

Groundwater

...at the Nevada Test Site

Background

From 1951 to 1992, the United States government conducted 828 underground nuclear tests at the Nevada Test Site (NTS) at depths ranging from approximately 90 to 4,800 feet below the ground surface. About one-third of these tests occurred near or below the water table, which resulted in some contamination of the area's groundwater. The U.S. Department of Energy (DOE) began preliminary hydrologic research in the 1970s; but a more intensive groundwater studies program was launched in 1989 with the formation of the Underground Test Area Project (UGTA) at the DOE Nevada Site Office (NSO).

Faced with the reality that no proven, cost-effective method currently exists for remediating deep, extensive groundwater contamination, the UGTA project team set out to develop an effective, long-term monitoring system. This network is being designed to identify radiological risks (if, where, and when they exist) to help ensure the safety of off-site populations. Scientists are developing computer models to effectively position monitoring wells along this monitoring network.



The “UGTA” Strategy

The complex geology and hydrology of the Nevada Test Site presents unusual challenges in understanding groundwater flow and the movement of contaminants. To meet these challenges, the UGTA project team embarked on an investigative process that incorporates various research components including well drilling and sampling, contaminant characterization, and computer model development.

With these components in mind, the team designed a phased approach -- the objective of which is to establish a sound monitoring network using both new and existing

wells. The first phase of the strategy (already complete) evaluated the NTS on a regional scale (i.e., explored groundwater pathways over large areas both upgradient and downgradient from historical underground nuclear testing locations). The “regional” model is a computer-generated image that illustrates this process. The second “local” phase (currently underway) will identify contaminant movement and develop contaminant boundaries that are unique to each of the underground test areas.

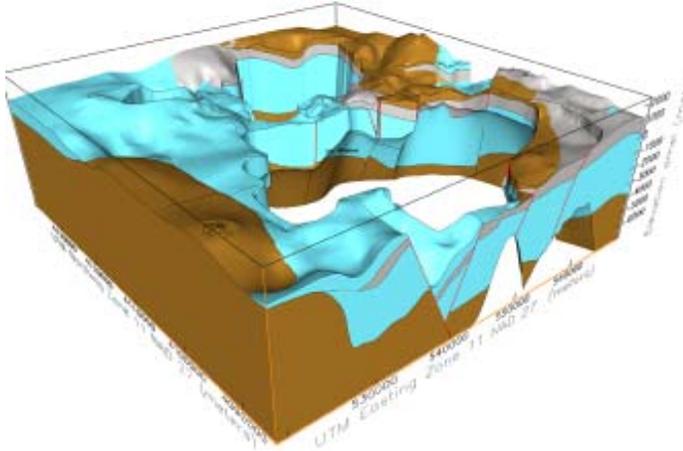
In order to complete these local groundwater models, the NSO will continue current sampling and characterization activities until the year 2022. After modeling each site, the UGTA Project will engage in a five year “proof of concept” period to confirm the validity of the models’ predictions regarding the behavior of the groundwater systems and the movement of contaminants.

What is a Contaminant Boundary?

UGTA scientists will use the results of the models to establish what is called a contaminant boundary. This boundary will distinguish where water is considered *safe* and *not safe* for domestic or municipal use. Boundary calculations are based upon predictions figured from contaminant dose limits over a maximum of 1,000 years.

What is a Computer Model?

Over the past ten years, scientists have used modeling technology to offer explanations on how groundwater systems behave. These models are able to integrate various forms of raw data to ultimately produce three-dimensional representations of the subsurface environment.



If the results are acceptable to both NSO and the state of Nevada, NSO will officially close these areas and establish a long-term monitoring program using existing wells and, if necessary, installing new wells.

Meanwhile in areas surrounding the Nevada Test Site, approximately 30 water sources will continue to be monitored on a regular basis. To date, this monitoring network has shown no evidence of off-site contamination caused by underground nuclear tests.

Long-Term Management

The NSO will establish institutional controls, including restricted access and use of groundwater, for the areas associated with the UGTA Project. The NTS, with the Nevada Site Office serving as the steward, will remain a restricted access facility for the foreseeable future.

Public Involvement

Throughout the years, public involvement has been a key element of the UGTA project. Stakeholders have participated in UGTA-

related public meetings and informational tours and have provided specific recommendations on project activities. The NSO, in fact, worked closely with the Community Advisory Board for Nevada Test Site Programs and interested stakeholders to initiate an independent peer review of the UGTA strategy and has since implemented several recommendations of the peer review.

For more information or to provide comments on groundwater-related issues, contact the NSO using the information provided below.

For more information, please contact:

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