A State's Perspective on MMRP Site Investigations and Cleanup Decision Making

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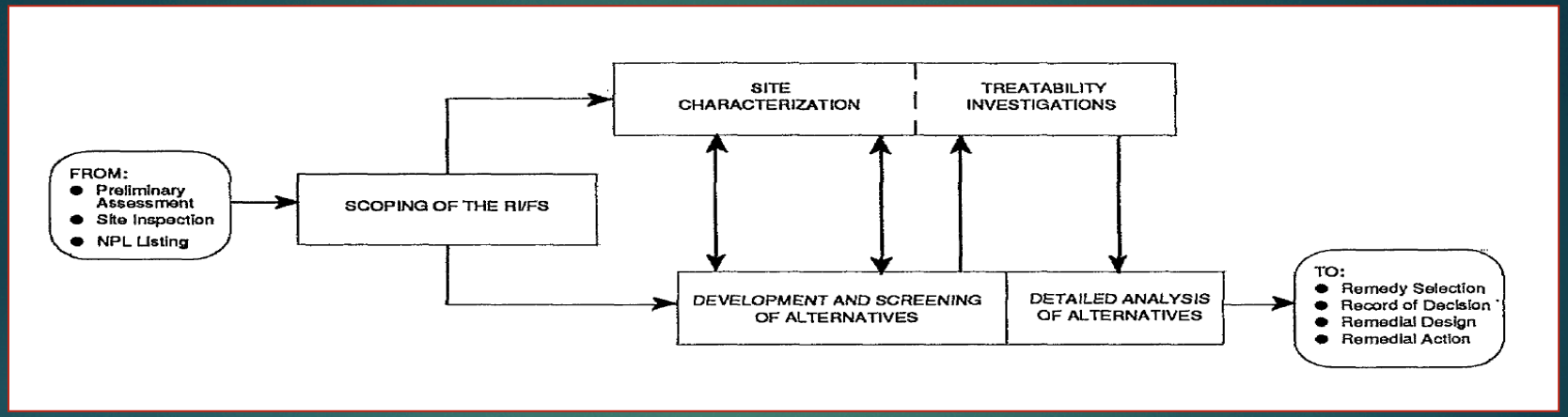
Big Picture – Key Ideas
Munitions RI/FS and Clean-up Decision Making

- Making "Good" clean-up decisions
  - Utilize RI/FS process, but don't let bureaucracy drive
  - Cleanup decision is just the beginning
  - A good decision is both protective, accepted & implementable
- Keys to a successful RI/FS and cleanup decision
  - Requires active stakeholder participation
  - Focuses on decision points before collecting data
  - Data must also support cleanup implementation
- Utilize a Munitions Cleanup Decision Matrix
  - Framework for scoping RI/FS & guiding cleanup decisions
  - Tool for Teams to negotiate site-specific decisions
  - Consider matrix as "point of departure" for decision making

What is a Good Munitions Cleanup Decision?

- Protective
  - Potential MEC hazards identified
  - Primary MEC hazards addressed
  - Potential residual risks identified and managed
- Accepted by Community Stakeholders
  - Early buy-in to cleanup goals and decision process
  - Stakeholder engagement and support of decision
- Implementable
  - Sufficient detail to support remedial design and removals
  - Long-term stewardship strategy

Role of RI/FS
Develop and Support a Cleanup Decision



- Provides basis for remedy selection
  - Source, nature & extent of contamination
  - Site users and exposure to site hazards
- Development of cleanup decision
  - Scope and evaluate cleanup alternatives
  - Decision formalized in Proposed Plan & Record of Decision

Keys to Successful RI/FS
Site Characterization to Cleanup Decision

- Scoping is critical to RI & FS
  - Collaborative process with all Stakeholders
  - Identify likely response scenarios and data needs early
- Focus on decision points
  - Focus on decision points before scoping field investigation
  - Identify likely cleanup decisions and data needs
- Known the facts, assumptions & uncertainty
  - Look at evidence of MEC hazards, not finding MEC items
  - Be wary of statistical statements and their uncertainty

MEC Cleanup Decision Matrix

Framework for Collaborative Cleanup Decisions

- Range of munitions use areas likely present
  - Munitions training ranges: Impact areas, firing points, buffers
  - Maneuver areas and other weapons training areas
- Range of site usage activities likely to occur
  - General types of activities and likely exposure potential
  - Development activities, recreational uses, agricultural uses
- Range of available response actions
  - No action, LUCs, surface removal, subsurface removal
- Match likely response actions to areas
  - Assign responses to combinations of munitions area and activites

