

The Evolution of U.S. Regulatory Guidance/Policy and Ongoing Debate Over Green vs. Sustainable Remediation

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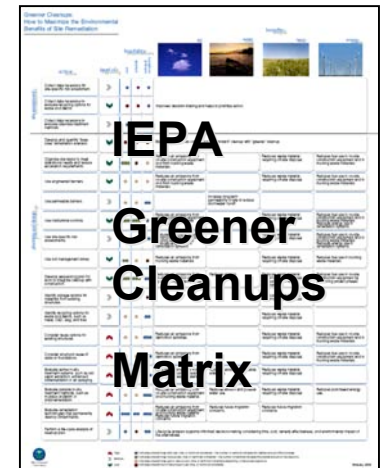
Presentation Outline

- Introduction
- History of Green/Sustainable Remediation
- Federal Guidance and Policies
- State Guidance and Policies
- Stakeholder/Regulatory Coalitions & Standards Organizations
- Green vs. Sustainable Remediation
- Conclusions and GSR Future
- Q and A



Green and Sustainable Remediation Evolution

- Minnesota PCA Sustainable Cleanups Toolkit - 2000
- Sustainable Remediation Forum (SURF) - 2006
- US EPA Region III RCRA Pilot Projects - 2007
- US EPA Green Remediation Research - 2007
- SURF UK established - 2007
- California Green Remediation Team – 2007
- Illinois EPA Greener Cleanups Program – 2007
- US EPA launches Green Remediation Website – 2008



Green and Sustainable Remediation Evolution

- ASTSWMO Green Remediation Team - 2008
- Wisconsin Initiative for Sustainable Cleanups (WISC, now WISRR) - 2008
- ASTM Standard Subcommittee – 2008
- ITRC Green Remediation Team - 2009
- SURF White Paper Published - 2009
- New York DEC Green Remediation Policy - 2010
- US EPA Regional Policy Development - 2008 – 2010
- SURF in International Geographies – 2009 - Ongoing



Green vs. Sustainable Remediation

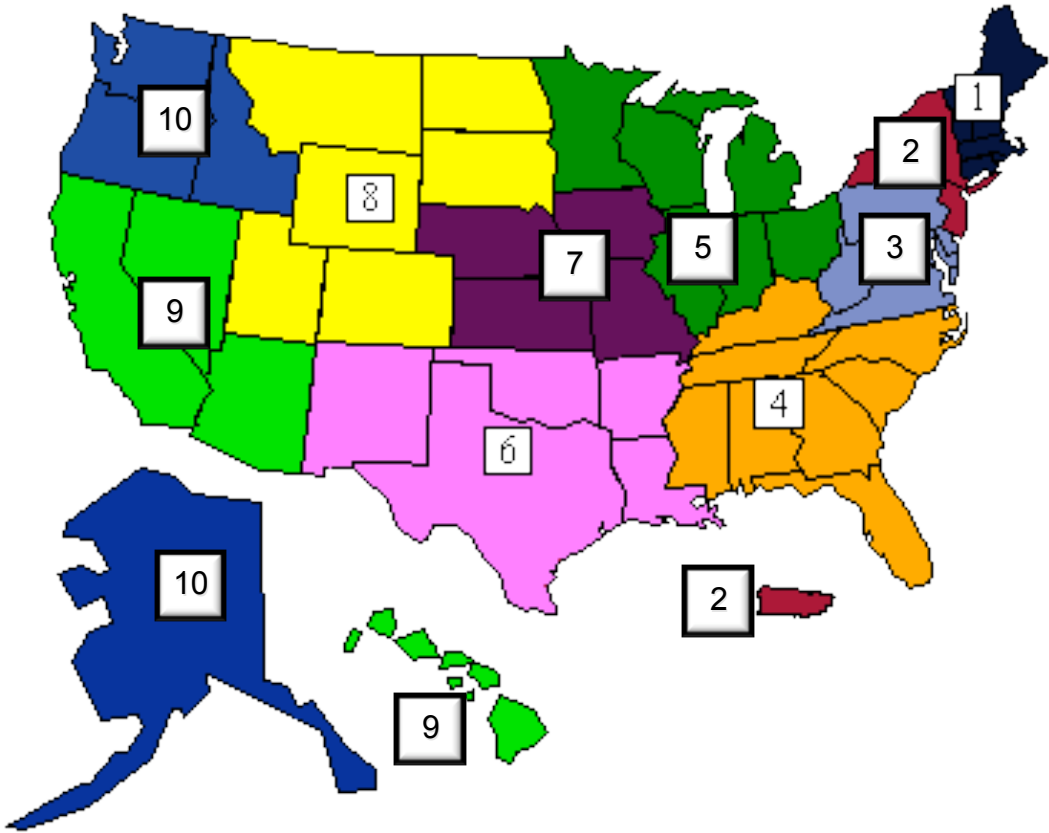
Green Remediation – the practice of implementing remedial actions in a manner that attempts to reduce possible environmental impacts after selecting a remedy but does not formally include those considerations in the remedy selection process.

