

Statement of Reasons Supporting the Governor of Nevada's
Notice of Disapproval of the Proposed Yucca Mountain Project

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Governor of Nevada

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Honorable members of Congress, it is my privilege and duty, under Section 116(b)(2) of the Nuclear Waste Policy Act, to articulate my reasons for issuing a Notice of Disapproval of the designation of Yucca Mountain in Nevada as the site for the nation's high-level nuclear waste repository. I trust you will carefully consider Nevada's views. As a matter of science and the law, and in the interests of state comity and sound national policy, Yucca Mountain should not be developed as a high-level nuclear waste repository.

Introduction

Nevada strongly opposes the designation of Yucca Mountain for nuclear waste disposal because the project is scientifically flawed, fails to conform to numerous laws, and the policy behind it is ever changing and nonsensical. The Department of Energy has so compromised this project through years of mismanagement that Congress should have no confidence in any representation made by DOE about either its purpose or its safety. Nevada is not anti-nuclear and does not oppose nuclear power. Our state is pro-science and pro-common sense.

Because of the state's longstanding opposition to the Yucca Mountain project, some have accused Nevada of being a not-in-my-backyard, or NIMBY, state. Nothing could be further from the truth. Nevada has already borne more than its fair share of this nation's radioactive waste burdens.

During the Cold War, Nevada served as host to hundreds of nuclear weapons tests, most with bombs several times more powerful than the Hiroshima blast. The government misrepresented the risks and impacts of those tests to our citizenry, and many Nevadans were injured as a result. Nearly 300 million curies of toxic radioactive contaminants remain in the ground in our state to this day. We have not forgotten this legacy.

Nevada is also being forced by the Energy Department to play host to the world's largest low-level and mixed radioactive waste disposal facility, at the Nevada Test Site. DOE plans to use this site for the disposal of hundreds of millions of cubic feet of radioactive and hazardous garbage and contaminated soil from the nation's nuclear weapons complex. Tens of thousands of shipments of this waste through our state are anticipated.

Once upon a time not long ago, the concept of “environmental equity” would have made it unthinkable, given the sacrifices already imposed on Nevada, that the state would be forced to play host to yet an additional nuclear waste dump – indeed, the dump to end all dumps. DOE plans to use Yucca Mountain for the disposal of 77,000 tons of high-level radioactive waste and spent fuel from throughout the United States and 42 other countries. And we know if we permit it to happen, it won’t end there.

But Nevada will not permit it to happen. Not simply because it is the wrong thing to do, at the wrong time, from the standpoint of environmental equity. Even when carrying the load of others, Nevadans will never tire of serving their country for a worthy cause.

We will not permit Yucca Mountain to happen – and it will not happen – because the project is manifestly *not* a worthy cause. Yucca Mountain is but the latest in a long series of DOE boondoggles – one based on bad science, bad law, and bad public policy. In addition, better, cheaper, and safer alternatives exist. Finally, national security will not be helped, but hindered, by this ill-advised project.

Some say Nevada should acquiesce to the project because the Yucca Mountain repository is now inevitable. Obviously, they fail to understand Nevadans, or the power of the American legal system. I assure you, the only thing inevitable about Yucca Mountain is that it will plot the course of so many other doomed DOE mega-projects.

The Science

Although DOE bureaucrats claim the Yucca Mountain site is suitable for nuclear waste disposal based on “sound science,” it is hard to find a *scientist* who agrees. Even the project’s apologists know that hundreds of technical issues remain unresolved. Initially, the scientific community was optimistic about the prospects of Yucca Mountain. When Congress selected the site in 1987 for intensive study, preliminary data showed it would likely have good geology. In the past four years, however, DOE’s own studies proved the mountain was in fact so porous to water, and otherwise so geologically unfit, that the very concept of geologic isolation of the waste had to be abandoned. But geologic isolation was the very purpose of the federal repository program.

DOE no longer refers to the Yucca Mountain project as a deep “geologic” repository. Rejecting the global scientific consensus that nuclear waste should be disposed of by means of geologic isolation, DOE now calls Yucca Mountain merely a deep “underground” repository. This is no surprise. There is nothing “geologic” about it. As the former director of the Yucca Mountain project, Dr. John Bartlett, recently testified, the project has become nothing more than a series of fancy engineered waste packages that just happens to be located 1000 feet underground. The Nuclear Energy Institute recently bragged that the repository can be licensed “without the mountain.”

