



**CUMBRIA MINERALS AND WASTE DEVELOPMENT
FRAMEWORK**

**EXAMINATION OF THE CORE STRATEGY AND GENERIC
DEVELOPMENT CONTROL POLICIES**

BACKGROUND PAPER ON RADIOACTIVE WASTES

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Radioactive Waste

1 DEFINITIONS

Radioactive waste is material that is above a certain level of radioactivity and has no further use. It is divided into four categories according to how much radioactivity it contains and the heat that this radioactivity produces. Under the Radioactive Substances Act 1993, radioactive waste is strictly controlled through authorisations granted to operators so as not to harm people and the environment.

2 DISCUSSION

The Health and Safety Executive (HSE) regulates the nuclear industry through its Nuclear Directorate (ND), which is responsible for operational and decommissioning safety regulation on civil, defence and research sites throughout the UK. As part of the ND, the Nuclear Installations Inspectorate (NII) licences all nuclear sites, attaching conditions with which sites must comply. Regular inspections are undertaken by NII and, if any contravention of licence conditions is found, the site may have to suspend operational or decommissioning activity until compliance is restored.

All users of radioactive materials and all accumulations or disposals of radioactive materials or waste must be approved by the Environment Agency (EA), in England and Wales, by the Scottish Environment Protection Agency (SEPA), in Scotland, and by the Industrial Pollution and Radiochemical Inspectorate (IPRI), in Northern Ireland.

The NII is responsible for regulating the storage of radioactive wastes.

Disposal of radioactive waste, whether by incineration or transfer to an authorised disposal/storage site, and discharges of radioactive substances, whether gaseous or aqueous, must be in accordance with an authorisation under the Radioactive Substances Act 1993. These authorisations are regulated by EA, SEPA and IPRI, who specify annual radiological and volumetric limits, to ensure that human health and the environment are protected from the effects of exposure to ionising radiation resulting from these disposals and discharges, in accordance with internationally agreed standards (Euratom Treaty and EU Directives).

The main source of radioactive waste within the UK is the nuclear power industry (>99%). Other sources are defence activities and medical, research and industrial sources (<1%); of these 'small' users, there are over 4,000 in England and Wales alone. The UK Radioactive Waste Inventory (DEFRA/NDA, 2007) provides comprehensive information on the sources, quantities and properties of radioactive wastes in the UK, both existing and forecast to arise in the future. It is part of an ongoing programme of research conducted by DEFRA and the Nuclear Decommissioning Authority (NDA), which is updated on a 3-yearly cycle.

The Inventory advises that the total volume of radioactive waste in the UK (existing and forecast) is 3.4 million cubic metres. About 95% (over 3.2 million cubic metres) of

this waste already exists, although much will not be able to be processed until nuclear facilities are decommissioned or dismantled. Less than 5% (around 150,000 cubic metres) is from planned future operations (It assumed *inter alia* no new nuclear power plants and that spent nuclear fuel is not classified as waste).

Radioactive waste in the UK is classified into four categories :

