### 4<sup>th</sup> grade Nevada History Discussion Lesson Template

Topic: Yucca Mountain

Lesson Authors: Misty Larsen and Elena Erwin

Related Essential Questions: How have conflict, compromise, and cooperation shaped Nevada's history?

Related Nevada History Chapters: Chapter 9 Modern Nevada

#### NV Social Studies Standards (Geography, Economics, Civics, History):

H2.4.1 Discuss examples of compromise and conflict within Nevada, i.e., Pyramid Lake Wars, water allocation, Sagebrush Rebellion.

H2.4.6 Explain how United States conflicts affected life and society in Nevada.

G7.4.4 Describe historical and current economic issues in Nevada using geographic resources, i.e., illustrate demographic changes due to mining and gaming.

#### **Literacy Standards:**

CCSS.ELA-Literacy.SL.4.1.A Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.

CCSS.ELA-Literacy.SL.4.1.D Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

CCSS.ELA-Literacy.RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-Literacy.RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.

CCSS.ELA-Literacy.W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

**Brief Overview of Lesson & Guiding Discussion Question:** This lesson is a modified structured academic controversy (SAC) that asks 4<sup>th</sup> grade students to form a consensus around the Yucca Mountain nuclear waste repository after exploring one side of the argument and participating in a small group discussion with classmates who have explored the opposing side of the argument.

#### Guiding Question: Should Nevada open Yucca Mountain to store nuclear waste?

**Brief Historical Background:** Nuclear repositories come packaged with all the makings of a controversy: nuclear power, nuclear weapons, terrorism, and the environment all rolled into one. The siting of such a facility demands a deliberate, scientific, accountable process (Macalester College, 2010). During this discussion students will look at the scientific and political reasons Yucca Mountain was selected as a possible national repository and come to a consensus on what should happen to the site now.

**Included Materials:** Links to PowerPoints, annotation matrix, background information, note taker, sources for discussion, writing task, self-assessment & reflection.

#### Lesson Sequence:

Approximate Time Frame	What is the teacher doing?	What are students doing?	Notes (additional scaffolds, logistical considerations, room arrangements, grouping, etc.)
Day 1 30 min	Zoom-In Teacher will facilitate zoom-in as a hook activity, reading the questions and providing time for student responses.	Students will share responses in pairs using evidence from the slides, and then debrief in a whole class setting.	Zoom-in can be retrieved from projecttahoe.org (NTS Zoom-In) Students should all be able to see the images displayed in the slide show.
Day 2-5 45-60 min sessions each day	Atomic Testing Overview Interactive Website This interactive website and accompanying questions serves to provide students with the Nevada Test Site background information before engaging in the Yucca Mountain SAC. Teacher can facilitate whole group or small group instruction depending on the availability of technology to support students learning.	Students will answer audio and text-based questions about the Atomic Testing content featured on the site.	Instructional sequence depends on the needs of the students and available technology. Students can work independently, in small groups, or whole group. Possible questions have been included in this document.
Day 6 and 7 45 min each	<ul> <li>Background Information</li> <li>Teacher will facilitate the reading of the background information and orientation to the background map whole group.</li> <li>Teacher will guide students in considering which elements of the text are in support of using Yucca Mountain as a nuclear waste repository and which are in opposition. Modeling annotation of the background sources will support their annotation of their assigned texts.</li> <li>Background Questions to pose whole group are included in this document.</li> </ul>	Students will annotate the text, as the teacher models the process identifying vocabulary terms and important facts to be used on the SAC note taker. Suggested vocabulary terms for teacher to highlight: Repository (lines 2,5,15,24 and throughout) – place where things are stored Amended (line18) - changed Water table (line 34) Suggested facts from reading to be included: *The National Academy of Science found the best way to store nuclear waste was to bury it deep underground. *Nevada has no nuclear power plant of its own. Yucca Mountain	Note: There is a slide show that accompanies this lesson and provides teacher instructions, rationale, and guidance. [Yucca SAC] It can be found on Projecttahoe.org, along with the Annotation Matrix and Historical Thinking Chart referred to in this lesson. A document camera or interactive whiteboard can be used to assist students in annotating the text. After the documents have been read once whole group, the teacher can introduce the students to the Structured Academic Controversy note taker and guide students through annotating,

