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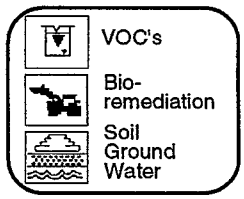
EPA

TECH TRENDS

The Applied Technologies Journal for Superfund Removals & Remedial Actions & RCRA Corrective Actions

THERMAL DESORPTION AT GAS PLANTS



By Ronald F. Lewis, EPA National Risk Management Research Laboratory

There are an estimated 3,000 former manufactured gas plants (MGP) in the United States. The EPA SITE Program (Superfund Innovative Technology Program) evaluated a Thermal Desorption System (TDS) designed to remove organic compounds and total petroleum hydrocarbons from soil, including contaminants typically found at MGPs from: (1) coke plant residuals; (2) purifier bed wastes; (3) sediments; and (4) water gas plant residuals. The TDS, developed by Clean Berkshires, Inc. (now renamed Maxymillian Technologies), was evaluated at the Niagara Mohawk Power Corporation's Remediation Technologies Demonstration Facility at Harbor Point in Utica, New York. Harbor Point is a former MGP and has been contaminated with coal coking by-products.

Contaminant levels were: benzene, toluene, ethylbenzene and xylene (BTEX) at concentrations ranging from 13 milligrams per kilogram (mg/kg) in coke plant residuals to 320 mg/kg in water gas plant residuals; polyaromatic hydrocarbon concentrations ranging from 320 mg/kg in coke plant residuals to 4,420 mg/kg in water gas plant residuals; organo-metallic ferricyanide complexes' (cyanide) concentrations ranging from 730 mg/kg in coke plant residuals to 1,120 mg/kg in purifier bed wastes. Estimated average removal efficiencies were: 99.7% total BTEX and total PAHs and 97.5% total cyanides. Estimated average concentrations for critical pollutants in processed solids were (estimated) 0.066 mg/kg total BTEX, 12.4 mg/kg total PAHs, and 5.4 mg/kg total cyanide. Spikes of the volatile compound xylene at 21.8 to 27.2 mg/kg and the semivolatile compound naphthalene at 232 to 318 mg/kg were added to assess air emissions of Clean Air Act principle organic hazardous contaminants (POHCs); destruction removal efficiencies were 99.99% or greater for both compounds.

The Clean Berkshires TDS is a direct-fired co-current thermal desorber based on standard rotary kiln technology. The kiln is made of an innovative metal alloy which allows the soil to be quickly heated for short passage time (eight minutes), thereby producing purified soil rather than ash. It is a process which is composed of three different operations: feed preparation, contaminant volatilization and gas treatment. Contaminant volatilization begins after the prepared feed material enters the kiln. The soil temperature is increased up to 800 degrees F through contact with an air stream heated by a natural gas burner located at the kiln's entrance. The kiln has special design features that lift and toss the soil within the kiln, exposing greater surface area to the hot gases, thereby improving volatilization. Treated soil exits the kiln and enters a pug mill which combines the material with solid residuals from the gas treatment sequence to form a consolidated processed solids stream. Water recycled from the quench tower is added at this time to cool the processed solids and control fugitive dust emissions. The solids are deposited onto a discharge conveyor and stockpiled.

Gas treatment begins when the kiln offgas, now filled with volatilized contaminants and entrained particulate, enters a multi-stage treatment sequence. Kiln offgases are first drawn through a cyclone to remove coarse particulate matter. The gases then enter a high-efficiency, natural gas-fired afterburner which combusts organic constituents at temperatures up to 1,800 degrees F. A quench tower cools the combustion gases by passing them through a highly atomized water mist. The cooled gas stream then enters a baghouse to remove fine-sized filterable particulate. If any acid levels are high enough to impact air quality standards, a scrubber could be added at this point in the treatment sequence. Treated gases exit the system through a 75-ft. high stack. Solid residuals from gas treatment are transferred by a screw auger to the pug mill and are combined with the treated soil from the kiln.

(continued on page 4)

***SPECIAL INSERT* COST AND PERFORMANCE DATA**

In this issue of TECH TRENDS we include a special insert, "Remediation Case Studies: Fact Sheet and Order Form." It describes a series of 37 case studies of full-scale site cleanups at Superfund sites and Federal facilities.

