



Uranium and water

Our water is a scarce and precious resource. The nuclear industry puts it at risk. The mining and milling of uranium uses massive amounts of water. Leaks and emissions from mines, tailings dams, enrichment facilities, waste dumps and power plants have contaminated local water sources throughout the world.

Why water?

Clean potable water is a scarcity in a world that is heating up. Changes in weather patterns and clearing of forests are already increasing the amount of droughts Australia and other places experience. Queensland is experiencing its own water crisis today, with dams at record lows and farmers seeing massive increases in the amount they pay to irrigate their crops from natural water sources.

Water and uranium mining

Uranium processing is perhaps the most water consumptive part of the nuclear cycle.

Water is used in the in-situ leach process where water and sulphuric acid are injected into the ore body to dissolve out the uranium. This process also extracts other contaminants including arsenic and lead, which are further extracted as waste.

The milling process, which is necessary to concentrate the uranium in the ore, uses huge amounts of water. Olympic dam, Australia's biggest uranium mine and mill, is permitted to use 42 litres per year, dwarfing the one megalitre a year used by the average Brisbane consumer.

The waste slurry from uranium milling is dumped in huge tailings dams, a toxic mix of acids, lead, arsenic and leftover uranium - still 85% as radioactive as what was extracted and also poisonous.

The dams kill local wildlife that drink or swim in them. Despite the precautions of air guns and floating obstacles to make Olympic Dam tailings dams unattractive to birds, in 2004 hundreds of birds and other wildlife were killed in one mass poisoning incident.

Tailings dams do contaminate local ground and surface water through leaks, overflows during rain and dam failure. In 1979 a tailings dam at Church Rock in Arizona collapse spewing 370,000 m³ of radioactive water, and 1,000 tonnes of contaminated sediment the local river

and 110m downstream, which to this day is too dangerous for the water to be used. It jeopardized the lives of the local

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Navajo population and decimated their local economy. In 1985 a tailings dam of Prealpi Mineraria failed at Stava, Trento, Italy. 200,000 cubic metres (m³) of tailings flowed 4.2 km downstream at a speed of up to 90 km/h, killing 268 people and destroying 62 buildings. The total surface area affected was 43.5 hectares. These are just two of the many major tailing dams accidents, but slow leaks are more common.

In 1994 Olympic Dam uranium mine tailings dams were discovered to have been

leaking, perhaps for as long as two years, releasing up to five million m³ of contaminated water into subsoil (WISE 2006). In addition, the site has been guilty of many license violations involving release of contaminated water. More than 10 million tonnes of tailings a year are placed in ponds near the mine.

Water and nuclear power

Despite the rhetoric of the pro-nuclear lobby, like other nuclear industries, nuclear power plants are contaminating local water sources and putting people's health and food sources at risk.



***Olympic Dam uranium mine tailings dams
South Australia***

In January 2006 the Union of Concerned Scientists petitioned the US Nuclear Regulatory Commission to act on the thousands of millions of litres of radioactive water leaking from the nations many nuclear power plants. Even if the leaks are discovered and stopped, the USNRC has little power to prosecute the companies concerned (UCS 2006).

In one important case in Connecticut (US) three nuclear power plants were shut down in 1996 after 29 years of unreported and underestimated contamination of local water. On closing of the plants the Connecticut Attorney General said the local pollution from the plants was so severe that, "The goal is no

longer to decommission a nuclear power plant, but rather to decontaminate a nuclear waste dump". Levels of two radioactive substances, Cobalt 60 and Cesium 137, were found to be three and six times, respectively, above federal limits, a local drinking well was discovered contaminated with tritium and it emerged that during the 1980s and into the 1990s the company had been giving away soil, asphalt, and concrete blocks from the site to local residents.

