

From: Miller.Scott@epamail.epa.gov
To: John.Mousa
Subject: Fw: Soil Remediation Performance Guarantee
Date: Thursday, November 20, 2008 8:47:29 AM
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----- Forwarded by Scott Miller/R4/USEPA/US on 11/20/2008 08:47 AM -----

"Alan Seech PhD,
CEO Adventus
Group"
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AM

To
Scott Miller/R4/USEPA/US@EPA
cc

Subject
Soil Remediation Performance
Guarantee

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(Embedded image moved to file: pic26587.jpg)Adventus News

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Adventus Group Offers Unique Soil Remediation Performance to file:
Guarantee (Embedded image moved to file: pic07234.gif)

Patented DARAMEND® technology ideal for U.S. Military and (Embedded image moved to file: pic14015.gif)FREE SITE ANALYSIS
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CHICAGO, Illinois (November 19, 2008) – The Adventus Group (AAI), has announced the only codified performance guarantee targeting the soil remediation biotechnology marketplace. Key beneficiaries include industrial site owners, state municipalities, and varied Department of Defense Restoration Program (DERP) projects - including Installation Restoration Program (IRP) and Base Realignment and Closure (BRAC) sites impacted by hazardous substances. The technology deployed is AAI's patented DARAMEND and TERRAMEND solutions, which have successfully remediated more than 4,000,000 tons of soil impacted with a wide range of contaminants including organic explosives compounds, TPHs, phthalates, pentachlorophenol (PCP), polycyclic aromatic hydrocarbons (PAHs), and a range of chlorinated herbicides and pesticides.

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Dr. Jim Mueller, president of AAI, outlined the general

parameters of this innovative policy. "The Adventus Group continues to demonstrate the powerful capabilities of our DARAMEND and TERRAMEND remediation biotechnologies. Confidence in both the science and field-performance of our products allows us to offer the industry's only performance guarantee for soil remediation of this type. By contractually guaranteeing clean-up results to a specified remedial goal within a certain time frame, we offer an unmatched and risk-free remedy to decision makers across the hazardous waste removal landscape".

Dr. Alan Seech, Chief Executive Officer of the Adventus Group, added, "Terms and conditions of the performance guarantee are based on the results of a site-specific engineering assessment or the results of pilot-scale tests. Working with Site owners and their consultants, we will agree to reach a defined remedial goal, or refund any money paid to us. As summarized below, our unique warranty of performance has been applied to soils containing organic explosives (OE) and other nitrogenous energetic compounds (NECs), chlorinated solvents, and pesticides.

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Representative Case Study

Project

Tooele Army Depot
TNT Washout Facility/SWMU-10
Pilot, Bench, and Full Scale Soil Corrective Measures
Client: MWH Constructors, Inc. under contract to the US Army Corps of Engineers
Contractor: Plexus Scientific Corporation.
Purpose: Reduction of TNT and RDX Concentrations in Soil

Summary

The Tooele Army Depot (TEAD) is in Tooele, Tooele County, Utah, 35 miles southwest of Salt Lake City. It consists of two separate areas, the North Area and the South Area. The North Area covers about 25,000 acres in Tooele Valley south and west of Tooele.

Since 1943, TEAD has had a fourfold mission: store ammunition, demilitarize ammunition, rebuild military equipment, and store military equipment. In fulfilling its mission, TEAD decommissions munitions by cutting the casings and removing and recycling the explosive material. The casings are then rinsed with water to remove residual explosives. Between 1948 and 1965, rinse waters were discharged into the "TNT Washout Area," which covers less than 1 acre in the North Area. The Army has detected trinitrotoluene (TNT) and cyclomethylenetriamine (RDX) in soil near the TNT Washout Area (designated as SWMU-10), threatening ground water. About 2,500 people depend on wells within 3 miles of the site as a source of drinking water.

