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Llywodraeth Cymru
Welsh Government

UK policy framework for managing radioactive substances and nuclear decommissioning



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Introduction

Purpose

- 1.1 This document has been developed by the UK Government and devolved administrations. Its purpose is to provide a coherent UK-wide policy framework for managing radioactive substances and nuclear decommissioning. It covers the management of radioactive substances under normal operating conditions, including orphan sources (radioactive sources which have been abandoned, lost, misplaced, stolen, or otherwise transferred without proper authorisation). Policy on managing radioactive incidents and emergencies is out of scope.
- 1.2 It replaces Command Paper 2919¹ and subsequent amendments and additions; specific policies that are being replaced are referenced in individual chapters.
- 1.3 It sets out to industry, arm's length bodies, and regulators, the UK Government's and devolved administrations' expectations in relation to the management of radioactive substances and nuclear decommissioning. Our aim is to provide a clear direction of travel and to drive earlier, more cost-effective nuclear decommissioning and effective management of radioactive substances, including radioactive waste.
- 1.4 Some of the policy areas in this framework are reserved meaning the UK Government sets policy for the whole of the UK. Other policy areas are devolved, with the legislatures and devolved administrations in Scotland, Wales and Northern Ireland being responsible for policy in their respective part of the UK. Where there is a policy difference, we refer to or summarise it in the main body of this document and/or set out in appendices any policies that are specific to a part of the UK, and which therefore do not apply across the whole of the UK.

Key considerations

- 1.5 Our policies on the management of radioactive substances and nuclear decommissioning are based on the following key considerations:
 - protection of human health and the environment;
 - safety and security;
 - sustainability, including the United Nations Sustainable Development Goals;²

¹ UK Government (1995). Command Paper 2919, Review of Radioactive Waste Management Policy: Final Conclusions. Available at: <https://www.gov.uk/government/publications/radioactive-waste-management-policy-review-1994>

² Sustainable Development Goals. Available at: https://unfoundation.org/what-we-do/issues/sustainable-development-goals/?gclid=EAlaIqobChMI7a2K4lia8gIVS-N3Ch2_IA6GEAAYAiAAEgLiFPD_BwE

- a proportionate risk-based lifecycle approach to the management of radioactive substances;
- a proportionate, risk-informed lifecycle approach to nuclear decommissioning and clean-up that demonstrates cost effectiveness and value for money while not compromising safety and minimising the impact on the environment;
- minimisation of greenhouse gas emissions and moving towards a low carbon economy;
- climate change adaptation; and
- transparency and openness in public engagement.

Sustainability

- 1.6 Our policies on the management of radioactive substances and nuclear decommissioning take into account internationally recognised best practice in sustainability. They support many internationally agreed sustainability goals for example the United Nations Sustainable Development Goals. In this policy framework we place particular emphasis on the sustainability goals concerned with protecting the environment, protecting communities and protecting health and well-being now and in the future. We want sustainability to be hard wired into thinking on the management of radioactive substances and how nuclear decommissioning is carried out.
- 1.7 The use of radioactive materials in our health service promotes better health outcomes for our people helping to work towards sustainability goals to ensure healthy lives and well-being. Nuclear technology continues to provide low carbon electricity in some parts of the UK.
- 1.8 The beneficial use of radioactive materials inevitably creates radioactive waste. Sustainable and resilient infrastructure for radioactive waste management is crucial to enable us to decommission our nuclear facilities, manage our nuclear legacy and to continue to benefit from radioactive materials. Innovation in construction of new waste management infrastructure, such as disposal facilities, is vital to minimise greenhouse gas emissions. Innovation in waste management processes with an emphasis on minimising the creation of waste in the first place has a key role in ensuring we can continue to benefit from the use of radioactive materials sustainably.
- 1.9 A sustainable approach to managing radioactive substances and nuclear decommissioning is also about supporting people, skills and jobs. Maintaining and developing a skilled and diverse workforce in the nuclear industry and other sectors where radioactive substances are used, supports economic growth in local communities giving them a sustainable future.

2

What are radioactive substances?

- 2.1 There are two kinds of radiation: **ionising radiation** and **non-ionising radiation**. Ionising radiation is any type of particle or electromagnetic wave that carries enough energy to directly or indirectly remove electrons from an atom (i.e. 'ionise' the atom). This includes high-energy electromagnetic radiation (gamma and X-ray radiation), charged particles (alpha and beta radiation), and neutrons. Such radiation can cause damage to body tissue. Non-ionising radiation can have enough energy to move atoms in a molecule around or cause them to vibrate, but not enough to cause ionisation. Examples of non-ionising radiation are radio waves, visible light and microwaves. Our policies apply to substances that produce ionising radiation (radioactive substances). The term radioactive substances covers both radioactive material and radioactive waste.
- 2.2 There are three main kinds of ionising radiation: **alpha radiation**, **beta radiation** and high energy electromagnetic radiation (**gamma rays** and **X-rays**). Neutrons can also be produced; these indirectly produce ionising radiation.
- 2.3 **Alpha radiation** – Alpha radiation consists of heavy, positively charged particles emitted by atoms of elements such as uranium and radium. Alpha radiation can be stopped completely by a sheet of paper or by the thin surface layer of our skin (epidermis). However, if alpha-emitting materials are taken into the body by breathing, eating, or drinking, they can reach internal tissues directly and can cause biological damage.
- 2.4 **Beta radiation** – Beta radiation consists of electrons. In general, a sheet of aluminium a few millimetres thick will stop beta radiation. However, if beta-emitting materials are taken into the body by breathing, eating, or drinking, they can reach internal tissues directly and can cause biological damage, though to a lesser degree than an equivalent amount of alpha radiation.
- 2.5 **Gamma rays and X-rays** – are electromagnetic radiation similar to light, and radio waves but of higher energy. Gamma rays can pass right through the human body, causing biological damage, but can be stopped by thick walls of concrete or lead. X-rays are of lower energy than gamma rays; they can cause biological damage but are more easily stopped than gamma rays.
- 2.6 **Neutrons** – are uncharged particles and do not produce ionisation directly. But their interaction with the atoms of matter can give rise to alpha, beta, gamma, or X-rays

which can then produce ionisation. Neutrons are penetrating but can be stopped by thick masses of concrete, water or paraffin.

- 2.7 The time it takes for half of the atoms in a radioactive substance to decay is known as the half-life. The half-life of a radioactive substance can vary from fractions of a second to billions of years.

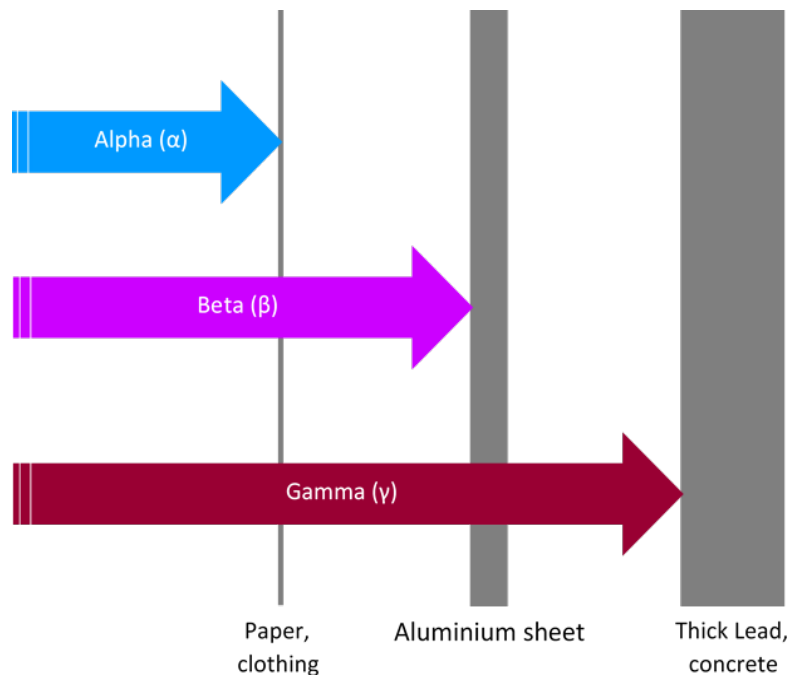


Figure 1. This figure shows the three main kinds of ionising radiation and materials they can penetrate (Source: DESNZ).

- 2.8 We use radioactive substances in many different products and processes. Some uses of radioactive substances and processes pose little risk to human health or the environment and therefore do not need any special handling or controls. Other uses can pose a greater risk to human health and the environment. Products or processes that use more hazardous radioactive substances must be more carefully controlled and the radioactive waste they produce managed and disposed of carefully. For instance, radioactive waste that is created during the operation and decommissioning of nuclear facilities requires controls, and in most cases special disposal facilities.
- 2.9 The management of radioactive materials and radioactive waste is controlled in accordance with international standards that are incorporated into the UK's legislative framework. The international standards require exposures and/or potential exposures to ionising radiation from human activity to be kept below a certain threshold and as low as reasonably achievable (ALARA).
- 2.10 Different regulatory regimes in the field of radiological protection in the UK use different terminology and have their own guidance, including reducing risks to as low as reasonably practicable (ALARP) and reducing exposure to ionising radiation to as

low as reasonably achievable (ALARA). The terminology is broadly synonymous, with both ALARA and ALARP incorporating considerations on economic, environmental and societal factors.

- 2.11 Dose is the term used to quantify the amount of biological harm from exposure to ionising radiation. There are different kinds of dose; the one that is generally used for regulatory purposes is the effective dose; the unit of the effective dose is the sievert (Sv). Since one sievert is a large dose, radiation doses are expressed in millisievert (mSv) or microsievert (μ Sv) which are one-thousandth or one-millionth of a sievert respectively. The radiation exposure from natural radioactivity occurring in food, building materials, the ground and from cosmic rays means that everybody receives some dose throughout their lifetime.

3

International guidelines, regulations, and obligations

- 3.1 The policies of the UK Government and devolved administrations on radioactive substances are framed within the context of international guidelines and regulations. A number of different organisations are involved, each with a distinct role.

International organisations

- 3.2 **The International Commission on Radiological Protection (ICRP)** is an independent body set up to advance the science of radiological protection for the public benefit. It provides recommendations and guidance on all aspects of protection against ionising radiation. The ICRP is generally regarded as the authoritative international body in this field.
- 3.3 **The International Atomic Energy Agency (IAEA)** is an autonomous inter-governmental organisation founded by the United Nations (UN). Its objective is to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally sound and economical use of nuclear energy for peaceful purposes. It sets international standards for safety and security in relation to radioactive substances. The UK is a member of the IAEA.
- 3.4 **The Nuclear Energy Agency (NEA)** of the Organisation for Economic Cooperation and Development (OECD) is an intergovernmental agency that facilitates co-operation among countries with advanced nuclear technology infrastructures to seek excellence in nuclear safety, technology, science, environment and law. It is responsible for developing international conventions and agreements in relation to various aspects of nuclear safety. The UK is a member of the NEA.

International conventions

- 3.5 International conventions governing safety, security and environmental protection, to which the UK is a signatory, have been developed by a number of bodies including the UN, the IAEA and the NEA. These include:

- **The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management** establishes fundamental safety principles. It applies to spent fuel resulting from the operation of civilian nuclear reactors and to radioactive waste resulting from civilian applications;
- **The Convention on Nuclear Safety** applies to civil nuclear installations. The Convention commits contracting parties to maintaining high levels of safety by establishing fundamental safety principles;
- **The Convention on the Physical Protection of Nuclear Materials** concerns physical protection of nuclear facilities and nuclear material used for peaceful purposes in domestic use and storage;
- **The Paris Convention** concerns liability and compensation for damage caused by nuclear accident;
- **The Brussels Convention** provides for a system to make additional resources available from public funds to compensate victims for damage caused by a nuclear accident where the amount needed to compensate exceeds the operator's liability limit under the Paris Convention;
- **The Aarhus Convention** grants the public rights regarding access to information, public participation, and access to justice in governmental decision-making processes on matters concerning the local, national and transboundary environment;
- **The Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention)** lays down the general obligation of countries to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries. The Convention covers a number of sectors and activities including nuclear power stations and disposal and processing of radioactive waste;
- **The Convention for the Protection of the Marine Environment of the Northeast Atlantic (OSPAR Convention)** is an agreement by 15 governments and the EU to protect the marine environment of the North-East Atlantic from various pollutants including radioactive substances and to organise programmes and measures designed to ensure effective national action;
- **The London Convention and Protocol** promotes the effective control of all sources of marine pollution through Contracting Parties taking effective measures to prevent pollution of the marine environment caused by dumping at sea. Under the Convention and Protocol, the dumping of radioactive waste or other radioactive matter in the sea is banned.

4

The UK regulatory framework: roles and responsibilities

- 4.1 In the UK there is a range of organisations involved in advising on and developing policy, implementing policy and enforcing regulatory requirements. Here we give a high-level overview of the roles and responsibilities of the following:
- UK Government and devolved administrations;
 - government delivery bodies;
 - independent regulators;
 - advisory bodies.

UK Government and devolved administrations

- 4.2 Radioactive substances, including policy on the management of radioactive waste and environmental protection, are devolved matters. The Welsh Government, Northern Ireland Executive and Scottish Government each have responsibility for these matters in their respective devolved administration.
- 4.3 Policy concerning nuclear installations (including nuclear safety, security and safeguards), health and safety at work as well as import and export control of radioactive substances is reserved.

Delivery bodies

- 4.4 **The Nuclear Decommissioning Authority (NDA)** is a non-departmental public body that was established by the Energy Act 2004. It is responsible for delivering decommissioning and clean-up of the publicly owned nuclear sites across the whole of the UK and the safe and secure management of radioactive waste arising from those sites. It is accountable to both the UK Government and Scottish Ministers. The NDA also has oversight of the decommissioning plans for EDF Energy's existing fleet of nuclear power stations, which will transfer to the NDA for decommissioning once they stop generating power and have been defueled. It also provides expert advice to the UK Government on nuclear new build operators' decommissioning and waste management plans.

- 4.5 The NDA's estate comprises the UK's 17 earliest nuclear sites (the nuclear legacy) across England, Scotland and Wales as well as organisations that deliver radioactive waste management solutions. The estate includes:
- **Sellafield**, which has played a pivotal role in the UK's nuclear industry since the 1940s. Also on the site are Calder Hall (the first nuclear power station to supply domestic electricity in the UK) and Windscale (produced plutonium for military purposes into the 1950s);
 - **Nuclear Restoration Services (NRS)** comprises 10 nuclear power stations that have ceased operating and were declared fuel free in Autumn 2019. It also comprises Harwell, which was the UK's first nuclear research facility, Winfrith which was a major centre for ground-breaking reactor development, and Dounreay, which was the UK's centre of research into fast reactors from 1955 until 1994. It is now Scotland's largest nuclear decommissioning and clean-up project;
 - **Nuclear Waste Services (NWS)**, which brings together LLW Repository Ltd, Radioactive Waste Management Ltd and the NDA group's Integrated Waste Management Programme. It oversees waste management activities across the NDA group. NWS is responsible for managing the low level waste disposal facility in Cumberland. The facility, which has been operating since 1959, has safely disposed of the nation's low level waste for over 50 years. NWS has been given the responsibility for implementing geological disposal of the UK's most hazardous radioactive waste;
 - **Nuclear Transport Solutions**, which is responsible for transport activities to support the NDA, such as transporting nuclear material from nuclear power plants to Sellafield and returning reprocessing products back to overseas customers.

The regulators

- 4.6 **The environmental regulators'** areas of responsibility include environmental pollution, waste management, natural resources (land, air and water), and conservation. They regulate the management of radioactive substances. The four regulators in the UK are:
- **The Environment Agency (EA)** is responsible for implementing and enforcing environmental protection legislation in England. It independently regulates the disposal of radioactive waste on or from nuclear sites and the keeping and use of radioactive material by tenants on nuclear sites. It also independently regulates the keeping and use of radioactive material and the accumulation and disposal of radioactive waste on or from all other premises.

- **The Scottish Environment Protection Agency (SEPA)** is responsible for implementing and enforcing environmental protection legislation in Scotland. It regulates the management of radioactive waste at nuclear sites and the management of radioactive material and radioactive waste at non-nuclear sites.
 - **Natural Resources Wales (NRW)** is responsible for implementing and enforcing environmental protection legislation in Wales. It regulates the disposal of radioactive waste from nuclear and non-nuclear sites.
 - **The Northern Ireland Environment Agency (NIEA)** is responsible for implementing and enforcing environmental protection legislation in Northern Ireland. NIEA regulates the management of radioactive material and radioactive waste at non-nuclear sites. It also regulates the transport of radioactive materials by road in Northern Ireland.
- 4.7 **The Office for Nuclear Regulation (ONR)** is the licensing authority for nuclear installations in Great Britain and independently regulates nuclear safety and security at nuclear licensed sites. ONR also regulates conventional health and safety on nuclear sites, the transport of radioactive materials, and ensures compliance by the UK with its safeguards obligations.
- 4.8 The ONR and the environmental regulators work together regulating the management and storage of radioactive waste on nuclear licensed sites to ensure decisions about the management of radioactive waste take into account environmental considerations including the disposability of waste alongside the nuclear safety considerations.
- 4.9 **The Defence Nuclear Safety Regulator (DNSR)** is the Ministry of Defence regulator responsible for regulating across the UK and overseas mobile nuclear equipment, the nuclear hazards of the Naval Nuclear Propulsion Programme and the Nuclear Weapons Programme (including operator and public safety and environmental impact).
- 4.10 **The Health and Safety Executive (HSE)** is responsible for regulating the health and safety of both workers and the public arising from work activities in Great Britain. It regulates workplaces involving exposure to ionising radiation, including from the use and management of radioactive substances. It regulates conventional health and safety on sites and in workplaces that fall outside of the jurisdiction of ONR (except for premises where local authorities or the Office for Rail and Road are the enforcing authority).
- 4.11 **The Health and Safety Executive Northern Ireland (HSENI)** is responsible for enforcing health and safety legislation in Northern Ireland. It regulates work that causes or could cause radiation exposure of workers, the public or both.
- 4.12 **The food safety regulators** are responsible for protecting public health and consumers' wider interests in food, including advice on food safety. They work with the environmental regulators to ensure protection of the food chain in relation to

radioactive waste disposal. They are also responsible for authorising food irradiation facilities.

- **The Food Standards Agency (FSA)** is responsible for food safety in England, Wales and Northern Ireland.
- **Food Standards Scotland (FSS)** is responsible for food safety in Scotland.

4.13 **Local planning authorities, including local authorities and national park authorities**, have a statutory duty to carry out specific planning functions, including land use and waste planning, for a particular area. More widely, local authorities are the democratically representative bodies in communities, with responsibilities including education/skills and economic development. They include district councils, county councils, borough councils and unitary authorities.

Advisory bodies

- 4.14 **The UK Health Security Agency** is an executive agency of the Department of Health and Social Care responsible for health improvement and health protection in England. Its remit also includes providing advice on public health protection from radioactive hazards for the whole of the UK.
- 4.15 **The Committee on Radioactive Waste Management (CoRWM)** provides independent scrutiny and advice to the UK Government and the devolved administrations on the management of radioactive waste. This includes advice on the delivery of geological disposal.
- 4.16 **The Committee on Medical Aspects of Radiation in the Environment (COMARE)** is a Department of Health and Social Care expert committee that provides independent advice to all government departments and agencies. Its members are chosen for their medical and scientific expertise. COMARE's role is to assess and advise the UK Government and the devolved administrations on the health effects of radiation (both ionising and non-ionising), and to assess the adequacy of the available data and the need for further research.
- 4.17 **The Centre for Environment, Fisheries and Aquaculture Science (Cefas)** is an agency of the Department for Environment, Food and Rural Affairs. Part of its role is to help to protect our seas, oceans, and rivers from radioactive pollution by providing data and advice to the UK Government and devolved administrations.

5

The UK's approach to managing radioactive substances

Radiological protection principles

- 5.1 In the UK, the management of radioactive substances is underpinned by radiological protection principles and a proportionate risk-based approach to regulating their management, known as a 'graded approach'. These principles and the graded approach are derived from ICRP recommendations and IAEA standards, which flow down to and inform domestic legislation and policies. They are enshrined in UK law and underpin the UK Government's and devolved administrations' policies on managing radioactive substances, including radioactive waste. The three fundamental principles are:
- justification;
 - optimisation of protection; and
 - dose limitation.
- 5.2 **Justification of practices** – this means any new type or class of practice involving exposure to ionising radiation should do more good than harm. No type or class of practice involving exposures to ionising radiation should be adopted unless it produces sufficient net benefit to the exposed individuals or to society to outweigh the health detriment it may cause. "Practice" means any human activity that can increase the exposure of individuals to ionising radiation through a planned exposure, such as the use of radioactive isotopes for medical purposes. (Justification of practices is discussed in more detail in paragraphs 5.12 to 5.18).
- 5.3 **Optimisation** of protection and safety - this means the likelihood of exposure, the number of people exposed, and the magnitude of their individual doses should all be kept as low as reasonably achievable (ALARA) taking account of economic, environmental, and societal factors. This is required in UK law in addition to compliance with dose limits.

- 5.4 **Dose limitation** (dose limits and dose constraints) – The annual public dose limit is 1 mSv per year.³ A dose limit is the total radiation dose to an individual that must not be exceeded. Dose limits are enshrined in law.
- 5.5 Dose constraints are part of the optimisation process. They are a tool to help restrict, as far as is reasonably practicable, an individual’s exposure to ionising radiation that might arise from a particular activity. These are especially useful at the planning stage of an activity and in relation to individuals who may be exposed to more than one source of radiation. Dose constraints are set so that it is unlikely that the dose limit of 1 mSv per year for members of the public is ever exceeded (other than for medical exposure). The maximum dose constraint is 0.5 mSv per year. Appendix 3 provides more detail on radiological protection standards.

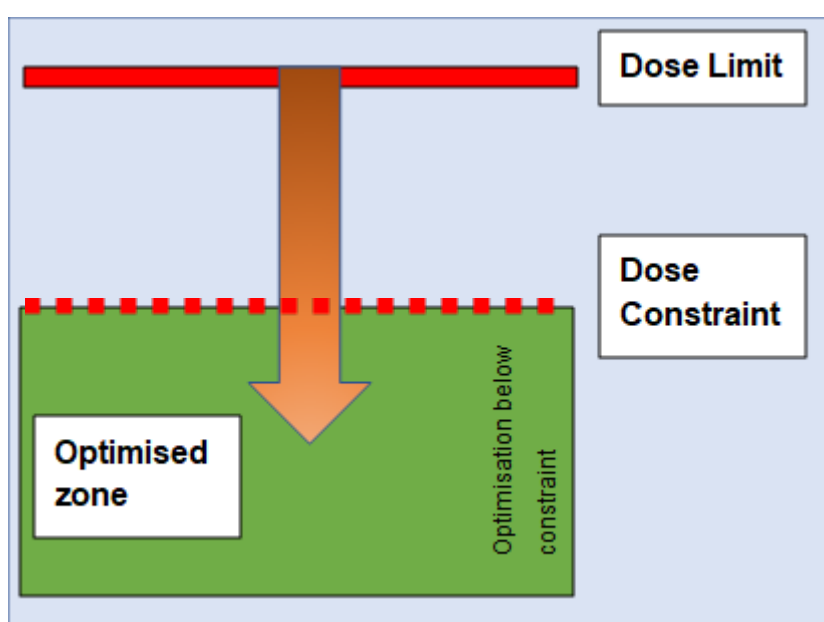


Figure 2. Dose limits and constraints for radioactive exposures to members of the public.

- 5.6 The principles of justification, optimisation and dose limitation are in line with the IAEA Safety Standards which take account of the ICRP’s recommendations. Requirements on ionising radiation protection are implemented in the UK through regulation. Different regulations apply in different parts of the UK, but they all have the same purpose: to protect people and the environment from the harmful effects of radiation. These include:
- the Ionising Radiation Regulations 2017 (IRR17);⁴
 - the Ionising Radiations Regulations (Northern Ireland) 2017 (IRR(NI)17);⁵

³ Derived from the IAEA’s International Basic Safety Standards. Available at: <https://www.iaea.org/publications/8930/radiation-protection-and-safety-of-radiation-sources-international-basic-safety-standards>

⁴ The Ionising Radiation Regulations 2017. Available at: <https://www.legislation.gov.uk/ukxi/2017/1075/contents/made>

⁵ The Ionising Radiations Regulations (Northern Ireland) 2017. Available at: <https://www.legislation.gov.uk/nisr/2017/229/contents/made>

- the Justification of Practices Involving Ionising Radiation Regulations 2004;⁶
- the Justification Decision Power (Amendment) (EU Exit) Regulations 2019;⁷
- the Ionising Radiation (Medical Exposure) Regulations 2017 (IR(ME)R);⁸
- the Environmental Permitting (England and Wales) Regulations 2016 (“EPR16”) in England and Wales;⁹
- the Radioactive Substances Act 1993 (“RSA1993”) in Northern Ireland;¹⁰ and
- the Environmental Authorisations (Scotland) Regulations 2018 (“EASR18”)¹¹ in Scotland.

5.7 The UK Government has published an overview of the UK regulatory framework, *How we regulate radiological and civil nuclear safety in the UK*, for all aspects of radiological and civil nuclear safety across the UK.¹²

Protection of the environment

5.8 In addition to ensuring that people’s health is protected from unacceptable levels of radiation, regulators should also seek to protect the integrity of the environment from harm from ionising radiation. There is a range of legislation within the UK and the devolved administrations to protect habitats and biodiversity, and the regulators must ensure that the various requirements are satisfied in their regulatory processes. An options appraisal process is also used to identify the best available techniques (BAT) in England and Wales and best practicable means (BPM) in Scotland and Northern Ireland, to prevent or minimise impacts on the environment as well as for people.

Graded approach

5.9 The UK has adopted a graded approach to regulation for all practices involving ionising radiation, and this is embodied in our policy and regulatory framework. Graded approach is the term used in the IAEA’s International Basic Safety Standards,¹³ to

⁶ The Justification of Practices Involving Ionising Radiation Regulations 2004. Available at: <https://www.legislation.gov.uk/ukxi/2004/1769/contents/made>

⁷ The Justification Decision Power (Amendment) (EU Exit) Regulations 2019. Available at <https://www.legislation.gov.uk/ukxi/2019/215/contents/made>

⁸ The Ionising Radiation (Medical Exposure) Regulations 2017. Available at: <https://www.legislation.gov.uk/ukxi/2017/1322/contents/made>

⁹ The Environmental Permitting (England and Wales) Regulations 2016. Available at: <https://www.legislation.gov.uk/ukxi/2016/1154/contents/made>

¹⁰ The Radioactive Substances Act 1993. Available at: <https://www.legislation.gov.uk/ukpga/1993/12/contents>

¹¹ The Environmental Authorisations (Scotland) Regulations 2018. Available at: <https://www.legislation.gov.uk/ssi/2018/219/contents/made>

¹² UK Government. *How we regulate radiological and civil nuclear safety in the UK*. Available at: <https://www.gov.uk/government/publications/how-we-regulate-radiological-and-civil-nuclear-safety-in-the-uk>

¹³ IAEA 2014. International Basic Safety Standards. Available at: <https://www.iaea.org/publications/8930/radiation-protection-and-chasafety-of-radiation-sources-international-basic-safety-standards>

describe proportionate regulation. Practices in this context mean work involving the production, processing, handling, disposal, use, storage, holding or transport of radioactive substances. A graded approach means applying regulatory controls that are commensurate with the characteristics of the given practice or the radioactive source being used in a practice, and with the magnitude and likelihood of the exposures to ionising radiation (i.e. with the risk posed to people's health and the environment).

- 5.10 Substances containing radioactivity which pose a trivial risk are not subject to any regulatory requirements and are thus out of scope of regulation. Radioactive substances, which are within scope of regulation but of low risk are exempted from the requirement to be authorised by the relevant environment agency. These exempted activities are instead authorised in legislation, under exemptions (in England, Wales and Northern Ireland) or general binding rules (Scotland).
- 5.11 For radioactive substances which are in scope, and which are not exempted, legislation (e.g. EPR16 and EASR18) allows for different levels of regulatory permission depending on the risk associated with the practice. The regulations also provide flexibility to the regulators regarding the conditions and limitations which can be included in their permissions.

Justification of practices

- 5.12 Justification decisions are taken by the Justifying Authority i.e. the devolved administrations for devolved matters, and the appropriate Secretary of State in relation to matters which have not been devolved. There is close co-operation between the different parts of the UK which is facilitated through a Concordat to achieve a common UK-wide approach to justification decisions.¹⁴
- 5.13 Radioactive substances which produce ionising radiation are integral to some technologies used in healthcare, pharmaceuticals, and other industries including nuclear power generation and supporting industries. Radioactive substances can be used, for example, at nuclear licensed sites, at universities for research, or at nuclear medicine sites that dispense radiopharmaceuticals for either diagnostic or therapeutic treatment. It is important that people can benefit from their use without being exposed to unacceptable risks. Our policy is that:
- no practice involving exposure to ionising radiation should be adopted unless it produces sufficient net benefit to the exposed individuals or to society to outweigh the potential harm it may cause; and

¹⁴ UK Government. Concordat on the Implementation of the Justification of Practices Involving Ionising Radiation Regulations 2004. Available at: <https://www.gov.uk/government/publications/the-justification-of-practices-involving-ionising-radiation-regulations-2004-guidance-on-their-application-and-administration>

- no-one may carry out a new class or type of practice that is likely to result in exposure to ionising radiation unless a decision has been made by the Justifying Authority confirming that the class or type of practice is justified.

How practices involving exposure to ionising radiation are justified

- 5.14 Justification is the process that is used to determine whether the individual or societal benefit from a class or type of practice resulting in exposure to ionising radiation outweighs the health detriment it may cause. The framework for determining whether a practice involving exposure to ionising radiation is justified is set out in the Justification of Practices Involving Ionising Radiation Regulations 2004¹⁵ as amended by the Justification of Practices Involving Ionising Radiation (Amendment) Regulations 2018¹⁶ and the Justification Decision Power (Amendment) (EU Exit) Regulations 2019.¹⁷ The regime applies across the UK.
- 5.15 Applications for decisions under the justification process are made to the Justification Application Centre which is managed by Department for Energy Security and Net Zero, (DESNZ). The Justification Application Centre also holds and maintains a register of existing types and classes of practice that are approved under the justification process.
- 5.16 There are three types of application that may be made by any person to the Justifying Authority in relation to any class or type of practice. These are:
- for a justification decision in respect of a new class or type of practice;
 - for a review of an existing class or type of practice in the light of new and important evidence about its efficacy or consequences;
 - for a determination as to whether a practice belongs to a new or an existing class or type of practice.
- 5.17 A Justifying Authority, when exercising functions under the Regulations, must be functionally separate from all other persons concerned with the promotion or utilisation of that particular practice. For example, where a Secretary of State is functionally linked with the promoter of the practice then another Secretary of State who is not linked would need to exercise the relevant functions as the Justifying Authority.

¹⁵ The Justification of Practices Involving Ionising Radiation Regulations 2004. Available at: <https://www.legislation.gov.uk/ukSI/2004/1769/contents/made>

¹⁶ The Justification of Practices Involving Ionising Radiation (Amendment) Regulations 2018. Available at: <https://www.legislation.gov.uk/ukSI/2018/430/contents/made>

¹⁷ The Justification Decision Power (Amendment)(EU Exit) Regulations 2019. Available at: <https://www.legislation.gov.uk/ukSI/2019/215/contents/made>

- 5.18 A Justifying Authority may also make a justification decision on a new type or class of practice without receiving an application. Further information on how the justification process operates and decisions are made can be found in our published guidance.¹⁸

¹⁸ The Justification of Practices Involving Ionising Radiation Guidance. Available at: <https://www.gov.uk/government/publications/the-justification-of-practices-involving-ionising-radiation-regulations-2004-guidance-on-their-application-and-administration>

6

Managing radioactive sources

- 6.1 This chapter sets out our policy for the management of radioactive sources on civil nuclear and non-nuclear sites. Policy on the import and export of radioactive sources is set out in chapter 10. Transport of radioactive sources is not covered in this policy framework.
- 6.2 The management of radioactive sources is devolved except for matters of national security, which is reserved.

What are radioactive sources?

- 6.3 Radioactive sources contain radioactive material for the purposes of utilising their radioactivity. In the UK and internationally, they are used for a variety of beneficial purposes including in medicine, industry, research, and education.
- 6.4 Radioactive sources can vary in terms of their physical characteristics (e.g. how much radiation they emit) and their form - whether they are 'sealed' or 'unsealed'.
- 6.5 Sealed sources are radioactive sources in which the radioactive substance is permanently sealed in a capsule or incorporated in a solid form with the objective of preventing, under normal conditions of use, any dispersion of radioactive substances. They are designed to withstand rough handling and elevated temperatures without unintentionally releasing their radioactive material. Sealed sources are commonly used in industry, healthcare, and research settings, for example in industrial radiography and to calibrate instruments, and in medicine to treat blood before transfusions and to treat cancers.
- 6.6 Unsealed sources are not permanently sealed within a container. They are generally dispersed during their use which may result in releases to the environment, for example as radioactive liquid discharges (see chapter 7). The use of unsealed sources may also generate solid radioactive waste as secondary waste (e.g. contaminated items and personal protective equipment). Unsealed sources are often in the form of powders, liquids and sometimes gases, and are used extensively in industry and in medicine (e.g. as radioactive tracers to help diagnose and treat diseases).
- 6.7 Radioactive sources can vary in terms of the amount of radiation they emit. 'High activity sealed sources' (HASS) are a type of sealed source that is associated with a higher level of risk due to the higher levels of radiation they emit.

