Each of the nine sections contains a summary of the issues and the NDA’s Strategy, followed by more detail on each of the areas covered.

**Appendix 1**
- Depicts the life cycle of a typical nuclear reactor site;

**Appendix 2**
- Outlines the nuclear fuel cycle;

**Appendix 3**
- Provides individual site life cycle overviews;

**Appendix 4**
- Gives the estimated life cycle costs of each site;

**Appendix 5**
- Outlines the NDA’s planning tools and cycle;

**Appendix 6**
- Explains the acronyms and abbreviations used in this document.

---

**Annex 1**
- Environmental Assessment Statement

**Annex 2**
- Response to Comments made by Respondents to Consultation

**Annex 3**
- Acronyms
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NDA Strategy
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Preface by Sir Anthony Cleaver, NDA Chairman

The Nuclear Decommissioning Authority (NDA) is a new organisation, set up by the Government to provide the first ever UK-wide strategic focus on decommissioning and cleaning up nuclear sites. Our business, therefore, is environmental restoration. Our arrival represents the biggest change to the structure of the nuclear industry in the last 35 years. Our current budget is around £2bn a year. We have been fully operational since April 2005 and we are getting to grips with our inheritance. The challenge is clear and we are determined to meet it.

Our mission is to deliver a world class programme of safe, cost-effective, accelerated and environmentally responsible decommissioning of the UK’s civil nuclear legacy in an open and transparent manner and with due regard to the socio-economic impacts on our communities. We also recognise our responsibilities to ensuring our commercial assets are operated effectively and efficiently and to maximise the revenue from these plants to offset the costs of decommissioning and clean-up.

This mission shapes our values. Safety, security and protection of the environment are paramount to the way in which we operate. We expect our contractors to deliver sustained excellence in safety, security and environmental performance.

We will look to secure best value for the taxpayer by creating competitive decommissioning and clean-up markets and by overseeing the management of the UK’s nuclear legacy in line with national and international regulatory requirements. The costs of decommissioning and clean-up are already substantial and, if other countries’ experiences are a guide, estimated costs will almost certainly rise further in the short-term. Nonetheless, we are confident that by encouraging innovation and by using competition we can, over time, provide better value to tax-payers.

The 2005 Life Cycle Baseline (LCBL) shows that the current estimated undiscounted cost of delivering the NDA’s remit (decommissioning, clean-up and commercial operations) is £62.7bn (£35.4bn discounted). Neither of these figures have been audited.

Looking ahead, there are other costs, not currently included in the 2005 LCBL, which will be included in the 2006 LCBL. These include R&D directly funded by the NDA, the cost of new LLW disposal facilities and potential costs for the long-term management of contaminated land. Including these items add £7.5bn to the costs. There are a number of exclusions even from this, including costs associated with the long-term management arrangements for ILW and the treatment and disposition of plutonium and uranium materials, should they be reclassified as waste.

Earning the trust and respect of our stakeholders is critical to our success. We will act openly and transparently and seek to generate public confidence in an industry that has, historically, been seen as secretive and opaque. We will protect only that information which is genuinely commercially or personally confidential or security sensitive. With this in mind, we are developing broad and inclusive stakeholder engagement processes.

Effective management of the nuclear legacy also means being sensitive to the impact of our programme on local...
Decommissioning and clean-up, together with the operation of commercial plant until existing contracts have been met, will continue to be a major source of employment in many areas for decades to come. Our aim is to ensure that the NDA plays its part in building a skills framework that supports the operational, decommissioning and clean-up programmes, while helping to manage the inevitable social and economic changes around our sites as commercial operations cease and decommissioning gathers pace.

Our mission covers several decades but, if successful, will deliver huge returns. In the next five years, our top six priorities are to:

- create robust, costed and funded plans to clean-up sites based on a comprehensive understanding of the liabilities;
- demonstrate real progress in reducing high hazards in legacy ponds and silos, especially at Sellafield;
- complete competitions for managing and operating most of our sites;
- determine a better approach to Intermediate Level Waste (ILW) interim storage and Low Level Waste (LLW) disposal;
- accelerate the decommissioning timescales for reactor sites (Magnox and others), if supported by a sound business and safety case;
- review site end states and agree decommissioning timescales for all sites.

As well as having:

- a clear understanding of the skills required to maintain commercial plant until existing contracts are met and to deliver decommissioning and clean-up, with plans being implemented to match skills with requirements; and
- fully developed plans for social and economic support to communities near our sites.

Within 25 years, we will aim to:

- achieve final site clearance at Culham, Harwell, Winfrith and possibly Capenhurst;
- achieve final site clearance at Springfields, depending on future commercial opportunities; and
- accelerate decommissioning at Dounreay.

In addition, our aspiration is to accelerate the decommissioning of Magnox reactors and achieve final site clearance within 25 years, subject to Government approving a business case and agreeing that this represents the best way forward.

Within 75 years, our aim is:

- to decommission the plants and facilities at Sellafield. All the wastes stored at Sellafield will have been placed safely under long-term management arrangements.

To succeed in our mission, we will need to work in partnership with the Government, the regulators and other stakeholders. We will need to be innovative in the way we and our contractors tackle decommissioning and clean-up and bring about significant structural and cultural changes within the industry, while seeking to improve safety, security and environmental performance. We very much look forward to the challenge that this presents.

This Strategy, which sets out our preferred direction of travel, has been subjected to a rigorous consultation process. It reflects comments we received from respondents and is generally supported by them. The Strategy sets out the challenges we face and our proposals for meeting them.

Sir Anthony Cleaver
Executive Summary

Introduction and context
The NDA is a non-departmental public body, set up in April 2005 under the Energy Act 2004. Our remit includes the development of this Strategy.

We are required to review our Strategy at least once every five years. However, we are likely to undertake a review starting in the second half of 2006 to take account of, in particular, the outcome of the CoRWM (Committee on Radioactive Waste Management) process and the Low Level Waste (LLW) policy review - both of which are fundamentally important to our Strategy.

Our core objective is to ensure that the 20 civil public sector nuclear sites are decommissioned and cleaned up safely, securely, cost-effectively and in ways that protect the environment for this and future generations. We are also required to operate existing commercial plant effectively and efficiently until current contracts have been met and to generate income to offset the cost to taxpayers of decommissioning and clean-up.

The nuclear legacy that we have inherited represents about 85% of the UK’s civil nuclear liabilities and is wholly the responsibility of the Government. It includes:
- the nuclear sites and facilities which were developed in the 1940s, 1950s and 1960s to support the Government’s research programmes, and the wastes, materials and spent fuels produced by these programmes; and
- the Magnox fleet of nuclear power stations built in the 1960s and 1970s and plant and facilities at Sellafield used for the reprocessing of Magnox fuel; and all associated wastes and materials.

The NDA operates in partnership with a number of key stakeholders. We are responsible to the Secretary of State for Trade and Industry and to the Scottish Ministers; we are funded by the Government; we have initial contracts with Site Licence Companies (SLCs) - British Nuclear Group Sellafield Ltd, Magnox Electric Ltd, Springfields Fuels Ltd and the United Kingdom Atomic Energy Authority (UKAEA) - to deliver agreed programmes of work to schedule and within agreed site funding limits; and we work closely with the regulators and local communities.

In developing this Strategy, we undertook an environmental assessment of the various options considered and we published jointly for consultation both our Draft Strategy and an Environmental Report. Both are available on our website www.nda.gov.uk and in hard copy.

Our approach to consultation
We published our Draft Strategy and Environmental Report for consultation on 11 August 2005. During the consultation period we issued over 6,000 copies of these documents, either in hard copy or electronically; and we delivered more than 40 presentations around Britain to Site Stakeholder Groups, site workforces, trades unions, special interest groups and others.

The consultation ended on 11 November 2005. We received more than 270 sets of comments (some extensive) from organisations and private individuals. We have considered all the comments received and where possible we have incorporated changes into the Strategy to reflect the views of the respondents. In a number of areas that has not been possible because the comments strayed beyond the scope of the Strategy. For example, we received many comments on new nuclear build, an issue clearly outside our remit.
Executive Summary

Key Elements of the Strategy

1. Health, Safety, Security and the Environment
Health, safety, security and protection of the environment are of paramount importance. We have made clear our absolute commitment to these fundamental principles in the Strategy and we expect our contractors to deliver sustained excellence in safety, security and environmental performance - both now and in the future. We will work in partnership with the regulators to achieve our common goal of no accidents, no harm to people and no damage to the environment.

2. Decommissioning and Clean-Up
Dealing with the higher-hazard legacy ponds and silos at Sellafield and Dounreay is our top decommissioning priority. This will bring about the hazard reduction that is required to make these sites safe for this and future generations. Subject to Government approving a convincing business case, our aspiration is to achieve earlier final site clearance at reactor sites. We will work with our contractors and the regulators to develop a comprehensive understanding of contamination on our sites and to develop fully costed and robust plans for the long-term management of contaminated land.

3. Waste Management
Our main objective is to ensure that radioactive waste is managed safely by putting it into a passively safe form. We will also ensure that appropriate plans are developed for dealing with non-radioactive wastes on our sites. Our priorities are to:
- ensure that the remaining quantities of liquid High Level Waste (HLW) are vitrified and put into a passively safe state;
- review our Strategy in the light of Government’s decisions on the outcome of the CoRWM process and the LLW policy review;
- evaluate the options for rationalising ILW interim storage;
- continue to use the LLW Repository near Drigg in Cumbria to meet our short-term needs;
- seek to minimise the amounts of waste generated at our sites; and
- ensure that integrated waste strategies (IWS) are developed for each site as well as developing a national IWS.

4. Commercial Operations
We will ensure our commercial plants operate effectively and efficiently until current contracts have been fulfilled. We will review the future of THORP (following publication of the Nuclear Installations Inspectorate’s report) and monitor the performance of SMP against its production targets. We will explore how best to preserve and, where sensible, enhance the commercial integrity of the Springfields site, while remaining focused on our core business of decommissioning and clean-up.

5. Management of Nuclear Materials
We will ensure that civil nuclear materials are stored safely, securely and without endangering the environment for this and future generations. We will discuss with the Government options for the future management of nuclear materials.
We will carry out an assessment of the full life cycle implications of spent fuel management in order to ensure that we can meet our obligations.

6. Competition and Contracting
We will use competition for the management and operation of our sites to encourage innovation, to improve contractor performance and deliver best value to taxpayers. Our competition schedule, which takes account of the sale of British Nuclear Group, sets out the arrangements we believe will deliver these objectives. We will compete the LLW Repository near Drigg in 2006. Our competition schedule is on page 12 and repeated in Section 6 on page 64.

7. Innovation: Skills, R&D and Good Practice
We will take steps to ensure that a skilled workforce is available to carry out our mission by developing, with others, a National Nuclear Skills Academy and a Nuclear Skills Institute. We will work in partnership with agencies and providers across the UK to develop locally specific provision. We will ensure the effective coordination of decommissioning and clean-up research and development (R&D) to support our mission and take steps to encourage the sharing of good practice across our sites. We are developing an Industry Wide Pension Scheme to ensure that workers who transfer between SLCs have their benefits protected.

8. Financial Requirements for Delivering our Remit
We will seek to strike the right balance between operations and accelerating decommissioning and clean-up and also between dealing with high-hazard plants and earlier site clearance. We will aim to spend at least £1bn of our annual budget on hazard reduction, decommissioning and clean-up. We will reduce the total cost of operations, decommissioning and clean-up in line with our PSA target and strive continually to deliver better value to the taxpayer.

9. Socio-economic Development and Stakeholder Relations
We will develop a socio-economic strategy that addresses national priorities yet is tailored to local needs. We will work with others to help to mitigate the socio-economic impact of decommissioning and clean-up on local communities and to create a sustainable future for affected communities. We will be open and transparent, seeking to protect only that information which is genuinely commercially or personally sensitive or which could prejudice national security. We will seek views on and assess the impact of our proposed plans and programmes through the UK National and Site Stakeholder Groups.
Environmental Assessment Statement
Protection of the environment is fundamental to the delivery of our Strategy. We undertook an environmental assessment to inform our Draft Strategy and published an Environmental Report for consultation. The Environmental Assessment Statement (see Annex 1) describes:

- how we have integrated environmental considerations into our Strategy;
- how we have taken account of the Environmental Report;
- how we have taken into account the views of respondents to the Draft Strategy consultation;
- why we have decided on our Strategy; and
- how we intend to monitor the implementation of our Strategy.

See Page 118 for the Environmental Assessment Statement - Annex 1
## Competition schedule

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<tr>
<th>Start Competition Process</th>
<th>Sites Competed</th>
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<tr>
<td></td>
<td>• Low Level Waste Repository (LLWR)</td>
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<td>2006</td>
<td>• BNG Sale</td>
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<td>2007</td>
<td>• Magnox South</td>
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<td></td>
<td>• Dounreay</td>
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<tr>
<td>2008</td>
<td>• Magnox North (including Calder Hall, Oldbury and Wylfa)</td>
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<td></td>
<td>• Harwell/Winfrith</td>
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<tr>
<td>2009</td>
<td>• Sellafield/Windscale</td>
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<tr>
<td>2012</td>
<td>• Capenhurst, Culham and Springfields subject to further review</td>
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* Windscale subject to further discussions on relicensing.
Timing assumes B205 Magnox reprocessing plant has ceased operation in 2012. Otherwise delayed until B205 closure.
**Delivering this Strategy: what we need from the Government**

We are convinced that this is the right Strategy to deliver an accelerated and cost-effective decommissioning and clean-up programme, while honouring existing commercial contracts. We also believe that the Strategy will deliver improvements in safety, security and environmental performance - and, though challenging, it is both achievable and deliverable.

However, we cannot do that alone. We will need to work in close partnership with the Government, the regulators and other key stakeholders. The long-term management arrangements for HLW & ILW and for LLW will be key enablers. We are, of course, dependent on the Government for financing our work.

If we can make the business case for accelerating the decommissioning of Magnox and other reactor sites, we still need to find a solution for the large quantities of graphite that will be generated. We intend to examine all possibilities, including commissioning appropriate R&D.

