



# EM UPDATE

ENVIRONMENTAL MANAGEMENT



## Summer 2007

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## AMEM Corner

by Stephen Mellington



**Stephen Mellington,  
Assistant Manager  
for Environmental  
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As the saying goes, nothing is constant but change itself. This holds true even here at the Nevada Site Office where the recent incorporation of the Environmental Protection Team has infused Environmental Management with a new synergy. As announced by the Nevada Site Office Manager, Jerry Talbot, the consolidation of all environmental-related activities will better enable the Nevada Site Office to "...work smarter to meet our mission requirements."

I'm excited about this opportunity since the Environmental Protection Team is comprised of dedicated and experienced members who manage the permitting, monitoring, reporting, National Environmental Policy Act (NEPA), ecology, geology, hydrology, and cultural resources for the Nevada Site Office. I strongly believe that the business end of environmental activities will function more efficiently and the environmental mission will be streamlined. This will be evident during the required review and analysis of the NEPA documentation for the Nevada Test Site. The results will be included in the Draft Supplement Analysis for the Site-Wide Environmental Impact Statement and are anticipated for public review in January 2008. Stakeholders will be kept informed as this project progresses.

In addition to the local changes instituted to ensure we are "working smarter," James Rispoli, the Assistant Secretary for Environmental Management has initiated an independent review of the relationship between U.S. Department of Energy Headquarters and its sites across the United States. As a result, members of the National Academy of Public Administration (NAPA) visited the Nevada Site Office in the spring. The resulting recommendations will be published in a report on the NAPA web site at:  
<http://www.napawash.org/index.html>.

While we continue to look at ways to work smarter, we never forget about the need to work safely. This summer, assessment activities have peaked to ensure we have the right safety culture in place. In particular, the Underground Test Area and Soils sub-projects have been rigorously assessed to ensure that work is being performed according to policies and procedures. I'm proud to report that although we continually self-assess and seek opportunities for improvement, the Environmental Management team reflects a conscientious and vigilant approach to completing mission requirements in the safest manner possible.

### Community Environmental Monitoring Program – Milford Station

The Community Environmental Monitoring Program is a network of 29 monitoring stations that screens communities surrounding the Nevada Test Site for manmade radioactivity. Each station collects a variety of environmental, radiological, and meteorological data. During the weeks of July 2 and July 9, 2007, elevated readings were detected at the Milford, Utah station. Air filter samples from the station were analyzed, and have indicated the radioactivity is consistent with normal background levels.

Extreme heat and static discharge at the Milford station are believed to have caused a piece of equipment, the pressurized ion chamber (PIC), to malfunction, resulting in the inaccurately elevated readings. The PIC has been replaced and sent to a laboratory for further testing. Additional information will be posted on the [Community Environmental Monitoring Program webpage](#) as it becomes available.



## Spotlight on UGTA

by John Myers

The Underground Test Area (UGTA) Sub-Project makes up a significant part of the Environmental Management Program, but what does UGTA really do? Yes, they drill deep wells, create colorful maps, compile huge tables of analytical data, and produce large documents, but the realm of groundwater modeling is a mystery to many.

Since the 1950s, 828 underground nuclear tests took place on the Nevada Test Site (NTS). Approximately one-third of the tests occurred near or below the water table, causing radioactive contamination of the groundwater within the boundaries of the NTS. Since no feasible technology exists to remove this deep contamination, UGTA seeks to identify the extent of radiological risks in the groundwater, predict movement of contaminated groundwater, and define the extent of contaminant migration. Although no groundwater contamination has yet been detected beyond the NTS boundaries, the tasks of well-drilling, groundwater sampling, contaminant characterization, and computer modeling will ultimately provide a greater understanding of groundwater movement and continue to enhance the existing long-term groundwater monitoring system.

UGTA first evaluated NTS groundwater pathways on a regional scale. Secondly UGTA will “fine-tune” the data by evaluating contaminant movement and boundaries unique to each of the underground test areas at a smaller scale (Yucca Flat or Pahute Mesa, for example). To do so, three-dimensional computer models are developed to include rock units, faults, groundwater flow, and sampling results to predict the boundary of groundwater contamination for the 1,000-year timeframe regulated under the Federal Facilities Agreement and Consent Order. Work has begun in all five UGTA areas; however, no contaminant boundaries have been identified to date.

