



THE MEMPHIS DEPOT TENNESSEE

ADMINISTRATIVE RECORD COVER SHEET

AR File Number 897

Memphis Depot



Dunn Field Source Areas Remedial Design

Presented by

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CH2MHILL

Public Briefing
May 10, 2007

Depot's CERCLA Status



- **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Process**

- Remedial Investigation (RI)
- Feasibility Study (FS)
- Proposed Plan (PP)
- Record of Decision (ROD)
- Remedial Design (RD)**
- Remedial Action (RA)

*Key decision making stages
have been completed*

RD process for Dunn Field divided into three phases: Disposal Sites, **Source Areas, Off-Depot Groundwater

Project Background



- **Final Record of Decision (ROD) for Dunn Field completed April 2004**
 - **Soil and groundwater remedies:**
 - **Disposal Sites (completed in 2006):** Excavation, Transportation, and Offsite Disposal (ET&D)
 - **Source Areas (this RD):** Thermal-enhanced Soil Vapor Extraction (SVE), Limited ET&D, Zero-Valent Iron injection (ZVI), Land Use Controls
 - **Off-Depot Groundwater (RD in development):** Enhanced Bioremediation Treatment (EBT) and Monitored Natural Attenuation (MNA)

Project Background



- **Dunn Field Source Areas Remedial Design completed April 2007**
 - Reviewed and approved by the Environmental Protection Agency and Tennessee Department of Environment and Conservation
- **Public Briefing required prior to start of Remedial Action (RA)**
 - Proposed schedule
 - Potential impacts (traffic disruptions, health and safety requirements, etc.) associated with construction and/or remedial action activities

Source Area RD Objectives



- **For Subsurface Soil**
 - Reduce Chlorinated Volatile Organic Compounds (CVOCs) levels in subsurface soils to prevent potential future exposures to an industrial worker (should a building be built on Dunn Field)
 - Reduce or eliminate further impacts to the shallow groundwater from the CVOCs in the subsurface soil
- **For Groundwater**
 - Land use controls to prevent use of groundwater
 - Restore groundwater to drinking water quality to be protective of the deeper Memphis aquifer
 - Prevent further offsite migration of groundwater containing CVOCs that exceed protective target levels

Remedial Design Development



- **Pre-Design Investigation**
 - Studies conducted between 2002 and 2006 to develop the Source Areas RD
 - SVE Treatability Study to define optimal SVE well design and spacing and size of the treatment system
 - ZVI Treatability Study to define optimal ZVI injection location spacing and mass of iron required to treat groundwater
 - Remedial Design Investigation to refine the size of the treatment areas
 - Data gathered during these studies is included in the Source Areas RD available in the Information Repositories

Implementation Phases

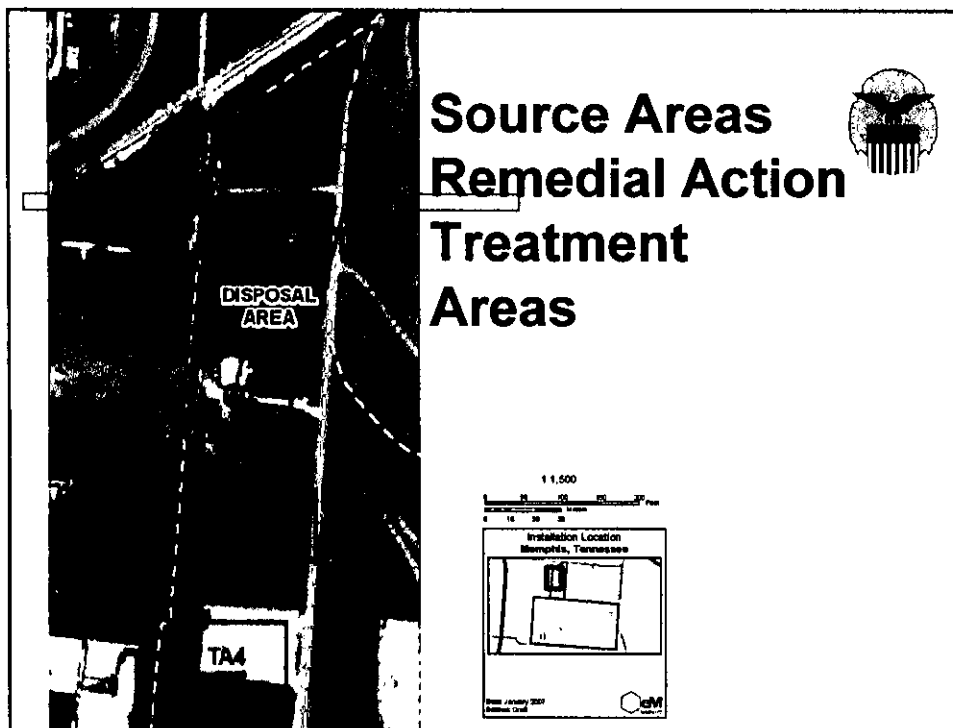


- Remedial action will be implemented in a phased approach to reduce levels in subsurface soils prior to treating the groundwater
 - Fluvial SVE System
 - Limited ET&D
 - Thermal-enhancement for SVE system
 - ZVI injections