Each case study documents project design, operation, performance and cost data and lessons learned at the sites. The reports should be useful to those evaluating the feasibility or design of these technologies at similar sites.

SITE Search

The Superfund Innovative Technology Evaluation (SITE) Program currently has a number of innovative remediation technologies that it has accepted as candidates to be evaluated under the Demonstration Program. We are searching for sites where eight of these technologies can be demonstrated. If you think that your site has contaminants and site conditions that match the technologies, we would very much like to talk with you. Below are brief descriptions of the technologies together with the contaminants to be remediated and the media in which we are interested. Please call the SITE Project Manager listed in the technology description for more information if you are potentially interested in nominating your site for the demonstration.

Zimpro Environmental, Inc. has adapted the PACT® wastewater treatment system to treat ground waters and leachates contaminated with hazardous organic pollutants. In general, the system can treat liquid wastes with a chemical oxygen demand of up to 60,000 parts per million (ppm), including toxic volatile organic compounds up to 1,000 ppm. The system combines biological treatment and powdered activated carbon (PAC) adsorption to achieve treatment standards not readily attainable with conventional technologies. The mobile, trailer-mounted system can treat 2,500 to 10,000 gallons of wastewater per day. Larger stationary systems, treating up to 53 million gallons per day, are already in operation. The SITE Program Project Manager is John Martin at 513-569-7758.

The Horsehead Resource Development Co., Inc. (HRD) flame reactor sysem is a patented, hydrocarbon-fueled, flash-smelting system that treats residues and wastes contaminated with metals and organic contaminants. The system can be applied to granular solids, soil, flue dusts, slags and sludges. The SITE Program has previously evaluated this technology for metals and found that it is capable of performing as designed. The SITE Program is now searching for a site to evaluate the effectiveness of the technology to remediate organic contaminants in addition to metals. The reactor processes wastes with hot (greater than 2,000 degrees Celsius) reducing gases produced by combusting solid or gaseous hydrocarbon fuels in oxygen-enriched air. Volatile metals are fumed and organic compounds are destroyed at the elevated temperature of the flame reactor technology. The end products from treated metal contaminants are a non-leachable, glass-like slag; a potentially recyclable, heavy metal-enriched oxide; and in some cases, a metal alloy. In general, the system requires that wastes be dry enough (less than 5% total moisture) to be pneumatically-fed and fine enough (less than 200 mesh) to react rapidly. Larger particles (up to 20 mesh) can be processed; however the efficiency of metals recovery is decreased. The SITE Program Manager is Marta Richards at 513-569-7692.

The Purus, Inc. PurCycle ™ is an on-site vapor treatment process that purifies air streams contaminated with volatile organic compounds (VOC), thereby controlling air emissions at site remediation projects, industrial wastewater facilities and industrial air processing sites. The technology works directly from soil extraction wells or from ground water (or wastewater) air strippers. The contaminants are trapped by using filter beds that contain a proprietary resin. This regenerative adsorption method involves one on-line treatment bed for influent air, while another bed undergoes a desorption cycle. An on-board controller system automatically switches between adsorption and desorption cycles. The desorption cycle uses a combination of temperature, pressure and purge gas to desorb VOCs trapped in the adsorbent bed. The contaminants are removed, condensed and transferred as a liquid to a storage tank; the recovered material can be easily reclaimed. The technology has a relatively high tolerance for water vapor, allowing efficient treatment of air streams with an RH greater than 90%. The SITE Program Manager is Norma Lewis at 513-569-7665.

SIVE Services has a steam injection and vacuum extraction-linear flow (SIVE-LF) process especially designed for in situ treatment of soil contaminated with semivolatile and volatile organic compounds at relatively shallow depths (30 feet). SIVE-LF can remove second phase liquids, such as fuels and oils, from the tops of underground water tables. Steam is forced to flow horizontally and uniformly from one trench, through the contaminated zone to another trench, where it is then extracted. The injected steam strips contaminants from the soil as it is forced across the contaminated zone. The steam raises the soil temperature, which increases mass transfer and phase change rates, reduces liquid viscosities, and accelerates desorption of contaminants from the soil. The moisture and warmth of the steam also accelerates biodegradation of residual contaminants. As a result, contaminants are extracted or degraded at increased rates, compared to conventional isothermal vapor and liquid extraction systems. The SITE Program Manager is Michelle Simon at 513-569-7469.

