Existing Sanitary Landfills
Explanation of Significant Differences
Fact Sheet

Introduction

This fact sheet summarizes a significant change to the remedy for the Existing Sanitary Landfills at the Rocky Mountain Arsenal (Arsenal) Federal Facility Site. The eight sanitary landfills (landfills), located in the central and eastern portion of the site, were used for burning and/or disposing of sanitary waste. The landfills' operational years ranged from the 1940s through the early 1980s, depending upon the specific landfill in use. As part of the Record of Decision, which outlines the Arsenal's 31 specific cleanup projects, the landfills were excavated and the material was taken to one of the on-site disposal facilities – the double-lined hazardous waste landfill (HWL) or the Basin A Consolidation Area (Basin A) depending on contamination levels.

Explanation of Significant Differences (ESD)

During the design phase for this project, new information obtained by the Army during detailed document review, and developed during additional field design investigation, resulted in changes to the landfill boundaries and cleanup volumes. These changes affected the cleanup volumes and project cost compared to the original Record of Decision estimate.

To ensure the complete removal of contaminated soil, additional soil was excavated resulting in a 34 percent increase in contaminated soil, known as Human Health Exceedance (HHE) and a 75 percent increase in soil posing a risk to wildlife, known as biota soil. The actual amount of trash/debris encountered during excavation resulted in a 42 percent decrease in volume, however, much of that trash/debris was placed in the HWL rather than Basin A due to the presence of asbestos-containing material. Together, these changes resulted in a project implementation cost increase of approximately 53 percent over the ROD estimate. *These changes, while necessitating an ESD, do not alter the overall hazardous waste management approach that was selected in the ROD.*

The proposed changes to the Existing Sanitary Landfills cleanup project are detailed in the "Explanation of Significant Differences for Existing Sanitary Landfills Soil Remediation Project, Rocky Mountain Arsenal Federal Facility Site, April 4, 2005." The ESD and related RMA design documents are available for public review and comment (see bottom of fact sheet for locations).

What are the significant changes to the remediation project?

Changes to the Contaminated Soil Remediation Volumes

The primary volume change for the contaminated soil cleanup is from additional excavation during the project implementation. The additional excavation increased the HHE soil volume from 14,323 bank cubic yards to 19,252 bank cubic yards and the biota soil volumes from 22,966 bank cubic yards to 40,236 bank cubic yards.

There were no changes made to the disposal location for HHE or biota soil. HHE soil was disposed of in the on-site HWL and the biota soil was disposed of in Basin A.

Changes to Trash/Debris Volumes

The trash/debris cleanup volume changed since less trash/debris was found during the excavation than was estimated in the original ROD or cleanup design. The overall trash/debris volume decreased from 383,100 bank cubic yards to 221,898 bank cubic yards.

The ROD specified that all trash/debris would be placed into Basin A beneath the soil cover. However, during design, significant amounts of asbestos-containing-material was found in the landfills. Because of disposal regulations, asbestos-containing material must be placed into the HWL instead of in Basin A. All asbestos-containing material was segregated from the general trash/debris waste stream, placed in appropriate sealed containers, and transported to the HWL.

Cost

Based on original cost estimates, the cost of the landfills cleanup project was $10.3 million. The final cost for implementing the landfills cleanup project is estimated at $15.8 million or a 53 percent increase. The cost increase is directly related to the substantial volume of asbestos-containing material discovered in the landfills, which required special handling and HWL disposal. In addition, management of other special wastes, such as containers and clearance requirements for potential munitions-related items increased project costs. Increases in the HHE and biota soil volumes due to additional excavation had little impact on project costs.

Site History

RMA is located in Adams County, Colorado, approximately 10 miles northeast of downtown Denver. The Arsenal On-Post Operable Unit (OU) encompasses 11,000 acres and is currently on the U.S. Environmental Protection Agency (EPA) National Priorities List for environmental cleanup as a result of contamination released during previous RMA operations. The On-Post ROD, which describes the site-wide remedy for the Arsenal, was signed by the U.S. Army, EPA and the State of Colorado with concurrence from Shell Oil Company (Shell) and the U.S. Fish and Wildlife Service on June 11, 1996. The selected remedy 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 as a deterrent 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, manufactured pesticides from 1952 to 1982. Common industrial and waste disposal practices used during these years resulted in contamination of structures, soil, surface water, and groundwater.

SUMMARY OF THE ROD REMEDY AND THE ESD CHANGES

Table 1: Changes to Remediation Volumes

ROD-Prescribed Remedy	Modification	ROD Remediation Volume (bcy)	Actual Volume (bcy)	Percent Change
Excavate ROD HHE volume and dispose in on-post HWL.	**Addition: Volume increase due to additional excavation of ROD-identified soil volume.** Excavation was performed to the ROD-identified depth as a minimum to ensure that all ROD-identified soil was removed. The additional excavation resulted in increased HHE volume.	**14,323**	**19,252**	**+34%**
Excavate ROD biota soil volume and dispose in Basin A.	**Addition: Volume increase due to additional excavation of ROD-identified soil volume.** Excavation was performed to the ROD-identified depth as a minimum to ensure that all ROD-identified soil was removed. The additional excavation resulted in increased biota soil volume.	**22,966**	**40,236**	**+75%**
Excavate ROD trash and debris volume and dispose in Basin A.	**Reduction: Volume decrease based on actual trash/debris encountered.** Trash/debris volume was identified in the ROD based on estimated trench depth and lateral extent. Remediation was performed to excavate all visible trash/debris from each identified trench. The actual trash/debris encountered was less than the ROD estimate.	**383,100**	**221,898**	**-42%**

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 U.S. Army to the U.S. Fish and Wildlife Service marking the official establishment of the Rocky Mountain Arsenal National Wildlife Refuge. In all, 15,000 acres will be transferred 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.