Which begs several questions: If the mountain itself is irrelevant, and waste packages can now be made to last for 10,000 years, why make tens of thousands of

shipments of lethal radioactive waste through the nation's cities to the seismically adverse, volcanic zone of Yucca Mountain? It can go practically anywhere else – or stay where it is. If the only reason the waste must be buried is to protect it from terrorists, why spend \$60 billion putting it 1000 feet underground, when a mere 20 feet would do the job? And this could surely be done at the reactor sites. NRC has recently re-affirmed the safety of on-site storage.

In the absence of geologic isolation, we don't believe for a minute that DOE can demonstrate the long-term safety of the Yucca Mountain repository. We don't believe an agency that, as the General Accounting Office has noted, has rarely succeeded at building anything can now build a first-of-a-kind waste package that will soak in Yucca Mountain groundwater for 10,000 years without a leak.

DOE's computer models of Yucca Mountain repository performance and radiation emissions currently have an uncertainty factor of up to 10,000. This incredible number bears some pondering. Imagine if a salesman with nothing but fancy computer models told you the brakes on his new model car would be safe for 10,000 miles, plus or minus an uncertainty factor of 10,000. Think about it. What this means is, your brakes could be safe for as many as 100 million miles, or as few as *one* mile. We simply can't know.

Maybe we Nevadans are a people of uncommon sense. Because that's a car we simply wouldn't buy. That's a car we wouldn't let on our roads.

DOE has yet to finish the very design of the Yucca Mountain repository. We don't even know whether it will be a high temperature repository (above the boiling point of water) or a low temperature repository (below the boiling point of water), a feature that could change the amount of real estate required for the project by up to a factor of 10. Imagine if you submitted a plan for your new house to local authorities for a building permit. You tell them: It may be a 4,000 square-foot gas-heated house, or a 40,000 square-foot all-electric house; the design is still unfinished. I don't have to tell you what our local authorities would do with that plan.

The scientific uncertainties of the Yucca Mountain project are so numerous as to defy enumeration. Attempting to count them all, the Nuclear Regulatory Commission recently identified 293 unresolved technical issues in 9 critical areas. Though DOE dismisses these as trivial, perfunctory, or problems that will be solved "as we go" over the next 300 years, their mere specification belies this claim.

The unresolved issues include critical matters such as volcanism: DOE's gamblers say the odds of a volcano at Yucca Mountain are only 1 in 70 million per year. Yet, there have actually been three active volcanic eruptions within 50 kilometers of the Yucca Mountain site in the past 80,000 years. Indeed, Nevada's geologic studies indicate Yucca Mountain appears to be at the center of one of the most potentially active volcanic areas in the west.

Unresolved are issues such as the seismic integrity of the site: Yucca Mountain sits dead-center in one of the largest earthquake fault zones east of California. In 1992, a magnitude 5.6 earthquake caused tens of thousands of dollars of damage to DOE's own facilities right at Yucca Mountain. More than 600 earthquakes greater than magnitude 2.5 have been recorded at Yucca Mountain just in the past two decades.

Among other things, there remains a real question whether the above-ground storage facility required to facilitate storage and burial of spent fuel at the site can ever meet Nuclear Regulatory Commission temporary storage standards, given the site's adverse seismicity. In other words, it may not be possible to license an above-ground concrete storage pad at this earthquake-prone location. What does this say about the safety of the complex underground facility? And why is it not necessary for DOE to complete seismic studies before plunging ahead with a site determination?

The plethora of unresolved issues includes critical problems such as rapid groundwater flow through the repository: Flows measured by DOE have been more than 100 times greater than was expected when Congress designated Yucca Mountain in 1987 as the only site to be characterized. Surface water that was supposed to have taken thousands of years to pass through the planned repository area to the underlying water table was found to have actually done so in less than 50 years. One former NRC Commissioner visiting the underground test area at Yucca Mountain described its humid environment as a "tropical rain forest."

