



THE MEMPHIS DEPOT TENNESSEE

ADMINISTRATIVE RECORD COVER SHEET

AR File Number 728

EnviroNews

Spring 2003



Dunn Field Feasibility Study: Depot considers cleanup options for Dunn Field

What are the most effective options for restoring the environment at Dunn Field? The answers will soon be available in the Memphis Depot Proposed Plan, expected to be released for public comment this spring.

Before we reach the Proposed Plan stage, the Memphis Depot's environmental team must consider all cleanup options available. During the current phase, known as the Feasibility Study (FS), the team applies the best available science to find the most effective cleanup methods to ensure that Dunn Field is safe for future use.

Steve Offner, Project Manager for the Depot's environmental contractor CH2M Hill, presented a summary of the Dunn Field Feasibility Study (FS) at the Restoration Advisory Board (RAB) meeting in February.

The FS report (Revision 1) is part of the Depot's ongoing Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process and has been reviewed by the Environmental Protection Agency (EPA) and the Tennessee Department of Environment and Conservation (TDEC).

"A cleanup alternative that is appropriate for one site may not be the most effective for another site," said Offner. "The purpose of the Dunn Field FS is to evaluate each proposed cleanup alternative against the cleanup goals for this particular site. And our primary goal is to ensure the protection of human health and the environment."

An important step in the FS is the identification of remedial action objectives (RAOs), or cleanup goals. RAOs were identified for the following areas of Dunn Field:

- sub-surface soil, which refers to the top 10 feet of soil on the site,
- disposal sites that include areas where containers of materials have been buried,
- the potential effects of environmental conditions in subsurface soil on indoor air quality, and
- impacted groundwater both on and off the site.

According to CERCLA guidelines, the range of cleanup alternatives considered in the FS must include:

- A no-action alternative,
- One or more alternatives that involve containment with little or no treatment,
- A range of alternatives to address the potential risk and eliminate or minimize the need for long-term management.

Proposed cleanup alternatives that met the CERCLA guidelines were first evaluated for their ability to meet the RAOs. Those that qualified were then further evaluated for technical efficiency, effectiveness and cost, resulting in the preferred options that will be presented for public comment in the Dunn Field Proposed Plan.

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Clyde Hunt says goodbye!

The Depot's Environmental Team and members of the Memphis Depot Restoration Advisory Board (RAB) took a few moments at the February RAB meeting to bid a fond farewell to Clyde F. Hunt Jr. After two years serving as the Depot's Remedial Program Manager, Clyde has returned to his former position with the Army Corps of Engineers (Memphis District).

Clyde joined the Depot's Environmental Team in January 2000 as the Corps' On-Site Coordinator and Technical Engineer Liaison during the chemical warfare material (CWM) removal project on Dunn Field. After the CWM project was completed, Clyde stayed on as the on-site Remedial Program Manager to assist Mr. John De Back, the BRAC Environmental Coordinator.

With a Bachelor's degree in civil engineering and a Masters degree in engineering management, Clyde's experience and commitment to the community provided valuable direction for the entire Depot team.

Mr. DeBack will continue to chair the future RAB



Mr. Michael Dobbs (left), Environmental Program Manager for the Defense Distribution Center (DDC), presented a commemorative plaque to Mr. Clyde Hunt. Mr. Hunt also received a special DLA coin in honor of his service to the former Memphis Depot.

meetings, manage the environmental program and serve as a point of contact for the community.

For more information, contact Mr. DeBack at (901) 544-0622, or call the Community Relations Office at 901-544-0613.

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DISPOSAL SITES:

The cleanup alternatives evaluated for the disposal sites and the associated subsurface soils are

- 1 No action (as required by CFRCLA).
- 2 Soil containment, including the placement of a protective cover or cap over disposal sites, and institutional controls,
- 3 Ex-situ (off-site) treatment through a process known as solidification or stabilization
- 4 Excavation, transportation and off-site disposal

GROUNDWATER:

There are a number of potential cleanup options for groundwater in the shallow aquifer. These were also evaluated for their effectiveness in protecting the deeper (drinking water) aquifer.

- 1 No action (as required by CFRCLA);
- 2 A combination of options that includes:
 - Enhanced Bioremediation in an off-site position,
 - Zero-Valent Iron (ZVI) Injection, a process that uses chemicals to reduce environmental conditions,
 - Enhanced Extraction and Monitored Natural Attenuation (MNA) to reduce environmental conditions in untreated areas of the plume,
 - Institutional Controls to prohibit the use of groundwater in shallow aquifers



Steve Offner of CH2M Hill presents details of the Dunn Field Feasibility Study at the February 2003 RAB meeting

- 3 A combination of options that includes:
 - ZVI Injection,
 - Permeable Reactive Barrier (PRB) constructed with iron that treats the groundwater as it passes through the treatment area,
 - MNA with Institutional Controls to prohibit the use of groundwater in shallow aquifers
- 4 A combination of options that includes:
 - Air Sparging, SVE, PRB, and MNA with Institutional Controls

SOIL-TO INDOOR AIR:

Although there are currently no structures on Dunn Field that would be affected, the cleanup goals require that any vapors entering indoor air from soil must meet standards for health protection.

