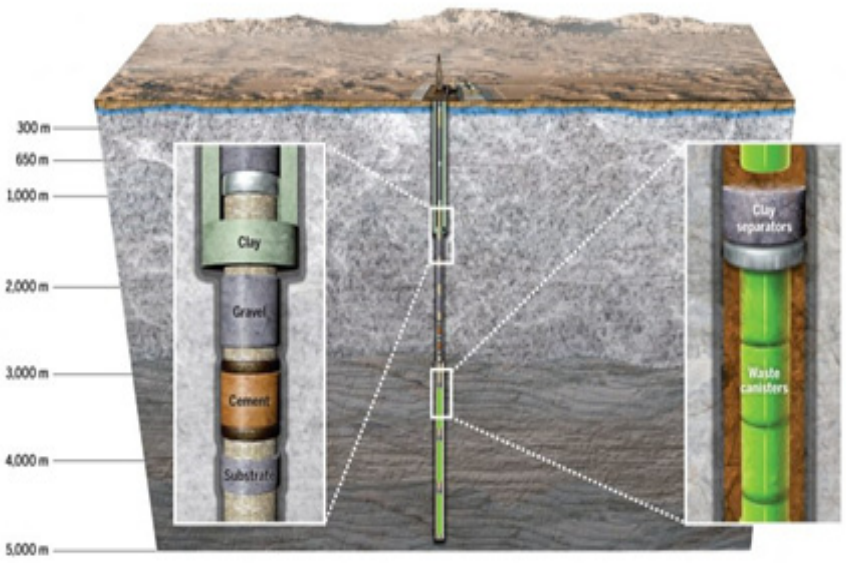
Borehole Test Proposals Repeatedly Rejected by Local Communities

By Kelly Lundeen

Since early 2016, the Department of Energy (DOE) has been looking for a site for a Deep Borehole Field Test for radioactive waste. Over a period of nine months, proposals were rejected in half of the targeted locations due to public opposition, so in December the DOE wrote a new contract to make people believe that there would be no radioactive waste in their future. The DOE revised its request for proposals to appear more "consent-based." Four contractors were chosen to help this proposal gain public acceptance in four locations. At all four sites there has been public outcry, but in Quay County, New Mexico the resistance was so strong that the County Commission rescinded its previous approval. The three remaining sites are Otero County, New Mexico; Haakon County, South Dakota; and Pecos County, Texas.



The Energy Dept. has been met with broad opposition from communities targeted for a borehole "test site" to study the theory of deep disposal of certain radioactive wastes. If a demonstration confirms the theoretical basis for the concept, waste could be placed "in the bottom mile" of a 3-mile-deep hole, under a "plug" of as-yet-undetermined material. Competing designs of potential "plugs" are among dozens of unresolved borehole questions.

Borehole background

The first test borehole will be eight inches wide and three miles deep, with mock "waste" to be placed only in the bottom mile. Borehole disposal is being considered for compact packages of radioactive waste that have no potential for reuse, such as cesium and strontium capsules from Hanford, Washington's nuclear weapons production; untreated calcine high-level radioactive waste currently stored at the Idaho National Laboratory (IDL); salt wastes from electro-metallurgical treatment of sodium-bonded fuels; and some DOE-managed waste reactor fuel currently stored in cooling pools at IDL and at the Savannah River Site in South Carolina.

Other forms of rad waste have not been ruled out for borehole disposal, including deadly used reactor fuel.

Why a borehole?

Boreholes are promoted by the DOE and the contractors that could profit from their development. Since the radioactive waste would be two miles below the surface, borehole proponents claim it is too far from the overlying rocks to affect the water table or surface environment, and it won't be affected by the climate or human activities. Contractors promise between five and 20 local jobs in the test period alone. Before the plan was rejected in Quay County, New Mexico, project representatives hoped some $30 to $40 million would come into the county. They said that a borehole study gives local schools a unique learning experience in science and technology.

What could go wrong?

Despite all the advertised benefits of accepting a borehole "test," some sites have refused to let their land be a science experiment. The DOE insists that the boreholes will not contain radioactive waste. However, the assurances have left many local residents and politicians skeptical. Commissioner Ronny Rardin of Otero County, New Mexico, described the public's opposition in his district. "They not only said no, they said *hell* no."

A panel of experts that joined the DOE in presenting to the US Nuclear Waste Technical Review Board (NWTRB) in December 2015 expressed concerns about the complexities of the structural and scientific properties of the Earth at the level the waste would be placed. "Surprises should be expected," the panel said. Surprises found in previous deep borehole drilling included active water flows, tectonic stress, irregular permeability, and microbial activity which can corrode steel casings and degrade seals on canisters. The NWTRB complained, "It does not appear that the DOE sufficiently considered how one might recover from an accident involving a waste emplacement package stuck in the borehole... It is not clear whether a stuck [and] leaking waste package could be retrieved during operations, as DOE assumes, or whether such waste package would be left in place." This was the concern in Sweden when its deep borehole research was halted.