Secretary Abraham recently wrote, in a *Washington Post* Op-Ed piece March 26, that "Yucca Mountain has an average precipitation of under 8 inches a year, less than half an inch of which actually makes it below the surface." If that is true, Mr. Secretary, why has DOE posted a sign deep within the mountain informing visitors not to worry about liquid dripping from the ceiling of underground caverns, that this liquid is only water, and that it is normal for the subterranean environment of Yucca Mountain? Why is DOE proposing to build a \$5 billion titanium "drip shield" around buried spent fuel to channel away effusive dripping water?

The tangled web of man-made contrivances necessary to compensate for the stunning geological surprises at Yucca Mountain has turned the repository system into a kind of Rube Goldberg contraption. To prevent the unexpected water from corroding spent fuel containers, a titanium drip shield is required for each package to channel water away from the containers. But channeled water is apparently subject to boiling from the decay heat of buried spent fuel. Therefore, say independent experts, the repository must be redesigned to space the fuel packages further apart, vastly increasing the real estate, and of course the amount of titanium, required. But there may not be enough real estate within the Yucca Mountain site boundary to do that. And the titanium itself is subject to corrosion. Therefore, all waste packages must be fabricated from a "miracle metal," Alloy-22, to prevent them from corroding if the drip shield fails.

And what about Alloy 22? You guessed it. As recently as last month, the Chairman of the Nuclear Waste Technical Review Board wrote DOE that so little is

known “it is not currently possible” to assess the likelihood of corrosion of Alloy 22 for the thousands of years that will be required to assure the safety of the facility. Indeed, Nevada’s independent laboratory tests of Alloy 22 showed corrosion in less than half a year. And the titanium apparently fares no better. Just two weeks ago, DOE’s own Waste Package Materials Performance Peer Review Panel issued its report with the astonishing revelation that, unless the proposed titanium drip shields somehow perform better in the ground than they have in laboratory tests, they *cannot be used* at Yucca Mountain. What’s next? Maybe the drip shield will need a drip shield.

Secretary Abraham calls this “sound science.” We beg to differ.

The Law

Nevada currently has four legal actions pending against the Yucca Mountain project. These include a challenge to the siting guidelines re-released at the eleventh hour by DOE, and a challenge to the Environmental Protection Agency’s gerrymandered health and safety standards for Yucca Mountain licensing. They include a challenge to DOE’s misuse of Nevada’s precious water resources, and a challenge to the legal soundness of both the Secretary’s and the President’s Yucca Mountain site recommendations.

At least two additional actions, one challenging DOE’s Environmental Impact Statement, and one challenging NRC’s Yucca Mountain licensing rule, will be filed imminently by Nevada.

These are each serious lawsuits, raising fundamental, dispositive legal issues – issues that ought to concern every member of Congress. Issues such as whether DOE cavalierly ignored the dictates of your institution and blatantly violated the Nuclear Waste Policy Act or the National Environmental Policy Act. Issues such as whether the repository is fundamentally unsafe even if it is theoretically “licensable.” Issues such as whether radioactive emissions from the site can be declared safe by EPA merely by first diluting them in Nevada’s drinking water.

We are not suing simply for the sake of suing. We are suing to enforce the law, because, unfortunately, government bureaucrats pushing Yucca Mountain have chosen to ignore it. It is not necessary for us to win them all, though we believe all are legally sound. One and only one will suffice.

It is astounding to Nevada that DOE refused to postpone its site recommendation pending the outcome of any of these lawsuits. After all, DOE itself says it will not be ready to submit a license application to NRC until at least December 2004. What, then, is the rush? It is likely that all of Nevada’s cases will have been decided long before that time.

Let me describe to you just one of our lawsuits – the one against DOE. It’s really quite remarkable: After 17 *years* of using one set of site suitability rules, DOE made the

surprising determination that Yucca Mountain, unlike the WIPP nuclear waste repository in New Mexico, couldn't pass the "good geology" test. Instead of reporting this bad news to Congress, as the law requires, DOE changed the rules late last fall. A mere 17 days or so later, DOE proclaimed the site "suitable" using these new rules, ignoring the bedrock geologic isolation requirements of Congress. "Good geology" – the cornerstone of every high-level nuclear waste repository program in the world – was simply ignored by DOE.

