

Nye County Nevada Perspectives on the State of the Yucca Mountain Project - 12388

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ABSTRACT

Responding to the Department of Energy decision to try to withdraw the Yucca Mountain license application and the Administration actions to close down the Yucca Mountain project, Nye County undertook a number of activities to articulate its support for continuing the Yucca Mountain project. The activities included responding to inquiries from federal agencies, including investigations undertaken by the Government Accountability Office addressing other potential uses for the Yucca Mountain site, responding to a Draft Environmental Impact Statement on the possible use of Yucca Mountain for disposal of Greater than Class C wastes, testifying in hearings, and interacting with the President's Blue Ribbon Commission on America's Nuclear Future. The paper summarizes Nye County's position on the Yucca Mountain repository, Nye County's perspectives on the various activities that were developed and considered by the Government Accountability Office, Nye County's concerns with the use of the Nevada National Security Site for Disposal of Greater than Class C Low-Level Radioactive Wastes, testimony of Nye County officials expressing local community support for the Yucca Mountain project, and Nye County's perspectives on recommendations provided by the Blue Ribbon Commission to move the nation's high-level radioactive waste disposal programs forward without consideration of the role Yucca Mountain could have served in those recommendations.

INTRODUCTION

While, officially, Nye County is neither for nor against the Yucca Mountain repository, it has had an oversight and independent science program since the early 1990's. The scientific work performed by Nye County scientists, and their review of Department of Energy work, demonstrated that the repository likely could be developed and operated safely. Yucca Mountain could be a technically successful repository with the potential for very significant economic development for the County and the State.

It is important to remember that Yucca Mountain was one of three sites recommended by the Department of Energy and approved by the President in 1986 for detailed site characterization. This point was reached by following the direction of Congress as laid out in the Nuclear Waste Policy Act. While forgotten by many, especially those opposed not only to Yucca Mountain but any repository, there were nine sites considered for the first repository program. Draft Environmental Assessments were prepared for each of the nine sites, and the potential suitability of the sites was assessed through Department of Energy siting guidelines that evaluated the potential for compliance with Environmental Protection Agency and Nuclear Regulatory Commission regulatory requirements. To determine which of the sites would be recommended for site characterization, the Department applied sophisticated multi-attribute utility analyses [1]. Yucca Mountain was the highest ranked of the 3 sites approved for characterization. The 1987 amendments to the Nuclear Waste Policy Act [2] designated Yucca Mountain as the only one of these sites to be characterized.

In July 2002, in accordance with provisions of the Nuclear Waste Policy Act, as amended, Congress overrode a State of Nevada notice of disapproval and Yucca Mountain was designated to be the site for a permanent repository for United States spent nuclear fuel and high level radioactive waste [3]. Nye County has actively engaged in repository oversight for over 20 years, both conducting independent scientific investigations and evaluating the Department of Energy's work. Nye County was a cooperating agency with the Department of Energy in preparing the environmental impact statements that accompanied the license application, and its views are reflected in those documents.

NYE COUNTY POSITION ON DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTE AT YUCCA MOUNTAIN

Nye County has adopted a position of active and constructive engagement with the Department of Energy and with participation in the license application process. In a series of Resolutions, the Nye County Board of County Commissioners has expressed its support for the Yucca Mountain project. Notable among these are: the Resolution Stating the Intent of Nye County to Actively and Constructively Engage with the U.S. Department of Energy (DOE), the Administration, and Congress as the Yucca Mountain Project Proceeds to Final Design, Licensing, and Implementation [4]; and, the Resolution Supporting Completion of the Nuclear Regulatory Commission's Review of the Yucca Mountain License Application [5]. In filings with the Nuclear Regulatory Commission in the Yucca Mountain license application, the County noted "Provided that the concerns raised by Nye County in its contentions filed today are addressed and satisfied by NRC's inclusion of appropriate conditions on construction authorization, Nye County believes that the repository will be constructed and operated in a manner which adequately protects the residents of Nye County and the public from radiological releases and exposures" [6].