Remedial Action Implementation



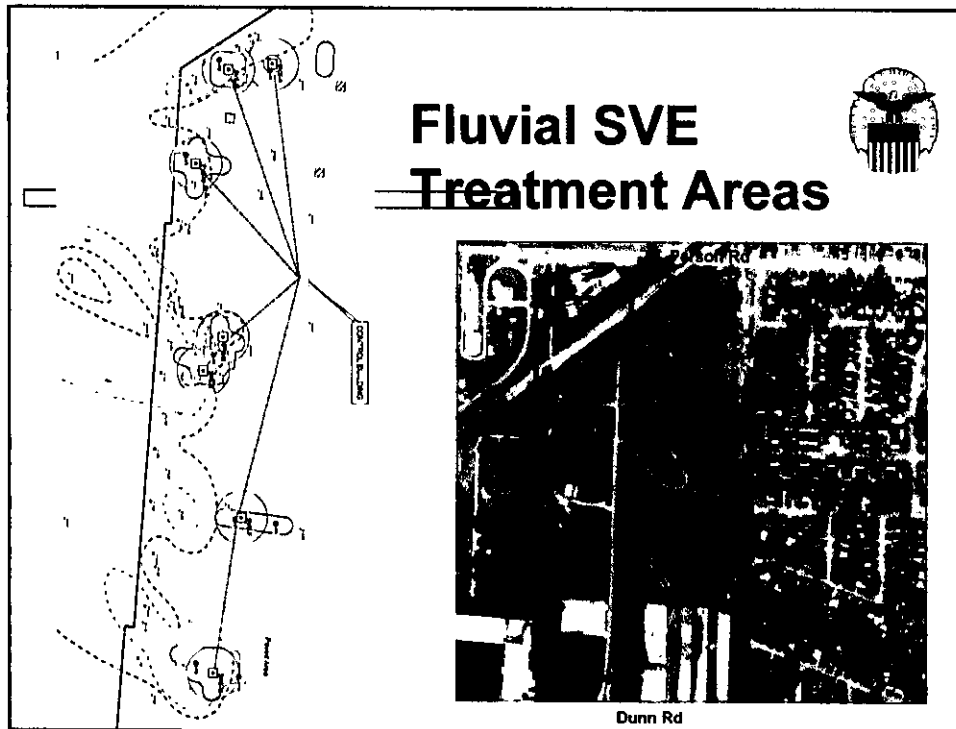
- Remedial Action Work Plans
 - Will be reviewed and approved by Environmental Protection Agency and Tennessee Department of Environment and Conservation
 - Construction drawings
 - Treatment areas and assembly points
 - Work procedures
 - Groundwater monitoring plan
 - Health and safety plan
 - Air monitoring
 - Personal protective equipment for workers
 - Cleaning protocol for equipment
- Work Plans will be available in Information Repositories



Remedial Action Implementation Fluvial SVE



- Pulls air through the soil to an extraction system that collects and safely removes the CVOCs
 - Air treated with carbon and sampled to ensure compliance with Clean Air Act requirements
 - Condensate from air collected for easy transfer to the sanitary sewer via the existing groundwater recovery system
- Construction will include:
 - Placement of a fenced treatment compound (being constructed off site)
 - Installation of 7 SVE wells and 10 vapor monitoring points
 - Installation of conveyance piping from individual SVE wells to the treatment compound
- All work will occur on Dunn Field with access via the Dunn Avenue entrance
- Anticipate operating the SVE system for 5 years



Performance Monitoring

- Baseline groundwater sampling
- Monitoring of vacuum influence
- Sampling of extracted air and condensate
- Ambient air monitoring to ensure proper operation of Fluvial SVE system extraction/treatment facility
- Soil sampling to ensure remedial action objectives achieved

Projected dates are based on current information and may be subject to change

Remedial Action Implementation Excavation, Transportation & Disposal



- Remove approximately 150 cubic yards of soil impacted by CVOCs
 - Perform air monitoring during excavation
 - Transport soil/debris off site for disposal in CERCLA-approved facility
- Performance Monitoring
 - Collect confirmation samples at excavation limits



