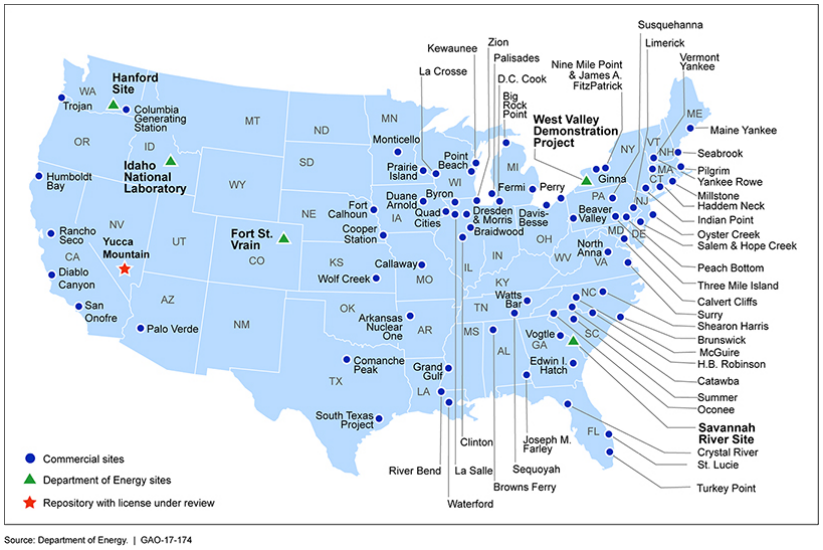
Yucca Mountain Is A Consensus Solution – If We Talk About It That Way

The world has long seen the United States as a titan of global power, with the ability to enact sweeping change to the global way of life in an instant. On a cosmic timescale, the life of a nation is imperceptible, but the choices it makes may shape the remainder of this planet's human habitation.

Six billion years ago, a series of supernovae formed the elemental uranium that would aggregate in the planet Earth as it cooled. For millions of years, this uranium worked its way to the crust before its formal discovery in 1789. Since that time, it has brought forth scientific advances, leaps in medical technology, innovations in electricity production, and threatened all life on earth. The United States has produced a significant proportion of that uranium, and the waste it generates will shape life on Earth for more than a billion years. Storing it safely is a necessity to properly harness the power of the atom for medical and energy purposes, and a national security concern of the highest order. An effective storage repository would need to be stable long past our current lifetimes and political alliances, resilient to geological threats and current security risks. It needs to be affordable, and it needs to be in the best interest of all Americans.

The Story of Yucca Mountain

Since the initial development of nuclear weapons in the United States in the 1940s, nuclear waste has been created by defense, energy, and medical programs throughout the country. Estimates place the total volume at approximately 94,000 metric tons, of which 14,000 tons is high-level weapons waste. As this accumulated, the need for a long-term storage repository became evident. In 1982, Congress passed the Nuclear Waste Policy Act and directed the Department of Energy (DOE) to search for a site, which selected Nevada's Yucca Mountain in 1985. However, most nuclear waste is currently stored at the site of its original use, while defense waste is transported to one of four federal centers due to political and technical challenges with the Yucca Mountain project. These sites are aging, and increased environmental contamination is expected.



Current Storage Sites for High-Level Radioactive Waste and Spent Nuclear Fuel and Repository with License under Review

> *"Nevada, I hear you on Yucca Mountain and my Administration will RESPECT you! Congress and previous Administrations have long failed to find lasting solutions – my Administration is committed to exploring innovative approaches – I'm confident we can get it done!"*
>
> *President Donald Trump, via Twitter, February 6th, 2020*

For thirty years, the Yucca Mountain project has been a political wrestling match, with both sides portraying the other in hyperbolic terms and intent on forcing the opposition to capitulate entirely. Under the Obama administration, the Yucca Mountain project was halted, and under the current Trump administration the project was restarted and then again stopped again in February 2020. Current opposition by the Trump Administration is almost certainly driven by the political value of swing-state Nevada to a presidential campaign.

