

GREENER CLEANUPS

Integrating More Sustainable
Approaches into
Brownfields Remediation

Connecticut
Brownfields Conference

May 17, 2016

Today's Panel

Camille Fontanella, CT DEEP, Remediation Division Technical Outreach Coordinator

John Simon, Gnarus Advisors, Director

Frank Gardner, EPA Region 1, Brownfields Coordinator

Russ Downey, Pfizer, Director of Environmental Engineering, Remediation & Transactions

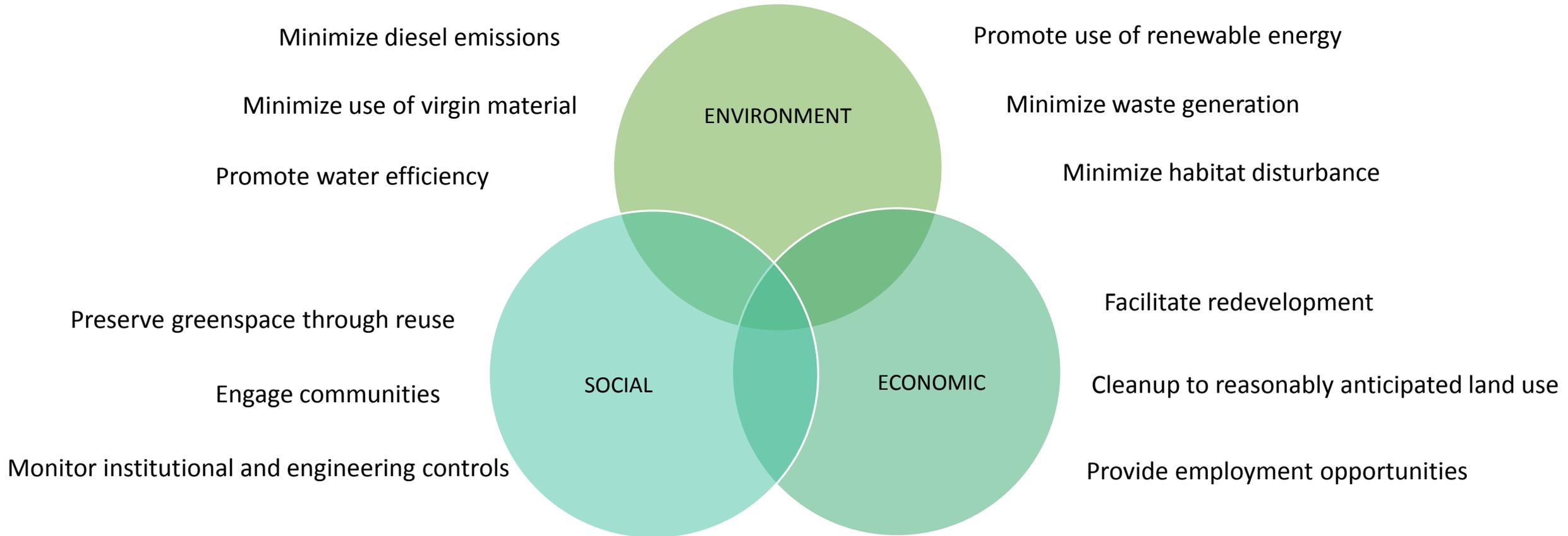
What are Greener Cleanups?

Reducing Environmental Footprint of Cleanups by:

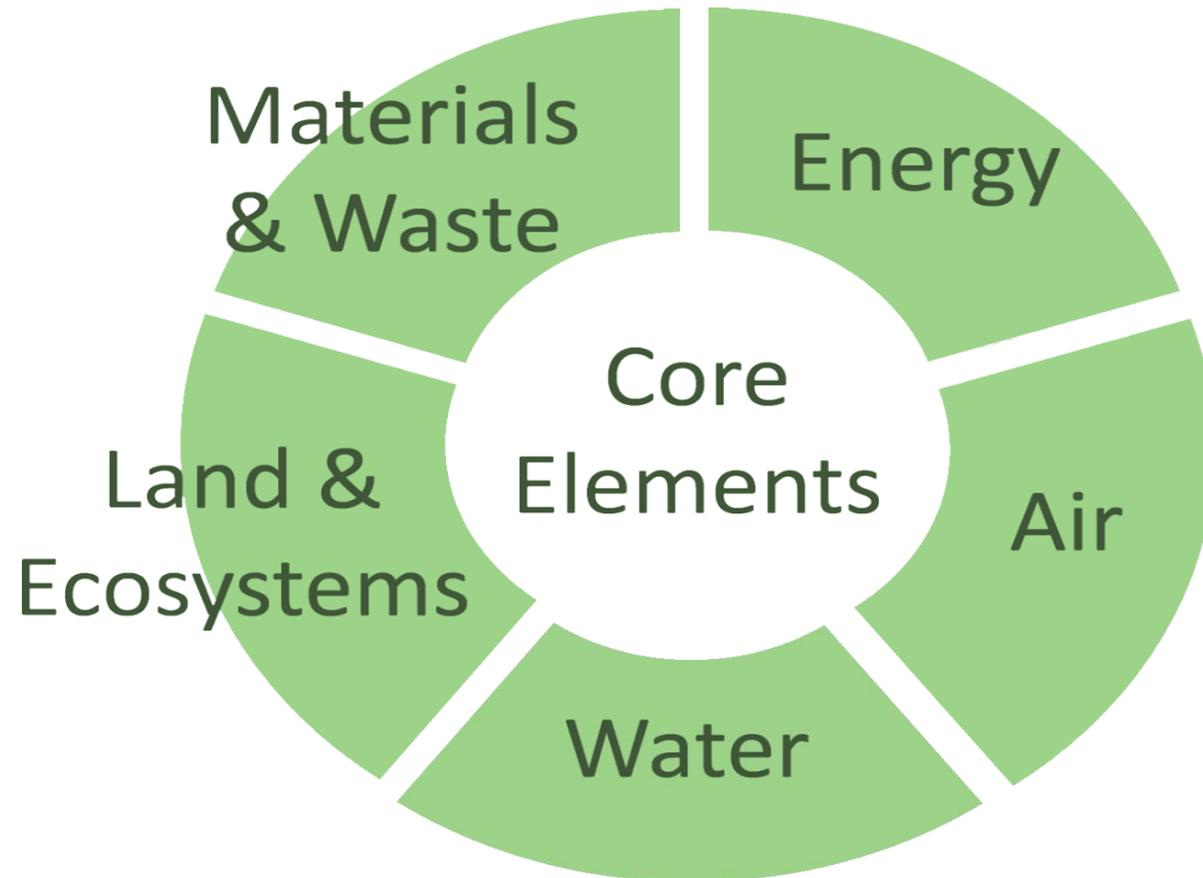
- Beginning with perspective of Sustainability
- Considering Greener Cleanup Principles during project planning
- Selecting investigative and remedial options that are greener