	The map will be used to link to Nevada Test Site location, Yucca Mountain site, and the southern part of the state (including the proximity to Las Vegas).	Repository would store nuclear waste from more than 100 plants across the country. *The site sits 1,000 feet under the mountain in volcanic rock and 1,000 feet above the water table. *The exact time for nuclear waste to decay is unknown.	identifying vocabulary terms and capturing some of the important facts. Students will have an opportunity to add to the facts that support their side of the argument.
Day 8 and 9 45 – 60 min* *may require additional time depending on time of year and student need.	Read and Annotate Assigned Documents and Complete Assigned Section of note taker Teacher assigns divides students in half to assign each a side of the argument. Teacher monitors and supports students reading of assigned text and note taking.	Students individually read and annotate their sources then work in partners to review their assigned sources and complete their portions of the note taker.	All students are responsible for taking notes in order to share information with new partners from the opposing side on the next day. Partners may pair with another pair from their same side of the argument if additional support and scaffolding is needed. Also consider small group guided instruction if students need additional support in reading and annotating the texts.
Day 10 60 min	Meet with Opposing Side Teacher reviews the discussion protocol with the whole class. The protocol is included in the instructional PowerPoint and times can be added to support students. Teacher places students into equal groups to share their opposing side of the argument. Teacher orients students to the section in the note taker for recording the opposing claims.	Students share their source information, claims and evidence with the opposing side. There are opportunities for to ask clarifying questions and summarize information being shared. Each student take notes recording key evidence supporting the opposing viewpoint in the correct section of the note taker.	Remind students they will be using their note takers to write their individual paragraphs. May review some of the claims with the whole class to support students in their upcoming writing task. Optional: Provide students with opposing claim sources if they decide to write from that viewpoint.
Day 11 45 min	Individual Writing Teacher reviews the writing expectations with students, and provides them with a	Students write a paragraph on either side of the argument using evidence from sources to support their writing.	SBAC Rubric will be used to assess student writing [May scan student writing samples (without names) for use when teaching this lesson to new classes]

	checklist/rubric with identified criteria. There is some guidance included in the Yucca SAC PowerPoint to assist with this process.		Scaffold and provide writing support as needed depending on student need. For example, a topic sentence could be constructed whole group for either side of the argument.
Day 12	Self-Assessment &		
25 min	<b>Reflection</b> Teacher guides students to	Students reflect on their experience and complete the self- assessment.	Consider having students respond to particular portions of the self-assessment and
	the Self-Assessment &		reflection based upon past
	Reflection portion of the note taker.		discussion experiences. Also, may consider having students make goals for future discussions.

**Possible Extension:** Science Connection using KidsCorner Nuclear Power Interactive Website (Link: <a href="http://c03.apogee.net/contentplayer/?coursetype=kids&utilityid=pseg&id=16182">http://c03.apogee.net/contentplayer/?coursetype=kids&utilityid=pseg&id=16182</a> )

#### **ATOMIC Testing Overview**

Source: The Guardian Interactive Website: <u>http://www.theguardian.com/us-news/ng-interactive/2015/sep/21/building-the-atom-bomb-the-full-story-of-the-nevada-test-site</u>

**Notes:** These questions were designed to support an instructional overview of Atomic Testing in Nevada. Teachers may utilize all or part of these questions as needed, the suggested timeframe would depend on whether the teacher was using the website link as a whole-class or small group sequence and the type of time allotted for social studies. The headings indicate questions that would be answered by listening to the audio or within the text. Teachers may also want to consider providing students with printed versions of the text if students do not have one-to-one access to technology.

These questions were designed to support 4<sup>th</sup> grade students in learning about Nuclear Activity in Nevada and would be used prior to students participation in the Yucca Mountain discussion lesson.

#### "The Guardian" Interactive Website Questions

#### **Bikini Atoll:**

Audio:

- Where did the U.S. conduct most of their early nuclear tests?
- Why did the U.S. need to move the nuclear testing?

#### **Building the Bomb:**

#### Audio:

- What did people fear about nuclear power?
- What helped people overcome their fear?
- When was the Nevada test site created?

#### Text:

- The U.S. feared a nuclear attack from which country?
- Starting in 1951 and continuing for over four decades, the Nevada Test Site conducted how many tests?
- Is the Nevada Test Site still used?

#### Having Lunch on an Atomic Bomb:

#### Audio:

- What does the word barren mean?
- What must observers wear to the watch the tests?
- What are 3 ways the atmosphere bombs were dropped?
- What material was used to cover the bombs to contain radiation?

#### Text:

• How many nuclear tests were performed?

#### Survival Town:

#### Audio:

- What were the main concerns for if we were to enter into a nuclear war?
- Why did they build houses on the test site?
- Describe the houses built on the test site.

#### Audio II:

• What were people suppose to do in case of a surprise nuclear attack?

#### Text:

• What was the purpose of the Apple-2 shot?

#### Count Down:

Audio:

• Describe the different conditions of the troops and the director when they were on the test site.

#### Text:

• What was the purpose of "Desert Rock?"

#### **Desert Rock:**

Audio:

• What impacts did the nuclear tests have on the soldiers?

Text:

• Besides scientists and the military, who else was interested in the mushroom clouds?

#### Viva Las Vegas:

#### Audio:

• How did atomic testing effect Las Vegas?

