REMEDIATION TECHNOLOGY
COLLABORATION
DEVELOPMENT
This morning’s agenda

1. Why?
2. What?
   ---is the need
   ---are the current challenges
   ---is focus
   ---has been done to date
   ---are the forecast challenges
3. How?
WHY?

“...to establish the capability to target reductions in the long-term liability associated with NASA’s most challenging remediation sites.”

Remediation Technology Collaboration Development
Remediation Task Order - NNH10AA15D
What...

...are the current challenges?

- 15 Centers each with multiple sites located in 10 States
- Various environments: Desert, urban, suburban, rural, coastal, mountainous, woodland
- Various geologies/geomorphologies: Consolidated /unconsolidated materials
  - Sandstones
  - Karst
  - Complex, layered sands/silts/clays
- Various jurisdictions and regulations
  - Federal level oversight: (USEPA oversight, cleanup conducted under CERCLA or RCRA regulations)
  - State level oversight: State cleanup programs (FDEP, NMDEQ, MDE, TCEP)
    Agencies within States (CA DTSC vs. CA RWQCB)
  - County level oversight
- Multiple Contaminants (ranging from petroleum based fuels to solvents to pesticides to heavy metals)
- Surface waters, soil, groundwater impacted
- Sensitive receptors threatened (municipal drinking water wells, wetlands and other sensitive environmental receptors, human health and safety issues such as indoor air)
What...
...is the focus?

It's all about...
...the technology!!!!!!!

Of course!

✓ Phase I: Compile and analyze all available information:
   Step 1: Gather/research info from available sources
   Step 2: Interview NASA EMD Liaisons
   Step 3: Survey NASA Centers
   Step 4: Analyze current cleanup efforts
   Step 5: Report of findings

✓ Phase II: --Seek to increase efficiency & effectiveness
   --Reduce cleanup time & expenditure
   --Deploy new/different/innovative technologies
   --Identify potential partnerships
Approach

Kennedy Space Center

Multiple sites...40+
Wetlands threatened; Center located adjacent to a wildlife refuge
For instance: (LC-34): 330 acre plume; 2 acre source area; 100k lbs of contaminant;
  6,000,000 cu yds of soil contaminated

Jet Propulsion Lab

Several municipal supply wells impacted
2 pump and treat systems in operation: Cost to operate per year = >$3,000,000
Systems allow groundwater resources to be used again

Santa Susana Field Laboratory

Contamination to ~ 900’
Contaminant in fractures in the bedrock and in the fractures/pore space of the rock itself

White Sands Test Facility

Plume is approx. 4 mi long x 1 mi wide x 300’ thick
2 pump and treat systems in operation
What...  
...are the ongoing challenges?

- costs: labor/materials/utilities/fuel/waste disposal
- need for resources vs. amount of resources available
- regulatory environment & scrutiny
- public awareness/involvement
- Emerging contaminants
Who knows where we will go in the next 10 years

- Increased use of nano-technologies

- Increased call for and use of green and sustainable technologies
  --- waste reduction via lo-flo/no purge sampling as a BMP
  --- targeted and focused remedial actions following SI’s
  --- increased use of bioremediation technologies inc. phytoremediation
  --- fuel cells or use of biogas where available

- Renewable energies
  --- solar///wind///tidal or wave energy///use of landfill gas

- Resource preservation practices such as JPL’s systems
QUESTIONS?

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NASA TEEREM website
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Thank you...and enjoy the rest of the workshop!