When Congress amended the Nuclear Waste Policy Act Amendments in 1987, it provided money for local communities impacted by Yucca Mountain to fund oversight activities. Nye County used that money to create an extensive independent science program, using unbiased scientists to conduct the work. After years of effort they found no reason to believe that the repository could not be built and operated safely. The work was of high quality and the results were available to everyone. The Department of Energy used Nye County information in the Yucca Mountain license application. While Nye County's oversight program did not answer every question about the safety of Yucca Mountain, the County was able to conclude that the Yucca Mountain repository could be built and operated safely. Nye County was actively involved in the now suspended Yucca Mountain licensing process. Six Nye County contentions related to enhancing public safety and environmental protection were admitted for consideration in the licensing proceeding. All of these contentions specified simple and inexpensive remedies. In comparison, the State of Nevada filed over 200 contentions demanding that the Yucca Mountain license application be summarily rejected and the project abandoned.

As in most things, when it comes to a radioactive waste repository, the safety of Nye County citizens is always the first consideration. A positive aspect of repository policy in this country is State and local government oversight specified in the Nuclear Waste Policy Act. Such ongoing oversight is valuable, if it is undertaken in an objective and constructive way, but it is expensive and would not be possible for any rural community to participate without Federal funding such as provided by law. Recent political developments have interfered with and severely affected

the chances of the Yucca Mountain repository ever being built and operated. They have also put the future development of new nuclear-powered electric generation in jeopardy.

Since 1987, Nevada officials elected statewide consistently have been on record as being opposed to the Yucca Mountain Repository. While campaigning in Nevada, then Senator Obama stated that if elected, he would stop the Yucca Mountain project. As president, Mr. Obama has followed through and declared that Yucca Mountain is not a “workable option” He directed the formation of a Blue Ribbon Commission to implement the administration’s policy to find other options to deal with the high-level radioactive waste issues [7]. The creation of the Blue Ribbon Commission was shadowed by an intimation that the science supporting the recommendation and licensing of Yucca Mountain was bad, a position that has not yet been substantiated. In spite of the stated objectives of the March 2009 scientific integrity policy directive of the Obama Administration [8], in the case of Yucca Mountain, politics appear to have trumped sound science and safety considerations.

In Nye County’s view, the US Nuclear Regulatory Commission process should decide the question of repository safety and provide the supporting scientific basis rather than relying on unsupported political rhetoric that merely says there are better options without stating them. The original intent of Congress in passing the Nuclear Waste Policy Act was to define a process that might survive changes of administration over a period of decades. After nearly 30 years of bi-partisan actions, survival of this process is in doubt.

ALTERNATIVE USES FOR THE YUCCA MOUNTAIN SITE

On February 2, 2010, Senator Reid sent a letter [9] to the Government Accountability Office noting that: “Now that forward progress on making Yucca Mountain the dumpsite for the nation’s nuclear waste has ended, we now need to keep this from being a total loss to the taxpayers and find a responsible way to use the Yucca facility.” He asked them to examine how the site could be used for activities unrelated to storing nuclear waste, including: national security activities, including armed services readiness; intelligence gathering, and defense technology testing and demonstration; renewable energy technology development, testing, and demonstration; arms control, verification, weapons detection, and other nonproliferation-related activities; a laboratory for sensitive work requiring either underground or remote experimentation; or a facility for government continuity-of-operations activities.

Nye County was afforded the opportunity to review portions of the work supporting the Alternative Use Study and provided comments on several of the possibilities examined. With an aim of being reasonable and honest about potential alternative uses, Nye County concluded it could support any viable alternative use of Yucca Mountain as long as such use posed no significant safety threat to the citizens of Nye County, and provided comparable economic benefits in lieu of those forfeited by the abandonment of the Yucca Mountain Project.

Stakeholders contacted proposed 30 alternative uses of the Yucca Mountain site [10]. The specific alternative uses examined included utilization of Yucca Mountain for an underground nuclear reactor, a geologic laboratory or storage facility, a research facility for advanced nuclear, defense, or information technologies and the possibility of solar energy and geothermal energy development. The Government Accountability Office found no broad consensus among the experts consulted about the benefits and challenges of these uses; many potential uses were found to be costly, likely would have required federal assistance, and likely would face

significant challenges. Several experts noted that many proposed alternative uses could be undertaken elsewhere.