The Government’s consultation on its LLW policy review started on 28 February 2006. This set out the reasons why a review is required now. One significant factor is that the LLW Repository near Drigg in Cumbria has insufficient capacity to take all the waste that will arise from decommissioning and clean-up at NDA sites and from other LLW producers in the UK.
We look forward to the outcome of the review in the expectation that it will deliver a framework that provides diverse and flexible LLW solutions.
The NDA’s Health, Safety, Security and Environment (HSSE) Policy

We are committed to achieving and maintaining excellence in nuclear safety, radiological protection, industrial health and safety, security and environmental protection at our sites through a process of continuous improvement. We believe that good health, safety, security and environmental protection - and especially the health, safety and security of everyone who works for us are not only paramount but fundamental to the success of the NDA.

**Key Issues**

<table>
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<th>Responsibilities</th>
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<tr>
<td>• How to deliver our duties in relation to safety, security and environmental protection.</td>
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<tr>
<th>Expectations</th>
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<tr>
<td>• What we require of our contractors in order to deliver our mission safely, securely and with due regard for the environment.</td>
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<tr>
<th>Hazard reduction</th>
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<tr>
<td>• 85% of the radioactive waste stored on our sites is in an untreated form and is potentially mobile.</td>
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<tr>
<th>Contractor performance</th>
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<tr>
<td>• How best to ensure our principal contractors deliver the NDA’s programme safely, securely and in ways that protect the environment.</td>
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<tr>
<th>Interactions with the regulators</th>
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<tr>
<td>• How best to work in partnership with the regulators to deliver our programme.</td>
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**Our Approach**

<table>
<thead>
<tr>
<th>Responsibilities</th>
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<tr>
<td>• We take seriously our safety, health, security and environmental responsibilities and have developed a Health, Safety, Security and Environmental (HSSE) Policy that sets out our goals and expectations and which applies to all organisations that carry out work on our behalf.</td>
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<table>
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<tr>
<th>Expectations</th>
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<tr>
<td>• We expect all our contractors to comply with our HSSE Policy.</td>
</tr>
<tr>
<td>• We expect all our contractors to have an HSSE culture that recognises that no activity is so important that it cannot be done safely, securely and with due regard to the protection of the environment.</td>
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<thead>
<tr>
<th>Hazard reduction</th>
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<tr>
<td>• Our main safety focus is aimed at reducing the hazard posed by the untreated radioactive wastes by ensuring their safe retrieval and immobilisation into a passively safe form for long-term storage or disposal. We intend to make our sites safer for this and for future generations.</td>
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<tr>
<th>Contractor performance</th>
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<tr>
<td>• We will agree a set of metrics that measure performance effectively in the areas of nuclear safety, industrial health and safety, security and environmental protection with our contractors.</td>
</tr>
<tr>
<td>• The performance of our contactors will be monitored by an independent oversight and assurance team that reports directly to our Nuclear Safety, Security and Environment Director.</td>
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<tr>
<th>Interactions with the regulators</th>
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<tr>
<td>• We will work in partnership with the regulators to achieve our common goal: - no accidents; - no harm to people; and - no damage to the environment.</td>
</tr>
<tr>
<td>• We have established Memoranda of Understanding with the HSE, EA, SEPA and OCNS to define our approach to partnership working. These are available on our website at: <a href="http://www.nda.gov.uk">www.nda.gov.uk</a></td>
</tr>
<tr>
<td>• We have organised a National NDA, Industry and Regulators Forum (NNIRF) to facilitate strategic and policy development to ensure the effective coordination of our activities.</td>
</tr>
<tr>
<td>• We are developing contractor and site-based ‘triangular’ arrangements to facilitate our discussions on HSSE performance with the regulators and our contractors.</td>
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</table>
Our top priorities are clear: Nuclear safety, industrial health and safety, security and the protection of the environment.

**Nuclear safety, health, security, and the environment**

Good health, safety, security and environmental performance, especially the health, safety and security of everyone who works for us, are not only paramount but fundamental to our success.

**Our goals are simple: no accidents, no harm to people and no damage to the environment.**

The health and safety of our employees, of contractors and the public, and the protection of the environment, are paramount in all that we do. The achievement of excellence in these areas is critical to the delivery of our goal of safe and efficient decommissioning of our sites and in the success of our commercial activities.

Our Health, Safety, Security and Environment (HSSE) Policy seeks, by a process of continuous improvement, to achieve and maintain excellence in health, safety, security and environmental performance. It applies to everyone involved in and supporting the NDA’s activities, including:

- permanent, contracted and agency staff employed directly by the NDA;
- Management and Operations (M&O) contractors’ staff charged with operating sites under contract to the NDA; and
- sub-contractors or agency staff engaged by the M&O contractors.

Compliance with the full set of HSSE Expectations is mandatory for every activity across the NDA organisation. The relevance, application and degree of implementation within a particular operation will be a function of the operational risk profile, local and national regulatory requirements; as well as voluntary HSSE management programmes.

**Responsibilities**

**Context**

We have direct responsibility for the health, safety and security of our staff and are responsible for the environmental effects of the activities of our staff. Nuclear safety, industrial health and safety, security and environmental protection at the nuclear licensed sites for which we are responsible are legally the responsibility of the Site Licence Companies (SLCs), which hold the nuclear site licences from the Health & Safety Executive (HSE) and the discharge authorisations from the Environment Agency (EA) for those sites in England and Wales and from the Scottish Environment Protection Agency (SEPA) for our Scottish sites. Accordingly, the SLCs are criminally liable for any failure to comply with the law and must, therefore, be the controlling mind for all activities that affect health, safety, security and the environment at all times.

**Issue**

We have a duty, in carrying out our functions under the Energy Act 2004, to have particular regard to each of the following:

- relevant Government policy;
- the need to safeguard the environment;
Our Approach to Health, Safety, Security and the Environment

- **the need to protect persons from the risks to their health and safety from activities involving the use, treatment, storage, transportation or disposal of hazardous material; and**
- **the need to preserve nuclear security.**

Although the above duties clearly overlap with those placed on the SLCs by other UK legislation, the Energy Act 2004 does not modify the other relevant legislation. The legal responsibility for health, safety, security and environmental protection rests, therefore, with the SLCs. While we recognise the legal responsibilities of the licensee and the absolute need for the nuclear site licensee to be the "Controlling Mind" for all HSSE issues, we also have HSSE responsibilities in respect of our contractors’ performance.

**Our approach**

We will work with our contractors and the regulators to ensure that, while we will agree with our contractors what can be done and by when, we will not dictate how things will be done in relation to HSSE-related activities, which is the absolute responsibility of the SLC. We will, as discussed later, agree a set of HSSE metrics to monitor effectively the performance of our contractors and, if we identify declining performance trends, discuss appropriate action with the regulators and our contractors to bring about improvement.

Our intention is to ensure that all our contractors deliver sustained excellence in nuclear safety, industrial health and safety, security and the protection of the environment. The delivery of our decommissioning and clean-up programmes will not be at the expense of health, safety, security and the protection of the environment.

**Safeguarding the environment**

**Context**

A primary focus of the NDA’s decommissioning strategy is to retrieve the radioactive wastes that are currently stored in an untreated form, often in ageing facilities, and to put them into a passively safe form for interim storage, pending the availability of long-term management arrangements. This will reduce the hazard presented by these wastes and make a significant contribution to protecting the environment and to enhancing safety for this and future generations.

**Issue**

Dealing with radioactive wastes, and the subsequent decommissioning of the facilities in which they have been stored, is our core activity. However, in carrying out these activities we must address the many potential effects on the environment: for example, short-term increases in radioactive discharges and increased transport.

**Our approach**

We have required our sites to base their site lifetime plans on optimised and integrated waste management strategies. These are described in more detail in Section 3 but in principal they aim to:

- **avoid the creation of wastes;**
Our Approach to Health, Safety, Security and the Environment

- reduce waste arising by the appropriate design of processes and equipment;
- reuse and recycle wastes under appropriate regulatory control;
- use the Best Practicable Environmental Option (BPEO) to manage residual wastes; and
- deliver value for money.

These integrated and optimised waste strategies must also be consistent with policy, legislation and regulatory requirements. This includes being consistent with the UK and Scotland’s Sustainable Development Strategies and radioactive and non-radioactive waste policy.

The planning of any activities that result in increases in discharges will need to demonstrate the BPEO for undertaking that activity, and that any discharges will be consistent with the UK Discharge Strategy, which defines how the UK intends to fulfil its obligations under the OSPAR convention on the protection of the marine environment of the North East Atlantic.
In developing our Strategy we felt it important to ensure that we took account of the environmental aspects of our proposals. We therefore undertook an environmental assessment to inform the emerging Strategy. This informed our Strategy in a number of key areas: in particular, it is clear that:

- more work is needed to review site end states and end dates, taking account of the potentially significant impact of climate change and coastal erosion;
- while contaminated land assessment work has been undertaken on a number of sites, more work is needed to develop agreed contaminated land management strategies;
- contaminated sediments and radioactive particulates are present as a result of past activities on our sites and there are no easy solutions. We therefore support the ongoing work in this area;
- the assessment of future waste arisings and discharges from our sites will need further consideration in the development of site waste strategies; and
- the socio-economic implications of site closures in remote areas are potentially significant and need to be considered in developing decommissioning programmes.

We have produced a Statement that describes:

- how we have taken account of the findings of our environmental report;
- how we have taken account of the views of respondents to the consultation on our Draft Strategy and Environmental Report; and
- why we have selected the proposals described in this Strategy.

This Statement is in Annex 1 and 2 of this document.
# Decommissioning and Cleaning up our Sites

We require all our sites to be operated safely, securely and in an environmentally responsible way. End states have been identified for each site but, following changes in Government policy to allow a more flexible approach, we believe these need to be reviewed with stakeholders. Some of the key issues on, or relating to, our sites concern potentially high hazards, contaminated land and the release of radioactive particles. We believe there will be significant opportunities to bring forward decommissioning and site clearance.

## Key Issues

<table>
<thead>
<tr>
<th>Site end states</th>
<th>Higher-hazard legacy facilities</th>
<th>Contaminated land and radioactive particles</th>
<th>Decommissioning Magnox stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>- How to take forward the consensus on site end states.</td>
<td>- How best to advance decommissioning and clean-up of the higher hazard legacy facilities at Sellafield and Dounreay.</td>
<td>- We do not yet have a full understanding of the extent and nature of the contamination on our sites.</td>
<td>- Whether we can make a business case for decommissioning Magnox reactors in around 25 years rather than the current 125 year programme.</td>
</tr>
<tr>
<td>- Incomplete historic records mean that the precise contents of these facilities are uncertain. Consequently, further work is required to choose the best way to retrieve the materials safely and without endangering the environment.</td>
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<td>- We will work with our contractors and regulators to accelerate the development of plans for addressing contaminated land.</td>
<td>- Whether we can make a business case for decommissioning Magnox reactors in around 25 years rather than the current 125 year programme.</td>
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## Our Approach

<table>
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</thead>
<tbody>
<tr>
<td>- We plan to consult and to seek consensus with stakeholders, including local communities, on site end states and to incorporate revised end states in our next Strategy.</td>
<td>- This is our number one decommissioning priority.</td>
<td>- We will work with our contractors and regulators to accelerate the development of plans for addressing contaminated land.</td>
<td>- We plan to develop a business case for accelerating the decommissioning of reactor sites to achieve site clearance in around 25 years.</td>
</tr>
<tr>
<td>- British Nuclear Group Sellafield Ltd has provided costed plans for decommissioning the Sellafield facilities.</td>
<td>- We will continue to work with UKAEA and the regulators to speed up hazard reduction at Dounreay, taking account of environmental factors.</td>
<td>- At Dounreay, we will work closely with UKAEA to ensure that adequate monitoring of radioactive particles continues to the satisfaction of SEPA. UKAEA will begin a consultation in 2006 into the BPEO for managing these fuel fragments once the Dounreay Particles Advisory Group reports its conclusions.</td>
<td>- Whether we can make a business case for decommissioning Magnox reactors in around 25 years rather than the current 125 year programme.</td>
</tr>
</tbody>
</table>
Decommissioning and cleaning up the higher-hazard facilities at Sellafield and Dounreay will bring about the hazard reduction needed to make these sites safe for future generations. **This is our number one clean-up priority.**

**Context**

Cleaning up these facilities involves:
- retrieving materials;
- characterising the materials: i.e. identifying what they comprise;
- treating and packaging the materials to make them passively safe;
- putting packages into interim storage pending the availability of long-term management arrangements; and
- decontaminating and demolishing the legacy storage facilities.

This will be a considerable challenge.

The higher-hazard facilities comprise:
- ponds used for the interim storage of Magnox spent fuel;
- silos, both wet and dry, used to store ILW.

**Issue**

These facilities have a number of features in common:
- they date back to the early years of the nuclear research programme and significantly pre-date the current management arrangements;
- they contain spent fuel and materials that are classed as ILW;
- incomplete historical records mean that the precise contents are uncertain - nor will they be fully known until the materials are retrieved and characterised;
- they present considerable technical challenges;
- they represent a significant proportion of the total clean-up cost; and
- decommissioning these facilities will lead to a major reduction in hazard.

British Nuclear Group Sellafield Ltd has provided detailed plans for dealing with the high hazard legacy facilities at Sellafield. Plans exist, or are well advanced, for the decommissioning of the legacy facilities at Dounreay.

We recognise that decommissioning these facilities may require some short-term increases in discharges as materials are retrieved, treated and packaged. Any discharges or wastes generated as a result of this work will be under the scrutiny of the environment agencies.

**Our approach**

The cost of dealing with the hazards presented by the Sellafield legacy facilities is likely to be very high. These are included in the 2005 LCBL.

Our contractors will need to demonstrate to the satisfaction of the environment agencies that their approach to decommissioning these higher-hazard facilities represents the BPEO.
We will engage with stakeholders to review site end states

**Context**
Before the Government announced the outcome of the decommissioning policy review in 2004, it was assumed that most sites could eventually be released for unrestricted use. However, the review suggested there could be a variety of end states, ranging from indefinite institutional control (retaining the site within the nuclear licensing regime) to unrestricted use.

**Issue**
For each site there is currently an agreed end state. However, these may not reflect the more flexible arrangements now available - which could provide opportunities to reduce costs or deliver other benefits.

**Our approach**
We are undertaking a review of site end states and end dates in 2006 through a consultation exercise involving the Site Stakeholder Groups, the regulators, Site Licence Companies and other interested stakeholders. There are advantages to this approach, including:

- achieving a clear direction and end date for decommissioning and clean-up activities on each site;
- more certainty around milestones and budgets;
- the opportunity to put contracts with incentive fees in place around delivery of agreed milestones and final end state;
- a clearer focus on the nature and timing of socio-economic support and development needs; and

- an improved outcome and better value for money for taxpayers.