#### Text:

- Who was <u>not</u> excited about the nuclear tests?
- What did the Radiation Exposure Compensation Act do?

#### Downwinders:

Audio:

• How did most of the residents feel about the atomic tests?

#### Text:

• Why do many Americans feel the Nevada Test Site is important?

#### Legacy:

#### Audio:

- What does it mean to be a "nuclear state?"
- What are some reasons that people support the Nevada Test Site?
- What are some reasons that people <u>do not</u> support the Nevada Test Site?

#### **Background Information**

#### Las Vegas Sun Topic: Yucca Mountain



*Photo by Sam Morris / Las Vegas* Sun Workers enter the main tunnel of Yucca Mountain.

- 1 One of the hottest subjects in Nevada is whether the federal government will go through with
- 2 long-time plans to build a repository for radioactive nuclear waste at Yucca, which is about 90
- 3 miles northwest of Las Vegas. If Senate Majority Leader Harry Reid, D-Nev., has anything to say
- 4 about it, it won't be built. Reid, who has slowed down and blocked the project was able to slash
- 5 more than \$100 million out of the budget for the Yucca Mountain repository project before the
- 6 end of 2007.
- 7

8 How did Nevada, which has no nuclear power plants of its own, come to be viewed as the spot to 9 store all spent radioactive waste from the country's 100-plus nuclear power plants?

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The Department of Energy has had its eye on Yucca since 1978. That's when the DOE looked at a
 1957 recommendation by the National Academy of Sciences that found the best way to dispose of

- 13 nuclear waste was to place it inside rocks deep underground. The Nuclear Waste Policy Act of
- 14 1982 established a program that put the DOE in charge of finding, building and operating an
- 15 underground waste repository. In 1985, the DOE gave President Reagan a choice of six potential
- sites. Reagan picked three for further study: in the states of Washington, Texas and Nevada. Then
- 17 in 1987, Congress approved a bill, known as the "Screw Nevada Bill," in which the DOE was to
- 18 concentrate solely on Yucca Mountain as the national site. The bill amended the Nuclear Waste
- 19 Policy Act to say that if Yucca Mountain is ever found unsuitable, then the DOE would find a new
- 20 storage site.
- 21

22 The DOE expected to open the repository and receive waste in January 1998, but delays have

- continually pushed the date back. In 2002, President George W. Bush signed the House Joint
- 24 Resolution 87 which allowed the DOE to start construction on the repository.
- 25
- 26
- 27

28 The Yucca Mountain facility is designed to continue further study and research the mountain. It

- 29 has a large U-shaped tunnel that's five miles long and 25 feet wide. There are several large alcoves
- 30 that are designed to house most of the scientific research in the mountain. There are also smaller
- 31 tunnels intersecting with the main tunnel called galleries that will store the nuclear waste. The
- 32 actual waste repository site will span 1,150 acres, be 1,000 feet under the mountain's surface and
- also be 1,000 feet above the water table. A water table is the point where the water pressure
- 34 equals the atmospheric pressure. In Nevada's case, the water table is the surface of the
- 35 groundwater below the mountain.
- 36

In 2006, the DOE chose March 31, 2017, as the opening date for the Yucca Mountain Repository,
and on that day 39 states would send their spent nuclear fuel and radioactive waste from the 126
nuclear sites around the country. But the political winds changed in 2006. Reid, a longtime
opponent of Yucca Mountain, became the Senate Majority Leader after Democrats took control of
the Senate. And since that time, he has been able to slow down and block the project. Reid has
called the project dead.

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Yucca Mountain is located inside the Nevada Test Site in Nye County, Nevada, and is actually a
 ridge comprised of volcanic rock. Because of the material that the volcanic rock is made of, some

46 experts believe that it is perfect to hold the waste long enough for it to decay. The exact time it

47 takes for nuclear waste to decay is unknown, but some estimate it can take over 100,000 years.

48 One concern is that the waste units will inevitably fail and that the waste will slowly seep out into

49 the underground water supply before it can fully decay. Another concern is the mountain's seismic

- 50 activity. Yucca Mountain does sit on tectonic deformation, but according to the DOE, the activity is
- 51 so low that it won't affect the repository.
- 52

53 The mountain sits on federally protected land within the test site, and is currently controlled by

54 the DOE, the U.S. Air Force and the Bureau of Land Management. No one lives at Yucca Mountain,

55 yet in 1987, the Nevada Legislature established the 144- square mile Bullfrog County around Yucca

56 Mountain. It was designed so federal money would get sent to the whole state, instead of just Nye

57 County.

58 The closest year-round housing for the site is about 14 miles south in Amargosa Valley. -

- 59
- 60

Sun new media intern Stephanie Kishi compiled this report.

#### **Background Information**



Source: Nevada Test Site Environmental Report (2004)

Questions to Consider on Background Information

How far is the site from Las Vegas?