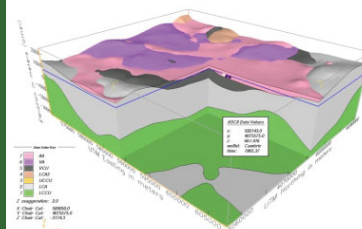
This evaluation will continue for many years to come. Sampling, characterization, and modeling activities are planned until the year 2022. After each area is modeled, the UGTA Sub-Project will undergo a five-year “proof of concept” period to confirm the validity of the computer models. If the results are accepted by the Nevada Site Office and the State of Nevada, the sites will enter into a long-term monitoring program. The long-term monitoring program will continue for 100 years.



No groundwater contamination resulting from historic nuclear testing has been detected outside the boundaries of the NTS.

The water systems from which Las Vegas and Pahrump draw water are separate and distinct from that of the NTS. Neither Las Vegas nor Pahrump is at risk from contaminant migration from underground testing.

What is a contaminant boundary? UGTA Sub-Project scientists are working to distinguish where water is considered safe or not safe for domestic or municipal use. This boundary will be based on contaminant dose limits over a maximum of 1,000 years



A three-dimensional groundwater computer model generated from data compiled through Underground Test Area activities at the NTS.



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Over the years, public involvement has been an integral part of planning for the UGTA project. The U.S. Department of Energy Nevada Site Office has worked alongside the Community Advisory Board for NTS Programs to initiate an independent peer review of the UGTA strategy, and has implemented several recommendations resulting from the peer review. More than \$3,000,000 has been spent by the U.S. Department of Energy to ensure Community Advisory Board members' recommendations are considered in the UGTA strategy. "This open communication has led to an increased understanding of UGTA activities for Community Advisory Board members, and promoted greater community involvement in the development of the UGTA strategy," adds Bill Wilborn, the Nevada Site Office UGTA Sub-Project Director.





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## EM PARTNER – Defense Threat Reduction Agency

by John Myers

When you hear the name Defense Threat Reduction Agency (DTRA), the first thoughts that come to mind probably do not include environmental management. After all, DTRA is a separate operating agency within the U.S. Department of Defense and its primary mission is to safeguard the United States from weapons of mass destruction. But DTRA is also involved in environmental management activities on the Nevada Test Site.

In fact, DTRA, including its predecessors, has been a part of the Nevada Test Site's history as far back as 1948 when the Armed Forces Special Weapons Project identified the Nevada Test Site as a suitable continental atomic testing site. Over time, the name of the organization changed to the Defense Atomic Support Agency (1959), the Defense Nuclear Agency (1971), and the Defense Special Weapons Agency (1996). In 1998, the organization became known as DTRA.

During the era of nuclear testing, DTRA's predecessors evaluated the effects of nuclear detonations on military offensive and defensive systems. Today DTRA's environmental management activities concentrate on any surface or near-surface contamination as a result of those evaluations. Current activities include identifying the nature and extent of contamination, determining the potential risk to humans and the environment, and performing appropriate corrective actions for the 119 DTRA sites.

Corrective actions may be as simple as removing an old vehicle battery or as complex as closure of a muckpile which contains approximately 8 million cubic feet of rock debris and waste excavated during reentry into a tunnel. Appropriate corrective actions are determined using a risk-based approach that considers many different factors such as the type and extent of contamination, current and future land use scenarios, and potential exposure routes to humans, plants, and animals. Not only does a risk-based approach ensure that the appropriate solution is selected for the specific problem, but it has also resulted in a cost savings of more than \$100 million to taxpayers.



If DTRA's environmental management activities sound similar to Industrial Sites clean up activities, it is because DTRA's sites are categorized as Industrial Sites. So what's the difference? The difference is the owner of the potentially contaminated area. While DTRA tackles contamination resulting from its U.S. Department of Defense predecessor agencies, the rest of the Industrial Sites project addresses contamination resulting from U.S. Department of Energy activities.



Excavated rock and debris removed from a tunnel DTRA used for nuclear testing on the northern portion of the Nevada Test Site.



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The DTRA will soon be completing its closure activities on the Nevada Test Site. However, DTRA will still be involved in other activities over the next few years. In cooperation with State of Nevada Division of Environmental Protection, the Nevada Site Office, and the Desert Research Institute, DTRA is developing Comprehensive Cultural Resources Evaluations to preserve the history of six tunnels on the Nevada Test Site that were used by DTRA predecessor agencies for nuclear weapons effects tests. According to Tiffany Lantow, the Federal Project Lead for DTRA's environmental management activities on the Nevada Test Site, "a great deal of research is involved in each tunnel evaluation, but the end result is certainly worth the time and effort. These tunnels have been an important part of our nation's history, and DTRA is privileged to ensure that valuable historical details are captured for future generations." When each report is complete, it will be submitted to the Nevada State Historical Preservation Office and the State of Nevada Division of Environmental Protection. The evaluations are expected to be completed by 2011.