Policy on managing radioactive sources

- 6.8 The UK is committed to managing radioactive sources in line with international standards and guidance, including the International Basic Safety Standards,¹⁹ Code of Conduct on the Safety and Security of Radioactive Sources,²⁰ and the Guidance on the Management of Disused Radioactive Sources.²¹
- 6.9 Our aim is to allow the safe and beneficial use of radioactive sources whilst avoiding undue burdens being placed on future generations. The UK has a well-established radiological safety regime governing the keeping and use of radioactive sources, and the management of radioactive waste, including waste sealed sources.²²
- 6.10 When used for their intended purpose, radioactive sources have far-reaching benefits. If used maliciously or handled inappropriately, radioactive sources have the potential to cause harm to people and the environment, which can result in long-lasting consequences and significant recovery costs. It is important for radioactive sources to be protected from loss, theft, sabotage, or from being used maliciously for the purposes of crime or terrorism.
- 6.11 The risks associated with radioactive sources can vary widely and are dependent on several factors. These include the specific type of source, its physical and chemical form, and its activity level. A proportionate level of safety and security should be applied in all cases where radioactive sources are managed. This is in line with the graded approach and ensures the stringency of control measures and conditions being applied are proportionate to the level of associated risk. The graded approach is discussed in more detail in chapter 5.
- 6.12 The UK has robust arrangements in place to keep radioactive sources secure. Government departments, environmental regulators, police and security specialists will continue to work together and follow international guidance^{23, 24} to ensure radioactive sources remain protected from those seeking to cause harm. The UK Government and the devolved administrations expect regulators, where appropriate, to consult with all relevant government departments, the police, security services or other relevant

¹⁹ Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards. Available at: <https://www.iaea.org/publications/8930/radiation-protection-and-safety-of-radiation-sources-international-basic-safety-standards>

²⁰ Code of Conduct for the Safety and Security of Radioactive Sources. Available at:

<https://www.iaea.org/publications/6956/code-of-conduct-on-the-safety-and-security-of-radioactive-sources>

²¹ Guidance on the Management of Disused Radioactive Sources. Available at:

<https://www.iaea.org/zh/publications/13380/guidance-on-the-management-of-disused-radioactive-sources>

²² How we regulate radiological and nuclear safety in the UK. Available at:

<https://www.gov.uk/government/publications/how-we-regulate-radiological-and-civil-nuclear-safety-in-the-uk>

²³ IAEA, Categorization of Radioactive Sources, IAEA Safety Standards Series No. RS-G-1.9, IAEA, Vienna (2005).

²⁴ IAEA Nuclear Security Series No. 11-G (Rev.1). Available at: https://www-pub.iaea.org/MTCD/Publications/PDF/PUB1840_web.pdf

persons to ensure that appropriate security standards are in place and implemented effectively.

- 6.13 Regulatory oversight should be maintained throughout the whole lifecycle of a source, including once a source is considered to be waste. Through a robust regulatory framework and efficient waste management infrastructure, the UK ensures continuous control of radioactive sources. This is known as a ‘cradle-to-grave’ approach and aims to ensure that radioactive sources do not fall out of regulatory control. This approach also ensures that radioactive sources considered to be waste are managed in line with environmental protection principles including the waste hierarchy. The waste hierarchy is a cornerstone of the UK’s waste management strategy and is at the heart of the regulation of radioactive waste. The waste hierarchy is discussed in more detail in chapter 8.
- 6.14 In some circumstances, security concerns about particular sealed sources may require a deliberate decision to depart from the priority order in the waste hierarchy. To remove the risk of these sealed sources being misused in future, disposal may be the preferred management option rather than to re-use or recycle. In such cases, we aim to facilitate their safe and secure disposal, and replacement with alternative, safer technologies where viable. This is achieved through close working between relevant government departments, regulators and organisations such as the NDA.
- 6.15 Those keeping and using radioactive sources should aim to use the minimum number and activity of sources required to fulfil their needs. This will reduce the relevant safety and security risks and help to minimise the amount of radioactive waste subsequently produced. Facilities that may become contaminated as a result of manufacturing or using radioactive sources should be managed appropriately throughout their lifecycle to ensure that they do not pose a risk to people and the environment, including when operations cease.
- 6.16 Information on radioactive sources needs to be collected and maintained. Regulators are required to maintain a comprehensive register of HASS (IAEA categories 1-3)²⁵ held in the UK. Holders of all radioactive sources must maintain records to demonstrate they are managing their radioactive sources appropriately. Regulators can request or review this information, for example, when conducting inspections. Such information helps regulators maintain regulatory oversight. This information also helps to inform future government policy and planning in areas such as safety, security, import and export, and long-term radioactive waste management. By providing accurate information about radioactive sources needing to be disposed of in the future, we can ensure that adequate waste capacity and infrastructures are in place and utilised most efficiently.

²⁵ IAEA Nuclear Security Series No. 11-G (Rev.1). Available at: https://www-pub.iaea.org/MTCD/Publications/PDF/PUB1840_web.pdf

How radioactive sources are regulated

- 6.17 The regulations for the management of radioactive sources are listed in chapter 5. These regulations state how radioactive sources should be managed and set out specific requirements for certain types of sources. These regulations also specify certain low risk activities involving radioactive sources which do not need to be authorised by an environment agency provided certain conditions are met.
- 6.18 For activities involving the management of other types of radioactive sources on non-nuclear sites, such as hospitals and universities, or of mobile sources, operators must be authorised by the relevant environment agency in England, Wales, Scotland, or Northern Ireland.
- 6.19 For sealed sources and aggregates of sealed sources in IAEA categories 1-4 a formal security regime is in place, which is based on standards recommended in IAEA guidance.^{26,27} Conditions in environmental permits, authorisations and certificates reflect these standards and source holders are required to comply with them. The environment agencies work with all relevant government departments and also with the police who advise on the adequacy of protective security measures for sealed radioactive sources.
- 6.20 An operator who no longer wishes to carry out their radioactive substances activity can apply to the relevant environment agency to surrender their permit, authorisation, notification or certificate. The regulator can grant or refuse an application for surrender. For a surrender application to be granted, the operator will need to demonstrate that there will be no significant risk to people, or the environment, and they must take necessary measures to return the facility to a satisfactory state in accordance with the requirements of the relevant legislation.
- 6.21 ONR has regulatory responsibilities where sources are managed on nuclear sites.

Disused sealed sources

- 6.22 A disused sealed source is a sealed source which is no longer used or intended to be used for the practice for which authorisation was granted, but which continues to require safe management. Disused sealed sources are at risk of falling out of regulatory control and becoming orphan sources which increases the threat to human health and the environment. It is therefore important to have robust arrangements to maintain effective control over disused sealed sources.

²⁶ IAEA, Categorization of Radioactive Sources, IAEA Safety Standards Series No. RS-G-1.9, IAEA, Vienna (2005)

²⁷ IAEA Nuclear Security Series No. 11-G (Rev.1). Available at: https://www-pub.iaea.org/MTCD/Publications/PDF/PUB1840_web.pdf

6.23 A source may be temporarily out of use or irregularly used. In such circumstances, it is important for source holders to consider whether they expect to use the sealed source again.

Policy on the management of disused sealed sources

6.24 Source holders should consider management options for their disused sealed sources, which should include effective storage and disposal to eliminate the risks that disused sealed sources may pose to people's health and the environment and ensure proper management throughout the whole lifecycle. Disused sealed sources should be identified and managed promptly.

6.25 Unless security concerns about particular sealed sources require a deliberate decision to be made to depart from the waste hierarchy, disused sealed sources should be managed in accordance with the waste hierarchy and may be:

- returned to the supplier;
- transferred to another organisation that is legally entitled to receive them. This may include transfer for reuse or recycling, or short-term storage and management by a source collection agency;
- transferred to a facility for long-term storage pending final disposal.

6.26 In line with our policy on the import and export of radioactive sources (see chapter 10), disused sealed sources that were manufactured in the UK may be imported to the UK for treatment and disposal.

6.27 We support the activities of source collection agencies (SCAs), commercial organisations specialising in the management of disused sealed sources. They can play an important role in the effective and efficient management of disused sealed sources and encourage the establishment of innovative management options for their reuse and recycling, where viable.

How disused sealed sources are regulated

6.28 The regulators require the safe management and control of disused sealed sources. Disused sealed sources should be stored safely and securely, and disposed of, or transferred, as soon as practicable, in accordance with conditions in permits, authorisations, certificates or relevant exemptions.

6.29 Operators who receive and manage disused sealed sources should dispose of these in accordance with the disposal routes specified in their permit or certificate.

6.30 Holders of HASS must:

- maintain up-to-date plans for the management of these sources once they become disused;

- maintain adequate financial provision to fund these plans, even if the source holder goes out of business.

Orphan sources

- 6.31 An 'orphan source' is a radioactive source which is not subject to regulatory control. This may be because it has never been under regulatory control, been abandoned, lost, misplaced, stolen, or otherwise transferred without proper authorisation. Orphan sources are rare; however they may arise through:
- the discovery of legacy radioactive materials in use prior to regulatory control, such as World War II cockpit instrument dials containing radium-based luminescent paint;
 - abandonment caused by the insolvency of source owners; or
 - the deliberate or inadvertent use of inappropriate disposal routes, such as disposing of radioactive sources with other metals at scrapyards.

Policy on the management of orphan sources

- 6.32 Our aim is for orphan sources to be prevented wherever possible. Our cradle-to-grave approach to the management of radioactive sources aims to minimise the risk of sources falling out of regulatory control and becoming orphaned.
- 6.33 Where orphan sources do occur these will be controlled, recovered and, where necessary, disposed of. If someone finds a source that they think may be orphaned, they should notify the relevant authority or the police.
- 6.34 Operators who are likely to find orphan sources as a consequence of their normal business should have arrangements in place to manage these sources in accordance with any requirements the environment agencies may have for permitting or notification.
- 6.35 The UK Government and the devolved administrations will continue to work with industry and stakeholders to raise awareness of the potential health and safety risks associated with orphan sources, including by encouraging detection of potential orphan sources particularly at high-risk areas such as scrapyards²⁸ and ports of entry.

How orphan sources are regulated

- 6.36 The UK Government and the devolved administrations have regulations to help ensure the prevention, detection, recovery, and management of orphan sources. The relevant

²⁸ Health and Safety Executive. Radioactive Contamination in Scrap in Metal Recycling. Available at: <https://www.hse.gov.uk/waste/radioactive-contamination.htm>

regulations are EPR16²⁹ (England and Wales), EASR18 (Scotland), and RSA93³⁰ and the High-activity Sealed Radioactive Sources and Orphan Sources Regulations 2005³¹ (Northern Ireland) and the Ionising Radiation (Basic Safety Standards) (Miscellaneous Provisions) Regulations 2018 (UK).³²

- 6.37 The environment agencies may issue permits for orphan sources to ensure that these are controlled and recovered or disposed of appropriately.

National arrangements for incidents involving radiation

- 6.38 In addition to requirements and duties on the environment agencies, there are further arrangements in Great Britain to protect the public from radiation hazards where orphan sources are discovered, and in situations where no formal contingency plans exist. In such instances, the National Arrangements for Incidents involving Radiation (NAIR) allow volunteers from hospitals and the nuclear industry to provide quick and accessible assistance to the emergency services. When incidents involve the recovery of orphan sources, responding organisations may volunteer to store these safely and securely on their premises pending disposal. These arrangements are currently under review to ensure that a sustainable model for dealing with future NAIR incidents continues to exist. We are committed to developing a long-term funding solution for the disposal of orphan sources arising from NAIR events in Great Britain. In Northern Ireland, arrangements for the management of radioactive material that falls outside of regulatory control are coordinated by NIEA.

²⁹ The Environmental Permitting (England and Wales) Regulations 2016. Available at: <https://www.legislation.gov.uk/ukSI/2016/1154/made>

³⁰ The Radioactive Act 1993, as amended by the Radioactive Substances Act 1993 (Amendment) Regulations (Northern Ireland). Available at: <https://www.legislation.gov.uk/nisr/2011/290/contents/made>

³¹ The High-activity Sealed Radioactive Sources and Orphan Sources Regulations 2005. Available at: <https://www.legislation.gov.uk/ukSI/2005/2686/contents/made>

³² The Ionising Radiation (Basic Safety Standards) (Miscellaneous Provisions) Regulations 2018 Regulations. Available at: <https://www.legislation.gov.uk/ukSI/2018/482/body>

7

Managing radioactive liquid and gaseous discharges

- 7.1 Small quantities of radioactive substances may be discharged into the environment, both from nuclear licensed sites and from non-nuclear operators such as universities, hospitals and the oil and gas industry. Radioactive discharges are most typically in the form of gases and liquids. Policy for liquid and gaseous discharges is devolved.

Policy on the management of radioactive liquid and gaseous discharges

- 7.2 The policy of the UK Government and devolved administrations is that the unnecessary introduction of radioactivity into the environment is undesirable, even at levels where doses to humans and other species are low and, on the basis of current knowledge, are unlikely to cause harm. This policy is underpinned by the principles of justification, optimisation, and dose limitation (as outlined in chapter 5) as a means of governing the unnecessary introduction of radioactivity into the environment.
- 7.3 The UK's policy is that Best Available Techniques (BAT) (in England and Wales – equivalent to Best Practicable Means (BPM) in Scotland and Northern Ireland) should be used to prevent or minimise gaseous and liquid discharges and their impacts on the environment.
- 7.4 Options for the management of radioactive waste range from direct discharge of gaseous or liquid radioactivity into the environment (“dilute and disperse”) to the trapping of radioactivity in a solid, concentrated form for storage and eventual disposal (“concentrate and contain”). The UK Government's and devolved administrations' policy, in line with IAEA guidance, is that “concentrate and contain” should be the preferred option for managing radioactive waste. However, we recognise that this may not always be reasonably practicable, or in some cases even possible, and that some releases to the environment are unavoidable. In all cases, the overriding principles should be that operators disposing of gaseous and liquid discharges must ensure they are below the relevant dose constraints. They must also ensure that exposures to radiation of people and the environment are kept as low as reasonably achievable – this is the optimisation requirement.
- 7.5 The UK Government's and devolved administrations' policy is to ensure a sustainable approach is taken towards the management of radioactive discharges. There should

be proportionate environmental monitoring and assessment of radioactive discharges. The results of this monitoring should be made available to the public.

OSPAR and the UK's strategy for radioactive discharges

- 7.6 The UK is a signatory to the Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention). The aim of the OSPAR Convention is to prevent and reduce pollution, including radioactive substances, and to protect the maritime area against the adverse effects of human activities.
- 7.7 To implement the provisions of the OSPAR Convention and meet the objectives of the *OSPAR Radioactive Substances Strategy (RSS)*,³³ the UK produced its first *Strategy for Radioactive Discharges* in 2002.³⁴ The second Strategy was produced in 2009 and reviewed in 2018.³⁵ The RSS aims to prevent pollution of the marine environment from radiation through progressive and substantial reductions of discharges, emissions and loss of radioactive substances.
- 7.8 The objectives of the UK's Strategy for Radioactive Discharges are:
- to implement the UK's obligations in respect of the RSS;
 - to provide a clear statement of government policy, as outlined in this document, and a strategic framework for discharge reductions, sector by sector, to inform decision-making by industry and regulators.

How radioactive liquid and gaseous discharges are regulated

- 7.9 Discharges are made by industry, nuclear licensed sites, hospitals, and other facilities in accordance with the limits and conditions specified in permits granted by the environment agencies. Radioactive discharges are regulated under *EPR16*³⁶ in England and Wales, *EASR18*³⁷ in Scotland, and *RSA93*³⁸ in Northern Ireland, to ensure that dose levels to members of the public remain well below the statutory limit and constraints, and that protection of both human health and the environment is optimised.

³³ The OSPAR Commission's Radioactive Substances Strategy 2010-2020. Available at: https://www.ospar.org/site/assets/files/1470/radsub_strategy.pdf

³⁴ UK Strategy for Radioactive Discharges 2001-2020. Available at: https://webarchive.nationalarchives.gov.uk/20090731144513/http://www.defra.gov.uk/environment/radioactivity/government/discharges/pdf/rad_dischargestrat1.pdf

³⁵ UK Strategy for radioactive discharges: 2018 review of the 2009 strategy. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718723/2018Review2009UKStratRadDischargeFin.pdf

³⁶ The Environmental Permitting (England and Wales) Regulations 2016. Available at: <https://www.legislation.gov.uk/uksi/2016/1154/contents/made>

³⁷ The Environmental Authorisations (Scotland) Regulations 2018. Available at: <https://www.legislation.gov.uk/ssi/2018/219/contents/made>

³⁸ Radioactive Substances Act 1993. Available at: <https://www.legislation.gov.uk/ukpga/1993/12/contents>

- 7.10 As set out in chapter 5, exposure to all sources of ionising radiation, including exposure from gaseous and liquid discharges, must be kept within dose limits. The dose limits on exposure to ionising radiation applied in the UK are derived from international recommendations from the ICRP and the IAEA and are set out in EPR16, EASR18, IRR17, IRR(NI)17³⁹ and the Radioactive Substances (Basic Safety Standards) Regulations (Northern Ireland) 2003.⁴⁰
- 7.11 Some discharges, due to their lower level of radioactivity and potential low risk, may not require full regulatory control. In line with the graded approach, the different regulatory frameworks within the UK have tiers of authorisation below a permit. These include notifications, registrations, general binding rules (Scotland) and exemptions (England, Wales, and Northern Ireland).
- 7.12 Below certain dose levels, the radiological risk to the public is considered too low to warrant further mitigation by operators so long as BAT/BPM is used. These levels are called thresholds for optimisation. Thresholds for optimisation are a UK-specific concept based on dose levels: 0.02 mSv per year in Scotland and Northern Ireland and 0.01 mSv per year in England and Wales. Below these levels, the regulators will not seek further reduction in discharge limits, as long as they are satisfied that BAT/BPM is being applied by the operators to protect the public.
- 7.13 To monitor discharges, the environment agencies and other regulators undertake independent monitoring of radiation in the environment, which is collated and analysed by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), and reported annually in the *Radioactivity in Food and the Environment (RIFE) reports*.⁴¹ This independent monitoring and assessment is used to determine the impact of discharges and contributes to the assessment of the implementation of the governments' policy and strategies.

³⁹ The Ionising Radiations (Northern Ireland) Regulations 2017. Available at: <https://www.legislation.gov.uk/nisr/2017/229/made>

⁴⁰ The Radioactive Substances (Basic Safety Standards) Regulations (Northern Ireland) 2003. Available at: <https://www.legislation.gov.uk/nisr/2003/208/contents/made>

⁴¹ Radioactivity in Food and the Environment (RIFE) reports. Available at: <https://www.gov.uk/government/publications/radioactivity-in-food-and-the-environment-rife-reports>

8

Managing radioactive waste in the nuclear and non-nuclear sectors

Introduction

8.1 This policy statement replaces:

- Policy for the long-term management of solid low level radioactive waste in the United Kingdom (2007);
- The UK Government's policy, Implementing geological disposal – working with communities: An updated framework for the long-term management of higher activity radioactive waste (2018);
- Implementing geological disposal: A framework for the long-term management of higher activity waste (2014), which up until this point was extant policy in Northern Ireland;
- Welsh Government Policy on the Management and Disposal of Higher Activity Radioactive Waste (2015);
- The Welsh Government's policy, Geological disposal of Higher Activity Radioactive Waste: Working with Communities (2019).

8.2 Policy on managing radioactive waste is devolved. There is a large degree of consistency in the policies of the UK Government and devolved administrations for managing radioactive waste. However, there are some differences. Where this is the case, we refer to or summarise the differences in the main body of this document and set out in full the separate policies in appendices or provide links to them. The Scottish Government has its own policy for higher activity radioactive waste⁴² which remains in effect. The UK Government's Working with Communities policy is in Appendix 1. The Welsh Government's Working with Communities policy is in Appendix 2.

8.3 The UK Government's and devolved administrations' policies on managing radioactive waste are based on the same basic principles that apply more generally to environmental policy and set out expectations in relation to:

- sustainable development;

⁴² Scottish Government. Radioactive Waste Policy. Available at: <https://www.gov.scot/policies/nuclear-energy/radioactive-waste/>

- decisions being based on the best possible scientific information and analysis of risks;
 - the precautionary principle;
 - the polluter pays principle;
 - application of the waste hierarchy.
- 8.4 In addition, the UK Government and devolved administrations expect those who own, produce and manage radioactive waste to consider how they can deliver net carbon zero emissions from radioactive waste management activities. This also applies to the development of new stores, treatment, or disposal facilities.
- 8.5 Opportunities to develop further innovative approaches to solve future challenges in all aspects of managing radioactive waste should also be taken.

Scope of the policy

- 8.6 The policy statement covers all aspects of the generation, management, and regulation of radioactive waste, which is included within the scope of the radioactive substances regulations (see chapter 5). This waste is primarily solid waste but also includes liquid wastes such as oils, solvents and raffinates and mobile wastes such as sludges.
- 8.7 The policy statement does not cover radioactive waste that is excluded from radioactive substances legislation because it is of low radiological risk to health and the environment (see Figure 3). However, such waste may still be subject to conventional waste regulations and transport regulations and must be managed in accordance with those requirements.
- 8.8 Nuclear materials, including spent nuclear fuel, uranium and plutonium, are not classified as radioactive waste whilst a future use for them is foreseen by the owner of the material. Policy on nuclear materials is set out in chapter 11. Should the material be classified as waste it would then fall within the scope of this policy statement.
- 8.9 The policy is relevant to those organisations responsible for the production, management, and regulation of radioactive waste. This includes the NDA and its subsidiaries and site licence companies, the Ministry of Defence, other radioactive waste producers and owners in the nuclear and non-nuclear sectors, owners and operators of waste management facilities including existing and proposed treatment, storage and disposal facilities, the relevant regulatory bodies and planning authorities.
- 8.10 Where relevant, waste producers and owners should take into account developments in the joint UK Government's and devolved administrations of Scotland and Wales's policy for the decommissioning and clean-up of the UK's nuclear facilities. This is discussed in chapter 9. Northern Ireland does not have any nuclear facilities and the

policy for the decommissioning and clean-up of such facilities does not apply in Northern Ireland.

- 8.11 Waste producers and owners, and organisations responsible for the management of radioactive waste, should also take into account relevant developments in the policies for the management of radioactive sources, nuclear material management and import and export of radioactive waste and spent fuel which are set out in chapters 6, 11 and 10 respectively. Policy on the disposal of liquid or gaseous waste through permitted discharges is set out in Chapter 7. Disposal of solid radioactive waste is covered in this chapter from paragraph 8.49 onwards.
- 8.12 Management of radioactively contaminated land is not covered in this policy framework. However, the management of any radioactive waste that is generated from activities to remediate contaminated land should be managed in accordance with this policy.

Aim of the policy

- 8.13 The policy provides a high-level framework within which decisions can be taken by those who produce, own, or manage radioactive waste to ensure safe, secure, environmentally acceptable, and cost-effective solutions for the management of this waste. These decisions should also demonstrate value for money and be appropriate and proportionate to the risk posed to people's health and the environment by the properties (radiological, chemical, and physical) of the waste concerned.
- 8.14 There is a diverse range of radioactive waste types, and levels of associated radioactivity as well as a range of chemical and physical properties. The policy therefore does not aim to be prescriptive. It is designed to provide flexibility to allow appropriate waste management solutions to be developed on a case-by-case basis.
- 8.15 The policy has the overall objective of reducing the risk to people and the environment of managing radioactive waste. These risks should be as low as is reasonably achievable/practicable taking account of social, environmental and economic factors. This is consistent with the principle of optimisation of protection of people when managing radioactive substances as recommended by the ICRP and is in alignment with IAEA standards.

Risk-informed decision-making

- 8.16 Those responsible for creating and managing radioactive waste (including owners), should take a risk-informed approach to decision-making. A risk-informed approach should be adopted throughout the full waste management lifecycle. It means:

- understanding the properties of the waste (radiological, chemical and physical), the hazard those properties pose to people and the environment, and the risk of harm to people and the environment from managing this waste;
- using this information for current and future arisings of all radioactive waste to inform the plans for the management of that waste;
- taking these hazards and risks into account when managing the waste to protect people and the environment.

8.17 The risk-informed approach is part of the overall decision-making in relation to radioactive waste management and should be considered as part of the process of optimisation. Any assessment of management options will be subject to appropriate regulatory scrutiny and will need to meet the BAT/BPM and ALARP requirements. The non-radioactive characteristics of radioactive waste, in particular hazardous chemicals, should be managed to standards consistent with those that apply to non-radioactive waste.

UK radioactive waste classifications

- 8.18 Within the UK, radioactive waste is classified in terms of the nature and quantity of radioactivity it contains and its heat-generating capacity. The classifications are used for the inventory of current and future arisings of radioactive waste from the nuclear industry and are used as part of the UK's international reporting obligations. The waste classifications across the full range of radioactive waste are broadly in line with international practice.
- 8.19 **Low level waste (LLW)** - waste having a radioactive content not exceeding four Gigabecquerels per tonne of total alpha activity or 12 Gigabecquerels per tonne of total beta/gamma activity. Within the LLW definition are additional sub-categories for low volume and high volume very low level waste (VLLW) (see box on the next page).

Low Volume VLLW is defined as: radioactive waste which can be safely disposed of to an unspecified destination with municipal, commercial or industrial waste (“dustbin” disposal), each 0.1 m³ of waste containing less than 400 kilobecquerels (kBq) of total activity or single items containing less than 40 kBq of total activity.

For waste containing carbon-14 or hydrogen-3 (tritium):

- in each 0.1 m³ the activity limit is 4,000 kBq for carbon-14 and hydrogen-3 (tritium) taken together; and
- for any single item, the activity limit is 400 kBq for carbon-14 and hydrogen-3 (tritium) taken together.

Controls on disposal of this material, after removal from the premises where the waste arose, are not necessary.⁴³

High Volume VLLW is defined as: radioactive waste with maximum concentrations of four megabecquerels per tonne (MBq/te) of total activity which can be disposed of in specified landfill sites. For waste containing tritium, the concentration limit for tritium is 40 MBq/te. Controls on disposal of this waste, after removal from the premises where the waste arose, will be necessary.

- 8.20 **Intermediate level waste (ILW)** - waste exceeding the upper boundaries for LLW, but which does not require heat generation to be taken into account in the design of storage or disposal facilities.
- 8.21 **High level waste (HLW)** - waste in which the temperature may rise significantly as a result of its radioactivity, so this factor has to be taken into account in the design of storage or disposal facilities.
- 8.22 In addition to the classifications set out above, the term “higher activity radioactive waste” is used by the Scottish Government in its 2011 policy statement. The term, as used in Scottish Government Policy, refers to ILW and LLW which is not currently suitable for disposal in existing LLW facilities. The Scottish Government Policy does not cover HLW as there is no HLW in Scotland. The UK Government and devolved administrations also often use the term “borderline (or boundary) waste” to describe solid waste which has a level of radioactivity close to the boundary between two waste categories, typically LLW/ILW.

⁴³ The UK regulatory approach to low volume VLLW is consistent with the graded approach and an example of the concept of ‘specific clearance’ described in IAEA GSG18.

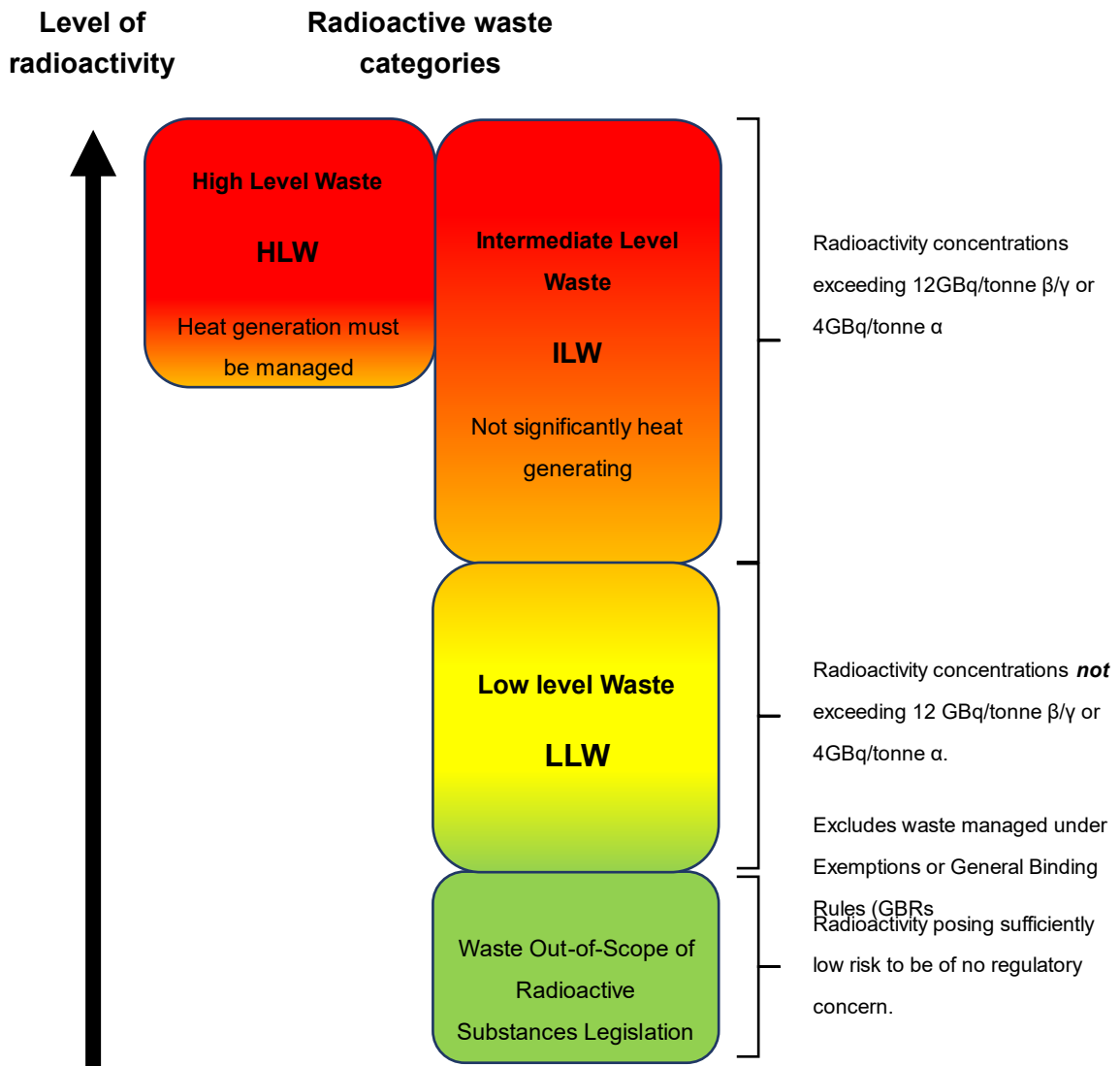


Figure 3. Classification of radioactive waste in terms of radioactivity and heat-generating capacity (ONR/SEPA/EA/DESNZ).

Radioactive waste in the UK

8.23 Radioactive waste is produced from operational and decommissioning and clean-up activities in the nuclear and non-nuclear sectors. Currently, the majority of this waste is generated by the nuclear sites which are the responsibility of the NDA and EDF Energy. It includes a range of materials such as paper; plastics; scrap metal; reactor components; contaminated metals; organic materials; concrete; graphite, disused sources from medical and industrial irradiators and waste containing naturally occurring radioactive material (NORM). It can also include wastes such as ion exchange resins and filter media, oils, solvents, sludges, flocculants, and highly active liquor (HAL) from spent nuclear fuel reprocessing. It may also include spent fuel and other nuclear materials if these become waste. Radioactive waste is also released in

the form of discharges from nuclear reactors, fuel processing plants, hospitals and research facilities. Policy on discharges can be found in Chapter 7.

Minimisation of waste arisings and the role of the waste hierarchy

8.24 Those responsible for creating and managing radioactive waste should do so in accordance with the waste hierarchy. The waste hierarchy⁴⁴ (Figure 4) describes the principle of adopting options for managing waste and potential waste arisings starting with those options that have least impact on the environment. Its application is central to the successful implementation of this policy.

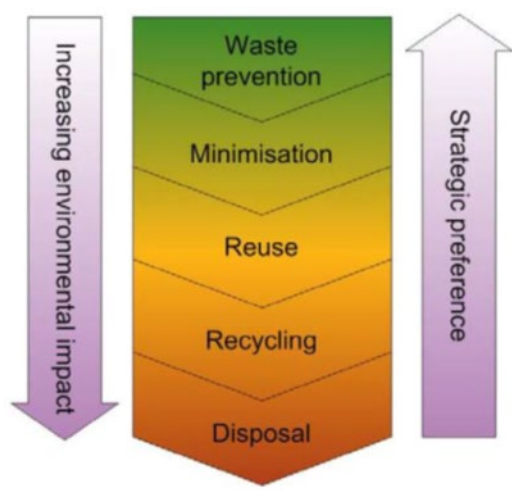


Figure 4. The Waste Hierarchy

8.25 The waste hierarchy should be used as a framework for decision-making for all radioactive waste across the UK. Effective application of the waste hierarchy, where practicable, should lead to the avoidance or minimisation of the production of radioactive waste including, for example, secondary radioactive waste produced during treatment or during decommissioning and clean-up activities. The waste hierarchy should be considered alongside the principles of optimisation and associated regulatory requirements, as laid out in chapter 5. Any option chosen will be subject to appropriate regulatory scrutiny and will need to meet the BAT/BPM and ALARP requirements.

