

US EPA ARCHIVE DOCUMENT

Greener Cleanups

Basics and Acronyms

Gary Victorine

Land and Chemicals Division

USEPA Region 5

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- Green Remediation
- Greener Remediation
- Sustainable Remediation
- Green Cleanups
- Greener Cleanups
- Green and Sustainable Remediation

Sustainable?

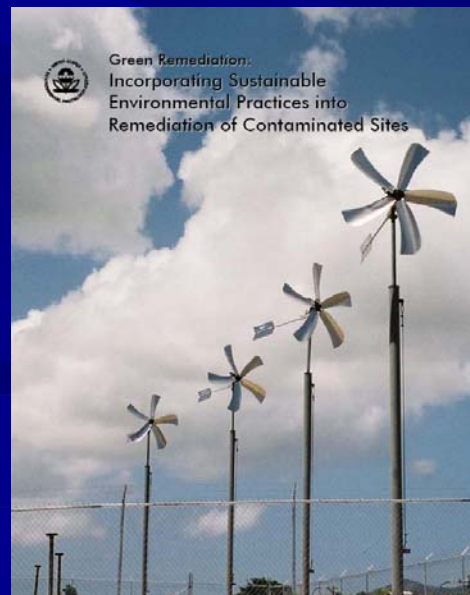
- Environmental Impacts
- Economic Viability
- Societal Impacts

Greener Cleanups

- Site Investigation
- Remedy Decision
- Optimizing Existing Remedy

Green Remediation

“The practice of considering all environmental effects of remedy implementation and incorporating options that maximize the net environmental benefit of the cleanup.”





2006-2011 EPA Strategic Plan



Charting Our Course



■ EPA Strategic Plan Goal 1: **Clean Air and Global Climate Change:**

- **Protect and improve the air so it is healthy to breathe and risks to human health and the environment are reduced. Reduce greenhouse gas intensity by enhancing partnerships with businesses and other sectors.**

■ EPA Strategic Plan Goal 5: **Compliance and Environmental Stewardship:**

- **Stewards of the environment recycle wastes to the greatest extent possible, minimize or eliminate pollution at its source, conserve natural resources, and use energy efficiently to prevent harm to the environment or human health.**

■ EPA Strategic Plan Goal 3: Land Preservation and Restoration:

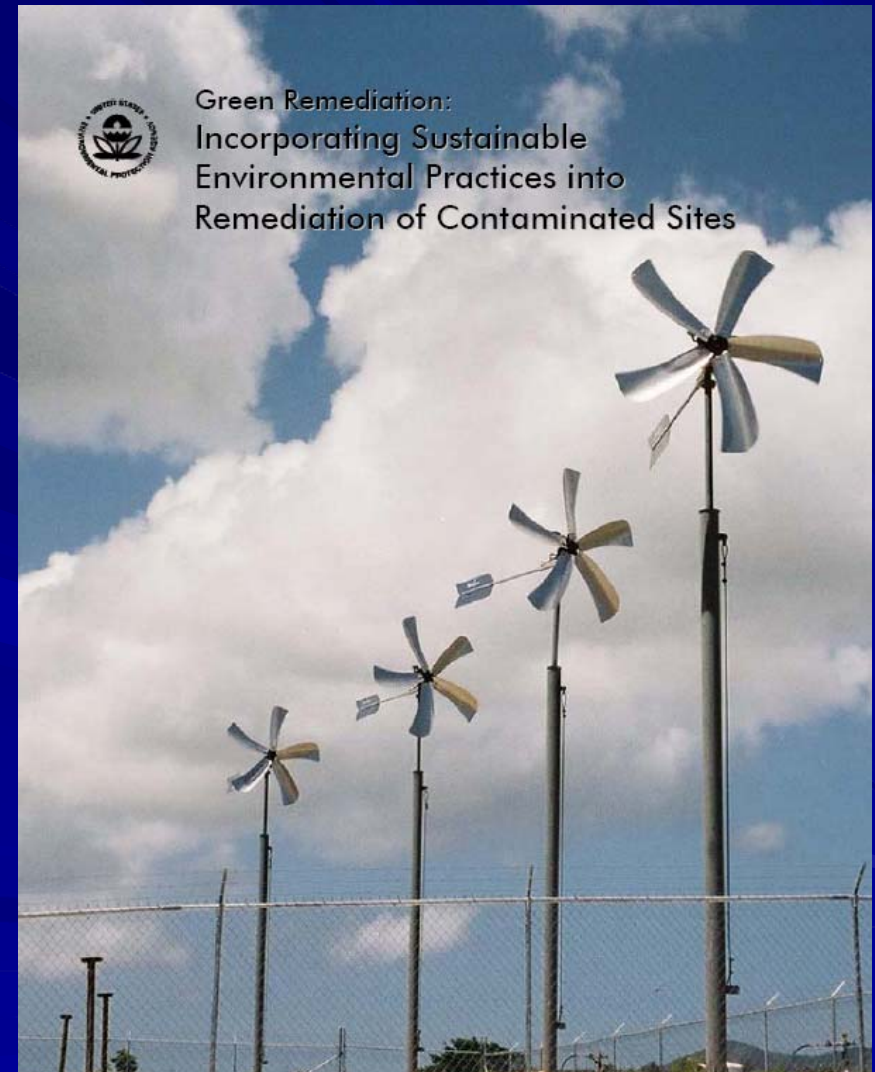
– Reduction of Greenhouse Gases:

- EPA is exploring approaches to develop green remediation practices that encourage energy efficiency and conservation during the cleanup of contaminated sites. EPA is also working to assess the impacts of biofuels on Underground Storage Tank cleanup sites and to evaluate the effectiveness of assessment approaches and cleanup technologies at these sites.