## Kicking Off the Last Industrial Sites Complex CAU

By Josh Dinsman

A momentous occasion is quickly approaching for the Industrial Sites Sub-Project as it prepares to kick-off work on its final Complex Corrective Action Unit (CAU) for the Environmental Restoration Project (ERP). While this does not mean that the work is over, it does signal the beginning of the end for a project that, when complete, will have closed more than 1,100 ERP Corrective Action Sites (CAS) across the Nevada Test Site and the Tonopah Test Range.

As part of the U.S. Department of Energy's (DOE) Environmental Management Program (EM), the Industrial Sites Sub-Project was established to conduct investigations and corrective actions at sites that were potentially impacted as a result of nuclear testing and support activities. Cleanup activities for the sub-project include identifying the nature and extent of contamination, determining its potential risk to the public and the environment, and performing the necessary corrective actions in compliance with guidelines and requirements. When complete, 71 of the 196 Industrial Sites ERP CAUs will have been closed using the Complex closure process, which involves planning and executing characterization activities, comparing and choosing appropriate corrective actions, and implementing the chosen corrective actions.

Although there are still some sites that will be addressed using the Streamlined Approach for Environmental Restoration (SAFER) process, the kick-off of CAU 546 means that all Complex Industrial Sites ERP CAUs are on their way to completion. "This sends a significant signal to the stakeholders that we are serious about completing the cleanup mission with which we have been entrusted by DOE," states Steve Mellington, Assistant Manager for Environmental Management. "It is a bittersweet moment, as we have an outstanding group of people and everyone is proud of the work, the outcome, and the contribution it has made to our country."

When asked for his thoughts regarding the kick-off of CAU 546, Industrial Sites Federal Sub-Project Director Kevin Cable discussed the importance of teamwork. According to Mr. Cable, "This project has required a tremendous team effort between contractors, U.S. Department of Energy personnel, and the State of Nevada. We have had very supportive stakeholders and regulators who were instrumental in helping us accomplish our mission. Hundreds of hard-working, dedicated people have contributed to this project and each one is responsible for its success."

**Corrective Action Site (CAS):** A site that has been identified as needing remediation. These sites can include everything from a simple vehicle battery to entire buildings.

**Corrective Action Unit (CAU):** A CAU is a grouping of CASs that are similar in remediation technique, type of contaminants, or proximity to each other.

Three different processes are used to clean up Industrial Sites:

The Housekeeping process is assumed when the extent of the waste for a site is clearly defined and can be readily removed.

The SAFER process is used when the site is clearly defined without the need for further characterization.

The Complex process is a method of cleaning up sites that require characterization and corrective action. Sites such as septic tanks, leachfields, sewage lagoons, waste dumps, mud pits, and facilities used in testing and support activities are often more complex to clean than a site containing a discarded vehicle battery, and thus require Complex closure.



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While the end is in sight, there is still plenty of work left to be done, as Complex closure sites can take several years to complete. All of those involved should be proud of their accomplishments, because the kickoff of CAU 546 signifies an important step in reaching EM's primary goal of risk reduction and cleanup of the environmental legacy of our nation's nuclear weapons program.

The Complex closure process includes the following steps:

- Corrective Action Investigation Plan
- Site Investigation
- Corrective Action Decision Document
- Corrective Action Plan
- Plan Implementation
- Closure Report

Corrective Action Unit (CAU) 546, the last Complex Industrial Sites Corrective Action Unit for the Environmental Restoration Sub-Project, currently includes one Corrective Action Site, which consists of an injection well at the bottom of a fenced potential crater.





## New Developments in the Soils Sub-Project

by Craig Jordan

Activities have intensified on the Nevada Test Site (NTS) and Nevada Test and Training Range (NTTR) in preparation for an aggressive campaign that will focus on managing and, where necessary, cleaning up contaminated soil resulting from more than 40 years of nuclear weapons testing.

Although some soils remediation has taken place, there has not been a comprehensive emphasis on remediating these sites. This is due to the fact that there is an absence of regulatory guidance dictating the minimum level of contamination at which remediation is required on the vast amount of land affected by nuclear testing. Also, as John Jones the Federal Sub-Project Director for the Soils Sub-Project stated, "The Community Advisory Board (citizen volunteers from Nevada who study Environmental Management projects and provide stakeholder feedback and recommendations) has placed a higher priority on the Underground Testing Area and the Industrial Sites sub-projects. They tend to view the Soils Sub-Project as a lower work priority since it likely poses less risk to workers and surrounding communities."

