



## **Proposed Plan for the Rocky Mountain Arsenal On-Post Operable Unit for Section 36 Lime Basins and Former Basin F**

### *Fact Sheet*

The U.S. Army in cooperation with the U.S. Environmental Protection Agency and the Colorado Department of Public Health and the Environment is announcing the preferred cleanup remedy for both the Lime Basins and Former Basin F at Rocky Mountain Arsenal (Arsenal). This is a change from the cleanup remedy identified in the June 1996, Record of Decision (ROD) for the On-Post Operable Unit. The ROD outlines the 31 cleanup projects to be implemented at the site.

This fact sheet provides a summary of the alternatives evaluated including the nine criteria used to identify the preferred remedy. The alternatives for the two projects are evaluated together in the Proposed Plan because the preferred alternative for Former Basin F is dependent on the selection of the preferred alternative for the Lime Basins. The U.S. Army encourages the public to read and comment on this Proposed Plan.

### **Why Is The Army Proposing A Change to the Remedy?**

While designing the Lime Basins project, it became apparent that actual conditions at the Lime Basins differed significantly from what was originally identified in the ROD. Specifically, the ROD anticipated a smaller amount of contaminated waste from the project to be placed in the Arsenal's on-site triple-lined landfill (landfill). Later studies

showed a much larger volume of waste would need to be excavated resulting in a more complicated excavation and a significant increase in short-term risks to workers and the surrounding community. Because of these issues, the Army is proposing not to excavate this site.

This proposed change will create additional space in the landfill to accept other Arsenal waste. The Army then evaluated its current and future cleanup projects to determine whether other site waste could be placed into the landfill. The Former Basin F project was reviewed and determined to be the best candidate. The original remedy was to stabilize the waste leaving it in place and construct a protective cover over the site. Now, the principal threat soil, also known as the most contaminated soil on site, could be excavated and placed into the landfill.

### **Preferred Remedy**

The Lime Basins cover approximately five acres and are located in the central portion of the Arsenal. Originally constructed in 1942, the three basins were designed to receive wastewater from the production of Lewisite. This wastewater was treated with lime in order to remove arsenic.

The preferred remedial alternative for the cleanup of the Lime Basins is containment consisting of:

- Constructing a Resource Conservation and Recovery Act (RCRA)-equivalent cover over the project site. This cover would consist of a protective layer of clay, soil and crushed concrete to prevent wildlife from burrowing into the waste. Once built, the cover would be reseeded with native vegetation;
- Installing a vertical groundwater barrier wall into the bedrock to isolate the groundwater;
- Lowering the groundwater within the barrier wall to below the waste; and
- Treating contaminated groundwater at on-site facilities.

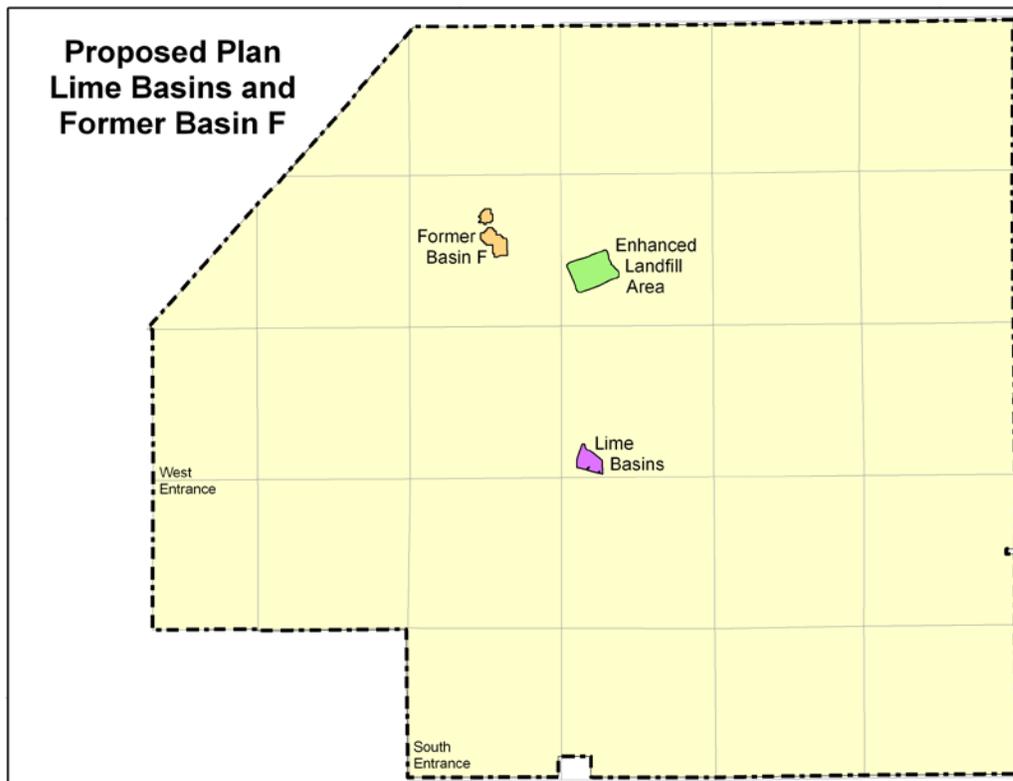
Former Basin F, located in the northwest portion of the site, was constructed in 1956 and is approximately 93 acres. It held liquid wastes from the Army and Shell operations including the Chlorine Plant, Shell Manufacturing Area and the North Plants manufacturing complex. An interim response action began in