8.26 Application of the waste hierarchy should be an integral part of the design and implementation of radioactive waste management activities, this includes:

- designing, constructing, operating and decommissioning new facilities with waste prevention in mind and ensuring that radioactive waste is only created

⁴⁴ Defra (2011). Guidance on applying the Waste Hierarchy. Available at: <https://www.gov.uk/government/publications/guidance-on-applying-the-waste-hierarchy>

if there are credible waste management plans and existing or planned disposal routes;

- where radioactive waste generation is unavoidable, minimising the quantities generated, consistent with the planned management of that radioactive waste;
- reusing or recovering resources and recycling of waste in preference to disposal, providing that all other elements of the policy and regulatory requirements can be satisfied (e.g. safety, security, environmental protection, public value etc).

8.27 Operators should ensure appropriate levels of waste characterisation are carried out in order for the waste hierarchy to be applied effectively.

Radioactive waste management lifecycle

8.28 Radioactive waste should be managed safely and compliantly throughout its lifecycle, from the initial planning and preparation stage, through generation, treatment, and packaging, to storage and disposal (Figure 5).

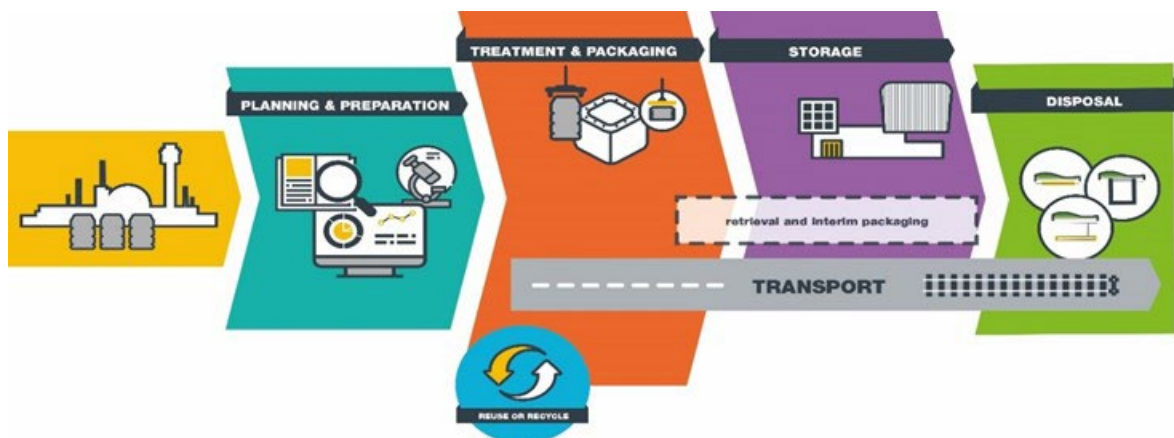


Figure 5. Radioactive waste management lifecycle

Planning and preparation

8.29 Early planning and preparation for the management of radioactive waste should be carried out to identify opportunities across the lifecycle to optimise waste management, to apply the waste management hierarchy and to ensure an integrated approach will be taken to waste management. It should then be an ongoing, iterative process throughout the waste management lifecycle. For planning and preparation to be successful, it is essential that there is a good understanding of the waste and materials that need to be managed throughout the waste management process.

Treatment and packaging

- 8.30 The policy of the UK Government and devolved administrations is that treatment and packaging should be used to process the waste into a form suitable for re-use, storage or disposal. This phase of the waste management lifecycle typically could include a number of phases; characterisation of the waste, undertaking techniques such as sorting and segregation, decontamination and treatment and conditioning before packaging of the waste.

UK Government and devolved administrations of Wales and Northern Ireland policy on HLW, ILW and LLW not suitable for disposal in current facilities.⁴⁵

- 8.31 For HLW, ILW and LLW not suitable for disposal in current facilities, early conditioning of this waste should be carried out where practicable to reduce its hazard and make it passively safe so that it is physically and chemically stable. That is, the waste is immobilised and the need for maintenance, monitoring or other human intervention is minimised. The waste should be packaged in such a way that it can be stored safely and securely in a manner which minimises the need for active control and safety systems pending the availability of a suitable disposal facility or for further conditioning.
- 8.32 Nuclear Waste Services (NWS) provides advice to waste producers on the suitability of their waste conditioning proposals for future disposal. This minimises the risk that waste needs to be repackaged and hence minimises the likelihood of ‘double handling’ of HLW, ILW and LLW not suitable for disposal in current facilities. This is undertaken using an established process, which is subject to scrutiny by the ONR and the relevant national environment agencies. Implementation of robust storage arrangements, informed by this advice on disposal from NWS, provides confidence that packages will be disposable at the end of the storage period.

Storage

- 8.33 During its lifecycle, radioactive waste may need to be stored to await, for example, further treatment, availability of suitable disposal routes, or development of alternative management options.
- 8.34 Whenever storage is required, it should provide for the safe, secure containment of radioactive waste, to protect people and the environment, in accordance with legal requirements and regulatory expectations, until the waste is retrieved for the next stage of waste management. Radioactive waste should be conditioned to a passively safe condition as soon as reasonably practicable. By exception containerised unconditioned radioactive waste may be stored in modern storage facilities where it is justified as the ALARA, BAT/BPM and ALARP option. Examples include where there is an imperative to progress with hazard reduction or to avoid foreclosure of other management options. Decisions on whether to store containerised, unconditioned

⁴⁵ Scottish Government. Radioactive Waste Policy. Available at: <https://www.gov.scot/policies/nuclear-energy/radioactive-waste/>

waste will need to comply with all regulatory requirements and will be considered on a case-by-case basis.

- 8.35 The types of storage options available include short term storage (buffer storage) and decay storage. Decay storage enables waste producers to take advantage of radioactive decay to allow a specified retrieval or treatment step, or to allow a change in disposal route. This management step can occur at the outset of packaging for storage, or it can be a management step that is selected after a period of interim storage.

Disposal

- 8.36 Disposal is the final stage in the waste management lifecycle for waste that cannot be managed higher up the waste hierarchy. It involves the emplacement of waste in a suitable facility with no intent to retrieve it. Disposal of solid radioactive waste is discussed in more detail from page 46. Disposal of liquid and gaseous waste through permitted discharges to the environment is discussed in chapter 7.

Presumption towards early solutions for radioactive waste in England, Wales and Northern Ireland and LLW in Scotland⁴⁶

- 8.37 When preparing programmes and plans for the management of radioactive waste generated during operational and decommissioning activities, there should be a presumption by the waste producer or owner towards management solutions which can be implemented sooner rather than later. Early solutions do not necessarily equate to early disposal. For example, storage can enable waste producers to take advantage of radioactive decay pending disposal. This might include enabling a specified retrieval or treatment step, or to allow a change in disposal route.
- 8.38 Where radioactive waste has been accumulated in legacy facilities, the programmes and plans might include a period of time to enable the next management step to be developed. However, if long periods prior to retrieval from any legacy facility are proposed, then the condition of the facility, the waste accumulated within and how they might degrade with time must be taken into account.
- 8.39 The objective should be to put solutions such as decay storage or volume reduction initiatives in place prior to the implementation of programmes and plans wherever possible. Where this is shown not to be possible, or it would be inappropriate, any interim management of waste will need to be conducted in a manner that meets regulatory requirements. This includes taking account of the agreed disposal route(s) identified from the options assessments required by the regulatory bodies. Such an approach will contribute to the achievement of intergenerational equity.

⁴⁶ Scottish Government. Radioactive Waste Policy. Available at: <https://www.gov.scot/policies/nuclear-energy/radioactive-waste/>

- 8.40 The UK Government and devolved administrations expect the NDA to continue to promote and support new initiatives where they add real value to the NDA's decommissioning and waste management activities including exploring proposals for waste management solutions brought forward by commercial operators. The NDA should also continue to invest in research and development to address the challenges of radioactive waste management and to track and benchmark international developments, including collaborating with other countries to share good practice.

The transport of radioactive waste as applied to all solid radioactive waste in England, Wales and Northern Ireland and LLW in Scotland⁴⁷

- 8.41 The UK Government and devolved administrations expect transport to be explicitly considered when options assessments are carried out to support the development of radioactive waste management plans (see paragraphs 8.44 to 8.48). This should take into account the volumes and radioactivity of the waste as well as the distance over which it will need to be transported for each option. Consideration should also be given to the alternatives to long distance transport where possible, in particular, in relation to the large quantities of soil and rubble contaminated with low levels of radioactivity that will arise from large nuclear site decommissioning and clean-up activities. However, while the desire to avoid excessive transport of radioactive waste is an important consideration, it must be balanced with all other relevant factors on a case-by-case basis.
- 8.42 Use of centralised facilities for the treatment (including smelting, surface decontamination, and incineration) of radioactive waste may be appropriate where this option would provide a more sustainable or cost-effective solution than developing treatment facilities on individual sites. It may also be appropriate to consolidate radioactive waste into a central or regional treatment or storage location, for example, where there are security benefits, or it makes optimal use of existing infrastructure. Such an option may require planning permission from planning authorities.
- 8.43 UK regulations concerning the transport of radioactive materials are consistent with IAEA guidance. The UK Government and devolved administrations believe these regulations have provided a safe environment for the transport of radioactive waste in the past and will continue to do so into the future.

Radioactive waste management plans

- 8.44 Those managing radioactive materials and radioactive waste, including both the nuclear and non-nuclear sectors, are expected to develop and maintain radioactive waste management strategies and plans.

⁴⁷ For the Scottish Government's policy on this issue and the associated "proximity principle" for higher activity waste see <https://www.gov.scot/policies/nuclear-energy/radioactive-waste/>

8.45 Waste management strategies and plans should:

- address all waste expected to be generated from operational and decommissioning activities (i.e. all current and anticipated future arisings);
- preferably be developed in advance of the production of any new radioactive waste streams;
- be proportionate to the hazard, risk and inventory of the predicted wastes that will be generated;
- be based on assessment of all practicable options;
- take account of all hazards and risks and other relevant factors throughout the lifecycle of the radioactive waste, including production, storage, transport (proximity), treatment and disposal;
- take account of all policy requirements, in particular the waste hierarchy and a risk-informed approach;
- demonstrate how waste is minimised throughout its lifecycle and that the chosen management option gives optimal outcomes for people and the environment as a whole;
- demonstrate how implementing these plans will leave nuclear licensed sites in a state suitable for release from radioactive substances regulation;⁴⁸
- be developed with appropriate engagement with regulators and other stakeholders (e.g. where the plan includes on-site treatment or disposal);
- be underpinned by appropriate research and relevant good practice;
- be regularly reviewed and updated;
- be adequately resourced so that they can be implemented when required.

Consultation and public involvement in radioactive waste management plans

8.46 Nuclear operators' proposed programmes and plans for the management and disposal of radioactive waste should be developed by including wide stakeholder engagement.

8.47 Engagement should involve local authorities and communities which may be impacted by the plans, including any host community in the vicinity of a waste treatment, storage or disposal facility. When environment agencies consult on applications to dispose of radioactive waste from nuclear sites, they should take account of operators' consultations and adopt a proportionate approach. Non-nuclear operators do not generally need to consult the public on their radioactive waste management plans. However, as part of the environmental regulators' consideration of any applications for

⁴⁸ SEPA, Environment Agency and Natural Resources Wales (2018). Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation. Available at: <https://www.sepa.org.uk/media/365893/2018-07-17-grr-publication-v1-0.pdf>

an authorisation to dispose of radioactive waste from non-nuclear producers, regulators may require consultation.

8.48 Guiding principles that should apply to nuclear operator consultations are:

- provision for early local community input into the decision-making process;
- openness and transparency at all stages;
- provision of well prepared, good quality, accurate and easily understandable briefing material;
- use of an iterative consultation process where appropriate.

Disposal of solid radioactive waste

8.49 This section covers disposal of all solid radioactive waste including liquid waste that has been immobilised and is to be disposed of as a solid. See Chapter 7 for disposal of liquid and gaseous waste through permitted discharges to the environment.

Disposal facilities for solid radioactive waste

8.50 Solid radioactive waste can range from waste that can be safely disposed of in conventional landfill sites, to items that need to be isolated and contained underground in highly engineered disposal facilities. It is the policy of the UK Government and devolved administrations to make the best practicable use of resources, by encouraging the disposal of radioactive waste to facilities designed to provide the isolation and containment appropriate to the risk posed by that waste, so that people and the environment are protected. It is therefore important to have a range of disposal facilities available for waste owners and waste producers.

8.51 In the UK there is a range of disposal facilities available for radioactive waste from both the nuclear and non-nuclear sectors. More will need to be developed in the future, in order to dispose of the radioactive waste that has accumulated since the 1950s, and as more of our nuclear, oil and gas and other non-nuclear facilities are decommissioned. The disposal facilities range from those that could accept the most hazardous radioactive waste that needs to be isolated and contained for hundreds of thousands of years in order to protect people's health and the environment, to facilities where no special controls are necessary, which are suitable for less hazardous radioactive waste.

8.52 Each disposal facility will have waste acceptance criteria. The waste acceptance criteria set out the characteristics of the waste that can be disposed of at that particular

facility. The environment agencies have published guidance^{49, 50} on their requirements for the authorisation of disposal facilities. The UK Government and devolved administrations expect the environment agencies to periodically review their guidance to ensure it remains up to date.⁵¹ The regulation of disposal facilities is discussed in more detail in paragraphs 8.113 to 8.122

8.53 The disposal options currently available to waste producers include:

- landfill sites;
- disposal facilities on site such as the Calder Landfill Extension Segregated Area (CLESA) at Sellafield, for the least hazardous LLW;
- specialised near surface disposal facilities such as the LLWR in Cumberland.

Planned and potential future disposal facilities for solid radioactive waste

8.54 In future more disposal capacity will be needed. The UK Government and the Welsh Government have already set out processes for identifying a suitable location for a geological disposal facility for the most hazardous radioactive waste in either England or Wales. More near surface disposal facilities could also be developed across England and Wales for the disposal of some less hazardous ILW. Scotland has already set out its strategy to develop near surface disposal facilities for some waste from decommissioning nuclear sites.

8.55 The policy of the UK Government and devolved administrations is to enable and encourage waste producers and waste owners to dispose of their radioactive waste in an optimal manner, that takes account of the radioactive and non-radioactive properties of the waste. Waste producers have to consider a wide range of factors including the properties of the waste and the waste acceptance criteria for disposal facilities to enable them to choose the optimal disposal route for their waste. This is necessary to ensure that the best use of disposal capacity is made across the UK as decommissioning and clean up progresses across the nuclear and non-nuclear sectors.

Geological disposal

8.56 It is the policy of the UK Government and devolved administrations of Wales and Northern Ireland to manage the UK's most hazardous radioactive waste through geological disposal. A search for a suitable location for a geological disposal facility

⁴⁹ EA, SEPA & NIEA (2009) Near-Surface Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation. Available at: <https://www.gov.uk/government/publications/near-surface-disposal-facilities-on-land-for-solid-radioactive-wastes>

⁵⁰ EA & NIEA (2009) Geological Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation. Available at: <https://www.gov.uk/government/publications/geological-disposal-facilities-on-land-for-solid-radioactive-wastes>

⁵¹ The regulatory guidance for near surface disposal facilities and geological disposal facilities in England and Wales is being revised and the intention is to prepare one revised Guidance on Requirements for Authorisation for the land-based disposal of solid radioactive waste.

(GDF) is taking place in England and Wales only. The Scottish Government is not participating in the geological disposal programme.

- 8.57 The decision of the UK Government and devolved administrations of Wales and Northern Ireland to implement geological disposal follows a recommendation by the Committee on Radioactive Waste Management (CoRWM). Between 2003 and 2006, CoRWM considered a wide range of options on how to deal with the UK's most hazardous radioactive waste, from indefinite storage on or below the surface through to propelling waste into space. In July 2006, CoRWM recommended that geological disposal, coupled with safe and secure interim storage, was the best available approach for the long-term management of the UK's most hazardous radioactive waste. CoRWM continues to recommend that geological disposal is the best available option for disposing of the UK's most hazardous radioactive waste.
- 8.58 A GDF isolates the waste deep underground to protect people and the environment from harm. It involves isolating radioactive waste deep inside a suitable rock formation to ensure that no harmful quantities of radioactivity ever reach the surface environment. This is achieved through the use of multiple barriers that work together to provide protection over hundreds of thousands of years (see Figure 6). It is not a case of simply depositing waste underground. The multiple barriers that provide safety for geological disposal are a combination of the:
- form of the radioactive waste itself - for example, liquid HLW is converted into a durable, stable, solid glass form before storage and disposal;
 - packaging of the waste;
 - engineered barriers that protect the waste packages and limit the movement of radionuclides if they are released from the waste packages;
 - engineered features of the facility that the waste packages are placed in;
 - stable geological setting (rock) in which the facility is sited.

8.59 There is general agreement internationally that geological disposal provides the safest long-term management solution for the most hazardous radioactive waste. Other countries that are progressing plans to implement geological disposal include Canada, Finland, France, Switzerland, Sweden and the United States of America.

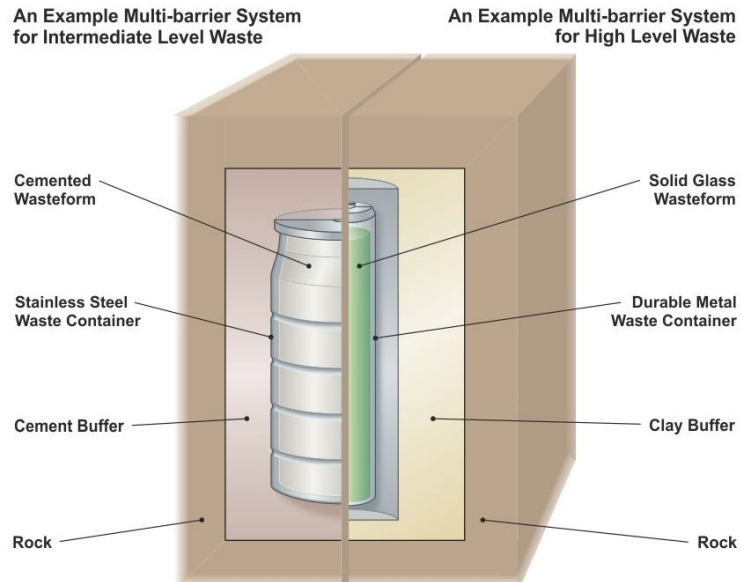


Figure 6. Multi-barrier system (Source: NDA)

Facility design

8.60 A GDF will have both surface and underground facilities. They will be linked by access tunnels and/or shafts, depending on the layout of these facilities. The underground facilities do not need to be located directly below the surface facilities – they could be separated by a distance of several kilometres and could be located under the seabed of the UK's territorial sea.

8.61 The precise layout and design of the facilities will depend on the inventory for disposal and the specific geological characteristics at the site in question. An artist's impression of one potential layout of a GDF can be seen in Figure 7.

8.62 Once a GDF is eventually closed, it will no longer require any human intervention (although the surrounding environment could still be monitored for as long as society decided it was necessary). This avoids placing the burden of dealing with this waste on future generations.

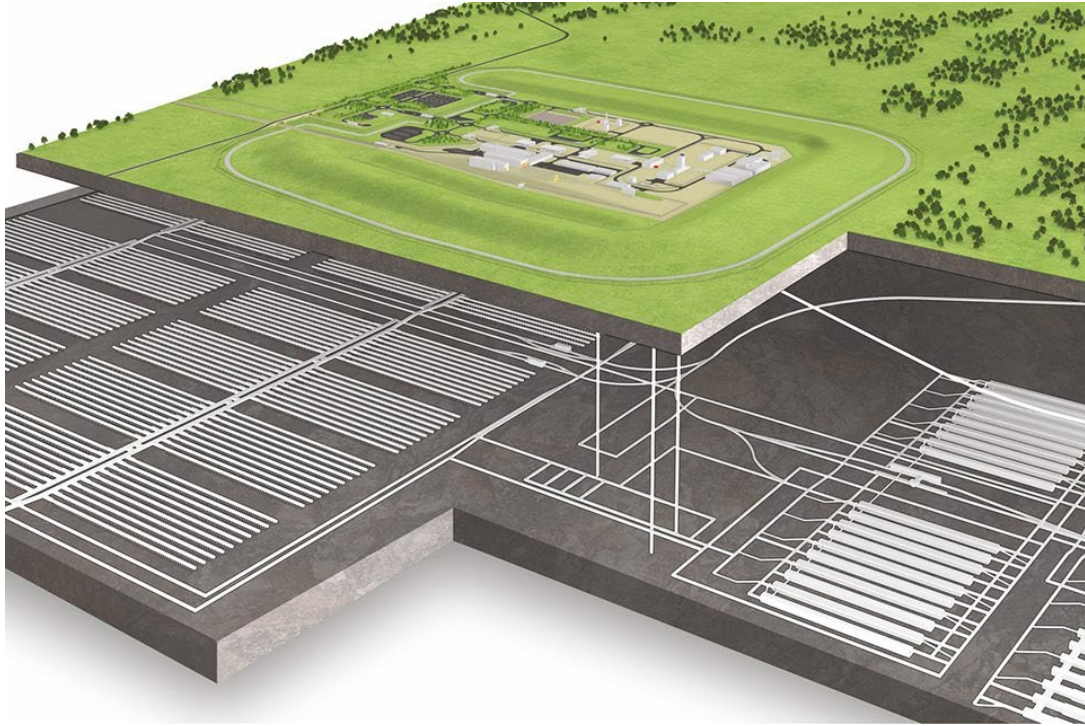


Figure 7. Artist's impression of a possible GDF layout (Source: NWS)

Inventory for disposal

8.63 The specific types of radioactive waste (and nuclear materials that could be declared as waste) which would comprise the inventory for disposal in a GDF are:

- HLW arising from reprocessed spent nuclear fuel at Sellafield;
- ILW arising from existing nuclear licensed sites, defence, medical, industrial, research and educational facilities that is not suitable for disposal in near surface facilities;
- the small proportion of LLW that is not suitable for disposal in near surface facilities;
- spent fuel from existing commercial reactors (yet to be declared waste) and from research reactors that is not reprocessed;
- spent fuel (yet to be declared waste) from new nuclear projects (including small modular reactors);
- spent fuel (yet to be declared waste) from advanced modular reactors if it is suitable for disposal in a GDF;

- ILW from new nuclear projects not suitable for disposal in near surface facilities;
- the plutonium inventory (yet to be declared waste) – either as spent fuel following reuse or in an immobilised form suitable for geological disposal;
- uranium stocks – including that arising from enrichment and fuel fabrication activities and reprocessing activities (yet to be declared waste); and
- irradiated fuel and nuclear materials (yet to be declared waste) from the UK defence programme.

8.64 As component parts of the inventory for disposal in a GDF it is not expected that the categories of waste and material listed above will change significantly. For the purposes of discussions with communities that are considering hosting a GDF, this description provides the most complete picture of the possible inventory for disposal at this point in time. If, however, the list of waste and materials were to change significantly it would need to be discussed with the potential host community for a GDF. A process for agreeing any future material changes to the categories of waste to be disposed of in a GDF would need to be agreed before the community took a decision on whether or not it wishes to host a GDF.

8.65 Until actual site investigations take place, there is no guarantee that a community willing to host a GDF would have a large enough volume of suitable rock to take the entire inventory for disposal, or that the developer would be able to make a safety case for the entire inventory. Whilst we are currently proceeding on the assumption that only one GDF will be necessary (subject to the safety case meeting the requirements of the independent regulators), if either of the above scenarios came to pass, one community might host a GDF to dispose of part of the inventory only, and an alternative site could be identified and developed elsewhere to dispose of the remainder. The UK Government favours an approach where one GDF will provide the capacity needed for the disposal of the inventory described in paragraph 8.63 above.

8.66 The volumes of this radioactive waste and materials are regularly assessed, revised and made publicly available as part of the UK Radioactive Waste Inventory (UKRWI).⁵² The volumes of waste are subject to change due to a number of factors, including improvements to the estimates of waste that will arise from planned operations and decommissioning programmes.

Funding for the GDF programme

8.67 A GDF will be a major infrastructure project and a significant long-term investment for the UK. The precise costs of developing a GDF will depend on a number of factors, including the type of rock in which the facility is constructed and exactly how long it

⁵² UK Radioactive Waste Inventory (NDA) (2022). Available at: <https://ukinventory.nda.gov.uk/>

operates before being closed. The costs of the development and operation of a GDF will be met by the waste owners.

- 8.68 In the case of waste from existing public sector civil nuclear sites, these are public liabilities owned by the NDA, and so the costs in connection with these are met by the UK Government. The same applies to waste owned by the Ministry of Defence. Any private companies (in both the nuclear and non-nuclear sectors) that produce radioactive waste for disposal in a GDF need to meet their full share of waste management and disposal costs. This includes operators of any new nuclear power projects.
- 8.69 Certain spent fuel and radioactive waste liabilities arising from the eight stations originally owned by British Energy Group Plc, and currently managed by EDF Energy, will be covered by the Nuclear Liabilities Fund (NLF), a segregated fund which exists to meet the costs of decommissioning these stations. This includes some liabilities in respect of material that may in future be classified as waste to be disposed of in a GDF.
- 8.70 Operators of new nuclear power stations are required by law to have a Funded Decommissioning Programme (FDP) approved by the Secretary of State before nuclear-related construction can begin. Alongside the approval of an operator's FDP, the UK Government will expect to enter into a contract with the operator regarding the terms on which the UK Government will take title to and liability for the operator's spent fuel and intermediate level waste. In particular, this agreement will need to set out how the price that will be charged for this waste transfer will be determined. The waste transfer price will be set at a level consistent with the UK Government's policy that operators of new nuclear power stations should meet their full share of waste management costs.

Identifying a site for a GDF

- 8.71 A process is underway to identify a suitable location for a GDF with a willing community in England and Wales. Nuclear Waste Services (NWS) is responsible for implementing geological disposal. The process for identifying a suitable location for a GDF in England is set out in Appendix 1 and the process for Wales is set out in Appendix 2. They are very similar community consent-based processes and require NWS to work in partnership with local authorities and other members of the community. They set out how:
- investment is provided to communities that participate in the process;
 - communities can withdraw from the process;
 - a positive Test of Public Support must be undertaken by the Potential Host Community before the construction and operation of a GDF can take place.

Ongoing research and development

- 8.72 In recommending geological disposal as the best available approach for the long-term management of the UK's most hazardous radioactive waste, CoRWM also recommended a commitment to a programme of research and development, and that developments in alternative management options should be actively pursued. Other long-term management options could emerge as practical alternatives to geological disposal for some waste in future. The NDA and NWS continue to review appropriate solutions including learning from and engaging with overseas programmes, which could have the potential to improve the long-term management of some of the UK's radioactive waste. Through this work the NDA has identified that it would be feasible to dispose of some less hazardous ILW in near surface facilities. Near surface disposal for ILW is discussed in paragraphs 8.87 to 8.103 .
- 8.73 Other alternatives remain under consideration by the NDA and NWS and may also become viable for parts of the inventory in the future. The NDA (directly or with the supply chain) may propose alternative disposal technologies for parts of the inventory should they be shown to be viable. Any proposals would be subject to public consultation and regulatory approvals before a decision is made on their use.
- 8.74 At the moment no credible alternatives have emerged that would accommodate all of the categories of waste in the inventory for disposal and it is clear that a GDF will remain necessary for some types of radioactive waste

Retrievability

- 8.75 The UK and Welsh Governments and regulators agree that the purpose of a GDF is ultimately to dispose of waste, not to store it.
- 8.76 During the operational stage of a GDF (when waste is being accepted), waste that has been placed into a GDF could be retrieved if there was a compelling reason to do so. Current NWS forecasts show that a GDF could be open for construction and waste emplacement for over one hundred years, to accommodate the current volume of legacy waste and waste from the new nuclear programme. Retrieving emplaced waste would tend to become more difficult with time, particularly after the end of the operational stage (that is, once a GDF has been closed permanently).
- 8.77 Permanently closing a GDF at the earliest possible opportunity once operations have ceased provides for greater safety, greater security, and minimises the burden on future generations.

Geological disposal and the planning regime in England

- 8.78 In England, GDFs, and the deep investigatory boreholes necessary to assess the suitability of potential sites for a GDF, fall within the definition of 'Nationally Significant Infrastructure Projects' (NSIPs) in the Planning Act 2008. This means that in England

planning applications for the deep investigatory boreholes (deeper than 150m) and the GDF will be made directly to the Secretary of State. The application will then be examined by the Planning Inspectorate, which will make a recommendation to the Secretary of State, before the Secretary of State makes a final decision.

- 8.79 Under the Working with Communities policy (set out in Appendix 1) NWS cannot apply for development consent for a GDF unless the community within the geographical area where it is proposed has indicated through a Test of Public Support that it is willing to host a GDF. The Test of Public Support is entirely separate to the development consent process. It does not prevent any member of the Community Partnership – and the potential host community – from making representations to the Planning Inspectorate while it is examining any application for development consent for geological disposal infrastructure. The siting process for a GDF, including the role of the Community Partnerships, can be found in Appendices 1 for England and 2 for Wales.

Geological disposal and the planning regime in Wales

- 8.80 Any GDF in Wales would be subject to the planning system in Wales. The planning arrangements in Wales differ to those in England, and further consideration will need to be given to the planning issues affecting the potential siting of a GDF in Wales.
- 8.81 The general planning policy framework in Wales is provided by *Future Wales*⁵³, *Planning Policy Wales*⁵⁴ and various *Technical Advice Notes*⁵⁵ and *Minerals Planning Guidance Notes*⁵⁶. Together they set the context for the preparation of Development Plans and for decision-making in relation to all types of development proposals.
- 8.82 The Planning (Wales) Act 2015 introduced a modernised framework for the delivery of planning services in Wales. This includes a new category of development for the largest and most technically complex devolved planning applications for which Welsh Ministers would assume responsibility. The new category of development for the largest infrastructure planning applications in Wales is called ‘developments of national significance’ (DNS).
- 8.83 The DNS regime is expected to be incorporated into a modern and simplified regime for the consenting of significant infrastructure projects in Wales, both on the land and in the sea. The intention is that a GDF where the part of the facility for disposal of radioactive waste is expected to be constructed at a depth of at least 200 metres beneath the ground will require an Infrastructure Consent issued by Welsh Ministers (subject to legislative change).

⁵³ Future Wales: the national plan 2040. Available at: <https://www.gov.wales/future-wales-national-plan-2040>

⁵⁴ Welsh Government. Planning Policy Wales. Available at: <https://gov.wales/planning-policy-wales>

⁵⁵ Technical Advice Notes. Available at: <https://gov.wales/technical-advice-notes>

⁵⁶ Planning policy and guidance: minerals and mining. Available at: <https://gov.wales/planning-policy-and-guidance-minerals-and-mining>

- 8.84 As is the case in England, the Welsh Government is clear that geological disposal can only proceed in Wales on the basis of the consent of a willing Potential Host Community via a Test of Public Support. The discussions may last for 15 to 20 years and a planning application for a GDF would be made only after a positive Test of Public Support. Applications for planning approval for exploratory boreholes would be made during the discussion period and would, as part of the planning process, be subject to public consultation, as is the case in England.
- 8.85 Planning policy on the application of the planning regime to geological disposal in Wales does not separately exist in Wales but the case for further policy is being kept under review.

Additional disposal facilities for intermediate level waste

- 8.86 ILW can range from radioactive waste that is very similar in nature and properties to LLW to very hazardous radioactive waste. In accordance with our policy set out in paragraph 8.89, less hazardous ILW may be disposed of in near surface facilities where it is safe to do so.
- 8.87 The waste streams potentially suitable for near surface disposal include cementitious material, graphite, stainless steel and other ferrous metals (such as mild steel). This is not an exhaustive list. The environmental safety case in respect of a site will specify the waste acceptance criteria for a particular disposal facility and will be used to determine the quantities and types of waste that can be disposed of in it.

Scottish Government's policy on ILW

- 8.88 The Scottish Government's policy for long-term management of ILW is set out in *Scotland's Higher Activity Radioactive Waste Policy 2011*.⁵⁷ As part of the programme of actions set out in the Scottish Government's Higher Activity Waste (HAW) Strategy, work is being undertaken to evaluate Scotland's radioactive waste inventory. This work will identify which waste may or may not be suitable for disposal using emerging near-surface disposal technologies, as well as developing disposal concepts for waste arising in Scotland that is identified as suitable for near surface disposal.

The policy of the UK Government and devolved administrations of Wales and Northern Ireland on ILW

- 8.89 The policy of the UK Government and devolved administrations of Wales and Northern Ireland is that less hazardous ILW may be disposed of in a near surface facility where it is safe to do so. More hazardous ILW will need the isolation and containment afforded by a GDF. Under this policy, potential locations for near surface disposal facilities for less hazardous ILW will be considered in England and Wales only.

⁵⁷ Scottish Government. Radioactive Waste Policy. Available at: <https://www.gov.scot/policies/nuclear-energy/radioactive-waste/>

- 8.90 Disposing of less hazardous ILW in near surface disposal facilities that meet all relevant safety and environmental protection criteria can be a more cost-effective solution for some waste than a GDF. It can also be a more sustainable and equitable solution by potentially speeding up decommissioning of some sites and freeing up the land earlier for other uses. Near surface disposal has the potential to reduce the burden on future generations of managing some of the waste by reducing the need for prolonged storage, storage facility construction and maintenance, and possible waste repackaging.