Almost all of the alternative uses considered required significant additional excavation for the existing facility to be viable for the proposed use. Considering that the Exploratory Studies Facility is a tunnel and that access is limited to the two existing portals, any use that alters its original intended purpose will limit access from one end or the other. The existing ventilation system was developed for construction of the five mile long tunnel. It would be very sensitive to any construction or facility that impeded air flow in the tunnel. The tunnel is in igneous rocks so there will be radon gas present. The buildup of radon gas is very sensitive to ventilation efficiency and may limit underground activities. The rocks of Yucca Mountain are high in silica content; the rock is hard, and silica dust has been associated with lung disease. This is not an insurmountable issue, but the cost of such excavation is slightly higher than for other rocks.

The proposals for weapons testing, especially the bunker buster concept that could result in the destruction of the facility would seem to be a potentially significant waste of a very expensive facility. Portions of the Yucca Mountain Site are on Bureau of Land Management, Air Force, and Department of Energy controlled lands; both portals are on Department of Energy controlled land. The Yucca Mountain project was operating on Right of Way agreements with the understanding that at some point in time a Yucca Mountain Land Withdrawal would establish clear ownership; the issues of land use remain for any non-weapons test use of the area. It is long understood that as long as the facility remains part of the Nevada National Security Site, and the existing Right of Way agreements remain in force, activities at Yucca Mountain will be subject to Department of Energy Orders and Operating Procedures. In relationship to what would be applied to a commercial facility, these are onerous, if not very expensive issues to address. These costs would likely dissuade anyone from operation of a commercial venture.

There is limited water available in the Amargosa Valley. The water in parts of the region is oversubscribed relative to that available, and the State Engineer allocates water with a principal emphasis on beneficial need. Whatever is proposed must compete with existing water rights. Further, there are already case law issues that the water appropriated for the Nevada National Security Site's uses cannot be used for any other purpose (this is the reason that Yucca Mountain had to get its own water appropriation for site characterization, which was subsequently revoked because the State Engineer ruled the use was not beneficial).

DISPOSAL OF GREATER THAN CLASS C WASTES

During this same time the Department of Energy issued a draft Environmental Impact Statement for the Disposal of Greater than Class C Low-Level Radioactive Waste [11]. This Environmental Impact Statement was of particular interest to Nye County, as current U.S. regulations require disposal of such wastes in a geologic repository. EIS scoping hearings had been held when Yucca Mountain was still considered viable by the Department of Energy. In fact, the Yucca Mountain Environmental Impact Statement had evaluated disposal of such wastes. The new Environmental Impact Statement contemplated disposal of the wastes in shallow trenches at existing low-level waste facilities at the Nevada Nuclear Security Site.

Nye County believes that Greater than Class C radioactive waste must be disposed of safely with a containment system designed pursuant to applicable regulations and licensing with independent, non-Department of Energy oversight. Stated succinctly, Greater than Class C

wastes need to be in a repository regulated by the Nuclear Regulatory Commission. At this time, only Yucca Mountain could potentially meet that requirement.

Selection of a Nye County location must ensure that the health, safety and economic well being of the County and local communities near the disposal sites are adequately protected and receive tangible benefits from the Federal Government's actions, not just the burden of an additional, long-term, radioactive source located at a site in perpetuity. Otherwise, there should be no further consideration of either of the Nye County sites, whether it is Yucca Mountain or the Nevada National Security Site. Further, all potential direct and cumulative impacts arising from the transportation and disposal of the Greater than Class C waste must be identified and mitigated. This would entail a long-term monitoring program, developed in cooperation with Nye County and funded by the Department of Energy, as an essential element.