To protect indoor air quality, Soil Vapor Extraction (SVE) has been chosen as a "presumptive remedy" according to EPA guidelines. A presumptive remedy is a technology that has been shown to be the most appropriate cleanup remedy for a specific type of CFRCLA site, based on past experience. SVE was pilot tested on Dunn Field in the fall and winter of 2002 and was found to meet the cleanup objectives.

The cleanup alternatives outlined in the Dunn Field FS are now being evaluated by the Depot's Base Realignment and Closure Cleanup Team (BCT), which includes representatives from the Depot, EPA and TDEC. The BCT will choose a preferred cleanup alternative and present it to the public for comment and evaluation in the Dunn Field Proposed Plan this spring (see article on next page for more information).

A copy of the Dunn Field FS has been placed in the Depot's Information Repositories, which are listed on Page 4. For more information, call the Depot's Community Relations Office at (901) 544-0613.

PROGRESS REPORT: Cleanup moves forward at Dunn Field

Work will begin this spring to confirm the contents of disposal sites, as the next phase in the cleanup program at Dunn Field.

As part of the Dunn Field Feasibility Study (FS), the Depot's environmental contractors are preparing to investigate 16 former disposal locations on Dunn Field over the next few months. The purpose of the investigation is to determine which cleanup alternative will be most effective in meeting the cleanup goals for the sites, based on the environmental conditions.

Dunn Field has undergone several cleanup projects since the environmental program began at the Depot, and additional projects are planned for the next two years. All cleanup projects are conducted in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CFRCLA) and are reviewed by the Environmental Protection Agency (EPA) and the Tennessee Department of Environment and Conservation (TDEC).

Here are a few highlights of the Dunn Field environmental program since it began:

- **January 1990** – Environmental Protection Agency (EPA) completed a Resource Conservation and Recovery Act (RCRA) Facility Assessment of the Depot, including Dunn Field.
- **September 1990** – A site investigation was completed.
- **January 1995** – The Corps of Engineers issued the Archives Search Report for ordnance and explosive waste/chemical warfare materials at Dunn Field.
- **May 1996** – EPA concurred with the Record of Decision for the Interim Remedial Action (IRA) for groundwater at Dunn Field.
- **August 1998** – The Corps of Engineers completed the Chemical Warfare Materiel (CWM) field investigation at Dunn Field.
- **September 1998** – Work began on the groundwater beneath Dunn Field with the installation of pumping wells connected to the city's sanitary sewer system.

- **June 1999** – The mounds of bauxite and fluorspar were removed from Dunn Field.
- **June 1999** – Roads were paved on Dunn Field in preparation for future removal projects.
- **May 2000** – CWM removal project began at Dunn Field. Weekly CWM briefings began to update the community about the CWM cleanup progress at Dunn Field.
- **May 2001** – CWM removal project was completed at Dunn Field.
- **January 2003** – Lead removal project began at the former pistol range on Dunn Field.
- **Spring 2003** – Pre-design investigation of former disposal sites on Dunn Field is scheduled to begin.

For more information on past and future cleanup activities on Dunn Field, please call the Depot's Community Relations Office at (901) 544-0613.



Work crews remove soil from the northeastern section of Dunn Field near Person and Hays Road as part of the Lead Removal Project. The soil, from the former pistol range, was transported to a licensed disposal facility and samples were collected to ensure the remaining soil is safe for future use. The removal project was completed in March 2003 when new grass seed was planted in the area.

Public invited to comment on Dunn Field Proposed Plan

The public will have the opportunity to review and comment on the Dunn Field Proposed Plan during a 30-day public comment period scheduled to begin in the spring of 2003.

The Proposed Plan provides information on all cleanup alternatives evaluated for soil and groundwater at Dunn Field. In addition, the plan will identify the cleanup actions that are preferred by the Base Realignment and Closure Cleanup Team (BCCT).

The BCCT includes members from the Depot, the Environmental Protection Agency (EPA), and the Tennessee Department of Environment and Conservation (TDEC). Using a set of nine criteria, the BCCT evaluated each alternative presented in the Dunn Field Feasibility Study (FS). Their findings will be presented in the Dunn Field Proposed Plan (PP).

Under the law, the criteria used to evaluate cleanup alternatives for Dunn Field are:

THRESHOLD CRITERIA:

1. Overall protection of human health and the environment,
2. Compliance with applicable and relevant state and federal cleanup requirements,

These first two criteria are required by law. Cleanup actions are not acceptable unless they meet these conditions.

BALANCING CRITERIA:

3. Long-term effectiveness and permanence
4. Reduction of toxicity, mobility or volume of environmental conditions through treatment
5. Short-term effectiveness
6. Ease of implementation
7. Cost

These five criteria are called balancing criteria because they are used to weigh the benefits of each cleanup alternative to find the most appropriate balance.