Leaving much to be desired, the DOE responded to this NWTRB concern by simply saying that the agency would "develop a description of the handling operations… prior to implementation. Risk analyses will be conducted for handling and emplacement operations and important potential accident scenarios."

Borehole disposal is the renewal of a once-abandoned scheme developed by the DOE for its mounting problem of radioactive waste. With three remaining potential borehole test sites, the agency may be able to move to the next phase of permitting and draft some work plans. However, the DOE has yet to verify boreholes' clear advantages over other radioactive waste disposal possibilities, or to guarantee that testing sites won't become permanent dumps.

—*Exchange Monitor,* Feb. 17; *Native Sun News Today,* Feb. 15, 2017; *Alamogordo Daily News,* Feb. 10, 2017 & May 27, 2016; US Nuclear Waste Technical Review Board, June 9, Jan. 2016 & Oct. 21, 2015; *Albuquerque Journal*, Nov. 4, 2013; Blue Ribbon Commission on America's Nuclear Future, January 2012.

Federal Regulator Halts Move to Toughen Radiation Exposure Limits

By John LaForge

Work has been halted on two rulemaking projects that would have reduced the amount of radiation the government permits workers and the public to be exposed to without their consent. The improved limits would have been in line with internationally accepted standards, Bloomberg BNA reports.

A Nuclear Regulatory Commission (NRC) announcement says stopping the process of setting stricter radiation exposure limits was "due to the high costs of implementing such changes." The purpose of the NRC is to protect public and nuclear worker health and safety, but this time it's just saving money for the nuclear industry.

The cancellation of two unfinished and long-overdue precautionary improvements, noted in the Dec. 27 Federal Register, came as a shock to nuclear industry watchdogs who have campaigned for increased radiation protection since 1990. That year, the International Commission on Radiological Protection (ICRP) recommended that radiation industry worker exposures be reduced by three-fifths, from 50 milliSieverts per year to 20 milliSieverts per year. (A milliSievert is a measure of the body's absorption of radiation.)

The recommendation has never been adopted by the United States. Based in Ottawa, Ontario, ICRP sets standards used worldwide as the basis for radiological protection.

Ed Lyman, with the Union of Concerned Scientists, told Bloomberg that termination of these projects "makes the US look out of step with the rest of the world. It makes it look like we're basing our regulations on obsolete information." Jerry Hiatt with the industry group Nuclear Energy Institute was relieved by the NRC move telling Bloomberg that existing rules were adequate, and that it's unnecessary to reduce today's permitted exposures.

The rulemaking project was begun by the NRC staff in 2008 and was intended to update the country's radiation protection standards in accordance with ICRP's international standards, primarily with respect to radiation dose. The NRC staff had previously recommended that the commission reduce the total radiation worker exposure from 50 milliSieverts-per-year to 20 milliSieverts-per-year—in line with the ICRP's 1990 global recommendation. However, the NRC rejected the recommendation.

The NRC's decision not to align permitted radiation exposures with those of the ICRP is the equivalent of "throwing out one of the most significant changes to get the US in step with the rest of the world," Lyman said. The commission formally approved the stop-work orders in April 2016, but it only notified the public on December 27.

The NRC also decided to stop work on a second rule-making which would have brought the US in line with international rules regarding daily releases of radioactive waste water from nuclear reactors. By way of explanation, the NRC said, its current standard "continues to provide adequate protection of the health and safety of workers, the public and the environment."

Over the last 70 years, permitted radiation exposure limits for workers and the public have dramatically decreased as science has come to better understand the toxic and cancer-causing properties of low doses.

In its 2012 pamphlet "Radiation Exposure and Cancer" the NRC reports that, "[A]ny increase in dose, no matter how small, results in an incremental increase in risk." Likewise the National Academy of Sciences, in its latest book-length report on the Biological Effects of Ionizing Radiation, BEIR-7, says: "[L]ow-dose radiation acts predominantly as a tumor-initiating agent," and "[T]he smallest dose has the potential to cause a small increase in risk to humans." The US Environmental Protection Agency agrees that "[A]ny exposure to radiation can be harmful or can increase the risk of cancer … In other words, it is assumed that no radiation exposure is completely risk free."

But today, when the standard international radiation exposure limit for workers and the public is less than half what our own government allows, the NRC is protecting radiation industry shareholders, not public health and safety.

—Bloomberg BNA, "Costs Stop Updates to New Radiation Protection Rules," https://www.bna.com/costs-stop-updates-n73014449122/; Federal Register, Dec. 27, 2016, https://s3.amazonaws.com/public-inspection.federalregister.gov/2016-31372.pdf.

Reno Red Cloud, Natural Resources Regulatory Agency Director of the Oglala Sioux Tribe in South Dakota, addresses a Rapid City, South Dakota mining firm. The Haakon County, South Dakota borehole proposal is located in unceded 1851 and 1868 Ft. Laramie Treaty territory, between the Oglala, Rosebud, and the Cheyenne River Sioux tribes' reservations—all of which are nuclear-free zones. Photo by Tatyana Novikova, *Native Sun News Today.*