Excavation Area

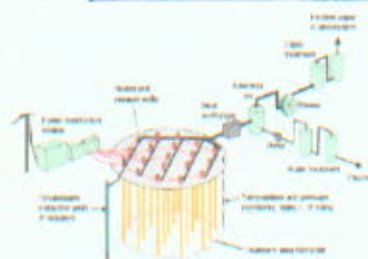


Dunn Rd

Remedial Action Implementation Thermal-enhanced SVE



- Heat subsurface soil (loess) to volatilize CVOCs and enhance the SVE system
 - Install about 200 SVE wells to serve as electrodes
 - Install about 20 temperature monitoring points
 - Anticipate operating thermal enhancement for 1 year



Thermal-enhanced SVE Treatment Areas



Dunn Rd

Performance Monitoring



- **Monitoring of soil temperature**
- **Monitoring of vacuum influence**
- **Sampling of extracted air and condensate**
- **Ambient air monitoring to ensure proper operation of SVE extraction/treatment facility**
- **Groundwater sampling to evaluate effectiveness of SVE systems and to refine ZVI injection locations**
- **Soil sampling to confirm remedial action objectives achieved**

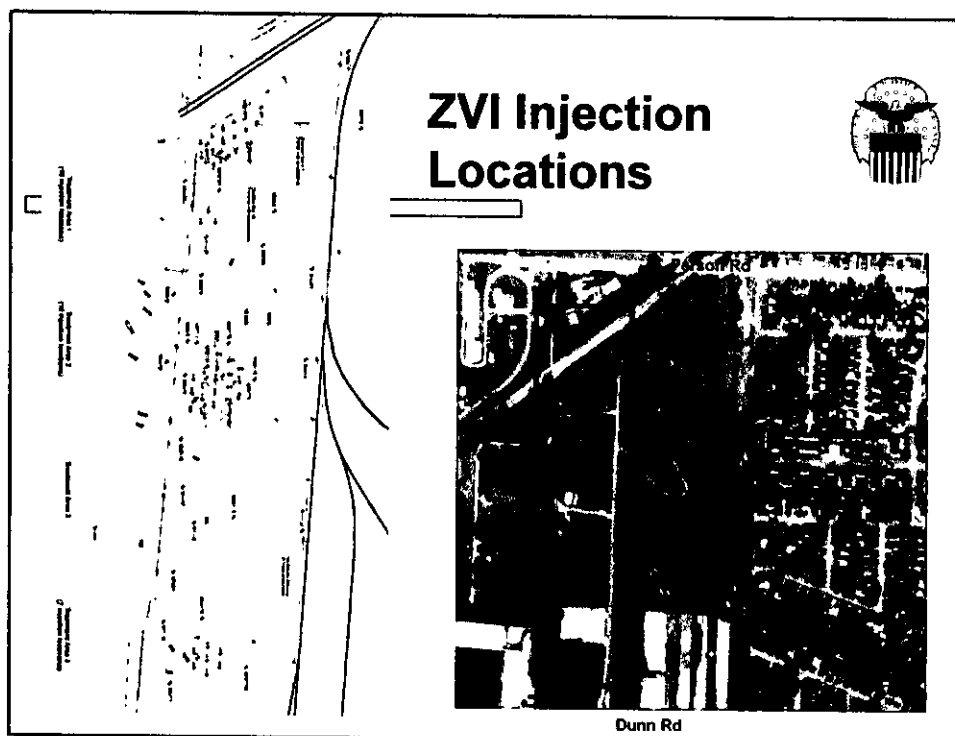
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Remedial Action Implementation

ZVI Injection



- **ZVI is iron powder that will be injected to break down CVOCs in groundwater**
 - **Groundwater sampling will determine ZVI injection locations**
 - **Inject 180 tons of iron through 44 injection locations**



Performance Monitoring



- **Monitoring of injection parameters**
 - Pressure, flow rate and ZVI mass
- **Soil sampling to evaluate ZVI distribution**
- **Groundwater sampling**
 - Quarterly for 1 year following ZVI injections
 - An additional year of monitoring may be conducted in areas selected for additional ZVI injections

Projected dates are based on current information and may be subject to change

Project Schedule – Next Steps



Spring 2007

- Prepare site
- Construct Fluvial SVE system

Fall 2007

- Complete Final Loess/Groundwater RA Work Plan
- Conduct ET&D
- Construct and operate Thermal-enhanced SVE system

Projected dates are based on current information and may be subject to change

Project Schedule



2008

- Operate and maintain Fluvial SVE system
- Complete Thermal-enhanced SVE and collect confirmation soil samples
- Collect groundwater samples to finalize ZVI locations

2009

- Begin ZVI injections
- Operate and maintain Fluvial SVE system

Projected dates are based on current information and may be subject to change

Project Schedule



2010

- Operate and maintain Fluvial SVE system
- Collect confirmation groundwater samples
- Receive Operating Properly and Successfully determination from EPA for Source Areas RA

2011

- Operate and maintain Fluvial SVE system

2012

- Collect confirmation soil samples for Fluvial SVE system
- Turn off Fluvial SVE system
- Conduct 5-Year Review

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