- *High Level Waste (HLW)*, also known as heat-generating waste, consists mainly of a nitric acid solution containing fission products separated from irradiated nuclear fuel during reprocessing. These are stored for at least 50 years to cool (as liquid in water-cooled, stainless steel tanks, or vitrified into glass blocks) in a highly engineered environment at Sellafield. Current UK policy is then for long-term disposal in a suitable deep geological repository, where the radioactivity will decay over tens of thousands of years. Although <1% of the total radioactive wastes volume, HLW contains about 95% of all radioactivity in wastes.
- *Intermediate Level Waste (ILW)* consists mainly of metals, with smaller quantities of organic materials, inorganic sludges, cement, graphite, glass and ceramics. About 7% of the total radioactive wastes volume falls into this category. ILW mainly arises from the dismantling of nuclear reactors, treatment of liquid effluents and reprocessing of spent fuel. ILW is stored temporarily, cement-grouted into tanks, vaults and drums, pending permanent disposal in a deep geological repository.
- *Low Level Waste (LLW)*, accounting for about 93% of the total radioactive wastes volume, includes metals (redundant equipment and building material), rubble, soil and laboratory equipment (clothing and paper towels). It contains less than 0.01% of the total radioactivity. LLW is super-compacted to decrease its volume, cement-grouted into half-height ISO-freight containers and placed in concrete lined vaults at the LLW Repository near Drigg in Cumbria. There is also controlled disposal of LLW in authorised landfills. There is currently a proposal to construct another LLW Repository at the Dounreay nuclear licensed site in Scotland.
- *Very Low Level Waste (VLLW)* is not included in the Inventory. It covers waste with very low concentrations of radioactivity, and mainly arises from hospitals and non-nuclear industry. This is disposed of with other municipal, commercial and industrial waste. In the future large volumes of VLLW are anticipated to arise through nuclear decommissioning. It is also sometimes referred to as High Volume Low Activity Waste (HVLA).

The current national long-term policy for the management of higher activity wastes is set out under the Government's 'Managing Radioactive Waste Safely' programme. The Committee on Radioactive Waste Management (CoRWM), an independent body, was appointed in 2003 to advise on the best technical long-term solution for higher activity wastes that is safe, environmentally sound and secures public confidence – their suite of recommendations was published in 2006. Since then, CoRWM has been re-constituted, with modified terms of reference and membership, in order to scrutinise the implementation of the MRWS programme. Along with publication of the White Paper on MRWS in June 2008, a letter was sent to all local authorities in the

UK inviting communities to express an interest in opening up 'without commitment' discussion on the possibility of hosting a geological disposal facility in the future.

The Nuclear Decommissioning Authority is a public, non-departmental body set up by the Government in April 2005, with responsibility for the UK's public sector civil nuclear liabilities and their subsequent management. In October 2006, the Government also gave the NDA the responsibility for developing and ensuring delivery and implementation of the programmes for interim storage and geological disposal of the UK's higher activity wastes.

From March 2007, the NDA was given responsibility for developing a UK-wide strategy for managing the UK nuclear industry's LLW and for securing disposal capacity for LLW generated by non-nuclear industry users.

3 LEGISLATIVE CONTEXT

[Environmental Protection Act 1990](#)

[Environment Act 1995](#)

[Radioactive Substances Act 1993](#)

[Nuclear Reactors \(Environmental Impact Assessment for Decommissioning\) Regulations 1999 \(SI 1999/2892\)](#)

Euratom Treaty (1957) and subsequent EU Directives (found at <http://www.defra.gov.uk/environment/radioactivity/government/international/euratom.htm>)

[PPS10: Planning for Sustainable Waste Management \(2005\)](#) – found at: <http://www.communities.gov.uk/planningandbuilding/planning/planningpolicyguidance/mineralsandwaste/wastemanagement/pps10/>

Town and Country Planning Act 1990 (found at http://www.opsi.gov.uk/acts/acts1990/UKpga_19900008_en_1.htm)

4 FURTHER INFORMATION AND LINKS

[Environment Agency](http://www.environment-agency.gov.uk/yourenv/eff/1190084/business_industry/213963/513813/) : http://www.environment-agency.gov.uk/yourenv/eff/1190084/business_industry/213963/513813/
[Defra](#)

[Nuclear Decommissioning Authority \(NDA\)](http://www.nda.gov.uk/) <http://www.nda.gov.uk/>
UK Radioactive Waste Inventory <http://www.nda.gov.uk/ukinventory/>
[NSCA, Pollution Handbook 2008](#)

HSE Nuclear Directorate <http://www.hse.gov.uk/nuclear/nsd1.htm>

CoRWM <http://www.corwm.org.uk/default.aspx>

Managing Radioactive Waste Safely

<http://www.defra.gov.uk/environment/radioactivity/mrws/>