

Beyond Nuclear

working for a world free from nuclear power and nuclear weapons



Nuclear waste has “the capacity to outlast human civilization as we know it and the potential to devastate public health and the environment.” — The D.C. Circuit Court of Appeals

Nuclear Energy Institute v. U.S. Environmental Protection Agency, 373 F.3d 1251 (D.C. Cir. 2004).

What is Nuclear Waste?

Nuclear waste, or high-level radioactive waste, generally refers to “spent” fuel rods that have been removed from nuclear power plant reactors because they can no longer sustain a nuclear reaction. After removal from the reactor, the spent fuel rods are placed in a pool of water to cool. After several years of cooling, they may be moved to dry casks. High-level waste can also refer to waste produced by reprocessing spent fuel. Spent fuel rods and reprocessing waste are high level waste because they remain highly radioactive for thousands of years.¹

We’ve Got a Lot of Waste.

Currently, around **90,000 metric tons** of HLW are stored in above-ground cooling pools or dry casks at operating and decommissioned (shutdown) nuclear power plants across the country. Additionally, in light of the current Administration’s push to expand nuclear energy production,² the waste problem is expected to get worse, not better.

¹ Alexander Nechaev et al., *Long Term Storage and Disposal of Spent Fuel*, IAEA Bulletin (Spring 1986), available at: <https://www.iaea.org/sites/default/files/publications/magazines/bulletin/bull28-1/28104681520.pdf>.

² *President Trump Signs Executive Orders to Usher in a Nuclear Renaissance, Restore Gold Standard Science*, The White House (May 23, 2025), available at: <https://www.whitehouse.gov/articles/2025/05/president-trump-signs-executive-orders-to-usher-in-a-nuclear-renaissance-restore-gold-standard-science/>.

³ U.S. Nuclear Regulatory Commission Factsheet on Radioactive Waste (Jan. 26, 2024), available at: <https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/radwaste.html>.

90,000 Tons of Nuclear Waste are Currently Stored at Nuclear Power Plants Throughout the United States—Why is this Dangerous?

This Waste Must be Permanently Disposed of Underground to Protect the Public.

Why is radiation from nuclear waste dangerous? Direct exposure to high level waste radiation can be fatal within minutes.³ Indirect exposure through radiation released into the environment can cause cardiovascular disease, cataracts, cancer, and it can even damage DNA, resulting in inheritable mutations.⁴

How long does radiation from nuclear waste remain in the environment?

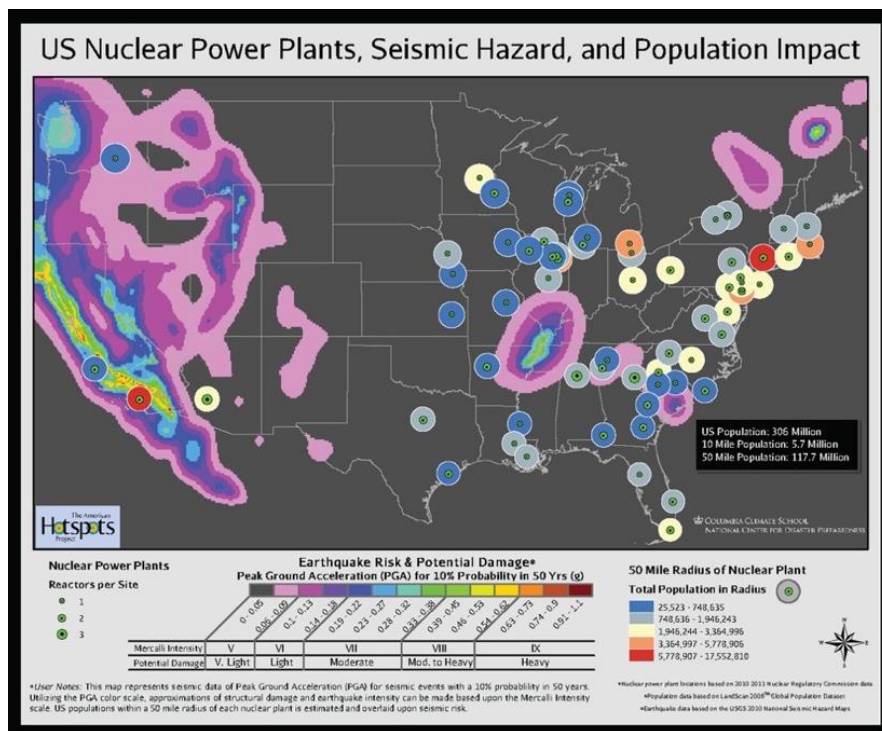
Spent fuel contains around 96% uranium, 3% stable fission products, and 1% plutonium.⁵ Over 98.5% of this uranium is U-238. It takes 4.47 billion years for half of U-238’s radioactivity to decay.⁶

Why is above-ground onsite storage dangerous? Accidents, natural disasters, or human interference are far more likely to damage spent fuel rods, and thus release radiation, if that high level waste is stored above ground in dry casks or cooling pools rather than permanently isolated underground. For example, if an event disrupts storage pool cooling, fuel rods can overheat, melt down, and release radiation.

