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Will Yucca Mountain Be Revived by Trump?

Hopes abound for Idaho's nuclear supporters that Trump will somehow revive the now stalled Yucca Mountain spent nuclear fuel repository in Nevada. With Senator Harry Reid, a strong leader of Nevada's opposition to construction of the repository retiring in January, and Republicans coming to the Whitehouse, there is talk of reviving Yucca Mountain.

Nuclear proponents can argue that there are no scientific reasons to block Yucca Mountain. But that is only because the bought and paid for science has delivered the answer that the repository is safe. The US Nuclear Regulatory Commission is both overseeing licensing and generously providing the Department of Energy with the desired answer through NRC's mathematical modeling prowess. The NRC created an exercise in mathematical gyration to show very low ingestion radiation doses from the facility for millennia—yielding results that no one should believe. ¹But, hey, the NRC can approve it as the NRC is to oversee the licensing of the Department of Energy owned Yucca Mountain. ²

The Idaho Falls Post Register reported that president-elect Donald Trump has not yet taken a public position on Yucca, but that during a campaign stop in Nevada, Trump said he was “going to take a look at it. . .a very strong look at it. . .and that he would come very strongly one way or the other. I will have an opinion.” ³

Nuclear proponents want to create the perception that there is a solution to their nuclear waste problem, despite the dim prospects for securing a permanent solution for spent nuclear fuel disposal over the next several decades.

¹ US Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Supplement to the US Department of Energy's Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain Nye County, Nevada, NUREG-2184, May 2016. <http://www.nrc.gov/docs/ML1612/ML16125A032.pdf>

² Yucca Mountain, NRC creates model for the Department of Energy, see public comment submittals for NRC docket NRC-2015-0051 including these by Dr. Jacob D Paz <http://www.nrc.gov/docs/ML1533/ML15337A076.pdf>

³ Luke Ramseth, *The Idaho Falls Post Register*, “Could Trump, revive Yucca Mountain – Idaho politicians support the idea of bringing back Nevada nuclear waste site,” November 25, 2016.

Is the hope of reviving the proposed spent nuclear fuel repository at Yucca realistic? The State of Nevada has a mountain of legal challenge to the NRC that would have to be concluded and the state has blocked access to needed water, land and licensing.^{4 5} Let me put it this way, it's as realistic as any other option for finding a permanent solution for the storage of spent nuclear fuel.

According the Rep. Dina Titus of Nevada: "Yucca Mountain is not a secure depository that would seal dangerous waste safely for a million years," Rep. Titus said. "It is instead a proposal based on bad science and faulty assumptions. Specifically, the NRC confirmed that it is not secure, that it will leak, and that radiation will travel miles through underground water sources to farming communities in the Amargosa Valley on its way to Death Valley National Park. But before the radioactive material can leak out of the ground, it first has to be shipped using untested procedures by truck and by rail through nearly every state and every congressional district in the lower 48. These shipments will occur for decades, passing homes, schools, parks, hospitals, churches, and farms. They will pass through the heart of my congressional district along the famed Las Vegas Strip where 42 million people come every year to work and play. We need to stop the Yucca Mountain boondoggle once and for all."⁶

November Senate Committee Proposes Costly Life Support for Dying Nuclear Industry

Among the weird ideas put forth to save the dying US nuclear energy industry is the idea of an independent quasi-public corporation to manage proposed advanced reactor initiative and nuclear waste.⁷

World Nuclear News stated: "The task force recommended the creation of an independent quasi-public corporation to manage the proposed advanced reactor initiative. . . . [And] committee staff had suggested a single entity could be created to manage both the advanced nuclear initiative and the implementation of the nuclear waste plans from the 2012 Blue Ribbon Commission on America's Nuclear Future."

Meanwhile, no one knows what the president elect means to the nuclear energy industry or to the clean power plans. The few speeches addressing energy by campaigning Donald Trump were all about denying climate change, dumping clean energy plans, and embracing "clean coal" which

⁴ Letter from Sen. Harry Reid to Marvin Fertel, President and CEO of Nuclear Energy Institute, September 6, 2016 at http://www.state.nv.us/nucwaste/news2016/pdf/reid_NEI_Yucca_9.6.16.pdf

⁵ Read more at State of Nevada nuclear waste website <http://www.state.nv.us/nucwaste/whatsnew.htm>

⁶ Statement by Dina Titus, US House, First Congressional District of Nevada, May 2016 <https://titus.house.gov/news/floor-statements/another-year-another-gop-yucca-mountain-charade>

⁷ World Nuclear News, "Act Now For Nuclear Future, US Senate Committee Told," November 18, 2016. <http://www.world-nuclear-news.org/NP-Act-now-for-nuclear-future-US-Senate-committee-told-1811167.html>

means among other things, reducing regulations to protect streams. But even though Trump's campaign promises on promoting coal helped him with crucial wins in Pennsylvania and Ohio, the demand for coal and the realities of the industry are unlikely to increase coal jobs.⁸

1000 New Nuclear Plants by 2050 Wouldn't Put a Dent in CO2 Production

Proponents of nuclear energy are pushing to build more nuclear power plants, 1000 plants by 2050, purportedly in order to combat CO2 production and address climate change. The cost, according to the Arnie Gunderson of non-profit Fairewinds, would be \$8.2 trillion but this would only make an estimated 3 percent dent in annual CO2 production in 2050.⁹ The opportunity cost is even higher because the money allocated for nuclear plant construction takes money away from more affordable solutions.