Sustainability Principles in Cleanup Programs



EPA's Greener Cleanup Principles



Examples of Best Management Practices

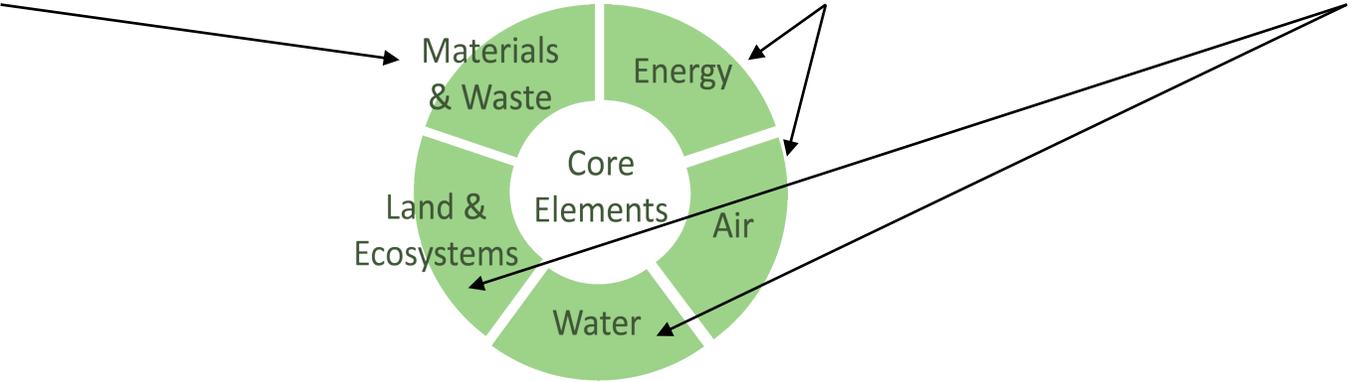
Recycled concrete for erosion control



Mobile solar system to power tools



Wetlands for stormwater & habitat





Take-Aways:

Works at ANY Site

**No regulatory review
necessary**

**Better environmental,
societal, and
economic outcomes**

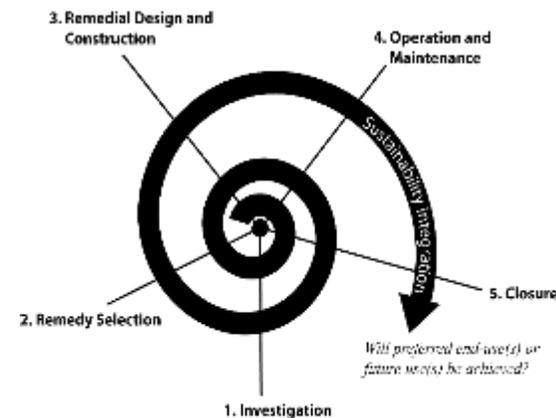


ASTM's Standard Guide for Greener Cleanups ASTM E2893

John Simon, ASTM Task Group Lead
SURF, President
Gnarus Advisors LLC

ASTM Framework for Greener Cleanup

- Greener Cleanup is a Process, not a Technology
 - Greener cleanup principles should be integrated into cleanup projects
 - Applied on a phase-by-phase basis
 - Is not just about remedy selection and green technologies
- ❖ “Only is green if it works”
 - Focus on how to incorporate BMPs into projects
- ❖ Ability to incorporate quantitative evaluation as an option



The Basics

- Provides a step-by-step approach
- Flexible, with qualitative and quantitative options
- Includes reporting expectations
 - Documentation must be publicly available (inhibits “green washing”)
- Environmental professional must lead the team and sign attestation that the standard was followed
- Applicable across regulatory programs and project phases
- Designed to be the industry standard; particularly if adopted by regulatory agencies

ASTM Standard Guide for Greener Cleanups

Why A Standard?

- ❖ Codifies best practices
- Defines a process for reducing environmental footprint
- Provides a protocol for contracting purposes
- EPA is using in orders and selected cleanup programs
 - EPA OLEM Assistant Administrator's memo encourages use of the standard
- States are becoming interested
 - e.g., MassDEP “strongly recommends” use of the standard for cleanups under the Licensed Site Professional Program
- Provides “brand recognition” for greener cleanups

Free Access!

- Beginning June 1st, Standard will be available to review for FREE for a 60-day period
- Includes the general public, not just ASTM members
- EPA Clu-in webinar to introduce standard on June 1st at 3:30 pm EDT

GSR in EPA Brownfields Program

Terms and Conditions (T&C)



T&C's within your award document will contain GSR language that will require:

- Use of a quarterly report template that includes a section on GSR achievements.
- Including climate change **resilience** risk factors in the evaluation of cleanup alternatives in the ABCA.
- Considering how GSR practices may optimize a selected cleanup alternative to minimize waste and adverse impacts.

Where do GSR and Climate Change Adaptation Considerations Fit?

- *Proposal – use any sustainability goals and observed or forecasted climate change impacts you identified in your successful proposal as a starting point.*
- Workplan
- Request for Proposals (RFP) and Contracting
- **Analysis of Brownfields Cleanup Alternatives (ABCA)**
- Public Engagement
- Quarterly Reporting



Don't forget to share your goals and achievements with both us and your community!