Facility design for near surface disposal facilities for ILW

- 8.91 Currently our existing near surface disposal facilities are used solely for the disposal of LLW. A near surface disposal facility for ILW is a facility that can be located at or below the surface (up to 200 metres, the minimum depth of a GDF), and may make use of existing structures. It differs from a GDF in the degree of isolation provided by the facility, including host geology, depth and design.
- 8.92 A near surface disposal facility for ILW below the surface could be constructed as silos, vaults or caverns and could be accessed by a tunnel or shaft. They would likely consist of multiple barriers including waste packages, grout, walls, backfill material and reinforced caps over the closed silos, vaults or caverns.
- 8.93 A disposal facility at the surface for ILW could be conceptually very similar to the LLWR in Cumberland or the Low Level Waste Disposal Facility (LLWDF) at Dounreay in Caithness. Waste packages would be stacked in engineered concrete vaults up to the approximate level of the surface. When the vaults are closed, they would be covered with an engineered cap to prevent rainwater entering and reduce the risk from inadvertent human intrusion. The barriers provided by the packaging of the waste, the concrete vaults and the engineered cap prevent any harmful amounts of radioactivity escaping. (See Figure 8 for an illustration of the at surface vault concept).

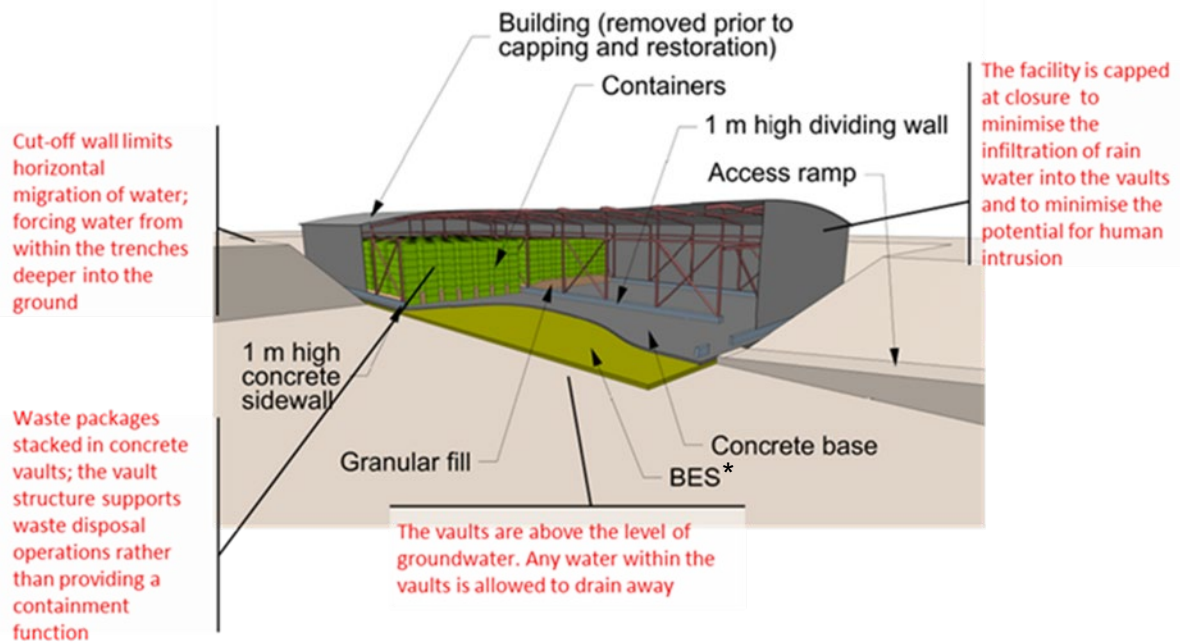


Figure 8. Artist's impression of the at surface concept for a near surface disposal facility for ILW (Source: NDA). BES = bentonite enhanced sand

- 8.94 The design, engineering and depth of a facility in England or Wales would be dependent upon the local site conditions and would be determined by the needs of the environmental safety case for the specific waste destined for disposal.

Identifying a site for a near surface disposal facility for ILW in England and Wales

- 8.95 The siting process for a near surface disposal facility suitable for ILW in England and Wales is different to the siting process for a GDF. The siting process for a GDF recognises that identifying a suitable site could take many years of geological investigations. In addition, the investigations necessary to identify suitable sites for near surface disposal are also less complex and time consuming.
- 8.96 The NDA's consideration of potential sites for near surface disposal will be limited to England and Wales. We anticipate they will primarily consider their own land, but this should not preclude from consideration other suitable locations outside their estate. The NDA will develop robust siting criteria based on technical, safety and suitability assessments, in line with the NDA's value framework, with support from regulators and key advisory bodies. The UK Government and devolved administrations of Wales and Northern Ireland expect the NDA to develop at least one near surface disposal facility for ILW in England or Wales, subject to a robust business case, authorisation from the relevant regulators, and planning permission from the relevant planning authority. The design of the facility would be dependent upon the location of the site and the level of hazard posed by the radioactive waste intended for disposal. The policy does not preclude the supply chain from participating in the development of near surface disposal facilities.

- 8.97 The NDA will be transparent in its approach for evaluating potential sites in line with its existing transparency and openness policy. In areas the NDA considers might be suitable for a near surface disposal facility, the NDA will engage with the local community on the proposals. More information on how the NDA engages with stakeholders, including communities, will be published in due course.
- 8.98 The NDA will also provide a community benefits package to the people that live in the local area of its chosen site or sites, as it does for all of its currently operational near surface disposal facilities, in recognition of the service that the community is providing for the rest of the UK. The NDA will determine the monetary value of the package and will work with the community to decide how it is to be administered and distributed in line with its socio-economic policies for supporting communities around NDA sites.
- 8.99 The NDA should also explore with relevant stakeholders, including regulators, local authorities and the local community the potential for optimising the existing near surface facility in Cumberland, the LLWR, to take less hazardous ILW.

Retrievability in England and Wales

- 8.100 The UK and Welsh Governments and regulators agree that the purpose of a near surface disposal facility is to dispose of waste, not to store it. There are no plans to design a near surface disposal facility with retrievability in mind.
- 8.101 Permanently closing a near surface disposal facility at the earliest possible opportunity once operations have ceased provides for greater safety, greater security, and minimises the burden on future generations.

Near surface disposal and the planning regime in England and Wales

- 8.102 Near surface disposal facilities are subject to the usual local planning requirements under the Town and Country Planning Act 1990. In addition to its obligations under the Town and Country Planning Act, before submitting a planning application for a near surface disposal facility, the NDA should engage with representatives from local communities and local authorities in that area. The NDA is encouraged to implement a Planning Performance Agreement with the local planning authority.

Disposal facilities for low level waste

- 8.103 There is a large variation in types of LLW, some of which poses little risk to health or the environment. Some VLLW is suitable for disposal in landfill sites. Other VLLW and LLW is disposed of at permitted disposal sites. These are provided by commercial operators. However, there is also an on-site disposal facility at Sellafield, permitted to accept VLLW and some lower activity LLW from the Sellafield site.
- 8.104 The UK Government's and devolved administrations' preference is that commercial operators, alongside the NDA's own permitted landfill sites, continue to provide

sufficient capacity for disposal of both low and high volumes of VLLW and low activity LLW that is likely to arise over coming decades. We will continue to work to ensure the regulatory framework supports the market approach.

8.105 LLW that requires the protection offered by an engineered near surface facility should be disposed of at facilities such as the LLWR in Cumberland and at the LLWDF at Dounreay in Caithness. The LLWR is a national facility owned by the NDA. It accepts waste from both the nuclear and non-nuclear industries in the UK and LLW from the Ministry of Defence. The LLWDF in Scotland accepts LLW for disposal from the decommissioning of the Dounreay site and the neighbouring Ministry of Defence Vulcan Naval Reactor Test Establishment.

On site disposal

8.106 During the final stages of decommissioning and clean-up of nuclear facilities, radiological hazards and risks to the environment and people's health are low. As buildings are demolished, very large amounts of rubble are generated. A small percentage of this material may be contaminated with radioactivity and would therefore be classified as LLW or high volume VLLW. In addition, there may be contaminated substructures, pipelines and soils on the sites.

8.107 Excavating this waste, packaging it and transporting it for disposal in approved facilities offsite can result in negative impacts, such as increasing the risks to workers' health and safety during excavation, increased HGV traffic and associated noise, dust, pollution and carbon dioxide emissions. In some cases, it may be safer and more sustainable to dispose of and monitor contaminated waste on site, rather than to excavate it and transport it for disposal elsewhere. There are three ways in which this can be done:

a) building engineered facilities on site (for waste that requires this level of protection);

b) minimising the generation of radioactive waste by disposing of sub-surface structures or pipelines in situ (known as in-situ disposal);

c) using lightly contaminated wastes in site restoration projects to reduce the use of building aggregates from elsewhere such as using lightly contaminated rubble to fill voids, to construct road foundations or screens, or for necessary landscaping on site (this is known as disposal for a purpose).

8.108 Existing environmental legislation, EPR16 (England and Wales) and EASR18 (Scotland) allows site operators to apply for a permit for any of these waste management options. Since existing procedures for option a) are well established, the remainder of this section focusses on options b) and c) above, which we refer to as "on-site disposal"

- 8.109 The environment agencies in England, Scotland and Wales have set out their requirements for the management of radioactive waste from decommissioning of nuclear sites, to enable decommissioning, clean-up and eventual release from radioactive substances regulation, which include options for on-site disposal.⁵⁸ Site operators should engage widely with local authorities, local communities and others in the development of their plans for decommissioning, clean-up and waste management. The relevant environment agency will only authorise the disposal of radioactive waste on a site when it is satisfied that disposal is part of a waste management plan that is optimised, so that it strikes the best overall balance between the safety of the public, workers and the environment, and other factors such as costs, potential future uses of the site, or the social impacts of transport of waste and materials. It also requires that the final condition of the site, and the work to be done to reach that condition, are safe for people and the environment. If waste is used for disposal for a purpose, then the site operator should also demonstrate that the waste has a suitable physical and chemical specification and replaces material that would otherwise be needed for that purpose. If a permit is granted, it will remain in place until the relevant environment agency is content that the site can be released for unrestricted use.
- 8.110 In addition to an environmental permit, on-site disposal will require planning permission in all cases where there is a change to the land use or if the waste is used as part of a disposal for a purpose.
- 8.111 On-site disposal has the potential to further reduce risks associated with excavation as well as reducing environmental impacts such as HGV traffic, dust, noise, pollution and carbon dioxide emissions.

How radioactive waste disposal facilities are regulated

- 8.112 Radioactive waste disposal facilities are regulated by the relevant environment agency using the graded approach, which is proportionate to the nature and quantity of radioactivity involved. This means that radioactive waste disposal facilities will need to be authorised. This usually means a permit is required unless the type of facility is specifically excluded from radioactive substances regulation. A permit will contain limitations and conditions on the radioactive waste that the facility can receive and manage in order to protect people's health and the environment.
- 8.113 Once a permit has been granted, the relevant environment agency will carry out inspections to ensure that operators are complying with the limits and conditions applied to them. If the operator is not complying, the environment agencies can take

⁵⁸ SEPA. Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation. Available at: <https://www.sepa.org.uk/media/365893/2018-07-17-grr-publication-v1-0.pdf>

enforcement action to make the operator comply. If necessary, fines and in some cases, prison sentences, can be applied to the operator for non-compliance.

- 8.114 When an operator ceases the disposal activity that has been permitted, and has closed the site, they can apply to surrender their permit. The relevant environment agency will only grant an application for surrender if they are content that the site has been returned to a satisfactory state.
- 8.115 The environment agencies publish guidance for the developers or operators of near-surface facilities and a GDF,^{59, 60} which is reviewed and updated periodically.⁶¹ The guidance documents explain the requirements a developer is expected to fulfil when they apply for an authorisation to develop a disposal facility in order to demonstrate that their facility will protect people and the environment. They need to show that their approach to developing a facility - including its design, construction, operation and closure - will meet a series of principles and requirements and they need to set this out in an environmental safety case. The environmental safety case must show that the facility will meet strict radiological protection criteria to protect people from harm during the operation of the facility and once it is closed. The radiological protection standards criteria are described in Appendix 3.
- 8.116 The complexity of the environmental safety case will depend on the hazard posed by the waste for which the disposal facility has been designed to receive. A simple environmental safety case may be adequate for a facility accepting waste with only very low concentrations of radioactivity, whereas a more complex environmental safety case may be needed for a facility accepting waste with higher concentrations of radioactivity or more toxic radionuclides. The environmental safety case will also specify detailed waste acceptance criteria for the disposal facility, that define and constrain the types, characteristics and quantities of waste that can be disposed of there.
- 8.117 In the future, certain disposal facilities may require a licence and would then also be regulated by ONR, in addition to the relevant environment agency. Whether a disposal facility comes under the nuclear licensing regime will depend on the type and quantity of the waste and the hazard and associated risk it presents during operations. The UK Government intends to bring forward legislation to ensure that a GDF will be a licensed facility during its construction and operation. We have provided more information on how a GDF will be regulated in Appendix 1.

⁵⁹ EA, SEPA & NIEA (2009) Near-Surface Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation. Available at: <https://www.gov.uk/government/publications/near-surface-disposal-facilities-on-land-for-solid-radioactive-wastes>

⁶⁰ EA & NIEA (2009) Geological Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation. Available at: <https://www.gov.uk/government/publications/geological-disposal-facilities-on-land-for-solid-radioactive-wastes>

⁶¹ The regulatory guidance for near surface disposal facilities and geological disposal facilities in England and Wales is being revised and the intention is to prepare one revised Guidance on Requirements for Authorisation for the land-based disposal of solid radioactive waste.

- 8.118 The UK Government and devolved administrations are also considering the circumstances in which near surface facilities should require a nuclear site licence from ONR to operate. Although radioactive waste that is suitable for disposal in near surface facilities requires less isolation and containment as it presents a low long-term risk to people and the environment, it may still present sufficient hazard and associated risk during handling operations to warrant regulation under a licence. However, this will only become clear when the inventory for disposal is defined in its environmental safety case and waste acceptance criteria.
- 8.119 Disposal facilities for LLW and VLLW do not require a licence from ONR to operate because they are lower hazard, lower risk operations. However, they will normally need a permit from the relevant environment agency that will apply limits and conditions. The LLWDF at Dounreay is not a licensed site but is operated under a permit granted by SEPA. The LLWR in Cumberland is a nuclear licensed site because of the legacy waste that was stored at the site and not because of its disposal activities.
- 8.120 In considering where to site a disposal facility, developers should take account of geographical and geological features, including the hydrogeology, of a proposed site. They should take due account of the potential future effects of climate change, for example from rising sea levels. The developer must demonstrate that the facility is sited, designed, constructed, operated and eventually closed, in a manner that provides an appropriate level of long-term protection to people and the environment.
- 8.121 Developers and operators of disposal facilities will also require planning permission from the relevant planning authority. Developers should engage early with planning authorities to ensure that their proposals can satisfy relevant planning requirements.

Use of NDA facilities by the nuclear and non-nuclear industry

- 8.122 The NDA should make its treatment, storage and disposal facilities available to other waste producers on commercially agreed terms. It is the UK Government's and devolved administrations' policy that disposal routes should be available for the long-term management of solid radioactive waste from the nuclear and non-nuclear industries and defence activities. The NDA should make the LLWR, a GDF and any other near surface disposal facilities it develops in England or Wales available to other waste producers on commercially agreed terms.
- 8.123 The UK Government and devolved administrations expect the NDA to ensure the optimal use of the LLWR. It should continue to assess whether a replacement for the LLWR might be required and plan accordingly. In considering the use of the LLWR and any replacement which the NDA might propose, either as a national, regional or local facility, the NDA should take into account the potential need for use of these facilities by other nuclear and non-nuclear industry waste producers. The NDA should also

continue to assess whether there is likely to be sufficient landfill capacity available for the VLLW and the low activity LLW that will arise during its decommissioning and clean-up programme taking account of the wider volumes and characteristics of radioactive wastes that might be generated from other industries (e.g. offshore oil and gas decommissioning).

9

Nuclear decommissioning

- 9.1 This policy statement replaces the statement of the UK Government and devolved administrations' policy on the decommissioning of the UK nuclear industry's facilities.⁶²
- 9.2 Some aspects of the policy for the decommissioning of nuclear facilities in the UK are reserved. However, the policy on the management of the radioactive waste arising from nuclear decommissioning and clean-up activities is devolved. In addition, under the Energy Act 2004, Scottish Ministers are consulted on matters relating to the nuclear sites in Scotland which are the responsibility of the NDA and, in parallel with the UK Government, approve the NDA's strategies and business plans in relation to Scotland. Consequently, this is a joint policy statement of the UK Government and the devolved administrations of Scotland and Wales. Northern Ireland does not have any nuclear facilities and the policy does not extend to Northern Ireland.
- 9.3 Policy on nuclear decommissioning is based on the same basic principles that apply more generally to environmental policy:
- sustainable development;
 - decisions being based on the best possible scientific information and analysis of risks;
 - the precautionary principle;
 - the polluter pays principle;
 - application of the waste hierarchy.
- 9.4 We also consider that the wider socio-economic benefits of decommissioning and clean-up should be maximised.
- 9.5 The policy takes into account the increasing focus and emphasis in the UK on sustainable approaches and solutions to the decommissioning and clean-up of our nuclear facilities. A significant contribution to sustainability is to remediate, clean-up, decommission, and manage the waste as soon as practicable considering all the relevant factors such as the availability of resources (people, supply chain, funding, waste management infrastructure). The UK Government and devolved administrations of Scotland and Wales expect that environmental impacts of decommissioning and

⁶² UK Government Statement (2004). Available at: <https://www.gov.uk/government/publications/the-decommissioning-of-the-uk-nuclear-industrys-facilities>

clean up should be minimised through, for example, reduction of greenhouse gas emissions and application of the waste hierarchy.

- 9.6 Innovative approaches to decommissioning and clean-up should also be pursued. This means drawing on learning from the nuclear sector, non-nuclear industries (including the oil and gas sector, for example), the underpinning research activities at national laboratories and universities, and the international arena.

Scope of the policy

- 9.7 The policy covers all (existing and future) UK nuclear facilities and their sites. In the UK, a nuclear site is one that is licensed under the Nuclear Installations Act 1965. There are a variety of facilities on civil nuclear sites in the UK, including power stations, other reactors, research facilities, fuel fabrication and reprocessing plants, treatment and storage facilities and laboratories. The policy includes, where relevant, Defence Nuclear Programme Sites and facilities. The policy also applies to delicensed former nuclear sites which are in the final stages of decommissioning and clean-up works. The policy is also relevant to the Small Modular Reactors and Advanced Modular Reactors programmes, and the new nuclear build programme in England and Wales. It should be noted that Scottish Government policy remains opposed to the building of new nuclear power plants under current technologies.⁶³
- 9.8 This policy also covers the JET facility used for fusion research. The decommissioning of a fusion facility has not yet been undertaken in the UK. The UK Government consulted on the regulation of fusion in England, including implications for fusion decommissioning and radioactive waste management. It has concluded that no major changes are required to existing policies and legislation that cover decommissioning of fusion facilities but intends to keep decommissioning of fusion facilities under review as the technology develops.⁶⁴ The decommissioning of JET is expected to inform future fusion decommissioning in the UK.
- 9.9 Any new facility covered by this policy should be designed, built and operated with decommissioning in mind, so as to minimise the complexity of subsequent decommissioning and associated waste management operations and costs across the full lifecycle of the facility. This approach will ensure the minimisation of radioactive waste generated over the lifecycle of the facility. In particular, it would avoid the

⁶³ Scottish Government (2023). Draft Energy Strategy and Just Transition Plan. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/01/draft-energy-strategy-transition-plan/documents/draft-energy-strategy-transition-plan/draft-energy-strategy-transition-plan/govscot%3Adocument/draft-energy-strategy-transition-plan.pdf>

⁶⁴ Towards fusion energy: The UK Government's response to the consultation on its proposals for a regulatory framework for fusion energy (June 2022). Available at: <https://www.gov.uk/government/consultations/towards-fusion-energy-proposals-for-a-regulatory-framework>

creation of unplanned or unresolved decommissioning challenges and problematic wastes from decommissioning that require resolution by future generations.

Aim of the policy

- 9.10 The key aim of the policy is to provide a high-level framework within which operators, the NDA and the Ministry of Defence can take decisions that would drive better, earlier, and more cost-effective solutions to decommissioning and clean-up of the UK's nuclear facilities. These decisions and solutions should take an integrated lifecycle approach to asset management, decommissioning and waste management whilst ensuring high standards of safety, security, and environmental protection. Decisions should reflect the changing nature of the hazards that exist throughout the lifetime of a nuclear facility and be proportionate to the level of risk associated with these hazards to people and the environment. The decisions and solutions should also demonstrate value for money to taxpayers and energy consumers. In particular, the UK Government and devolved administrations of Scotland and Wales expect the nuclear sector to continue to seek further opportunities to optimise, accelerate, and reduce the lifetime cost of the decommissioning and clean-up programmes for the nuclear legacy and the operating nuclear power stations.
- 9.11 The policy takes account of the requirements for the management of radioactive substances including radioactive waste, spent fuel and nuclear materials that are set out in chapters 7, 8 and 11 of this document.
- 9.12 The policy also provides the framework for facilitating our ambition for the UK to continue to be a world leader and influencer in the field of nuclear decommissioning and clean-up through promoting good practice and sharing expertise and experience.

Overview of nuclear decommissioning objectives and activities

- 9.13 Nuclear decommissioning in the UK is undertaken in accordance with international standards. In particular, IAEA Safety Standards for protecting people and the environment - *Decommissioning of Facilities: General Safety Requirements Part 6* (No. GSR Part 6).⁶⁵ Additionally, the UK is a Contracting Party to the Convention on Nuclear Safety⁶⁶ and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.⁶⁷ Consequently, the UK Government and devolved administrations' decommissioning policy complies with the

⁶⁵ IAEA (2014). IAEA Safety Standards: Decommissioning of Facilities. Available at: <https://www.iaea.org/publications/10676/decommissioning-of-facilities>

⁶⁶ IAEA. Convention on Nuclear Safety. Available at: <https://www.iaea.org/topics/nuclear-safety-conventions/convention-nuclear-safety>

⁶⁷ IAEA. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Available at: <https://www.iaea.org/topics/nuclear-safety-conventions/joint-convention-safety-spent-fuel-management-and-safety-radioactive-waste>

Conventions. The UK Government and devolved administrations will continue to comply with these specific requirements and meet internationally agreed standards.

Definitions

- 9.14 The decommissioning of a nuclear facility refers to all the technical and administrative actions that are required to allow the release of an installation from regulatory control. For the purposes of this policy statement, **‘facilities’** means buildings and their associated land and equipment in which radioactive substances are produced, processed, used, handled or stored where the hazard and risk posed by the facility requires the consideration of protection and safety of workers, people and the environment. **‘Land’** includes the surface, subsurface soil, and any surface or subsurface water or aquifers potentially affected by radioactive substances and non-radioactive material such as asbestos.

For the purposes of the Energy Act 2004,⁶⁸ the meaning of **‘cleaning-up’** and **‘decommissioning’** in relation to a nuclear site or installation includes activities such as:

“The treatment, storage, transportation, and disposal of hazardous material and of other matter and substances that need to be dealt with or removed in or towards making the site or installation suitable to be used for other purposes; and

The construction of buildings and other structures to be used in connection with the cleaning-up or decommissioning of the site or installation.”

- 9.15 Nuclear decommissioning in England, Scotland and Wales is carried out using a risk-informed approach to progressively and systematically reduce the radiological and non-radiological hazards a facility poses, giving due regard to security considerations, the safety of workers and the general public, and protecting the environment.

Approaches to nuclear decommissioning

- 9.16 The IAEA General Safety Requirements⁶⁹ recognises two possible approaches to decommissioning— immediate dismantling where there is no delay after cessation of operations, or deferred dismantling with varying periods of deferral that are in principle applicable for all facilities.
- 9.17 The UK Government recognises that, in practice, the two general decommissioning approaches are not mutually exclusive when considered across a number of facilities or sites. For example, an integrated rolling decommissioning approach, where a mixture of immediate dismantling and deferral periods are employed across sites may be optimal.

⁶⁸ See section 37(1) of the Energy Act 2004, Available at: <https://www.legislation.gov.uk/ukpga/2004/20/section/37>

⁶⁹ IAEA (2014). Available at: <https://www.iaea.org/publications/10676/decommissioning-of-facilities>

- 9.18 The operator also needs to consider the pace – how fast or how slowly – that the work could progress.
- 9.19 The NDA’s rolling decommissioning programme is a mix of site-specific strategies for the NRS reactor fleet which involve deferred dismantling with varying deferral periods, and immediate dismantling. The pace of decommissioning is also optimised for each site.
- 9.20 The NDA have produced a Code of Practice for the selection of the timing and pace of dismantling, which its sites are required to reference.⁷⁰ The UK Government also considers this a useful resource for other nuclear site operators undertaking decommissioning activities.

Immediate dismantling means decommissioning activities take place immediately after permanent shutdown. The equipment, structures, systems and components of a facility containing radioactive material are removed and/or decontaminated to a level that allows the facility to be released from regulatory control for unrestricted use or released with restrictions on its future use.

Deferred dismantling involves placing the facility into a condition suitable such that the final dismantling can be deferred or delayed. This generally means an initial preparation phase, then a deferral period (often known as ‘care and maintenance,’ ‘quiescence’ or ‘safe storage’). The approach is intended to realise specific benefits such as radioactive decay which can reduce worker dose and radioactivity, and the volume of radioactive waste produced when decommissioning resumes. After removal of the nuclear fuel from the facility (for nuclear installations), all or parts of a facility containing radioactive material is either processed or placed in such a condition that it can be kept in a safe and stable condition for varying time periods. The facility is maintained in this state until decommissioning resumes and it is subsequently decontaminated and/or dismantled. Deferred dismantling may involve early dismantling of some parts of the facility and early processing of some of the radioactive material and its removal from the facility, as part of the preparatory steps for the subsequent safe storage of the remaining parts of the facility.

- 9.21 Entombment, whereby all or part of the facility is encased in a structurally long-lived material, is not recognised in the UK as a planned approach to decommissioning. In line with IAEA guidance,⁷¹ the UK recognises that entombment is appropriate only

⁷⁰ NDA (2023) Determining the timing and pace of decommissioning – code of practice. Available at: <https://www.gov.uk/government/publications/determining-the-timing-and-pace-of-decommissioning/determining-the-timing-and-pace-of-decommissioning-code-of-practice>

⁷¹ IAEA, Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities. Available at: <https://www.iaea.org/publications/12210/decommissioning-of-nuclear-power-plants-research-reactors-and-other-nuclear-fuel-cycle-facilities>

under exceptional circumstances, for example, following a severe accident. It is not the same as on-site disposal, including in-situ disposal or disposal for a purpose.

Decommissioning activities

- 9.22 Decommissioning is the last process in the lifecycle of a nuclear facility. It is a staged process through which the facility is taken out of service after normal operations have ceased. It may include the full or partial dismantling of buildings and their contents, the decontamination of buildings which are not to be dismantled and the remedial treatment of the land under and around the facility.
- 9.23 Decommissioning should be progressed as soon as reasonably practicable. The UK Government and devolved administrations of Scotland and Wales recognise that different strategies to achieve this objective are available to operators and that decommissioning may involve two or more separate stages spanning a number of decades. Provided safety and security can be demonstrably maintained, a case might be made by the operator, through an evidence-based assessment, that deferral of decommissioning of individual facilities or whole sites represents the highest value option after taking many factors into account. Factors may include:
- taking advantage of new or developing technologies;
 - further development of existing good practice;
 - taking benefit from radioactive decay;
 - adopting a learn and lead approach;
 - realising an opportunity to re-use a facility.
- 9.24 Other factors that may influence the timing of decommissioning include:
- access restrictions;
 - availability of waste management infrastructure;
 - limited resource including supply chain capacity;
 - changing hazard and risk profiles associated with aging facilities;
 - long-term asset management and maintenance cost where decommissioning is deferred (“hotel costs”);
 - availability of expertise and knowledge relevant to the facility in question;
 - quantities and characteristics of waste expected to be produced.
- 9.25 Operators need to justify the approach to decommissioning they have selected for their site or group of sites to the regulators. They also should periodically review this approach, including any underpinning assumptions.

- 9.26 A lifecycle approach should be taken to the decommissioning and clean-up of nuclear facilities, sites and groups of sites. We consider this to be key to good decision-making, optioneering, and prioritisation.
- 9.27 A different culture, mindset, and set of skills are required for decommissioning and clean-up activities compared to that required for an operating facility. This change in culture should be considered during the operational phase before the early stages of decommissioning and planning.
- 9.28 The long timescales of decommissioning and clean-up activities and the fact that disposal routes for all types of waste are not yet available inevitably leads to some uncertainty. This will need to be managed effectively by operators and nuclear liability owners. Operators are expected to record assumptions made during their choice of decommissioning strategy, which can be kept under review.

Decommissioning strategies and plans

- 9.29 Each operator should produce and maintain a decommissioning strategy and plans for their sites. The UK Government and devolved administrations of Scotland and Wales expect that those strategies and plans will take into account the views of stakeholders, including relevant local authorities, public and stakeholder groups. The decommissioning strategies and plans will also need to take into account the developments in policies on the management of radioactive substances which are set out in chapters 6, 7, 8 and 11 of this document.

Decommissioning strategies

- 9.30 A decommissioning strategy may apply to more than one facility on a site, a number of similar facilities on different sites, a site as a whole, or several sites. The strategy should assess and present factors affecting decommissioning in a transparent way, underpinned by objective information and arguments. Strategies inform the development of comprehensive decommissioning plans for each site covered by the strategy. The UK Government and devolved administrations of Scotland and Wales also expect that operators will typically begin to refine strategies and plans, in consultation with regulators and stakeholders before they plan to close the facilities. A strategy should take into account a number of factors such as those in the NDA Value Framework and NDA decommissioning Code of Practice.⁷² ⁷³ Factors to be considered in a strategy include:

- maintaining the standards of worker, public, and environmental safety;

⁷² NDA (2016). The NDA Value Framework (version 1.2) January 2016. Available at: <https://www.gov.uk/government/publications/nda-value-framework-how-we-make-decisions>

⁷³ NDA (2023) Determining the timing and pace of decommissioning – code of practice. Available at: <https://www.gov.uk/government/publications/determining-the-timing-and-pace-of-decommissioning/determining-the-timing-and-pace-of-decommissioning-code-of-practice>

- maintaining site security;
- maintaining adequate site stewardship;
- maintaining sufficient subject matter experts, knowledge base and skills necessary for decommissioning activities and the management of associated waste, taking into account the long timescales for decommissioning and clean-up programmes. This should include the retention, recruitment and training of staff and the preservation of the documentation necessary to fully underpin the activities. Actions to acquire new skills or develop existing ones should be carried out as necessary. Operators and public and private nuclear liability owners may also wish to bring forward decommissioning activities in order to utilise existing skills or knowledge;
- maintaining accurate records, taking account of the long timescales for nuclear decommissioning and clean-up programmes. These records should be retained and archived (see paragraphs 9.50 to 9.55);
- providing adequate funding for decommissioning and clean-up work;
- giving due regard to socio-economic and environmental sustainability, including in relation to greenhouse gas generation and climate change;
- using resources effectively, efficiently, and economically including, for example: existing assets, finances, materials and human resources;
- taking an integrated and lifecycle approach to asset management, decommissioning and waste management which is key to good decision-making, optioneering and prioritisation;
- using existing good practice wherever possible including applying learning from other nuclear sites, other sectors, international experience, and engaging with regulators to augment skills and ensure that decommissioning activities are carried out effectively. The UK Government and devolved administrations of Scotland and Wales consider it important that all operators and public and private nuclear liability owners identify, implement and share good practice, if necessary, under appropriate financial arrangements;
- conducting research and development to develop the necessary skills or good practice including taking into account innovations in, for example, remote decommissioning techniques and measurement science, as well as broader fields such as asset management. The strategy should also take account of decommissioning synergies with other sectors' research and development objectives;
- using, BAT/BPM and the application of the waste hierarchy to achieve the best overall outcomes for people and the environment by optimising the management of radioactive waste. This should minimise the environmental impacts including through re-use or recycling materials wherever possible and provide for effective and safe management of waste which is generated.

Decommissioning and clean-up strategies should be waste led, seeking to avoid the creation of waste in forms which may foreclose options for its safe and effective long-term management;

- taking benefit from radioactive decay as a possible management option, alongside others, where there are clear benefits to be had from slowing or deferring decommissioning;
- taking account of the effects of climate change in the development of plans and programmes to mitigate against possible adverse impacts on decommissioning activities;
- taking account of a risk-informed approach for the management of radioactive waste when considering the waste arisings from decommissioning and clean-up activities. This will ensure that the most appropriate and proportionate management route is identified based on the properties of the waste (radiological, chemical, physical) and the risk it poses to people and the environment;
- taking account of the policy requirements for liquid and gaseous radioactive discharges, the requirements of the UK Radioactive Discharges Strategy⁷⁴ and the UK's obligations under the OSPAR Convention.⁷⁵ Short term increases of some radionuclides may be unavoidable during decommissioning and clean-up activities. However, where this is the case, the relevant environment agency and ONR will need to be satisfied that, among other things, they represent the optimal result from appropriate option studies and reflect the application of BAT/BPM/ALARP principles;
- ensuring the site end-state is optimised particularly during the latter stages of decommissioning and clean-up;
- consulting appropriate public and stakeholder groups on the options considered and the contents of the strategy;
- deferring physical decommissioning works until a proven or viable waste management route is available. This may include an interim solution provided it is necessary and proven or viable, and the process to install it is underway. Where waste is created, priorities for managing the various types of waste which do arise should be established. Radioactive waste should be managed in accordance with the radioactive waste management plan (see chapter 8);
- considering possible interim uses of sites during any periods of deferral, provided they do not impede the overall decommissioning strategy and the decommissioning plans for those sites.