Wheelabrator Technologies, Inc. has patented the WES-Phix stabilization process that significantly reduces the solubility of certain heavy metals in solid waste streams by altering the chemical composition of the waste material. The process does not produce a solidified mass, unlike most other stabilization technologies. The WES-Phix process uses a proprietary form of soluble phosphate to form insoluble and highly stable metal phosphate minerals. An important innovative feature of this process is that reaction kinetics are rapid; thus, no curing step is necessary. As a result, treated waste will immediately pass toxicity characteristic leaching procedure (TCLP) requirements for the targeted metals. Although the process was originally developed to treat, and has successfully treated, municipal waste combustion ash containing heavy metals, data indicate the technology can also treat contaminated soils, sludges and baghouse dusts. Recent research indicates that the process is particularly effective at stabilizing lead, cadmium, copper and zinc in a variety of media, as measured by the TLCP and other laboratory

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FEDERAL REMEDIATION TECHNOLOGIES ROUNDTABLE

Remediation Case Studies: Fact Sheet and Order Form

Introduction

Increasing the cost-effectiveness of site remediation is a national priority. The selection and use of more cost-effective remedies requires better access to data on the performance and cost of technologies used in the field. To make data more widely available, member agencies of the Federal Remediation Technologies Roundtable are working jointly to publish case studies of full-scale remediation and demonstration projects. The Roundtable has published 37 case study reports organized by technology into a four-document set; a collection of abstracts is also available. Future case studies will be based on an important new Roundtable Guide for documenting future site cleanups.

Contents of Case Study Reports

The 37 case study reports prepared by the Federal agencies describe both above-ground and in situ technologies. Twenty-two of the projects are completed. Case studies are available in four separate volumes:

Remediation Case Studies: Bioremediation
Remediation Case Studies: Groundwater Treatment
Remediation Case Studies: Soil Vapor Extraction
Remediation Case Studies: Thermal Desorption, Soil Washing, and In Situ Vitrification

Exhibit 1 lists the case studies contained in each report, with the contaminants and matrix addressed, the quantity or volume of material treated, and the duration of the project. Each case study is 10-30 pages long and documents project design, operation, performance, cost, and lessons learned. Graphics include concentration distribution, site stratigraphy, and treatment schematics.

Abstracts of Remediation Case Studies

This document contains 2-page abstracts of all 37 cleanup case study reports. Each abstract describes the site and waste treated, waste source, technology, period of operation, technology vendor, technology description, contaminants and media treated, regulatory requirements, summary of performance and cost, points of contact, and the significance of the application.

Guide to Documenting Cost and Performance for Remediation Projects

The Roundtable has prepared this Guide to better capture Federal agency cleanup experience. The Guide provides recommended procedures for documenting the matrix characteristics and technology operation, performance, and cost. Recommendations include specific parameters to measure and report for the following 13 conventional and innovative cleanup technologies:

In Situ Soil Remediation
Soil Bioventing
Soil Flushing
Soil Vapor Extraction

Groundwater Remediation
Groundwater Sparging
In Situ Groundwater Bioremediation
Pump-and-Treat

Ex Situ Soil Remediation
Composting
Incineration
Land Treatment
Slurry-Phase Soil Bioremediation
Soil Washing
Stabilization
Thermal Desorption

Order Information

Abstracts of Remediation Case Studies and *Guide to Documenting Cost and Performance for Remediation Projects* are available free-of-charge from the U.S. EPA/National Center for Environmental Publications and Information (NCEPI), P.O. Box 42419, Cincinnati, OH 45242, or FAX requests to (513) 489-8695. The four *Remediation Case Study* documents are available from the National Technical Information Services (NTIS) at (703) 487-4650. Prices and additional ordering instructions are on the last page of this fact sheet.

On-Line Access

The case study abstracts are available on-line through EPA's Cleanup Information Bulletin Board System (CLU-IN). To access CLU-IN by modem, call (301) 589-8366, or to contact the CLU-IN help desk, call (301) 589-8368. CLU-IN is available on the Internet; the telnet address is clu-in.epa.gov or 134.67.99.13.