However, with the Industrial Sites Sub-Project anticipating completion within the next five years, new focus is being placed on the Soils sites. An increase in staff and plans for categorization and corrective actions are being formulated for implementation in 2008.

The process of characterizing Soils Sub-Project sites will be concentrated on surface and shallow subsurface soils. Contaminants typically include radioactive materials as well as contaminated instruments and structures resulting from weapons testing activities. In addition, Soils team members are collecting information from radiological surveys and "flyovers" (aerial surveys) as well as conducting investigations to locate and gather data obtained during historic soil sampling activities.

This data will be presented to the State of Nevada Division of Environmental Protection (NDEP) for the purpose of negotiating corrective action strategies to address the potential risk to the public and the environment. This collaboration with the NDEP is driven by the Federal Facility Agreement and Consent Order (FFACO). In accordance with the FFACO, NDEP must approve all corrective actions which are planned and documented in advance and range from restricting access to removing contaminated soil from an area.

### What is the Soils Sub-Project?

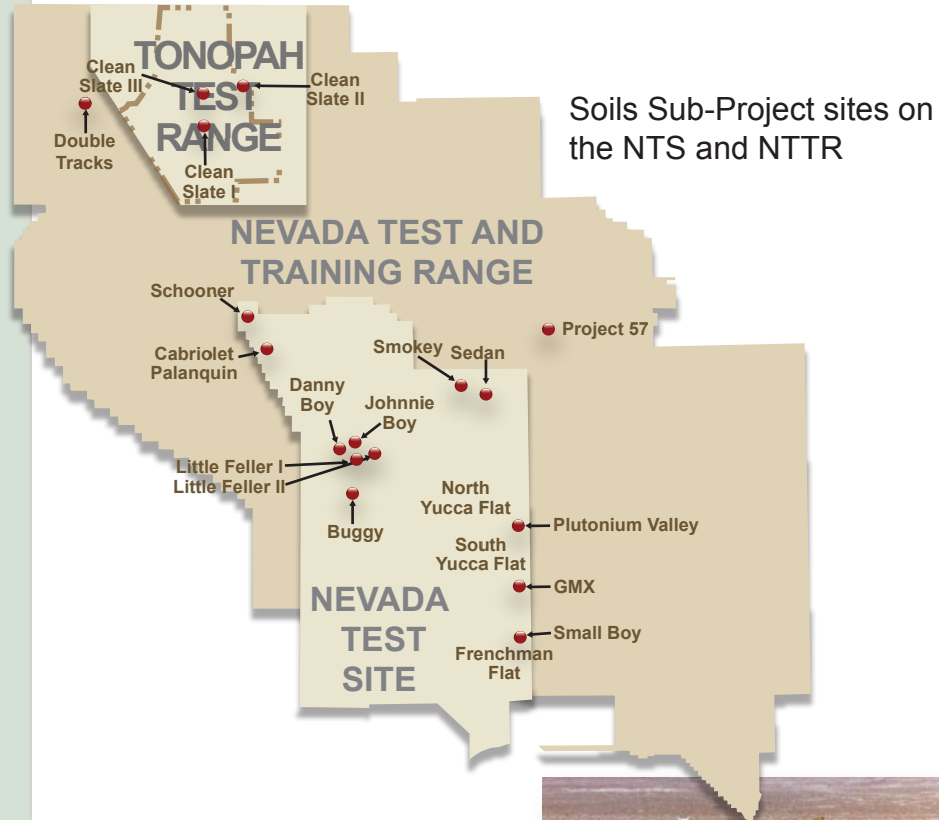
The Soils Sub-Project is responsible for: identifying the nature and extent of any surface contamination present at sites affected by nuclear testing on the Nevada Test Site and Nevada Test and Training Range; remediating the sites using a variety of methods, such as closing in place or removing soil; ensuring that appropriate controls (i.e., signage/postings, barriers, etc.) are in place at the sites where residual contamination remains, and; conducting long-term monitoring of sites with use restrictions.



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Although scheduled for completion by fiscal year 2022, it is likely that some Soils Sub-Project sites will be maintained with use restrictions and monitored indefinitely. The sub-project team will also continue to provide information to the CAB, interested stakeholders, and the State of Nevada.



