

# Protecting Idaho from nuclear waste – in all its forms – demands vigilance

By Beatrice Brailsford, Nuclear Program Director

The Snake River Alliance works hard to protect Idaho from the harmful effects of nuclear waste. All nuclear waste is radioactive and capable of hurting people and causing permanent environmental damage, even under low exposure conditions. The National Research Council of the National Academies advises the US government on the relationship between human health and exposure to low levels of radiation. Because of the work of the NAS's Biological Effects of Ionizing Radiation (BEIR) committees, the radiation protection community increasingly assumes that *any* amount of radiation may pose some risk for causing cancer and hereditary effect. The risk is higher for higher exposures, and there is no threshold below which the risk is zero.

Every step in the production of nuclear weapons and nuclear power creates nuclear waste. The waste is categorized based on how it's made, how radioactive it is, or how long it will remain hazardous, though those characteristics bleed back and forth between the waste types. A substantial amount of nuclear waste is even defined by what it is *not*. Methods of handling, storing, and disposing of radioactive waste differ depending on its type.

In Idaho, the role of the Idaho National Laboratory (INL) in the US Department of Energy (DOE) nuclear weapons complex and the commercial nuclear industry has led to nuclear waste of every kind being stored above the Snake River Aquifer, the lifeblood of southern Idaho and the sole source of drinking water for 300,000 of our friends and neighbors. The Snake River Alliance is dedicated to ensuring the cleanup of the waste that is already here and preventing more from being generated or imported. Read on to learn more about the types of nuclear waste at issue.

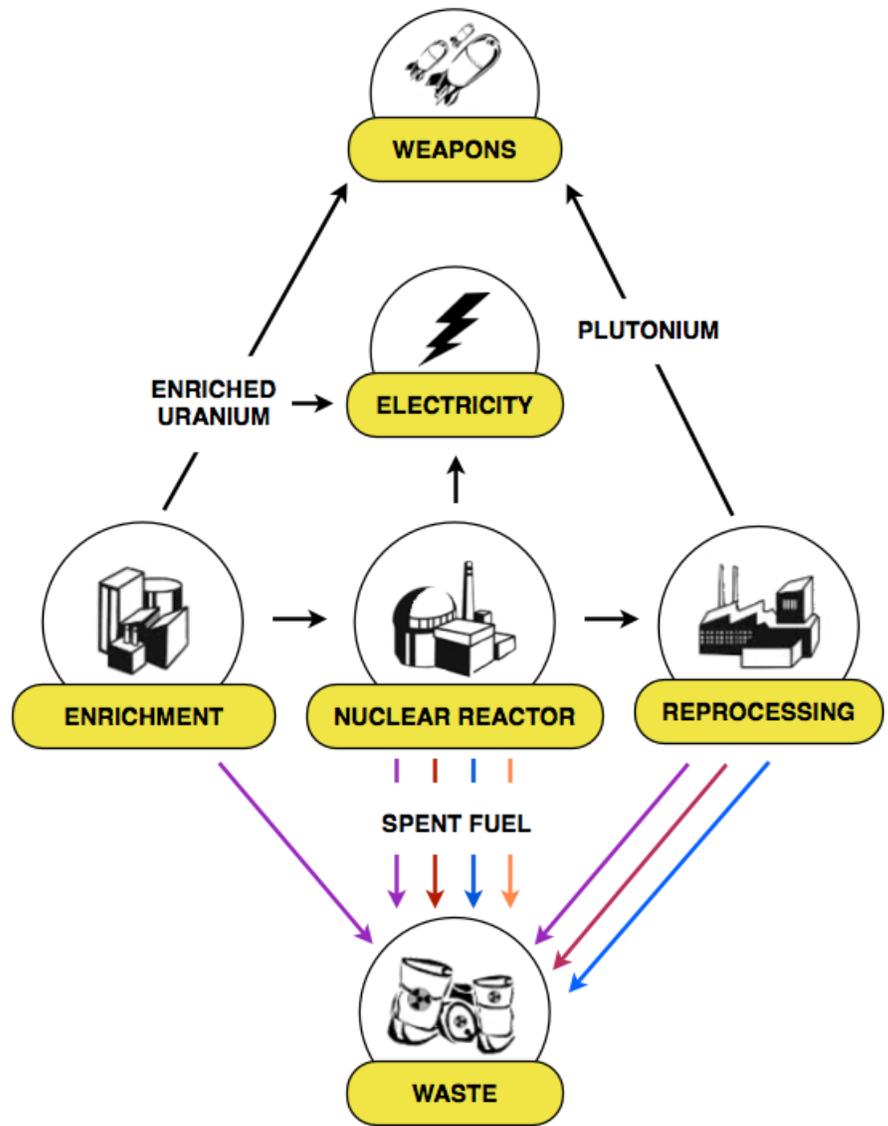
➔ **Low-level waste.** Low-level waste is all nuclear waste that is *not* transuranic waste, *not* high-level waste, and *not* spent nuclear

fuel. The majority of low-level waste has low concentrations of radioactivity, but some is very radioactive and workers can't come in direct contact with its containers. Most is buried just below the earth's surface. A fairly substantial quantity of low-level and mixed low-level waste comes from the uranium enrichment process. (Before uranium can be used in reactor fuel or nuclear bombs, it has to be "enriched" so the concentration of its fissionable isotope – U-235 – is increased).<sup>1</sup>

INL plans to bury enough of the more radioactive low-level waste from the nuclear navy and nuclear power research

and development to fill a two-car garage every year for the next 50 years. That new waste will come from the nuclear navy and nuclear power research and development.