According to the third paragraph, what did the Nuclear Waste Policy Act of 1982 do? How was the act amended, and what was this bill called? (Lines 17-20) What are some of the design features of Yucca Mountain? (Lines 28-35) What concerns do some people have about storing waste at Yucca Mountain? (44-51) Who controls Yucca Mountain?

Our SAC Question: Should Nevada open Yucca Mountain to store nuclear waste?

## **Structured Academic Controversy**

**Question:** Should Nevada open Yucca Mountain to store nuclear waste?

My argument:	
Backgrour	nd Reading
Vocabulary terms/meanings I should know and use when I speak	Important facts from background reading that support my side
Preparing M	ly Argument
My Claims (statements that support my argument)	My Evidence and Reasoning to Support My Claims
1.	
2	
2.	
3	
5.	

The Other Side of the Argument		
<b>Opposing Claims</b>	<b>Opposing Evidence and Reasoning</b>	
1.		
2.		
3.		
Common Ground &	Further Questions	
We can agree that	We need further clarification on	
1.	1.	
2	2	
2.	2.	

What is your final personal (not assigned) position on the issue? Explain using at least three pieces of evidence.

Reflection & Self-Assessment
Reflect on your participation in the discussion. What did you do well? What will you improve upon in future discussions?
Stating my points/claims clearly:
Using evidence from the text:
Using reasoning with my evidence to describe it in my own words:
Working with my partner:
Using eye contact:
Speaking loudly enough for my group to hear me:
Staying focused:
Listening and learning from the other side:
Helping the group to come to consensus:
Other:
I would assess myself with a/10 for my participation in the discussion today.

- 1 Source: Excerpted from the Institute for Energy and Environmental Research
- 2 (Retrieved from <a href="http://ieer.org/resource/commentary/yucca-mountain/">http://ieer.org/resource/commentary/yucca-mountain/</a>)
- 3

## 4 If not Yucca Mountain, then what?

5 AN ALTERNATIVE PLAN FOR MANAGING HIGHLY6 RADIOACTIVE WASTE IN THE UNITED STATES

7 By Lisa Ledwidge

8 One of the biggest obstacles facing the nuclear industry is what to do with spent

9 nuclear fuel. Because it is highly radioactive and will remain so for many

10 thousands of years, spent nuclear fuel is inherently dangerous to human health

11 and to future generations. Because it contains materials used in making nuclear

- 12 weapons, spent fuel also poses proliferation risks.
- 13

14 Most countries' preferred option for isolating spent fuel from humans and the

- 15 environment is to bury it underground in a deep geological repository. In the
- 16 United States, which has a repository schedule decades ahead of other
- 17 countries, Yucca Mountain is being offered by the nuclear establishment as the
- 18 sole solution for the disposal of spent fuel. Proponents want it to be the
- 19 country's first underground storage facility for spent fuel from the 100-plus
- 20 commercial nuclear power plants in the United States.
- 21 But Yucca is not a sound solution to the nuclear waste problem.

22 In the short term, irradiated reactor fuel should be stored as safely as possible

- 23 on site or as close to the point of generation as possible for an interim period
- 24 (several decades) that would be long enough to allow a long-term management
- 25 plan to be implemented. In light of the attacks of September 11, IEER has
- 26 recommended on-site or close-to-site subsurface dry storage of spent fuel, in
- 27 the type of structures built for the storage of the vitrified high-level wastes at
- 28 the DOE's Savannah River Site in South Carolina. This would reduce the risk of
- 29 large-scale catastrophe in case of a terrorist attack. The federal government
- 30 should use monies from the Nuclear Waste Fund to pay for additional on-site
- 31 storage necessitated by delays in the repository program.
- 32

33 For the long-term, more basic research on various geologic settings is needed before sites for permanent disposal of radioactive waste can be scientifically 34 screened. IEER recommends three broad approaches for waste storage 35 research: geologic disposal on land, sub-seabed disposal, and upper mantle 36 disposal. The main aim would be to yield sufficient data and analysis in one to 37 two decades to enable a comparison between these options. Repository types 38 39 need to be considered in tandem with the development of engineered barriers that mimic natural materials and structures that retard the migration of 40

41 radioactivity for millions of years or more.

proliferation – rapid spread or increase

repository – place where things are stored

irradiated – exposed to radiation

in tandem with - work together

42

- 43 Various kinds of repository types and environments should be studied for ten to fifteen years without any attempt to identify, rank, or screen specific locations 44 45 as potential repository sites. Yucca Mountain should be converted into a 46 research center for scientific investigation of problems central to the concept of geologic repository disposal of waste, subject to approval by the Western 47 Shoshone people, who do not recognize as valid the U.S. government's 48 49 ownership claim to the land on which Yucca Mountain sits, and the state of 50 Nevada. 51 52 The institutional framework for the long-term research is at least as important 53 as the technical issues. IEER has recommended that a public corporation be 54 established to handle certain aspects associated with the long-term 55 management of highly radioactive waste. The details of this proposal are available in Science for Democratic Action Volume 7, Number 3. 56
- 57
- 58 It is premature at this time to select actual repository sites or even to engage in
- 59 a site selection process. Finding an appropriate repository site is a very difficult
- 60 and complex process that must balance a wide range of considerations,
- 61 including sound science, which has not yet been completed.
- 62