A key consideration in the determination of site end states will be the long-term management of any radioactive or non-radioactive contaminated land present on the site (See section 2.3). Where the revised end states involve radioactive or non-radioactive material being left on the site, we and the regulators will need to be satisfied that this does not present an unacceptable risk to people or the environment, now or in the future.

This consultation will be supported and informed by:
- clear information on the current status of sites and easily understood descriptions of the potential end states available;
- the steps necessary to achieve end states;
- information on the likely timescales for achieving end states;
- the potential safety, security, environmental and socio-economic implications;
- the need to ensure consistency with statutory requirements for periodic safety reviews.

We expect that, for some sites, the process will be relatively straightforward and that we can reach agreement promptly. For more complex sites the process may take longer but we expect the exercise to be completed in time for the outcomes to be recorded in our next Strategy. The consensus we seek would be confirmed in a publicly available document. In some cases it may be possible only to reach consensus on an interim
end state during the planned review, which does not foreclose options for the final end state, but which none the less allows decommissioning and clean-up to progress unhindered.

We recognise that, given the long timescales involved in the decommissioning of some sites, periodic reviews of end states will need to be undertaken to confirm that the preferred approach is still valid in light of any new information or developments in Government policy or the regulatory framework. In particular, future reviews of end states will need to take account of the developing understanding of any contaminated land present on the site and the potential threats posed by coastal erosion and climate change.
We do not yet have a full understanding of the extent and nature of the contamination on all of our sites.

**Context**
There are varying degrees of radiological and chemical contamination at all of our sites which, in some cases, extends beyond the site boundary. We have an indication of the quantities of land that have been contaminated at each site and we are obtaining additional information to provide a fuller understanding to inform our decision-making. We believe that the contamination does not currently represent an immediate risk to the workforce, the public or the environment. However, more work is required to determine the ways in which it could have an effect on people and the environment in the future and to identify the actions necessary to avoid this.

**Issue**
At Sellafield, it has been estimated that there may be as many as 20 million cubic metres of contaminated land, caused mainly by leaks from legacy and disposal facilities.

Dounreay, Springfields and Harwell also have significant quantities of radioactive or non-radioactive contaminated land, although not on the same scale as Sellafield. Lower levels of radioactive and non-radioactive contamination are present at the Magnox Sites although, in some cases, these remain significant.

Identifying the extent of radioactive and non-radioactive contamination and the future risks it may pose to the workforce, public and environment is a complex process. It requires painstaking technical work to establish the nature and extent of contamination, as well as the potential for it to migrate to locations where it could affect people or the environment.

For some sites, it will take a number of years to develop appropriate remediation plans that represent the BPEO for managing contaminated land in the long-term.

**Our approach**
We are requiring our contractors to provide additional information on contaminated land to increase our understanding of the extent and nature of it and the potential risk to people and the environment. This will enable us to identify specific areas where further characterisation or remediation is required.

We will use this information to work with our contractors and the regulators to accelerate the characterisation of contaminated land. We will then ensure that fully costed and robust long-term management plans for contaminated land are developed, including the creation and maintenance of appropriate records.

The development of long-term contaminated land management plans will need to be based upon an assessment of how contaminated land could potentially affect people and the environment. The key advantages and disadvantages of alternative approaches will be evaluated in order to identify the BPEO.
We will make sure that these management plans are developed in line with good practice, such as that developed through the SAFEGROUNDS learning network - a forum for developing and disseminating good practice guidance on the management of radiological and chemically contaminated land on nuclear and defence sites in the UK. They will also be subject to independent scrutiny by the regulators.

At sites with limited contamination, such as the two most modern Magnox sites (Oldbury and Wylfa), we expect plans to be ready by mid-2007. For the other sites, we expect plans to be ready between 2008 and 2010. As noted earlier, we need to balance the need for accelerated clean-up with the importance of determining the right solution. Contaminated land is a key consideration in determining the appropriate end state for each site as discussed in section 2.2.

While long-term management plans are being developed, monitoring of contaminated land will continue to be undertaken by the Site Licence Companies. The regulators will continue to exercise their powers where necessary to protect the public and the environment.

Where it is considered that the BPEO is to leave contamination in situ for very long periods, management plans will need to take into account the potential effect of climate change, coastal erosion and other environmental implications. This will ensure that the environment is protected for this and future generations.

Harwell - one of the sites with significant quantities of radioactive or non-radioactive contaminated land

We will accelerate plans for managing contaminated land on our sites
Radioactive Particles and Contaminated Sediments

We support the current approach for dealing with radioactive particles in the environment.

Discharges of radioactivity to waters from our sites are regulated by the environment agencies. Specific authorisations are required from the agencies before discharges can take place. These authorisations contain limits, set conservatively to provide protection to people and the environment, on the quantities of radioactive materials that can be discharged.

Work is being undertaken by the Dounreay Particles Advisory Group (DPAG), set up by the Scottish Environment Protection Agency (SEPA), to advise on the hazards posed by these particles and to ensure adherence to the appropriate monitoring regime. DPAG intends to publish its final report on the hazard posed by the particles in 2006. A consultation exercise on the BPEO for dealing with the particles will follow publication of this report.

Radioactive Particles
Issue
At Dounreay, radioactive fuel fragments have been released into the environment from activities associated with the historic processing of radioactive material at the site. These have settled in offshore sediments and a small number of particles have been washed ashore on local beaches.

Currents and tidal movements periodically release some of these particles (the size of a grain of sand), which are then washed onto local beaches and so pose a risk, albeit an extremely low one.

Arrangements are in place to monitor for these fuel fragments and to recover those that are found.

Our approach
There is no easy solution to the particles issue. Based on our current understanding, we do not expect the situation at Dounreay to deteriorate but we will continue to work closely with our contractor to ensure adequate environmental monitoring is undertaken to the satisfaction of the regulators.

Contaminated Sediments
Issue
Around some of our sites, radioactive materials resulting from authorised discharges have attached to naturally occurring sediment. Over time, this material has become concentrated in the sediments in certain areas, including the Irish Sea, the Solway Firth (a Special Protection Area for the conservation of wild birds), the Ribble Estuary and in Llyn Trawsfynydd in the Snowdonia National Park. However, there is no evidence of risk to people or to the environment arising from this phenomenon.

Our approach
We will take account of the sediments in Llyn Trawsfynydd in considering any changes to the use of the lake or to the operation of the Maentwrog hydro-electric power station which we own. The contamination is due to the accumulation of historic discharges from Trawsfynydd Nuclear Power Station, although these do not contain any fuel fragments of the type found near Dounreay.
**Context**

Seven Magnox stations are at various stages of defuelling or decommissioning. Removing the fuel from the reactors (defuelling) and sending it to Sellafield for reprocessing removes 99% of the radiological hazard from the site.

Apart from work related to dealing with operational ILW and the arrangements for the disposal of LLW, most of the remaining work is concerned with decontaminating and dismantling buildings and other structures. The culture and skills-mix needed for decommissioning are, therefore, fundamentally different from those at an operational station. This does not imply that the challenges, job interest or benefits are any less rewarding nor does it imply that operators could not be retrained to take on a decommissioning role.

Following the introduction of the Environmental Impact Assessment for Decommissioning Regulations 1999 (EIAD), consent from the HSE is required before decommissioning of a reactor site can commence. Consent is also needed for any changes that are likely to have adverse environmental effects. The process for achieving this includes an HSE-sponsored public consultation based on an EIAD for the decommissioning of the reactor site.

At the Berkeley site, for example, the decommissioning process is well advanced. The station ceased generating electricity in 1989, started decommissioning in the early 1990s and is expected to enter the ‘care and maintenance’ stage in 2009, with final site clearance in 2083.

There is a range of options for decommissioning Magnox stations.

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**Diagram 1: Current Magnox Decommissioning Approach**
2.5 Magnox Stations: Decommissioning Approach

There are options for decommissioning Magnox stations

The current strategy for decommissioning the Magnox reactor sites after defuelling involves:

- 20 to 25 years to reach care and maintenance;
- 80 to 100 years in care and maintenance; and
- dismantling and final site clearance after 80 to 100 years.

(See Diagram 1: Current Magnox Decommissioning Approach)

One alternative to the current strategy is British Nuclear Group's proposed Magnox Innovations approach. The main features of this proposed approach are:

- as little as five years to reach care and maintenance;
- 80 to 100 years in care and maintenance; and
- dismantling and final site clearance after 80 to 100 years.

(See box overleaf: British Nuclear Group's Innovation Project)

However, it may be possible to accelerate the dismantling of Magnox reactors and achieve final site clearance within much shorter timescales than these approaches. For example, EDF (the French nuclear power station operator) has adopted a 25 year approach for the decommissioning of its gas-cooled reactors. Under this approach, the reactor dismantling ILW would be stored at one of EDF's sites until long-term waste management arrangements are available.

We believe there could be benefits to be achieved by accelerating the decommissioning of Magnox and other reactor sites. These include:

- better use of the existing knowledgeable workforce and associated socio-economic benefits for the local area;
- not leaving final site clearance for future generations;
- earlier availability of the site for other uses;
- fewer ILW interim stores needed with consequential cost savings; (see Section 3.2 - ILW interim storage);
- visible signs of decommissioning and clean-up, including reductions in visual impact; and
- mitigation of the potential threat of coastal erosion and climate change at a number of our sites.

However, to implement such an approach successfully in ways that protect people and the environment, a number of issues need to be addressed. These come mainly from the reduced period available for radioactive decay before final decommissioning and include:

- agreed waste routes;
- processing waste of higher activity with the potential to increase discharges;
- handling larger quantities of radioactive waste in each activity category; and
- a need for further controls to limit worker exposure to radiation including remote handling technologies.

This approach could also be adopted at non-Magnox reactor sites, for example, Windscale, Harwell, Winfrith and Dounreay.
Based on experience in Spain, British Nuclear Group has been examining ways to accelerate the stage between the end of generation and entering care and maintenance, in line with existing Government policy. The benefits include reaching this stage faster and more cheaply without compromising on safety, security or environmental performance.

The proposed British Nuclear Group approach would be to:

- remove fuel from the reactors on a day shift (instead of working around the clock);
- retrench all radiological facilities/activities into one area of the site;
- store operational ILW, on an interim basis, in the reactor buildings; and
- dispose of LLW on the sites that are suitable (‘on-site disposal’).

If fully deployed, the innovation approach could achieve care and maintenance in as little as 5 years at a much lower cost than current LCBL costs. However, this would still leave a care and maintenance period of 80-100 years and would require future generations to finish the process. The existing workforce would be made redundant earlier, with associated cost and socio-economic consequences.

We will develop a business case for accelerating reactor decommissioning of Magnox (and other) reactor sites.
2.5 Magnox stations: Decommissioning Approach

**Issue**
The current strategy represents a safe, well-understood and costed approach to decommissioning Magnox reactor sites. However, British Nuclear Group’s current and proposed decommissioning strategies leave the demolition of reactor buildings and final site clearance to future generations. These strategies have been driven by the fact that, hitherto, there was no prospect of an ILW management facility in the foreseeable future. Housing the internals of the reactor in their pressure vessels, contained within robust biological shields, represented the safest and most cost effective way of storing ILW until its long-term management is resolved.

**Our approach**
The strategy for decommissioning Magnox sites will remain the approach currently pursued by British Nuclear Group. However, we believe that the case for decommissioning the Magnox reactors to an accelerated timescale warrants serious evaluation and we propose to work with the industry and regulators to do this. We recently signed a Mutual Cooperation Agreement with EDF to share know-how, R&D and new technological developments. This will allow access to EDF’s accelerated decommissioning technology and will help to inform the business case that we plan to develop.

We will develop a business case for accelerating the decommissioning of Magnox (and other) reactor sites.
Waste Management

Site Licence Companies (SLCs) are legally responsible for ensuring that the management of radioactive and non-radioactive wastes, arising from their activities, protect people and the environment both now and in the future. However, the NDA has a role in coordinating and optimising waste management from the sites for which it is responsible at a national level. There are currently no national long-term arrangements for the management of High Level Waste (HLW) or Intermediate Level Waste (ILW). This means that waste needs to be managed on an interim basis on the NDA sites, possibly for several decades. Most Low Level Waste (LLW) is currently disposed of at the LLW Repository near Drigg in Cumbria. This site also accepts LLW from non-NDA and from non-nuclear consignors.

Key Issues

**High Level Waste (HLW) Management**
- How to manage the significant quantities of liquid and vitrified HLW arising from reprocessing activities at Sellafield.

**Intermediate Level Waste (ILW) Management**
- Whether, and how, to rationalise the interim storage of ILW pending the availability of long-term management arrangements.

**Low Level Waste (LLW) Management**
- How best to dispose of increasing volumes of LLW.
- How best to reduce the cost of disposal, particularly for the larger volumes of low activity LLW.
- The future capacity of the LLW Repository is limited and will not be able to take all LLW from decommissioning and clean-up operations and further capacity will be required.
- We need additional planned capacity at the LLW Repository to fulfil our short to medium term decommissioning objectives.

Our Approach

**High Level Waste (HLW) Management**
- We will ensure our contractors meet the NII’s liquid HLW reduction targets, which will ensure that HLW is stored in passively safe conditions.

**Intermediate Level Waste (ILW) Management**
- We will review our Strategy in the light of Government’s decisions on the outcome of the CoRWM review and the LLW policy review.
- We will evaluate the options for national/regional interim ILW storage, taking advantage of potential economies of scale and account for stakeholders’ views.

**Low Level Waste (LLW) Management**
- We plan to compete the management and operation of the LLW Repository in 2006.
- We will consider whether there are better, more cost effective management solutions for LLW other than the LLW Repository.
- We fully support the ongoing work at the LLW Repository to provide additional disposal capacity to meet short to medium-term strategic requirements (i.e. delivery of a new disposal vault).
Our strategy for dealing with radioactive waste is largely dependent on the outcome of wider reviews initiated by the Government.

Our overriding objective is to ensure that radioactive waste is managed safely by putting it into a passively safe form. In the UK, radioactive wastes are classified according to their levels of radioactivity and their capacity to generate heat. The three main categories are High Level Waste (HLW), Intermediate Level Waste (ILW) and Low Level Waste (LLW).