1988 to remove the waste and then install a soil cover over the site.

The preferred remedial alternative for cleanup of the Former Basin F contaminated (principal threat) soil is:

- Excavation and disposal into the landfill.

All activities for both projects would be conducted with appropriate air emission and odor controls as determined during the design process. The preferred alternatives were selected because they provide greater overall protection of public health and the environment and provide short-term risk reduction by eliminating the more complicated excavation of the Lime Basins. The preferred alternatives can be accomplished in approximately the same time frame and at a lower cost than the original remedies chosen in the Record of Decision (ROD).



## What Are The Alternatives?

The tables below summarize the alternatives that were evaluated by the Army and regulatory agencies.

Summary of Remedial Alternatives for the Lime Basins	
Remedial Alternative	Description
<b>Alternative 1:</b> No additional action (leave the existing soil cover on the project site).	<ul style="list-style-type: none"> <li>No additional action for the Lime Basins; and</li> <li>The basins are contained beneath an 18-inch soil cover that was constructed in the early 1990s as part of the Interim Response Actions for the Lime Basins.</li> </ul>
<b>Alternative 2:</b> Excavate and dispose of the waste in the landfill; Repair the existing soil cover.	<ul style="list-style-type: none"> <li>Contaminated soil and lime material are excavated and disposed of in the on-post landfill;</li> <li>Air emissions and odors are controlled during excavation and landfill activities; and</li> <li>The site is backfilled and the existing soil cover is repaired.</li> </ul>
<b>Alternative 3:</b> Construct a RCRA-Equivalent Cover; Install a vertical groundwater barrier and dewatering system.	<ul style="list-style-type: none"> <li>Install a vertical groundwater barrier into the bedrock isolating the historic lime basins;</li> <li>Install wells to lower the water (dewater) within the barrier wall;</li> <li>Treat the dewatered contaminated groundwater at the Arsenal's on-site facilities; and</li> <li>Construct a RCRA-equivalent cover over the entire Lime Basins project area.</li> </ul>

Summary of Remedial Alternatives for the Basin F Principal Threat Soil	
Remedial Alternative	Description
<b>Alternative 1:</b> No additional action (RCRA-Equivalent Cover)	<ul style="list-style-type: none"> <li>No additional action for the Former Basin F contaminated soil; and</li> <li>The entire basin is contained beneath a RCRA-equivalent cover.</li> </ul>
<b>Alternative 2:</b> In-place solidification/stabilization of contaminated soil and construct a RCRA-Equivalent Cover	<ul style="list-style-type: none"> <li>Contaminated soil is treated through in-place solidification/stabilization;</li> <li>Air emissions and odors are controlled during treatment; and</li> <li>The entire basin is contained beneath a RCRA-equivalent cover.</li> </ul>
<b>Alternative 3:</b> Excavate soil and dispose into the landfill. Construct a RCRA-Equivalent Cover	<ul style="list-style-type: none"> <li>Contaminated soil is excavated and disposed of into the landfill;</li> <li>Air emissions and odors are controlled during excavation and landfill activities;</li> <li>The excavation is backfilled with clean soil; and</li> <li>The entire basin is contained beneath a RCRA-equivalent cover following remediation of the contaminated soil.</li> </ul>

## How Are The Alternatives Evaluated?

The table below lists the criteria used to evaluate the alternatives discussed above.

