



The USACE's Sponsors Public Information Meeting to Discuss Project

The U.S. Army Corps of Engineers (USACE) invites you to attend an upcoming Public Meeting to learn about a number of cleanup activities the former Raritan Arsenal, including recent ordnance removal actions, indoor air investigations currently underway and the progress being made toward site closure. Additional information about these site activities is summarized on this fact sheet. Please join us:

Wednesday, November 9, 2011 • 7 – 9 p.m.
Edison Municipal Complex • Edison Room (on 3rd Floor)
100 Municipal Boulevard • Edison, New Jersey

Meeting Agenda

- 7:00 p.m. – USACE Presentation**
- 8:00 p.m. – Questions and Discussion**

For more information, please contact Sandra Piettro, USACE Project Manager, at 917-790-8487.

Ongoing Indoor Air Monitoring

The USACE evaluated indoor air quality in 48 buildings ranging in size from 1,225 square feet up to 243,000 square feet for levels of volatile organic compounds. Many of the buildings house multiple tenants, such as light industrial, warehouse, mixed-use office space and daycare centers. Evaluations of all buildings are summarized in indoor air reports, Indoor Air Quality Reports #1 thru 6. The latest report (#7) on indoor air evaluations will be issued in late 2011.

Current Status:

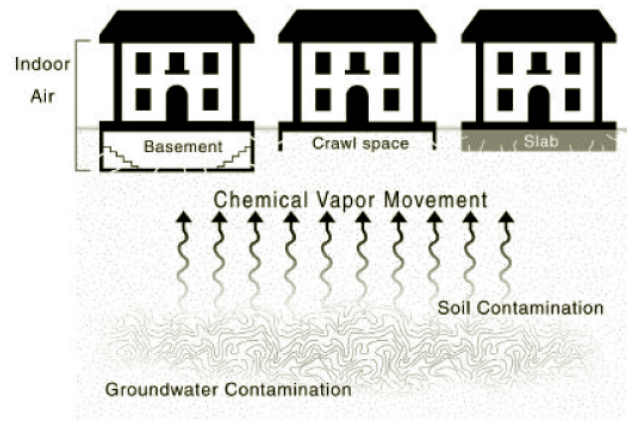
- 48 building evaluated
 - 39 buildings: Indoor air quality safe, no evidence of potential vapor intrusion
 - 9 buildings: Current monitoring efforts include sub-slab and indoor air
 - Indoor air quality safe in all 9 buildings
 - Potential vapor intrusion:
 - 2 buildings: Vapor intrusion not present; semiannual monitoring to confirm
 - 7 buildings: Mitigation system installed and monitored

The addresses of the 9 buildings currently undergoing USACE ongoing indoor air monitoring efforts include:

- 165 Fieldcrest Avenue
- 160 Fieldcrest Avenue
- Campus Plaza 4
- 102-168 Fernwood Avenue
- A series of EPA owned buildings (numbers 10, 18, 200, 205 and 209).

Most of these buildings are equipped with indoor air mitigation systems, and the USACE periodically monitors the air quality of these properties in cooperation with NJDEP.

Vapor Intrusion



Vapor intrusion can occur when vapors are present in the zone directly next to or under the foundation of the building, resulting in the seepage of those vapors into living spaces.

Vapor intrusion occurs when gases from contaminated soil or ground water seep into cracks and holes in foundations or slabs of buildings and accumulate in basements, crawl spaces or living areas, as shown in the diagram above. A subsurface depressurization system, similar to a system to mitigate radon gas is an effective method to prevent vapor intrusion in affected buildings. A sub-slab depressurization system consists of PVC piping installed through the slab floor and a fan connected to the piping. When the system is on, the fan acts a vacuum beneath the slab, pulling the vapors from the soil beneath the building into the pipe, where they are safely dissipated in outside air.