Most of the higher level wastes come from legacy facilities associated with the Government’s early nuclear research programme and from reprocessing operations at Sellafield.

High Level Waste (HLW)
The waste arising from reprocessing is in liquid form and there are currently around 2,000 cubic metres of such HLW in the UK, two thirds of which is held in storage tanks and is waiting to be treated. The other third has already been encapsulated into glass blocks (i.e. vitrified) and put in robust stainless steel containers. The un-encapsulated proportion of this waste is the most hazardous waste on any of our sites. There is a systematic approach to reducing the volumes held in storage tanks, which will be completed in 2015. The timeframe for reducing the hazard presented by HLW is, therefore, dependent on the performance of the vitrification plants and future decisions on reprocessing.

Treating this material and putting it into glass blocks and stainless steel containers for interim storage is our overriding waste priority.

Some of the HLW in the UK arises from the processing of foreign fuel. This material is scheduled to be returned as vitrified waste product to foreign customers in a programme scheduled for completion by 2016. Using a range of key performance indicators (KPIs), we will monitor closely the activities of British Nuclear Group Sellafield Ltd. to ensure that vitrified waste products are returned to overseas customers as soon as practicable.

Intermediate Level Waste (ILW)
ILW is present at most of our sites. It arises both from site operations and decommissioning. In volume terms, we expect there will be around 350,000 cubic metres of ILW. Although some ILW has already been packaged for eventual disposal, the majority will arise when facilities are dismantled, or when wastes are retrieved from those facilities in which they are currently held.

As with HLW, there is no long-term management solution yet available.

We expect SLCs to continue with their programmes for the management of ILW to reduce hazard in line with HSE, EA and SEPA guidance ‘Conditioning of Intermediate Level Wastes on Nuclear Licensed Sites’.

An issue we urgently need to address is whether ILW should continue to be stored on each site or whether there is a practical case for rationalising ILW interim storage. At present, ILW is held in interim storage facilities at the sites where it arises.
Transport of Nuclear Materials in the UK
The safe transport of nuclear material around the UK occurs on a daily basis. Transport is a key consideration in the development of a national waste management strategy and will be explored in detail. Transporting large volumes of waste has implications for infrastructure and the environment. We will, therefore, need to consider:

- opportunities for reducing the volumes of waste produced;
- infrastructure issues, i.e. roads, railways, waterways needed for the safe and successful movements of all waste types;
- BPEO assessment of the transport of wastes;
- resolving or mitigating security issues;
- all appropriate transport options, i.e. road, rail or sea as part of an overall strategy; and
- minimising movements of wastes between sites while delivering site clearance objectives.

Waste Treatment Technologies
The NDA will aim to optimise its waste management strategy by developing a mixture of innovation and pragmatic fit-for-purpose solutions. This includes the development of waste treatment technologies which will support our aim of delivering improved standards of safety, environmental performance and value for money.

Examples of this are:
- minimising waste;
- recycling or reusing material;
- treatment to allow the reclassification of wastes; and
- where practicable, standardised equipment and waste treatment methods.

This approach could be of greatest benefit in treating:
- high volume demolition wastes;
- technically challenging wastes; and
- wastes containing materials with economic value.
Low Level Waste (LLW)
By volume, LLW represents the largest proportion of radioactive waste. It is estimated that a further 2 million cubic metres of wastes characterised as LLW will be generated during the NDA’s decommissioning and clean-up programme. This does not include the estimated 20 million cubic metres of contaminated land at Sellafield (see Section 2.3). Most LLW is currently disposed of at the LLW Repository. However, this facility does not have sufficient capacity to accommodate all future arisings of LLW in the UK. Alternative disposal options will, therefore, be needed. It is crucial that, in the short-term, there is sufficient capacity at the LLW Repository to ensure that authorised LLW disposal is available. The big issue, therefore, is to ensure that suitable waste management and disposal routes exist for LLW.

Low Level Waste policy review
Recognising that existing capacity for LLW disposal is limited, the Government - supported by the NDA - instigated a review of LLW policy. The aim of the review is to produce a more flexible framework for dealing with LLW disposal, including the higher-volume lower-activity LLW arising from decommissioning and site clean-up, while maintaining a high level of protection for people and the environment. The outcome of the review is expected to be announced in summer 2006, following public consultation.

In 2005, the Scottish Executive directed the Scottish Environment Protection Agency (SEPA) not to authorise consignments of LLW from Dounreay to the LLW Repository. In the accompanying explanatory document, the Scottish Ministers stated their support for the long-term disposal of Dounreay LLW at Dounreay. While we welcome the Scottish Ministers’ decision, we are clear that the capacity needed for LLW disposal will exceed that available at the LLWR and the proposed Dounreay facility and further capacity will be required.

Graphite wastes
We will explore the management/treatment options for graphite waste, taking account of worldwide developments and best practice. Finding an innovative solution to graphite wastes would inform a business case for accelerated decommissioning at Magnox reactor sites.

Sealed sources
A small proportion of the wastes on our sites is made up of sealed radioactive sources, which have arisen from a variety of activities within and outside the nuclear industry. These activities include the use of sources by hospitals and research laboratories and for industrial radiography purposes.

When sealed sources are no longer required they need to be collected for reuse, recycling or disposal. Some lower activity sources have been sent for disposal to the LLWR near Drigg. However, a number of sources have accumulated at Harwell as part of the National Sources Disposal Programme. This programme ended in the 1990s, leaving a legacy of sources that need to be dealt with. In addition, Nexia Solutions Ltd., a tenant on the Windscale site, accepts higher activity sources for processing and packaging for long-term safe storage at the Sellafield site.
Waste Management

Integrated Waste Strategy (IWS)
A variety of radioactive and non-radioactive wastes need to be managed on our sites. Ideally, they should be managed in an integrated way in terms of their treatment, packaging, storage and eventual disposal. We believe such an integrated approach would ensure that our sites:

- avoid the unnecessary creation of wastes;
- reduce waste arising by the appropriate design of processes and equipment;
- reuse and recycle materials under appropriate regulatory control;
- use the BPEO to manage residual wastes; and
- deliver value for money.

To achieve these aims, the NDA has required its contractors to base their life cycle plans on optimised and integrated strategies; these cover solid, liquid and gaseous radioactive and non-radioactive wastes and the management of nuclear materials. To support this, we have issued our contractors with a specification defining the content of the IWSs, together with a guidance document, developed by a working group including our current contractors and the environmental, safety and security regulators, that pulls together policy, legislative and regulatory requirements. Both of which are available at www.nda.gov.uk.

In addition to ensuring that site lifetime plans contain the actions necessary to manage waste in an integrated and optimised way, the information within the sites’ strategies will be used to aid understanding in strategic waste issues. The sites are required to ensure that their integrated waste strategies are consistent with, for example, the UK and Scottish Sustainable Development Strategy, the UK Discharge Strategy and radioactive waste and non-radioactive waste policies. This information will inform the NDA’s approaches to the management of wastes and nuclear materials as well as informing future policy development.

We also plan to use this information, together with that provided by our directly managed research programmes, to produce a document that sets out the waste issues that have been identified and how we intend to address them. Further work is needed to develop fully optimised and IWSs.
The NDA supports the current approach to reduce the volume of liquid HLW and to return foreign HLW to its country of origin.

**Context**
Liquid HLW comprises fission products contained in concentrated nitric acid. It is heat generating and is therefore stored in cooled tanks waiting to be encapsulated in glass (i.e. vitrified) to make it passively safe. The glass is then put in robust stainless steel containers and stored in environmentally controlled, safe and secure conditions pending the availability of long-term management arrangements. The independent Nuclear Installations Inspectorate (NII) has imposed limits on the quantities of liquid HLW that can be stored at Sellafield awaiting vitrification (see Diagram 2 below). Failure to meet the NII’s specification could result in the THORP operations being suspended.

Some of the HLW in the UK arises from the processing of foreign spent fuel. This material is scheduled to be returned as vitrified waste product to overseas customers in a programme targeted for completion by 2016.

**Issue**
Significant quantities (currently around 1,345 cubic metres) of liquid HLW have built up over the years. There are three vitrification lines in operation to encapsulate the wastes in glass as part of the process to achieve passive safety.

These lines will need to operate effectively and continuously (stopping only for planned maintenance) if the volume reduction target date of July 2015 is to be met. Any unexpected or unplanned shutdowns will put that target at risk and result in the NII restricting THORP operations until the programme is back on track.

To meet these regulatory requirements, a programme agreed between BNFL and NII was put in place in 2000 to reduce the volume of liquid waste in tank storage to a buffer level of 200m³ by around 2015. In order to meet the Government’s desire to see the earliest possible return of reprocessing waste to overseas customers, a number of requirements need to be addressed in a timely manner. These include:

- the availability of suitable facilities for the export of such wastes;
- the procurement of appropriate means of transport; and
- ensuring that contractual arrangements are fully in place to secure the return of these wastes including HLW substitution.

**Diagram 2: Planned reduction of Liquid HLW.**

The NDA supports the current approach to reduce the volume of liquid HLW and to return foreign HLW to its country of origin.
Our approach
We will continue to treat this programme for reducing major hazard as a high priority. We will provide appropriate incentives through our contract with British Nuclear Group Sellafield Ltd to ensure that they meet the liquid HLW reduction targets and get the remaining quantities of this material into passive safety in accordance with the HLW volume reduction target.

The vitrification of HLW results in radioactive and non-radioactive discharges to the environment and the generation of some secondary wastes from the vitrification process. However, given the need to make this liquid HLW passively safe, and to meet the NII’s requirements to reduce the volume of mobile/unconditioned liquid HLW stocks, we believe that this is the only viable option and consider it a high priority.

Using a range of Key Performance Indicators (KPIs), we will monitor closely the activities of British Nuclear Group Sellafield Ltd. to ensure that these vitrified waste products are returned to overseas customers as soon as practicable.
3.2 Arrangements for Interim Storage of ILW

There could be significant benefits from rationalising interim ILW storage

Winfrith - one of the sites making significant investments in treating and storing ILW

Context
Until a long-term management solution is available, Intermediate Level Waste (ILW) will need to be stored in a passively safe form, possibly for several decades.

The current approach to interim storage of ILW is to build storage facilities at the sites where it is created. Some Magnox reactor sites - and, indeed, Dounreay, Harwell and Winfrith - are, or will be shortly, making significant investments in treating and storing ILW.

As noted earlier in this section, the Committee on Radioactive Waste Management (CoRWM) is due to make recommendations to the Government on options for long-term management arrangements for higher level radioactive wastes (ILW and HLW) in July 2006. The Committee's recommendations, the Government's subsequent decision on and implementation of the preferred solution will have implications for our approach to the interim storage of these wastes.

Issue
The issue is whether it makes sense to rationalise ILW interim storage at a smaller number of storage centres than currently planned, such as Sellafield, Dounreay (for its own waste) and perhaps one of our southern sites.

The timetable for delivering the long-term management arrangements will also be a determining factor in whether a regional/national approach to interim storage is preferable, or whether it makes more sense to proceed with the currently proposed programme of building ILW stores on each site.
Our approach
We cannot take a fully informed decision on the best approach to ILW interim storage until the Government has decided on the long-term management arrangements for ILW and until the implementation timetable is clear. We welcome, therefore, CoRWM's intention to report to the Government in July 2006. We propose to evaluate alternative approaches to ILW interim storage, including:

- **whether to have a local, regional or national interim storage solution, including storage at either:**
  - every site;
  - Dounreay, Sellafield and one of our Southern sites;
  - Dounreay and Sellafield; or perhaps
  - Sellafield alone (it currently stores 60 per cent of UK ILW in terms of its radioactivity).
- **whether we could use existing infrastructure for a proportion of the required ILW interim storage rather than building new stores; and**
- **whether to build interim stores on either a generic or bespoke design basis.**

We would not want any of our interim storage facilities to be considered as providing a long-term management solution (i.e. several hundred years) since they are not being designed to fulfil such a function. Criteria we will use in evaluating the options will include:

- **safety, security and environmental considerations,** which are paramount;
- **stakeholder views (regulators, local communities, NGOs etc);** including the concepts of volunteerism, veto and compensation;
- **impact on site end states and end dates;**
- **life cycle analysis i.e., the cost to build, maintain, operate and dismantle the storage facilities under each of the options;**
- **transportation, security and logistics costs;**
- **the handling, conditioning and packaging options and costs;**
- **the form of waste arising;**
- **the volume and profile of conditioned ILW generated in compliance with the improved regulation of waste packaging;**
- **socio-economic implications; and**
- **the application of our prioritisation process.**

A national review of waste arisings and storage conditions is now in progress, which will inform the basis of a 'forward stores' strategy. Other activities to be carried out in the near future include safety and environmental impact studies and modelling studies of early site closures. We would expect to address these issues further in our review of the Strategy that we expect to begin in late 2006.
Context
The Low Level Waste Repository (LLWR) in Cumbria has been operating since 1959. Although it was originally constructed for the disposal of waste from Sellafield, it receives LLW generated on other nuclear sites throughout the UK and wastes from the non-nuclear sector, excluding hospitals and universities.

Issue
The future capacity of the LLW Repository is dependent on the approval for construction of a number of additional disposal vaults at the site. Currently there are seven historic disposal trenches and one concrete vault. The plans we inherited from BNFL are based around the construction of seven further vaults to provide 700,000 m$^3$ of LLW disposal capacity until 2050. However, current estimates suggest that there would still be insufficient capacity at the LLW Repository for the anticipated arisings of LLW generated by decommissioning and clean-up. Without taking into account the more flexible LLW management arrangements we hope will arise from the Government’s LLW policy review, the estimated volume of future LLW arisings could not be accommodated in the LLWR.

Local authority planning consents are needed for any additional vaults at the LLW Repository and for any other LLW facilities developed. Applications for planning consents could lead to public inquiries. It is expected that the current disposal vault at the LLW Repository will be filled by 2008. Contingency arrangements are, therefore, in hand for the site to continue to offer a disposal route for LLW from nuclear and non-nuclear industry waste generators until the construction of the next disposal vault (Vault 9). In the meantime, we need to encourage waste producers to place more emphasis on waste minimisation to relieve pressure on the LLW Repository.