Sustainable Remediation – encompasses green remediation but also includes relatively detailed analyses of environmental, social and economic impacts as part of remedy selection and design.

US EPA Green Remediation Policies

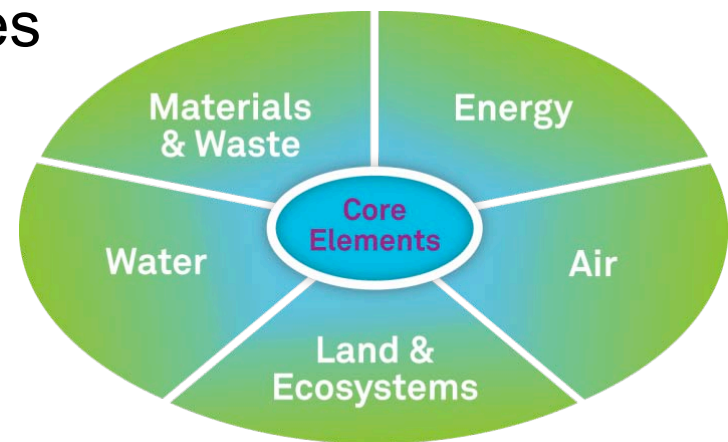
Green Remediation Programs

- Superfund
- Federal Facilities
- RCRA
- Brownfields
- LUST
- State/Tribe Cooperative Agreements



Green Remediation – US EPA Focus

- The goal is not to change the remedy selection criteria, but to incorporate sustainability into the process.
- Should not influence whether to remediate or technology selection but will influence how to implement remediation.
- Focus on 5 Core Elements
- US EPA Charter is to “cleanup” sites
- Practical barriers to GSR change
 - Environmental Policy
 - Lack of regulatory infrastructure
 - Hard to equate results into common metrics
 - Certain applicable metrics are qualitative
 - No standard methodology