(Proposed additional language for 2009–2014 Strategic Plan)

EPA Green Remediation Primer

- Released April 2008
- Provides intro to best practices; examples of how and where they are used
- Focuses on remedy implementation across regulatory frameworks





*U.S. Environmental Protection Agency
Office of Solid Waste and Emergency Response*

Principles for Greener Cleanups

Protecting Communities and the Environment for a Sustainable Future

As a nation, we value land as a natural, cultural, and economic resource. Cleaning up contaminated land protects human health and the environment and enables communities and other stakeholders to pursue future beneficial use or reuse of resources for economic, environmental, and societal purposes. Prevention and remediation of contamination plays a central role in seeking a sustainable future.

A goal of the U.S. Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response (OSWER) and its many partners is to preserve and restore land by promoting and using protective waste management practices and by assessing and cleaning up contaminated sites. OSWER cleanup programs (including national and regional programs) address contaminated soil, groundwater, surface water, sediments, air, and other environmental media.

EPA cleanup programs include common elements such as an initial site assessment, initial site stabilization when needed to protect against imminent threats, site characterization, cleanup option evaluation, selection, and implementation, and when appropriate, longer-term management of the site. When done in close consultation with local communities, these cleanup programs not only protect human health but also allow communities and other stakeholders to promote beneficial, protective future uses of the property.

Doing our Work Smarter – and Greener

Cleaning up sites can be viewed as "green" from the perspective of the cleanup improving environmental and public health conditions. However, cleanup activities use energy, water and materials resources to achieve cleanup objectives. The process of cleanup therefore creates an environmental footprint of its own. Over time, we have learned that we can optimize environmental performance and implement protective cleanups that are **greener** by increasing our understanding of the environmental footprint and, when appropriate, and taking steps to minimize that footprint.

OSWER cleanup programs should consider these Principles for Greener Cleanups during any phase of work, including site investigation, evaluation of cleanup options, and optimization of the design, implementation, and operation of new or existing cleanups. All cleanup approaches, and all elements of the cleanup process, can be optimized to enhance their overall environmental outcome; therefore, green remediation involves more than merely adopting a specific technology or technique.

These Principles for Greener Cleanups are not intended to allow cleanups that do not satisfy threshold requirements for protectiveness, or do not meet other site specific cleanup objectives, to be considered greener cleanup. The Principles are not intended to trade cleanup program

Principles of Greener Cleanups

1. Minimize Total Energy Use and Maximize Use of Renewable Energy.

- Minimize energy consumption;
- Power on-site cleanup equipment through on-site renewable energy;
- Purchase commercial energy from renewable resources.

Principles of Greener Cleanups

2. Minimize Air Pollutants and GHG Emissions.

- Minimize the generation of GHGs;
- Minimize generation and transport of airborne contaminants and dust;
- Use heavy equipment efficiently;
- Maximize use of machinery equipped with advanced emission controls;
- Use cleaner fuels;
- Sequester carbon onsite.

Principles of Greener Cleanups

3. Minimize Water Use and Impact to Water Resources

- Minimize water use;
- Capture, reclaim, and store water for reuse;
- Minimize water demand for revegetation;
- Employ best management practices for stormwater.

Principles of Greener Cleanups

4. Reduce, Reuse, and Recycle Material and Waste

- Minimize consumption of virgin materials;
- Minimize waste generation;
- Use recycled products and local materials;
- Beneficially reuse water materials;
- Segregate and reuse or recycle materials such as soil, C&D debris, buildings.

Principles of Greener Cleanups

5. Protect Land and Ecosystems

- Minimize areas that need use limitations;
- Minimize soil and habitat disturbance or destruction;
- Use native species to support habitat;
- Minimize noise and lighting disturbance;

Acronyms

Acronyms

- **CHP** – Co-generated Heat and Power, or Combined Heat and Power.
- **DOC** – Diesel Oxidation Catalyst.
- **DPF** – Diesel Particulate Filter
- **LCA** – Life Cycle Analysis

Acronyms

- **LFGE** – Landfill Gas to Energy.
- **PPA** – Power Purchase Agreement.
- **ULSD** – Ultra Low Sulfur Diesel.
- **WEG** – Wind-driven Electrical Generator.

Acronyms

- **WTE** – Waste to Energy
- **BTSC** – Brownfields and Land Revitalization Technology Support Center.
- **OSWER** – Office of Solid Waste and Emergency Response

[www.epa.gov/reg5rcra/
wptdiv/cars/remediation/](http://www.epa.gov/reg5rcra/wptdiv/cars/remediation/)