The Environment Agency is currently considering responses to its recent consultation on the review of the LLW Repository authorisation, which determines the wastes that can be disposed of there. The review includes consideration of British Nuclear Group Sellafield Ltd’s Post Closure Safety Case (PCSC) and Operational Environment Safety Case (OESC) for the facility. The outcome of the review may have implications for the future of the LLW Repository.

In 2005, the Scottish Executive directed the Scottish Environment Protection Agency (SEPA) not to authorise consignments of LLW from Dounreay to the LLW Repository. In the accompanying explanatory document, the Scottish Ministers stated their support for the long-term disposal of Dounreay LLW at Dounreay. While we welcome the Scottish Ministers’ decision, we are clear that the capacity needed for LLW disposal will exceed that available at the LLWR and the proposed Dounreay facility and further capacity will be required.
Our approach
Given the imminent capacity limitations of the LLW Repository, priority may need to be given to providing a continuing LLW disposal route to ‘small’ users. A situation could occur after 2008 where there is insufficient capacity to take LLW from all nuclear sites. We are working with British Nuclear Group to understand and mitigate this risk. In the meantime, British Nuclear Group Sellafield Ltd has obtained planning consent for temporary higher stacking of waste containers in Vault 8 and is developing other temporary storage solutions to alleviate the problem.

In addition, we will address the following issues:

- how to avoid, or reduce, the generation of LLW by our decommissioning, clean-up and commercial operations to ease the demand on disposal facilities;
- what opportunities exist for reusing and recycling materials that arise on our sites through decommissioning activities;
- what opportunities exist for the rationalising waste processing arrangements;
- what role smelting and incineration might play in reducing waste volumes;
- how we could use decontamination techniques to enable release of materials from our sites;
- what opportunities exist to dispose of LLW on sites where it arises, subject to considerations on coastal erosion and climate change and in consultation with stakeholders;
- what other options are available and how many more facilities like the LLWR might be needed; and
- how to ensure that only those materials that really need to go to the LLWR are consigned there.

Depending on the outcome of the Environment Agency’s authorisation review, it may be locally more acceptable and operationally more efficient to close the LLW Repository and focus on providing a new LLWR at, or close to, Sellafield. In general, our preferred approach would be to build on the principle established at Dounreay that, where possible, sites should host their own LLW facilities. In many cases, this will be specifically for higher volume low activity LLW. Local stakeholders will be consulted on any proposals and, so far, we have found that local communities are generally open-minded.

The NDA will review its Strategy following decisions on the outcome of the Government consultation on the review of Low Level Waste policy which was published on 28 February 2006.

However, given the time required to consider and develop alternative disposal facilities, the LLW Repository will be required to provide disposal capacity for nuclear and non-nuclear industry LLW generators in the short and medium term. As the current disposal vault is due to reach full capacity in 2008, a number of contingency actions have been taken, including:
- completion of a backlog of activities in the
current disposal vault to maximise capacity;
- temporary higher stacking of waste containers in the current disposal vault;
- investigating temporary storage of LLW on existing hard standing at the LLWR; and
- steps to develop an additional temporary storage area that could be converted into part of the next disposal vault (Vault 9) if permission for this is granted.

If approval is not given to these proposals, or they prove insufficient to maintain disposal capacity at the LLWR, then further temporary storage of LLW at Sellafield may be required as Sellafield is the major consignor of LLW to the LLWR.

We will compete the management and operation of the LLW Repository, starting in 2006. We expect the competition process to focus on solving existing technical challenges and to ensure the continued provision of LLW management services at the LLW Repository. However, we may expand the scope of the contract to cover wider LLW management issues.
## Commercial Operations and Assets

The NDA has responsibility for a number of commercial facilities which currently provide some 50% of our budget. The revenue from these facilities will be maximised while maintaining the delivery of our core mission. This income is likely to rise in 2006/07 with continued high electricity prices. However, it will decline sharply over the next few years as Magnox generation comes to an end. This will place an increasing reliance on public funding. The future of THORP and SMP will be determined by the Government. The Springfields site is unique and offers the NDA potentially greater commercial opportunities.

### Key Issues

**Commercial Operations**
- The future of THORP and SMP.
- How best to maximise income from the operational facilities to offset the cost of decommissioning and clean-up.
- Deciding on which new commercial business opportunities to pursue.
- Considering which assets and operations should be divested.
- The implications of a sale of British Nuclear Group

**THORP**
- THORP reprocesses spent fuel for UK and overseas customers. The AGR fuel contracts in place with British Energy (BE) cover the reprocessing of a proportion of the spent fuel and storage of the remainder until long-term management solutions are established following the outcome of the CoRWM process.

**SMP**
- The future commercial viability of SMP.
- SMP depends on the success of the commissioning programme and whether it can be made to operate effectively and efficiently to meet existing and potential future customers’ requirements.

**Springfields**
- How best to utilise Springfields’ site assets when Magnox fuel production is complete in 2007.

**Possible Sale of British Nuclear Group**
- We propose to explore with BNFL/British Nuclear Group and the Government whether any of the smaller British Nuclear Group businesses (e.g. ESTL, PNTL, and Fellside) have a strategic value that suggest they should be excluded from any possible sale of British Nuclear Group.

### Our Approach

**Commercial Operations**
- We expect our contractors to remain customer focused.
- We intend to run operational facilities efficiently and effectively until they close, with the aim of maximising revenue.
- All contract extensions or new business will be evaluated against strict criteria agreed with the Government.
- We propose to discuss with the Government which non-core assets and operations could be divested.

**THORP**
- We expect to restart THORP subject to approval from the NII and NDA Board.
- We will commission work to examine the options for the interim storage of spent AGR fuel, pending the availability of long-term management arrangements.

**SMP**
- We intend to continue to take a close interest in the commissioning of SMP and to monitor its performance. If SMP is unable to meet its production targets we will discuss its future with the Government.

**Springfields**
- We propose to consider options for the future management of the Springfields site, which we will discuss with the Government.
We will continue to maximise the revenue from operational facilities and apply strict criteria when considering any new business opportunities.

**Context**

Commercial operations are the activities on our sites (and in our subsidiaries) producing electricity, nuclear fuel, reprocessing spent fuel, transporting nuclear and non-nuclear freight, and property management. The operations include the four Magnox power stations still generating electricity as well as, THORP, SMP, Springfields, Spent Fuel Services (SFS), Direct Rail Services (DRS) and our share in Pacific Nuclear Transport Limited (PNTL).

We are required by the Energy Act 2004 to operate our commercial assets effectively and efficiently in order to support the funding of our clean-up programmes. There will be various opportunities to increase our income from new business but these will have to be evaluated against the criteria set out by the Government.

**Issues**

While our commercial operations provide a significant contribution to our budget, they must not divert attention away from our key mission of decommissioning and clean-up. Commercial operations will decline fairly rapidly in the medium-term. Two more Magnox power stations cease electricity production at the end of 2006, with the final two closing in 2008 and 2010 respectively (see Section 4.2 - Magnox stations). So although our revenue from operational plant and facilities currently provides around 50% of our total annual budget, this will decline in the medium-term.

**Our approach**

The NDA intends to continue to operate commercial facilities effectively and efficiently until they close.

Decisions to take on new contracts, or to close operating assets, are matters for the Government, although the NDA will inform the decision-making process. In considering any potential new business opportunities, the Government is likely to want us to maximise potential revenue but would require safety, security and environmental protection standards to be maintained or improved. It would need to be satisfied, that new opportunities did not, for example:

- threaten the security of the UK's energy supply;
- significantly delay decommissioning of sites;
- adversely affect the NDA's ability to achieve its Public Service Agreement (PSA) or other targets (e.g. returning of overseas waste);
- entail unacceptable financial risk;
- result in a net increase in costs;
- significantly increase the total stock of radioactive waste;
- result in an unacceptable increase in hazard;
- require unaffordable initial investment by the NDA;
- require regulatory approvals or other steps that the NDA is advised are unlikely to succeed: e.g. planning approvals;
- involve plant operating at a level that does not allow for downtime necessary for routine repair and maintenance; or
- involve diverting staff from pre-agreed clean-up roles; otherwise jeopardise the completion of agreed plans or deflect from the cultural change needed to get a proper focus on clean-up activity.
Context
Of the original 11 Magnox reactor sites (see Diagram 3), four remain operational: Dungeness A in Kent, Sizewell A in Suffolk, Oldbury in Gloucestershire and Wylfa on Anglesey. Dungeness A and Sizewell A will cease generating electricity in December 2006, Oldbury in December 2008 (although operational difficulties are currently being experienced which may bring forward its closure) and Wylfa in 2010. Closure dates for Magnox sites could be subject to change by the Government but the NDA does not plan to recommend any extension. However, we are examining whether it would be sensible to run Wylfa until 31 December 2010, subject to Government approval. Operating Wylfa until the end of 2010 would not have implications for the closure of the Magnox reprocessing plant at Sellafield by the end of 2012.
4.3 THORP

We need to find a long-term solution to the management of AGR spent fuel

**Context**

British Nuclear Group Sellafield Ltd currently has contracts with a number of customers for the reprocessing and storage of spent nuclear fuel at the THORP plant at Sellafield. These include contracts for reprocessing Advanced Gas Cooled Reactor (AGR) fuel for British Energy (BE) and reprocessing other fuels for overseas customers. All current THORP reprocessing contracts are due to be completed by about 2010. Contracts for the storage of AGR fuel extend to 2086. THORP is currently shut down following a major incident reported in April 2005.

**Issue**

Under the Energy Act 2004, the Government will take final decisions on any new reprocessing contracts and closure of the THORP plant on advice from the NDA. We are committed to keeping customers fully informed of developments on the restart of THORP.

Apart from uncertainty about when, THORP will be able to restart its operations, we need to consider the long-term solution to the management of AGR spent fuel. The operating life of THORP is likely to be less than that of BE’s AGR power stations.

British Nuclear Group Sellafield Ltd has contracts with BE to provide spent fuel services. Under the ‘new’ contracts, title to AGR spent fuel transfers from BE to British Nuclear Group Sellafield Ltd. This fuel is expected to be discharged from BE reactors in approximately five years’ time. For spent fuel and reprocessing products from the ‘old’ contracts, the title remains with BE.

THORP operates under close regulatory scrutiny and its radioactive waste generation and discharges are within allowable limits. Continued operation of THORP will result in further radioactive and non-radioactive discharges and the generation of wastes and nuclear materials. Prompt closure of THORP would require alternative solutions for the safe return of overseas customers’ spent fuel and require an alternative short-term solution for the management of AGR spent fuel from British Energy’s reactors. Contingency arrangements for continued receipt and storage are well-developed to manage this risk.

**Our approach**

There are a number of options with regard to the immediate future of THORP, ranging from not restarting the plant through to the reinstatement and operation of the plant to meet the existing baseline plan and associated reprocessing commitments. We are assessing these options against the following criteria:

- **life cycle safety and security impacts**;
- **life cycle costs**;
- **contractual obligations and liabilities**;
- **security of energy supply**; and
- **socio-economic impacts**.

Subject to satisfactory implementation of the NII’s recommendations for improvement and NDA Board approval, we plan to restart THORP in mid-2006. In order to keep all options open, we have asked British Nuclear Group Sellafield Ltd. to develop an engineering solution for the restart of THORP that would enable an early return to operations, should this be the outcome of our strategic options analysis.

We will establish in 2006 a national review of the longer term management options for spent fuel involving all relevant stakeholders and taking account of the outcome of the CoRWM process and subsequent decisions by the Government.
Context
All reprocessing contracts signed since 1976 have contained an option to return waste from reprocessing operations to the country of origin. In 1986, the Government took the decision that this option should be exercised. The Vitrified Residue Return (VRR) project was initiated by BNFL to enable the return of High Level Waste (HLW) to its country of origin. This project is underway, with the first quantities of HLW scheduled to be returned in 2008.

Issues
The project for the delivery of these wastes is in the early stages of implementation but there are a number of issues that could challenge the delivery date. It is Government policy that vitrified HLW should be returned to its country of origin in place of ILW and HLW (i.e. waste substitutions). In order to implement this policy, it will be necessary to agree detailed arrangements for the sale and secure movement of this material, which are needed to allow the substitution programme to run in parallel with the VRR project.

Our approach
In order to ensure the timely delivery of this programme, we are regularly monitoring progress on the project. We will discuss with the Government any signs that the project may not be on target. Proposals for a mechanism to enable substitution are being developed. Before any proposals are implemented, they will be the subject of a formal review by the customers concerned. We will scrutinise carefully these arrangements and advise the Government on the acceptability of the proposed mechanism before any formal agreement with the customers.

Context
The Sellafield Mox Plant (SMP) continues to increase its output safely to meet existing customer obligations. The first four fuel assemblies are performing well in service and, despite ongoing technical issues related to plant commissioning, progress is underway to fulfil the remainder of this order.

Issue
The future of SMP depends on the success of the commissioning programme and the achievement of a sustained production rate to meet existing or future customers' requirements.

SMP operates under close regulatory scrutiny and its radioactive waste discharges are within allowable limits. Ceasing operations would reduce overall quantities of waste arising but would require spent fuel and other nuclear materials belonging to overseas customers to be repatriated and it would prevent the use of SMP in plutonium disposition.

Our approach
Various plant enhancements have been identified to improve the prospects of achieving the required production rates to meet future order book demands. We are scrutinising closely the implementation of these improvements and overall operation of the plant through a structured monitoring regime. We will discuss with the Government any signs that SMP may not be on track to meet its production targets. In addition to monitoring the performance of SMP, we will continue to explore the potential use of SMP technology in dealing with the UK plutonium stocks.

We will ensure that contractual commitments to return waste from reprocessing operations to its country of origin are honoured.

The future of SMP depends on whether it can be made to operate effectively and efficiently.
4.6 Springfields

We are considering options for the future management of Springfields

Context
The Springfields site is owned by the NDA and is managed on its behalf by the Westinghouse Group, which is currently part of British Nuclear Fuels Ltd (BNFL). BNFL is in the process of selling the Westinghouse business to Toshiba. The sale is expected to be completed by the end of 2006. We intend to discuss with Toshiba its plans for Springfields and to enter into a new site management and operations contract.

The nature of the work at Springfields includes long-term contracts for fuel manufacture and for the production and conversion of uranium hexafluoride. Although some decommissioning and clean-up is underway, this accounts for only 5-10% of the site’s activities.