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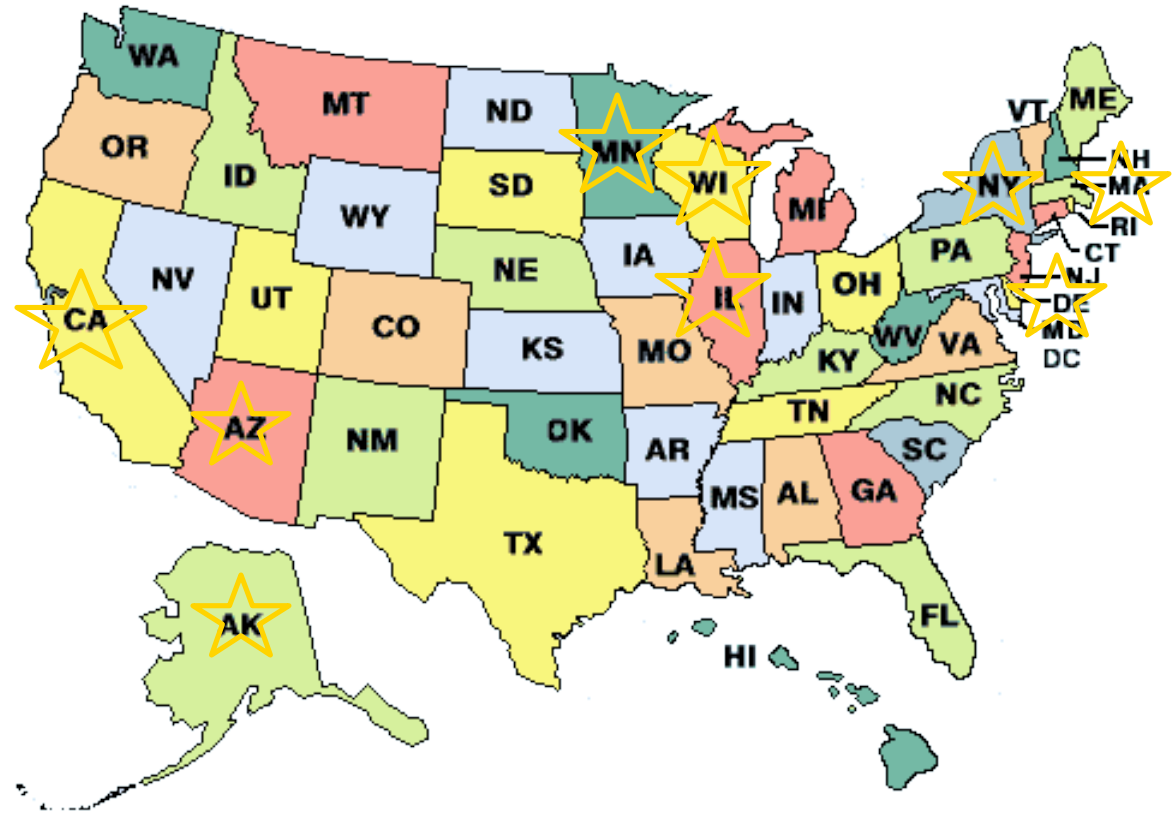
Other Federal Guidance and Policies

- U.S. Air Force – AFCEE
- U.S. Navy - NAVFAC
- U.S. Army - USACE
- Federal Remediation Technologies Round Table
- All of these incorporate broader aspects of Sustainable Remediation



State Regulatory Initiatives and Programs

- California
- Illinois
- Massachusetts
- Minnesota
- Wisconsin
- New York
- ASTWMO
- ITRC