This fact sheet was written by Lisa Ledwidge of the Institute for Energy and Environmental Research for the <u>Alliance for Nuclear Accountability</u> and was based largely on IEER materials, especially <u>High-Level Dollars</u>, Low-Level Sense and <u>Science for Democratic Action Volume 7, Number 3</u>.

valid – true

Source: Text is from a public information bulletin created by Public Citizen, a non-profit consumer-rights advocacy group. Retrieved from Nuclear Information Resource Service www.nirs.org

#### Get the Facts about YUCCA MOUNTAIN, NEVADA and Nuclear Waste!

Yucca Mountain is located in Nevada, about an hour northwest of Las Vegas. It is in the desert, and the land it occupies 1 2 includes public land, Nevada Test Site land, and Nellis Air Force Base land. However, all of this land is part of the 3 Western Shoshone traditional homelands. If a dump is built at Yucca Mountain, the Shoshone will lose access to this 4 sacred place.

6 Yucca Mountain is the only site being considered by the Department of Energy (DOE) as a "permanent disposal" site for

the United States' highly radioactive nuclear waste. This spent 7 nuclear fuel and high-level waste is currently located at 77 sites 8 9 across the country and would have to be transported by truck 10 or rail to Yucca Mountain if that site is approved as a geologic repository. 11

12 Under current law, 70,000 metric tons of waste would be 13 allowed to be stored at Yucca Mountain, with 63,000 tons of 14 that being commercial waste and the rest being DOE waste. 15 16 However, that still would not accommodate all the waste projected to be produced in the U.S. (an estimated 107,500 17 18 metric tons of both commercial and DOE waste. 19 Scientific study at Yucca Mountain has revealed a host of potential problems at the site. Besides being sacred land, Yucca 20 Mountain has many characteristics that make it an unsuitable 21 22 place to store highly irradiated nuclear waste. 23 24 For instance, the people who live near Yucca Mountain, in the Amargosa Valley, depend on the aquifer beneath the mountain 25

for their drinking and irrigation water. This water is sure to be 26 27 contaminated if nuclear waste is stored inside the mountain.

- 28 Further, Yucca Mountain is located in an extremely active
- 29 earthquake zone.
- 30

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Calij 50 Miles

> Data Source Council of the National Seismic System Composite Catalog, 1976 to present Southern Great Basin Seismic Networl

Should an earthquake hit the Yucca Mountain area while nuclear waste is stored there, disastrous consequences could 31 32 result. The groundwater table could rise, coming into contact with the stored waste and contaminating it. Or the storage 33 canisters themselves could break open.

- 34
- 35 Also, portions of the mountain could collapse, permitting no access to the broken canisters inside.



Earthquakes Magnitude 2.5 and Greater in the Vicinity of the

- 36 Nevada ranks third in the nation for current seismic activity. Since
- 37 1976, there have been more than 600 seismic events of a magnitude
- 38 greater than 2.5 within a 50-mile radius of Yucca Mountain. The
- 39 Western Shoshone call Yucca Mountain "Serpent Swimming
- 40 Westward" and speak of its constant movement. In 1992, an
- 41 earthquake with a magnitude of 5.6 originating just 10 miles from
- 42 Yucca Mountain caused significant damage to the DOE field office
- 43 building at the site.
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- 45 Further, some scientists believe that a significant rise in groundwater
- 46 levels could occur as the result of an earthquake, possibly flooding the47 repository. This type of event would surely compromise the integrity of
- 48 the nuclear waste containers and contaminate the groundwater
- 49 beneath Yucca Mountain. Despite the evidence to the contrary, the DOE has said it considers it unlikely that an
- 50 earthquake would strike the region.





# The Battle Continues to Stop Yucca Mountain from Becoming a Nuclear Waste Dump

#### By Derrick Broze / February 18, 2016

Not far from the site of 40 years of nuclear weapons testing, a proposed long-term nuclear waste dump draws opposition from the Shoshone and Paiute Nations, environmental activists and even Nevada state officials.



lan Zaparte points to the Yucca Mountain, proposed site for a nuclear waste disposal site.

#### (Photo: Derrick Broze/MintPress News)

Native communities have a long history of resources discovered beneath the reservations being <u>exploited by the</u> <u>U.S. government and supported industries</u>. These communities have suffered exposure to dangerous substances through <u>uranium mining and milling</u>. In Nevada, the lives of generations of Western Shoshone and Moapa Paiute have become intertwined with the history of nuclear weapons testing and, more recently, the disposal of nuclear waste from faraway power plants.