⁷⁴ UK Government (2018) UK Strategy for radioactive discharges. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249884/uk_strategy_for_radioactive_discharges.pdf

⁷⁵ Convention for the Protection of the Marine Environment of the North-East Atlantic. Available at: <https://www.ospar.org/convention>

- 9.31 The factors set out above should be applied throughout each decommissioning programme to ensure that programmes are optimised, and to help to establish the earliest practicable timetable for the decommissioning stages.
- 9.32 The NDA are required by the Energy Act 2004 to publish a strategy every five years, which includes the decommissioning and clean-up of the sites they manage.

Decommissioning plans

- 9.33 Operators should develop and maintain comprehensive decommissioning plans to implement their decommissioning strategy and to safely carry out decommissioning activities with due regard to security and the protection of the environment. The decommissioning plans should be financially underpinned. In addition, where the approach taken for a facility involves deferred dismantling, plans should include details of how facilities will be managed in the intervening periods to ensure that decommissioning plans remain viable and cost-effective, safe for people and the environment, and that undue burden is not passed to future generations.
- 9.34 Each decommissioning plan should take into account any proposed future use of the site in question. Operators of sites which are the responsibility of the NDA are expected to produce and maintain plans for their sites. Each plan for sites within the NDA estate will need to be consistent with the overall strategy of the NDA and be subject to its approval.

Future use of sites

- 9.35 Sites of decommissioning nuclear facilities may represent a potentially valuable resource. The future use of the site, once decommissioning activities have been safely completed, could therefore be a significant factor in determining the decommissioning and clean-up activities. It may be possible in some cases to complete decommissioning activities to the point where unrestricted use is possible, although an overriding consideration will be whether it represents the best optimised end-state, and the site has been delicensed. Experience to date indicates that uses will range from industrial and commercial use to unrestricted use.
- 9.36 The objective should be to get the best solution overall taking into account the needs of the environment, the safety of workers and the local community, and socio-economic factors. The range of facilities and circumstances to which the policy applies will mean that the specific use (or uses) of each site cannot sensibly be determined many years in advance of decommissioning and clean-up activities. To do otherwise risks foreclosing options currently not envisaged or imposing uses which turn out to be unsuitable or unnecessary.
- 9.37 The UK Government and devolved administrations of Scotland and Wales expect operators to consider the potential next use of the site including the beneficial reuse of sites sooner rather than later, taking into account local factors and the wishes of the

local community. Operators will therefore need to discuss potential uses with the relevant local and planning authorities, the regulators, and public and Site Stakeholder Groups. The condition to which a site is restored will need to comply with the requirements set out in the environment agencies' guidance *Management of radioactive waste from decommissioning of nuclear sites: Guidance on the requirements for release from radioactive substances regulation*.⁷⁶

- 9.38 The UK Government and devolved administrations of Scotland and Wales consider that the land on which publicly owned nuclear facilities are located may be a key strategic asset and as such priority should be given to potential next uses that involve national infrastructure. For sites that are the responsibility of the NDA, our expectation is that the NDA's strategy and annual business plans should take into account wider policy of the UK Government and the devolved administrations of Scotland and Wales, and the best strategic future use of NDA sites. This includes optimising the wider socio-economic benefits of decommissioning and clean-up.

Review of decommissioning strategies and plans

- 9.39 Operators should review their decommissioning strategies and plans, and in particular the assumptions made, at least every five years or when changes in circumstances, including relevant government policies, make this necessary. Operators whose sites are an NDA responsibility will need to work closely with the NDA to ensure that their site plans are modified when the need arises.

Funding of decommissioning and clean-up activities

- 9.40 The UK Government and devolved administrations of Scotland and Wales expect that all operators will take the steps necessary to ensure that their decommissioning and clean-up activities are adequately funded. No stage of a decommissioning project should be started unless it is clear that sufficient funds will be available to complete the decommissioning of the stage in question in a safe and secure way which meets the BAT/BPM/ALARP requirements for the site.
- 9.41 The NDA, which is responsible for the decommissioning and clean-up of the UK's 17 earliest nuclear sites, is funded directly by the UK Government. The financial arrangements for the NDA include a dedicated statutory segregated account. This ensures that sufficient funds are available to enable the NDA to drive forward delivery of its mission.

⁷⁶ SEPA, EA and NRW joint publication. Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation. Available at: <https://www.sepa.org.uk/media/365893/2018-07-17-grr-publication-v1-0.pdf>

- 9.42 Funding for the decommissioning and clean-up of the UK's seven advanced gas-cooled reactors (AGRs) and one operational pressurised water reactor (PWR) is assured through the Nuclear Liabilities Fund (NLF)⁷⁷ which is underwritten by the UK Government. The NLF is a segregated fund which has been set up to meet the decommissioning and clean-up costs of the UK's current fleet of operating nuclear power stations.
- 9.43 Operators of all new nuclear power stations are required, under the Energy Act 2008,⁷⁸ to have a Funded Decommissioning Programme (FDP) approved by the Secretary of State before nuclear-related construction can begin and to comply with that programme thereafter. The purpose of the FDP is to ensure that new nuclear power station operators have secure funding arrangements in place to meet the full costs of decommissioning, waste management and the disposal of spent nuclear fuel. The FDP is also used to satisfy licensing regime requirements regarding decommissioning liability.

How nuclear decommissioning is regulated

- 9.44 The UK Government, the devolved administrations of Scotland and Wales and the regulators are committed to ensuring that the application of the regulatory controls before and during decommissioning is transparent. For nuclear licensed sites, the key parts of the regulatory regime are the controls imposed by the ONR under national regulations, including safeguards, and the nuclear site licence. They also include the relevant regulations and conditions imposed by the environment agencies in permits. The ONR and the national environment agencies for England, Scotland, and Wales have different statutory remits but work together to achieve outcomes in the regulation of the generation and disposal of radioactive waste that arises from decommissioning. The ONR considers the environmental impact assessments from site operators for the decommissioning of reactor sites and gives consent to start the decommissioning process under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999. The ONR also regulates nuclear licensed sites in relation to civil nuclear security. A decommissioning project may also include points where planning permission from the local planning authority is required, such as building an interim waste store, or for on-site disposals. The decommissioning of the JET facility is regulated by the Environment Agency and the Health and Safety Executive.
- 9.45 The UK Government and devolved administrations of Scotland and Wales expect the regulators to ensure that the level of regulation is proportionate to the level of the risk to safety, the environment or security posed by the site while ensuring that the public and the environment are protected in accordance with the dose and risk criteria set out

⁷⁷ Nuclear Liabilities Fund. Available at: <https://www.nlf.uk.net/>

⁷⁸ UK Government. Energy Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/32/contents>

in Chapter 5 and Appendix 3. We expect that the total amount of regulation will reduce as decommissioning proceeds although it is recognised that there may be periods of intense decommissioning activity when regulatory oversight will need to be temporarily increased. The UK Government will continue to develop the regulatory framework to enable a proportionate approach to regulating sites in the final stages of decommissioning.

Records management

9.46 The UK Government and devolved administrations of Scotland and Wales expect relevant nuclear records to be maintained, retained and archived.⁷⁹ Nuclear records in this context refers to reports, including instrument charts, certificates, logbooks, computer data and printouts kept at a nuclear facility, in particular:

- records relating to compensation claims by workers (including possible future claims by workers);
- records relating to spent fuel and nuclear materials;
- records that support continued decommissioning and waste management;
- records of generic importance, e.g. degradation of stainless steel and or concrete;
- records about the location and quantities of any radioactive waste disposal permitted on the site;
- any other records that are required to comply with their environmental permits.

9.47 A regular process of review is required, in order to determine which records should be retained and which can be disposed of. This review process should be informed by ONR guidance on the need and use of a record.⁸⁰

9.48 These records should be organised in such a way that they provide a complete and objective past and present representation of facility operations and activities, including all phases from design through to closure and decommissioning (if the facility has been decommissioned).

9.49 We consider maintaining accurate records during operation and decommissioning of nuclear facilities to be vital to ensuring that safe working practices are followed and that both human health and the environment are protected both now and in the future.

⁷⁹ ONR. Nuclear site licensing. Available at: <https://www.onr.org.uk/licensing.htm>.

⁸⁰ ONR has developed Technical Inspection Guides (TIGs) and a Technical Assessment Guide (TAG) which set out ONR's expectations on records for nuclear licence holders: TIG for LC 6 www.onr.org.uk/operational/tech_insp_guides/ns-insp-gd-006.pdf TIG for LC25 www.onr.org.uk/operational/tech_insp_guides/ns-insp-gd-025.pdf TAG on duty holder management of records www.onr.org.uk/operational/tech_asst_guides/ns-tast-gd-033.pdf

We expect site operators to keep accurate records in order to make decisions about current and future work that needs to be undertaken. Records must therefore be accurate, legible, readily retrievable, and accessible to all those who need the information in order to operate and decommission nuclear sites.

Archiving records

- 9.50 It is the policy of the UK Government and devolved administrations of Scotland and Wales that sites will be able to exit the nuclear licensing regime, including the third-party liability regime, when international standards are met. However, claims for liability can be made up to 30 years after a site has exited the regime. Therefore, once a site has been decommissioned, nuclear records must be retained in order to assess claims under the third-party nuclear liability regime and to inform decisions about possible future use of the land.
- 9.51 We expect ONR to archive records relating to its decisions regarding the end of the liability regime and delicensing as part of the selection and preservation required by section 3(1) of the Public Records Act 1958 (PRA58).⁸¹
- 9.52 Former nuclear sites will continue to be regulated by the relevant environment agency until they meet the conditions for surrender of the environmental permit. These conditions are described in the 2018 environment agencies' joint publication '*Guidance for the Release of Nuclear Sites from Radioactive Substances Regulation*'.⁸² We expect the environmental regulators to ensure archiving of the site-wide environmental safety case and waste management plan under the Public Records Act 1958, the Government of Wales Act 2006 and the Public Records (Scotland) Act 2011 (as applicable) at the point of delicensing. We also expect the site-wide environmental safety case to be archived just prior to the surrender of the environmental permit, since it will contain information that may be required by local authorities and future users of the site.
- 9.53 Nuclear operators should also consider archiving records for their historic interest.

Nuclear Archives

- 9.54 During the operation and decommissioning of nuclear facilities, nuclear records are held on site in accordance with statutory and/or regulatory requirements and regulatory guidance. Currently, historic records are held at various sites across the UK including the sites of the NDA and its subsidiaries but also by a variety of commercial organisations, some dating back to the beginning of the UK nuclear industry. The nuclear sector is exceptional in the long timeframes involved in the lifecycle of nuclear

⁸¹The Public Records Act 1958. Available at: <https://www.nationalarchives.gov.uk/documents/public-records-act-1958-web-27-4-10.pdf>

⁸² UK Government (2018). Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation. Available at: <https://www.sepa.org.uk/media/365893/2018-07-17-grr-publication-v1-0.pdf>

facilities. These long timeframes also extend to nuclear records which can require archiving for hundreds of years. The UK Government and devolved administrations of Scotland and Wales therefore consider it important that records are securely stored in suitable facilities.

- 9.55 Nucleus, the Nuclear & Caithness Archives, has recently been established as the single long-term repository for the civil nuclear industry's records. It is an extension of the National Archives at Kew and is run by NDA Archives Ltd (a wholly owned subsidiary of the NDA). The UK Government and devolved administrations of Scotland and Wales expect the NDA to make its archives available to all former nuclear site operators and to regulators to store other relevant records. The NDA may negotiate suitable commercial terms with operators for the provision of this service.

10

Import and export of radioactive substances

10.1 This chapter outlines the UK Government's policy for the import and export of radioactive substances. It provides a high-level framework for the import and export of radioactive materials and radioactive waste. It sets out how the UK Government expects the regulators to apply tests to inform their decisions on applications they receive to import or export radioactive waste. Policy on the import and export of radioactive materials and waste is reserved, however, its implementation is devolved.

Scope of the policy

10.2 The policy covers all types of radioactive substances i.e. materials and waste. Policies on non-proliferation and security of nuclear material and on the transport of radioactive substances are outside the scope of this document.

Aim of the policy

10.3 This policy aims to ensure that the UK has access to radioactive materials that are not produced or manufactured in the UK, but which are necessary for UK industry, research and healthcare. The policy also aims to enable UK waste producers to access the most efficient and appropriate methods of radioactive waste management (e.g. where quantities are too small for national solutions to be cost effective or sustainable). It aims to support growth opportunities for UK industry, helping sustain and improve UK capability in radioactive waste management (including skills and technology) and enable inward investment opportunities where appropriate.

10.4 The UK Government recognises that radioactive materials and the resulting radioactive waste, can pose long lasting hazards. That is why the policy requires that decisions on the import and export of radioactive materials and waste should always be taken with the aim of minimising risk to people's health and the environment. Any processes carried out in the UK on imported radioactive waste must also be subject to appropriate regulation.

10.5 The principal independent regulators for the import and export of radioactive substances are the environment agencies for England, Scotland, Wales, and Northern Ireland. These regulators each make their own decisions on proposals they may receive to import or export radioactive substances where the shipment ends or starts in their jurisdiction. When proposals for shipments involve more than one part of the

UK, for example waste is imported and treated in one part followed by subsequent treatment and disposal operations taking place in another part - the respective regulators cooperate to realise the aims of the policy. The UK Government and the devolved administrations work closely together to ensure the policy is implemented consistently across the different parts of the UK.

How the import and export of radioactive substances is regulated

10.6 The import and export of radioactive materials and radioactive waste is subject to various international conventions and UK legislation:

- The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management:⁸³ this international convention addresses the issue of spent fuel and radioactive waste management safety on a global scale. Article 27 covers the transboundary movements of radioactive wastes and spent fuel.
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal:⁸⁴ this international convention governs the movement of hazardous waste.
- The assimilated law version of the Waste Shipment Regulation (EC) No 1013/2006⁸⁵ as amended by the International Waste Shipments (Amendment) (EU Exit) Regulations 2019:⁸⁶ these regulations cover the transboundary movements of naturally occurring radioactive material (NORM) waste.
- The Transfrontier Shipment of Radioactive Waste and Spent Fuel (EU Exit) Regulations 2019:⁸⁷ provide for the transfer of radioactive waste across national boundaries. The regulations require prior application and authorisation by the regulators before any radioactive waste can be exported from, or imported to, the UK. They also apply to the import to the UK for disposal of disused sealed sources manufactured in the UK.

⁸³ The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Available at: <https://www.iaea.org/sites/default/files/infcirc546.pdf>

⁸⁴ The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Available at: <http://www.basel.int/TheConvention/Overview/TextoftheConvention/tabid/1275/Default.aspx>

⁸⁵ Regulation 1013/2006 on the shipments of waste. Available at: <https://www.legislation.gov.uk/eur/2006/1013/contents>

⁸⁶ The International Waste Shipments(Amendment)(EU Exit) Regulations 2019. Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111178539/contents>

⁸⁷ The Transfrontier Shipment of Radioactive Waste and Spent Fuel (EU Exit) Regulations 2019. Available at: <https://www.legislation.gov.uk/uksi/2019/156/contents/made>

- Under the Northern Ireland Protocol, Northern Ireland will continue to apply Council Directive 2006/117⁸⁸ to any intra-community shipments between Northern Ireland and EU Member States.
- The Shipments of Radioactive Substances (EU Exit) Regulations 2019:⁸⁹ these regulations cover the movement of sealed radioactive sources from the EU to the UK.
- The Export of Radioactive Sources (Control) Order 2006⁹⁰ controls the export of certain high-activity radioactive sources as defined under the International Atomic Energy Agency (IAEA) Code of Conduct on the Safety and Security of Radioactive Sources.

10.7 The UK Plan for Shipments of Waste⁹¹ applies to the transboundary movements of NORM waste. It is also important as it sets out the UK policy on imports of NORM waste of UK origin, which is the output from the treatment or recovery of NORM contaminated wastes which have previously been exported.

Policy on import and export of radioactive materials

10.8 Radioactive materials have considerable economic and social value in energy, medical, scientific, and industrial applications. It is important that the UK has adequate access to radioactive materials, such as radioactive sources that are not manufactured in the UK, but which are necessary for UK industry, research and healthcare. For example, the UK routinely and safely imports medical radioisotopes for use in hospitals. It is equally important that the UK can export radioactive materials to countries that need them, and which may not be in a position to manufacture them.

10.9 The policy of the UK Government is that radioactive materials may be imported and exported provided shipments comply with any relevant safety and environmental regulations. This enables the UK to import radioactive materials for beneficial uses and to supply them to other countries that need them.

Policy on import and export of spent nuclear fuel

10.10 Any proposals to import or export spent fuel to or from the UK are subject to approval by the regulators and the UK Government would expect to be consulted. Any spent fuel which is imported or exported for the purpose of reprocessing would need to be in

⁸⁸ Council Directive 2006/117/Euratom on the supervision and control of shipments of radioactive waste and spent fuel. Available at: <https://www.legislation.gov.uk/eudr/2006/117/contents/adopted>

⁸⁹ The Shipments of Radioactive Substances (EU Exit) Regulations 2019. Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111178898/contents>

⁹⁰ The Export of Radioactive Sources (Control) Order 2006. Available at: <https://www.legislation.gov.uk/uksi/2006/1846/contents/made>

⁹¹ UK plan for shipments of waste. Available at: <https://www.gov.uk/government/publications/uk-plan-for-waste-shipments>

line with our policy for the management of uranium (paragraphs 11.19-11.25). Policy on virtual reprocessing and waste substitution are covered in chapter 11, paragraphs 11.15 to 11.18.

Key principles underpinning policy on import and export of radioactive waste

10.11 The UK Government's policy for the import and export of radioactive waste covers all radioactive waste, including NORM waste. It is based on the following key principles:

- radioactive waste should, so far as is practicable, be managed in its country of origin. This principle ensures that policy on trade in radioactive waste is broadly similar to that for other waste i.e. that there should be a presumption of self-sufficiency;
- the protection of human health and the environment requires that, so far as is possible, radioactivity should not be introduced unnecessarily to the environment and any risks from radioactivity are kept as low as reasonably achievable. This assessment is for the global environment rather than the risk to individual countries. When assessing applications for import or export of radioactive waste, an assessment should be made as to whether risks can be kept as low as reasonably achievable if the waste is moved to a country with better facilities to treat the waste;
- radioactive waste should be managed as close to the point of generation as possible. However, the UK Government recognises that there may be circumstances where a country may not have the necessary facilities to manage its own radioactive waste. In those circumstances the transboundary movement of waste may be necessary to ensure the risk to human health and the environment is kept as low as reasonably achievable.

10.12 These principles are interlinked and should be considered together when assessing applications for the import or export of radioactive waste.

Policy on import and export of radioactive waste

10.13 Radioactive waste is produced by many sectors which are important to the UK economy. It is important for UK industry to have access to facilities in other countries to treat radioactive waste, and for facilities in the UK to be able to offer treatment services for radioactive waste from abroad. UK Government implementation of international conventions is intended to enable the import and export of radioactive waste where it is in accordance with the principles set out above, and in compliance with environmental legislation.

10.14 UK Government policy is that the UK should not become the destination for the disposal of other countries' radioactive waste. However, the UK may have waste

treatment facilities that other countries do not possess. Equally, other countries may have treatment facilities that the UK wishes to use. For example, in the past we have exported metallic radioactive waste going to metal smelting facilities in Sweden which are not available in the UK.

10.15 UK Government policy is that radioactive waste should not, in general, be imported to or exported from the UK. In line with international obligations, every country should have ultimate responsibility for the radioactive waste it generates. This principle forms the basis for all hazardous waste management in the UK and reflects international best practice. The import and export of radioactive waste may only be allowed in certain well-defined circumstances, and in light of an assessment of all practicable options.

10.16 Radioactive waste should only be exported to countries where we are satisfied that it will be managed safely and securely and in accordance with international environmental standards and legislation.

10.17 Import and export of LLW will only be permitted for the following reasons:

- the recovery of reusable materials;
- for treatment that will make its subsequent storage and disposal more manageable;
- to send samples for investigative analysis;
- the return to the country of origin of radioactive waste resulting from the processing of radioactive waste or spent fuel in another country (or an equivalent amount of other radioactive waste by way of substitute).

10.18 Import and export of HLW and ILW will only be permitted for the following reasons:

- the recovery of re-usable materials, where this is the genuine prime purpose;
- to send samples for investigative analysis;
- for treatment to make its subsequent storage and disposal more manageable where the processes are at a developmental stage or where the quantities are too small to be practicable in the country of origin;
- the return to the country of origin of radioactive waste resulting from the processing of radioactive waste or spent fuel in another country (or an equivalent amount of other radioactive waste by way of substitute).

10.19 Where the quantities of waste arising from the processes set out in paragraphs 10.17 and 10.18 would add materially to the waste needing to be disposed of in the UK or the country of destination, the presumption should be that it will be returned to the country of origin to a timescale agreed by the country of origin and destination.

10.20 LLW, ILW and HLW may be imported to the UK if it is:

- in the form of disused sources which were manufactured in the UK;

- waste from small users, such as hospitals, situated in countries which produce such small quantities of waste that the provision of their own specialised facilities would be impractical;
- waste from developing countries which cannot be reasonably expected to acquire suitable disposal facilities.

10.21 All decisions about the import or export of radioactive waste should be subject to tests by the regulators, which aim to ensure that:

- any proposals to import radioactive waste to or export radioactive waste from the UK are consistent with UK policy;
- consideration has first been given to managing the radioactive waste in the country of origin;
- consideration has been given to managing the radioactive waste in countries that are closer to the country of origin;
- radioactive waste is only exported to countries where it will be managed safely and securely in accordance with international environmental standards and legislation;
- where HLW or ILW is imported or exported for the recovery of reusable materials, this must be the genuine prime purpose. This test is aimed at preventing the import or export of radioactive waste for 'sham' recovery;
- the quantities of HLW or ILW must be too small for treatment processes to be practicable in the country of origin;
- the quantities of waste arising from the recovery of reusable materials or treatment of imported or exported radioactive waste would not add materially to the waste needing to be disposed of in the UK or country of destination. If the waste would constitute a material addition, the presumption should be that it will be returned to the country of origin, to a timescale agreed by the competent authorities in the countries of origin and destination;
- the UK has the facilities capable of managing the imported radioactive waste safely and in an economically viable manner;
- any material recovered from the treatment of imported radioactive waste would have a positive economic value in the UK.

10.22 The UK Government intends to develop guidance to set out how this policy should be applied by the regulators.

11

Managing nuclear materials and spent nuclear fuel

- 11.1 In this chapter we discuss the management of nuclear materials. In this context nuclear materials principally include spent nuclear fuel and uranium. Policy relating to the management of nuclear materials is a reserved matter.
- 11.2 As a pioneer of civil nuclear power, the UK has been producing and managing a range of nuclear materials since the early 1950s. These nuclear materials are produced and managed throughout various stages of the nuclear fuel cycle at a variety of nuclear facilities around the country.

How nuclear materials are regulated

- 11.3 Nuclear materials are managed in accordance with relevant safety, security and safeguards regulations, as well as relevant IAEA guidance. The principal independent regulator for the management of nuclear materials held on nuclear licensed sites in the UK is ONR. The national environment agencies for England, Scotland, and Wales regulate the generation and disposal of waste that arises from nuclear material management. There are no nuclear licensed sites or nuclear materials held in Northern Ireland.
- 11.4 Nuclear safeguards are a fundamental component of global nuclear non-proliferation. They consist of various reporting and verification processes which assure and demonstrate that civil nuclear material is not diverted unlawfully into non-peaceful purposes. Nuclear safeguards are also vital to a flourishing nuclear industry, both in terms of operations and trade, since these are dependent on the UK acting in line with our international commitments on nuclear safeguards and non-proliferation. The ONR is the UK's domestic safeguards regulator and is responsible for operating a comprehensive nuclear safeguards regulatory function, including the UK State System of Accounting for and Control of Nuclear Materials (SSAC).

Spent fuel management

- 11.5 Spent fuel is nuclear fuel that has been used in a nuclear reactor and then permanently removed from it. There is a diverse range of spent fuels held in the UK and more is expected to arise from the current and future reactor fleets. The UK

Government's policy on the management of spent fuel is to maintain flexibility to allow for different management options.

- 11.6 Spent fuel can either be managed through interim storage prior to final disposal or through reprocessing. Interim storage involves safely and securely storing the spent fuel, potentially for several decades, until it is conditioned and permanently disposed of as waste in a GDF. The interim storage of spent fuels over long periods of time, in line with international good practice, does not preclude reprocessing them at some point in the future. Reprocessing involves separating spent fuel into its component parts. This can be done to separate potentially re-usable material from the spent fuel or to provide an alternative management route for the components of the spent fuel.
- 11.7 It is the UK Government's policy that spent fuel should not be categorised as waste whilst a future use for the spent fuel can be foreseen by the owner. Decisions on the management of spent fuel are a matter for the owner of the spent fuel, subject to meeting the necessary regulatory requirements. If an owner categorises spent fuel as a waste for disposal, they should continue to meet the appropriate requirements for safety, security and safeguards applied to spent fuel.
- 11.8 In the British Energy Security Strategy⁹² and the Powering up Britain: Energy Security Plan⁹³ the UK Government set out its vision for how new and advanced nuclear power will contribute to achieving net zero targets. Meeting this vision will result in new spent fuel arisings from new and advanced nuclear power plants which will need to be managed.
- 11.9 The UK Government expects developers of new or advanced nuclear power plants to demonstrate appropriate spent fuel and waste management plans, including financing, whilst also ensuring compliance with the necessary regulatory and policy requirements in the Funded Decommissioning Programme Guidance.⁹⁴

Reprocessing

- 11.10 This policy statement replaces all previous statements on reprocessing.
- 11.11 The UK Government's policy is that the decision of whether or when to reprocess spent fuel is a matter for the owner of the spent fuel. Industrial scale reprocessing techniques, including those that were deployed at the Thermal Oxide Reprocessing Plant (THORP) and the Magnox and Dounreay Reprocessing Plants, separate spent fuel into uranium, plutonium, various waste streams and authorised discharges. The

⁹² UK Government (2022). British Energy Security Strategy. Available at:

<https://www.gov.uk/government/publications/british-energy-security-strategy>

⁹³ UK Government (2023). Powering up Britain: Energy Security Plan. Available at:

<https://www.gov.uk/government/publications/powering-up-britain>

⁹⁴ UK Government (2010). Funded Decommissioning Programme Guidance. Available at:

<https://www.gov.uk/government/consultations/revised-funded-decommissioning-programme-guidance-for-new-nuclear-power-stations>

policy on the management of uranium is set out in paragraphs 11.19 to 11.25. Radioactive waste management policy is set out in chapters 7 and 8.

- 11.12 The UK reprocessed spent fuel on an industrial scale from the 1950s to 2018. Commercial industrial scale reprocessing came to an end in the UK with the closure of THORP in 2018. Reprocessing at the Magnox Reprocessing Plant ended in July 2022.
- 11.13 Whilst industrial scale reprocessing of spent fuels in the UK has ended, the UK Government recognises the value of the UK's nuclear fuel cycle knowledge and skills base, both in managing the UK's nuclear legacy and its existing liabilities and in supporting future capabilities and research programmes in the sector. The UK Government is continuing to support the nuclear sector through investments in research facilities and programmes.
- 11.14 However, while the decision to reprocess spent fuel continues to rest with the owner of the fuel, in the absence of proposals from industry, nuclear power stations should proceed on the basis that spent fuel will not be reprocessed and waste management plans including financing should reflect this. Any proposals for future reprocessing of spent fuel would need to be in line with regulatory and policy requirements for the management of all nuclear materials and radioactive waste streams including national security, safeguards and UK non-proliferation commitments. Should any proposals for reprocessing come forward in the future, they would need to be considered on their merits at the time and the UK Government would expect to consult on them.

Virtual reprocessing

- 11.15 In order to manage a small quantity of overseas-origin, non-standard spent fuel which was deemed too difficult to reprocess due to technical or economic reasons, the UK Government consulted on and introduced a policy of virtual reprocessing. This policy allowed the NDA to allocate a radiologically equivalent amount of nuclear material and waste to the customer as if the spent fuel had been reprocessed. This ensured the UK did not become a net importer of radioactive waste, enabled historic THORP and Dounreay reprocessing contracts with overseas customers to be fulfilled, and supported the closure of THORP in November 2018. All overseas origin spent fuel which has been managed through this policy is now owned by the NDA. This policy enabled the UK to safely and securely manage spent fuel which had already been imported into the country for reprocessing purposes.
- 11.16 The UK Government recognises that virtual reprocessing may be an appropriate management option for spent fuel but any new proposals to apply the principle of virtual reprocessing would need to be considered on a case-by-case basis and be subject to public consultation.

Waste substitution

- 11.17 Waste substitution is an internationally accepted practice where a radiological equivalent amount of waste is returned to the customer in a form that is acceptable to them. UK Government policy is to return to the country-of-origin radioactive waste that arises from reprocessing spent fuel that has come from overseas. UK Government policy also provides for LLW and ILW arising from reprocessing overseas origin spent fuel to be managed in the UK and a radiological equivalent amount of UK HLW to be returned to the country of origin, along with any additional HLW generated during reprocessing. This policy has enabled radioactive waste arising from historic reprocessing contracts with overseas customers to be returned to their country of origin.
- 11.18 The UK Government recognises that waste substitution may be an appropriate management option for spent fuel but any new proposals to apply the principle of waste substitution would need to be considered on a case-by-case basis and be subject to public consultation.

Uranium management

- 11.19 Uranium is the raw material used for today's nuclear fuel. Uranium is both radioactive and chemically hazardous and so requires appropriate management arrangements to ensure safe storage and handling, and to minimise any potential damage to people and the environment. There is a diverse range of materials containing uranium currently held in the UK and the potential for more to arise in the future. This diverse range of materials requires bespoke lifecycle management solutions. The UK Government's policy on the management of uranium is to maintain flexibility to allow for different management options.
- 11.20 Uranium is traded as an asset openly on world markets. In some circumstances carrying out such trade efficiently requires quantities of uranium to be exchanged. Exchanges of uranium in this way are carried out in accordance with the applicable nuclear safeguards obligations and without physical movement of the materials (i.e. transfer of ownership), which avoids the need to transport materials from place to place as they go through the various processes of the nuclear fuel cycle.
- 11.21 Uranium held in the UK is managed in line with its owners' requirements, including where appropriate, the owners' country's policy for managing uranium, as well as in accordance with the UK's laws and applicable UK nuclear safeguards obligations. Uranium is managed as an asset and is specifically not categorised as a waste. This is because uranium has the potential to be used as nuclear fuel, subject to the availability of the appropriate power stations and supporting infrastructure.

11.22 The UK Government does not wish to foreclose options on the use of uranium and as such it is UK Government policy that uranium should not be categorised as waste whilst a future use can be foreseen by the owner. Decisions on management of uranium are a matter for the owner of the uranium, subject to meeting necessary regulatory requirements, compliance with any applicable inter-governmental agreements, and the UK's nuclear safeguards obligations.

Transfer of ownership of uranium to the NDA

11.23 The NDA manages a significant quantity of uranium owned by the NDA itself and on behalf of domestic and overseas customers. The UK Government supports the NDA in taking ownership of overseas-owned uranium that it manages in order to close out historic spent fuel reprocessing contracts and associated liabilities. This is consistent with the NDA's approach to managing other nuclear materials and provides greater certainty of the inventory of uranium which the NDA will need to manage in the future. We would anticipate the NDA taking ownership of overseas owned uranium on a small number of occasions to close out historic spent fuel reprocessing contracts.

11.24 The NDA may take ownership of overseas-owned uranium in order to close out historic spent fuel contracts provided that:

- taking ownership complies with the owner's country's policy for managing uranium;
- the NDA complies with any applicable inter-governmental agreements;
- the NDA complies with any applicable nuclear safeguards obligations;
- the NDA has in place a clear strategy for managing the uranium, which may include sale to a third party for recycling and re-use;
- the NDA has in place acceptable commercial arrangements which represent value for money over the lifecycle of managing the uranium, including disposal.

Re-use of uranium for other purposes not in the nuclear fuel cycle

11.25 Uranium is also used for purposes other than in the nuclear fuel cycle, including in the production of medical isotopes and a potential use as part of the engineered barrier system for the GDF. The UK Government recognises the wider societal and sustainability benefits which can be achieved through the re-use of uranium for purposes other than in the nuclear fuel cycle, provided that any applicable nuclear safeguards obligations and other regulatory requirements are met.

12

Appendix 1 The UK Government's working with communities policy for implementing geological disposal

Introduction

- 1 Finding a suitable location for a GDF is a process that will take many years. The Government's preferred approach is to find a community that is willing to host a GDF. The Government has put in place a policy framework to work in partnership with communities to build trust and understanding of the development before any commitment from them is required.
- 2 This appendix describes the siting process for Nuclear Waste Services (NWS)⁹⁵ to work in partnership with communities and the principal local authorities that represent those communities – i.e. district councils, county councils and unitary authorities. It recognises that a successful consent-based process needs a willing community with relevant principal local authority support. The process itself must be open, transparent, as flexible as possible and democratically accountable.
- 3 Principal local authorities have a range of responsibilities including economic planning, infrastructure development and provision of services that would potentially be affected by the development of a GDF. The extent of their responsibilities varies depending on the administrative arrangements in place in the area. In areas where there are two tiers of principal local authorities there may be some overlap. The policy recognises this and seeks to ensure principal local authority participation whilst maintaining a degree of flexibility to take account of the different administrative structures and the different communities across the country.
- 4 Discussions about a proposed location for a GDF can be initiated by anyone or any group of people with an interest in the siting process, and who wish to propose an area for consideration. The interested party may suggest an area of any size; it could be as large as a county, or it could be a small area of a few fields.