Example –Hartford ABCA

Background: UST site with soil and free-phase petroleum contamination

Resiliency Context: Regional trends show increased and extreme precipitation. Site is 50 feet higher elevation than river so flooding unlikely, but potential for increased runoff and erosion exists.

Alternatives: ♦ No Action ♦ Remove UST/In-situ Bioremediation
♦ Remove UST/Excavate Soil/In-situ Bioremediation

Analysis: No difference in effectiveness of active alternatives due to forecasted climate vulnerabilities (stormwater/erosion controls to be used and excavation planned for dry months to reduce dewatering)

Recommended Alternative: Remove UST/Excavate Soil/In-situ Bioremediation

GSR Measures for Recommended Alternative:

- States that BMPs in ASTM Greener Cleanups Standard will be referenced
- Idle-reduction policy and heavy equipment with advanced emissions controls
- Minimize mobilizations and use erosion control measures
- Ask bidding cleanup contractors to propose additional GR techniques in proposal

Example – Willimantic ABCA

Background: Contaminated soils from historic mill activities.

Resiliency Context: Portions of the site along the river are within the 100 year flood elevation. Regional trends show risk of increased and extreme precipitation.

Alternatives: ♦ No Action ♦ Soil Cap ♦ Targeted Excavation and Disposal, ELUR

Analysis: Appropriate erosion control measures during construction and armoring and grading to prevent future events from exposing soils along the river will protect against flood events for active alternatives. The proposed project results in an overall reduction in impervious surface which will also reduce run-off to the river.



Recommended Alternative: Targeted Excavation and Disposal, ELUR



GSR Measures for Recommended Alternative:

Use existing office building instead of trailer;

Vegetation will be utilized for erosion control where practical;

Erosion control measures will be conservative and protective of the adjacent river;

Native tree removal will be minimized;

Contractors will be required to adhere to an idling reduction program;

Soils will be pre-characterized to facilitate direct loading and reduce handling.

Helpful Links

ASTM Greener Cleanups Standard

www.astm.org/Standards/E2893.htm

CLU-IN (Technical resources):

www.clu-in.org/greenremediation

Questions

Brownfields
Green Remediation Lead:
Laurie O'Connor
617-918-1605
oconnor.laurie@epa.gov

Brownfields
Sustainability Lead:
Jessica Dominguez
617-918-1627
dominguez.jessica@epa.gov

