



September 9, 2011 Nevada Site Office Environmental Management

EM NEWS FLASH

NNSS Groundwater Scientists Gear Up to Test Frenchman Flat Model

After years of extensive work in the field and the laboratory, groundwater scientists at the Nevada National Security Site (NNSS, formerly the Nevada Test Site) are ready to conduct a formal evaluation of the Frenchman Flat computer model.

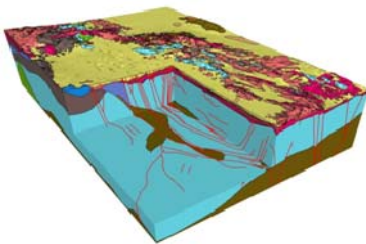
Model evaluation is a crucial point in the groundwater strategy as scientists are using such model forecasts to understand the movement of radionuclides resulting from historic underground nuclear tests—information that will help Federal and State officials make regulatory decisions for the long-term protection of the public.

“...we will not cut any corner when it comes to protecting human health and the environment.”

*—UGTA Physical Scientist,
Dr. Bimal Mukhopadhyay*

Beginning in 2012, crews are scheduled to drill two new groundwater model evaluation wells in the Frenchman Flat basin of the NNSS. Scientists will use data from the two new wells to determine, or *evaluate*, whether contamination is behaving the way the computer model forecasted it would. Groundwater specialists arrived at this evaluation stage after spending many years constructing a well network in the Frenchman Flat area and refining model calculations based on sampling results from this well network.

*A **groundwater model** is a computerized three-dimensional depiction of contaminant movement through groundwater flow paths and the geologic features that make up the area's subsurface. In this model example, each unit (rock layers grouped by hydraulic properties) is represented by a different color. The red lines represent faults.*



“It is a very significant step for the Frenchman Flat area and all future activities relating to the groundwater at the NNSS,” remarked Federal Sub-Project Director, Bill Wilborn of the U.S. Department of Energy (DOE), National Nuclear Security Administration Nevada Site Office. “So much effort goes into developing and refining our models,” he added; “to be evaluating one in the field is critical in the process. We are continually learning more and more about Frenchman Flat and the remaining historic underground test areas.”

Frenchman Flat will be the first of four [Underground Test Areas](#) (UGTA) to undergo the computer model evaluation, or *Corrective Action Decision /Corrective Action Plan (CAD/CAP)**, phase. The go-ahead for the model evaluation

comes on the heels of the *Frenchman Flat CAD/CAP* report, which was approved in July 2011 by the State of Nevada Division of Environmental Protection.

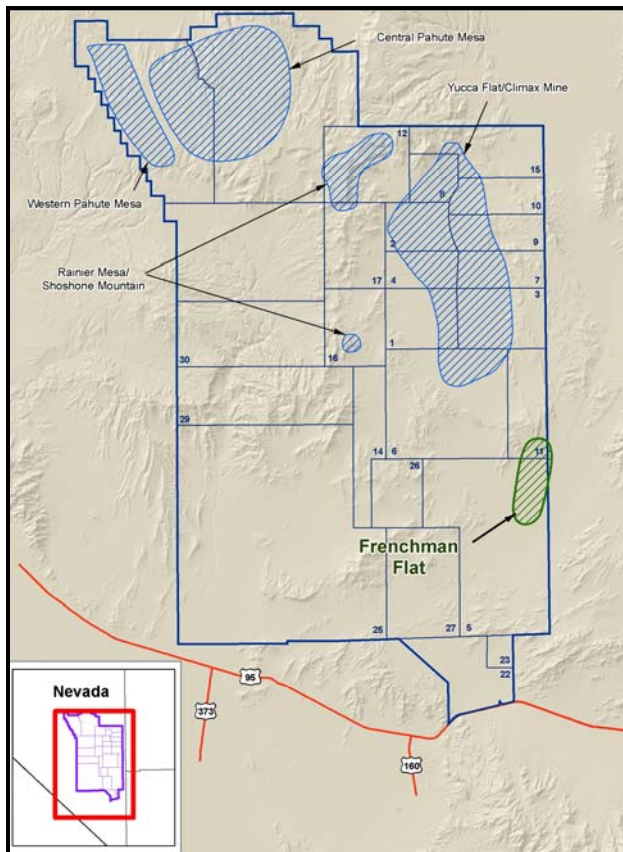
“The goal of model evaluation,” according to UGTA Physical Scientist, Dr. Bimal Mukhopadhyay, “is to tell us if the model is a reasonable tool on which to base regulatory decisions. Model evaluation,” said Dr. Mukhopadhyay, “is a process used to test model forecasts that show how far groundwater containing radionuclides beyond safe drinking water

standards would travel over a thousand-year period. If information from new wells substantially disagrees with the current model's forecasts," he explained, "we cannot move forward until the difference is reconciled. If the information does *not* significantly disagree, the model is sound."

While computer modeling technology is widely embraced by the scientific community as an effective forecasting tool, the Frenchman Flat model has been subjected to rigorous review over the past years. "We wanted to thoroughly scrutinize the approach during the model development stage," said Wilborn, "so that we can feel confident that the model is working and will work for the remaining test areas." In August 2010, an independent peer review panel made up of hydrologists, radiochemists, and modelers assessed the computer modeling approach and results for Frenchman Flat... calling model projections "carefully tested."

According to panelist, James Rumbaugh, the Frenchman Flat model is "a lot more sophisticated than any other model the panel has seen."

"The great amount of work going into the model serves a larger purpose," explained Dr. Mukhopadhyay. "We are making a very conscious effort to understand how radionuclides are moving in groundwater on and near the NNS. We will be efficient as possible," he added, "but we will not cut any corner when it comes to protecting human health and the environment."



Underground Test Areas are grouped into four units (combined units include: Western/Central Pahute Mesa and Rainier Mesa/Shoshone Mtn). Frenchman Flat (shown in green) is the first of the units to undergo model evaluation.

* The Corrective Action Decision /Corrective Action Plan (CAD/CAP) outlines the activities that will take place during the model evaluation phase. The CAD/CAP is part of the [UGTA Strategy](#) contained in the [Federal Facility Agreement and Consent Order](#).

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