And these costs do not account for the loss of health, loss of clean water, loss of clean air and soil for millennia because of routine nuclear plant emissions, accidents, and the expected trickle out of radioactive contaminants from waste and spent nuclear fuel disposal over the millennia that the waste remains hazardous. With only about 100 nuclear plants for a few decades, the US already is approaching enough spent nuclear fuel for two Yucca Mountain repositories — which over time trickle out radionuclides into watersheds. This country can't even site one Yucca Mountain repository — and now they would need several more? The waste from 1000 nuclear plants and an accident every decade or so, will completely poison the country, many people and remain toxic for millennia.

The claimed reason for nuclear plants as a low carbon energy source belongs with the original claim that nuclear energy that would be “too cheap to meter” (it did not) and the promised “nuclear renaissance” in the early 2000's that was sure to bring many more nuclear plants to the US landscape BECAUSE they claimed that the industry now had the technology to control construction costs—it did not. Nuclear energy costs even without accounting for the real cost of managing the waste far exceed other energy sources. And the construction costs have continued to escalate and the schedules to complete the plants in the US and around the world keep slipping.

⁸ Clifford Krauss and Michael Corkery, *The New York Times*, “A Bleak Outlook for Trump's Promises to Coal Miners,” November 19, 2016. <http://www.nytimes.com/2016/11/20/business/energy-environment/a-bleak-outlook-for-trumps-promises-to-coal-miners.html>

⁹ Arnie Gunderson, Fairewinds.org, “Truthout: Nuclear Power is Not “Green Energy”: It is a Fount of Atomic Waste,” November 14, 2016. <http://www.fairewinds.org/nuclear-energy-education/truthout-nuclear-power-is-not-green-energy-it-is-a-fount-of-atomic-waste-arnie-gundersen>

Hanford Settlement \$125 million — Contractors Deny Wrongdoing

The Associated Press has reported that Hanford contractors URS Corp and Bechtel National Inc. are to pay \$125 million to settle a lawsuit alleging subpar work in building a nuclear waste treatment facility at the Hanford site in Washington State. The suit also was addressing accusations that the contractors illegally used tax-payer money to lobby members of Congress. They had lobbyists downplay the concerns brought by an independent federal oversight board. The companies denied any wrongdoing.

The suit was initially brought in 2013 by three whistleblowers worried about safety issues at the Hanford Waste Treatment Plant that was being constructed. Liquid radioactive high level waste from the production of plutonium for nuclear weapons in nuclear reactors at the Hanford site is still being stored in aging underground tanks, dozens of which are leaking, threatening the Columbia River nearby. The government's investigation showed that the contractors "recklessly purchased deficient materials and services with taxpayer money."¹⁰

If the treatment plant ever operates, it is supposed to vitrify the liquid waste into logs. The storage of these glass logs is more stable than liquid waste in tanks, but glass breaks down overtime due to the radioactivity. The Department of Energy has expressed to the Idaho National Laboratory Citizens Advisory Board that they hope to ship the vitrified waste, eventually, to the WIPP facility in New Mexico. The vitrified Hanford waste is not currently licensed to be disposed of at WIPP.

The Hanford site soil and river are already highly contaminated. Buried waste already at the Hanford site will be trickling into the Columbia River for millennia.¹¹ Radioactive waste was also dumped directly into the river from operations at Hanford not only for plutonium production but also for the secretive production of fissile weapons material uranium-233.¹² Interest and investigation into U-233 production began in the 1940s. There was and continues to be considerable secrecy especially around U-233 production. It appears that it was considered

¹⁰ Gene Johnson and Phuong Le, Seattle AP, *The News Tribune*, "Feds: Hanford contractors to pay \$125 million settlement," November 23, 2016. <http://www.thenewstribune.com/latest-news/article116786008.html>

¹¹ See Institute for Energy and Environmental Research analyses and comment for the disposal of Greater-Than-Class-C waste at Hanford and the high amount of buried waste there in this 2011 comment submittal on GTCC waste at http://ieer.org/wp/wp-content/uploads/2011/06/GTCC-EIS-Comments-2011_YakamaNation_with_IEER.pdf

¹² Norm Buske, Government Accountability Project, "Hanford Radioactivity in Salmon Spawning Ground," Report to the Citizens' Monitoring and Technical Assessment Fund for Grant No. MTA-1-001, December 19, 2001. <http://www2.clarku.edu/mtafund/prodlib/gap/round1/2001-12-19.pdf> See also "Questions and Answers on Uranium-233 at Hanford – Overview of the Thorium-to-Uranium-233 Program at Hanford." <http://www.radioactivist.org/Q%20&%20A%20from%20GAP.pdf>

acceptable waste management practice to dump the thorium and uranium separated materials into the Columbia River prior to and during the 1960s and even into 1970s.