Value Proposition -
Greener Cleanup
An Industry Perspective

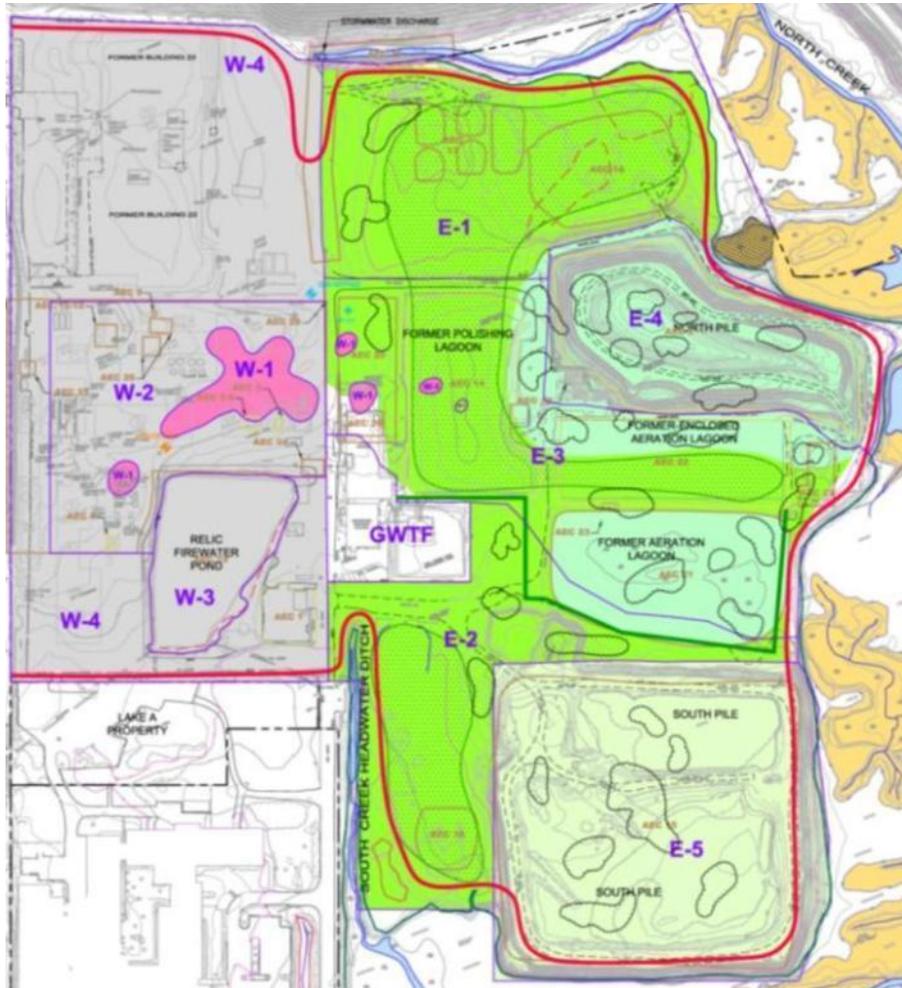
2016 CT Brownfields
Conference
17 May 2016



Why consider greener cleanup and sustainability? GLOBAL SUPPLY

- A Pfizer core value is “Respect for Society”. Community input indicates a significant desire to return impacted properties to beneficial reuse within reasonable timeframe through cleanup that maximizes safe and sustainable means and methods, including greener cleanup approaches during remedy execution
- Value Proposition:
 - Reduce environmental footprint (e.g. < GHG emissions and resource consumption) -- Increase operational efficiencies
 - Increase social responsibility and public outreach
 - Tailor remedy protectiveness to appropriate future land reuse
 - Consider in situ remedies over ex situ remedies that consume less energy and pose less exposure to both on-site workers and community

Key Components of EPA Approved Remedy



- Groundwater control and treatment, long-term operations

East Side Components

- Sediment removals, tidal wetlands mitigation
- Eastern side consolidation, protective barriers, ecological enhancements

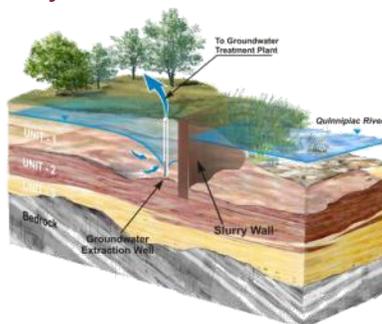
West Side Components

- Thermal desorption to treat the most impacted area
- Western side protective barrier

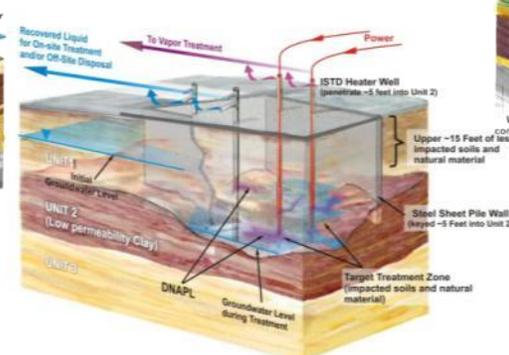
CMS Alt 4 Selected Remedy

- CMS Alt 3 had the lowest total CO₂ emissions
- CMS Alt 4 had slightly higher total CO₂ emissions than CMS Alt 3, but achieved a greater reduction of toxicity, mobility and volume
- CMS Alt 5 had significantly higher total CO₂ emissions without substantial, commensurate benefits and presented increased worker risks.