"There are multiple problems. Moving the waste is a problem. High risk, unnecessary risk. If the company is
ever going to benefit from nuclear power they should process it and store it themselves. Stop shipping it across
the country and exposing the population to a potential disaster," Lee said, alluding to the controversial
long-term nuclear waste repository planned for Yucca Mountain, about a three hours' drive from the
reservation.

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13 The plan for the Yucca Mountain Nuclear Waste Repository had the support of President George W. Bush, but 14 met with opposition from Nevada state officials and environmental and Native activists, who fear that the rock 15 at Yucca Mountain will not be able to contain nuclear waste for long periods of time.

- 16 In 2009, environmental and anti-nuclear organizations, including Beyond Nuclear, Greenpeace, Center for
- 17 Health, Environment & Justice, and the International Society for Ecology, sent a letter to President Barack
- 18 Obama calling the selection of the Yucca Mountain site "a purely political decision." They argued that it has

- been evident since 1992 that the site "could not meet the EPA's general radiation protection standard for repositories."
- 21
- Obama opted to end funding for the project, setting off an ongoing legal battle. In August 2013, the U.S. Court of Appeals for the District of Columbia ordered the Nuclear Regulatory Commission to approve or reject the DOE application for the proposed waste storage site at Yucca Mountain. The Associated Press reported:
- 25
- "In a sharply worded opinion, the court said the nuclear agency was 'simply flouting the law' when it allowed
  the Obama administration to continue plans to close the proposed waste site 90 miles northwest of Las Vegas.
  The action goes against a federal law designating Yucca Mountain as the nation's nuclear waste repository."
- 29
- In January 2015 the <u>NRC concluded</u> that the DOE's license application for Yucca Mountain satisfies nearly all
   of the commission's regulations. The commission must now clear all challenges from the state of Nevada and
   Native communities, a process which could take several more years.
- 33
- As this process drags on, two companies are providing interim storage sites for the country's nuclear waste. One
   is located in Andrews County, Texas, and owned by Waste Control Specialists. The other is an <u>underground</u>
   storage site in Southeastern New Mexico, operated by Holtec International and the Eddy-Lea Alliance of New
   Mexico. Waste Control Specialists are <u>hoping to turn the temporary West Texas facility into a long-term</u> waste
   storage site.
- Ian Zaparte represents the Western Shoshone traditional government and has been fighting in defense of his
  community and the planet for 30 years. Zaparte says the NRC and the DOE are ignoring the possibilities for
  danger in the area and denying the impact the Yucca Mountain Nuclear Waste Repository would have on local
  communities, including the Paiute and the Shoshone.
- 44

"There are 26 faults, seven cinder cone volcanoes, 90 percent of the mountain is saturated with 10 percent
water," Zaparte told MintPress. "If you heat the rock, it will release that water. If the water comes up and
corrodes the canisters, it will take whatever is in storage and bring it into the water and into the valley."

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Although the Yucca Mountain project has stalled during the Obama administration, a new president, especially
 a nuclear-friendly president, could theoretically rally for funding of the Yucca Mountain Nuclear Waste

51 Repository. The timing of the DOE's study could potentially make the Yucca Mountain a topic of debate in the 52 2016 presidential election. **EDITORIAL** 

# **Congress should resume funding of Yucca Mountain nuclear waste site**



FILE 2002/ASSOCIATED PRESS

Yucca Mountain in Nevada has long been studied as a nuclear waste storage site.

NOVEMBER 01, 2014

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USING YUCCA Mountain in Nevada as a central repository for the byproducts of nuclear power generation in the United States is not a perfect solution to a complex problem, but it's far better than the status quo. <u>A recent Nuclear</u> <u>Regulatory Commission report</u> found that Yucca Mountain meets government

requirements for the safe storage of nuclear waste. That conclusion should end 5 the decades-long debate on the suitability of the site, but it almost certainly 6 won't stop political opposition to the project. Congress should lay politics aside 7 and move forward anyway. 8

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For more than a quarter century, the government has been considering whether to use 10 Yucca Mountain, about 100 miles from Las Vegas, as the country's only long-term 11 storage facility for waste from nuclear reactors. The plan is to collect the nuclear waste 12 created by power plants and bury it underneath the mountain. The site was chosen 13 because it is geologically inert; natural processes such as earthquakes are highly 14 unlikely to will disturb any materials placed at the site, which scientists say will 15 maintain its integrity for at least 300,000 years. The problem isn't any lack of 16 supporting research; it's that <u>Democrats have been loath</u> to support the construction of 17 the site. Senate Majority Leader Harry Reid, from Nevada, has consistently blocked 18 funding for Yucca Mountain. Barack Obama vowed to kill the project as a candidate for 19 office, and has opposed it as president — mainly to placate Nevada voters who oppose 20 constructing a large repository in their state. 21

