

The Yucca Mountain Nuclear Waste Burial Proposal

Suitability Disqualified

NUKEWATCH FACT SHEET

The Nuclear Waste Policy Act sets strict standards that must be met before any proposed nuclear waste site can be licensed to receive a maximum of 77,000 tons of high-level radioactive waste from nuclear power reactors. The Yucca Mountain site in Nevada — the only place currently being considered for burial of the utility industry's waste reactor fuel — is on land reserved in treaty law by the Western Shoshone Nation which is opposed to the dump.

The water table under Yucca Mt. is 700 feet below the proposed repository, 90 miles northwest of Las Vegas, the fastest growing city in the United States. The site's geology does not meet the original requirements established for deep geologic disposal of high-level radioactive waste. Instead, legal specifications have been weakened repeatedly. Yucca Mountain cannot prevent the nuclear waste's radiation from leaking.

Federal Environmental Protection Agency's standards now in place hope to limit the site's release of radiation to levels that will cause no more than 1,000 cancer deaths over 10,000 years. Increased cancer *incidence* has not been estimated. Whether or not the EPA's technically callous requirements can be met is a matter of strenuous scientific debate and courtroom investigation.

According to various studies and reports, the Yucca Mt. nuclear waste plan is ill conceived, ill-managed and can no longer be defended on scientific grounds.

In a 1998 study, the DOE itself acknowledged that the proposed site is a fractured, leaky mountain plagued by earthquakes, and that its untested waste containers have limited viability. As Mary Olson of Nuclear Information and Resource Service Southeast says, "Yucca Mountain is a sieve."¹

The DOE's proposed transport routes — from 72 U.S. reactor sites to the proposed dump — would take the deadly wastes through at least 40 states, 40 Indian Reservations, 600 counties and 100 major cities. About 138 million Americans would be exposed to the risk of dangerous levels of radiation and inevitable truck and train crashes. U.S. Dept. of Transportation and Nuclear Regulatory Commission (NRC) regulations allow these containers at their surface to emit 100 millirems per hour ³/₄ equal to the allowable public dose for an entire year. One-meter away, tied-up in traffic, people in their cars would get the equivalent of one X-ray per hour.²

In January 2008, Clark County, Nevada planner and former state transportation analyst Fred Dilger caused a state-wide uproar when he said that as the waste trains go through Las Vegas, "All of the casinos on the west side of Las Vegas Boulevard would be bathed in gamma radiation."³

The Yucca Mountain plan does not begin to address the nuclear waste problem. It merely transfers the risk of radiation accidents

and leaks to Nevada and to communities located along transport routes.

An August 1999 DOE report declared that leaving the waste at reactor sites is just as safe as moving it to Yucca Mountain, as long as the waste is repackaged every 100 years.⁴

Given the uncertainties about Yucca Mt. and the enormous risks of moving waste fuel, it makes much more sense to leave it at the power reactors while developing better alternatives. Independent scientists suggest on-site, aboveground, monitored storage, along with additional counter-measures for safety and security.

Yucca Mountain's Suitability Should Be Disqualified

Yucca Mountain's suitability as a long-term dump site has been challenged many times. A list of nine scientific reasons to disqualify the site follows. Any one of these major problems should have already disqualified the site.

1. In 2007, the Bow Ridge earthquake fault was discovered by the DOE to be hundreds of feet east of where scientists had estimated and directly under a planned pad where waste canisters would cool down before they become entombed in tunnels inside the mountain. A May 21, 2007 letter from the chief of the U.S. Geological Survey's Yucca Mt. Project Branch to the DOE's lead laboratory announced the "show stopper." The error means designers must revamp or scrap their plans. Project officials say they are still developing repository design, construction and operating ideas for the dump. The DOE has never produced blueprints that state officials can review for comments, and "Everything is conception designs and cartoons," said Bob Loux, director of the Nevada Agency for Nuclear Projects.⁵

2. In 2002, a mild earthquake on June 14 about 12 miles southeast of Yucca Mt. fueled opposition to plans for the nuclear waste dump. The magnitude 4.4 quake was called a "wake-up call" by opponents of the project. The critics pointed to the potential for damage to above-ground storage facilities, where tens of thousands of tons of the waste brought to the site would be kept for decades while it cools. "If anyone ever wondered about the wisdom of locating an underground radioactive dump site on an active fault line, this shows why," Rep. Shelley Berkley, D-Nev., said after the quake.⁶

3. In August 1999, evidence that the inside of the mountain is periodically flooded with water came in the form of Zircon crystals found deep inside. "Crystals do not form without complete immersion in water," said Jerry Szymanski, a former DOE geologist whose suggestion that deep water rises and falls inside Yucca Mt. was discarded by the DOE.⁷ "That would mean hot underground water has invaded the mountain and might again in the time when radioactive waste would still be extremely dangerous. The results would be catastrophic."⁸