Department of Energy Past Waste Water Practices at INL Included Dumping Thorium and Uranium into the Aquifer: They Keep Pretending It's There Naturally

The acceptance of direct dumping of thorium and uranium related material following separations or examinations processes at the Department of Energy's Hanford facility gives important insight into the dumping practices at Idaho's Department of Energy site, now called the Idaho National Laboratory. There were many U-233 programs at the Idaho site at the Naval Reactors Facility, Test Reactor Area (now the ATR Complex), ANL-W (now the Materials and Fuels Complex), and the Radioactive Waste Management Complex.

In fact, the thorium and uranium in the Snake River Plain aquifer found by various US Geological Survey reports is not naturally occurring but is there because of radioactive waste disposal into the aquifer by the Department of Energy.¹³ For an idea of the radioactive and chemical waste resulting from one DOE facility at the Idaho National Laboratory, see this CERCLA cleanup report and others at the administrative record.¹⁴

The high levels of gross alpha from uranium and thorium radioactive wastes, along with hexavalent chromium, have long reached Idaho's Magic Valley. The state's drinking water monitoring program has done what it can to pretend this isn't from INL. Experts attending the INL Citizens Advisory Board continue to claim that only a few molecules of contamination can be found south of the INL. This frequently repeated falsehood along with inadequate state oversight ignores the elevated cancers in counties downgradient from the Idaho National Laboratory that are probably because of the chemical and radioactive contaminants in the aquifer from the INL.

¹³ LeRoy L. Knobel et al., US Geological Survey, "Chemical Constituents in the Dissolved and Suspended Fractions of Ground Water From Selected Sites, Idaho National Engineering Laboratory and Vicinity, Idaho, 1989," Report 92-51, March 1992. See Table 19 for USGS well 14 contamination including thorium-232 decay products lead-212 and radium-228. They were mystified by the variations in monitored contaminant levels in the same well. But the variations likely resulted from the stratified contamination levels and variation in mixing the stratified levels during well sampling. <http://pubs.er.usgs.gov/usgspubs/ofr/ofr925>

¹⁴ See INL CERCLA Cleanup Administrative Record at <https://ar.icp.doe.gov> and See one report for an idea of contaminants in Department of Energy Idaho Operations Office, "Final Removal Action Report for CPP-601, CPP-602, CPP-627, CPP-630, and CPP-640," DOE/ID-11453, February 2012. See Table 3, p. 19 and 20. <https://ar.icp.doe.gov/images/pdf/201202/2012022800768BRU.pdf>

One of the contaminants particular to U-233 production that does not occur otherwise in reactors is the production of contaminant europium-152. While highly enriched U-235 reactor produce europium-154, they do not produce Eu-152.

INL cleanup contaminant-of-concern lists include Europium-152, thorium and uranium from INL waste disposal. A surface soil report for the Department of Energy also reported Europium-152 in Arco Idaho.¹⁵

An Idaho National Laboratory summary of contaminants of concern, though incomplete, lists Eu-152 for TRA and INTEC as well as thorium and uranium-233 for TRA and RWMC.¹⁶

Hexavalent Chromium Around the Country as EPA Delays

Millions of Americans are drinking chromium-6 laden water. In 2008, the National Institutes of Health published groundbreaking research showing how chromium-6 caused cancerous tumors in mice and rats.¹⁷ This prompted the Environmental Protection Agency (EPA) to evaluate hundreds of studies, concluding that chromium-6, also known as hexavalent chromium, likely causes cancer in people who drink it. In 2011, the EPA was on the verge of forming more stringent rules on the contaminant.

Then in 2012, the EPA bowed to pressure and said it would wait for new studies conducted by the chemical industry that likes its use of chromium-6. It's tobacco science all over again. The industry shoots down credible studies and replaces them with biased studies to obtain the result the industry wants.

This matters in Idaho where citizens downgradient from the Idaho National Laboratory have been and continue to have chromium-6 (hexavalent chromium) in their aquifer drinking water. Vast amounts of the chemical were dumped into the aquifer at the INL Test Reactor Area now called the ATR Complex.

