



## A Profile in Using Green Remediation Strategies

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**Altus Air Force Base**  
Oklahoma

**Federal Facility**

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**Cleanup Objectives:** Biodegrade a volatile organic compound (VOC) hotspot 10-18 feet below ground surface in a remote location

**Green Remediation Strategy:** Treats ground water in a 10,000 square-foot bioreactor containing organic waste products

- Used woody waste supplied by a local municipality
- Obtained cotton-gin trash from the local cotton industry
- Relies exclusively on electricity generated by an onsite 200-watt photovoltaic array to recirculate ground water through the treatment system
- Employs a small submersible pump designed for solar applications and suitably sized for low rates of ground-water transfer

**Results:**

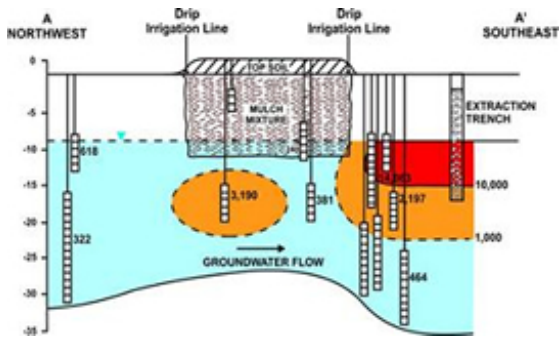
- Avoids air emissions associated with consumption of grid electricity
- Found beneficial use for waste products generated by local organizations
- Achieves increased concentrations of VOC break-down compounds
- Transfers 1,300 cubic meters of carbon-enriched leachate into the aquifer each year
- Maintains a ground-water flow rate of 928 gallons each day
- Avoided significant cost for connection to the electricity grid
- Incurred capital costs of only \$2,300 for the pump/solar system
- Provides low-maintenance alternative for potentially extended time
- Provides opportunity of re-using alternative energy source with 20- to 30-year lifespan at other locations or sites

**Property End Use:** Continued military operations

**Point of Contact:** [Jim Gonzales](#), AFCEE

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The bioreactor serves a dual purpose: (1) degrading TCE and other chlorinated aliphatic hydrocarbons in the ground water and (2) generating leachate with high dissolved oxygen content.



Altus Air Force Base uses four 50-watt, fixed-position photovoltaic panels to power a small submersible pump recirculating trichloroethene-contaminated ground water through a mulch bioreactor. During each minute of peak sunlight hours, the pump returns two to three gallons of water from an extraction trench to the bioreactor for treatment.

### Altus Air Force Base

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[http://www.cluin.org/greenremediation/profiles/subtab\\_d1.cfm](http://www.cluin.org/greenremediation/profiles/subtab_d1.cfm)



United States Environmental Protection Agency  
Office of Solid Waste and Emergency Response (5202P)

**For more information:**  
[www.cluin.org/greenremediation](http://www.cluin.org/greenremediation)  
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