Both Magnox and AGR reactor fuels are manufactured at Springfields. The AGR fuel manufacturing plant is unique and is crucially important to meeting British Energy’s current and future fuel requirements.

The Magnox fuel production plant will cease operating in 2007. The decommissioning of this plant will be completed by 2012. Hex conversion will continue until 2016 based on new business opportunities being realised.

Issue
We need to explore how best to preserve and, where sensible, enhance the commercial integrity of the Springfields site, while focusing on our core business of decommissioning and clean-up.

Our approach
There are a number of options for Springfields including:
- maintaining the current balance between commercial operations and clean-up;
- increasing the focus on clean-up at the expense of commercial income; and
- increasing the focus on commercial operations.

We will explore these options further with Springfields Fuels Ltd (the Site Licence Company) and Toshiba and consider operating and contracting models that are appropriate to the circumstances. Our preference is to look for opportunities that bring in new business, while not losing the focus on decommissioning and clean-up.

Regulatory and Government approval will be required for any changes made to the current arrangements for managing the Springfields site.

The site is currently due to close in 2024. As the sole manufacturer of AGR fuel, any further applications by BE to extend the lifetimes of its AGR power stations would, unless other fuel manufacturing facilities are found, require a later date for the closure of Springfields. We will need to consider the implications of this in the light of BE’s strategy for its stations.
Context
Following the final restructuring of British Energy (BE) and the establishment of the NDA, DTI ministers nominated the NDA to be the agent to perform those functions assigned under the BE Restructuring Agreements. This is provided for in the Energy Act 2004.

Our approach
Our responsibilities relate to overseeing British Energy’s planning for and decommissioning of its nuclear power plants and for the discharge of certain nuclear liabilities not covered under commercial contracts with a third party. These activities include:

- reviewing and approving annual plans that (a) detail BE’s work programme and costs for the following rolling three years and (b) detail changes in BE’s nuclear liabilities cost estimates;
- reviewing and approving BE’s strategies and budgets for decommissioning its power plants and discharging its uncontracted liabilities;
- confirming whether certain increases in BE’s nuclear liabilities arising from changes in its operations should be funded through the Nuclear Liabilities Fund (NLF); and
- approving, for payment by the NLF, those invoices submitted by BE for work carried out in discharging those liabilities covered by the NLF.

Unless otherwise directed by the Government, these are our only supervisory functions. We have no direct responsibility for the actual decommissioning work or for discharging uncontracted nuclear liabilities at BE’s sites. These remain with BE. Should the NLF prove to be inadequate, the Government will stand behind it. We will ensure that BE undertakes these activities in a cost-effective manner that is consistent with the NDA’s Strategy, including the approach it adopts to decommissioning its civil reactors.

We have also completed a thorough review of British Energy’s request to extend the scheduled closure date for Dungeness B power station by a period of 10 years (i.e. to 2018). We concluded that the extension was justified within the terms of the Nuclear Liabilities Funding Agreement (NLFA) and that the benefits of a lifetime extension would outweigh any additional decommissioning costs incurred. We presented the outcome of our work to the Government with a recommendation to approve this lifetime extension. British Energy announced in September 2005 that it intends to operate Dungeness B power station until 2018.
4.8 International Transport

We will ensure that the return of overseas nuclear waste products is expedited.

Context
The NDA owns seagoing vessels designed to transport nuclear and non-nuclear materials. They are managed and operated by British Nuclear Group Sellafield Ltd. Pacific Nuclear Transport Limited (PNTL) carries out the international shipment of nuclear materials principally to Japan on behalf of British Nuclear Group Sellafield Ltd and a French nuclear business. PNTL has British, Japanese and French shareholders.

Our approach
The NDA will ensure that British Nuclear Group Sellafield Ltd. continues to be able to offer a safe and reliable sea transport service for overseas' spent fuel, MOX fuel and radioactive waste products. The transport of all nuclear materials is controversial but the UK Government’s policy is that nuclear waste arising from reprocessing activities should be returned to its country of origin. We will also seek to use the vessels, where appropriate, for non-nuclear cargoes. At the end of their useful lives, the NDA will ensure that ships are decommissioned safely and with proper regard to the environment in accordance with international standards.
**Direct Rail Services (DRS)**

**Context**
DRS is a wholly owned subsidiary of the NDA, operating rail transportation services for nuclear materials in the UK. DRS is also a fully functioning freight company which, with facilities and expertise in freight operations, has a track record of winning freight and train service contracts in the non-nuclear sector.

**Our approach**
DRS will continue to compete for contracts and to expand its business in order to mitigate the loss of Magnox transportation contracts, which will fall away in line with the closure of the Magnox stations and increase its income.

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**Property Management**

**Context**
The NDA estate includes a number of non-nuclear assets close to nuclear sites, such as quarries, farms and industrial units.

**Our approach**
We will continue to manage these properties but we propose to review the need to hold them in public ownership and discuss options with the Government and other stakeholders, including local communities.

Should this review suggest that it may no longer be appropriate to hold properties in public ownership, the options we identify will take full account of the safety, environmental and socio-economic implications of any change in ownership.

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We will continue to manage non-nuclear commercial assets.
The UK has large stocks of spent nuclear fuel, uranic materials, plutonium (from the reprocessing of spent fuel), Magnox Depleted Uranium (MDU - a by-product of Magnox reprocessing) and ‘Hex tails’ (a by-product of the uranium enrichment process). We will continue to ensure that nuclear materials are stored safely, securely and without endangering the environment for this and future generations. We will provide advice, as appropriate, to the Government’s Energy Policy Review. We will engage with the Management of Nuclear Materials Issue Group of the recently established UK National Stakeholder Group to consider the most effective management strategies for civil nuclear materials.

**Key Issues**

**Uranics**
- The proportions of uranic materials to be regarded as strategic stock (for example, as a potential future energy source) or waste.
- Whether we should look for a third party to deal with conversion of the hex tails into a passively safe form.

**Plutonium**
- The proportions of the plutonium stock to be regarded as strategic stock or waste.
- How and when plutonium belonging to overseas customers should be returned to them:
  - the Government’s policy is for the return of plutonium derived from THORP reprocessing as MOX fuel for electricity generation. However, the ability to do this will depend on the successful commissioning of the Sellafield MOX plant.
- The disposition options for UK plutonium that is declared as waste.

**Our Approach**

**Uranics**
- We propose to discuss with the Government what proportion of civil owned material should be retained as a potential energy source.
- We will seek appropriate solutions for dealing with uranics such as:
  - contracting with a UK nuclear licence site holder to convert the material into a passively safe form;
  - contracting with an overseas operator to convert the material; and
  - constructing a new facility at one of our sites to carry out this work.

**Plutonium**
- We propose to discuss with the Government:
  - what proportion of the civil plutonium stock should be regarded as a potential energy source;
  - whether any portion of the civil plutonium stock should be regarded as waste, the arrangements for dealing with such material and funding implications; and
  - the arrangements for the repatriation of foreign owned plutonium.
Spent fuels

**Context**
We are responsible under the Energy Act 2004 for the management of spent nuclear fuel on our sites. This includes a significant volume of fuel from historic operations, fuel from Magnox power stations and British Energy’s Advanced Gas-Cooled Reactor (AGR) power stations and contractual obligations inherited by the NDA. The main objectives of our spent fuel strategy are to:

- **reduce hazard through ensuring the safe management of spent fuel and ultimately to produce passively safe packages that will be suitable for final disposal;**
- **fulfil contractual obligations for the management of spent fuel on behalf of UK and overseas customers;**
- **ensure that there is sufficient available capacity to accept all currently projected consignments of Magnox and AGR spent fuel from UK reactors; and**
- **drive innovation and skills development to ensure the delivery of obligations in a timely and cost-effective manner.**

**Issues**
Currently, spent fuel from the Magnox reactors is reprocessed at the Magnox reprocessing plant at Sellafield. This plant is due to cease operations in around 2012. Spent AGR fuel is currently stored and reprocessed at the Thermal Oxide Reprocessing Plant (THORP) at Sellafield, which is expected to fulfil its reprocessing commitments in around 2010. Following the end of reprocessing operations and unless arrangements are found, spent AGR fuel will be stored in the THORP storage pond for up to 85 years. This proposal has not been fully explored and does not currently have regulatory support.

**Our approach**
For this and other reasons, we need to carry out an assessment of the full life-cycle implications of spent fuel management to ensure that we can meet our obligations.

This review will inform our approach to spent fuel management, including an assessment of the risks and opportunities, and will include:

- **a full life-cycle financial, safety, security and environmental assessment of the range of options available for spent fuel management;**
- **engaging with a broad range of stakeholders, including the Nuclear Materials Issue Group established by the National Stakeholder Group on the options available;**
- **criteria to be used to assess the different options will include safety, security, environmental and economic considerations.**
The UK has significant quantities of materials containing uranium (commonly known as uranics). This uranic material can be generally considered as one of five main types:

- ‘Tails’-depleted uranium (uranium hexafluoride, known as ‘hex tails’);
- ‘Magnox reactor’ depleted uranium (uranium trioxide, and known as MDU);
- ‘THORP’ uranium product (uranium trioxide);
- Natural uranium (stored in many forms, such as uranium metal); and
- High enriched uranium (in many forms, known as HEU).

The hex tails arise from the uranium enrichment process (part of the nuclear fuel production cycle), while the Magnox reactor depleted uranium and THORP uranium product arise from the reprocessing of spent nuclear fuel from reactor operations. These three forms constitute the majority of the UK’s uranium stocks. Although most is now owned by the NDA, some of it belongs to the Ministry of Defence (MoD). All uranics, however, are stored safely, securely and without endangering the environment on NDA sites.

Some uranic material, for example hex tails, may be considered to have strategic value. In the future, it could become a source of energy if used in a fast breeder reactor programme. These stocks are equivalent to several hundred years of coal supplies for electricity generation. MDU has similarly been regarded as a strategic stock and could also provide a future energy source.

The hex tails arise from the uranium enrichment process, while the Magnox reactor depleted uranium and THORP uranium product arise from the reprocessing of spent nuclear fuel from reactor operations. These three forms constitute the majority of the UK’s uranium stocks. Although most is now owned by the NDA, some of it belongs to the Ministry of Defence (MoD). All uranics, however, are stored safely, securely and without endangering the environment on NDA sites.

We will work with the Government to ensure the most effective management of nuclear materials.
Our approach

We will work with our contractors and the regulators to ensure the conversion of hex tails into a passively safe form for safe and secure storage. We will discuss with the Government the long-term strategy for the management of MDU and hex tails in the context of its energy review.

In the case of hex tails we expect there to be several options, including:

- contracting with a UK nuclear licence site holder to convert the material into a passively safe form on a commercial basis;
- contracting with an overseas operator to convert the material - though there may be transportation issues that would preclude shipping this material to another country; or
- constructing a new facility to carry out this work at one of our sites.

Solutions to deal with MDU will be sought. We will review the current plans for locating MDU at Capenhurst. MoD strategic uranic stocks will continue to be stored on NDA sites, for which MoD pays storage costs.

We will assess the options for managing uranic materials. This assessment will consider safety, security, environmental and economic considerations.

We will engage with the UK National Stakeholder Group’s Nuclear Materials Issue Group, to consider the most appropriate management strategies for uranic materials.
Plutonium

Context
The UK’s plutonium stock (civil and MoD) derives from military, Magnox and THORP reprocessing activities. MoD owned plutonium will continue to be stored, as now, at Sellafield (refer to Diagram 4). Civil plutonium is held under internationally agreed safeguard arrangements. There is currently no final disposition route for civil plutonium.

Issue
Although plutonium is a potential source of energy for future generations, it is currently regarded as a zero-value asset. To declare it as waste would add several £billion to the cost of dealing with the nuclear legacy. Some of the plutonium stored in the UK belongs to British Energy and to overseas customers, whose spent fuel was reprocessed at THORP and in the Magnox reprocessing plant.

It is the Government’s policy to return plutonium from THORP reprocessing that belongs to overseas customers as MOX fuel manufactured at the Sellafield MOX Plant (SMP). The ability to do this depends on overseas customers completing contracts for MOX fuel manufacture in (SMP) (see Section 4.5 - SMP).

We will continue to store MOD-owned plutonium, as now, at Sellafield (see Diagram 4).

Although there are no current proposals to build new nuclear power stations in the UK or to use MOX fuel, that position could change in future.
We do not believe there are any significant environmental effects associated with the continued storage of plutonium. If any of it were designated as waste, this would need to be done in a safe and environmentally responsible way, but it is likely that there would be some additional waste arisings and discharges to the environment as a result. The extent of additional waste arisings and discharges would depend on the approach adopted.

Our approach
Our first priority for plutonium is to store it safely and securely - using both existing stores and the first £200m phase of the new store currently being built at Sellafield, approved by the NDA Board.

We have begun discussions with the Government on plutonium management options, and in particular:
- the proportion of civil plutonium that should be regarded as having strategic value as a potential future energy source and the proportion that should be reclassified as waste. The useful life of plutonium will need to be taken into account in making this decision;
- the arrangements for the return of foreign-owned material as MOX fuel; and
- whether and in what circumstances to sell UK plutonium to an overseas manufacturer of MOX fuel.

The advice we offer will take account of the stakeholder engagement exercise undertaken by BNFL and discussions with the recently established Nuclear Materials Issues Group.

Additionally, we will examine whether there are circumstances in which we would need to consider a backup to SMP.

We have agreed with the DTI that we will develop a macro-economic analysis of the life cycle costs associated with plutonium management options. This analysis will include safety, security, environmental and economic considerations.

We also intend to discuss plutonium management options with other bodies and Government Departments and agencies such as DEFRA, the Scottish Executive, the HSE, SEPA, the EA and the MoD.

Wider implications
If SMP is unable to meet its expected operational targets, we will need to consider alternative arrangements for dealing with plutonium. We are working closely with the Government to monitor SMP’s performance. If a decision were made to close SMP (which is a matter for the Government) we would need to review our options for the return of overseas-owned plutonium and the long-term management of the UK’s plutonium stock.

As a contingency, we are already engaged in a plutonium R&D programme with Nexia Solutions Ltd. The objective of the initial studies is to assess the technical feasibility of plutonium treatment technologies.
We will compete the management and operation of our sites. We believe that the early introduction of competition is necessary to stimulate improved performance and to bring in new ideas and experience. Our competition schedule takes into account the Government’s decision to enable the sale, through a competitive process, of British Nuclear Group - the parent company for the BNG Sellafield Ltd. and Magnox Electrics Ltd. Site Licence Companies (SLCs).