<p><b>1. Overall Protection of Human Health and the Environment</b> determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.</p>
<p><b>2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)</b> evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to a site or whether a waiver is justified.</p>
<p><b>3. Long-Term Effectiveness and Permanence</b> considers the ability of an alternative to maintain protection of public health and the environment over time.</p>
<p><b>4. Reduction of Toxicity, Mobility or Volume of Contaminants through Treatment</b> evaluates an alternative's use of treatment to reduce the harmful effects of contaminants, their ability to move in the environment, and the amount of contamination present.</p>
<p><b>5. Short-Term Effectiveness</b> considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.</p>
<p><b>6. Implementability</b> considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.</p>
<p><b>7. Cost</b> includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.</p>
<p><b>8. Regulatory Agency Acceptance</b> considers whether EPA and the CDPHE agree with the Army's analyses and recommendations, as described in the Technical Summary and Proposed Plan.</p>
<p><b>9. Community Acceptance</b> considers whether the local community agrees with the Army's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.</p>

### Site History

The Arsenal is located in Adams County, Colorado. The ROD, signed by the U.S. Army, EPA, the State of Colorado with concurrence from Shell Oil Company (Shell) and the U.S. Fish and Wildlife Service (Service) on June 11, 1996, includes 31 different cleanup plans for soils, structures and the treatment of groundwater contaminants.

The Arsenal was established in 1942 by the U.S. Army to manufacture chemical warfare agents and incendiary munitions for use in World War II. Following the war and through the early 1980s, the facilities continued to be used by the U.S. Army. Beginning in 1946, some facilities were leased to private companies to manufacture industrial and

agricultural chemicals. Shell, the principal lessee, primarily manufactured pesticides from 1952 to 1982. Common industrial and waste disposal practices used during these years resulted in contamination of structures, soil, surface water, sediment, and groundwater.

Currently, the Arsenal is undergoing an extensive environmental cleanup of the site's soil, structures and groundwater. Once cleanup is complete, the Arsenal's vast open spaces will constitute one of the nation's largest, urban wildlife refuges. In April 2004, 5,000 acres of Arsenal land were transferred from the Army to the Service marking the official establishment of the Rocky Mountain Arsenal National Wildlife Refuge. In all, 15,000 acres will be transferred to the Service by the time cleanup is complete

in 2011. The site now provides sanctuary for nearly 330 species of animals, including deer, coyotes, bald eagles and white pelicans.

### **Conclusion**

As the lead agency for the ROD-specified remedy, the Army is required to issue a Revised Proposed Plan when proposing an amendment to the ROD that fundamentally changes the remedial action and alters the basic features of the selected remedy, with respect to scope, performance or cost. Based on the information available at this time, the Army believes the preferred alternatives identified above are the best options available. The preferred alternatives are protective of public health and the environment, comply with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, are cost effective and use a permanent solution.

This Fact Sheet summarizes information that can be found in greater detail in the Revised Proposed Plan and the

Summary of Remedial Alternatives for Section 36 Lime Basins and Former Basin F Principal Threat Soil Remediation Projects and other documents in the Administrative Record, which were used as the basis to select the preferred alternatives. The Regulatory Agencies have reviewed the supporting documents and the Revised Proposed Plan and concur with the selection of the preferred alternatives.

The Army, in consultation with the EPA and the Colorado Department of Public Health and the Environment, will select a remedial alternative and issue a ROD Amendment for the Lime Basins and Former Basin F after reviewing and considering all comments submitted during the public comment period. Therefore, the Army encourages the public to review all documentation regarding remediation of the Lime Basins and Former Basin F and to review and comment on all the alternatives presented in this Revised Proposed Plan.

**For more information, please contact:**

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- U.S. Environmental Protection Agency  
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**Document Locations**

- Joint Administrative Record and Document Facility (JARDF)  
Rocky Mountain Arsenal, Building 129  
Commerce City, Colorado 80022  
Monday – Friday 12 – 4 p.m. or by appointment  
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