But there is a real cost to congressional inaction on Yucca Mountain. There are over 70 24 nuclear power plants in the United States, and currently each one is responsible for 25 storing the waste it generates. While each of those sites is secured by guards and 26 certified by the Nuclear Regulatory Commission, none were designed to permanently 27 hold radioactive materials. Instead, power plant operators were expecting to be able to 28 send their waste to a central disposal facility by 1998. Every year that goes by, plants are forced to store more and more hazardous materials on site, putting communities near 30 them at risk. 31

There are valid logistical concerns about Yucca Mountain, such whether waste can be 33 safely transported to the site. But these obstacles can be addressed. While the 34 Department of Energy does not currently transport waste generated by power plants, 35

36	the government has a long track record of safely transporting hazardous substances for
37	the military by rail, including materials used in the nuclear weapons program. There is
38	no reason a similarly robust system can't be adopted for civilian use.

39

40 The solution is for Congress to resume funding the Yucca Mountain project. Democrats
41 should recognize that, whatever their qualms about the site, the current situation can't
42 continue indefinitely. Republicans, who have been historically much more willing to
43 fund the project, should make it a priority if they take over the Senate in November.
44 Allowing nuclear materials to build up at power plants is far more dangerous than
45 burying them at Yucca Mountain.

## Nuclear Regulatory Commission: Yucca Mountain Safe to Store Nuclear Waste

By Barbara Hollingsworth January 30, 2015 12:22 PM EST

1	(CNSNews.com) – The Nuclear Regulatory Commission (NRC) has released the final two volumes of a five-
2	volume safety report that concludes that Nevada's Yucca Mountain meets all of its technical and safety
3 1	requirements for the disposal of highly radioactive nuclear waste.
+ 5	"With reasonable assurance subject to proposed conditions DOF's [Department of Energy] application meets
6	the NRC's regulatory requirements" for the disposal of "high-level nuclear waste." the regulatory agency
7	announced Thursday.
8	
9	However, "completion of the safety evaluation report does not represent an agency decision on whether to
10	authorize construction," the NRC noted, adding that DOE "has not met certain land and water rights
11	requirements" and that other environmental and regulatory hurdles remain.
12	
13	Republicans in Congress expressed hope that progress can now continue on the creation of a permanent
14	repository at the site for over 70,000 metric tons of high-level nuclear waste now in temporary storage.
15	
16	"Today's report settles it: To continue to oppose Yucca Mountain because of radiation concerns is to ignore
17	science," Sen. Lamar Alexander (R-TN), chairman of the Senate Appropriations Subcommittee on Energy and
18	Water Development, said in a statement on Thursday.
19	
20	This report says that Yucca Mountain would meet all of the Nuclear Regulatory Commission's performance
21	requirements for safe operation. Combined with previous reports, the science is clear that Yucca Mountain
22	would meet all safety requirements related to radiation.
23	
24	"There is no reason Congress shouldn't make Yucca Mountain part of the solution to end the stalemate on
25	nuclear waste – paving the way for nuclear power to be a larger source of the clean, cheap, reliable electricity
26	we need to power our 21st-century economy," Alexander added.
27	
28	with the SEK [Safety Evaluation Report] now complete, we re one step closer to keeping the federal
29	government's promise to build a permanent repository for nuclear waste. we now know from this independent