⁹⁵ Nuclear Waste Services (NWS) is a division of the Nuclear Decommissioning Authority (NDA) group, and brings together the expertise of site operator LLWR, which manages the low level waste site in Cumberland and associated operations, and RWM which is responsible for delivering the Geological Disposal Facility (GDF) Programme, as well as the NDA's Integrated Waste Management Programme (IWMP).

- 5 Once NWS and the interested party have had an initial exchange of information and agree that the proposal merits further consideration, they must jointly inform all relevant principal local authorities and open up discussions more widely in the community. Increasingly detailed investigations will be carried out by NWS over a number of years. If there appears to be sufficient promise and there is continuing interest from within the community then deep investigative boreholes will need to be drilled to carry out further testing of the geological conditions at depth. In order to carry out deep borehole investigations at potential sites, NWS will need to obtain development consent from the Secretary of State and environmental permits from the Environment Agency.
- 6 Detailed site investigations may take up to 15 years depending on the investigations necessary to understand the geology in an area and be confident that a facility can be designed to safely and securely isolate and contain the radioactive waste. When NWS has sufficient information to satisfy itself that a GDF is viable and the community has indicated it is willing to host it, NWS will need to obtain development consent to build the GDF. A GDF will also require an environmental permit from the Environment Agency and a nuclear site licence from the Office for Nuclear Regulation. The figure below illustrates the consent-based process for working with communities. The regulation of a GDF is discussed in more detail in a later section of this appendix.



Figure 9. Process for working with communities

- 7 The UK Government expects that it will take around 10 years to construct the first vaults within a facility. Alongside construction, there are likely to be continued underground investigations and testing of the geology to make sure that a GDF meets the necessary high standards of safety, security and environmental protection. Once the first vaults have been built, construction of the facility and the disposal of the waste will continue in parallel; with new tunnels and vaults being built as existing tunnels and vaults are filled.
- 8 For reasons of simplicity, this appendix refers in some places to the actions of NWS in progressing through various milestones associated with identifying a suitable location for a GDF. In some cases, the decision to proceed with that action will require approval

from the Secretary of State, specifically the decision on selecting which communities to progress to deep borehole investigation and the final site selection.

- 9 This appendix sets out a framework that is based on an approach of working in partnership with willing communities. As has been the case since 2008, the Government continues to reserve the right to explore other approaches in the event that, at some point in the future, such an approach does not look likely to work.

Initial discussions

- 10 Identifying a willing host community with a suitable site for a GDF may be a lengthy process. This is because it will take NWS time to identify, investigate and evaluate potential sites and to make sure that communities that choose to get involved understand the implications of a GDF being developed in their area. The intention is that NWS, as the delivery body, will work in partnership with communities to provide answers to their questions, so the community can make an informed decision about whether to support a facility being developed in their area.
- 11 The process starts with initial discussions between an interested party and NWS. Initial discussions can be initiated by anyone with a proposal for an area to be considered for a GDF. Examples include local authorities, landowners, businesses, community groups or interested individuals. NWS may also proactively encourage interested parties and local communities to come forward and engage.
- 12 An interested party could come forward without any specific land in mind but a general ambition to find out if there is potential to develop a GDF within their area. Alternatively, interested parties could come forward with a particular site in mind.
- 13 It is possible that an interested party may suggest a location for a GDF beneath the UK's territorial waters, with the surface facilities being located on land, which could be a feasible option. Government owned land may also be put forward.
- 14 Where a third party puts forward a potential site that it does not own, the third party and NWS should consider at what point it would be appropriate to include the landowner(s) in discussions.
- 15 Under all scenarios NWS will undertake initial work to understand whether the land identified has any potential to host a GDF. At this point discussions may remain confidential (subject to disclosure requirements contained in information law legislation, including the Freedom of Information Act 2000 and the Environmental Information Regulations 2004), though they should be made public at the earliest opportunity if the interested party and NWS decide to move forward.
- 16 It may be that NWS decides after its initial work that there is little or no potential to host a GDF in the area under consideration. Equally, the interested party may, after finding

out more from NWS, decide that it is no longer interested. In either scenario the process would end for that area. If, however, both NWS and the interested party want to progress they must inform all relevant principal local authorities before going public with the proposals and starting a dialogue with the people in the local area.

Forming a Working Group and identifying a Search Area

- 17 In order to begin a conversation with the people in the area, the interested party, NWS, an independent chair and an independent facilitator will form a Working Group. All relevant principal local authorities that represent the people in all or part of the area under consideration must be invited to join the Working Group.
- 18 This early part of the process is essentially about fact finding, gathering information about the community and providing information to the community about geological disposal. At this stage, it is important to ensure a community has the ability to have fact-finding and exploratory discussions with NWS without having to wait for a principal local authority to join the Working Group. Therefore, relevant principal local authority membership on the Working Group is not a requirement, although it would be preferable to have at least one relevant principal local authority as a member, given their invaluable knowledge and experience of the local area and people.
- 19 Relevant principal local authorities will receive financial support from the UK Government to participate throughout the process including as a member of the Working Group, so that local taxpayers do not incur any additional financial burden. Funding will also be provided to support the Working Group's activities and will be available to cover reasonable out-of-pocket expenses for individuals taking part in the Working Group (e.g. travel costs for attending meetings). NWS will provide clear advice and guidance on activities where expenses can be covered and how costs will be reimbursed.
- 20 The Working Group may want to consider whether it would be beneficial to invite representation from a Local Enterprise Partnership and parish and town councils. Given the potentially large number of parish or town councils in any given area, it may not be feasible for them all to join. It may instead be possible for them to collectively agree to send a representative to join the Working Group.

Defining the Search Area

- 21 An early task for the Working Group is to identify a Search Area. The Search Area is the geographical area within which NWS seeks to identify potentially suitable sites to host a GDF. Defining the boundaries of the Search Area is important in order to identify appropriate membership for the Community Partnership, including relevant principal local authorities, and to determine eligibility for Community Investment Funding.

Projects, schemes and initiatives within the Search Area may be eligible for this funding. The Community Partnership and Community Investment Funding are discussed in paragraphs 28 to 47 and paragraphs 68 to 81 respectively.

- 22 The Search Area is derived from the area first put forward for consideration by the interested party and is defined using district or unitary council electoral ward boundaries, depending on the administrative arrangements in place for the particular area. The Search Area, therefore, encompasses all the electoral wards within which NWS is able to consider potential sites. For areas which include potential for development under the seabed, the Search Area comprises only that area on land.
- 23 The geographical boundaries of the Search Area are likely to change as the search for a potential location for the surface and underground facilities progresses and more is understood about the area. The Search Area will be refined over time by the Community Partnership. As NWS's investigations progress the Community Partnership may identify areas that it wants to rule out of consideration or bring in additional areas that it did not at first consider to be part of the Search Area. Any future changes to electoral ward boundaries should be reflected in the Search Area as it evolves over time.
- 24 Eventually the Search Area will be narrowed down until the Community Partnership identifies a specific site and the community which will be directly affected by the facility being on that site. This is referred to as the Potential Host Community. More detail on the Potential Host Community, including how its boundaries would be determined, is set out in paragraphs 86 to 90.

The role of the Working Group

- 25 As it identifies the Search Area, the Working Group will start work to understand the local area and any issues or questions the community within it might have. Funding will be provided for independent support and a facilitator to support the Working Group. The independent facilitator will be a member of the Working Group and will help to bring together different views so that discussions progress in a constructive and informative manner. NWS will provide guidance on the support that will be available to the Working Group.
- 26 The Working Group will work to identify members of the community who may be interested in joining a Community Partnership. This work will include:
 - gathering information about the different people and organisations in the area who will have an interest or who are likely to be affected;
 - gathering information to understand the existing geographic, social, economic, environmental, cultural and administrative structures of the Search Area;

- understanding the community’s issues, concerns and questions about geological disposal and the process for identifying potential locations for a GDF;
- engaging with relevant principal local authorities within the Search Area (if they have not joined the Working Group).

27 NWS will use independent evaluation to review the practical effectiveness of this part of the process to help improve future engagement. Table 1 sets out the membership of the Working Group.

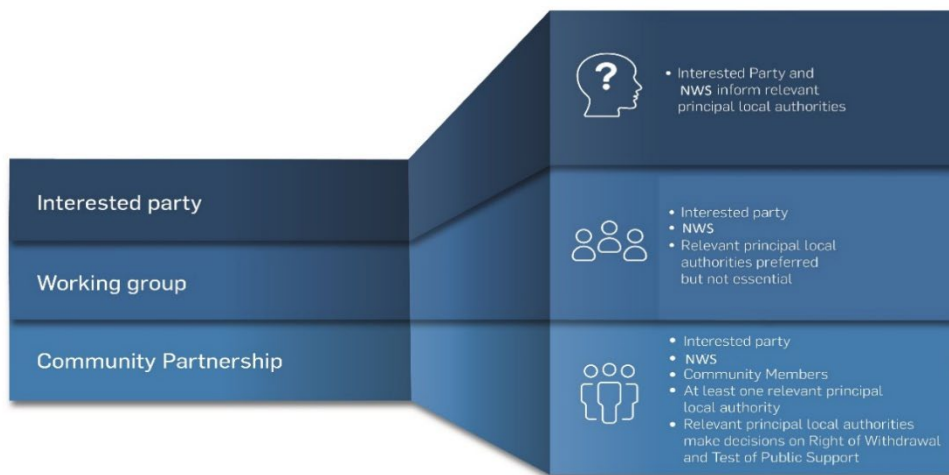
Table 1 Membership of Working Group

Member	Role
Independent Chair	The Chair will ensure that meetings and discussions are run appropriately. Someone to fulfil this role could be procured from an approved list of contractors on behalf of the interested party, or there may be existing community organisational structures in the local area that could be used.
Independent Facilitator	The independent facilitator will aim to ensure that discussions progress in a constructive and informative manner. The facilitator can assist in asking relevant questions and directing conversations to cover the points of interest from the interested parties and other members of the community.
Interested Party	This is the group, organisation, or individual(s) who first started discussions with NWS.
NWS	The delivery body who are engaging with the community – providing information to the community and promoting the benefits of a GDF.
Relevant Principal Local Authorities (optional)	Relevant principal local authorities are the district, county and unitary authorities that represent the people in all or part of the area under consideration. It may be that the Local Authority is the interested party. If not, they must be informed of discussions and invited to join the Working Group.

The Community Partnership

28 A Community Partnership can only be formed and continue to operate if one or more relevant principal local authorities in the Search Area agree to participate. There must be at least one relevant principal local authority representing each district or unitary authority electoral ward in the Search Area. In an area with two tiers of local government (i.e. district and county) in order to maintain flexibility, it is not a requirement that both join. It may be, where two tiers of local government exist, that one of the relevant principal local authorities is content for a Community Partnership to continue its work without it being a member. Where a relevant principal local authority decides not to be a member, the Community Partnership should keep it informed of its work. Any relevant principal local authority that does not initially join the Community Partnership may decide to join at any point in the future.

29 All of the Search Area must be represented by a relevant principal local authority on the Community Partnership. If a relevant principal local authority decides to leave the Community Partnership with the result that part of the Search Area (or, once identified, the Potential Host Community) is no longer represented by any of the relevant principal local authorities on the Community Partnership, then it will no longer form part of the Search Area (or Potential Host Community). The figure below summarises the role of relevant principal local authorities in the process.



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Figure 10. The role of principal local authorities

The role of the Community Partnership

30 The role of the Community Partnership is to:

- facilitate discussion with the community;

- identify relevant information that people in the Search Area and Potential Host Community want or need about the siting process;
- be the key vehicle for community dialogue with NWS;
- review and refine the boundaries of the Search Area as NWS's investigations progress;
- identify priorities for Community Investment Funding;
- make recommendations to the relevant principal local authorities on the Community Partnership on whether to invoke the Right of Withdrawal and if and when to launch a Test of Public Support;
- agree a programme of activities to develop the community's understanding of the siting process and the potential implications of hosting a GDF;
- develop a community vision and consider the part a GDF may play in that vision;
- monitor public opinion in relation to siting a GDF within the Search Area and the Potential Host Community.

- 31 There will be a lot of information to share between the community, NWS and other parties (e.g. the Environment Agency and the Office for Nuclear Regulation) over a long period of time. The Community Partnership provides a vehicle for sharing that information and to find answers to the questions the community may have about geological disposal and its impacts, the siting process and how the community could benefit.
- 32 Subgroups could be set up to consider some of the issues set out above, for example on communication and engagement, in which people from the community could get involved. We would expect that members of sub-groups would normally be appointed through an open process; however, from time to time the Community Partnership may want to co-opt members with particular expertise.
- 33 When identifying prospective members of the Community Partnership, the Working Group needs to consider the types of skills, knowledge and experience that the Community Partnership will need. It may invite particular organisations to join, as well as inviting applications through an open process. It should aim for membership that is reflective of the community in the Search Area. Prospective members of the Community Partnership will be identified by a selection panel of Working Group members. The selection panel must include the independent chair, NWS and any relevant principal local authority on the Working Group. The process for selecting members must be open and transparent. Prospective members will be appointed onto the Community Partnership upon signing the Community Partnership Agreement (see paragraphs 48 to 50).
- 34 The Community Partnership will be formed of representatives from community groups, organisations and individuals, at least one relevant principal local authority and NWS. It

is appropriate to invite representation from organisations that have responsibility for managing or regulating large areas of land such as National Park Authorities, the National Trust, or the Forestry Commission, should the Search Area include land for which they are responsible.

- 35 The Community Partnership should seek to include representation from parish and town councils. Given the potentially large number of parish or town councils in any given area, it may not be feasible for them all to be members of the Community Partnership. It may be possible for the parish or town councils to collectively put forward a representative for membership of the Community Partnership. Once the Potential Host Community is identified, there may be scope for individual parish or town councils to be on the Community Partnership.
- 36 It may also be appropriate to invite representatives of combined authority areas (where relevant) and Local Enterprise Partnerships. Members representing organisations will be responsible for sharing all information discussed and developed through the Community Partnership with the rest of their organisation.
- 37 It will be for each Community Partnership to decide on its number of members and to appoint a chair. However, in order to function effectively we would suggest it should be around 12 people.
- 38 NWS has a key role to play in the Community Partnership as a source of information and expertise on geological disposal and as the developer working together in partnership with the community. NWS will help the community access information from a range of resources, from its own technical and scientific teams, or from independent parties who can help to answer questions.

Decision-making within the Community Partnership

- 39 Principal local authorities play a crucial role in respect of planning, infrastructure development and service provision. For this reason, and to ensure democratic accountability, the relevant principal local authorities on the Community Partnership will take two key types of decisions. They will have the final say on:
 - whether to seek to withdraw the community from the siting process (through invoking the Right of Withdrawal);
 - if or when to seek the community's views on whether it wishes to host a GDF (i.e. proceed to a Test of Public Support).
- 40 Although the relevant principal local authorities will have the final say in relation to these two key decisions, they should involve other members of the Community Partnership in discussions on whether they intend to seek to withdraw the community from the process and the appropriate time to launch a Test of Public Support. Equally, the other members of the Community Partnership should be able to make recommendations to the relevant

principal local authorities on the Community Partnership on invoking the Right of Withdrawal and the timing of the Test of Public Support.

- 41 All relevant principal local authorities on the Community Partnership must agree before the Right of Withdrawal can be invoked or the Test of Public Support can take place. For example, in an area with two tiers of local government and where both relevant principal local authorities are on the Community Partnership then they must both agree to invoke the Right of Withdrawal and to carry out the Test of Public Support. It would not be appropriate for principal local authorities to take these decisions without being members of the Community Partnership and fully engaged in the process. They must be a member of the Community Partnership in order to have a say.
- 42 The relevant principal local authorities can either take the decision to withdraw the community from the process themselves or do so after seeking the community's views. If the relevant principal local authorities agree that the decision to withdraw the community from the process should involve the community directly, then the method for seeking the community's view on possible withdrawal from the process will be considered by the Community Partnership as a whole. The Community Partnership's view on what mechanism could be used for this should be set out in the Community Partnership Agreement, which can be updated as views on this develop over time.
- 43 The relevant principal local authorities must, however, seek a final view from the community, through a Test of Public Support, on whether it is willing to host a GDF before NWS seeks the necessary regulatory approvals and development consent for the construction and operation of a GDF. The Test of Public Support can only take place if all relevant principal local authorities on the Community Partnership agree to it being held.
- 44 If the relevant principal local authorities agree that it is an appropriate time to seek the community's view on whether or not it wishes to host a GDF then the method for taking that Test of Public Support will be decided by the Community Partnership as a whole. The Community Partnership's view on what mechanisms could be used for this should be set out in the Community Partnership Agreement, which can be updated as views on this develop over time. The Community Partnership Agreement is discussed in more detail in paragraphs 48 to 50.
- 45 In the event that the relevant principal local authorities do not agree on whether to invoke the Right of Withdrawal or move to the Test of Public Support, NWS could fund independent mediation to ensure concerns are heard, understood and attempts are made to address them. The Right of Withdrawal and the Test of Public Support are discussed in more detail in paragraphs 91 to 97 and paragraphs 98 to 106 respectively.
- 46 All other decisions, such as priorities for the Community Investment Funding, or agreeing the programme of activities, should be taken by the Community Partnership. It will be for the Community Partnership to decide how it takes these decisions, for

instance whether unanimity is required, or a simple majority and what constitutes a quorum, or whether a decision is delegated to a sub-group. This should be set out in the Community Partnership Agreement.

- 47 At times it may be appropriate for the UK Government to hold direct discussions with the relevant principal local authorities on the Community Partnership. Table 2 sets out the membership of the Community Partnership.

Table 2 Membership of the Community Partnership

Member	Role
Community Members	Organisations and individuals that reflect the make-up of the community.
Relevant Principal Local Authorities	Relevant principal local authorities are the district, county and unitary authorities that represent all or part of the area under consideration. At this point they will be the principal local authorities that represent people in the Search Area (and Potential Host Community when it is identified). In order for the Community Partnership to form and continue to operate at least one relevant principal local authority must join. Relevant principal local authorities on the Community Partnership will take two key types of decisions. They will have the final say on whether to seek to withdraw the community from the siting process and if or when to seek the community's views on whether it wishes to host a GDF.
NWS	A key member of the partnership as the delivery body of a GDF. They will provide information as required by the Community Partnership and provide updates on their investigations into the feasibility of the area to host the

	facility. NWS will explain the concept of a GDF and its benefits. They will be responsible for all technical decisions.
Chair	At the beginning this could be the same chair as was used during Working Group discussions, or a new chair could be appointed. They will ensure that the work of the Community Partnership is fair, unbiased and reflects the needs of the community.

The Community Partnership Agreement

- 48 The prospective members of the Community Partnership will develop and sign a Community Partnership Agreement. Once the Community Partnership Agreement is in place Community Investment Funding can be made available. (Community Investment Funding is discussed further in paragraphs 68 to 81).
- 49 The Community Partnership Agreement will set out the principles of how the members of the Community Partnership will work together and their roles and responsibilities. It should include terms of reference to clarify how the Community Partnership operates, how it will take decisions, settle disputes and an outline programme of activities. NWS will provide a template Community Partnership Agreement and further guidance.
- 50 In the first instance, the Community Partnership Agreement will cover the period immediately following the establishment of the Community Partnership. As the siting process progresses, the Community Partnership Agreement may evolve and will be subject to review, for example to reflect any change in geographical scope of the Search Area and therefore membership.

Community engagement activities

- 51 The Community Partnership will need to engage with the community over a long period of time. Getting people actively involved on any issue can be challenging and it is possible that vocal minorities can dominate debate. It will therefore be important to open up community participation through a wide number of channels.
- 52 One way of doing this could be to hold open public meetings of a Community Stakeholder Forum inviting people from the Search Area and neighbouring local authority areas. The Forum could meet at regular intervals, and could also exist online, giving the Community Partnership the opportunity to report on activities it has undertaken and the outcome of those activities. It would give members of the community the opportunity to raise questions and issues that they want addressed,

which could then be fed into the programme of activities. It will be important that all interactions between the Community Partnership and people in the community are made public.

- 53 The Community Partnership could also consider engagement through social media, dedicated outreach work with particular groups (for example engagement with young people through schools and colleges) and using existing networks to reach out to people. It will be important to consider how to address diversity and accessibility issues so that people within the Search Area or Potential Host Community are not excluded from participating.

Communicating the inventory for disposal

- 54 An important issue that will need to be communicated to the community will be the inventory for disposal. As set out in chapter 8, paragraph 8.63 the inventory for disposal comprises a number of categories of waste and material. It is not anticipated that those categories of waste and material will change significantly. If, however, the list of waste and materials were to change significantly it would need to be discussed with the Potential Host Community. A process for agreeing any future material changes to the categories of waste to be disposed of in a GDF would need to be agreed before the Test of Public Support.
- 55 In April 2022 the UK Government set out an ambition in its British Energy Security Strategy⁹⁶ to increase its plans for deployment of nuclear power to up to 24 gigawatts through large-scale nuclear power stations, small modular reactors (SMRs) and advanced modular reactors (AMRs).
- 56 The waste from a new build programme of large-scale nuclear power stations and SMRs, comprising spent fuel (yet to be declared waste) and ILW not suitable for disposal in near surface facilities will be disposed of in a GDF. Waste from any future AMRs will also be disposed of in a GDF if it is suitable to do so. It would need to undergo an Assessment of Disposability by NWS in support of the regulatory and permitting processes of the Office for Nuclear Regulation and the Environment Agency before a final decision can be taken on whether it will be disposed of in a GDF.
- 57 The UK Government recognises that communities considering hosting a GDF will want to have as clear as possible an understanding of the inventory for disposal before they take a Test of Public Support. This information will also be needed by NWS for its application for a development consent order for a GDF. Changes in the UK Radioactive Waste Inventory (UKRWI), and hence the Inventory for Geological Disposal, will occur as UK nuclear sites evolve and the decommissioning programme matures. For planning

⁹⁶ British Energy Security Strategy. Available at: <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

purposes, however, NWS will factor the waste from the new nuclear ambition of up to 24 gigawatts into their planning for a GDF as the siting process progresses.

- 58 The estimated quantity and the types of waste to be consigned to a GDF needs to be visible. Regular published updates to the inventory will ensure transparency. UKRWI updates are currently published every 3 years. To support the implementation of geological disposal NWS also publishes a quantified description of the Inventory for Geological Disposal every 3 years. In future this will continue to include updated estimates of waste arising from new nuclear build, based on the realistic pipeline of development at the time. The UK and Welsh Governments are committed to providing as much clarity as possible as the position evolves.

Funding to support the activities of the Community Partnership

- 59 Engagement Funding will be provided throughout the siting process. It is intended to support the activities of the Working Group and the Community Partnership.
- 60 Engagement Funding is intended to cover the costs of the Community Partnership's engagement activities, information gathering, and support services that may be required. It will be used to cover the administrative costs associated with the operation of the Community Partnership and disbursement of community investment funding. It will also provide for independent facilitators to work with the Community Partnership and Stakeholder Forum to provide constructive guidance and challenge to make sure all voices are heard and to help reconcile different views where possible.
- 61 The types of engagement and information gathering activities by the Community Partnership provided through engagement funding could include:
- activities through which communities learn about geological disposal;
 - commissioning of reports on specific issues;
 - accessing independent scientific and technical advice;
 - communications activity, such as a stakeholder forum, websites, information leaflets, social media and outreach and information events.
- 62 Engagement Funding will also be available to cover reasonable out-of-pocket expenses for individuals taking part in the work of the Community Partnership (e.g. travel costs for attending meetings). NWS will provide clear advice and guidance on activities where expenses can be covered and how costs will be reimbursed.

Access to scientific and technical information

- 63 It is vital that communities have confidence in the information provided to them about the siting process, including on all relevant scientific and technical issues. NWS will be

the first port of call for information on geological disposal and the siting process. The Community Partnership will also be able to call on the advisory body, CoRWM and regulators.

- 64 The Community Partnership may also commission reports and research on specific topics from independent experts, as part of the agreed programme of activities. Given the range of advice and information available it may be that the Community Partnership receives conflicting statements from different parties. If that is the case the UK Government is making available a mechanism through which the Community Partnership can access independent experts for views on contested and unresolved scientific or technical issues.
- 65 The UK Government has signed a Memorandum of Understanding with a number of Learned Societies, who have agreed a mechanism under which the Community Partnership may approach their members for a view on any scientific or technical questions it may have remaining after discussing them with NWS, the regulators and any research and reports that they may have had commissioned. It is not envisaged that this mechanism will be used on a regular basis. It would be used only where there are contested and unresolved scientific or technical issues that have arisen through the community engagement and one of the parties feels that a further view from a relevant Learned Society member may be helpful in addition to all of the existing information provided by NWS. The mechanism can also be used by NWS.
- 66 The Memorandum of Understanding has been signed by: BEIS (now the Department for Energy Security and Net Zero); the Welsh Government; NWS; the Geological Society of London; the Institute of Environmental Management and Assessment; and the Learned Society of Wales. When called upon a committee will be formed of these Learned Societies for them to identify the appropriate Learned Society (depending on the subject matter) to provide a view. This may be an individual or collective view from a group of people. Where the question falls outside the expertise of the Committee, it may approach a Learned Society which has not signed the Memorandum of Understanding.

Funding for the community in the Search Area and the Potential Host Community

- 67 In addition to the engagement funding explained in paragraphs 59 to 62, there will be Community Investment Funding for the community in the Search Area and the Potential Host Community, and significant additional investment for the community that eventually hosts a GDF.

Community Investment Funding

- 68 A GDF is a multi-billion-pound infrastructure investment and is likely to have a positive effect on the local economy. It is estimated that a GDF will provide jobs and benefits to the economy for more than 100 years. Current estimates are that it will create more than 4,000 jobs within the first 25 years. Work on a GDF will carry on for about 175 years, generating an average of 2,000 jobs in any given year.
- 69 A GDF is also likely to involve major investments in local transport facilities and other infrastructure and create secondary benefits within industry, local education resources and local service industries. However, these benefits will not materialise for a number of years. The Government is therefore making available Community Investment Funding to those communities that form Community Partnerships and participate in the process.
- 70 The funding will be available once the Community Partnership is formed, and a Community Partnership Agreement has been signed. It will continue for as long as the community remains in the siting process and continues to demonstrate engagement through a programme of activities.
- 71 During the early parts of the siting process, the UK Government has committed to make available Community Investment Funding of up to £1 million annually per community. This will rise to up to £2.5 million annually per community where deep borehole investigations take place to assess the geological suitability of a site. Initially there may be several communities interested in participating in the process and these will go through a down selection process to a smaller number of communities that will progress to deep borehole investigation. The Community Investment Funding is provided in addition to the Engagement Funding described in paragraphs 59 to 62.
- 72 Community Investment Funding must be spent in accordance with best practice in delivering value for money as set out in *Managing Public Money*⁹⁷ and in accordance with other legal requirements.
- 73 The funding can be used to pay for projects, schemes or initiatives that:
- improve community well-being, for example improvements to community facilities, enhancement of the quality of life or health and well-being of the community;
 - enhance the natural and built environment including cultural and natural heritage, especially where economic benefits, for example through tourism, can be demonstrated; or
 - provide economic development opportunities, for example employment opportunities, job creation, skills development, education or training,

⁹⁷ *Managing public money*: <https://www.gov.uk/government/publications/managing-public-money>

promotion of local enterprise, long-term economic development or economic diversification.

- 74 The Community Partnership will need to consider these principles along with any local economic vision and socio-economic strategies or plans in order to develop locally specific funding criteria. They may wish to consider funding initiatives that could help them derive greater benefit from hosting a GDF. The Community Investment Funding must not be used to fill shortfalls in local authority budgets.

How will Community Investment Funding be administered?

- 75 It is the Government's preference that the Community Investment Funding should be administered by a third party. This is intended to provide additional transparency and independence from NWS, as the conduit of the funding. The third party that administers the funding must have a legal personality (be a legal 'entity') as it will need to enter into an agreement or agreements with NWS, employ staff to support applicants for funding and enter into agreements to release funding for projects.
- 76 An appropriate existing community or public body could be used to administer the funds if the Community Partnership wishes, provided it has the necessary skills and resources, legal personality and the appointment is compliant with all relevant procurement rules.

How will the community access the Community Investment Funding?

- 77 Community Investment Funding is available for projects, schemes and initiatives within the Search Area and the Potential Host Community when it is identified. Once the Potential Host Community is identified the Community Partnership may decide to prioritise applications within the boundaries of the Potential Host Community.
- 78 The funding is accessed through an open and transparent application process. Applicants will have to set out what they would like the funding for, how it will benefit the community and how it meets any locally agreed criteria. Applications will be submitted to the funding administrator. A Community Investment Panel reviews recommendations made by the funding administrator and decides on applications for funding against the principles set out in paragraph 73 and any additional criteria the Community Partnership has decided to apply.
- 79 The Community Investment Panel will be made up of NWS and other members of the Community Partnership. The Community Partnership may choose to appoint members to the Community Investment Panel through an open process. The funding administrator will provide advice and support to help members of the community apply for funding.
- 80 The funding is available on an annual basis. However, it will still be possible for communities to benefit from projects, schemes, or initiatives that may be spread over a number of years. NWS will provide further guidance on this point.

- 81 If either the community or NWS withdraws from the siting process, the Community Investment Funding will end in that community. Any funding that has been committed within that financial year by the Community Investment Panel will be honoured.

Significant additional investment for the host community

- 82 The UK Government will provide additional investment to the community that is ultimately selected to host the GDF. For the community chosen to host the GDF the significant additional investment will replace the Community Investment Funding. This additional investment will enhance the significant economic benefits that are inherent in hosting a Nationally Significant Infrastructure Project and recognise the long-term commitment from the community toward the national interest. Investment could include improved local education and skills capacity, improved transport infrastructure or improved recreational facilities. This additional investment will be significant and comparable to other international GDF projects.
- 83 The investment is additional to the investment and jobs that a major infrastructure project of this kind will bring to an area. It is also additional to any funding for planning obligations associated with mitigating impacts during development of a GDF, the Community Investment Funding and Engagement Funding provided during the siting process. NWS will work with the Community Partnership to identify a community vision, and what this might mean for the significant additional investment package.

Property compensation

- 84 The Government recognises that communities may be concerned about effects geological disposal infrastructure may have on property values in the local area. Most major infrastructure projects involve making provision for compensation for local residents and property owners who experience an impact on the value of their property as a result of construction of the new infrastructure.
- 85 NWS will undertake work with Community Partnerships in the siting process to assess whether there is likely to be any impact on local property prices and consider whether a property support scheme would be appropriate. Once this assessment work is complete, a decision will be taken, and an appropriate approach will be adopted for each community.

The Potential Host Community

- 86 The Potential Host Community is the community within a geographical area that could potentially host a GDF. It will be identified over time from within the Search Area. The

boundaries of the Potential Host Community need to be defined to determine who will get a say in the Test of Public Support.

87 The Potential Host Community will be defined using district, or unitary council electoral ward boundaries, depending on the administrative arrangements in place in the area. The Potential Host Community would include all of the wards in which the following would be located:

- proposed surface and underground elements of a GDF;
- any associated development (as defined under the Planning Act 2008 in England) and any land required to mitigate impacts;
- transport links/routes from the GDF site to the nearest port, railhead or primary road network (i.e. out to where minor roads meet the nearest A roads);
- direct physical impacts associated with underground investigations, construction and operation of the GDF (identified through environmental impact assessment work carried out to support NWS's engagement with communities and its development consent applications).

88 The Potential Host Community will likely be made up of several wards. Furthermore, all the wards could be contained within one district, county, or unitary authority or could cross local authority boundaries. The geographical boundaries of the Potential Host Community will be agreed by the Community Partnership based on information gathered through the siting process and the criteria above. The boundary of the Potential Host Community will reflect any future changes to electoral ward boundaries that may occur.

89 The Government's view is that only residents in the area that will be directly impacted by the development should have a final say in whether they wish to host a GDF. It will be the people living in the Potential Host Community, through a Test of Public Support, that will decide whether they want to continue with the process for siting a GDF in the area. The Test of Public support is considered further in paragraphs 98 to 106.

90 If the Potential Host Community boundary is near other local authority boundaries, the Community Partnership will need to consider engaging with people within neighbouring local authorities. They would not, however, have a say in the Test of Public Support.

Right of Withdrawal

91 The community can withdraw from the siting process at any point up until a Test of Public Support is taken. The Community Partnership itself might have concerns about continuing further in the process. Or it may judge, through its monitoring of public opinion, that there is no realistic prospect of building support for a GDF within the community.

- 92 Where there are concerns about the siting process, the Community Partnership, including NWS should make all attempts to address these concerns before considering withdrawing from the process. In this situation NWS could fund independent mediation to ensure concerns are heard, understood and all reasonable attempts have been made to address them.
- 93 The decision on whether to withdraw the community will be taken by the relevant principal local authorities on the Community Partnership. In an area with two tiers of local government, and where both tiers of relevant principal local authorities are on the Community Partnership, then they must both agree to invoke the Right of Withdrawal; in these circumstances no single principal local authority will be able to unilaterally invoke the Right of Withdrawal. Separately, if a relevant principal local authority decides to leave the Community Partnership with the result that the people in part of the Search Area (or once identified, the Potential Host Community) are no longer represented by any of the relevant principal local authorities on the Community Partnership, then this area will no longer form part of the Search Area (or Potential Host Community), but the process could continue in the remaining Search Area or Potential Host Community.
- 94 The relevant principal local authorities may decide to seek the views of the community on whether to withdraw from the process. The UK Government considers it would be good practice to consult the community on the question of whether to withdraw.
- 95 If the relevant principal local authorities decide they wish to consult the community, then the decision on how they seek views would be a decision taken by the entire Community Partnership and should be set out in the Community Partnership Agreement. The method chosen to seek views could be either a local referendum, a formal consultation or statistically representative polling. If new methods of consultation emerge in the future the Community Partnership may wish to consider a different approach.
- 96 If the relevant principal local authorities on the Community Partnership decide to seek the views of the community on whether to withdraw from the process it would be residents of the Search Area (as set out in paragraphs 21 to 24) that would participate or the residents of the Potential Host Community (as set out in paragraphs 86 to 90) if it had been identified by the time withdrawal was being considered.
- 97 NWS can also choose to withdraw from the process. For example, NWS could withdraw for technical reasons or other reasons which demonstrated there were no longer prospects of finding a suitable site within either the Search Area or Potential Host Community. NWS could also withdraw in order to prioritise available funds across other communities in the siting process. NWS will be transparent in its considerations to withdraw from a community.