TESTIMONY TO THE HOUSE SUBCOMMITTEE ON THE ENVIRONMENT AND ECONOMY

Nye County was afforded an opportunity to appear before the House Subcommittee on the Environment and Economy. At that hearing the Chairman of the Nye County Board of County Commissioners testified that there is indeed local community support for a repository at Yucca Mountain. As previously noted, Nye County has passed a resolution of support for completing the Yucca Mountain license application. This view is shared by the leaders of other rural Nevada counties; similar resolutions have been passed by Esmeralda, Mineral, Lander, Churchill, and Lincoln counties. Thus, six rural counties that would be impacted most by Yucca Mountain have called on the Nuclear Regulatory Commission to complete the Yucca Mountain licensing process. These counties are on record that they are willing to accept the results of a fair, scientific review process. The resolutions state that the decision on Yucca Mountain should be made based on sound science and this can only happen after a full review by the Nuclear Regulatory Commission. If the Nuclear Regulatory Commission determines that the repository is safe, the counties favor its construction. These counties encompass an area of more than 46,500 sq. mi. That is equivalent to an area more than 215 miles on a side, the distance from Washington, DC to New York City. That area is also larger than the areas of eighteen states, including Pennsylvania, Ohio, or Virginia. It is also larger than a number of countries, including, for example, Portugal, Austria, or Iceland.

Beyond the political leaders of those counties, a majority of the residents also support the license application. The Chairman of the Nye County Board of County Commissioners testified that all five current Nye County Commissioners expressed their support for Yucca Mountain and all were elected or reelected by their constituents. To get the full picture, however, there is a need to see all the evidence from every source. That includes information and analysis by the Department of Energy, by the staff of the Nuclear Regulatory Commission, and by the State of Nevada. Every piece of evidence must be reviewed so that a final determination of the safety of Yucca Mountain can be made. That determination can only happen if the licensing process is completed. If the Nuclear Regulatory Commission determines that a repository at Yucca Mountain cannot be built and operated safely, the County would object to its construction. The Nye County position is to follow the law, see that the facts are determined in a scientific way through the established legal process, and let the facts, not politics, dictate the result.

INTERACTIONS WITH THE BLUE RIBBON COMMISSION

Nye County's interactions with the Blue Ribbon Commission endeavored to establish a correct understanding on the part of the Commission members, and documenting in the Commission's

records, information on the level of local community support for the Yucca Mountain program. Further, the interactions served to provide a constant reminder to the Commission that until the Nuclear Waste Policy Act is changed, or the Nuclear Regulatory Commission finds that the license application is not technically credible; developing a repository at Yucca Mountain is the law. The failure of the Commission to address the only alternative legally authorized in the U.S. today for disposal of spent nuclear fuel and high-level radioactive waste is unconscionable.

The charter of the Blue Ribbon Commission on America's Nuclear Future is to conduct a comprehensive review of all policies and alternatives for managing the back end of the nuclear fuel cycle. Nonetheless, deliberations and draft recommendations of the Commission fail to consider the only alternative legally authorized in the U.S. today for disposal of spent nuclear fuel and high-level radioactive waste. With wastes accumulating in greater volumes due to reactor life extensions, and growing interest in advanced reactor technologies, the decision by the Department of Energy to cease the development of the Yucca Mountain repository and seek an unattainable alternative solution is simply not justifiable.

At the February 1, 2011 Blue Ribbon Commission meeting in Washington, D.C. expert witnesses present for the meeting testified to the importance of local government support and the necessity of a definitive role for state government. It took eleven years for the State of New Mexico to agree to the terms of its definitive role with the Waste Isolation Pilot Plant. Today, Yucca Mountain sits, hi-jacked by the politics of a single powerful senator and what some view as complicity by the Nuclear Regulatory Commission Chairman. As a minimum, for the sake of the science and other lessons that can be learned from the experience, Nye County has asked that the Blue Ribbon Commission recommend completion of the Nuclear Regulatory Commission review of the Yucca Mountain license application. Nuclear waste has always been an Achilles heel for nuclear energy development; the waste issue must be resolved for new nuclear reactor development to be successful. Geologic disposal is needed no matter what choices are made for future fuel cycles. In fact, most studies indicate the need for more than one repository.

If the Blue Ribbon Commission recommendations [12] are implemented, a considerable amount of time and money will be spent attempting to recover the U.S. national spent fuel program to the point it is today. There are numerous impediments to implementing these recommendations.

