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Abstract from the 17th Annual AEHS West Coast Conference - San Diego 2007

Passive In-Situ Oxygen and Nutrient Injection Project in Santa Rosa, California
By James A. Jacobs and Don McEdwards

Enhanced bioremediation is a useful groundwater technology for sites containing residual petroleum hydrocarbons where source removal has occurred. Although enhanced aerobic bioremediation is a slow process, it can reduce site closure schedules from decades for natural attenuation in an anaerobic environment to a few years with the addition of dissolved oxygen. Several passive and semi-passive oxygen delivery systems have been developed over the past decade. The iSOC gas infusion system works in wells as small as 2-inch diameter and has been used on over 250 sites. The gas diffusion system allows oxygen to dissolve slowly at about 15 cc/min or 0.77 cubic feet per day per monitoring well.

For in-situ enhanced aerobic bioremediation of petroleum hydrocarbons, providing dissolved oxygen in the groundwater is necessary. Nonetheless, measuring dissolved oxygen has always been problematic and a potentially major source of error. A former gasoline underground storage tank case study from northern California had pre-treatment levels of dissolved oxygen ranging from 4.10 mg/l to 5.76 mg/l in the central core of the hydrocarbon plume (8,400 to 23,000 ƒÝg/l TPH-g) and 5.61 to 6.84 mg/l in the wells without reportable concentrations of TPH-g or BTEX compounds. The evaluation relied on a variety of indirect indicators in combination to obtain a clear understanding of the subsurface conditions. Based on a combination of indirect

indicators, the dissolved oxygen data were questioned and the original interpretation was completely reversed, changing the course of remediation from monitored natural attenuation to enhanced bioremediation. Seven iSOC tools were installed in dedicated wells.

After one year, with marginal operational effort, the four monitoring wells in the core of the plume showed decreases in TPHg and BTEX compounds of 47% and 61%, respectively.

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Abstract from the 17th Annual AEHS West Coast Conference - San Diego 2007

Update on Three-Step Remedial Process to Recover Heavy Oil in Former Underground Tank Pit, Northern California
By James A. Jacobs and Matthew Ryder-Smith

A three-step process was developed to recover heavy waste oil from a former tank pit at a northern California facility. Free product was measured up to 16-inches prior to the treatment. Weekly free product measurements and bailing were performed. A passive hydrophobic oil skimmer was installed in one well, but the waste oil was too viscous to flow into the trap.

The 3-step remedial process included high-pressure air-injection to displace the trapped oil located within the saturated zone. A high-pressure injection (200-600 psi) of CytoSol® biosolvent was used to thin and increase the mobility of the trapped heavy oil. A high-vacuum extraction (28" Hg) was used to recover both the heavy oil and the biosolvent from the subsurface. The final stage was to separate the heavy oil from the unspent biosolvent and groundwater.

The air/biosolvent delivery/extraction system included nine 4-inch diameter liquid recovery wells and nineteen temporary ¾-inch diameter injection rods on ten-foot centers. High-pressure compressed air was initially used to dislodge the submerged heavy oil from the pore spaces. The floating oil was vigorously mixed with 300 gallons of biosolvent injected into the pit gravels at 200 to 600 psi. A 20-hp water ring vacuum pump extracted the oil, biosolvent and groundwater. The waste oil was skimmed off. The extracted unspent biosolvent was reinjected for three complete tank pit flushes. A thermal oxidizer treated the extracted vapors. A total of 550 gallons of heavy waste oil and 480 gallons of spent biosolvent/water mixtures were recovered from the former UST pit. A total of 7,790 gallons of groundwater was extracted and treated by aqueous-phase activated carbon vessels, and discharged to the sanitary sewer. One month after treatment, maximum waste oil thickness was 1/2-inch, later turning into a sheen. The property is being evaluated for site closure.

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EPA Adds Six and Proposes 11 Sites to Superfund's National Priorities List

The EPA is adding six new hazardous waste sites that pose risks to human health and the environment to the National Priorities List of Superfund sites.

To date, there have been 1,587 sites listed on the NPL. Of these sites, 329 sites have been deleted, resulting in 1,258 sites currently on the NPL. With the proposal of the 11 new sites, there are 64 proposed sites awaiting final agency action: 58 in the general Superfund section and six in the federal facilities section. There are a total of 1,322 final and proposed sites.

Contaminants found at the final and proposed sites include arsenic, asbestos, cadmium, chromium, copper, cyanide, lead, mercury, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), selenium, silver, sulfuric acid, tetrachloroethene (PCE), trichloroethane (TCA), trichloroethene (TCE), vinyl chloride, and zinc.

In addition, EPA is withdrawing the proposal to add the Kennecott (South Zone) site in Copperton, Utah to the NPL because all cleanup projects have been completed and no further EPA actions are needed.