The Federal Remediation Technologies Roundtable consists of senior executives from eight agencies with an interest in site remediation technology. The Roundtable meets twice each year to coordinate the exchange of information on remediation technologies and to consider cooperative efforts. Primary members include the U.S. Departments of Defense, Energy, and Interior, and the U.S. Environmental Protection Agency. Other participants include the Nuclear Regulatory Commission, National Aeronautics and Space Administration, Tennessee Valley Authority, and the U.S. Coast Guard.

Exhibit 1. Summary of Remediation Case Studies

Site Name, State	Technology	Contaminants	Media (Quantity)	Project Duration
Remediation Case Studies: Bioremediation				
Brown Wood Preserving Superfund Site, FL	Land treatment	PAHs	Soil (8,100 yd^3)	12/89 - 7/90
Eielson Air Force Base, AK	Bioventing	BTEX/TPH	Soil (not available)	Operational since 7/91
French Ltd. Superfund Site, TX	Slurry-phase bioremediation	BTEX, PAHs, and Chlorinated Aliphatics	Soil and sludge (300,000 tons)	1/92 - 11/93
Hill Air Force Base, Site 280, UT	Bioventing	BTEX/TPH	Soil (not available)	Operational since 12/90
Hill Air Force Base, Site 914, UT*	Bioventing preceded by SVE	BTEX/TPH	Soil (5,000 yd^3)	10/88 - 12/90
Lowry Air Force Base, CO	Bioventing	BTEX/TPH	Soil (not available)	Operational since 8/92
Lowry Air Force Base, CO	Land treatment	BTEX/TPH	Soil (not available)	Operational since 7/92
Scott Lumber Company Superfund Site, MO	Land treatment	PAHs	Soil (15,916 tons)	12/89 - 9/91
Umatilla Army Depot Activity, OR	Composting	TNT/RDX/HMX	Soil (224 yd^3)	5/92 - 11/92
Remediation Case Studies: Groundwater Treatment				
Amcor Precast, UT	In situ density-driven sparging	BTEX/TPH	Soil (not available) Groundwater (not available)	3/92 - 9/93
Amoco Petroleum Pipeline, MI	GW extraction w/GAC	BTEX/TPH	Groundwater (775 million gallons in 5 years)	Operational since 10/88
Ft. Drum, Fuel Dispensing Area 1595, NY	GW extraction w/air stripping and GAC	BTEX/TPH	Groundwater (not available)	Operational since 2/92
Langley Air Force Base, IRP Site 4, VA	GW extraction w/air stripping	BTEX/TPH	Groundwater (not available)	Operational since 7/92
Lawrence Livermore National Laboratory Gasoline Spill Site, CA	In situ dynamic underground stripping	BTEX/TPH	Groundwater (not available)	11/92 - 12/93
McClellan Air Force Base, Operable Unit B/C, CA	GW extraction w/air stripping	Chlorinated Aliphatics	Groundwater (660 million gallons in 7 years)	Operational since 1988
McClellan Air Force Base, Operable Unit D, CA	GW extraction w/air stripping	Chlorinated Aliphatics	Groundwater (not available)	Operational since 1987
Twin Cities Army Ammunition Plant, MN	GW extraction w/air stripping	Chlorinated Aliphatics	Groundwater (1.4 billion gallons 10/91 - 9/92)	Operational since 10/87
U.S. Department of Energy Kansas City Plant, MO	GW extraction w/advanced oxidation processes	Chlorinated Aliphatics	Groundwater (11.2 million gallons in 1993)	Operational since 5/88
U.S. Department of Energy Savannah River Site, A/M Area, SC	GW extraction w/air stripping	Chlorinated Aliphatics	Groundwater (198 million gallons per year)	Operational since 9/85
U.S. Department of Energy Savannah River Site, A/M Area, SC	In situ air stripping	Chlorinated Aliphatics	Groundwater (not available) Soil (not available)	Operational since 7/90