➔ **Spent nuclear fuel.** Over time, enriched uranium reactor fuel becomes so radioactive it can no longer efficiently maintain the nuclear chain reaction. It is then considered said to be "spent" and is replaced. Spent nuclear fuel is intensely radioactive – someone standing one yard away from an unshielded commercial-sized spent fuel assembly could receive a lethal dose of radiation in less than three



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minutes.

Spent nuclear fuel has been generated and stored in Idaho for decades. Since INL was established in 1949, 52 nuclear reactors have been built there, producing spent fuel that is still in Idaho. In addition, all the spent fuel from the nuclear navy comes to Idaho, and Idaho has received spent fuel from domestic and foreign research reactors and commercial power reactors. The INL even stores the reactor core debris from the Three Mile Island nuclear accident. All told, INL has about 300 metric tons of spent nuclear fuel in “interim” storage.

In the early 1990s, the Snake River Alliance launched its Stop the Shipments campaign to highlight the flood of spent fuel coming into Idaho and build support for the State to challenge the shipments in court. The State’s lawsuit forced the federal government to agree to a monitored regimen of naval and research reactor spent fuel shipments to Idaho and to an absolute ban on commercial spent fuel coming here for storage. The 1995 Settlement Agreement also mandates exhumation and/or treatment and removal from the state of some of the more problematic waste stored here.

The Alliance will continue to lead the resistance to consolidating commercial spent fuel in Idaho, as there are clearly political and corporate forces that are laying the ground for reversing the ban.

➔ **High-level waste.** In its primary role as the country’s chief nuclear weaponeer, the DOE reprocessed spent nuclear fuel at three of its sites: Hanford, WA; Savannah River, SC; and the INL. During reprocessing, spent fuel is dissolved in acid so the targeted ingredients – enriched uranium and plutonium – are precipitated out of the liquid to be used in nuclear reactors or nuclear bombs. The resulting liquid acid waste contains intensely radioactive, short-lived fission products, long-lived radioactive isotopes, hazardous chemicals, and toxic heavy metals. It is categorized as high-level waste because it is produced by reprocessing.

INL reprocessed spent fuel for the nuclear weapons complex between 1953 and 1988. Most of the Site’s liquid high-level waste has been dried to a powder, and 4,300 cubic meters of dry high-level waste are stored in large, shielded bins above ground. Buried tanks still hold 900,000 gallons. Construction of a new facility to dry that waste has so far cost about \$800,000,000, and it’s not certain it will ever operate. Reprocessing spent nuclear fuel and managing the resulting waste is a lucrative business for corporations that have the stomach for it, and that income stream is an acknowledged inducement for consolidating spent nuclear fuel as the feedstock for a reprocessing plant.

➔ **Transuranic waste.** Reprocessing and other nuclear weapons production activities also produce transuranic waste. Transuranic waste contains man-made elements with atomic numbers higher than uranium on the periodic table and half-lives longer than 20 years. All will remain hazardous for at least 200 years, but most remains hazardous a good deal longer. Bomb-grade plutonium, for instance, remains hazardous for a quarter of a million years.

From 1954 to 1970, the plutonium bomb plant at Rocky Flats, CO, shipped tens of thousands of cubic meters of transuranic waste to INL, where it was buried in unlined pits and trenches. After 1970, the waste was no longer buried but was stacked on a very large asphalt pad and covered with dirt. INL laid out its plans to deal with the above-ground waste in 1998, which initially included an incinerator to burn PCB-contaminated plutonium waste. The Alliance helped lead stiff opposition to burning nuclear waste, and the incinerator proposal was abandoned. After a number of false starts, exhumation of nearly 6 acres of targeted waste began in 2005.

Like high-level waste and spent nuclear fuel, transuranic waste should be isolated from the human biosphere until the end of time. So far, there is no deep geologic repository for spent fuel or high-level waste anywhere on earth, but the US does

have a deep geologic repository in New Mexico for transuranic waste called the Waste Isolation Pilot Plant (WIPP). INL has sent more waste to WIPP than any other DOE site, but two accidents there last winter shut the facility. INL is continuing to exhume transuranic waste for safer above ground storage. In 2015, the Alliance will join colleagues from other affected communities to help people understand the implications of WIPP’s closure.

Through the support of our members, the Alliance’s leadership has been strong and has helped create a reality where INL has one of the better nuclear waste cleanup programs. But serious contamination still needs to be addressed, and DOE may be prematurely shifting its attention to new nuclear projects that will create new nuclear waste. And that’s why we can never let our guard down – and why we must continue our vigilance over activities at INL that threaten our land, people, and water.

<sup>1</sup> A few years ago, the French nuclear giant Areva set out to build a uranium enrichment factory in Idaho. The Snake River Alliance was determined to delay construction long enough for the weak nuclear market and Areva’s own mismanagement to kill the project. Thus far, we have succeeded. See <http://snakeriveralliance.org/areva-uranium-enrichment-factory/>.