The Nuclear Waste Policy Act Remains the Law

If the country decides to pursue geologic disposal at a site other than Yucca Mountain, it will be necessary to change the Nuclear Waste Policy Act. Currently, the Nuclear Waste Policy Act does not allow the Department of Energy to pursue a different repository siting option unless the Secretary had reported to Congress that the Yucca Mountain site was not suitable. In 2002, the Secretary informed the President that the Yucca Mountain site was suitable, and the President forwarded that recommendation to Congress, where Congress reviewed the recommendation, and overrode the state of Nevada's notice of disapproval. As the Nuclear Regulatory Commission's Construction Authorization Licensing Board found, the Department of Energy does not have the legal authority to withdraw the license application [13].

It took Congress several years to reach the compromises necessary to allow them to pass the Nuclear Waste Policy Act. If Congress chooses to completely revamp the U.S. policy on siting repositories it is likely that there will be numerous contentious hearings before such a policy

could be developed. There is no simple path forward under current law, even if a local community volunteers. It will also be necessary to redevelop the regulations governing high-level radioactive waste disposal. Regulations would need to be developed by the Environmental Protection Agency, the Nuclear Regulatory Commission, and the Department of Energy. With experience gained under the Nuclear Waste Policy Act as a precedent, it is unlikely that new policy and a new regulatory structure could be developed in less than five to ten years. In other words, before a new program could even begin searching for a site, an additional five to ten years will have passed.

The Cost of Restarting the Repository Siting Process

Walking away from the Yucca Mountain project and restarting the national program would take as much time and cost at least as much and likely more, given that multiple sites would likely have to be characterized. This does not even consider the effects of the delaying tactics anti-nuclear opponents have learned from their Yucca Mountain experience. The time to redo the national screening programs, the site characterization programs, and the licensing activities that have been accomplished to date for the Yucca Mountain project would, based on the Yucca Mountain precedent, likely be fifteen to twenty years; it is inconceivable that multiple sites could be identified and characterized in less time. Adding to the time to develop new policy and regulations to the time necessary to identify and characterize a new site suggests that twenty to thirty years will have passed before the country could be back to the point where it is today. The cost of the current geologic disposal program in the United States not including the damages being paid for the failure to accept the waste for disposal by the 1998 contract date exceeds \$15 billion (\$5 billion of defense taxes and \$10 billion from rate payers). The cost of the continually accruing damages that the federal government must pay to the utilities for failure to take the spent nuclear fuel in 1998 will add billions more to this cost, and the waste still will not have moved to a disposal site.

The Yucca Mountain license application design, while demonstrating that a repository could be built safely at the Yucca Mountain site, still has opportunities for enhancements that could lower the eventual cost of the repository program. For example additional research, which could be done while the repository was in its construction phase, could lead to design changes that would be less costly than those currently planned. For example, there are indications that additional research could lead to a demonstration that the drip shields, which are expected to cost several billion dollars, might not be necessary. Further research on thermal loading and backfilling of the Yucca Mountain repository could demonstrate that the repository could be made even safer than it is projected to be today.

The Challenges of a Volunteer Only Process

While it seems reasonable on its face to pursue a volunteer only approach to siting and developing a new repository, there was no success with the negotiator created by the Nuclear Waste Policy Act amendment. A volunteer site only works if the scientific and technical qualifications of the site are suitable for a repository. It is not reasonable to assume that a local community would volunteer without the provision that it could reverse its position.

The situation in Nye County for Yucca Mountain was similar to that seen in Utah, where a willing local community was thwarted by the state. An election changed existing federal policy and stopped the Yucca Mountain project. An election at a local level could easily change the will of

the majority of the people in the area that had volunteered. This could lead to a situation where significant amounts of money could be lost simply because of a change in local policy.