4. In March 1998, the Yucca Mt. site was found to be subject to earthquakes or lava flows every 1,000 years — 10 times more frequently than earlier estimated — according to a California Institute of Technology study. The finding means that radiation dispersal from the Yucca Mt. site is much more likely during the proposed 10,000-year lifetime of the dump, not to mention the 250,000-year radioactive hazard period.⁹

5. In June 1997, DOE researchers announced that rain water has seeped from the top of Yucca Mt. 800 feet into the repository in a mere 40 years (as dated by chlorine-36). Government scientists had earlier claimed that rainwater would take hundreds or thousands of years to reach the waste caverns. Federal guidelines have long required that the existence of fast-flowing water would disqualify the site.¹⁰

6. In March 1995, physicists at Los Alamos National Laboratory dropped a bomb on the Yucca plan by charging that the wastes might erupt in a nuclear explosion, scattering radioactivity to the winds or into groundwater or both.¹¹ Dr. Charles Bowman and Dr. Francesco Venneri noted that serious dangers will arise thousands of years from now after the steel waste containers dissolve and plutonium slowly begins to disperse into surrounding rock. “We think there’s a generic problem with putting fissile materials underground,” Dr. Bowman said.¹² So serious a dispute so late in the planning process might cripple the plan or even kill it, the *New York Times* reported.

7. In July 1990, the National Research Council said the DOE’s plan for Yucca Mt. is “bound to fail” because it is “a scientific impossibility” to build an underground nuclear waste repository that will be safe for 10,000 years.¹³

8. In 1989, sixteen geologists at the U.S. Geologic Survey bluntly charged that the DOE was using stop-work orders to prevent the discovery of problems that would doom the repository.¹⁴ The government geologists reported that, “There is no facility for trial and error, for genuine research, for innovation, or for creativity.”¹⁵ Even the U.S. NRC complained then that work at Yucca Mt. seemed designed mostly to get the repository built rather than to determine if the site is suitable.¹⁶

9. In 1983, the National Academy of Sciences noted that the chemical characteristics of the water at Yucca Mt. are such that the wastes would dissolve more easily than at most other places.¹⁷

While plutonium-239 in the reactor waste is radioactive and deadly for essentially the rest of time, some reporters have lately been understating the duration of its toxicity. *New York Times*’ science writer Matthew Wald has noted that some of the waste “remains radioactive for millions of years.”¹⁸ A month later Wald wrote again, “Though the wastes that would go into the site would be hazardous for millions of years, predictions are limited to 10,000 years.”¹⁹ Nine years later Wald minimized the danger by an order of magnitude, writing, “The wastes would be dangerously radioactive for hundreds of thousands of years and would most likely reach humans through water flowing underground through the wastes and eventually reaching the surface through springs or wells.”²⁰

Department of Energy scientists know that the steel canisters will dissolve long before the waste’s radiation hazards are gone. Current canister designs envision a mere 10,000-year life span for the dump. Because of the million-year cancer dangers of the waste, “testing of the whole project is impossible,” according to Dr. R. Darryl Banks, biophysicist at World Resources Institute in Washington, as it “would require a time machine.”²¹

There are better alternatives than a Yucca Mountain dump. Storing the waste at reactor sites will allow time to give other plans the consideration they deserve and allow the most dangerous fission products (cesium-137 and strontium-90) to become less hazardous.

End notes:

¹ Nuclear Information and Resource Service SE, Report on Dec. 18, 1998, DOE “Viability Assessment” for the Yucca Mountain nuclear waste repository

² *Ibid.*

³ *Las Vegas Review-Journal*, Jan. 17, 2008

⁴ *Las Vegas Sun*, Mar. 27, 1995; *Washington Post*, Dec. 15, 1998

⁵ *Las Vegas Review-Journal* and *Las Vegas Sun*, Sept. 24, 2007

⁶ *Washington Post*, June 15, 2002

⁷ *New York Times*, Aug. 7, 1999 6. *The Christian Science Monitor*, Mar. 27, 1998

⁸ *The New York Times*, Aug. 10, 1999

⁹ *Christian Science Monitor*, Mar. 27, 1989

¹⁰ *The New York Times*, June 20, 1997

¹¹ *The New York Times*, Mar. 5, 1995

¹² *Ibid.*

¹³ *The Milwaukee Journal-Sentinel*, July 19, 1999

¹⁴ *The New York Times*, Jan. 17, 1989

¹⁵ *The New York Times*, Feb. 12, 1989

¹⁶ *The New York Times*, Jan. 17, 1989

¹⁷ *Ibid.*

¹⁸ *Ibid.*

¹⁹ *The New York Times*, Feb. 12, 1989

²⁰ *The New York Times*, June 20, 1997

²¹ *The New York Times*, Aug. 2, 1995

Nukewatch, PO Box 649, Luck, Wisc. 54853
(715) 472-4185 <nukewatch@lakeland.ws> <www.nukewatch.com>