Test of Public Support

- 98 The UK Government's policy is not to impose a GDF on a community, but to seek to build community support through open and transparent engagement in a consent-based siting process. Before NWS seeks regulatory approval and development consent to begin construction of a GDF in a particular community, there must be a Test of Public Support of residents in the Potential Host Community to determine whether the community is willing to host a GDF.
- 99 The relevant principal local authorities on the Community Partnership will take the decision on if or when to hold a Test of Public Support. In order to move to a Test of Public Support all relevant principal local authorities on the Community Partnership must agree. Therefore, in an area with two tiers of local government and where both tiers of relevant principal local authority are on the Community Partnership then they must both agree to a Test of Public Support. As set out in paragraph 44 the Community Partnership as a whole will choose the mechanism for carrying out the Test of Public Support.
- 100 The Test of Public Support is designed to determine a final view from the community as to whether they are willing to host a GDF. If the result of the Test of Public Support is positive, NWS may then proceed with statutory licensing, environmental permitting and development consent application processes to build a GDF. This process is discussed further in the next section. If the result of the Test of Public Support is not positive, NWS will not be able to seek regulatory approval and development consent for a GDF and the siting process will cease in that community.
- 101 The Test of Public Support will be carried out in the Potential Host Community. As with the Right of Withdrawal, there are currently three main mechanisms that could be used for the Test of Public Support: a local referendum, a formal consultation or statistically representative polling. If new methods to test public opinion emerge in the future, the Community Partnership may wish to consider a different approach.
- 102 NWS will produce guidance which will set out in more detail how the Test of Public Support could potentially operate, but it will be for the Community Partnership to decide how it wishes to approach it. Whatever approach is adopted, it is important that the Community Partnership carries out the Test of Public Support in a way that is fair and robust. Funding will be provided to cover the cost of carrying out the Test of Public Support.
- 103 The Test of Public Support would only be taken after extensive community engagement when the community has had time to ask questions, raise any concerns and learn about a GDF. There will be only one opportunity for a Test of Public Support in each Potential Host Community. However, the UK Government expects the Community Partnership to monitor public opinion throughout the process.

- 104 The community's Right of Withdrawal will cease following the Test of Public Support. Once it has been established that the community is willing to host a facility, and NWS, has identified a preferred site, NWS, subject to the Secretary of State's agreement, will proceed with applications for the relevant planning and regulatory consents required for the underground investigations, construction and operation of a GDF.
- 105 The development consent application and the applications that NWS makes for various permits and licences are likely to involve further elements of public participation. This means that members of the Community Partnership, the Potential Host Community and any other member of the public or organisations that have an interest, will have further opportunities to offer their views after a positive Test of Public Support.
- 106 The Working with Communities policy framework covers the process of community engagement up until the Test of Public Support. After this point the Community Partnership may then transition into a liaison group to provide an enduring interface between NWS and the local community during the development consent process, the regulatory permitting and licensing processes and through to the construction, operation and closure of the facility.

Protecting people and the environment

Finding a suitable site

- 107 The safety and security of a GDF is paramount. It will not be built unless NWS can demonstrate it meets the high standards of safety, security and environmental protection required by the Environment Agency and Office for Nuclear Regulation. Demonstrating that a chosen location will meet these high standards is a complex process that could take many years. That is why the UK Government has put in place this framework requiring NWS to work in partnership with communities to build trust and understanding of the development throughout this process before any commitment to host a GDF is required.
- 108 The process to identify and select a site for a GDF requires detailed technical work that could take around 15 to 20 years. The eventual construction and operation of the facility will then run for 100+ years. It will require geological and site suitability investigations. Then deep investigatory boreholes will need to be drilled to carry out further testing of the geological conditions at depth. Applications will need to be made for development consent to carry out deep borehole investigations at potential sites. Alongside this, environmental permits will also be required for borehole investigations.
- 109 Detailed site investigations could take 15 years, depending on how long it takes to understand the underlying geology and be confident that a facility can be designed to safely and securely isolate and contain the waste. When NWS has gathered sufficient information to satisfy itself that a GDF is viable, and the community has indicated that it

is willing to host a facility, NWS will make an application for development consent for the facility itself and any associated development (for example, transport infrastructure). A GDF will also require an environmental permit and a Nuclear Site Licence.

- 110 Depending on the local geology, it is anticipated to take around 10 years to construct the first vaults to take waste. Once operational, construction of the facility will continue in parallel with waste emplacement with new tunnels and vaults being built to receive waste as existing tunnels and vaults are filled. The figure below illustrates the process from the launch of the siting process through to the construction, waste emplacement and closure of a facility.

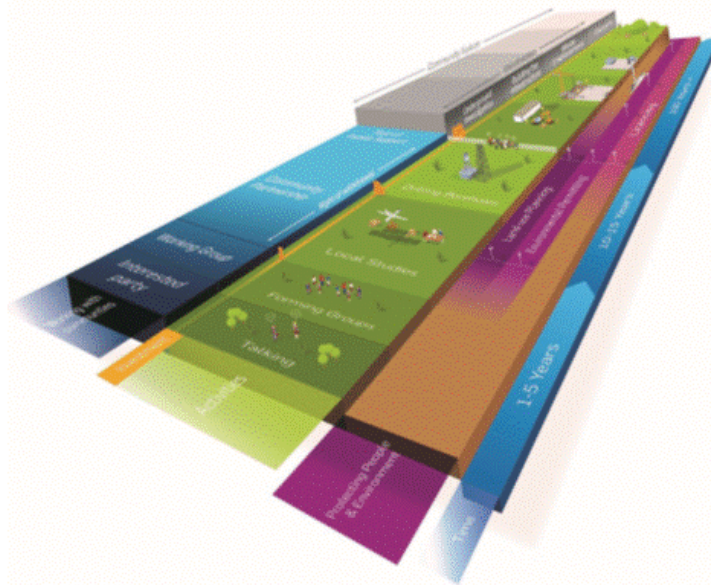


Figure 11. Process for implementing geological disposal.

Safety cases

- 111 NWS will be required to present safety arguments for all aspects of a proposed facility – everything from transporting waste to the facility, to its design, construction and operations, and safety in the long-term following closure. To demonstrate how a GDF meets high standards of safety, security and environmental protection throughout the lifecycle of the facility, NWS will need to develop and maintain a number of safety cases (including operational safety, environmental safety and transport) and security plans, all of which will be subject to scrutiny by the independent regulators.
- 112 NWS has developed a generic Disposal System Safety Case (DSSC),⁹⁸ which is a suite of documents that considers the safety and environmental implications of the geological disposal facility. The suite of documents is designated as a ‘generic’ safety case: it is not site-specific as no site has yet been chosen for a GDF. It provides information on

⁹⁸NWS. Overview of the generic Disposal System Safety Case 2016. Available at: <https://www.gov.uk/government/publications/generic-disposal-system-safety-case-for-a-geological-disposal-facility-overview>

how a GDF could be designed, constructed and operated safely, in compliance with regulatory guidance, in a range of geological environments. This safety case also provides the basis for the design of packaging for waste ready for disposal in a GDF.

- 113 There are three main safety case reports on operational, long-term environmental and transport safety and a series of individual assessments for each of the different safety case reports. The suite of reports includes a detailed specification for the disposal system, the assumed inventory for geological disposal and a description of the illustrative designs of the transport system and the disposal facility, which are the basis of the assessments. Information is also provided on the findings from a comprehensive, ongoing research programme and learning from facilities around the world.

Long-term environmental safety case

- 114 The ultimate safety of any GDF proposal will rest on a range of factors – not just the basic geological setting (e.g. rock type, faults and fractures), but a detailed understanding of features such as the hydrogeology, geochemistry, and how NWS proposes to design, engineer and operate a facility within that setting.
- 115 The main principle of geological disposal of radioactive waste is to put a number of engineered and natural barriers between the wastes and the surface to ensure that the materials are isolated from the surface environment and contained for the time required for the levels of radioactivity associated with them to naturally reduce.
- 116 The aim of the long-term environmental safety case is to demonstrate that the combination of barriers can provide the necessary long-term safety. The barriers include the form of the waste, the waste containers, the buffer material around the containers, and the natural geological barrier.
- 117 The geological barrier is provided by the rock in which the GDF is constructed and the surrounding and overlying rocks. Many rocks in the UK have been stable for many millions of years and so have the ability to isolate the wastes from the surface environment over the long timescales required. In suitable formations deep underground (between 200 - 1000 metres), the GDF is protected from significant climate or landform changes at the surface and any movement from earthquakes is much reduced. The rock in which the GDF is constructed will also protect the engineered components around the waste.

The regulators

- 118 The regulators in England with an important role to play in geological disposal are the Environment Agency, the Office for Nuclear Regulation and the Health and Safety Executive.
- 119 The Environment Agency is responsible for implementing and enforcing environmental protection legislation in England. Its areas of responsibility include environmental

pollution, waste management, flood risk management, water resources, fisheries and conservation. The Environment Agency also regulates disposals of radioactive waste from nuclear licensed sites as well as from other premises that use radioactive substances. Disposals of radioactive waste include radioactive discharges to air and water and disposal of solid waste to land, including disposals at the Low Level Waste Repository as well as geological disposal.

- 120 The Office for Nuclear Regulation licenses nuclear sites and is responsible for regulating safety and security, on licensed nuclear sites in Great Britain. It also regulates the safety of transporting radioactive materials and plays a key role in ensuring that the UK's safeguards obligations are met. The Office for Nuclear Regulation and the Environment Agency work together regulating the management and storage of radioactive waste on nuclear licensed sites to ensure decisions about the management of radioactive waste take into account the disposability of conditioned waste alongside the nuclear safety considerations.
- 121 The Health and Safety Executive will have a role in ensuring the health and safety of work relating to surface-based investigations, for example, where deep boreholes are being drilled to investigate the geology of possible sites.
- 122 Developing a GDF in England will also involve Natural England and, if a coastal site is selected, the Marine Management Organisation. Natural England has specific responsibilities for making sure that England's natural environment, including its land, flora and fauna, freshwater and marine environments, geology and soils, are protected and improved. The Marine Management Organisation's role is to license, regulate and plan marine activities in the seas around England.
- 123 It should be noted that the regulators have no role in making decisions about selecting potential sites for a GDF. The regulators will support this process by explaining how they will regulate a GDF. They will only license or permit a GDF if it can be shown to meet the stringent regulatory requirements for protection of people and the environment.

Regulatory control

- 124 Regulation of the development, operation and eventual closure of a GDF takes place in a staged manner. NWS is not able to progress from one stage to the next without first securing the relevant permissions it needs. The purpose of this staged approach to regulation is to ensure that at all times the development is undertaken safely and securely, and in ways that ensure proper protection of people and the environment, without inadvertently undermining the long-term performance of the facility.
- 125 The formal regulatory process for geological disposal will start when NWS decides there is a need for surface-based investigations such as drilling boreholes. At this stage, NWS will need to apply to the Environment Agency for an environmental permit prior to undertaking any such works. As stated in paragraph 121 the Health and Safety Executive will regulate the health and safety of work relating to borehole investigations.

- 126 Environmental permits granted under the Environmental Permitting (England and Wales) Regulations 2016 allow an operator to carry out certain activities, subject to conditions and limits on discharges to the environment. The regulations cover multiple environmental permitting regimes, including radioactive waste disposal. The Regulations ensure NWS controls discharges to air and water, protects groundwater and surface water, prevents land contamination and manages waste appropriately during the investigation, construction, operation and closure of the facility.
- 127 A GDF will be a nuclear installation under the Nuclear Installations Act 1965. Nuclear sites require a licence from the Office for Nuclear Regulation in order to operate under the Nuclear Installations Act 1965. The Office for Nuclear Regulation will ensure that NWS has met the requirements of its licensing process before construction commences. Once satisfied it will grant a nuclear site licence which will last the operational lifetime of the GDF. Granting the licence does not, in itself, give the licensee permission to begin nuclear safety-related construction on the site, as the Office for Nuclear Regulation will ordinarily use the conditions attached to the licence to specify that the licensee should not commence nuclear safety-related construction without a regulatory Consent. Throughout construction and installation, the Office for Nuclear Regulation may identify further “hold points” where Office for Nuclear Regulation Consent is required before the licensee may proceed from one stage to the next. The Health and Safety Executive’s involvement will cease once the Office for Nuclear Regulation has granted a nuclear site licence for a GDF.
- 128 The regulators work closely together to ensure that their separate regulatory requirements are met in a way that provides the required high standard of protection of people and the environment. It is expected that joint regulation between the Office for Nuclear Regulation and the Environment Agency will continue while the facility is being constructed, while it is operating and during the closure period. At an appropriate time after the facility has closed, when the requirements to protect people and the environment now and in the future have been demonstrated, the site will no longer need to be regulated and regulatory control will end. The figure below illustrates the regulatory process from the launch of the siting process through to the construction, waste emplacement and closure of a facility.



Figure 12. Staged regulation governing GDF

Relationship between the siting process, land-use planning and regulation

- 129 The environmental permitting and nuclear site licensing processes are independent from decision-making relating to site selection and land-use planning. The regulators support the processes for site selection and land-use planning by providing information, advice and comment on matters within their respective remits. Such discussions, between NWS, regulators, communities and others, will be an important part of implementing geological disposal throughout the lifecycle of a GDF.
- 130 The Office for Nuclear Regulation and the Environment Agency must be consulted in any application for development consent for a GDF. The Environment Agency will be consulted on the Environmental Statement(s) and Habitats Regulations Assessment(s) required to support development consent order applications for deep boreholes, and for each subsequent stage in developing a GDF that requires planning consent. The Environment Agency will also be consulted on other matters within its area of responsibility such as environmental permitting, flood risk management and groundwater protection.
- 131 The regulatory process will continue until the regulators accept that the operator no longer needs to hold a nuclear site licence or environmental permit.

13

Appendix 2 Welsh Government working with communities policy for implementing geological disposal

Introduction

- 1 Radioactive waste disposal is a devolved matter - the Welsh Government is responsible for determining the policy for this within Wales. Based on international consensus and independent scientific advice the Welsh Government has adopted a policy for geological disposal as the best and safest long-term management solution for the most hazardous elements of the radioactive waste inventory. This policy is based on a community or communities being willing to host a geological disposal facility (GDF). Geological disposal will provide a permanent and safe solution for the disposal of the most hazardous solid radioactive waste. Some less hazardous solid radioactive waste can be safely disposed of in alternative, highly engineered near surface facilities but a GDF will still be required in order to dispose of the most hazardous radioactive waste.
- 2 Although the Welsh Government has adopted a policy for the geological disposal of the most hazardous radioactive waste this does not mean that a GDF will necessarily be built in Wales or that the Welsh Government will seek to have a GDF built in Wales. Our policy is clear: a GDF will only be built in Wales if a community is willing to host it and a suitable and safe site can be found.
- 3 This appendix details the Welsh Government policy for engaging with communities and the support available for communities which may wish to enter discussions, without prior commitment, about potentially hosting a GDF.
- 4 Safety and protecting human health and the environment are fundamental to delivering geological disposal.
- 5 This appendix outlines the way that the delivery body, Nuclear Waste Services (NWS), will work with parties in Wales who may be interested in finding out more about the potential for hosting a GDF.

Compatibility with the UK Government policy

- 6 The UK Government is funding the GDF programme, so it is important that there are compatible arrangements between Wales and England with regards to key elements e.g. the Right of Withdrawal and the Test of Public Support. To this end we have worked

closely with the Department for Business, Energy and Industrial Strategy (now Department for Energy Security and Net Zero) on the development of policy proposals that, whilst based on the Welsh Government's own public consultation and policy development process, remain sufficiently aligned with UK Government policy to support efficient delivery. Consequently, this appendix follows a similar structure to that used by the UK Government to cover its respective policy and in places uses common text. Compatible arrangements do not necessarily have to be identical, and we recognise that arrangements adopted in Wales will need to reflect policy differences with other parts of the United Kingdom and considerations such as the Welsh language, separate planning arrangements, and the way that local authorities are structured.

Purpose of this appendix

- 7 This appendix provides the policy framework for NWS to work in partnership with communities (and the local authority⁹⁹ or authorities of that community) in Wales that are potentially interested in finding out more about hosting a GDF. Welsh Government policy will only allow a GDF to be constructed in Wales if a community partnership is formed and engaged in discussions, is supported by the relevant local authority(ies) and if a positive Test of Public Support takes place in that community. As every community is different the policy is sufficiently flexible to allow for the needs of different communities but within a structure that ensures any potential host community is treated fairly. This policy sets out the roles of the various parties that will have a role in the siting process.
- 8 The process to find and select a location for a GDF requires detailed technical work that is estimated to take about 15 to 20 years. It is an inter-generational project that will span several political cycles. The construction and operation of the facility will take a further 100+ years.
- 9 Discussions about a proposed location for a GDF can be initiated by anyone or any group of people with an interest in the siting process, and who wish to propose an area for consideration. The interested party may suggest an area of any size; it could be as large as a county, or it could be a small area of land.
- 10 Once NWS and the interested party have had an initial exchange of information and agree the proposal merits further consideration, they must jointly inform all relevant local authorities and open up discussion more widely in the community. NWS will carry out increasingly detailed investigations over a number of years. If there is continuing interest from the community then deep investigative boreholes will need to be drilled to carry out further testing of the geological conditions at depth. NWS will need to apply via the Welsh planning system for planning permission to carry out deep borehole investigations at potential sites and to Natural Resources Wales (NRW) for

⁹⁹ The term local authority is used throughout this appendix – this refers to the 22 unitary authorities in Wales: <https://gov.wales/topics/localgovernment/unitary-authorities/?lang=en>

environmental permits. This is likely to take around 18 months from the application to the decision.

- 11 Detailed site investigations may take up to 15 years, as it is essential to understand the geology and be confident that a facility can be designed to safely and securely isolate and contain the radioactive waste. When NWS has sufficient information to satisfy itself that a GDF is viable and the community has indicated it is willing to host it, NWS will be able to apply for planning permission to build a GDF. A GDF will also require environmental permits from NRW and a nuclear site licence from the Office for Nuclear Regulation.
- 12 NWS anticipates that it will take around 10 years to construct the first vaults within a facility. Alongside construction, there will likely be continued underground investigations and testing of the geology to make sure that the GDF meets the necessary high standards of safety, security and environmental protection. Once the first vaults have been built, construction of the facility and the disposal of the waste will continue in parallel; with new tunnels and vaults being built as existing ones are filled.

Welsh Language

- 13 NWS is aware of the need to ensure Welsh language or bilingual provision where required. NWS is fully aware of the importance of ensuring that discussions can be conducted bilingually. NWS understands the importance of stakeholders having the option to communicate in Welsh or English and will ensure that suitable provision is made or arranged.
- 14 NWS's public-facing material relevant to Wales is already bilingual. NWS appreciates the importance of ensuring that material made available to a potential host community, interested party, or stakeholder in Wales can be provided in both Welsh and English.

Initial Discussions

- 15 Identifying a willing host community with a suitable site for a GDF will be a long process. This is because it will take NWS time to identify, investigate and assess potential sites and make sure that communities that choose to get involved understand what will happen and how it might affect them. The intention is that NWS, as the delivery body, will work in partnership with communities to provide answers to their questions and any concerns, so the community can make an informed decision about whether to support a facility being developed in their area as more information becomes available through NWS's investigations.
- 16 Initially, NWS will raise awareness of geological disposal with the public and invite anyone with an interest to have initial conversations to find out more. Discussions with the delivery body can be initiated by anyone. We anticipate that local authorities, landowners, businesses, community groups or interested individuals may come forward to request further information.
- 17 An interested party could come forward without any specific land in mind but a general ambition to find out if there is potential to develop a GDF within their area. Alternatively interested parties could come forward with a particular site in mind. NWS's investigations to understand whether a potential site could be suitable will extend beyond the area of the proposed site itself. This is because in order to determine whether a site is potentially suitable, NWS will need to understand the surrounding geological environment.
- 18 It is possible that an interested party may suggest a location for a GDF beneath the UK's territorial waters, with the surface facilities being located on land, which could be a feasible option. Government owned land may also be put forward. Where a third party puts forward a potential site that it does not own, the third party and NWS should consider at what point it would be appropriate to include the landowner(s) in further discussions.
- 19 In the case of a local authority coming forward the initial area under consideration could be very large and NWS would seek to understand more about the area proposed, based on existing, readily available information.
- 20 Under all scenarios NWS will undertake initial work to understand whether the land identified has any potential to host a GDF. At this point discussions may remain confidential (subject to disclosure requirements contained in information law legislation, including the Freedom of Information Act 2000 and the Environmental Information Regulations 2004), though they should be made public at the earliest opportunity if the interested party and NWS decide to move forward.
- 21 It may be that NWS decides there is little or no prospect of siting a GDF in the area under consideration, or the interested party, after finding out more from NWS, decides

that they are no longer interested. If, however, both NWS and the interested party want to progress they must inform all relevant local authorities before going public with the proposals and starting a dialogue with the people in the local area.

Forming a Working Group and identifying a Search Area

- 22 In order to begin a conversation with the people in the area, the interested party, NWS, an independent chair and an independent facilitator will form a Working Group. The term 'Working Group' replaces the term 'formative engagement team' used in the consultation as the former is more readily understood by stakeholders.
- 23 This early part of the process is essentially about fact finding, gathering information about the community and providing information to the community about geological disposal. At this stage, it is important to ensure a community has the ability to have fact-finding and exploratory discussions with NWS without having to wait for a relevant local authority to join the Working Group. Therefore, relevant local authority membership on the Working Group is not a requirement, although it would be preferable to have at least one relevant local authority as a member, given their invaluable knowledge and experience of the local area and people. Relevant local authorities will receive financial support from NWS to participate throughout the process including as a member of the Working Group, so that local taxpayers do not incur any additional financial burden. Funding will also be provided to support the Working Group's activities. Funding will also be available to cover reasonable out-of-pocket expenses for individuals taking part in the Working Group (e.g. travel costs for attending meetings). NWS will provide clear advice and guidance on activities where expenses can be covered and how costs will be reimbursed.
- 24 The Working Group may also want to consider whether it would be beneficial to invite representation from a Special Enterprise Zone¹⁰⁰ and community councils.¹⁰¹ Given the potentially large number of community councils in any given area, it may not be feasible for them all to join. It may instead be possible for them to collectively agree to send a representative to join the Working Group.

Defining a Search Area

- 25 An early task for the Working Group will be to identify a Search Area. The Search Area is the geographical area within which NWS will seek to identify potentially suitable sites to host a GDF. Defining the boundaries of the Search Area is important in order to identify appropriate membership for the Community Partnership, including the local authority(ies), and to determine eligibility for Community Investment Funding. Projects, schemes and initiatives within the Search Area may be eligible for this funding. The

¹⁰⁰ <https://businesswales.gov.wales/enterprisezones/>

¹⁰¹ http://www.onevoicewales.org.uk/OVWeb/all_about_councils-7450.aspx

Community Partnership and Community Investment Funding are discussed in paragraphs 33-53 and 67-79 respectively.

- 26 A number of interested parties from different areas of England and Wales may come forward during the siting process, so it is possible there may be a number of Search Areas in the siting process at any given time.
- 27 The Search Area will be derived from the area first put forward for consideration by the interested party and will be defined using community council area boundaries. Some parts of Wales don't have a community council but are part of a community council area. The Search Area will, therefore, encompass all the community council areas within which NWS will be able to consider potential sites.
- 28 For areas which include potential for development under the seabed, the Search Area will comprise only that area on land.
- 29 The geographical boundaries of the Search Area are likely to change as the search for a potential location for the surface and underground facilities progresses and more is understood about the area. The Search Area will be refined over time by the Community Partnership (the Community Partnership is discussed in more detail in paragraphs 33-53). As NWS investigations progress the Community Partnership may identify areas that they want to rule out of consideration or rule in additional areas that they did not at first consider to be part of the Search Area. Any future changes to community council area boundaries will be reflected in the Search Area as it evolves over time.
- 30 Eventually the Search Area will be narrowed down until the Community Partnership identifies a specific site and the community which will be directly affected by the facility being on that site. This will be referred to as the Potential Host Community. The Potential Host Community is discussed in more detail in paragraphs 84-88.

The role of the Working Group

- 31 As it identifies the Search Area the Working Group will start work to understand the local area and any issues or questions the community within it might have, and to identify members of the community who may be interested in working with NWS by joining a Community Partnership. This work will include:
 - gathering information about the different people and organisations in the area who will have an interest or who are likely to be affected;
 - gathering information to understand the existing geographic, social, economic, environmental, cultural (including the Welsh language) and administrative structures of the Search Area;

- understanding the community’s issues, concerns and questions about geological disposal and the process for identifying potential locations for a GDF;
- engaging with the local authority(ies) within the Search Area (if they have not joined the Working Group).

32 NWS will use independent evaluation to review the practical effectiveness of this part of the process to help improve future engagement.

Table 1 Membership of Working Group

Member	Role
Independent Chair	The Chair will ensure that meetings and discussions are run appropriately. Someone to fulfil this role could be procured from an approved list of contractors on behalf of the interested party, or there may be existing community organisational structures in the local area that could be used.
Independent Facilitator	The independent facilitator will aim to ensure that discussions progress in a constructive and informative manner. The facilitator can assist in asking relevant questions and directing conversations to cover the points of interest from the interested parties and other members of the community.
Interested Party	This is the group, organisation, or individual(s) who first started discussions with NWS.
NWS	The delivery body who are engaging with the community – providing information to the community and promoting the benefits of a GDF.
Relevant Local Authorities (optional)	Relevant local authorities are the local authorities that represent all or part of the Search Area. It may be that the local authority is the interested party. If not, they must be informed of discussions and invited to join the Working Group.

The Community Partnership

33 A Community Partnership can only be formed and continue to operate if the local authority(ies) in the Search Area agree to participate. Where there is more than one local authority in the Search Area, they must each be invited to join. Where a relevant local authority decides not to be member, then the community council areas within its boundaries will not form a part of a Search Area or a Potential Host Community. When

identifying prospective members of the Community Partnership, the Working Group will need to consider the types of skills, knowledge and experience that the Community Partnership will need. It may invite particular organisations to join, as well as inviting applications through an open process. It should aim for membership that is reflective of the community in the Search Area. Prospective members of the Community Partnership will be identified by a selection panel of Working Group members. The selection panel must include the independent chair, NWS and any local authority on the Working Group. The process for selecting members must be open and transparent. Prospective members will be appointed onto the Community Partnership upon signing the Community Partnership Agreement (see paragraphs 48-50).

- 34 The Community Partnership will be formed of representatives from community groups, organisations and individuals, which reflect as far as possible the community, any relevant local authority(ies) and NWS. It would be appropriate to invite representation from organisations that have responsibility for managing or regulating large areas of land such as National Park Authorities or the National Trust Wales should the Search Area include land for which they are responsible.
- 35 The Community Partnership should seek to include representation from community councils where they exist. Given the potentially large number of community councils in a Search Area, it may not be feasible for them all to be members of the Community Partnership. It may be possible for community councils to collectively put forward a representative for membership of the Community Partnership to reflect their views. Once the Potential Host Community is identified, there may be scope for individual community councils to be on the Community Partnership. It may also be appropriate to invite representatives of Special Enterprise Zones. Members representing organisations will be responsible for sharing all information discussed and developed through the Community Partnership with the rest of their organisations.
- 36 It will be for each Community Partnership to decide on its number of members and to appoint a chair. However, in order to function effectively it is suggested it should be around 12 people.

The role of the Community Partnership

- 37 The role of the Community Partnership is to:
 - facilitate discussion with the community;
 - identify relevant information that people in the Search Area and Potential Host Community want or need about the siting process;
 - be the key vehicle for community dialogue with NWS;
 - review and refine the boundaries of the Search Area as NWS's investigations progress;
 - identify priorities for community investment funding;

- make recommendations to the local authority(ies) on the Community Partnership on whether to invoke the Right of Withdrawal and if and when to launch a Test of Public Support;
- agree a programme of activities to develop the community’s understanding of the siting process and the potential implications of hosting a GDF;
- develop a community vision and consider the part a GDF may play in that vision;
- monitor public opinion in relation to siting a GDF within the Search Area and the Potential Host Community.

38 There will be a lot of information to share between the community, NWS and other parties (e.g. Natural Resources Wales and the Office for Nuclear Regulation) over a long period of time. The Community Partnership provides a vehicle for sharing that information and to find answers to the questions the community may have about geological disposal, the siting process and how they, as a community, could benefit.

39 Subgroups could be set up to consider some of the issues set out above, for example on communication and engagement, in which people from the community could get involved. We would expect that members of sub-groups would normally be appointed through an open process; however, from time to time the Community Partnership may want to co-opt members with particular expertise.

40 NWS will have a key role to play in the Community Partnership as a source of information and expertise on geological disposal and as the developer working together in partnership with the community. NWS will help the community access information from a range of resources, from its own technical and scientific teams, or from independent parties who can help to answer questions.

Table 2 Membership of the Community Partnership

Member	Role
Community Members	Organisations and individuals to reflect the make-up of the community.
Relevant Local Authorities	Relevant local authorities are those whose community council areas are in the Search Area (and Potential Host Community when it is identified). If a local authority does not agree to join or decides to leave the Community Partnership, then the land within the community council areas in its boundaries will no longer be considered in the siting process. Local authorities on the Community Partnership will take two key decisions. They will have the final say on whether to seek to withdraw the community from

	the siting process and on seeking the community's views on whether it wishes to host a GDF.
NWS	A key member of the partnership as the delivery body of a GDF. They will provide information as required by the Community Partnership and provide updates on their investigations into the feasibility of the area to host the facility. NWS will explain the concept of a GDF and its benefits. They will be responsible for all technical decisions.
Chair	At the beginning this could be the same chair as was used during Working Group discussions, or a new chair could be appointed. They will ensure that the work of the Community Partnership is fair, unbiased and reflects the needs of the community.

Decision-making within the Community Partnership

41 Local authorities play a crucial role in respect of planning, infrastructure development and service provision. For this reason, and to ensure democratic accountability, the Welsh Government has decided that the relevant local authority(ies) on the Community Partnership will take two key decisions. They will have the final say on:

- whether to seek to withdraw the community council areas within its boundaries from the siting process (through invoking the Right of Withdrawal);
- seeking the community's final view on whether it wishes to host a GDF (i.e. proceed to a Test of Public Support).

42 As explained above a Search Area and Potential Host Community could potentially encompass land in more than one local authority. The siting process will not continue within the boundaries of a local authority in Wales if it does not agree to be on the Community Partnership. Any relevant local authority in Wales will be able to bring the siting process to an end in the community council areas within its boundaries by either leaving the Community Partnership or enacting a Right of Withdrawal. The relevant local authority(ies) can either take the decision to withdraw the community from the process themselves or seek the community(ies)'s views on this directly.

43 Although the relevant local authority(ies) will have the final say in relation to these two key decisions, they should involve other members of the Community Partnership in discussions on whether they intend to seek to withdraw the community from the process and the appropriate time to launch a Test of Public Support. Equally the other members of the Community Partnership should be able to make recommendations to the local authority(ies) on the Community Partnership on invoking the Right of Withdrawal and the timing of the Test of Public Support.

- 44 The relevant local authority(ies) must, however, seek a final view from the community, through a Test of Public Support, on whether it is willing to host a GDF before NWS seeks the necessary regulatory approvals and planning permission for the construction and operation of a GDF. The Test of Public Support can only take place within community council areas within a local authority if that local authority is on the Community Partnership and has agreed to it being held.
- 45 If the relevant local authority(ies) on the Community Partnership agree that it is an appropriate time to seek the community's view on whether or not it wishes to host a GDF then the method for taking that Test of Public Support will be decided by the Community Partnership as a whole. The Community Partnership's view on what mechanisms could be used for this should be set out in the Community Partnership Agreement, which can be updated as views on this develop over time. The Community Partnership Agreement is discussed in more detail at paragraphs 48-50.
- 46 If the relevant local authority(ies) agree that the decision to withdraw the community from the process should involve the community directly then the method for seeking the community's view on possible withdrawal from the process will be considered by the Community Partnership as a whole. The Community Partnership's view on what mechanism could be used for this should be set out in the Community Partnership Agreement, which can be updated as views on this develop over time. The Right of Withdrawal and the final Test of Public Support are discussed in more detail in paragraphs 89-95 and 96-104 respectively.
- 47 All other decisions, such as the priorities for community investment funding, or agreeing the programme of activities, should be taken by the Community Partnership. It will be for the Community Partnership to decide how it takes these decisions, for instance whether unanimity is required, or a simple majority and what constitutes a quorum. This should be set out in the Community Partnership Agreement.

The Community Partnership Agreement

- 48 The prospective members of the Community Partnership will develop and sign a Community Partnership Agreement. Once the Community Partnership Agreement is in place Community Investment Funding can be made available. (Community Investment Funding is discussed further in paragraphs 67-79).
- 49 The Community Partnership Agreement will set out the principles of how the members of the Community Partnership will work together and their roles and responsibilities. It should include terms of reference to clarify how the Community Partnership operates, how it will take decisions, settle disputes and an outline programme of activities and how progress in completing the activities will be monitored as set out in paragraphs 51-53. NWS will provide a template Community Partnership Agreement and further guidance.