MODIFYING CRITERIA:

8. State acceptance
9. Community acceptance

These final two criteria are evaluated after the Proposed Plan has been presented for public comment, prior to the Record of Decision being finalized.

The Dunn Field Proposed Plan will be available for review in the Depot's Information Repositories during the Public Comment Period. The dates for the Public Comment Period and the Public Comment Meeting will be advertised in The Commercial Appeal, In-State Defender and the Silver Star News.

In addition to the Public Comment Meeting, the public can submit comments by mail, phone, fax or email to:

Mr. John DeBack
Base Transition Coordinator
The Memphis Depot
2163 Airways Blvd., Bldg. 144
Memphis, TN 38114
Phone: (901) 544-0622
email: John.DeBack@dla.mil

For more information, call the Depot's Community Relations Office at (901) 544-0613.

Cleanup terms defined

A number of environmental cleanup remedies are being considered for use on Dunn Field. If you have attended RAB meetings or other public events at the Depot, some of these terms may be more familiar than others.

For your reference, here are some of the remedies that were considered in the Dunn Field Feasibility Study. These will be helpful in reviewing the preferred alternatives presented in the upcoming Proposed Plan.

Air Sparging:

Some of the compounds detected at Dunn Field are solvents known as volatile organic compounds (VOCs). When VOCs are exposed to air, they quickly vaporize. Air Sparging involves injecting air into the groundwater to speed up this process. It is similar to blowing air through a straw into a glass of water. The vapors rise to the surface where they can be captured and treated.

Enhanced Bioremediation:

Natural substances such as vegetable oil are injected into the ground to promote the rapid growth of tiny organisms that exist in the soil and groundwater. These organisms naturally digest and break down compounds such as VOCs.

Enhanced Extraction:

Enhanced Extraction involves injecting pressurized steam into the ground to speed up the vaporization process. As the steam rises through the soil, some compounds such as solvents are drawn to the surface where they can be extracted as vapor and treated.

Institutional Controls:

There are two types of controls used to ensure site conditions are protective of human health and the environment. Engineering Controls include methods such as enhanced bioremediation, air sparging, and soil excavation. Institutional Controls include land-use controls such as zoning or deed restrictions.

Institutional controls are used to prevent certain activities on a site, such as installing a groundwater well for use as drinking water. They can also be used to ensure that a long-term engineering solution remains in place (such as a groundwater pump and treat system).

Monitored Natural Attenuation (MNA):

Some compounds found in the soil and groundwater at Dunn Field will break down naturally over time. This process is called natural attenuation. Studies have shown that, under certain conditions, natural attenuation can work as fast or faster than an active removal option. Monitored Natural Attenuation as a cleanup remedy involves monitoring the progress of natural attenuation to ensure that the environmental conditions are improving with time.

Permeable Reactive Barrier (PRB):

A wall, or barrier, is placed underground in an area where groundwater contains substances such as volatile organic compounds (VOCs). The wall allows water to flow through it (permeable), and contains a natural compound or biological organism that reacts with chemicals present in the groundwater by breaking them down into safe, natural compounds.

Soil Vapor Extraction (SVE):

This is one of the most frequently used treatment methods to remove solvents that evaporate when exposed to air. Using SVE, air is pulled through the soil, which speeds up the natural vaporization process. An extraction system then collects the vapor and passes it through a series of filters to safely remove the solvents.

SVE was pilot tested on Dunn Field in the fall and winter of 2002.

Zero-Valent Iron (ZVI) Injection:

This cleanup method involves injecting natural iron particles, known as zero-valent iron, into the groundwater. When the iron particles come in contact with certain chemicals present in the groundwater, there is a reaction that breaks the chemicals down into safe natural compounds. □

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FOR YOUR INFORMATION.....

The Information Repositories are at the following locations:

The Depot, 2163 Airways Blvd, Bldg. 144,
Memphis, TN (901) 544-0613
The Community Outreach Room is located in Building
144 Please call ahead for an appointment to ensure
that we are available to help you

Memphis/Shelby County Health
Department, Pollution Control Division
814 Jefferson Ave, Memphis, TN
(901) 576-7775

The Pollution Control Division is open Monday
to Friday from 7 30 a m to 4 30 p m

Memphis/Shelby County Public Library,
Cherokee Branch, 3300 Sharpe Ave.,
Memphis, TN (901) 743-3655
The Cherokee Branch is open Monday to Thursday
from 10 a m to 6 p m and Saturday from 10 a m to
6 p m Closed on Friday & Sunday

HOW TO REACH US....

If you have any questions or comments about the Depot's environmental cleanup program,
please feel free to contact any one of the following

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Visit the Depot's website at www.ddc.dla.mil/memphis



EnviroNews is published by the Memphis Depot to
update the public on the environmental cleanup
program. If you have comments, questions, or
suggestions for future articles, please call
Ms. Alma Black Moore at (901) 544-0613.

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