### Key Issues
- The timetable for the competition process.
- How to group our sites for competition.
- The preparations required for competition.

### Our Approach
- We propose to let a significantly revised contract for Sellafield, to run for five years from successful completion of the sale of British Nuclear Group expected by Autumn 2007.
- We propose to launch our first competition in 2006 for the LLW Repository.
- New Site Licence Companies (SLCs) will need to be created to enable the completion of our competition schedule. This will require the relicensing of nuclear sites and new radioactive discharge authorisations to be obtained.
- Site management competition will be for separate, stand-alone legal entities.
- The relevant UKAEA assets will be transferred by the Government to the NDA by 31 March 2007.
- Invitations to tender will need to be prepared and posted in the OJEU, with fair and open competitions run.
Context

The Government has set us a Public Service Agreement (PSA) target of completing competitions for half of our 20 sites by the end of 2008. The need to facilitate a sale of British Nuclear Group - which we support - within our competition schedule will mean that we will need to review this target with the Government to ensure that it continues to be relevant. Whilst it will not result in half of the sites being competed in the original time-frame, a sale of British Nuclear Group will introduce many of the benefits of competition, including effective competition of around 60% of the liabilities for which the NDA is responsible.

The NDA has Parent Company Agreements with British Nuclear Group and Westinghouse UK to provide additional guarantees of performance for the Site Licence Companies (SLCs) that we inherited. The Parent Company holds the shares in the SLC for the period of the contract (see table for the Parent Company and SLCs by site).

The NDA has initial contracts with the SLCs to deliver agreed programmes of work, both to schedule and to agreed annual site funding limits. The contracts are for an initial period of two years. A secondary period, varying from one year to three years, may be awarded beyond the initial period based on the SLC’s performance. In all cases, the secondary period has to be earned and is reviewed annually.

The SLCs hold the contracts with the NDA and are responsible for the day-to-day operation of the sites. They hold the nuclear site licence and are regulated by the UK’s independent regulators: the Nuclear Installations

<table>
<thead>
<tr>
<th>Sites</th>
<th>Current Parent Company</th>
<th>Current SLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkeley</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
<tr>
<td>Bradwell</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
<tr>
<td>Calder Hall</td>
<td>British Nuclear Group</td>
<td>British Nuclear Group Sellafield Ltd</td>
</tr>
<tr>
<td>Capenhurst</td>
<td>British Nuclear Group</td>
<td>British Nuclear Group Sellafield Ltd</td>
</tr>
<tr>
<td>Chapelcross</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
<tr>
<td>Culham JET</td>
<td>British Nuclear Group</td>
<td>Not a licensed site</td>
</tr>
<tr>
<td>Dounreay</td>
<td>British Nuclear Group</td>
<td>UKAEA</td>
</tr>
<tr>
<td>LLW Repository</td>
<td>British Nuclear Group</td>
<td>British Nuclear Group Sellafield Ltd</td>
</tr>
<tr>
<td>Dungeness A</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
<tr>
<td>Harwell</td>
<td>British Nuclear Group</td>
<td>UKAEA</td>
</tr>
<tr>
<td>Hinkley Point A</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
<tr>
<td>Hunterston A</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
<tr>
<td>Oldbury</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
<tr>
<td>Sellafield</td>
<td>British Nuclear Group</td>
<td>British Nuclear Group Sellafield Ltd</td>
</tr>
<tr>
<td>Sizewell A</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
<tr>
<td>Springfields</td>
<td>Westinghouse</td>
<td>Springfields Fuels Ltd</td>
</tr>
<tr>
<td>Trawsfynydd</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
<tr>
<td>Windscale</td>
<td>UKAEA</td>
<td></td>
</tr>
<tr>
<td>Winfrith</td>
<td>UKAEA</td>
<td></td>
</tr>
<tr>
<td>Wylfa</td>
<td>British Nuclear Group</td>
<td>Magnox Electric Ltd</td>
</tr>
</tbody>
</table>

We will use competition as our main mechanism to improve performance and to bring in new ideas and experience.
6.1 Competition for Management and Operation

We will use competition as our main mechanism to improve performance and to bring in new ideas and experience.

Inspectorate (NII) on behalf of the HSE; the Environment Agency (EA) in England and Wales; the Scottish Environment Protection Agency (SEPA) in Scotland; and the Office of Civil Nuclear Security (OCNS) (see Diagram 6). We recognise that delivery of our competition schedule will be dependent on regulatory input. Nominated personnel are seconded into the SLC from the parent company for the duration of the contract.

On expiry of the contract, these personnel move out and new individuals move in. These arrangements are formally controlled by the regulators under Licence Condition 36 (NII) and Condition 6 (EA and SEPA) and by the NDA under the competition process.

In order to compete a site, or group of sites, some restructuring of the current SLCs may be necessary to align with our proposed competition schedule. New SLCs, capable of holding the relevant nuclear site licence and radioactive discharge authorisation(s), will be created to operate a site, or group of sites. It is the management and operation of these new SLCs, with management by a new Parent Company, that will be competed at Tier 1. NDA expects that special purpose vehicles (SPV) may be set up by Companies to bid for these contracts in which case there will be multiple parents. In subsequent competitions, the new SLCs form the ‘transferable entities’, which pass from one SPV to another according to who has the contract with the NDA. The SLCs will continue to operate under the nuclear site licence they hold.

The role of the NDA is to manage the contract, not the contractor. We are not the "controlling mind" in terms of health, safety, security and environmental compliance. This is the responsibility of the site licensee. The SPV will own the shares in the SLC for the duration of the contract and be responsible for seconding into the SLC appropriate personnel to discharge the terms of the Parent Company Agreement. Responsibility for the delivery of safe, secure, cost-effective and environmentally responsible decommissioning and clean-up will be the joint responsibility of the SLC, the SPV and the Parent Companies. The NDA has informed the current SLCs of the performance factors that it will take into account in awarding extensions to their current contracts, beyond their initial two year period. These include: safety, security and environmental performance; production of quality Life Time Plans (formerly Life Cycle Baselines) and Near Term Work Plans (NTWPs); quality, cost and programme performance against site NTWPs; relations with the NDA; quality of performance and portfolio management; innovation; cost savings; and progress on competing sub-contracted work.

The current contracts are cost-reimbursable and incentivised. Our contractors are paid all their legitimate (allowable) costs and can earn fees (profit) for meeting set key performance targets. Disallowable costs must be paid by the contractor, or the Parent Company, from their fee or other income. The current fee pool is 4.4% of NDA annual site funding, within which the more important or challenging targets are the most highly incentivised. We also rebalance the funding and related fee between sites at appropriate times to reward sites that are performing well. This enables them to earn higher fees where costs are reduced and work accelerated.
Successful competition will bring the best available skills and experience to the decommissioning and clean-up of our sites safely, securely and with proper regard to the environment. Other longer-term benefits, including greater innovation, better value for money and appropriate risk transfer.

We recognise the perception of some stakeholders that competition could lead to a reduction in safety or environmental standards. We will take steps, initially through the bidding process, to ensure that this does not happen. We expect competition to bring improvements in a number of areas, including safety management and environmental performance. International experience has shown this to be the case.

We also recognise the concerns of the workforce that competition could result in job losses. However, the competition is for the management and operation of the sites. Contractors will have to deliver their decommissioning and clean-up programmes to agreed targets and a skilled and highly motivated workforce will be essential if they are to do so. Contracts will have specific restrictions concerning the employees of the SLCs.

We can also learn from the experience of others. The US Department of Energy, for example, has implemented a successful programme of contract management over several years for the decommissioning and clean-up of nuclear sites. This has involved awarding specific contracts for site closure and rewarding contractors who take higher commercial risks to deliver fixed targets ahead of schedule, with enhanced fee for earlier closure, or accelerated performance. We will examine what benefits we can derive from the USA and other contracting experience to move in that direction and consider whether fees of the order of 8% to 15%, or higher, are justified under an appropriate risk/reward agreement.

Initial steps
We have started to prepare for competition. A Prior Information Notice (PIN) has been logged in the Official Journal of the European Union (OJEU) for the LLW Repository competition. We have started work with our contractors and the regulators to prepare for the competition of the Magnox and UKAEA sites, such as the formation of new Site Management Companies (SMCs) and SLCs, and we will work with BNFL to facilitate the sale of British Nuclear Group. We will also hold ‘industry days’ to provide interested bidders with an early opportunity to understand our preliminary market proposal. All NDA competitions will be managed according to the EU Procurement rules.

Pre-qualification criteria
It is clearly important, not least to address the concerns of stakeholders, that we should set clear criteria by which we judge whether bidders can meet the requirements of the UK market. Broadly described, the pre-qualification information that will be required by the NDA is set out below (including references and security clearances):

- first-rate health, safety, security and environmental performance;
- successful change management experience
We will use competition as our main mechanism to improve performance and to bring in new ideas and experience.

and record of innovation;
- demonstrable experience of effective engagement with stakeholders, including trade unions;
- comprehensive understanding of the UK regulatory environment;
- comprehensive understanding of nuclear site licence holder obligations;
- a sound balance sheet, providing adequate parent company guarantees as appropriate;
- strength in depth of general management and technical competencies;
- practical experience of dealing with multi-unionised, highly skilled undertakings and having sound HR strategies, including training;
- evidence of skills in programming, scheduling, project management and cost control;
- evidence of public and political acceptability;
- demonstrable record of achievement within the nuclear decommissioning industry in the UK or elsewhere; and
- commitment to relocate management staff within our nuclear site communities and contribute to the socio-economic well-being of the area.

We are developing these criteria further for the LLW Repository competition and the sale of British Nuclear Group.

As part of the tendering process, we will publish the precise criteria and the evaluation process it will use to assess tenders and to decide on winning bids.

Approach to the number of bidders
We do not propose to put artificial limits on the number of qualified companies or consortia planning to bid since we believe that the market will limit itself naturally; our pre-qualification criteria are necessarily extensive and experience has shown that companies tend to bid in consortia. We will follow the best practice guides from the Office of Government Commerce (OGC) when developing our approach to the market. We will look to attract suitable and sufficient interest commensurate with the specific scope, programme and risk transfer required. Normally, we will seek to attract at least three to six viable individual, or consortia, bidders in order for competitions to be considered successful.
Proposed Approach to Contract Bundling

The LLW Repository
This is a small site with a low risk profile compared with many nuclear sites and will be fairly straightforward to compete. As such, it is a ready candidate against which the NDA can prove its competition process while also allowing companies to gain valuable bidding experience. The contract may be let in two phases, the second including wider LLW management.

Non generating Magnox Sites
Berkeley, Bradwell, Calder Hall, Chapelcross, Hinkley Point A, Hunterston A and Trawsfynydd are closed and have similar requirements for decommissioning and clean-up. Dungeness A and Sizewell A are due to reach the end of their generating lives in 2006. To drive economies of scale and optimise contractor experience and interest, we believe that these sites could be competed as two packages, broadly on geographic lines, North and South. We will consider splitting Calder Hall from the Sellafield site to form part of one of these packages. This would require relicensing and transfer of discharge authorisations. The two packages would comprise Berkeley, Bradwell, Hinkley Point A, Dungeness A and Sizewell A; and Calder Hall, Chapelcross, Hunterston A, Trawsfynydd and (see Other Generating Magnox Sites) Oldbury and Wylfa.

Dounreay
This site is already focused on decommissioning, has no operations and is relatively self contained.

Harwell, Winfrith and Culham
Harwell and Winfrith are in close proximity and would be competed as a single site closure package after we have competed Dounreay. Subject to its designation by the Government to the NDA we will consider in due course when best to compete Culham, given its ongoing nuclear fusion research programme, as part of our discussions on site end dates.

Other Generating Magnox Sites
Oldbury and Wylfa are due to continue generating to 2008 and 2010 respectively. On the cessation of generation, we plan (see earlier) to fold these sites into the competed Magnox North package (1).

Sellafield
As part of the sale of British Nuclear Group, we will let a significantly revised contract for the management and operation of Sellafield to run for five years from completion of a sale (expected by Autumn 2007). The new contract will be appropriate for the private sector and designed to improve performance through innovation, greater incentive arrangements and a higher risk/reward profile. We will have a significant role in the sale process, with the aim of ensuring that the successful bidder is the best available to improve performance at Sellafield.

Windscale
We will discuss with UKAEA and other stakeholders the possibility of moving Windscale into the Sellafield site in due course.

Springfields
Our priority is to consider the best future use of this site with Toshiba, the new owner of Westinghouse in 2006/7 (see section 4.6) before determining any time-frame for competition or other options.

Capenhurst
We will also consider whether, when and in what form it would be sensible to compete Capenhurst, possibly as a closure contract.
### Competition Schedule

<table>
<thead>
<tr>
<th>Start Competition Process</th>
<th>Sites Competed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2006</strong></td>
<td>• Low Level Waste Repository (LLWR)</td>
</tr>
<tr>
<td><strong>2007</strong></td>
<td>• BNG Sale</td>
</tr>
</tbody>
</table>
| **2008**                  | • Magnox South  
• Dounreay |
| **2009**                  | • Magnox North (including Calder Hall, Oldbury and Wylla)  
• Harwell/Winfrith |
| **2012**                  | • Sellafield/Windscale |
| **Other**                 | • Capenhurst, Culham and Springfields subject to further review |

* Windscale subject to further discussions on relicensing. Timing assumes B205 Magnox reprocessing plant has ceased operation in 2012. Otherwise delayed until B205 closure.
We propose largely to frame contracts around the outputs and end states we require; we intend to say 'what' not 'how'. For example, the recent development of a waste cementation plant at Winfrith was achieved through a contract to produce a given number of drums of waste, rather than by seeking industrial tenders to design, build, commission and operate a cementation plant. This single output approach avoided conflicts between the various contract stages.

We will explore the full range of cost models and choose the one best suited to the risk and key site/NDA drivers. Arrangements such as the one noted above would be costed on a simple fee-per-drum basis whereas arrangements where the scope or risk is poorly defined are likely to remain on a cost reimbursable basis. In these circumstances, appropriate performance-based incentives would be defined and payable on achievement of given milestones. Novel forms of funding may be considered where these drive appropriate behaviours. Contracts can be terminated at the NDA’s convenience to ensure support for competition and for poor performance.