- Related programs or guidance in progress:
 - Alaska, Arizona, Delaware

ITRC GSR Team

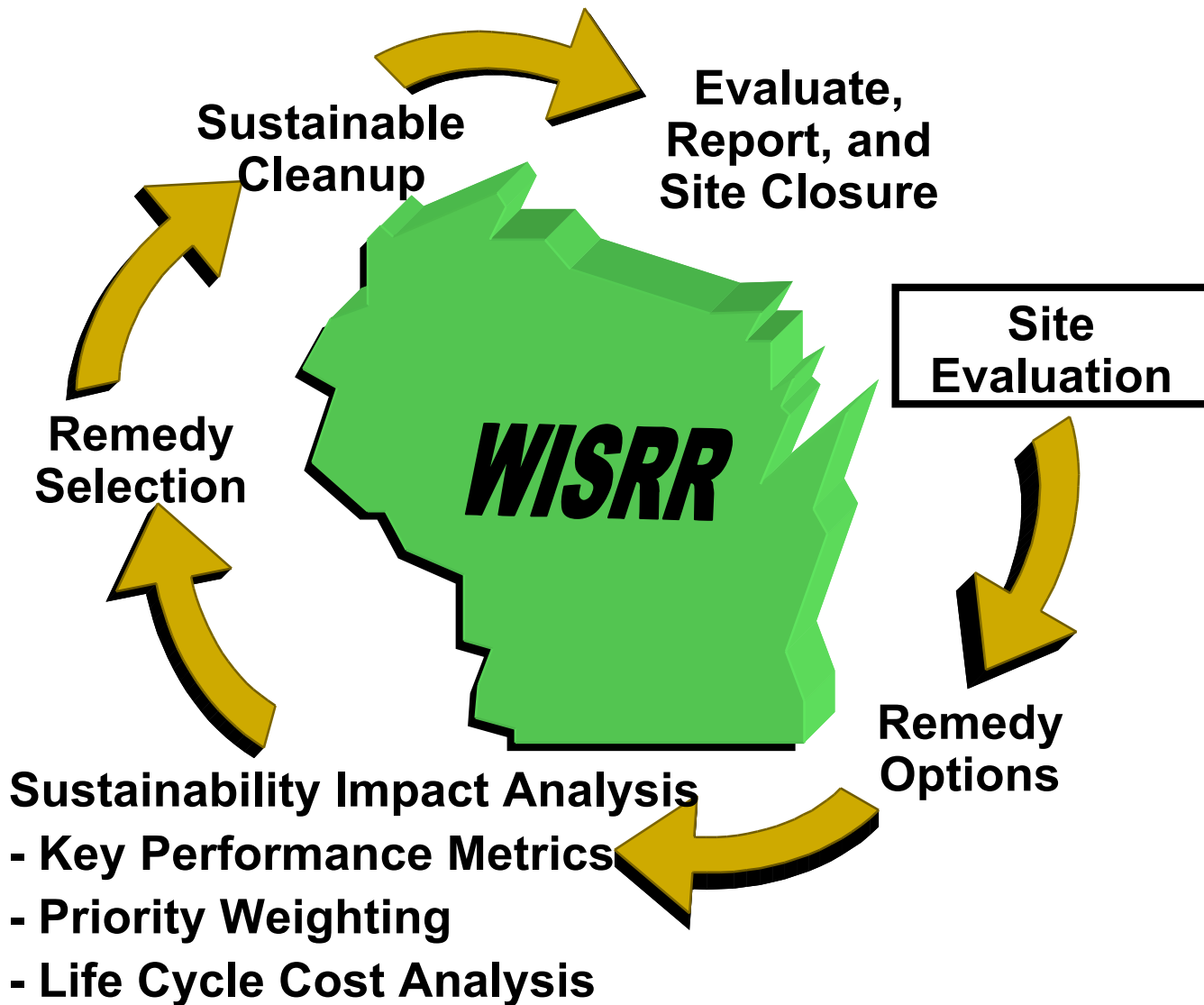
- Developing a Framework for Regulators
- A Team of 75 representing 13 states, EPA (5), DOD (15), DOE (2), Academia (4), Stakeholders (4) and Consulting (30)
- Working with SURF, ASTM, and ASTSWMO
- Embracing Sustainable Remediation
- Overview document in technical editing now
- Tech-Reg document out for initial review in June
- Internet Based Training (IBT) development ongoing