To Nevadans, we are like passengers sitting on the runway in a brand new experimental aircraft for 17 hours while mechanics crawl all over the plane inspecting it. After this enormously long wait, the mechanics finally determine the plane is unfit to fly. At the same time, bureaucrats come on the loudspeakers: "Not to worry, folks. We've just changed the flight fitness rules, and the plane will be taking off in 17 seconds." Needless to say, that's a plane none of us would dare dream of flying. But that is exactly what DOE has done with Yucca Mountain.

The *New York Times* recently published an editorial suggesting Congress should simply approve the Yucca Mountain site recommendation and refer all remaining issues of site suitability to the NRC, which was purported to have the expertise to make appropriate decisions in this regard. Remarkably, notwithstanding his own agency's clear statutory duties, Secretary Abraham likewise adopted this view in his recent editorial.

This approach, however, poses both a scientific and a legal paradox. DOE and NRC have each taken the position, in their respective Yucca Mountain rules, that site suitability is a matter to be assessed by *DOE* and its geologists, not by NRC and its nuclear engineers. Under NRC's current licensing rule for Yucca Mountain (which Nevada will soon fight in court), site suitability is presumed determined the moment the Yucca Mountain application comes in the door. NRC merely determines repository licensability, not Yucca Mountain site suitability. NRC will not evaluate the suitability of Yucca Mountain's geology. That was supposed to have been DOE's job.

Adopting the approach suggested by the *New York Times* would mean DOE's bogus site suitability determination could never be reviewed on the technical merits. On an issue of this magnitude, Nevada and the country as a whole deserve their day in court. And we think Congress should wait until that day has come and gone.

National Security and Public Policy

In the wake of the terrorist attacks of 9/11, DOE has tried to paint the Yucca Mountain project as a badly needed national security measure. A well-financed promotional campaign by the nuclear industry appears to have helped shape the public policy debate in this regard. The Secretary himself, in his *Washington Post* piece last month, strongly urged that "*one safe site*" for the nation's nuclear waste is best for national security, rather than having the waste scattered at numerous reactor sites across

America. This national security myth is one that can and must be debunked. The Yucca Mountain site will contribute nothing to national security.

Even if you believe DOE's optimistic schedule, Yucca Mountain will not be ready even to begin receiving spent fuel from reactor sites for a decade. DOE plans to ship 77,000 tons of high-level waste and spent fuel – the project's design capacity – in up to 98,000 shipments extending through 2046. Once there, the spent fuel will remain stored above ground at Yucca Mountain for up to 100 years while it cools. In the meantime, reactors (many operating on renewed licenses) will continue to generate at least 2000 additional tons of waste each year.

By 2046, even if (in the unlikely event) Yucca Mountain proceeds on schedule, there will be *at least* 77,000 tons of additional waste still stored at reactor sites, awaiting shipment to a supposed second repository. As the waste is removed, it will merely make room for an equivalent amount of newly generated waste that will take its place at the various sites. I'm no nuclear engineer, but this sounds like the status quo to me. I fail to understand how this aids national security.

DOE's Acting Director of the Yucca Mountain project affirmed last month before a House appropriations committee that as long as there are nuclear reactors operating, there will continue to be spent fuel stored above ground at sites all across America. In fact, he confirmed, given the slow pace at which spent fuel will be transported to Yucca Mountain, together with the fact that newly generated waste will continue to pile up almost as fast as the old waste is removed, the current backlog of 46,000 tons at plant sites now *will never be less than 42,000 tons* by the time Yucca Mountain is filled to its design capacity. In short, Yucca Mountain will change nothing.

And that may not be the end, but apparently only the beginning. In its annual strategic plan, "Vision 2020," the Nuclear Energy Institute claims utilities will build as many as 50 new nuclear plants by 2020 if their growing nuclear waste stockpiles are bounded by the availability of Yucca Mountain. More waste is coming to your jurisdictions, not less.