⁴ National Institutes of Health, *The Genetic Effects of Chernobyl Radiation Exposure* (May 4, 2021), available at: <https://www.nih.gov/news-events/nih-research-matters/genetic-effects-chernobyl-radiation-exposure>.

⁵ World Nuclear Association, *Processing of Used Nuclear Fuel* (Aug. 23, 2024), available at: <https://world-nuclear.org/information-library/nuclear-fuel-cycle/fuel-recycling/processing-of-used-nuclear-fuel>.

⁶ U.S. Centers for Disease Control and Prevention, *Radiation Emergencies: Uranium-235 (U-235) and Uranium-238 (U-238)* (Apr. 17, 2024), available at <https://www.cdc.gov/radiation-emergencies/hcp/isotopes/uranium-235-238.html>.



The map above shows where nuclear power plants are located across the country, how at risk those areas are of experiencing an earthquake, and how many people live within 50 miles of each plant (and thus could be harmed if an earthquake were to damage a plant and release radiation).

US Nuclear Power Plants, Seismic Hazard, and Population Impact, available at: <https://ncdp.columbia.edu/nuclear-power-plants-earthquake-risk/>.

“Even though it’s decommissioned, the San Onofre Nuclear Generating Station poses serious public safety risks to the millions of Americans in Orange County and San Diego areas in addition to Camp Pendleton’s facilities.” — U.S. Rep. Young Kim

Press Release, “Rep. Mike Levin Reintroduces Bipartisan Legislation to Prioritize San Onofre for Spent Nuclear Fuel Removal” (Feb. 6, 2025), available at: <https://levin.house.gov/media/press-releases/rep-mike-levin-reintroduces-bipartisan-legislation-to-prioritize-san-onofre-for-spent-nuclear-fuel-removal>.

Case Study: The Dangers of Onsite Storage—San Onofre, California⁶

Decommissioned nuclear power plant San Onofre Nuclear Generating Station currently stores 1,600 tons of spent fuel rods on site in dry casks. The casks are inside a concrete pad about 100 feet from the ocean, separated only by a sea wall. **The site is near multiple geological faults**, raising concerns that an earthquake or tsunami could damage the dry casks, releasing radiation.

The surrounding community wants the nuclear waste gone. On February 6, 2025, U.S. Representatives Levin, Issa, and Kim reintroduced the **Spent Fuel Prioritization Act** to prioritize the removal of nuclear waste from decommissioned nuclear sites in areas with **large populations, high seismic hazard**, and where the continued storage poses a **national security risk**.⁷ The bill is agnostic about whether the waste will go to a permanent repository or an interim storage site. The bill specifically aims to make San Onofre a top priority because it is “high-risk.” Over nine million people live within 50 miles of the site, there is high risk of seismic activity in the region, and the site is located on Marine Corps Base Camp Pendleton.

While San Onofre highlights the dangers of onsite storage as a permanent solution, the Nuclear Regulatory Commission asserts that onsite storage is the safest storage option until an underground repository is built. We should not settle for relocation to an interim storage facility and instead should leverage the desire to move the waste from San Onofre to site and build a permanent underground repository. Simply moving the waste from one temporary storage site to another is not a permanent solution.

⁶Rebecca Tuhus-Dubrow, *What Should America Do With its Nuclear Waste?*, The Washington Post (Apr. 11, 2022), available at: <https://www.washingtonpost.com/magazine/2022/04/11/america-nuclear-waste-san-onofre/>.

⁷Press Release, “Rep. Mike Levin Reintroduces Bipartisan Legislation to Prioritize San Onofre for Spent Nuclear Fuel Removal” (Feb. 6, 2025), available at: <https://levin.house.gov/media/press-releases/rep-mike-levin-reintroduces-bipartisan-legislation-to-prioritize-san-onofre-for-spent-nuclear-fuel-removal>.