Site Name, State	Technology	Contaminants	Media (Quantity)	Project Duration
Remediation Case Studies: Soil Vapor Extraction				
Commencement Bay, South Tacoma Channel Well 12A Superfund Site, WA	SVE w/product recovery	Chlorinated Aliphatics	Soil (98,203 yd^3)	Operational since 8/92
Fairchild Semiconductor Corporation Superfund Site, CA	SVE w/GAC	Chlorinated Aliphatics	Soil (42,000 yd^3)	1/89 - 4/90
Hastings Groundwater Contamination Superfund Site, Well Number 3 Subsite, NE	SVE w/GAC	Chlorinated Aliphatics	Soil (185,000 yd^3)	6/92 - 7/93
Hill Air Force Base, Site 914, UT*	SVE w/catalytic oxidation followed by bioventing	BTEX/TPH	Soil (5,000 yd^3)	10/88 - 12/90
Luke Air Force Base, North Fire Training Area, AZ	SVE w/thermal oxidizer	BTEX/TPH	Soil (not available)	10/90 - 12/92
McClellan Air Force Base, Operable Unit D, Site S, CA	SVE w/catalytic oxidizer and scrubber	Chlorinated Aliphatics	Soil (not available)	Operational since 1993
Rocky Mountain Arsenal Superfund Site (Motor Pool Area - Operable Unit #18), CO	SVE w/product recovery and GAC	Chlorinated Aliphatics	Soil (34,000 yd^3)	7/91 - 12/91
Sacramento Army Depot Superfund Site, Tank 2 (Operable Unit #3), CA	SVE w/GAC	Chlorinated and Non-chlorinated Aliphatics	Soil (650 yd^3)	8/92 - 1/93
SMS Instruments Superfund Site, NY	SVE w/catalytic incineration and scrubbing	Chlorinated and Non-chlorinated Aliphatics	Soil (1,250 yd^3)	5/92 - 10/93
Verona Well Field Superfund Site (Thomas Solvent Raymond Road - Operable Unit #1), MI	SVE w/catalytic oxidation and GAC	Chlorinated and Non-chlorinated Aliphatics	Soil (26,700 yd^3)	3/88 - 5/92
Remediation Case Studies: Thermal Desorption, Soil Washing, and In Situ Vitrification				
Anderson Development Company Superfund Site, MI	Thermal desorption	MBOCA and PAHs	Soil (5,100 tons)	1/92 - 6/93
King of Prussia Technical Corporation Superfund Site, NJ	Soil washing	Heavy Metals (Cr, Cu, Ni)	Soil and sludge (19,200 tons)	6/93 - 10/93
McKin Superfund Site, ME	Thermal desorption	BTEX/PAHs	Soil (11,500 yd^3)	7/86 - 4/87
Outboard Marine Corporation Superfund Site, OH	Thermal desorption	PCBs	Soil and sediment (12,755 tons)	1/92 - 6/92
Parsons Chemical/ETM Enterprises Superfund Site, MI	In situ vitrification	Pesticides, Heavy Metals, and Dioxins	Soil (3,000 yd^3)	5/93 - 5/94
Pristine, Inc. Superfund Site, OH	Thermal desorption	BTEX, PAHs, Pesticides, Dioxins, and Chlorinated Aliphatics	Soil (12,800 tons)	11/93 - 3/94
T H Agriculture & Nutrition Company Superfund Site, GA	Thermal desorption	Pesticides	Soil (4,300 tons)	7/93 - 10/93
Wide Beach Development Superfund Site, NY	Thermal desorption w/dehalogenation	PCBs	Soil (42,000 tons)	10/90 - 9/91

*One case study report on both bioventing and SVE at Hill Air Force Base, Site 914.

Key:

GW - Groundwater
GAC - Granular Activated Carbon
SVE - Soil Vapor Extraction
BTEX - Benzene, Toluene, Ethylbenzene, and Xylene
TPH - Total Petroleum Hydrocarbons
PAHs - Polynuclear Aromatic Hydrocarbons
PCBs - Polychlorinated Biphenyls
TNT - 2,4,6-Trinitrotoluene
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine
HMX - Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

Ordering Instructions

The following documents are available free-of-charge from the U.S. EPA/National Center for Environmental Publications and Information (NCEPI). To order, mail or fax the completed form below to: U.S. EPA/National Center for Environmental Publications and Information, P.O. Box 42419, Cincinnati, OH 45242, or FAX requests to (513) 489-8695.