The bottom line is this: Even if Yucca Mountain proceeds, spent fuel will continue to be stored above ground at reactor sites across America for many decades, perhaps centuries, to come. Secretary Abraham's "one safe site" is a figment of DOE's imagination. The Yucca Mountain site is neither "safe" nor will it ever be "one."

The solution to the security issue is to shore up existing storage facilities and increase security at the reactor sites – not to magnify the existing storage facility targets with shipments of tens of thousands of mobile, new targets traversing the country on their way to a geologically flawed Yucca Mountain repository. Not to expose tens of millions of additional citizens to the risks posed by spent fuel packages.

Utilities across the nation are now building interim dry storage facilities, where spent fuel will be stored in casks capable of safely containing the fuel for up to hundreds

of years. Several such interim storage facilities are already operating at various utility sites. Since, in any event, these casks will be stored on site for many decades, some experts say they should be covered in a concrete containment to shield them from terrorist attack. NRC is studying the use of anti-aircraft guns at nuclear sites. Reactor sites already have armed guards and comprehensive security plans. Given these measures, the casks will continue to be far more secure at reactor sites than they will ever be on the streets of St. Louis, Chicago, or Peoria – or on barges cruising the Hudson River.

What really *does* implicate national security is the widespread shipment of spent fuel in casks that, we now know, are not impervious to ubiquitous armor-piercing weapons. It was surprising for us to learn recently from NRC that, since 9/11, the only analysis done by industry or the government of the impacts of terrorism on spent fuel shipments involved merely a computer simulation of a Boeing 767 engine (unaccompanied by aircraft and fuel) striking a railcar shipping cask at 350 miles per hour. Not to worry, said the modelers: the virtual train car moved only a virtual tenth of an inch from the virtual impact, and the virtual lethal waste was contained.

To anyone who watched in horror as the twin towers of the World Trade Center collapsed, this timid virtual test result seems more than a bit incredible. On the other hand, the possibility of a terrorist shooting at a cask from the back of a pickup truck with a small optically-guided armor-piercing missile has been considered by NRC and the industry as “too remote.” We once heard the same about suicide bombers.

Thanks to a secret videotape of an industry-sponsored test done by the Army at the Aberdeen Proving Grounds in 1998, obtained last month by Nevada representatives, we now know such a weapon can blow a hole through even the heartiest of spent fuel casks. According to credible sources, there are over 500,000 TOW missiles alone in circulation in at least 36 countries, including over 1700 in Iran. These missiles can penetrate up to 30 inches of armor. Smaller, hand-held weapons in widespread use, like the Stinger, can pierce up to 15 inches of steel.

If Yucca Mountain proceeds, just one of these could potentially give a terrorist access to tens of thousands of radioactive “dirty bombs,” with free delivery to hundreds of U.S. targets. Clearly, this is an issue warranting careful investigation by Congress, not a cover-up of the facts by DOE. Many in Congress already share my view; hearings on the security of waste transport to Yucca Mountain are scheduled for later this spring.

In responding to our legitimate concerns, some have accused Nevada of fear-mongering, claiming the Aberdeen test was flawed, that a small missile would “only” blow a six-inch hole in some casks, that few if any people would die in such an event, and that further tests are unnecessary. Since no one has studied the issue in light of current events, however, we don’t really know. If DOE will not undertake these studies, surely Congress must. If Nevada’s mere mention of the potential event is causing fear, imagine the panic if, God forbid, it actually happens.

The “PECO Alternative”

Though the nuclear industry seems to prefer you didn't know it, there *is* a viable alternative to Yucca Mountain – one that has already been quietly embraced by DOE and at least one utility, PECO Energy, a division of the nation's largest nuclear utility, Exelon Corporation.

In June 2000, PECO signed a deal with DOE that would ultimately have DOE take title to PECO's spent fuel on-site at the Peach Bottom nuclear plant in Pennsylvania. PECO will construct a dry storage facility, ownership of which will also eventually be assumed by DOE. At a date certain, DOE will own, operate, and manage the facility, with the waste stored there in robust, dry casks for the indefinite future. Funds for the deal are provided from the \$8 billion Nuclear Waste Fund.

At the time, DOE touted the deal as an arrangement all nuclear utilities should follow. And for good reason. If adopted by the industry, the PECO alternative would solve a host of pressing problems.

