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Nevada Site Office Environmental Management

EM NEWS FLASH

Change in Construction Makes Wells More Efficient

The question is... *Can you study more than one groundwater aquifer at the Nevada National Security Site (NNSS) using only one well?* Until recently, the response would have been... *no*. But thanks to the resourcefulness of groundwater specialists from the U.S. Department of Energy, National Nuclear Security Administration Nevada's Site Office (NSO), the answer has changed.

In the past, a major challenge facing scientists from the NNSS (formerly, the Nevada Test Site) was being able to isolate groundwater aquifers, or water-bearing rock formations, because water from different aquifers can mix when drilling to extreme depths. Information from these aquifers is used to help groundwater experts better understand the movement of contamination relating to historic underground nuclear tests.



Field workers prepare to take down-hole measurements of a well.

“When drilling to depths of up to 5,000 feet, boreholes typically penetrate aquifers that can ‘cross communicate’ if not separated via well casing,” explained Navarro-Intera Field Operations Manager and NSO contractor, Jeffrey Wurtz. “The mixture of two aquifers through cross communication makes the interpretation of groundwater very difficult.”

The solution has been a change in well design and construction. By redesigning the well so that certain areas can be sealed off at marked intervals, groundwater specialists can collect pristine, distinct samples from multiple aquifers without the interference of aquifers that lie above or below the target aquifer. This means scientists can revisit the same well and withdraw samples over time to monitor the changes in the groundwater at specific depths.

While the technology is not new, it is a reconfiguration of existing capabilities that gives wells more technical utility, explained Federal Sub-Project Director Bill Wilborn. “We can get so much more information out of one well now,” Wilborn commented, “and we’re increasing efficiency while saving money.”

And the benefits are already being realized. On Pahute Mesa in the northwestern region of the NNSS, groundwater specialists recently studied three separate aquifers using one well (Well ER-EC-11) and plan to do the same at a nearby well (Well ER-EC-12) that was completed in June 2010. These wells are part of a Phase II drilling campaign that will add ten new wells in the Pahute Mesa region by 2012 and will contribute to an existing sampling network that includes well clusters on Pahute Mesa, Frenchman Flat, Yucca Flat and other areas on and near the NNSS.

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