Groundwater

A groundwater remedial action work plan (GWRAWP) was completed in July 2008 and identifies a number of locations, identified as Areas of Concern (AOCs), requiring evaluation and monitoring. This work plan and report addressed known DOD-related groundwater concerns (except Area of Concern No. 2 and 8A/B) and recommended Monitored Natural Attenuation (MNA) as the preferred remedial method. MNA is the sum of natural processes that leads to the monitored reduction of contaminant concentrations in groundwater over time. The primary objective of MNA is to demonstrate that natural processes will reduce those concentrations in groundwater to levels below regulatory standards before a point of compliance, such as an off-site receptor, is reached.

This report concluded MNA is a feasible remedial alternative for AOCs 4A, 4B, 6A, 6B, 6C, 8C, 8D, 9, and 10, with a recommendation for long-term monitoring for a Classification Exception Area (CEA) that encompassed all AOCs within the former Raritan Arsenal. The report recommended No Further Action for AOCs 3, 7, and 4B, and received NJDEP approval for AOCs 3 and 7, with a request to sample one well for AOC 4B. AOCs 2 and 8A/B were excluded from the GWRAWP due to of ongoing source investigations, groundwater treatability work and indoor air monitoring. These areas will be addressed under a separate GWRAWP in the future, and the results will be shared with the community.

USACE installed and completed long term monitoring wells and commenced the groundwater sampling effort as outlined in the USACE approved Groundwater RAWP, dated July 2008. The primary groundwater contaminants of concern at each AOC (except AOC 9) are chlorinated volatile organic compounds, primarily TCE (trichloroethylene) and PCE (tetrachloroethylene) and their breakdown products.

For Groundwater AOC 2, the USACE completed post injection monitoring of the pilot tests in summer 2010. Results to date indicate reduction in AOC 2 contaminants. The results of the pilot tests treatability study has been summarized in a report and issued to NJDEP for review in November 2010.

USACE implemented a site-wide well abandonment project consisting of two phases. Phase One: abandoning wells no longer needed at the site; proposing wells not located within or near any GW AOCs. Phase Two: abandoning wells no longer needed at the site;

proposing wells are part of the USACE's monitoring program under the approved GWRAWP.

USACE is generating a Groundwater / Vapor Intrusion (GW/VI) Feasibility Study (FS) to evaluate the need for, and possible alternatives to address, final remedies for the groundwater contamination at Areas of Concerns 2, 4A, 4B, 6A, 6B, 6C, 8A/B, 8C, 8D, 9, and 10.

Munitions Clearance, Area 12

Through the use of state-of-the-art technologies, the USACE has made advances to clear buried munitions from Area 12 at the former Raritan Arsenal. A new technical approach using digital geophysical mapping (DGM) has allowed the USACE to detect buried items and distinguish if they are potential munitions. Based on the results of this survey, munitions locations were then mapped using high-resolution global positioning system (GPS) data.

This approach has enabled the USACE to make significant improvements in the detection and evaluation of subsurface anomalies before the digging takes place. Furthermore, this has also allowed for the identification of an 86-acre area where anomalies were spaced at a great enough distance to give the removal contractor exact GPS coordinates for each location they were to dig, also resulting in a shorter time period to complete the removal action.

The DGM survey also identified areas with concentrations of potential ordnance anomalies in Area 12. Using this information, the USACE completed an ordnance removal clearance of 21.423 acres in Area 12. Our contractor, USA Environmental, Inc. of Oldsmar, FL task order contract was worth \$7,615,856 in 2011. Intrusive work on this effort began in April 2009 and completed in October 2011.

Since the start of the project, USA Environmental, Inc. has located an estimated 130,000 pounds of munitions debris (MD). The MD processing team cut that estimate down to 80,000 pounds, documented, sealed and shipped the material off to an approved facility for shredding and smelting.

Most of the munitions recovered from Area 12 date to the period between World Wars I and II. All items containing explosives were safely destroyed and all metals were recycled.