government review that Yucca Mountain is safe and can meet the technical standards," said Rep. John Shimkus 30 (R-IL), chairman of the House Environment and the Economy Subcommittee. 31 32 "I again commend the NRC staff scientists and engineers for their years of thorough work on this safety 33 evaluation. Completing the SER is a milestone achievement, but there is still a long road ahead. I am eager to 34 work with my colleagues in both chambers and on both sides of the aisle this Congress to ensure the NRC, 35 DOE, and the State of Nevada have all the resources and incentives they need to keep moving forward on this 36 37 national asset," Shimkus said. 38 Since there is no permanent disposal facility, spent fuel from the nation's nuclear reactors – "enough to fill a 39 football field 17 meters deep," according to a 2012 Government Accountability Office (GAO) report - is 40 currently being stored at dozens of above-ground sites. GAO expects the amount of radioactive waste to double 41 to 140,000 tons by 2055 when all of the currently operating nuclear reactors are retired. 42 43 Yucca Mountain, which is located about 90 miles north of Las Vegas, is in a remote area that formerly 44 contained the Nevada Test Site, where more than 800 nuclear weapons were tested by the military during the 45 Cold War. 46 47 The area is arid and geologically stable, with the odds of a volcanic eruption during the next 10,000 years 48 estimated at one in 70 million. In 2002, after a three-decade search and more than 60 public hearings, Yucca 49 Mountain was designated by a bipartisan majority in Congress as the nation's sole permanent repository for 50 spent nuclear fuel and high-level radioactive waste. 51 52 However, the Obama administration opposed the long-planned project. 53 In 2010, then NRC chairman and former Reid aide Gregory Jaczko terminated the licensing process DOE had 54 55 begun two years earlier and directed NRC staff to begin "the orderly closure" of all Yucca Mountain activities, including completion of the safety report. 56 57 The regulatory agency was sued by Washington State, the State of South Carolina, the National Association of 58 Regulatory Utility Commissioners and Nye County, Nevada for allegedly violating the Nuclear Waste Policy 59 Act of 1983. In 2013, the D.C. Court of Appeals sided with plaintiffs in the lawsuit and ruled that the NRC "has 60 continued to violate the law governing the Yucca Mountain licensing process." 61 62 63 After noting that "this case raises significant questions about the scope of the Executive's authority to disregard federal statutes," the appeals court ordered the NRC to complete its safety analysis of Yucca Mountain as 64 required under the statute. 65 66 67 "The President may not decline to follow a statutory mandate or prohibition simply because of policy objections," the court ruled, or use "political guesswork about future congressional appropriations as a basis for 68 violating existing legal mandates." 69 70 As a result of that order, Volumes 2 and 5 of the Yucca Mountain Safety Evaluation were released on Thursday. 71 72 Volumes 3 and 4 were published last year. The study concluded that nuclear waste stored 1,000 feet beneath 73 Yucca Mountain would be safe for a million years.

# Yucca project could bring economic incentives to Nevada



By Timothy Cama - 05/11/15 06:01 AM EDT

- Proponents of building a nuclear waste disposal site at Nevada's Yucca Mountain are hoping that offering
   certain incentives to the state could convince its leaders to support the project.
- 3

While there are few specifics, lawmakers in Congress say that they're willing to discuss with Nevadans
whether new infrastructure, schools, water rights or money could bring Yucca closer to being the country's
first permanent repository for nuclear waste.

And some of Nevada's officials are starting to listen to proposals that could help bring jobs, economic
development, money or other benefits to the state.

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- 11 But the state still overwhelmingly opposes the nuclear waste plan, with most of its leaders and
- representatives in Congress saying there's no incentive that could make up for dumping nuclear waste in theirbackyard.
- 14
- Incentives are becoming a more central part of the Yucca debate as supporters see more opportunity than
   they have had in decades to get the project, first proposed in the 1980s, moving forward.
- 17
- 18 While the Obama administration stopped work on the project in 2010, Sen. <u>Harry Reid</u> (D-Nev.), who has
- acted as a strong force against Yucca for years, lost his position as the Senate's majority leader when
- 20 Democrats lost power of the chamber in 2014. He has also announced that he'll leave the Senate at the end of
- his term in early 2017.

22	Rep. John Shimkus (R-III.), one of Yucca's most vocal supporters in the House and chairman of the Energy and
23	Commerce Committee's Environment and Economy subpanel, has long been open to negotiating incentives, in
24	addition to the funds that have already been paid locally to monitor the area.
25	
26	"These funds allow those closest to the project to actively participate in the debate and continued study of the
27	site," Shimkus wrote in April in the Las Vegas Review-Journal.
28	
29	"Beyond these established benefits, I've also personally offered to discuss additional benefits with state, local
30	and tribal leaders — including financial, infrastructure, transportation and resource requests," he said.
31	
32	Some of the incentives that Nevadans might be open to would be building the proposed Interstate 11
33	between Las Vegas and Phoenix, getting more rights to the water in the Colorado River or establishing a
34	nuclear research hub.
35	
36	Rep. Dan Newhouse (R-Wash.), another vocal Yucca backer, is also supportive of the idea. Will Boyington, a
37	spokesman for Newhouse, said the congressman "has expressed general support for potential
38	accommodations for the state but would wait for a specific proposal to comment."
39	
40	Because of its ardent opposition to Yucca as a nuclear waste site, the state has historically not been open to an
41	incentives plan. But that started to change in March, when freshman Rep.
42	Cresent Hardy (R-Nev.) wrote in the Review-Journal that the state should be open to discussing benefits.
43	
44	"What if Nevada were to receive a larger share of water rights from the Colorado River, or obtain greater
45	leverage in our quest for better transportation and infrastructure funding across the state," he wrote.
46	
47	He also mentioned school funding and resources to create improve scientific research at the state's university
48	system.
49	
50	Eric Herzik, chairman of the political science department at the University of Nevada, Reno, said Hardy allowed
51	a small amount of discussion in the state about Yucca that had not happened in decades.
52	
53	"Hardy kind of opens a crack in the door, to where people are now at least talking about it, barely," he said,