Integrating Green and Sustainable Practices with Navy’s Remediation Projects

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NAVFAC Emphasis on Sustainability

• DON Environmental Strategy, April 2008
  - Vision "Sustaining our Environment, Protecting our Freedom"
    - Links accomplishing Navy’s warfighting mission with our responsibility to safeguard the natural systems upon which our quality of life depends.

• Opportunities exist within the NAVFAC Environmental Restoration (ER) Program to minimize a remedy’s environmental footprint and support EO 13423
  – reducing energy and greenhouse gasses; promoting renewable energy; reducing water consumption, air emissions, waste generation, community impacts; and improving safety

• “Green / Sustainable” optimization of Navy ER Sites will:
  – Complement current optimization approaches
  – Draw on already existing methods and technologies
  – Demonstrate commitment to long-term stewardship
Navy’s Path Forward

• DON Optimization Workgroup recently tasked by HQ
  – Determine how Optimization and Tiger Team reviews could incorporate and evaluate methods to utilize green / sustainable engineering and reduce environmental impacts of remedies

• Defining scope and developing Navy’s general approach
  – Consider sustainability during remedy selection and optimization of existing remedies
  – Life cycle approach
  – Parameters (GHG footprint, energy use, resources consumption (water, land), air emissions, community impacts (noise, odor, traffic) collateral risk)
  – Determine metric(s) of success
Navy’s Path Forward (cont.)

• **Case Studies for Lessons Learned**
  – Plan to apply & evaluate sustainability tools at ~6 Navy sites. Selection of sites and tools is in progress
  – Sites in remedy selection and remedy O&M phases
  – Focus on existing tools

• **DON Optimization Policy & Guidance Documents**
  – Currently optimize for cost, performance of the remedy, and timeliness in meeting cleanup objectives
  – Does not mention minimizing a remedy’s environmental footprint
  – Sustainability considerations to be included in future revisions of guidance documents
Navy’s Path Forward (cont.)

• Outreach to Navy RPMs
  – Fact sheet
  – RPM Newsletter articles
  – T2 e-mail announced USEPA Green Remediation Primer and Website
  – Navy/Marine Corps Cleanup Conference Presentations
  – Future RITS Topic

• NAVFAC ESC Participation / Partnering
  – SURF Meetings, including supporting development of a white paper
  – ITRC Team - Green Sustainable Remediation Team
  – FRTR Sub group - Green Remediation
  – Partner with AFCEE and USACE to address sustainability from DoD perspective

• NAVFAC ESC proposal to Navy Environmental Sustainability Development to Integration (NESDI) Program
  – Proposal Under Review for FY10 Start
Example – Sustainability Evaluation of Soil Remediation Alternatives

• Navy site in remedy selection phase
• Remediation Alternatives
  – S2: Limited excavation, off site disposal, engineered cap, ICs, & monitoring
  – S3: Excavation, off site disposal, ICs, & monitoring
  – S4: Limited excavation, off site disposal, SVE, ICs, & Monitoring
• Battelle performed this evaluation
• Feasibility study under review
• **Sustainability Parameters**
  – GHG Emissions: CO$_2$, CH$_4$, N$_2$O, other gases - reported as CO$_2$ equivalents
  – Energy Use: Electricity and fuel
  – Air Emissions: NO$_x$, SO$_x$, PM, VOCs
  – Collateral Risk: fatality and injury from on site remedial activity and off site actions (transportation)
  – Resource Consumption
GHG Emissions and Energy Usage

• GHG emissions and energy usage show similar trends
• Largest contribution - CO$_2$ emissions from fuel consumption during excavation and transportation
• Calculate life cycle impacts from remedy components and consumable materials
Air Emissions and Landfill Space

• Air emissions are mostly from heavy equipment use on site and transportation
• Largest source is diesel fuel
• Off site landfill disposal
• High cost for excavation and disposal of Rad waste in alternatives S3 & S4
• Total Cost:
  S2 - $1.2 million
  S3 - $10 million
  S4 - $9.8 million
Injury risk is low for this site
Most of the risk is from transportation of soil and fill
Fatality risk is low for this site

Most of the risk is from transportation of soil and fill
Renewable Energy Sources at ER sites

- On-going efforts to identify potential sites with high energy demand – potential candidates for renewable energy systems
- Some current applications
  - Remote sites in Adak Alaska installed wind turbines for free product recovery
  - Camp Pendleton Project – Excavated contaminated soil using clean diesel technologies, biofuels, and retrofitted equipment. Used rail for soil transportation to disposal facility
Summary

• DON taking actions to integrate green / sustainable practices with remediation projects
• Informational resources becoming available to Navy RPMs
  – RPM newsletter and T2 updates
  – Websites
  – Fact sheet
• DON Optimization workgroup tasking
  – Identify sites – in progress
  – Conduct case studies
  – Evaluate tools
  – Develop guidance
• Working with other agencies for sharing lessons learned
Questions