In another incident a nuclear power plant in Mississippi accidentally dumped about 190 thousand litres of radioactive waste water into the Mississippi River which feeds the local drinking water system. In many other cases drinking water has been contaminated by human error and construction failure. In other cases radioactive water has been released into the environment on purpose, such as at Lake Ontario, New York. The extent of the radioactivity was not revealed to the US Nuclear Regulatory Commission by the company for 8 years.



ANDRA has only a partial inventory of the multitude of existing waste categories, as large quantities have not yet been declared by the main waste producers EDF and Cogema, including spent nuclear fuel or waste from the uranium enrichment industry".

Water and other nuclear industries

Other forms of nuclear industry including enrichment facilities, weapons manufacturers and irradiation plants have released radioactivity into local water.

In 1982 a food irradiation plant in Dover, New Jersey USA was flooded with contaminated water when a pump malfunctioned. The water drained into the sewer of the heavily populated local area. The company did not tell the Nuclear Regulatory Commission of the accident until 10 months later.

There have been hundreds of US and Russian nuclear submarine accidents and sinking, leaving a legacy of nuclear waste dumps under the worlds oceans. Until recently, US

Water and waste dumps

Nuclear waste remains dangerous for millions of years. Despite 50 years of the nuclear industry, no safe disposal method has yet been found and evidence is mounting that current storage methods have been contaminating local ground and surface water for some time.

50 years of nuclear waste storage in France has come

under the spotlight in 2006, with at least two major leaks being discovered. In Normandy, local dairy cows had been consuming the water and in the Champagne region, the leaks put at risk Frances important wine industry. The storage facilities house waste from Frances 77 nuclear power reactors as well as waste from reprocessing.

A May 2006 Greenpeace report found that, "evidence is emerging that a new nuclear dumpsite in the Champagne region of France is leaking radioactivity into the ground water threatening contamination of tritium and at a later stage other radionuclides. The French nuclear waste authority

WATER CONTAMINATION - A VERY REAL RISK

- 1960 A nuclear missile melted, causing plutonium contamination in the ground water below, New Jersey
- 1964 fish contaminated by uranium found in Colorado rivers
- 1961 A B52 carrying nuclear weapons crashed into North Carolina farmland, where it still contaminates
- 1971 Minnesota Nuclear Power Plant (NPP) spills 190,000 litres radioactive water into Mississippi River
- 1978 Dr William Lochstet of Pennsylvania State U argued that the operation of a single uranium mine could result in 8.5 million deaths over time through local water contamination. Substantiated by US Nuclear Regulatory Commission
- 1979 Tailings dam collapses at Church Rock, New Mexico. Contaminates local rivers with thorium and radium to this day
- 1981 birth defect in Shiprock, New Mexico linked to tailings piles
- 1983 208,000 gallons of water with low-level radioactive contamination was accidentally dumped into the Tennessee River
- 2006 The Union of Concerned Scientists, a coalition of 22 organizations petitioned the Nuclear Regulatory Commission to take action on the many radioactive leaks contaminating water around US NPPs.
- 2006 substantial leaks from two separate waste storage facilities in France discoverd to be affecting grondwater and risk to farming
- 2006 uranium discovered in drinking water of Burdekin, QLD primary schools.

submarines and ships were also likely to discharge large amounts of radioactive coolant into the oceans as standard operational practice.

Oak Ridge nuclear weapons plant in the US has contaminated local groundwater not only with radioactive substances, but also PCBs, heavy metals, and 1,200 tons of mercury. US Bases leave a similar legacy of pollution.

US military policy of not declaring nuclear material on board their vessels means that sunken planes, submarines and ships may contian much more nuclear material undersea. The 2005 crash of a US jet 300km off the coast of Brisbane is one nearby example of an undersea unrecovered potential nuclear hazard.



Australia is a dry continent and nuclear contamination presents too great a risk to our precious water resources.



Nuclear Free Queensland is an initiative of
The Queensland Nuclear Free Alliance
The Queensland Conservation Council and
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Beyond Nuclear Initiative



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