Title	Number	Price	Please Send
Abstracts of Remediation Case Studies [106pp]	EPA-542-R-95-001	Free	_____
Guide to Documenting Cost and Performance for Remediation Projects [64pp]	EPA-542-B-95-002	Free	_____

Name_____ Date_____

Organization_____

Address_____

_____

City/State/Zip_____ Telephone_____

Internet Address_____

The following documents are available by calling the National Technical Information Service (NTIS) at 703-487-4650 or writing them at: National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161

Title	Number	Price*
Remediation Case Studies: Bioremediation	PB95-182911	$17.50
Remediation Case Studies: Groundwater Treatment	PB95-182929	$17.50
Remediation Case Studies: Soil Vapor Extraction	PB95-182937	$25.50
Remediation Case Studies: Thermal Desorption, Soil Washing, and In Situ Vitrification	PB95-182945	$17.50
Remediation Case Studies: Four Document Set	PB95-182903	$67.00

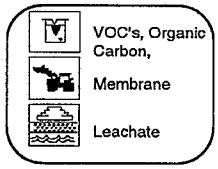
Other Federal Remediation Technology Roundtable (FRTR) documents available from NTIS:

Title	Number	Price*
Accessing Federal Databases for Contaminated Site Clean-Up Technologies (3rd Edition)	PB94-144540	$17.50
Federal Publications on Alternative and Innovative Treatment Technologies for Corrective Action and Site Remediation (3rd Edition)	PB94-144557	$17.50
Synopses of Federal Demonstrations of Innovative Site Remediation Technologies (3rd Edition)	PB94-144565	$44.50
Remediation Technologies Screening Matrix and Reference Guide (2nd Edition)	PB95-104782	$45.00

* Additional fee for shipping and handling; next day delivery also available. Major credit cards accepted.

SITE Subjects

INNOVATIVE MEMBRANE REMOVES CONTAMINANTS FROM LIQUIDS



By Douglas Grosse, EPA National Risk Management Research Laboratory

The SITE (Superfund Innovative Technology Evaluation) Program evaluated the Disc Tube Module (DTM), developed by Rochem Separation Systems, Inc., at the Central Landfill in Johnston, Rhode Island. The DTM is an innovative membrane separation process that removes contaminants from liquid hazardous waste streams. The patented DTM can be the primary treatment for waste streams such as landfill leachate. Traditionally, membrane separation processes have been used as a secondary or polishing step in waste treatment schemes rather than as primary treatment. However, the DTM is designed to treat waste that is higher in dissolved solids' content, turbidity and contaminant levels than waste treated by conventional membrane separation processes. The patented DTM features larger feed flow channels and a higher feed flow velocity than other membrane separation systems.

Membrane material for the DTM is formed into a cushion with a porous spacer material on the inside. The membrane cushions are alternately stacked with hydraulic discs on a tension rod. The hydraulic discs support the membranes and provide flow channels to pass the feed liquid over the membranes. After passing through the membrane material, permeate flows through permeate collection channels to a product recovery tank. A stack of cushions and discs is housed in a pressure vessel. Flanges seal the ends of the module in the pressure vessel and provide the feed water input and the product and the reject output connections. The number of discs per module, number of modules and the membrane materials can be custom designed to suit the application. Modules are typically combined in a treatment unit or stage. The DTM technology can use reverse osmosis, ultrafiltration or microfiltration membrane materials. The membranes are more permeable to water than to contaminants or impurities. The percentage of water that passes through the membranes is a function of the operating pressure, membrane type and concentration of the contaminants.

For the SITE demonstration, approximately 33,000 gallons of hazardous landfill leachate were treated by the DTM using reverse osmosis membranes. The leachate contained chlorobenzene and 1,2-dichlorobenzene at average concentrations of 21 milligrams per Liter (mg/L) and 16 mg/L, respectively, and lower levels of toluene, xylenes and ethylbenzene; total organic carbon at an average concentration of 460 mg/L; low levels of heavy metals ranging from 1.4 mg/L for barium to 48 mg/L for iron to 710 mg/L for sodium; and total dissolved solids at an average concentration of 4,900 mg/L. For treatment of this waste, a three-stage DTM process was utilized. Two stages in a series treated the landfill leachate and produced the final permeate. The third stage was a high pressure unit (HPU) which further treated the concentrate rejected by the first stage to increase the system water recovery. Media and cartridge filters were built into each unit to remove suspended particulates, and acid was added at the first stage and at the HPU for pH control.