50 In the first instance, the Community Partnership Agreement will cover the period immediately following the establishment of the Community Partnership. As the siting process progresses, the Community Partnership Agreement may evolve and will be subject to review, for example, to reflect any change in geographical scope of the Search Area and therefore membership.

Community engagement activities

51 The Community Partnership will need to engage with the community over a long period of time. Getting people actively involved on any issue can be challenging and it is possible that vocal minorities can dominate debate. It will therefore be important to open up community participation through a wide number of channels.

52 One way of doing this could be to hold open public meetings of a Community Stakeholder Forum, inviting people from the Search Area and neighbouring local authority areas. The Forum could meet at regular intervals, and could also exist online, giving the Community Partnership the opportunity to report on activities it has undertaken and the outcome of those activities. It would give members of the community the opportunity to raise questions and issues that they want addressed, which could then be fed into the programme of activities. It will be important that all interactions between the Community Partnership and people in the community are made public.

53 The Community Partnership could also consider engagement through social media, dedicated outreach work with particular groups (for example engagement with young people through schools and colleges) and using existing networks to reach out to people. It will also be important to consider how to address diversity and accessibility issues so that people within the Search Area or Potential Host Community are not excluded from participating.

Communicating the inventory for disposal

54 An important issue that will need to be communicated to the community will be the inventory for disposal. As set out in chapter 8 paragraph 8.63 the inventory for disposal comprises a number of categories of waste and material. It is not anticipated that those categories of waste and material will change significantly. If, however, the list of waste and materials were to change significantly it would need to be discussed with the Potential Host Community. A process for agreeing any future material changes to the categories of waste to be disposed of in a GDF would need to be agreed before the Test of Public Support.

55 In April 2022 the UK Government set out an ambition in its British Energy Security Strategy¹⁰² to increase its plans for deployment of nuclear power to up to 24 gigawatts

¹⁰² British Energy Security Strategy. Available at: <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

through large-scale nuclear power stations, small modular reactors (SMRs) and advanced modular reactors (AMRs).

- 56 The waste from a new build programme of large-scale nuclear power stations and SMRs, comprising spent fuel (yet to be declared waste) and ILW not suitable for disposal in near surface facilities will be disposed of in a GDF. Waste from any future AMRs will also be disposed of in a GDF if it is suitable to do so. It would need to undergo an Assessment of Disposability by NWS in support of the regulatory and permitting processes of the Office for Nuclear Regulation and relevant environmental agency before a final decision can be taken on whether it will be disposed of in a GDF.
- 57 The Welsh Government recognises that communities considering hosting a GDF will want to have as clear as possible an understanding of the inventory for disposal before they take a Test of Public Support. This information will also be needed by NWS for its application for the relevant planning consent for a GDF. Changes in the UK Radioactive Waste Inventory (UKRWI), and hence the Inventory for Geological Disposal, will occur as UK nuclear sites evolve and the decommissioning programme matures. For planning purposes, however, NWS will factor the waste from the new nuclear ambition of up to 24 gigawatts into their planning for a GDF as the siting process progresses.
- 58 The estimated quantity and the types of waste to be consigned to a GDF needs to be visible. Regular published updates to the inventory will ensure transparency. UKRWI updates are currently published every 3 years. To support the implementation of geological disposal NWS also publishes a quantified description of the Inventory for Geological Disposal every 3 years. In future this will continue to include updated estimates of waste arising from new nuclear build, based on the realistic pipeline of development at the time. The UK and Welsh Governments are committed to providing as much clarity as possible as the position evolves going forward.

Funding to support the activities of the Community Partnership

- 59 Engagement Funding will be provided by NWS throughout the process. It is intended to support the activities of the Working Group and the Community Partnership.
- 60 Engagement funding is intended to cover the costs of the Community Partnership's engagement activities, information gathering, and support services that may be required. It will be used to cover the administrative costs associated with the operation of the Community Partnership and disbursement of community investment funding. It will also provide for independent facilitators to work with the Community Partnership and Stakeholder Forum to provide constructive guidance and challenge to make sure all voices are heard and to help reconcile different views where possible.
- 61 The types of engagement and information gathering activities by the Community Partnership provided through engagement funding could include:

- activities through which communities learn about geological disposal;
- commissioning of reports on specific issues;
- accessing independent scientific and technical advice;
- communications activity, such as a Stakeholder Forum, websites, information leaflets, social media and outreach and information events.

62 Relevant local authorities will receive financial support from NWS to participate throughout the process including as a member of the Community Partnership, so that local taxpayers do not incur any additional financial burden. Engagement Funding will also be available to cover reasonable out-of-pocket expenses for individuals taking part in the work of the Community Partnership (e.g. travel costs for attending meetings). NWS will provide clear advice and guidance on activities where expenses can be covered and how costs will be reimbursed.

Access to scientific and technical information

63 It is vital that communities have confidence in the information provided to them about the siting process, including on all relevant scientific and technical issues. NWS will be the first port of call for information on geological disposal and the siting process. The Community Partnership will also be able to call on the Government's independent advisory body, CoRWM and regulators.

64 The Community Partnership may also commission reports and research on specific topics from independent experts, as part of the agreed programme of activities. Given the range of advice and information available it may be that the Community Partnership receives conflicting statements from different parties. If that is the case the Government is making available a mechanism through which the Community Partnership can access independent experts for views on contested and unresolved scientific or technical issues.

65 The Welsh Government and BEIS (now Department for Energy Security and Net Zero) have signed a Memorandum of Understanding with a number of Learned Societies, who have agreed a mechanism under which the Community Partnership may approach their members for a view on contested and unresolved scientific or technical questions it may have remaining after discussing them with NWS, the regulators and any research and reports that they may have had commissioned. It is not envisaged that this mechanism will be used on a regular basis, only where there are contested and unresolved scientific or technical issues that have arisen through the community engagement and one of the parties feels that a further view from a relevant Learned Society member may be helpful in addition to all of the existing information provided by NWS. The mechanism can also be used by NWS.

66 The Memorandum of Understanding has been signed by: BEIS (now Department for Energy Security and Net Zero; the Welsh Government; NWS; the Geological Society of London; the Institute of Environmental Management and Assessment; and the Learned Society of Wales. A committee will be formed of these Learned Societies for them to identify the appropriate expert (depending on the subject matter) who will be asked to provide a view. This may be an individual or collective view from a group of people. Where the question falls outside the expertise of the Committee, it may approach a Learned Society which has not signed the Memorandum of Understanding.

Funding for the community in the Search Area and the Potential Host Community

67 In addition to the Engagement Funding explained in paragraphs 59-62 there will be Community Investment Funding for communities that participate in the process i.e. communities in the Search Area and the Potential Host Community, and significant additional investment for the community that eventually hosts a GDF.

Community Investment Funding

68 A GDF is a multi-billion-pound infrastructure investment and is likely to have a positive effect on the local economy. It is estimated that a GDF will provide jobs and benefits to the economy for more than 100 years. Current estimates are it will create more than 4,000 jobs within the first 25 years. Work on a GDF will carry on for about 175 years generating an average of 2000 jobs in any given year. In addition, it is also likely to involve major investments in local transport facilities and other infrastructure and create secondary benefits within industry, local education resources and local service industries. However, these benefits will not materialise for a number of years. The UK Government is therefore making available Community Investment Funding to those communities that form Community Partnerships and participate in the siting process.

69 The funding will be available once the Community Partnership is formed, and a Community Partnership Agreement has been signed. It will continue for as long as the community remains in the siting process and continues to demonstrate engagement through a programme of activities.

70 During the early parts of the siting process, the UK Government has committed to make available Community Investment Funding of up to £1 million per community per year. This will rise to up to £2.5 million per community, per year for communities where deep borehole investigations take place to assess the geological suitability of a site. Initially there may be several communities interested in participating in the process and these will go through a down selection process to a smaller number of communities that will progress to deep borehole investigation. The funding will be provided by NWS. It must not be used to fill shortfalls in local authority budgets. The Community Investment

Funding is provided in addition to the Engagement Funding described above in paragraphs 59-62.

- 71 Community Investment Funding must be spent in accordance with best practice in delivering value for money as set out in the Managing Public Money guidance issued by HM Treasury and in accordance with other legal requirements. NWS will need to ensure that the funding is distributed in accordance with the requirements of regularity and propriety set out in the guidance. Regularity requires that the use of public money is compliant with relevant legislation and delegated authorities. Propriety relates to meeting the high standards of public conduct, robust governance requirements and parliamentary expectations (in particular, transparency).
- 72 The UK Government has developed some high-level principles for the use of community investment funding. The funding can be used to pay for projects, schemes or initiatives that:
- improve community well-being, for example improvements to community facilities, enhancement of the quality of life or health and well-being of the community;
 - enhance the natural and built environment including cultural and natural heritage, especially where economic benefits, for example through tourism, can be demonstrated; and
 - provide economic development opportunities, for example employment opportunities, job creation, skills development, education or training, promotion of local enterprise, long-term economic development or economic diversification.

73 The Community Partnership will need to consider these principles along with any local economic vision, socio-economic strategies or plans in order to develop locally specific funding criteria. They may wish to consider funding initiatives that could help them derive greater benefit from hosting a GDF.

How will Community Investment Funding be administered?

- 74 The Welsh Government consider it advisable that the Community Investment Funding should be administered by a body separate to NWS. This is intended to provide additional transparency and independence from NWS, as the conduit of the funding. The body that administers the funding must have a legal personality (be a legal 'entity') as it will need to enter into an agreement or agreements with NWS, employ staff to support applicants for funding and enter into agreements to release funding for projects.
- 75 An appropriate existing community or public body could be used to administer the funds if the Community Partnership wishes, provided it has the necessary skills and resources, a legal personality and the appointment is compliant with all relevant procurement rules.

How will the community access the Community Investment Funding?

- 76 Community Investment Funding will be available for projects, schemes and initiatives within the Search Area and the Potential Host Community when it is identified. Once the Potential Host Community is identified the Community Partnership may decide to prioritise applications within the boundaries of the Potential Host Community.
- 77 The funding will be accessed through an open and transparent application process. Applicants will have to set out what they would like the funding for, how it will benefit the community and how it meets any locally agreed criteria. Applications would be submitted to the fund administrator. A Community Investment Panel would review recommendations made by the funding administrator and decide on applications for funding against the principles set out in paragraph 72 and any additional criteria the Community Partnership has decided to apply. The Community Investment Panel will be made up of NWS and other members of the Community Partnership. The Community Partnership may choose to appoint members to the Community Investment Panel through an open process. The funding administrator will provide advice and support to help members of the community apply for funding.
- 78 The UK Government, who will provide the funding via NWS, recognise that some projects, schemes, or initiatives may be spread over a number of years. Although the funding will be available on an annual basis this should not be a barrier to funding multi-year projects. NWS will provide further guidance on this point.
- 79 If either the community or NWS withdraws from the siting process the community investment funding will end in that community. Any funding that has been committed within that financial year by the Community Investment Panel will be honoured.

Significant Additional Investment for the host community

- 80 The UK Government will provide additional investment to the community that is ultimately selected to host a GDF. For the community chosen to host the GDF the significant additional investment will replace the Community Investment Funding. This additional investment will enhance the significant economic benefits that are inherent in hosting a major infrastructure project and recognise the long-term commitment from the community to the national interest. Investment could include improved local education and skills capacity, improved transport infrastructure, or improved recreational facilities. This additional investment will be significant – comparable to other international GDF projects.
- 81 The investment is additional to the investment and jobs that a major infrastructure project of this kind will bring to an area. It is also additional to any funding for planning obligations associated with mitigating impacts during development of a GDF, the Community Investment Funding and Engagement Funding provided during the siting

process. NWS will work with the Community Partnership to identify a community vision, and what this might mean for the significant additional investment package.

Property compensation

82 The UK Government and Welsh Government recognise that communities may be concerned about effects geological disposal infrastructure may have on property values in the local area. Most major infrastructure projects involve making provision for compensation for local residents and property owners who experience an impact on the value of their property as a result of construction of the new infrastructure.

83 NWS will undertake work with Community Partnerships in the siting process to assess whether there is likely to be any impact on local property prices and consider whether a property support scheme would be appropriate. Once this assessment work is complete, a decision will be taken, and an appropriate approach will be adopted for each community.

The Potential Host Community

84 The Potential Host Community is the community within the geographical area that could potentially host a GDF. It will be identified over time from within the Search Area. The boundaries of the Potential Host Community need to be defined to determine who will get a say in the Test of Public Support.

85 The Potential Host Community will be defined in Wales by community council areas. The Potential Host Community will include all of the community council areas in which the following are located:

- proposed surface and underground elements of a GDF; any associated development which is relevant to the GDF facility, and any land required to mitigate impacts;
- transport links/routes from the GDF site to the nearest port, railhead or primary road network (i.e. out to where minor roads meet the nearest A roads);
- direct physical impacts associated with underground investigations, construction and operation of the geological disposal facility (identified through environmental impact assessment work carried out to support NWS's engagement with communities and its planning permission applications).

86 The Potential Host Community will likely be made up of several community council areas. Furthermore, all the community council areas could be contained within one local authority or could cross local authority boundaries. The geographical boundaries of the

Potential Host Community will be agreed by the Community Partnership based on information gathered through the siting process and the criteria above.

- 87 The Welsh and UK Government's view is that only residents in the area that will be directly impacted by the development should have a final say in whether they wish to host a GDF. It will be the people living in the Potential Host Community, through a Test of Public Support that will decide whether they want NWS to continue with the process for siting a GDF in the area. The Test of Public Support is considered further in paragraphs 96-104.
- 88 If the Potential Host Community boundary is near other local authority boundaries, the Community Partnership will need to consider engaging with people within neighbouring local authorities. They would not, however, have a say in the Test of Public Support.

Right of Withdrawal

- 89 The community can withdraw from the process at any point up until a Test of Public Support is taken.
- 90 The Community Partnership itself might have concerns about continuing further in the process. Or it may judge, through its monitoring of public opinion, that there is no realistic prospect of building support for a GDF within the community.
- 91 Where either the Community Partnership or the community have concerns about the siting process, the Community Partnership, including NWS should make all attempts to address these concerns before considering withdrawing from the process. In this situation NWS could fund independent mediation to ensure concerns are heard, understood and attempts have been made to address them.
- 92 The decision on whether to withdraw the community will be taken by relevant local authority(ies) on the Community Partnership. Regardless of how many local authorities are on the Community Partnership a relevant local authority can remove the community council areas within its boundaries from the siting process by leaving the Community Partnership or enacting the Right of Withdrawal.
- 93 The relevant local authority(ies) may decide to seek the views of the community on whether to withdraw from the process. The Welsh Government considers it would be best practice to consult the community on the question of whether to withdraw. If the relevant local authority(ies) decide they wish to consult the community then the decision on how they seek views would be a decision taken by the entire Community Partnership and should be set out in the Community Agreement. The method chosen to seek views could be either a local referendum, a formal consultation or statistically representative polling. If new methods of consultation emerge in the future the Community Partnership may wish to consider a different approach.

- 94 If the relevant local authority(ies) decides to seek the views of the community on whether to withdraw from the process it would be residents of the Search Area (as set out in paragraphs 25-30) that would participate or the residents of the Potential Host Community (as set out in paragraphs 84-88) if it had been identified by the time withdrawal was being considered.
- 95 NWS can also withdraw from the process. It could withdraw for technical reasons or other reasons which demonstrated there were no longer prospects of finding a suitable site within either the Search Area or Potential Host Community. NWS could also withdraw in order to prioritise available funds across other communities in the siting process. NWS will be transparent in its considerations to withdraw from a community.

Test of Public Support

- 96 Before NWS seeks regulatory approval and planning permission to site a GDF in a particular community, there must be a Test of Public Support to determine whether the community is willing to host a GDF.
- 97 The relevant local authority, or authorities where there is more than one, on the Community Partnership will take the decision on if or when to hold a Test of Public Support. A relevant local authority must agree that the Test of Public Support can take place in order for the community council areas within its boundaries to be included in the test. As set out in paragraph 45 the Community Partnership will take a view on what mechanisms could be used for the Test of Public Support.
- 98 The Test of Public Support is designed to determine a final view from the community as to whether they are willing to host a GDF within their community. If the result of the Test of Public Support is positive, NWS may then proceed with statutory licensing, environmental permitting and planning permission application processes to build a GDF. Without a positive Test of Public Support NWS will not be able to seek regulatory approval and planning permission for a GDF and the siting process will end in that community.
- 99 The Test of Public Support will be carried out in the Potential Host Community. As with the Right of Withdrawal, there are currently three main mechanisms that could be used for the Test of Public Support: a local referendum, a formal consultation or statistically representative polling. If new methods to test public opinion emerge in the future, the Community Partnership may wish to consider a different approach.
- 100 NWS will produce guidance which will set out in more detail how the Test of Public Support could potentially operate, but it will be for the Community Partnership to decide how it wishes to approach it. Whatever approach is adopted, it is important that the Community Partnership carries out the Test of Public Support in a way that is fair and robust. The cost of carrying out the Test of Public Support will be funded by NWS.

- 101 The Test of Public Support would only be taken after extensive community engagement when the community has had time to ask questions, raise any concerns and learn about a GDF. There will be only one opportunity for a Test of Public Support in each Potential Host Community. However, the Welsh Government expects the Community Partnership to monitor public opinion throughout the process and as discussed in paragraphs 89-95 the community may be withdrawn from the process at any time.
- 102 The Right of Withdrawal will cease following the Test of Public Support once it has been established that the community is willing to host a facility, and NWS, has identified a preferred site. NWS, subject to the Secretary of State's agreement, will proceed with applications for the relevant planning and regulatory consents required for the construction and operation of a GDF.
- 103 The planning permission application and the applications that NWS makes for various permits and licenses are likely to involve further elements of public participation. This means that members of the Community Partnership, the Potential Host Community and any other member of the public or organisations that have an interest, will have further opportunities to offer their views after a positive Test of Public Support.
- 104 The Working with Communities framework covers the process of community engagement up until the Test of Public Support. After this point the Community Partnership may then transition into a liaison group to provide an enduring interface between NWS and the local community during the planning permission process, the regulatory permitting and licensing processes and through to the construction, operation and closure of the facility.

14

Appendix 3

Radiological protection standards and their application to radioactive substances activities

- 1 The UK Government and devolved administrations have taken account of international^{103, 104} and national¹⁰⁵ recommendations in setting radiological protection standards for the management of radioactive substances. This ensures that individual members of the public are not exposed to unacceptable risks.
- 2 These standards apply only to exposure of the public; they do not apply to occupational or medical exposures. They apply to all radioactive substances activities authorised¹⁰⁶ by the UK's regulators.
- 3 These activities range from the dispensing of radiopharmaceuticals in hospitals, the inspection of welds in engineering, the operation of nuclear sites, to the management of radioactive waste at disposal sites.
- 4 We also require operators to apply the optimisation principle at all stages of their activities involving radioactive substances, so that radiation exposures and the likelihood of them occurring are kept as low as reasonably achievable, taking into account environmental, economic and social factors.

¹⁰³ International Commission on Radiological Protection (2007) The 2007 Recommendations of the International Commission on Radiological Protection. ICRP Publication 103. Available at:

<https://www.icrp.org/publication.asp?id=ICRP%20Publication%20103>

¹⁰⁴ International Atomic Energy Agency (2014) Radiation protection and safety of radiation sources: International Basic Safety Standards. IAEA General Safety Requirements Part 3. Available at:

<https://www.iaea.org/publications/8930/radiation-protection-and-safety-of-radiation-sources-international-basic-safety-standards>

¹⁰⁵ Health Protection Agency (2009) Application of the 2007 recommendations of the ICRP to the UK. Advice from the HPA. HPA RCE-12. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/335097/RCE-12_for_website_v2.pdf. Note: The Health Protections Agency's functions have now moved to [UK Health Security Agency](#).

¹⁰⁶ "Authorised" is being used in a broad sense to cover any form of licence, permit or registration issued by a regulator, or notification, exemption or general binding rule complied with by an operator.

- 5 These standards and the principle of optimisation should be applied by operators at the planning and authorisation application stages for any radioactive substances activity, and by regulators before they issue or accept the surrender of any authorisation.

Public annual dose limits from all controlled and authorised sources of radiation

- 6 We specify a 1 mSv limit on doses that can be received in a year by any member of the public from all controlled and authorised sources of radiation. We also specify a dose limit of 15 mSv in a year for exposures of the lens of the eye and 50 mSv for exposures to the skin (averaged over 1 cm²). These radiological protection standards are defined in legislation.^{107 108 109}

Normal operation during authorisation of all radioactive substances activities

- 7 To ensure the annual dose limits can be met, operators must be appropriately authorised for the radioactive substances activities they wish to undertake. To restrict radiation exposure from the normal operation of a defined source (in this context, a facility, or group of facilities which are considered as a single unit for the purpose of optimisation), and to place a ceiling on optimised exposures, we require the regulators to have regard to dose constraints when authorising radioactive substances activities.
- 8 While the appropriate authorisations for a radioactive substances activity are in place, we require that exposures to the public from any single authorised source should not exceed a dose constraint of 0.3 millisieverts (mSv) per year. This constraint applies to all exposures due to operational discharges to the air or water. It also includes direct radiation exposures from facilities on nuclear sites or radioactive waste disposal facilities.
- 9 We also require that the aggregated exposures to the public due to planned discharges from a number of authorised sources of radiation at a single location should not exceed the site related dose constraint of 0.5 millisieverts (mSv) per year. This constraint applies to the combined exposures from, for example, two or more neighbouring but separately authorised, nuclear sites or a number of separately authorised sources on the same site.

¹⁰⁷ The Environmental Permitting (England and Wales) Regulations 2016. Available at <https://www.legislation.gov.uk/uksi/2016/1154/contents/made>

¹⁰⁸ The Environmental Authorisations (Scotland) Regulations 2018. Available at <https://www.sepa.org.uk/regulations/how-we-regulate/environmental-authorisations-scotland-regulations-2018/>

¹⁰⁹ The Ionising Radiations Regulations 2017. Available at <https://www.legislation.gov.uk/uksi/2017/1075/contents/made>

10 These dose constraints continue to apply to radioactive waste disposal sites (including landfill sites and specialised radioactive disposal facilities) and to decommissioning nuclear sites during the period after radioactive substances activities, such as waste disposal or clean-up, have ceased, and while an environmental permit remains in place. During this period, monitoring and surveillance at the sites must continue to ensure the protection of people and the environment, until the relevant environment agency has agreed the operators' permit can be surrendered.

Disposal sites and decommissioned nuclear sites after surrender of environmental permit

11 When an operator eventually surrenders the permit for a closed disposal site or a decommissioned and cleaned-up nuclear site, some radioactive waste or contamination may remain in the ground. This means that there is the potential for the exposure of people and the environment to radioactive substances in the future.

12 We require that the risks from such potential exposures, which may or may not happen, satisfy additional criteria, which we have established to protect future generations. Before an operator can be allowed to surrender their permit, they must assess the residual risks to people and the environment, and they must demonstrate to the relevant environment agency that the public are protected from unacceptable risks.

13 In their planning for the eventual surrender of the environmental permit for their site, operators must take all reasonable and practicable measures to protect people from potential exposures. We therefore require that after permit surrender the risks to the public of a fatal cancer or heritable defect do not exceed a risk constraint of one in one hundred thousand per year.^{110,111}

14 Furthermore, to account for uncertainties inherent in exposure projections far into the future, operators should seek to achieve a risk guidance level of one in one million per year. This will give confidence that the risk constraint in paragraph 13 above can be met.

¹¹⁰ Health Protection Agency (2009) Application of the 2007 recommendations of the ICRP to the UK. Advice from the HPA. HPA RCE-12. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/335097/RCE-12_for_website_v2.pdf Note: The Health Protections Agency's functions have now moved to [UK Health Security Agency](#).

¹¹¹ Health Protection Agency (2009) Radiological Protection Objectives for the Land-based Disposal of Solid Radioactive Wastes: Advice from the Health Protection Agency. HPA RCE-8. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/335110/RCE-8_for_web_v2.pdf Note: The Health Protections Agency's functions have now moved to [UK Health Security Agency](#).

- 15 This risk guidance level applies to all potential exposures that might occur due to processes and events affecting a site, during its expected natural evolution after permit surrender.
- 16 However, the risk guidance level cannot be applied to all potential exposures.^{112,113} Such potential exposures could include people coming into direct contact with radioactive substances if external influences adversely affected the protective measures at a site.
- 17 Where the risk guidance level cannot be applied, operators must ensure that, after permit surrender, potential exposures do not exceed a dose guidance range of around 3 mSv per year (for exposures lasting more than one year) to 20 mSv (for exposures of one year or less).¹¹⁴
- 18 The dose guidance range restricts the consequences to people if intrusion or disruption were to impair the measures an operator has taken to contain radioactive substances remaining in the near-surface environment at a site. It ensures that, in the event of the unexpected, future generations will be protected to the same levels that are considered acceptable under similar circumstances now.^{115,116}
- 19 For a geological disposal facility, the potential for inadvertent human intrusion has already been much reduced by placing the waste at depth. It is therefore not useful to specify a dose guidance range for a GDF. However, it is still important to consider the potential for intrusion and to demonstrate that protection has been optimised.

¹¹² International Commission on Radiological Protection (1998) Radiation Protection Recommendations as Applied to the Disposal of Long-lived Solid Radioactive Waste. ICRP Publication 81. Available at: <https://www.icrp.org/publication.asp?id=ICRP%20Publication%2081>

¹¹³ International Atomic Energy Agency (2011) Disposal of radioactive waste: International Basic Safety Standards. IAEA Safety Standards Series No. SSR-5. Available at: https://www-pub.iaea.org/MTCD/publications/PDF/Pub1449_web.pdf

¹¹⁴ Health Protection Agency (2009) Radiological Protection Objectives for the Land-based Disposal of Solid Radioactive Wastes: Advice from the Health Protection Agency. HPA RCE-8. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/335110/RCE-8_for_web_v2.pdf Note: The Health Protection Agency's functions have now moved to [UK Health Security Agency](#).

¹¹⁵ International Commission on Radiological Protection (1998) Radiation Protection Recommendations as Applied to the Disposal of Long-lived Solid Radioactive Waste. ICRP Publication 81. Available at: <https://www.icrp.org/publication.asp?id=ICRP%20Publication%2081>

¹¹⁶ International Atomic Energy Agency (2011) Disposal of radioactive waste: International Basic Safety Standards. IAEA Safety Standards Series No. SSR-5. Available at: https://www-pub.iaea.org/MTCD/publications/PDF/Pub1449_web.pdf

Glossary

ALARP - “As Low As Reasonably Practicable”. The level to which risk is expected to be controlled. ALARP involves weighing a risk against the trouble, time and money to control it.

Becquerel (Bq) - The standard international unit of radioactivity equal to one radioactive decay per second.

Best Available Techniques (BAT) - The available techniques which are the best for preventing or minimising emissions and impacts on the environment. In England and Wales, BAT has replaced Best Practical Means (BPM) and Best Practicable Environmental Option (BPEO) for the regulation of radioactive discharges. BPM and BPEO continue to be used in Scotland and Northern Ireland.

Best Practicable Means (BPM) - Level of management and engineering control that minimises, as far as practicable, the release of radioactivity to the environment whilst taking account of a wider range of factors, including cost-effectiveness, technological status, operational safety, and social and environmental factors.

Best Practicable Environment Option (BPEO) - An option decided following a systematic and consultative decision-making procedure which emphasises the protection and conservation of the environment across land, air, and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole, at acceptable cost, in the long term as well as in the short term.

Decay storage - Interim storage for the purposes of taking advantage of radioactive decay.

Development Consent Order (DCO) - The planning consent given by the relevant Secretary of State for a nationally significant infrastructure project.

Disposal - In the context of solid waste, disposal is the emplacement of waste in a suitable facility without intent to retrieve it at a later date.

Environmental permit or authorisation - Permission granted by the relevant environmental regulator in England or Wales to allow an operator to carry out certain activities, subject to conditions and limits on discharges to the environment. In Scotland, the equivalent is referred to as an environmental authorisation.

Graded approach - Graded approach is the term used by the IAEA to describe proportionate regulation. It is a structured method by which the stringency of regulatory control is commensurate with the risk associated with a loss of control.

Ionising radiation - Any type of particle or electromagnetic wave that carries enough energy to directly or indirectly remove electrons from an atom (i.e. ‘ionise’ the atom).

National Policy Statement - A statement that provides guidance to the Planning Inspectorate and Secretary of State on assessing and deciding on development consent applications for a particular type of infrastructure.

Nuclear materials - Nuclear materials principally include uranium and plutonium.

Potential Host Community - The Potential Host Community is the community within a geographical area that could potentially host a Geological Disposal Facility (GDF).

Proximity principle - This principle requires that waste should generally be dealt with as near to the place of production as possible.

Radioactive materials - Materials that produce ionising radiation not including radioactive waste.

Radioactive source - Radioactive material which is used for the purpose of using its radioactivity

Radioactive substances - The term includes radioactive materials that are in use, as well as radioactive waste.

Radioactive waste - Any material that is either radioactive itself or is contaminated by radioactivity above certain thresholds defined in legislation and which meets the definition of waste in that legislation.

Radionuclides - An unstable form of a chemical element that radioactively decays, resulting in the emission of nuclear radiation. Also called a radioisotope.

Regulatory requirements - Requirements set out in published guidance on the standards that a developer or operator would need to meet to be granted an environmental permit or a nuclear site licence. Regulatory requirements are also included as conditions in environmental permits and a nuclear site licence; it is a legal requirement for a developer or operator to comply with such conditions.

Reprocessing - A physical or chemical process which separates spent nuclear fuel into reusable material such as uranium and plutonium, and highly radioactive fission products.

Right of Withdrawal - With respect to the policy on implementing geological disposal - the ability for a community or the developer, NWS to withdraw from the siting process.

Self-sufficiency - This principle requires that most waste should be treated or disposed of within the region in which it is produced.

Sham recovery - This is an operation that purports to recover reusable material but amounts to waste disposal.

Sievert - A unit of radiation dose. It represents the risk of biological harm to a body's tissues from a given absorbed dose.

Site licence - Nuclear sites require a licence in order to operate under the Nuclear Installations Act 1965. ONR is required to attach licence conditions to the nuclear site licence which identify matters of safety which the licensee must address through implementing adequate arrangements.

Spent fuel - Nuclear fuel removed from a reactor following irradiation that is no longer usable in its present form because of depletion of fissile material, poison build-up or radiation damage.

Storage - The emplacement of waste in a suitable facility with the intent to retrieve it at a later date.

Sustainable development - Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

Test of Public Support - A mechanism to establish whether residents of the Potential Host Community support the development of a GDF within their community.

UK Radioactive Waste Inventory (UKRWI) - The latest national record of radioactive wastes and materials in the UK. It is updated every 3 years. It is a snapshot of wastes and materials at a specific point in time, called the 'stock date'.

Waste hierarchy - The waste hierarchy ranks management options according to the best outcome for the environment. It gives priority to preventing the creation waste in the first place. When waste is created, it gives priority to preparing it for re-use, then recycling, then recovery, and last of all disposal.

List of Abbreviations

- AGR** – Advanced Gas-Cooled Reactor
- ALARA** – As low as reasonably achievable
- ALARP** – As low as reasonably practicable
- AMR** – Advanced Modular Reactor
- BAT** – Best Available Techniques
- BEIS** – Department for Business, Energy and Industrial Strategy
- BPEO** – Best Practicable Environment Option
- BPM** – Best Practicable Means
- CEFAS** – Centre for Environment, Fisheries and Aquaculture Science
- COMARE** – Committee on Medical Aspects of Radiation in the Environment
- CoRWM** – Committee on Radioactive Waste Management
- DNSR** – Defence Nuclear Safety Regulator
- DSSC** – Disposal System Safety Case
- DESNZ** – Department for Energy Security and Net Zero
- EA** – Environment Agency
- FDP** – Funded Decommissioning Programme
- FSA** – Food Standards Agency
- FSS** – Food Standards Scotland
- GDF** – Geological Disposal Facility
- HASS** – High Activity Sealed Sources
- HAW** – Higher Activity Waste
- HGV** – Heavy goods vehicle
- HLW** – High level waste
- HSE** – Health and Safety Executive
- IAEA** – International Atomic Energy Agency
- ICRP** – International Commission on Radiological Protection
- ILW** – Intermediate level waste
- LLW** – Low level waste
- LLWR** – Low Level Waste Repository

MOX – Mixed Oxide Fuel

NDA – Nuclear Decommissioning Authority

NEA – Nuclear Energy Agency

NIEA – Northern Ireland Environment Agency

NLF – Nuclear Liabilities Fund

NORM – Naturally occurring radioactive material

NRW – Natural Resources Wales

NSD – Near surface disposal facility

NWS – Nuclear Waste Services

OECD – Organisation for Economic Cooperation and Development

ONR – Office for Nuclear Regulation

OSPAR – Convention for the Protection of the Marine Environment of the Northeast Atlantic

PWR – Pressurised Water Reactor

SCA – Source Collection Agency

SDGs – Sustainable Development Goals (of which there are 17)

SEPA – Scottish Environment Protection Agency

SMR – Small Modular Reactor

SSAC – UK State System of Accountancy and Control of Nuclear Materials

THORP – Thermal Oxide Reprocessing Plant

UKAEA – UK Atomic Energy Agency

UKRI – UK Research Institute

UKRWI – UK Radioactive Waste Inventory

VLLW – Very low level waste

WAC – Waste Acceptance Criteria

This publication is available from: www.gov.uk/government/consultations/managing-radioactive-substances-and-nuclear-decommissioning

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