With all Superfund sites, EPA tries to identify and locate the parties potentially responsible for the contamination. For the newly listed sites without viable potentially responsible parties, EPA will investigate the full extent of the contamination before starting significant cleanup at the site. Therefore, it may be several years before significant cleanup funding is required for these sites.

Sites may be placed on the list through various mechanisms:
· Numeric ranking established by EPA's Hazard Ranking System.
· Designation by states or territories of one top-priority site.
· Meeting all three of the following requirements:
· The Agency for Toxic Substances and Disease Registry (ATSDR) of the U.S. Public Health Service has issued a health advisory that recommends removing people from the site;
· EPA determines the site poses a significant threat to public health; and
· EPA anticipates it will be more cost-effective to use its remedial authority than to use its emergency removal authority to respond to the site.

The following six sites have been added to the National Priorities List:
Iron King Mine – Humboldt Smelter (Dewey-Humboldt, Ariz.)
Nelson Tunnel/Commodore Waste Rock (Creede, Colo.)
Flash Cleaners (Pompano Beach, Fla.)
Aberdeen Contaminated Ground Water (Aberdeen, N.C.)
East Troy Contaminated Aquifer (Troy, Ohio)
Old Esco Manufacturing (Greenville, Texas)

The following 11 sites have been proposed to the National Priorities List:
B. F. Goodrich (Rialto, Calif.)
Raleigh Street Dump (Tampa, Fla.)
Arkla Terra Property (Thonotosassa, Fla.)
U.S. Smelter and Lead Refinery, Inc. (East Chicago, Ind.)
Fort Detrick Area B Ground Water (Frederick, Md.)
Curtis Papers, Inc. (Milford, N.J.)
Behr Dayton Thermal System VOC Plume (Dayton, Ohio)
New Carlisle Landfill (New Carlisle, Ohio)
Borit Asbestos Tailings Pile (Ambler, Penn.)
Barite Hill/Nevada Goldfields (McCormick, S.C.)
U.S. Magnesium (Tooele County, Utah)
For Federal Register notices and supporting documents for these final and proposed sites, click here.

EPA Provides Incentives for Clean Water Permit Fee Programs

EPA is issuing a new rule that will provide financial incentives for states to use fees when administering a clean water permit program. EPA can give up to a total of $5.1 million to states that have adequate permit fees for their National Pollutant Discharge Elimination System (NPDES) programs.

This rule is designed to encourage states to voluntarily implement adequate fee programs and shift part of the financial burden to those who benefit from the permits. It will also allow states to move funds to other critical water quality program activities.

The increased cost of administering water permit programs has already prompted some states to implement permit fee programs to cover some costs. A number of states, however, still operate with little or no reliance on permit fees.

The permit fee incentive will only be made available if federal funding for state water pollution control programs is more than the fiscal year 2008 level. Therefore, state grants will not decrease as a result of this rulemaking. The

rule will be in effect for the fiscal year 2009 grant cycle and beyond.

As authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating municipal, industrial and related sources that discharge pollutants into waters of the U.S.
For Water Pollution Control Program Grants, click here.

Expanded Oven Line

Jeio Tech, Woburn , Mass., offers the expanded line of Lab Companion Ovens now includes 11 models to satisfy the majority of laboratory applications. Lab Companion offers forced convection, natural convection, economy and vacuum model ovens.

The forced convection models have a capacity from 2.1 cu. ft. (60L) to 5.3 cu. ft. (151L). Temperature range is 10°C above ambient to 250°C.

The natural convection models range from 1.8 cu. ft. (52L) up to 4.8 cu. ft. (135L). Temperature range is 15°C above ambient to 250°C.

Two model vacuum ovens are available both offering a temperature range from 5°C above ambient to 250°C. Chamber sizes are 1 cu. ft. (28L) and 2.3 cu. ft. (65L).
For more information click here.

Laboratory Stirring Bar Assortment

From Bel-Art Products, Pequannock, N.J., select the right size stirring bar for your particular application with the Spinpak® Assortment with Spinbar® Restrainer. This great selection offers Spinbar® Octagonal Magnetic Stirring Bars in ½", 1", 1 ½" and 2" lengths in either a 5/16" or 1/8" diameter. The white, yellow, blue and red colors provide a contrast with mixing solutions. They are also useful for designating ownership and distinguishing which stirring bars to use for certain solutions. A molded pivot ring aids in reducing friction and chattering, while the 8-sided profile provides greater surface area and added turbulence when compared to smooth cylindrical bars. Bel-Art's quality Spinbar® Magnetic Stirring Bars contain a powerful Alnico V magnet to achieve strong vortexes with less "spin-out". They are encapsulated in Teflon® PTFE for remarkable chemical resistance.

As a bonus, the multipack includes a Spinbar® Magnetic Restrainer. The restrainer fits comfortably in one hand and when held alongside the outer wall of a mixing vessel it attracts and securely holds stirring bars up to 80mm (3") long. It helps prevent splashing hazards when decanting and facilitates easy and safe stirring bar retrieval.
For more information click here.

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