The percentages of rejections were greater than the test criteria of: 99% for total dissolved solids; 92% for total organic carbon; and 99% for all target metals. In addition, the average percentage rejection for volatile organic compound was greater than the test criteria of 90%. The average water recovery rate for the DTM technology during the demonstration was approximately 75%, which met the test criteria.

For more information, call Doug Grosse at EPA's National Risk Management Research Laboratory at 513-569-7844. An Innovative Technology Evaluation Report, due August 1995, will present key findings from the demonstration, including complete analytical results, baseline test results and an economic analysis.

ORDER BACK ISSUES

EPA has a limited supply of some back issues of both TECH TRENDS and GROUND WATER CURRENTS. To order copies of these back issues, contact our repository, the National Center for Environmental Publications (NCEPI). You can order by FAX (513-489-8695) or by mail (NCEPI, P.O. Box 42419, Cincinnati, OH 45242-2419). Please refer to the Document Numbers when ordering. The Document Number for TECH TRENDS is: EPA-542-E-95-001. The Document Number for GROUND WATER CURRENTS IS: EPA-542-E-95-002.

CONFERENCE ALERT

Don't miss the Southeast Remediation Marketplace Business Opportunities for Innovative Technologies, July 20-21, 1995, in Atlanta Georgia. This conference will provide opportunities for developers and vendors of innovative treatment technologies to explore new business and expand user markets. Call 800-783-3870 for more information.

(continued from page 1)

The TDS layout is flexible and facilitates the rearrangement or addition of process equipment, as required. This permits Maxymillian Technologies to customize operations based on site-specific combinations of media and pollutants. It is transportable and is monitored and controlled by a computer-based data acquisition system. The TDS is capable of handling a variety of solid waste types including, soil, sediment and sludge.

Maxymillian Technologies treated approximately 1,500 tons of waste during the SITE demonstration and an additional 6,600 tons during other tests at Harbor Point outside the scope of this SITE project. All 8,100 tons of treated materials have met special site-specific New York State Department of Environmental Conservation treatment standards and are currently stockpiled onsite. The process does generate some residuals that require further treatment; as such, the technology should not be considered entirely stand-alone.

For more information, call Ron Lewis at EPA's National Risk Management Research Laboratory at 513-569-7856. A SITE Technology Capsule, (Document No. EPA/540/R-94/507a) describing the demonstration in more detail can be ordered by calling 513-569-7562.

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leaching tests. The SITE Program Manager is Chien Chen at 908-906-6985.

Powerful Green International, Inc. has a proprietary surfactant to be used in a soil washing system to remediate soil contaminated with petroleum hydrocarbons. There are two SITE demonstration needs in regard to this technology. First, the developer is seeking an appropriate soil washing system to demonstrate the effectiveness of the surfactant. Second, the SITE program is searching for a demonstration site. The SITE Program Project Manager is Vince Gallardo at 513-569-7176.

The SITE Program is interested in evaluating the CF Systems® Solvent Extraction Process in a field demonstration. EPA's Superfund Technical Assistance Response Team (START) and SITE Programs has already completed a treatability study that determined that the solvent extraction system was effective in separating polychlorinated biphenyls (PCBs) from soil collected at a Superfund site. The results of the study indicated that 98% removal of PCBs was achieved for the test runs using three extraction cycles. Results further indicated that the number of extraction cycles required for attaining the lowest concentrations of PCBs in product solids was greater than three but less than or equal to five. The SITE Program Project Manager is Mark Meckes at 513-569-7348.

The University of Dayton Research Institute has developed a novel photochemical process embodied in a device called a Photothermal Detoxification Unit (PDU) which offers an efficient means of destroying hazardous organic wastes. The PDU overcomes the problems of slow reaction rates and incomplete destruction of hazardous materials often associated with photochemical waste reduction. Organic compounds which efficiently absorb near ultra-violet (UV) radiation are relatively easily destroyed by the photohermal process. Toxic organic compounds whose molecular structure includes alkene or aromatic structures (i.e., chlorinated alkenes, chlorinated aromatics, chlorinated dibenzo-p-dioxins, etc.) are likely to absorb the near UV radiation which is necessary for the photothermal detoxification process. Molecules which only weakly absorb near-UV radiation (i.e. alkanes and chloroalkanes) may require deep UV sources such as low pressure mercury lamps. The SITE Program Project Manager is Chien T. Chen at 908-906-6985.

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