Role of Risk in Cleanup Decision
(Assessment vs. Management)

Risk Assessment:

Risk = **Hazards** x **Exposure**

Reduce Hazard **Or** **Reduce Exposure**

Risk Management:

Focused MEC Removal Actions
(surface & subsurface)

Management of Site Use and/or Users Activities

Manage Exposures to MEC on the site

MEC Cleanup Alternatives

Range of Alternatives	General Response Actions			
	No Further Action	Land Use Controls	Surface Clearance	Subsurface Clearance
Alternative 1 – No Further Action	✓			
Alternative 2 – Land Use Controls		✓		
Alternative 3 – Surface Clearance		✓	✓	
Alternative 4 – Subsurface Clearance		✓	✓	✓

Note: *Representative technology* are identified in the FS for each General Response Action and used to screen and evaluate remedial action alternatives. Specific technology are identified during the remedial design for actual use during the response action.

Munitions Cleanup Decision Matrix

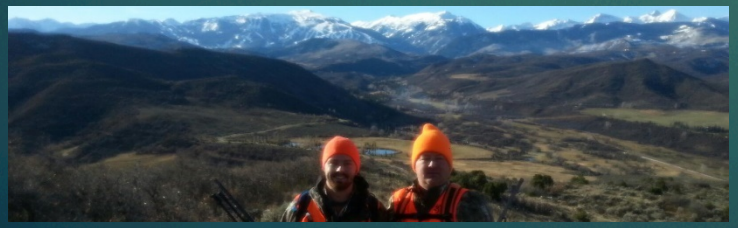
Example Framework & Points of Departure

Types of Munitions Use Areas	Range of Site Usage				
	Woods with Little Access	Agricultural Fields	Woods w/Public Access or Hunting Lease	Parks, Playground, & Schools	Rural Home Sites
Firing Points	Alternative 2 LUCs	Alternative 2 LUCs	Alternative 3 Surface	3 or 4	3 or 4
Buffers and Safety Fans	Alternative 2 LUCs	Alternative 2 LUCs	2, 3 or 4	3 or 4	3 or 4
Impact Areas (practice, HE)	Alternative 3 Surface	Alternative 4 Subsurface	3 or 4	Alternative 4 Subsurface	Alternative 4 Subsurface
Maneuver Areas	2 or 3	Alternative 3 Surface	2, 3 or 4	Alternative 4 Subsurface	Alternative 4 Subsurface

Preliminary Matrix developed by Project Team during RI scoping.
Deviations expected based on site-specific data during RI/FS.

Example Decision Matrix
Camp Hale – Ruby Gulch Range Complex

- Ruby Gulch Complex ~5,000 acres
- WWII high altitude infantry training
  - Maneuver training areas
  - Practice landmine area
  - Impact Areas (mortar & artillery)
- White River Nation Forest
  - Camping, hunting, hiking, fishing
  - Mountain hut system
  - 4x4 roads & hiking trails



Munitions Cleanup Decision Matrix
Example: Ruby Gulch Points of Departure

Types of Munitions Use Areas	Range of Site Usage				
	Remote Forest and Wilderness	General Forest	Roads & Trails	Disperse Camping Areas	Campgrounds and High Use Areas
Maneuver Areas	Alternative 2 LUCs	Alternative 2 LUCs	2-3	Alternative 3 Surface	3-4
Firing Points	Alternative 2 LUCs	Alternative 2 LUCs	2-3	Alternative 3 Surface	3-4
Weapons Training Areas (Non-Impact Areas)	Alternative 2 LUCs	2-3	2-3	3-4	Alternative 4 Subsurface
Impact Areas	Alternative 3 Surface	3-4	3-4	Alternative 4 Subsurface	Alternative 4 Subsurface

Preliminary Matrix developed by CDPHE for use during Camp Hale RI scoping.
Deviations expected based on site-specific data and discussions with USACE and USFS.

Closing Thoughts
Munitions RI/FS and Clean-up Decision Making

- Successful RI/FS ends with a good decision
  - Utilize RI/FS process, but don't let bureaucracy drive
  - Focuses on decision points before collecting data
  - Use RI data no support decision and minimize uncertainty
- "Good" clean-up decisions:
  - Require active stakeholder participation
  - Protective, Accepted by Stakeholders, & Implementable
- Utilize a Munitions Cleanup Decision Matrix
  - Framework for scoping and decision making
  - Consider matrix as "point of departure" in decision making

Questions?

"I would not give a fig for the simplicity this side of complexity, but I would give my life for the simplicity on the other side of complexity."

Oliver Wendell Holmes