The Need to Repackage Spent Nuclear Fuel

At present, there are nearly 70,000 tons of spent nuclear fuel in storage in pools or dry cask storage at reactor sites. These storage containers, as currently configured, are too large to take underground into a repository that does not have ramp access such as is possible at Yucca Mountain. Furthermore, the unique character of the Yucca Mountain repository, including its ability to retain stable openings for very long periods of time, permitted a repository strategy that allowed the spent fuel to cool while it was underground before closing the repository. Ongoing analyses of repositories in other rock types suggests that in order to have a safely functioning repository, the fuel that is currently in storage at the reactor sites would have to be repackaged into smaller packages. This not only brings about an additional cost that would not be necessary with the repository at Yucca Mountain, but also increases the radiation exposure to workers who must handle the wastes more than once.

Reprocessing is not a Substitute for a Repository

There is no doubt that the spent nuclear fuel has commercial value for future use of the uranium it contains. Until such time as the country is ready to consider reprocessing, however, it is reasonable to want to collect and store the nuclear fuel at a single underground location to provide for eventual retrievability. Repositories in other media, particularly shale and salt, do not have the long-term demonstrable capability for retrievability that the Yucca Mountain repository would have.

Regardless of any new approach in this country that might look at reprocessing, previous work that has been done in this country demonstrates that the fuel that exists before the reprocessing activities are underway is not likely to be reprocessed. Under the Global Nuclear Energy Partnership studies a report was prepared addressing this issue; the conclusion of that report was that the legacy waste, which is the waste that exists before the reprocessing began, would not be reprocessed.

The Concerns with Leaving Spent Nuclear Fuel in Storage

If the spent nuclear fuel is not moved to a repository at Yucca Mountain, it will remain in storage for at least another twenty to thirty years. There are technical concerns for leaving the fuel in storage, especially given the current high burn-up rates for the fuels. As the spent nuclear fuel sits in storage, it ages, and the levels of radiation decrease, leading to a decrease in the spent nuclear fuel's inherent self shielding protection due to the radiation field. This increases the opportunity for an intruder to access the fuel containers.

The integrity of high burn-up fuel decreases with time. Current reactor operations increase the amount of time that the fuel is left in the reactor; this is known as high burn-up. High burn-up leads to the development of metal hydrides in the cladding that can cause the cladding to become more brittle and susceptible to damage. This is exacerbated as the temperature drops, which will happen as the fuel ages. The net result is that the longer this fuel sits before it is shipped for disposal, the more likely it is that the fuel can break. Much of this fuel is in large storage containers, and will have to be repackaged for disposal for a repository other than

Yucca Mountain, which could have taken the large containers. The condition of the fuel, if degraded, will make it difficult to repackage the fuel.

The Nuclear Waste Fund Cannot Pay for the Blue Ribbon Commission Recommendations

The recommendations of the Blue Ribbon Commission, taken as a whole, cannot be funded by the Nuclear Waste Policy Act's Nuclear Waste Fund. The most recent Fee Adequacy Report indicates that the Fund could pay for disposal of the wastes projected to be produced. It cannot pay for a program that walks away from a point where licensing hearings were nearly ready to begin and starts completely from scratch to try to find volunteer sites. The recommendations include not only one or more repositories but also one or more sites for Centralized Interim Storage facilities. The efforts of characterization, licensing, construction and operation of these multiple facilities are time consuming and costly.

The total costs do not include the ever increasing costs of damages for the country's failure to honor the contracts with utilities to take the wastes in 1998. Those costs do not come from the Nuclear Waste fund but are borne by U.S. taxpayers, some of whom have already paid for the disposal of the wastes at Yucca Mountain.

CONCLUSIONS

Nye County believes that every effort should be made to, at a minimum, fund the Nuclear Regulatory Commission to complete the license application review. Then, if Congress does decide to change the Nuclear Waste Policy Act, there will be valuable information available to support new policy development.

This administration contends that Congressional language associated with the FY2010 and FY2011 appropriations and authorization process is sufficient evidence of its intent to terminate the Yucca Mountain repository program. The appropriation process needs to be explicit that, absent explicit language to the contrary, the Nuclear Waste Policy Act stands. It also should include language that requires the Department of Energy to preserve all necessary records until the Nuclear Waste Policy Act is amended or rescinded by specific Congressional action.

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