

Managing Radioactive Waste

ANSTO is Australia's national nuclear science organisation and the centre of Australian nuclear expertise. The entire Australian community benefits from radioisotopes produced here. In the radioisotope production process, radioactive material must be disposed of properly.

Radioactive waste can be classified in a number of ways. The physical forms – solid, liquid or airborne – are important as they impact on the mobility of the waste in the environment. Radioactive wastes are also classified as low, intermediate or high, depending on their hazard to people. The majority of ANSTO's wastes are low level, but small quantities of intermediate waste are also produced. ANSTO produces no high level waste.

Low Level Waste (LLW)

LLW contains enough radioactive material to require action for the protection of people, but not so much that it requires shielding during handling, storage or transportation.

Intermediate Level Waste (ILW)

Intermediate Level Waste requires shielding for personal protection, but generates minimal heat.

High Level Waste (HLW)

High Level Waste requires shielding and generates heat through radioactive decay. ANSTO does not produce any HLW.

Solid Wastes

The majority of solid waste produced by ANSTO is LLW. These include a variety of items used in the handling of radioisotopes such as tissues, disposable gloves, protective clothing and plastic tubing. ANSTO produces small quantities of intermediate-level solid waste.

Liquid Wastes

Most of the water used at ANSTO is associated with non-radioactive work. Only a small amount of this water, approximately 6,000 cubic metres, needs treatment for radioactivity prior to discharge. Waste water discharged from ANSTO meets World Health Organisation radiological drinking water level standards, as measured at the relevant sewage treatment plant.

About 300 litres of intermediate level liquid waste is generated annually at ANSTO as a result of the production of the radioisotope molybdenum-99, the basis of much of Australia's nuclear medicine treatments.

Managing Radioactive Waste

ANSTO has an active waste minimisation program. It is also preparing for removal and disposal of solid LLW currently stored on its site.

Managing Low Level Waste

Currently the solid LLW generated through the handling of radioisotopes is primarily collected in plastic lined fibreboard containers and then compacted into 200-litre steel drums.



Drummed low level waste storage

These drums are stored in a dedicated building on racks designed to withstand earthquakes. Most of this solid, drummed LLW will be transferred to the proposed national repository for LLW.

All low level waste water is collected, analysed and treated to remove radioactivity. Once the treated waste water meets the discharge clearance levels, the water is released to the Sydney Water sewer in accordance with a Trade Waste Agreement similar to other industrial organisations.

Managing Intermediate Level Waste

Solid ILW generated by ANSTO is stored below ground in specially designed concrete pits within retrievable containers.

Currently, liquid ILW is stored in shielded tanks. The ILW is currently being processed into a solid form that is suitable for storage for up to 50 years in specially designed concrete pits. ANSTO is also working on a project to convert this ILW waste into a more durable solid form that will allow for an indefinite disposal and storage period.

Transportation of Low Level Waste to the Proposed National Repository in South Australia

ANSTO places the highest priority on safety in the undertaking of all its activities. ANSTO carries out the transportation of radioactive material under rigorous national and international standards, including the Australian Code of Practice for the Transportation of Radioactive Material 2001. Over several decades, tens of millions of packages containing radioactive material have travelled safely around the world and there has never been an accident causing serious human health, economic or environmental consequences.

Initially, approximately 140 steel shipping containers of LLW will need to be removed from ANSTO and placed in the proposed national waste repository. Following this initial waste movement, there will be only periodic transfers of LLW shipping containers to the repository. These transfers will occur approximately every 5 years and consist of about 15-20 steel shipping container consignments.

Radiation and Transportation of Low Level Waste

The waste to be transported to the repository will be comprised of mainly solid LLW, which emits very low levels of radiation. The risks to the community of exposure to radiation when transporting LLW are minimal. Standing two metres away from a truck of LLW for an hour would expose you to less radiation than if you took a return flight from Sydney to Los Angeles.

Safety and Transportation of Low Level Waste

The LLW and short-lived intermediate level waste transported to the repository will be encased in concrete as necessary, sealed in steel drums and transported in six metre long steel shipping containers designed to remain intact in the event of an accident. Because ANSTO will only be transporting solid wastes, there is no danger of any leakage. In comparison, potential spills from the transport of hazardous materials such as petrol and other toxic chemicals, which are routinely transported on Australian roads, pose a much greater risk to public health and the environment than any accidents involving vehicles carrying LLW.

Even in the event of an accident, because of the low levels of radiation in the waste and because of its solid nature, there would be no significant or life-threatening radiological consequences.

Radioactive Waste and the Replacement Research Reactor

The volume of radioactive waste produced by the replacement research reactor will be of similarly small levels to HIFAR. Advances in radioisotope production technology will mean that, even with the projected increases in the production of medical radioisotopes, the volume of wastes arising from radioisotope production will be less than at present.

More Information

For more information, visit www.ansto.gov.au, phone (02) 9717 3111 or email enquiries@ansto.gov.au

To keep up to date with ANSTO's science and technology email your details to enquiries@ansto.gov.au and say you would like to receive regular online updates.