USACE will be implementing Vegetation Clearing and Digital Geophysical Mapping utilizing the Air Force Research Laboratory of Tyndall Air Force Base, Panama City, FL to perform vegetation clearance of 10-17 acres at Area 12 and perform subsurface ordnance location with autonomous robotics equipment towing and EM-61 array. Work on this effort will begin winter 2011 (weather permitting). It is expected that this effort will result in the ability create way point navigation and path planning to tow an EM-61 sensor package for subsurface ordnance locating in the 10-17 acres in this area.

The following robotic platforms will be used:



All-Purpose Remote Transport System (ARTS) with Brush Cutter attachment



Advanced Mobility Research and Development System (AMRADS) autonomous platform with EM-61 towed array

A contract was awarded to CH2M Hill from Atlanta, GA in 2011, the current contract worth is \$4,250,383.66 to

perform the following within Areas 1, 6, 6A, 6B, 10, 10C, 11, 12, 13, 16, 18D and 19:

- Evaluate all previous historical data (HTRW & MMRP) investigations and removal actions
- Based on the findings/results, provide recommendations
- Generate a site specific Human Health Risk Assessment
- Generate a Remedial Investigation (RI), Feasibility Study (FS), Proposed Plan (PP) and Decision Document (DD) documenting all previous investigations, removal actions and findings
- Any munitions discovered during investigation contractor will perform removal action

A contract was awarded to Hydrogeologic, Inc (HGL) from Reston, VA in 2011, the current contract worth is \$206,254.60 to document all previous investigations and findings into a desktop Remedial Investigation in order to achieve state regulatory concurrence on a project close-out.

The USACE remains committed to protecting public safety by reducing the risk presented by the presence of military munitions to the maximum extent possible. Future ordnance removal operations will be conducted as funding is available. While these operations reduce the risk of encountering munitions items in the future, they cannot eliminate that risk entirely. For that reason, USACE recommends that ordnance construction safety support services are included in all development plans where digging will take place in area that areas previously contained ordnance.

Soil Investigation at Area 18E

A draft remedial investigation work plan and site-specific sampling and analysis plan for Area 18E and adjacent EPA buildings was issued to NJDEP for review in September 2008. NJDEP completed its review in May 2009 and agreed with the elements of the work plan. The work plan calls for delineating VOCs and metals in soil, both vertically and horizontally. The investigation will determine whether VOCs and polychlorinated biphenyls (PCBs) have impacted specific soil AOCs which had not been investigated previously. The investigation results will show if contaminated soil identified within Area 18E has impacted groundwater within Groundwater AOC 8. The initial phase of the investigation consisted of Geoprobe soil sampling activities, Geoprobe shallow groundwater sampling activities, soil borings and the installation of monitoring wells.



Site map of Area 18E and adjacent EPA buildings

The results from this initial sampling show the delineation of VOCs and metals in soil, both vertically and horizontally, at former soil sample locations, resulting in the need for additional testing. The results of the investigation have been generated into a remedial investigation report. Additional investigation was performed and the results from this additional sampling were documented in a Supplemental Remedial Investigation Report dated September 2011 and issued to NJDEP for review.

A contract was awarded to H&S Environmental, Inc. of Westborough, MA to address shallow contaminated subsurface soils over the nine acre Area 18E. Work plans were approved by NJDEP in September 2011 and soil removal is scheduled for fall 2011. An estimated 1,850 cubic yards (approximately 90 truck loads) will be excavated and disposed of off-site.



Site preparation and excavation activities. (File Photo)

Fiscal Year 2011 Completed Milestones

The following list presents a summary of recently completed site activity from October 1, 2010 to September 30, 2011:

- Final – Preliminary Remediation Goals (Human Health Risk Assessment) – October 2010
- Draft – Groundwater / Vapor Intrusion Feasibility Study currently being finalized – Winter 2011
- Preliminary Draft – Ecological Risk Management Report submitted to USACE for review – July 2011; currently being finalized
- Preliminary Draft – Groundwater Remedial Action Work Plan Progress report submitted to USACE for review – March 2011; currently being finalized
- Final – Phase I – Well Abandonment Work Plan and Trip Report submitted to NJDEP – August 2011
- Draft – Groundwater Compliance Monitoring Progress Report submitted to NJDEP – August 2011
- Final – Supplemental Remedial Investigation Report on Area 18E submitted to NJDEP – August 2011
- Revision 1 – Remedial Action Work Plan for Area 18E Removal Actions submitted to NJDEP. Soil removal actions to be completed – Winter 2011
 - Public review process of the Engineering Evaluation / Cost Analysis (EE/CA) for Area 18E Soil Removal Actions – Sept. thru Nov. 2011
- Continue indoor air quality evaluations and monitoring (9 buildings)
 - Final – Annual Indoor Air Quality monitoring report #6 submitted to NJDEP and landowners – Sept 2011
 - Annual Draft Final – Indoor Air Quality report #7 being finalized; final report will be submitted to NJDEP and landowners – Winter 2011
- Area 5: Generate a Remedial Investigation report to document the completion of chemical warfare materiel (CWM) removal actions; contract awarded – Sept 2011
- Site-wide Military Munitions Response Program (MMRP) contract awarded – Sept 2011
- Area 12: removal activity at Area 12 completed – Sept 2011

Fiscal Year 2012 Planned Future Activities

The following list presents the future plans (October 1, 2011 to September 30, 2012) for the site.

- Continue indoor air and sub-slab monitoring at select buildings
- Area 5: Generate a desktop remedial investigation report to document removal of chemical warfare material (CWM) project
- Area 12: A Site Specific Final report will be generated and submitted to NJDEP for review – Winter 2011
- Area 18E: Soil removal action commences/completes; Prepare a Remedial Action Completion Report – Winter 2011
- Site-wide Military Munitions Response Program (MMRP): Commence investigation of the awarded areas; Prepare Remedial Investigation report GW Long Term Monitoring (Monitored Natural Attenuation) addendum – Summer 2012
- Prepare Annual Indoor Air Quality (IAQ) report #7 – Winter 2011
- Prepare PP / DD for Middlesex County College, Thomas Edison Park, Commercial / Industrial Area, USEPA property
- Prepare Final – Groundwater / Vapor Intrusion Feasibility Study
- Prepare Final – Preliminary Remediation Goals (Human Health Risk Assessment)
- Prepare Final – Ecological Risk Management Report
- Prepare Final – Groundwater Remedial Action Work Plan Progress Report
- Prepare Final – Groundwater Compliance Monitoring Progress Report
- Prepare Draft Phase II – Well Abandonment Work Plan
 - Revise Management Action Plan
 - Update Community Relations Plan

About the Formerly Used Defense Sites Program

Congress established the Formerly Used Defense Sites (FUDS) Program in 1986 to clean up properties that were formerly owned, leased, possessed or used by the Army, Navy, Air Force or other defense agencies. The U.S. Army Corps of Engineers manages the FUDS Program. The New York District is responsible for various FUDS locations, including the former Raritan Arsenal site, which is comprised of approximately 3,200 acres located along the Raritan River in the Townships of Edison and Woodbridge, Middlesex County, New Jersey, approximately 20 miles south of Manhattan.

Site History: Operations Began in 1917

The former Raritan Arsenal was used extensively for U.S. Army operations from 1917 to 1963. Operations included receipt, storage, and maintenance of ammunition shipped from other ordnance facilities or returned from overseas; renovation of ammunition designated for long-term storage; the salvage of outmoded or seriously deteriorated ammunition; ordnance research and development; and shipment and receipt of weapons. During operations, waste materials, including ordnance, were routinely buried on site as this was the standard method of disposal at that time. The arsenal was closed in 1963.

Following closure, areas of the site were identified for further study with respect to possible ordnance and explosives contamination. This preliminary remediation work resulted in many of the areas being surface cleared or partially decontaminated. More extensive investigations followed, including work under the FUDS program.



Site map of the former Raritan Arsenal

For more information, please contact the following:

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