First, it would end all utility spent fuel lawsuits against DOE – now estimated to pose up to a \$58 billion contingent liability. Second, it would allow utilities to remove spent fuel liabilities from their books and decommission their retired nuclear plants on schedule. Third, it would remove the fuel from utility rate bases and the jurisdiction of state utility commissions, ending their numerous lawsuits against DOE as well. Fourth, it would buy the government time to find a viable new repository or develop new technologies to vastly reduce the dangers of nuclear waste. (Many of these technologies, under development at our national laboratories, already look promising.) Fifth, as Senator Domenici has long indicated, it would preserve the substantial energy content of spent fuel for later use if necessary to supplement the nation's energy needs. Finally, implementing the PECO alternative would cost ratepayers and taxpayers merely pennies on the dollar to the estimated \$60 billion (and growing) price tag of Yucca Mountain.

Far from embracing the deal, however, a group of competing utilities sued last year to block it, claiming, ironically, that it gives PECO an unfair economic *advantage* over utilities who choose to sue the government and place their bets on Yucca Mountain. A ruling is expected from the Eleventh Circuit Court of Appeals soon. Rather than await this key decision, DOE pressed forward with its Yucca Mountain site recommendation as if its own PECO deal were nonexistent. The PECO alternative is not even mentioned in the 67 pounds of Yucca Mountain documents DOE recently sent to the President. It is not even mentioned in the so-called “no action” alternative to Yucca Mountain in DOE's voluminous Final Environmental Impact Statement. Yet, when the deal was signed less than two years ago, DOE endorsed it as “a precedent for additional settlement negotiations with other utilities.”

I urge Congress to explore DOE's arrangement with PECO in detail. I applaud the deal made by the nation's leading nuclear utility in the state of our new Homeland Security Director, Tom Ridge, while he was a fellow Governor in Pennsylvania. The

PECO arrangement is a convincing and practical alternative to a diseased and utopian Yucca Mountain project. It is a *real* contributor to national security, not a mythical one.

Conclusion

The State of Nevada will redouble its efforts to bring science and the law back to the nation's high-level waste program, and to restore sanity to America's nuclear energy security policy. But we are not alone.

A growing chorus of scientists and independent technical reviewers has voiced grave reservations about the project. These include the NRC's Advisory Committee on Nuclear Waste, the General Accounting Office, the Congressionally-created Nuclear Waste Technical Review Board, the National Academy of Sciences, *Physics Today*, the International Atomic Energy Agency, and the OECD's Nuclear Energy Agency, among others. A recent national poll concludes that those Americans opposed to Yucca Mountain now equal in number those in favor.

I urge each and every one of you to look carefully at the facts. Yes, Yucca Mountain is the most studied piece of real estate in the world. What the studies starkly *concluded*, however, has been overshadowed by the mere fact they occurred. A hundred more years of study will not change the fatally poor geology of Yucca Mountain, or remove the site from an earthquake fault zone. Nor will decades of moving waste across the countryside to Yucca Mountain even dent the amount of spent nuclear fuel stored above ground at nuclear sites throughout America.

We are well beyond the days when Yucca Mountain was simply Nevada's problem. If the project proceeds, high-level nuclear waste shipments will impact as many as 44 states, 703 counties, and 109 cities with populations of 100,000 or greater, including several major metropolitan areas. Nearly 50 million American citizens reside within three miles of a proposed shipping route. There will be more spent fuel shipments in the first year of Yucca Mountain operations than occurred in the entire history of such shipments in this country. We are in this together.

In short order, Congress will have the prerogative to consider my Notice of Disapproval and, under procedures in the Nuclear Waste Policy Act, override it by simple majority vote in both houses, with a signature by the President. I respectfully urge Congress not to take such action. With the proliferation of safe, economical dry storage facilities at reactor sites, we face no spent fuel emergency. Nuclear power plants face no risk of shutdown. We have the time to do this right. And Yucca Mountain is not right.

Nevada deserves better, and so does this nation.

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For additional information, see Nevada's Yucca Mountain website at www.state.nv.us/nucwaste. This Statement of Reasons has been posted there.