



## **Explanation of Significant Differences for Offsite Waste Disposal and Cost Increase for Onsite Disposal Facility**

### **Fact Sheet**

#### **INTRODUCTION**

This fact sheet summarizes a significant change to a portion of the remedy to allow the disposal of waste off-site and to explain the increase in costs for on-site disposal facilities at the Rocky Mountain Arsenal (RMA) Federal Facility Site.

The selected cleanup approach in the Record of Decision (ROD), which outlines the overall remediation program, includes constructing a Hazardous Waste Landfill (HWL) and Enhanced Landfill (ELF) for Arsenal hazardous waste disposal, and utilizing Basin A for lower-level contaminated waste consolidation. The remedy schedule indicated that the three disposal areas would remain open to accommodate on-site disposal of ROD-specified waste.

Due to an accelerated cleanup schedule, placement of all waste identified in the ROD for disposal into the landfills has been completed, therefore the landfills have closed. The closures do not affect routine waste such as wastewater, batteries or used oil, which will continue to be taken off-site to approved disposal facilities. In addition, all remediation waste generated during the remainder of the remedy will be managed in

accordance with the Explanation of Significant Differences for Off-Site Waste Disposal and Cost Increases for On-Site Disposal Facility Projects, which is available for public review.

#### **EXPLANATION OF SIGNIFICANT DIFFERENCES (ESD)**

##### Off-site Disposal

Although there are no projects remaining with ROD-specified waste for disposal in the HWL/ELF, cleanup support activities have the possibility of generating these types of waste. Examples include contaminated soil identified from sampling activities along haul roads or in other remedy support areas, munition debris, waste from water treatment plants (monitoring, collection and treatment), personal protective equipment, petroleum-contaminated material, waste from well installation or removal, and miscellaneous debris.

All waste will be evaluated to determine the appropriate disposal facility and will be disposed of at an off-site Environmental Protection Agency-approved facility. Encountering hazardous waste is expected to be minimal. Off-site transportation and disposal will be conducted in accordance with all applicable federal, state and

local requirements. Community notification about transportation routes, amount of truck-loads and type of waste being transported will be provided if hazardous waste, other than the routine wastes previously mentioned, is taken off-site.

In preparation for the Arsenal's old headquarters building (Building 111) demolition, asbestos is being removed and taken off-site beginning mid-April 2008. Asbestos has been taken off-site to an approved disposal facility in the past. The asbestos being removed from Building 111 is anticipated to total less than 20 truck-loads of waste with approximately five truck-loads taken to the facility each week. Basin A will remain open to accept the Building 111 demolition debris as well as other structures that are being demolished.

The only building that will not be demolished in time for disposal into Basin A is the CERCLA Wastewater Treatment Plant. Although the plant was identified in the ROD for continued operation to support cleanup activities, the plant is no longer needed for day-to-day support of Arsenal cleanup projects. The plant will continue to treat water through June 30, 2010, or until the plant is decommissioned, whichever is longer. Equipment and debris generated from the building demolition will be disposed or recycled at an approved off-site facility.

#### Cost Increase

Construction, operations, closure and project oversight/support costs for the HWL and ELF have increased

significantly from the ROD-estimated costs. The increase is due to constructing the facilities with larger capacities, which resulted in higher construction and operations costs, constructing support facilities, and additional design requirements not accounted for in the ROD. Particularly, the landfill cap designs are considerably more complex than described in the ROD.

*These changes while necessitating an ESD do not alter the overall management approach that was selected in the ROD.*

The proposed changes are detailed in the "Explanation of Significant Differences for the Off-Site Waste Disposal and Cost Increases for On-Site Disposal Facility Projects," dated June 12, 2008. Design documents are available for public review and comment (see bottom of fact sheet for locations).

#### **WHAT ARE THE SIGNIFICANT CHANGES?**

The significant changes involve transporting remediation waste to an off-site approved disposal facility because the Arsenal's landfills are now closed.

The HWL and ELF had significant cost increases, which are detailed below in Tables 1 and 2. The HWL and ELF projects increased in cost by 185 and 77 percent respectively due to cell construction, operations, closure and project oversight/support. Even with these cost increases, the overall cleanup program remains on budget due to cost savings on other cleanup projects.

## HWL Cost

**Table 1: Changes to HWL Project Costs<sup>1</sup>**

Cost Element	ROD Baseline Cost <sup>2</sup>	Escalated ROD Cost	Actual or Estimated Cost	Difference from ROD	Percent Change
<b>Cell Construction</b>	<b>\$ 14,833</b>	<b>\$ 16,985</b>	<b>\$ 29,494</b>	<b>\$ 14,661</b>	
Excavate Biota/HHE Soil	\$ 1,808 <sup>4</sup>	\$ 2,070	\$ 2,833	\$ 1,025	
Materials/Cell Construction	\$ 6,610	\$ 7,569	\$ 10,121	\$ 3,511	
Leachate Treatment System	NA	NA	\$ 5,684	\$ 5,684	
Leachate Conveyance System	NA	NA	\$ 2,104	\$ 2,104	
Ancillary Systems	NA	NA	\$ 3,818	\$ 3,818	
<b>Operations</b>	<b>\$ 12,156</b>	<b>\$ 15,425</b>	<b>\$ 24,976</b>	<b>\$ 12,821</b>	
Increase in disposal volume	NA	NA	\$ 6,091	\$ 6,091	
Facility maintenance	NA	NA	\$ 897	\$ 897	
Operational Groundwater Monitoring	NA	NA	\$ 1,306	\$ 1,306	
Intermediate Cover	NA	NA	\$ 2,303	\$ 2,303	
Sludge Management	NA	NA	\$ 133	\$ 133	
<b>Closure<sup>3</sup></b>	<b>\$ 8,076</b>	<b>\$ 11,960</b>	<b>\$ 30,113</b>	<b>\$ 22,037</b>	
Final cap components	\$ 7,176	\$ 10,627	\$ 19,370	\$ 12,194	
Gravel Capping Layer	NA	NA	\$ 3,039	\$ 3,039	
Miscellaneous Construction	NA	NA	\$ 4,611	\$ 4,611	
Revegetation	\$ 344	\$ 509	\$ 1,980	\$ 1,637	
<b>Project Oversight/Support</b>	<b>\$ 1,717</b>	<b>\$ 2,225</b>	<b>\$ 20,153</b>	<b>\$ 18,435</b>	
<b>Total Estimated Project Costs</b>	<b>\$ 36,781</b>	<b>\$ 46,596</b>	<b>\$ 104,736</b>	<b>\$ 67,955</b>	<b>+ 185 %</b>