Operable Units

The On-Post Operable Unit is one of two operable units at RMA. The On-Post

Operable Unit addresses contamination within the boundaries of the Arsenal. The Off-Post Operable Unit addresses contamination north and northwest of the Arsenal.

The overall remedy required by the 1996 Record of Decision (ROD) for the On-Post Operable Unit (OU) includes:

- Interception and treatment of contaminated groundwater at the three existing on-site treatment plants.
- Construction of a new Resource Conservation and Recovery Act (RCRA)- and Toxic Substances Control Act-compliant HWL on-post.
- Demolition of structures with no designated future use and disposal of the debris in either the HWL or Basin A, depending upon the degree of contamination.
- The contaminated soil at the Arsenal is addressed primarily through containment in the on-post HWL, under caps/covers, or through treatment, depending upon the type and degree of contamination. Areas that have caps or covers require long-term maintenance and will be retained by the Army. These areas will not be a part of the Rocky Mountain Arsenal National Wildlife Refuge.
- The Basin A disposal area is used for consolidating structural debris from other Arsenal contaminated areas and soil that poses a risk to wildlife, known as biota soil. Once all of the waste is received, a wildlife barrier and soil cover will be placed over Basin A.

The landfills ROD cleanup requirements are described below:

- Excavate Human Health Exceedance (HHE) soil and dispose in the on-post HWL
- Excavate biota soil and consolidate beneath the Basin A soil cover
- Excavate trash/debris and consolidate beneath the Basin A soil cover
- Backfill trash/debris and HHE soil excavations with clean soil
- Reseed all disturbed areas with native vegetation

Site Contamination

The contaminated areas within the On-Post Operable Unit include approximately 3,000 acres of soil, 15 groundwater plumes and 798 structures. The most highly contaminated sites were identified in South Plants (i.e., Central Processing Area, Hex Pit, Buried M-1 Pits, Chemical Sewers), Basins A and F, the Lime Basins, and the U.S. Army and Shell Trenches. The primary contaminants found in the soil and/or groundwater at these areas is pesticides, solvents, heavy metals and chemical agent by-products.

The most contaminated areas (those showing the highest concentrations and/or the greatest variety of contaminants) are located in the central manufacturing, transport and waste disposal areas. The highest contaminant concentrations tend to occur in soil within about five feet of the ground surface, though the higher contamination is also found at greater depths particularly where burial trenches, disposal basins or manufacturing complexes are located.

Groundwater contaminant plumes predominantly consist of organic compounds, arsenic, fluoride and chloride. The overall concentrations and configurations of the plumes suggest that the greatest contaminant releases to the unconfined flow system have occurred from Basin A, the Lime Settling Basins, the South Plants Chemical Sewers, the South Plants Tank Farm and Production

Area, the U.S. Army and Shell Trenches in Section 36, and the former Basin F. Plumes flowing from the Motor Pool, Rail Yard and North Plants areas are other sources of contaminant releases to the unconfined flow system.

Public Participation

A public notice was published on April 4, 2005 in the *Denver Post, Rocky Mountain News, Brighton Blade, Commerce City Beacon and Commerce City Gateway* newspapers announcing the document's public comment period, how to provide comments and where the document is available for review. A presentation explaining the ESD will be provided to the Arsenal's Restoration Advisory Board (RAB) on April 14, 2005. The RAB is a community group that meets regularly to receive information and provide input on the cleanup. The public comment period will close on May 4, 2005. Upon completion of the comment period, the Army, in consultation with the EPA and the State of Colorado, will evaluate each comment and any significant new data received before issuing a final report documenting the landfills changes.

This ESD and all documents that support the changes and clarifications are part of the Administrative Record and are available at the Joint Administrative Records and Document Facility (JARDF) and the EPA Region 8 Superfund Records Center. The JARDF can be reached at 303-289-0362. Hours of operation are Monday through Friday 12 p.m. to 4 p.m. or by appointment. EPA's Superfund Record Center can be reached at 303-312-6473. Hours of operation are Monday through Friday from 8 a.m. to 4:00 p.m.

Affirmation of Statutory Determinations

Considering the new information presented in this ESD, the U.S. Army, in consultation with EPA and CDPHE, believes that the landfills cleanup, with the modifications described, satisfies the requirements of CERCLA Section 121, is protective of public health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, uses a permanent solution through proper disposal and containment of the wastes in the on-post HWL and Basin A, and is cost effective.

For more information, please contact:

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Document Locations

- Joint Administrative Record and Document Facility (JARDF)
  Rocky Mountain Arsenal, Building 129
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  Monday – Friday 12 – 4 p.m. or by appointment (303) 289-0362

- EPA Superfund Records Center
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