Soil Sampling





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## Safely Stepping Toward TRU Completion

by Josh Dinsman and Dona Stevens

The Transuranic Waste Sub-Project is gaining momentum to achieve completion following the disposition of one-third of the remaining legacy drum inventory and after making progress toward repackaging the 58 oversize boxes at the Nevada Test Site (NTS).

These accomplishments began with the re-evaluation of existing characterization data and performance of additional characterization using non-destructive assay on approximately 150 drums of TRU waste. By conducting assay on these drums, the presence and amount of radionuclides were identified by detecting unique energy signatures using specialized equipment. As a result of these activities, 50 drums were determined to contain low-level and mixed low-level waste. The low-level waste was disposed on-site at the NTS Area 5 Radioactive Waste Management Site and treatment of the mixed low-level waste is underway at approved facilities in Tennessee and Texas. Treatment is required for the mixed low-level waste to meet Land Disposal Restrictions in accordance with the NTS Resource Conservation and Recovery Act permit issued by the State of Nevada Division of Environmental Protection. Once treatment of the mixed low-level waste is complete, it will be returned to the NTS and disposed in the Mixed Waste Disposal Unit located within the Area 5 Radioactive Waste Management Site.

Concurrent with the above drum characterization and disposal activities, a team completed the design modifications for the Visual Examination and Repackaging Building. This building will house a self-contained structure where workers breathing supplied air and wearing protective suits will cut open 58 oversize boxes to sort and repackage radioactive waste contents. Construction modifications are underway and completion is expected in November. Once complete, workers will practice the process on demonstration boxes and prepare for a rigorous safety evaluation which must be passed before actual operations can commence.

An additional safety measure taken is the installation of vents in the 58 oversize boxes to release filtered gases. These gases are generated by the “break down” or deterioration of TRU elements over time and could cause an explosion when workers cut open the boxes. Since these boxes have been stored in the NTS TRU Pad Cover Building for more than 20 years, the primary contractor responsible for the TRU Sub-Project, National Security Technologies, LLC, determined that extra precautions were needed to protect its workers. Venting is accomplished by inserting a small filter vent into the boxes using a special device that punctures and seals the vent in place.



A worker prepares to vent an oversize box using a portable, single-operator, pneumatic driver that inserts a vent by penetrating the metal of the boxes.

### What is Transuranic Waste?

Transuranic waste contains man-made radioactive elements heavier than uranium, hence the name “trans” or “beyond” uranium. Transuranic waste that contains both radioactive and hazardous (as defined by the Resource Conservation and Recovery Act) components is referred to as mixed transuranic. Most of the transuranic waste managed at the Nevada Test Site was generated as part of a U.S. nuclear weapons research and development program at Lawrence Livermore National Laboratory near Oakland, California. This legacy waste, which was shipped to the Nevada Test Site in drums and oversize boxes for temporary storage between 1974 and 1990, includes protective clothing and miscellaneous equipment contaminated with transuranic elements.



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This activity allows any gas that accumulates to safely vent and effectively prevents the release of radionuclides. Using equipment available at the NTS, workers have installed vents in approximately 80 percent of the oversize boxes and completion of the remaining 12 boxes is expected by October.

Taking the extra time needed to ensure the safety of the workers, the public, and the environment is a top priority throughout the entire TRU sub-project. According to Federal TRU Sub-Project Director Joni Norton, "We are pleased with the progress, but to be absolutely certain that all safety measures are in place, we have decided to extend the Sub-Project completion date to September 30, 2008." As the Sub-Project gets closer to reaching its objective of disposing all NTS legacy TRU waste, regular progress updates will be provided. Next up will be the results of the safety evaluation and details on the commencement of characterization.





# Nevada Test Site Public Tour Schedule

October 23, 2007



Radioactive Waste Management Complex

November 20, 2007



Sedan Crater

December 20, 2007

January 29, 2008



Railroad Bridge

February 26, 2008

March 20, 2008

April 17, 2008



Apple II House

For a complete listing of tour dates, go to: <http://www.nv.doe.gov/nts/tours.htm>. Tour participants will visit historic nuclear test locations, such as Sedan Crater, as well as observe areas where work activities are currently taking place, like the Radioactive Waste Management Complex. The tour covers approximately 250 miles. Call (702) 295-0944 for more information.

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To join the the Environmental Management mailing list and receive electronic news regarding activities, please e-mail us at:

[envmgt@nv.doe.gov](mailto:envmgt@nv.doe.gov)

You can also request specific information on activities including the Community Advisory Board, by sending your name, address, and phone number to

[envmgt@nv.doe.gov](mailto:envmgt@nv.doe.gov)

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