<sup>1</sup>Costs presented in \$1,000s.

<sup>2</sup>ROD costs are in 1995 dollars.

<sup>3</sup>Costs based on estimate at completion.

<sup>4</sup>Cost for excavation of HHE soil (\$210) is included in the ELF project in the ROD baseline estimate.

## ELF Cost

**Table 2: Changes to ELF Project Costs<sup>1</sup>**

Cost Element	ROD Baseline Cost <sup>2</sup>	Escalated ROD Cost	Actual or Estimated Cost	Difference from ROD	Percent Change
<b>Cell Construction</b>	<b>\$ 13,472</b>	<b>\$ 18,059</b>	<b>\$ 20,523</b>	<b>\$ 7,051</b>	
Materials/Cell Construction	\$ 10,513	\$ 14,093	\$ 15,053	\$ 4,540	
Leachate Riser Control Houses	NA	NA	\$ 1,017	\$ 1,017	
Leachate Storage/Loadout Facility	NA	NA	\$ 847	\$ 847	
Ion Exchange System (LWTS)	NA	NA	\$ 271	\$ 271	
CCSCS	NA	NA	\$ 1,390	\$ 1,390	
Support Facilities	\$1,166	\$1,563	NA	(\$1,166)	
<b>Operations</b>	<b>\$ 22,283</b>	<b>\$ 31,815</b>	<b>\$ 22,607</b>	<b>\$ 324</b>	
Waste Placement / Emission Control	\$ 21,735	\$ 31,032	\$ 19,035	(\$ 2,699)	
Facility maintenance	NA	NA	\$ 428	\$ 428	
Operational Groundwater Monitoring	NA	NA	\$ 647	\$ 647	
Operations Facility Demolition	NA	NA	\$ 825	\$ 825	
<b>Closure<sup>3</sup></b>	<b>\$ 5,526</b>	<b>\$ 8,554</b>	<b>\$ 22,099</b>	<b>\$ 16,573</b>	
Final cap components	\$ 4,928	\$ 7,630	\$ 15,751	\$ 10,823	
Leachate Disposal	NA	NA	\$ 724	\$ 724	
Revegetation	\$ 49	\$ 76	\$ 2,674	\$ 2,625	
<b>Project Oversight/Support</b>	<b>\$ 1,912</b>	<b>\$ 2,532</b>	<b>\$ 11,107</b>	<b>\$ 9,195</b>	
<b>Total Estimated Project Costs</b>	<b>\$ 43,193</b>	<b>\$ 60,961</b>	<b>\$ 76,336</b>	<b>\$ 33,143</b>	<b>+ 77 %</b>

<sup>1</sup>Costs presented in \$1,000s.

<sup>2</sup>ROD costs are in 1995 dollars.

<sup>3</sup>Costs based on estimate at completion.

### **SITE HISTORY**

RMA is located in Adams County, Colorado, approximately 10 miles northeast of downtown Denver. The Arsenal On-Post OU encompasses 4,000 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.

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. By fall 2006, more than 12,000 acres of Arsenal land had been transferred from the U.S. Army to the U.S. Fish and Wildlife Service, officially establishing and later expanding the Rocky Mountain Arsenal National Wildlife Refuge. After the Arsenal's remaining cleanup projects are completed and areas removed from the EPA's National Priorities List, the Army will transfer about 2,500 acres to the Service to increase the size of the Refuge to more than 15,000 acres. By 2010, the cleanup program will be finished and the Army will retain approximately 1,100 acres to maintain its landfills, soil cover areas and groundwater treatment plants.

The Refuge now provides environmental education and interpretive programs, catch-and-release recreational fishing, close to nine miles of trails, wildlife viewing opportunities and site tours for the public, and is a sanctuary for more than 330 species of animals, including wild bison, deer, coyotes, bald eagles and burrowing owls.

### **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.

### **SITE CONTAMINATION**

The contaminated areas within the On-Post Operable Unit included 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 are 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 beginning June 13, 2008, in the *Denver Post*, *Rocky Mountain News*, *Brighton Blade*, *Commerce City Beacon* and *Gateway News* 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 was provided to the Arsenal's Restoration Advisory Board (RAB) on April 10, 2008. 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 July 14, 2008. 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 project 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 303-289-0983. 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 Army, in consultation with EPA and CDPHE, believes that the HWL and ELF Projects, with the modifications described, satisfy the requirements of CERCLA Section 121 and are protective of human health and the environment, comply with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, use a permanent solution through proper disposal and containment of the wastes in the on-post HWL, ELF, or approved off-site facility, and are cost effective.

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**Document Locations**

- Joint Administrative Record and Document Facility (JARDF)  
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