The Challenge

Project plans included treatment of approximately 10,000 yards of soil impacted with TNT and RDX at concentrations as high as 2,500 and 1,000 mg/kg, respectively. In addition, soils were required to be treated to levels below the remediation goals of 86 mg/kg TNT and 31 mg/kg RDX.

Initial treatability and feasibility analyses suggested that conventional composting would be the most cost-effective alternative for soil treatment, utilizing organic amendments at a rate of 70 weight percent (wt %) of the total compost mass, and treating in seven batches over the course of twelve months' time. However, a combination of factors resulted in an increase in projected costs. The combination of a considerable rise in fuel and shipping costs, a long haul distance to the

site from agricultural areas, and the need for relatively large quantities of compostable organic materials combined to make the originally-preferred alternative economically unfavorable.

As a consequence of changes in project economics, the contractor recommended use of DARAMEND® as an alternate form of treatment to reduce costs and make it possible for the project to be completed within budget. MWH and the Army Corps accepted this alternative following the completion of pilot-scale soil treatment that met the site remediation goals.

Field Work

Pilot-scale soil treatment with Adventus' DARAMEND was conducted at TEAD SWMU-10 to assess field efficacy of DARAMEND for composting site soils for treatment of TNT and RDX. Both the pilot and a concurrent bench-scale treatment study effectively demonstrated that the DARAMEND technology effectively treated site soils to levels below the remediation goals of 86 mg/kg TNT and 31 mg/kg RDX. Based on these results, the Army implemented Full-Scale DARAMEND treatment of the SWMU-10 soils.

For the full-scale treatment, soil was treated in large batches (about 3,000 cubic yards each) in a large sprung structure. In an effort to reduce treatment time and the associated labor and equipment costs, DARAMEND was added in a single dose of 3.5 wt% to soil mass upon initiating treatment of each batch, rather than through smaller incremental additions at the start of each treatment cycle. Given the very dry arid soils and limited water supply, it took approximately a week to add sufficient water to the soil to achieve adequate moisture content for treatment.

The Result

Soils were effectively treated to the remediation goals in a single application cycle. Results for the first batch of soil are typical of subsequent batches, and are shown below. Note that additional reductions continued to occur with additional tilling and soil resting, but without the addition of more DARAMEND. Treatment of the three batches was completed in approximately five months, considerably less than the original estimate of one year with conventional composting.

The Conclusion

DARAMEND was highly effective in the treatment of TNT and RDX in soil, providing a safe, effective, reliable and more economical alternative to conventional composting. Moreover, at a material cost of \$62/yd³, the DARAMEND approach provided great economic value to the clients, saving them both time and money.

Other Companies

MWH <http://www.mwhglobal.com/>
Plexus Scientific <http://www.plexsci.com/>
More DARAMEND case studies online at http://www.adventusgroup.com/projects/proj_daramend.shtml

Adventus Group – Environmental Biotechnologies for the 21st Century

The Adventus Group provides a growing portfolio of leading environmental remediation technologies, including patented offerings from Adventus Americas Inc., and EnviroMetal Technologies Inc. Our business model supports site owners, environmental engineers, consultants, regulators, and the academic community by providing unbiased design, and selection of the most cost-effective remediation strategies.

Adventus exclusively offers DARAMEND®, EHC® and related

ZVI technologies for In Situ Chemical Reduction (ISCR) along with TERRAMEND®, AQUABLOK+™, EHC-O™, O-SOX™, and mGCW™ systems to address myriad soil, sediment and groundwater impacts. Our world-class technical team is a clearly recognized industry leader. Since its inception in 2003, Adventus has successfully deployed field installations at hundreds of sites across North America, South America, Europe, Asia, and Oceania.

The Adventus family of companies is always seeking strategic partnerships with complementary remediation biotechnologies, and qualified international licensees in numerous countries. For more information contact Michael Mueller at mike.mueller@adventusgroup.com or visit us online at www.AdventusGroup.com or www.eti.ca.
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