The State of the Discourse

The political value of state support plays a crucial role in the negotiation of the Yucca Mountain project. In contrast to federal storage facilities, state utility corporations store non-defense waste at local sites licensed by the Nuclear Regulatory Commission (NRC). State and local governments have varying authority over these sites. State actors, including powerful members of Congress from Nevada, have fought to limit further exposure to nuclear waste beyond the existing Cold War-era weapons testing range, while federal actors have sought to move the project forward based on its preferred status among available American sites. Other states, such as Texas and New Mexico, which hosts the nation's Los Alamos National Laboratory for nuclear research, have proposed competing sites.

Former Senator Harry Reid and other powerful representatives from Nevada successfully framed the issue as an instance of governmental overreach, and a case of the federal government enforcing its will on the people it governs. This has been an effective strategy to prevent the development of the site, but it has been assisted by the political value of the state of Nevada. Its powerful Congressional delegation and early influence on the presidential primary has resulted in both Democratic presidents since 1988 opposing the project, making it a highly partisan issue. Republicans have argued that Democrats have placed politics over the needs of the country. These arguments peak each year during budget season, opening with the highly political Presidential Budget Request, and are especially fierce in campaign years. By reducing the issue to a political argument, it has resulted in an intractable conflict.

> *"President Trump tried to shove nuclear waste at Yucca Mountain down our throats for three years. We beat him badly and he knows it."*
>
> *Representative Dina Titus (D-NV), February 6th, 2020*

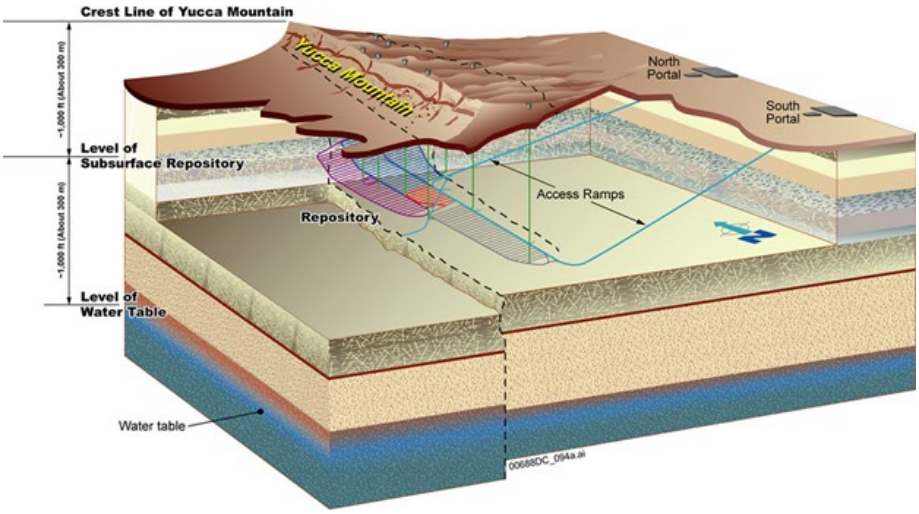
This mutual political framing has resulted in gridlock for both the project and nuclear waste storage at large, and efforts by both parties to expand the scope of negotiations by incorporating alternative solutions or other issues are few and far between. To drive this project forward, it will be necessary to reframe the project as a solution to issues for all stakeholders, and a reduction in hostilities would be necessary. Convincing the general public requires a move to a bipartisan technical solution, and to move from a political framing to the necessary technical one would require a significant expansion of the current negotiating table. Economic incentives for Nevada, such as a new DOE National Laboratory for nuclear waste research, would be an imperative. Beyond that, a broader expansion of clean energy and environmental management spending would be a wise concession from Republicans hoping to bring Democrats to the table. The project represents an opportunity to bolster Nevada's economic future, and this argument proves to be among the best at aligning conflicting parties. To end this stalemate, it is necessary to present the problem as a solution to mutual needs and present it on its technical merits.

Moving Forward with Yucca Mountain

The best available solution is to continue the development of the Yucca Mountain site for storing all types of US nuclear waste. By utilizing this site, the United States has the opportunity to store the entirety of its nuclear waste in a single, secure location, thereby reducing proliferation, cost, and long-term risk. Staunch supporters of these arguments include the NRC, the Department of Energy, as well as local residents who support the opportunity for employment that the site would provide.