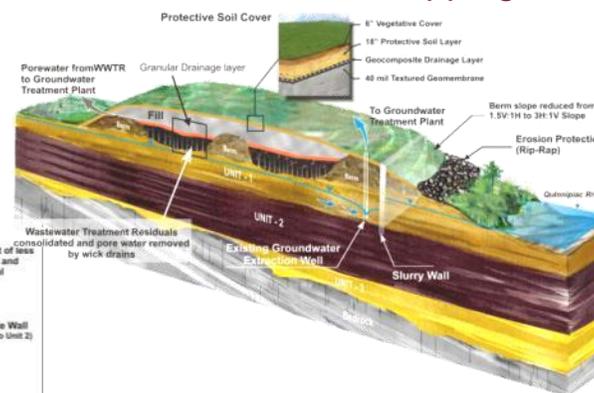
Hydraulic Barrier Wall



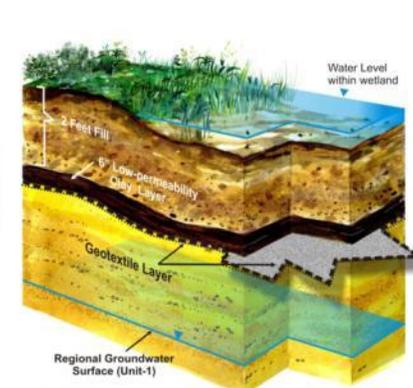
In-Situ Thermal



Consolidation and Capping



Constructed Wetlands



Greener Cleanup Value-Added: Not Just Money Saved

- ***The cost of Greener Cleanup is not only measured in dollars but also the comparative environmental footprint over the project life-cycle as well as the timeframe for return of the property to future beneficial reuse***
- ***The currency of added value or reduced costs must be viewed by resources consumed and impacts to the environment as well as dollars spent***

Review of Green Remediation Cost Impacts for North Haven

Green Remediation Aspects	Cost Impacts
Use of local labor resources (where feasible)	Cost neutral since this was included in contract terms at the beginning of the contract
Use of recycled material in hydraulic barrier wall mix design	Unit cost comparable to other reagents – Change in mix design resulted in project cost change
Hydraulic barrier wall at toe of slope	Resulted in reduction of HBW mix and elimination of a MSE wall
Low permeability cover system with storm water directed to BMP/wetland restoration area	Results in 40% reduction in groundwater treatment flows due to reduced storm water infiltration (treatment plant operational savings)
In-Situ Thermal Remediation (ISTR)	ISTR costs offset by cost avoidance (savings) for need of DNAPL waste incineration at Port Arthur, TX
Consolidation of on-site material for cover system sub-grade	Reduced amount of clean fill import that was needed by 40,000 cu yds

- Pharmacia & Upjohn cleanup project lessons learned on green remediation cost impacts:
 - Incorporating green remediation concepts early in the design process minimizes any cost impacts
 - Include green remediation aspects in contract terms/scope upfront
 - Most companies/contractors/vendors have green/sustainable goals that align with green remediation aspects

Current State of Green Remediation in CT

Developing Brownfields is “ ‘green’ as it saves land, reduces the effect of contamination... and provides redevelopment where existing infrastructure exists.” – Task Force on Brownfields Strategies (February 2009)

- Redevelopment of brownfields with a greener cleanup in mind can provide cost savings and better environmental and societal outcomes





Supporting greener cleanups results in...

- economic benefit to our state and business/industry through cost savings and job growth
- energy efficiency and conservation through best use of natural resources
- better environmental practices and outcomes



Current State of Green Remediation in CT

Website Resources

- Green Remediation – resource links, existing guidance
www.ct.gov/deep/greenremediation
- Renewable Energy - financial incentives for use
www.ct.gov/deep/brownfieldrenewableenergy
- CT Brownfields – CT Brownfields Inventory, List of Landfills
www.ct.gov/deep/brownfields
- EPA's Clu-in – Site profiles, BMP fact sheets, quantitative evaluation
www.cluin.org/greenremediation



Q & A