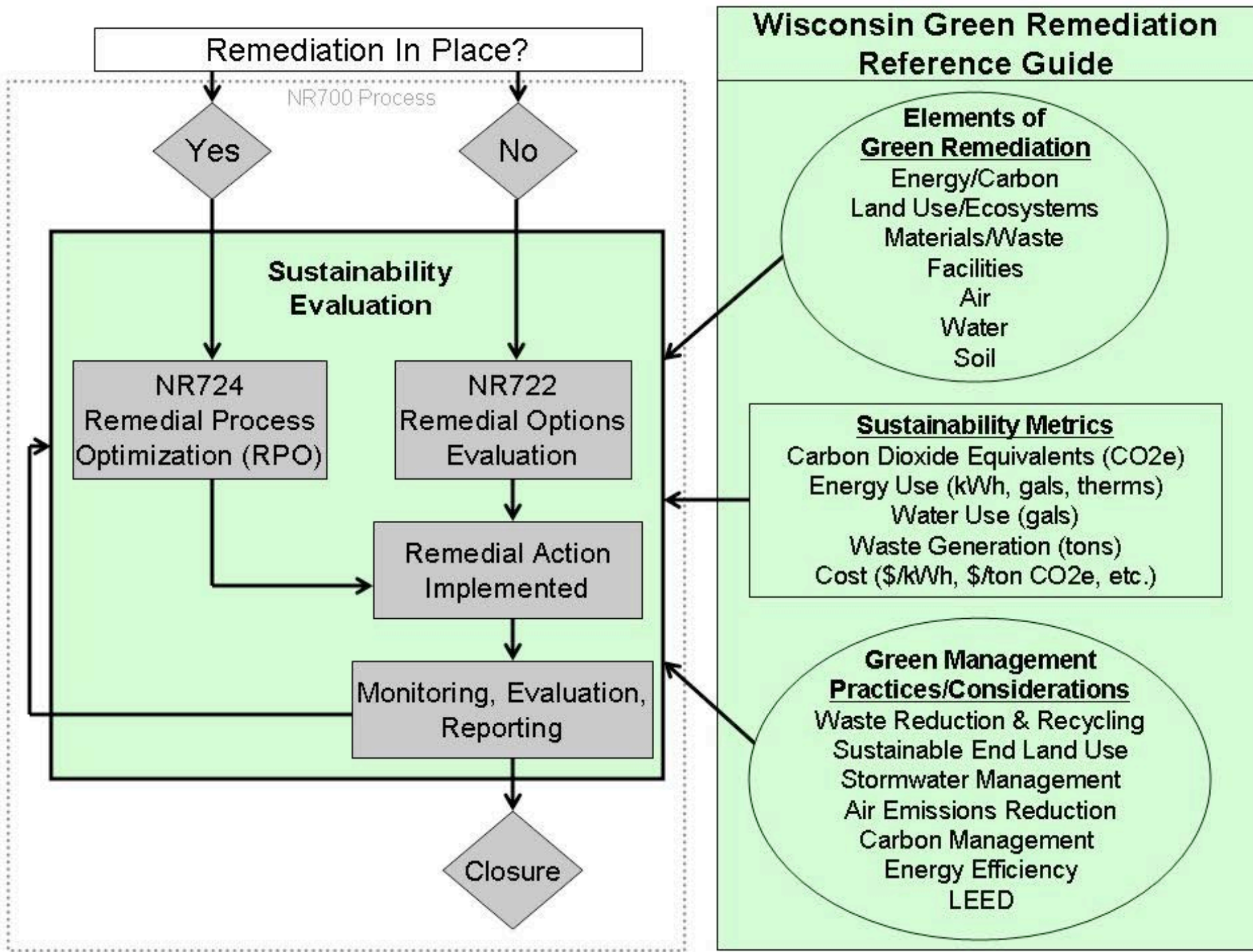


Wisconsin Initiative for Sustainable Remediation and Redevelopment

- Sustainability considered in remedy selection, but must not compromise environmental protection.
- Develop guidance document to help WDNR project managers evaluate and implement sustainable remediation.
 - Develop meaningful sustainability performance metrics to document and explain progress to stakeholders, administrators, and the public.
 - Easy to use and implement and broadly applied to state and federal remedial activities.
 - Provide a pathway for green optimization of existing systems.

Process to Implement WISRR at State Lead Sites





Remediation In Place?

NR700 Process

Yes

No

Sustainability Evaluation

NR724
Remedial Process Optimization (RPO)

NR722
Remedial Options Evaluation

Remedial Action Implemented

Monitoring, Evaluation, Reporting

Closure

Wisconsin Green Remediation Reference Guide

Elements of Green Remediation
Energy/Carbon
Land Use/Ecosystems
Materials/Waste
Facilities
Air
Water
Soil

Sustainability Metrics
Carbon Dioxide Equivalents (CO2e)
Energy Use (kWh, gals, therms)
Water Use (gals)
Waste Generation (tons)
Cost (\$/kWh, \$/ton CO2e, etc.)