¹⁵ S. M. Rood et al., "Background Dose Equivalent Rates and Surficial Soil Meal and Radionuclide Concentrations for the Idaho National Engineering Laboratory," INEL-94/0250, Rev 1, August 1996, Lockheed Martin for the Department of Energy Idaho Operations Office. See page A-3, europium-152 contamination found in city of Arco December 1982 and Montevue in 1982 (p. A-19). Radium-228 also associated with thorium cycle is found at Atomic City in 1978 (p. A-6) and other locations.

¹⁶ Department of Energy, Environmental Management under DOE-ID, INEEL Subregional Conceptual Model Report, INEEL/EXT-03-01169, Rev. 2, September 2003. p. 4-2. at <https://inldigitallibrary.inl.gov/sti/3562854.pdf>

¹⁷ David Heath, The Center for Public Integrity, "How industry scientists stalled action on carcinogen," March 13, 2013. <https://www.publicintegrity.org/2013/03/13/12290/how-industry-scientists-stalled-action-carcinogen>

The Idaho Department of Environmental Quality drinking water programs have only existed since the late 1980s and have used the very high 100 micrograms/liter level as a sign of trouble. Levels below the maximum contaminant level (MCL) of 100 ug/L have basically been reported as “zero” more often than not, even though the levels are far above what the State of California has set its regulatory limit of 10 ug/L and determined to be their public health goal of not exceeding 0.02 ug/L.¹⁸ There are natural forms of chromium that are not a health concern, but the IDEQ doesn't try to distinguish them from chromium-6.

Rocky Flats Health Survey Being Conducted for 1952-1992

Over 1700 people responded to the Rocky Flats health survey, over 800 had cancer. The survey of people who lived near the Rocky Flats plant between 1952 and 1992 was launched in May and is still ongoing.¹⁹

Carol Jensen, a nurse and a professor at Metropolitan State University of Denver, said that there are enough worrisome results to warrant further study. But she cautioned that people who are ill may have been more likely to respond to the survey.

The survey was conducted in cooperation with the Rocky Flats Downwinders citizens group. The results showed an unexpectedly large number of thyroid and other rare cancers.²⁰

Plutonium produced at the Department of Energy's Hanford nuclear reactors was brought to the DOE's Rocky Flats facility to form nuclear weapons components. Then waste from this processing was shipped to be buried in Idaho, over the Snake River Plain aquifer. Some of this waste was stored above ground rather than buried and is being shipped for disposal at the New Mexico Waste Isolation Pilot Plant, WIPP. **But most of the Rocky Flats waste buried at Idaho's Radioactive Waste Management Complex is staying buried and staying in Idaho along with radioactive waste from INL operations and from around the country, despite frequent propaganda made to sound like all of the waste is being removed from Idaho.** The Rocky Flats waste included carbon tetrachloride that now exceeds drinking water standards and is increasing despite vapor-extraction methods being conducted at the waste site. Vast quantities of uranium, depleted uranium, americium from plutonium purification processes and plutonium

¹⁸ See our newsletter for July 2016, “Hexavalent Chromium from INL Waste Water: Someone Should Tell Idaho DEQ It's Not Healthy.” <http://www.environmental-defense-institute.org/publications/News.16.July.pdf>

¹⁹ See the Rocky Flats Downwinders website at www.RockyFlatsDownwinders.com See the Metropolitan State University of Denver health survey webpage: https://msudenver.qualtrics.com/jfe/form/SV_5hdTsfuXsZNIaPT

²⁰ John Ingold, The Denver Post, “Rocky Flats health survey indicates areas of concern but isn't conclusive,” November 18, 2016. <http://www.denverpost.com/2016/11/18/rocky-flats-health-survey-not-conclusive/>

are not being removed from the RWMC despite the accelerated retrieval projects that remove “targeted waste” that was the most chemically laden waste from Rocky Flats. ²¹

A very readable way to learn more about the harm from past operations at Rocky Flats is provided in Kristen Iversen’s *Full Body Burden*.²² Stack emissions, fires at the plant and water runoff from storage areas spread plutonium to neighboring citizens. While workers may be eligible for Energy Employee Occupational Illness Compensation, those living near the plant, especially children living and playing in plutonium-laden soil and water who died will never be compensated. The Department of Energy knowingly contaminated its neighbors and did nothing to inform citizens of escalating contamination levels. The FBI raided the plant in 1989.

Articles by Tami Thatcher, for December 2016.

²¹ Read more on our website and in our September 2015 newsletter, “Status of Cleanup at the Radioactive Waste Management Complex,” <http://www.environmental-defense-institute.org/publications/News.15.Sept.Final.pdf>

²² Kristen Iversen, *Full Body Burden – Growing Up in the Nuclear Shadow of Rocky Flats*, www.crownpublishing.com, ISBN 978-0-307-95563-0, Copyright 2012.