Current storage measures at local sites present a significant risk of proliferation by granting malicious state and non-state actors a wide range of locations and circumstances through which to illicitly obtain nuclear material. By storing all the nation's waste in a singular location and promptly sending spent material from local sites to Yucca Mountain, this risk is significantly reduced.

Yucca Mountain also provides for the long-term safety of the nation. While the history of American nuclear research covers less than one hundred years, the responsibility for managing the waste will extend for billions. Storage at Yucca Mountain provides for a geologically stable, easily secured central point that can be maintained as a national security priority, as opposed to disparate locations across the nation. The theft, misappropriation, and misuse of Soviet military and nuclear material following the collapse of the Soviet Union makes clear the risk of a dispersed, variably secured collection. While the United States does not face such a collapse, the timeframe of nuclear storage requires the consideration of all possible geopolitical scenarios. Studies of the site performed by the NRC conclude that it would be resilient to geologic and geopolitical threats over all relevant time scales. Uranium has been with Earth since its formation, and storage of its waste must consider this. Current on-site dry cask storage cannot accommodate these time scales.



Proposed design of Yucca Mountain repository and geologic features

Finally, the site reduces the cost of security and maintenance significantly. A single site reduces expenses for states and local governments, while centralizing federal oversight and reducing its expenditures in the long run. The cost of restarting the program is also minimal, with a recent DOE request totaling only $120 million as a portion of the Department's $28 billion annual budget. Estimates of the government's liabilities to utilities currently storing the waste approach $50 billion, not including the cost of litigation and other transactional costs, making a centralized solution significantly more affordable.

"...Social and political opposition to a permanent repository, not technical issues, is the key obstacle. Important tools for overcoming such opposition include transparency, economic incentives, and education."
Government Accountability Office, 2011

Major opponents of the Yucca Mountain project point to sections of surveys that have been conducted at any point since the initial recommendation by both public and private groups, arguing that the seismic or groundwater contamination risks are too great. While there are elements of the project yet to be resolved, the overwhelming majority of the surveys make clear that this is the best available option, and the GAO's nonpartisan experts have concluded that the root of such opposition is largely politically motivated. Nevada's attorney general argues that there are unresolved issues, but the key findings are not in dispute. Scientific consensus is never unilateral.

Other opponents, such as Nevada's congressional delegation, argue that it makes the location a threat for terrorist activity and that transportation links would be terror targets. The NRC notes, however, that no hazardous accidents have taken place in 40 years of nuclear waste transport. Furthermore, the immediate proximity of Nellis Air Force Base and other US military installations provides significantly more protection than most current nuclear waste storage locations, in addition to the added security the site would be assigned.

The above groups, as well as opposed local citizens and corporations, believe that this project would amount to unfairly burdening Nevada with the nation's waste. While this is a reasonable argument, the site was selected scientifically from among all of the nation's available sites. Nevada is a part of the United States and benefits from its successes, but must also support its endeavors. Citizens of Texas manage the concerns of oil refinement

so that Nevada may have access to gasoline, for example. Finally, the value of the facility in terms of well-compensated jobs in security, research, defense, and environmental management is high. The Yucca Mountain project stands to provide mutual benefit for Nevada and the nation.

The Next Chapter at Yucca Mountain

The Yucca Mountain project should be completed to ensure a lasting solution to the storage of nuclear waste and to enable a cleaner nuclear future. Republican and Democratic leaders must come to a mutual agreement to present a unified strategy for the project. By presenting Yucca Mountain as a bipartisan, technical solution to a series of well-understood problems, public support will congeal behind the project. Yucca Mountain is an effective storage repository, stable long past our current lifetimes and political alliances, and is resilient to both geological threats and security risks. It is affordable and is in the best interest of all Americans.

The United States has spent more than 75 years accumulating nuclear waste, and more than thirty arguing over where to put it. In the lifetime of the uranium in question, that is barely a blink. Nuclear waste will outlast any political party, but the decisions made now will shape the impact that waste has on generations to come.

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