Green Management Practices/Considerations
Waste Reduction & Recycling
Sustainable End Land Use
Stormwater Management
Air Emissions Reduction
Carbon Management
Energy Efficiency
LEED

NYSDEC DER-31 Green Remediation Policy

- Final DER-10 issued May 3, 2010: New Section 1.14 Sustainability and Green Remediation outlines use of Green Remediation in NYS remedial programs
- DER-31 is a new NYSDEC Program Policy
 - effective on September 17, 2010
 - Intended for NYSDEC staff, RPs & consultants/contractors
 - Provides general framework for green remediation concepts
 - Includes Sustainable Remediation concepts;
 - Conducted at FS/remedy selection stage
- Specific methods/criteria not identified
- Applicable to all Programs and Phases, new and existing projects

DER-31 / Green Remediation	
New York State Department of Environmental Conservation	
DEC Program Policy	
Issuing Authority: Val Washington	Title: Deputy Commissioner Office of Remediation and Materials Management
Date Issued: August 11, 2010	Latest Date Revised:

I. Summary

This document identifies the New York State Department of Environmental Conservation (DEC) Division of Environmental Remediation (DER) approach to remediating sites in the context of the larger environment, a concept known as green remediation. "Green Remediation" (or "greener cleanups") can be defined as "the practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprint of cleanup actions." It is intended to be a holistic approach which improves the overall sustainability of the cleanups by promoting the use of more sustainable practices and technologies. Such practices and technologies are, for example, less disruptive to the environment, generate less waste, increase reuse and recycling, and emit fewer pollutants, including greenhouse gases (GHGs), to the atmosphere. The approach also recognizes the potential for positive economic and social benefits of site reuse and supports coordination of site reuse and remediation to effect the most beneficial and sustainable reuse of the site.

This document provides concepts and techniques of green remediation and guidance on how to apply them to DER's remedial programs, but does not specify methods or criteria to be used to quantify the effectiveness of the various green remediation concepts or remedial alternatives. The concepts will be considered and implemented to the extent feasible, and documented.

This policy applies to all phases of the site cleanup process, from investigation through completion of remediation for sites in the Spill Response Program, Inactive Hazardous Waste Disposal Site Remedial Program (State Superfund Program), Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and the Resource Conservation and Recovery Act (RCRA) Program.

II. Policy

DER is dedicated to developing and promoting innovative cleanup strategies that restore contaminated sites to productive use, promote environmental stewardship, and reduce associated costs while minimizing secondary environmental impacts from these cleanups. Applying green remediation concepts, such as minimizing energy consumption, reducing GHG emissions, maximizing the reuse of land and the recycling of materials, and conserving natural resources such as soil, water and habitat helps to achieve that objective. Green remediation concepts will be applied to the existing (ongoing) cleanups and future cleanup of contaminated properties. This policy does not modify or replace existing remedial program goals. It is also not intended to encourage, and does not justify, implementation of a "no action" or lesser remedy when a more comprehensive remedy is called for, appropriate, and feasible. The priority remains implementing remedies that are protective of public health and the environment.

Green vs. Sustainable - Points of Agreement

- Remediation projects should be conducted in an environmentally responsible manner.
- Green metrics probably have limited role on time critical remediation projects
- Protection of human health is a baseline requirement
- All relevant stakeholders should have say in decision-making
- A goal should be to reduce energy consumption, carbon footprint and any other deleterious effect of remediation
- We can make better remediation decisions; there are previously unaccounted for considerations



Green vs. Sustainable – Discussion Points

- Health and Safety
 - Voluntary vs. Involuntary Risk
 - Risk of Remedy
- Triple Bottom Line
 - Social and Economic?
- Ineffective Remedies
 - Eliminate risk vs. chasing unachievable goals
- Timing
 - Reasonable Timeframe?
- Litigation



Conclusions

- Various States and Industry groups are embracing Sustainable Remediation
- US EPA has embraced Green Remediation
- Lots of activities, some complementary and some not
- Points of Agreement and Challenges
- There are previously unaccounted factors that may influence how to remediate and even whether to remediate
- How do we weight and compare metrics?
- Does better remediation necessarily mean more?

The GSR Future?

- States with risk-based regulatory framework are best suited to embrace Sustainable Remediation
- Additional State Guidance expected as economy rebounds
- Increasing advancement of science of GSR
- Dramatic increase in case studies and lessons learned
- Evolution to the point of Standard Practices or at least accepted methodology
- US EPA adoption of Sustainable Remediation?
- Influence of International GSR evolution?

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Questions?



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