5177 or send an e-mail to ***amy.l.laybourn@cpmx.saic.com***.

## *National Governor's Association Area Contingency Planning Workshop*

The National Governor's Association's Center for Best Practices will be holding an Area Contingency Planning Workshop October 18-19, 1999, in Portland, Oregon. Topics to be covered include state area contingency planning activities, enhancing coordination between government agencies during a spill, involving regulated facilities in the planning process, using alternate cleanup technologies on inland spills, and using geographic information systems to plan for sensitive areas and natural resource damage assessments. Contact Jim Whitter at (202) 624-7825 for more information.

## *Clean Gulf '99*

Clean Gulf '99, the Ninth Annual Conference and Exhibition on Oil and Haz-Mat Spill Prevention, Response, and Technology in the Gulf Coast Region will be held November 8-10, 1999, in Galveston, Texas. The conference will feature real case histories, options, and solutions from both regulator and industry perspectives. Key professionals from state agencies, the federal government, and private industry will address issues and trends in the industry. To register call (713) 463-5930 or send an e-mail to ***registration @summitreg.com***.

## *International Petroleum Environmental Conference*

The Sixth Annual International Petroleum Environmental Conference will be held November 16-19, 1999, in Houston, Texas. The conference will focus on current petroleum-related environmental problems, and will include technical discussion sessions, a poster session, exhibits, and pre-conference workshops. Questions about registration can be directed to (918) 631-3088, or by mail at ***conted_ccc@utulsa.edu***. Information about the conference can be found on the web at ***ipec.ens.utulsa.edu***.

## *Freshwater Spills Symposium 2000*

Check your mailbox for brochures, to be sent out in the coming weeks, for the Third Biennial Freshwater Spills Symposium. Session chairpersons are busy arranging speakers for the symposium, which will be held March 6-8, 2000, in Albuquerque, New Mexico. Sessions will cover response and removal techniques, contingency planning, shoreline remediation, ecological issues in freshwater areas, emerging issues and research, and a number of other informative topics. For more information, see ***www.epa.gov/oilspill/fss***.

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