The site management competitions will be for separate, stand alone legal entities (SLCs) that will not be dependent on existing, centralised shared service centres. These legal entities will have the capacity to resource facilities and systems from the most appropriate source. Throughout this process the SLC must be capable of discharging all regulatory requirements, including those associated with being an ‘intelligent customer’.

The length of contracts will vary depending on site complexity and their position along the decommissioning path but are expected to be of around five years duration with the possibility of extensions for good performance. It should be possible to award ‘closure contracts’ for Winfrith and Harwell, and possibly Capenhurst, whereby contractors would be incentivised to achieve early site closure. A closure contract approach could also be taken in due course for some of the Magnox sites.
Tier 1 contractors (that is the site management and operations contractors) generally use sub-contractors (Tier 2 and below) to execute much of their work. Tier 1 contractors are required to include certain terms and conditions in their sub-contracts, including the right to terminate the contracts. The NDA holds the Tier 1 contractor ultimately responsible for the performance for any sub-contracted work.

For a number of our sites, the amount of work sub-contracted is already high for example, it is 50% - 60% at Sellafield and 66% at Dounreay. However, we believe the number and diversity of Tier 2 contractors on our sites can be increased through competition. We plan to publish metrics on our website regarding the value of work sub-contracted on each site; the percentage of Tier 2 contracts that are let competitively; and other relevant data to increase transparency and value for money.

We are keen to see the development of a robust supply chain that will actively participate in the acceleration and innovation of decommissioning processes. We are also keen to have our Tier 1 contractors continue to develop open, fair and well-publicised Tier 2 and below competitions that will, in turn, stimulate the supply chain.

We will publish site Life Time Plans and intend to require our Tier 1 contractors to publish their annual procurement plans on their websites to provide extra visibility for potential work at all levels. We will also discuss with Tier 1 contractors the potential for competing significant packages of work at the Tier 2 level, especially at larger sites and where this does not conflict with Tier 1 competitions.

Although the NDA does not contract at the Tier 2 level, it does hold the Tier 1 contractors responsible for all lower-tier work. We expect Tier 1 contractors to enhance the participation of a larger number of companies in the supply chain to increase innovation, to satisfy skills requirements and to deliver early and effective competition for decommissioning and clean-up work.
We are responsible for ensuring that there is an appropriately skilled workforce available to carry out decommissioning and clean-up activities and to ensure the continued operation of commercial plant to meet existing contracts. Both existing and new knowledge will be needed for operations to progress. We will encourage contractors to be innovative in order to deliver our mission more effectively, including improvements in safety, security, environmental and socio-economic performance. We also aim to ensure that good practice is shared between contractors for the benefit of the UK-wide decommissioning and clean-up mission.

**Key Issues**

- Replenishing the nuclear industry’s ageing workforce and developing new skills.
- Managing peaks and troughs in labour demand.
- Knowledge management, transfer of good practice and how to promote a culture that constantly strives to improve the effectiveness of operations.
- How to best encourage and reward innovative ideas.
- Delivering value through sponsoring, funding and managing R&D.
- The UK Government is considering the case and options for a National Nuclear Laboratory.

**Our Approach**

- We plan to work with our contractors, regulators and the unions to find the best ways of retraining, reskilling or redeploying people in a way that encourages a more flexible workforce.
- We plan to work with our contractors and the regulators to identify the skills and workforce requirements to deliver our mission.
- We will work with others to evaluate the potential for a National Nuclear Skills Academy and a Nuclear Institute; a National Graduate Scheme that will work in partnership with agencies and providers across the UK to develop locally specific provision.
- We will contribute to the Government's review of the case for a National Nuclear Laboratory and work with the Government and others to implement whatever decisions are made.
- We have set up a Waste Management and Decommissioning Research Board to take an overview of UK and international developments and capabilities.
- We recognise the contribution of the workforce and will look for better ways to reward them for accelerating decommissioning and clean-up.
- We will establish an industry-wide pension scheme.
We will ensure the industry has a sufficiently skilled workforce to carry out our mission

Our commitment and responsibility

We welcome the responsibility we have been given for maintaining and developing a skilled workforce that is properly equipped with the facilities, laboratories, codes and standards to deliver our mission safely, securely and in an environmentally responsible way.

Many members of the British Nuclear Group’s workforce have spent much of their careers in a largely operational environment. That is not the case at UKAEA where the majority of the workforce has been dedicated to decommissioning and clean-up for many years. However, it is also important to recognise that a good deal of decommissioning and clean-up has already been achieved at a number of British Nuclear Group sites, notably Capenhurst and at Magnox reactor sites.

Although some of the work associated with decommissioning is highly skilled and unique to that process – for example, removing spent fuel from reactors and retrieving and treating radioactive waste – there are also a number of areas which share skills with other industries such as demolition work, construction, finance and mechanical engineering. Tapping into other industries for skills will provide a healthy cross-fertilisation of ideas and the transfer of good practice. However, this may also result in competition across industry sectors for certain types of high-demand skills such as project management. Where appropriate, the NDA will seek to work with local, national and international organisations to address these issues.

British Nuclear Group and UKAEA have training programmes in place to re-equip their staff to meet the challenge of decommissioning and clean-up. In many cases, the skills required in an operating environment can be readily transferred to this next phase. We will work with our contractors to ensure that the necessary investment is made to produce the long-term skills required to deliver our mission.

We also need to work with SLCs and the unions to agree the best ways of retraining, reskilling or redeploying people to build a more flexible and mobile workforce equipped for the challenges we face.

The Life Cycle Baselines (LCBLs) show a slow decline in employee numbers over the next ten years or so. After about 15 years, that decline will accelerate and then plateau out at just a few thousand people. In around 35 years from now, there is a projected small increase in employment linked with the assumed date for the development of the long-term ILW management facility, before falling again to the previous level after five years.

Only in about 80 years’ time, when Magnox reactor decommissioning and final site clearance is currently planned to begin, do job numbers rise significantly again. Such a fluctuating employment profile raises serious issues for both the NDA and for the regional economies of the nuclear site communities. (These estimates are currently based on a 100 year time frame for decommissioning Magnox stations. These assumptions would alter if decommissioning was to accelerate).
This pattern of employment also makes it difficult on any sensible basis to ensure that the necessary skills base is available over such a protracted time period.

Were an accelerated approach to decommissioning to be adopted, subject to Government approving a business case, the potential effects on employment levels would be fully explored.

**Key issues**
The main difficulties to overcome are:

- **the workforce in the nuclear industry is ageing, with consequential long-term succession problems;**
- **the absence of a consistent picture across the nuclear industry on long-term skills needs. Although we do not believe there is an imminent skills shortage, we need to address the issue now to mitigate a potential skills shortage in the medium term (3-5 years);**
- **competition - and the increased use of contractors to deliver the decommissioning and clean-up mission - adds to the need for us to maintain a focus on our long-term national skills requirements. We need, therefore, to establish national standards to manage a potential fragmentation of the workforce;**
- **the present focus of university courses, skills initiatives and standards reflects the historic focus on operations, rather than the current focus on decommissioning and clean-up; and**
- **many communities in which the NDA operates will not readily be able to handle significant peaks and troughs in employment trends.**

**Our approach**
The initiatives described below are aimed at ensuring that the workforce has the ability to acquire the skills required to make the transition from operations to decommissioning, and offer retraining and continued career development at all levels. The skills triangle diagram (see Diagram 6 overleaf) shows the progression of skills and the link with some of the key initiatives in which the NDA will invest to create a national infrastructure that will enable the delivery of our mission. Key to the success of this strategy are partnerships with national and local organisations that will enhance NDA investment.

The key initiatives are:

- **a Nuclear Skills Institute: a joint venture with Manchester University aimed at creating an Institute based at Westlakes in Cumbria that will carry out world class research, delivery of MSc courses and provide a link to the broader UK academic network;**
- **a National Nuclear Skills Academy: a 'hub and spoke' model that will establish skills requirements nationally while delivering training through local colleges and training organisations close to the relevant NDA sites.**
Skilled Workforce

We will ensure the industry has a sufficiently skilled workforce to carry out our mission.

Subject to Government policy decisions on the need for a National Nuclear Laboratory and decisions on what form it may take, we will want to play a role in its implementation.

The NDA, working in partnership, will:
- promote sustainable employability within the nuclear industry;
- using LCBLs, establish a clear picture of the skills needed and any gaps present;
- ensure that contractors identify, maintain and develop the long-term skills needed for nuclear decommissioning and clean-up;
- where appropriate, maintain the skills required to deliver ongoing operations for the lifetime of the plant;
- encourage contractors to retrain and reskill the existing workforce to carry out decommissioning and clean-up;
- work with our contractors, Cogent (the relevant Sector Skills Council) and training providers to establish what the needs are for national standards in key skill areas; and
- develop a model and skills categorisation system to inform national decision making.

We have allocated around £35 million to these initiatives over the next five years and we will work closely with others who have responsibilities in these areas to:
- ensure that our contractors continue to retrain and reskill the existing workforce to carry out decommissioning safely, securely and in an environmentally responsible way, while providing sustainable employment;
- work in partnership with the Northwest Regional Development Agency, Cogent and other organisations to investigate the feasibility...
The Skilled Workforce section of the NDA Strategy outlines strategies to develop a national nuclear skills workforce. Key points include:

- Pursuing the concept of a Nuclear Institute based in West Cumbria to develop skills in key technical areas that support the NDA mission.
- Working closely with the Scottish Executive, Scottish Enterprise, Highlands and Islands Enterprise (HIE), the University of the Highlands and Islands (UHI), and other further education providers in the South and West of Scotland, to ensure the unique needs of Scotland, and the Dounreay area in particular, are properly catered for.
- Developing a business plan with the College at Thurso and local contractors that seek to enhance existing infrastructure and courses in support of clean-up at Dounreay and enable the College to play a wider UK role.
- Working closely with stakeholders in areas affected by NDA activities to ensure initiatives address both the local socio-economic issues and the establishment of appropriate training provision.
- Working with contractors and the regulators to establish a national graduate programme that provides opportunities to provide experience across the NDA and gain nationally recognised qualifications.

We will seek, where possible, to support initiatives that provide local social and economic benefit. A good example is the proposed National Nuclear Skills Academy. This initiative is a 'hub and spoke' model (see Diagram 7 below) that will establish skills requirements nationally while delivering training through local colleges and training organisations close to the relevant NDA sites. Our approach to skills development is also integral to our socio-economic strategy (see section 9).
7.2 Knowledge-management and good practice

Key issues
To devise a knowledge-management policy that:

- ensures both historic and future generated knowledge required to decommission and clean-up the UK's civil nuclear legacy is identified, captured and broadly accessible;
- provides incentives to contractors to share good practice with each other and to seek to adopt good practice developed in other countries and in other industries;
- ensures knowledge, such as intellectual property rights (IPR), is managed in order to encourage innovation and the transfer of good practice while supporting decommissioning and clean-up;
- ensures know-how is identified, captured and managed (through the appropriate skills institutions);
- ensures knowledge is available for use under initiatives such as the proposed National Nuclear Archive; and
- ensures that legal requirements for the preservation of knowledge are fully satisfied.

Our approach
We will:

- develop an overarching policy that states the objectives for knowledge management and ensures this is embedded in current and future contracts, providing a framework under which innovative methods can be developed in a competitive environment;
- build on the good work already undertaken in the industry by using good practice obtained from outside the NDA; and
- encourage the development of a 'learning culture' that constantly strives to carry out operations more efficiently and effectively.

The NDA's knowledge management policy will

- consider the most appropriate means to manage intellectual property across the industry to encourage innovation and

maximise benefit to taxpayers, while ensuring that the NDA maintains the access it needs to IPR to oversee decommissioning and clean-up and commercial operations;

- consider how best to promote the sharing of good practice across the industry in disciplines such as project management, engineering, business systems, safety management systems and innovation.

7.3 Innovation

We intend to promote and reward innovation. We regard innovation as the application of good ideas that improves the effectiveness, safety or environmental impact of operations carried out on our sites. Innovation is not, however, restricted to technical systems and engineering, nor does it exclusively involve the development of ‘high-tech’ solutions. For example, it could involve innovative methods of contract management that reward accelerated decommissioning or fit-for-purpose solutions for dealing with traditional problems; or better training to improve the way people carry out decommissioning operations.

We have encouraged British Nuclear Group, UKAEA and Westinghouse to bring forward innovative ideas and informed them that innovation will be a key factor in considering the award of competed contracts.

We are not seeking over-engineered solutions. Rather, we are looking for pragmatic and fit-for-purpose approaches.

Some international examples from which we might learn are:

- removing and drying of spent fuel from ponds;
- using dry spent fuel storage facilities; using temporary buildings / vehicles for characterising and sorting waste;
Research and Development

7.3 Innovation

- using conventional machinery that is not bespoke to the nuclear industry for demolition;
- innovative approaches to decontamination; and
- using incinerators and metal smelters (in line with appropriate environmental standards) to reduce the volume of contaminated materials, and LLW etc.

While we welcome any savings in time or cost (though not, of course, at the expense of safety, security or environmental performance), experience to date in decommissioning suggests that innovation is key to delivering positive step-changes in both cost and time. The most effective innovation generally involves either fundamental changes in thinking and approach leading to novel solutions, or the application of existing ideas and well tested technologies from other industries. The framework we develop will address the drivers, environment and contractual arrangements most likely to encourage innovation among our contractors and their subcontractors.

7.4 Research and Development

**Context**

Science and technology play a fundamental role in ensuring the safe, cost-effective delivery of the decommissioning and clean-up programme. Applying R&D intelligently can significantly reduce both costs and timescales and provide a rigorous basis for developing solutions to strategic and technical issues.

By identifying both short and long-term R&D needs, this will enable us to take appropriate investment decisions.

**Issue**

To date, R&D activities associated with decommissioning and clean-up in the UK have been carried out by nuclear operators, universities and specialist contractors with only limited collaboration and cross-fertilisation of ideas.

**Our approach**

The key elements of the NDA’s approach are:
- organising R&D on a national basis so that necessary capabilities are available to support all NDA sites;
- developing a science and technology ‘roadmap’ to ensure that R&D work undertaken is linked to the LCBLs;
- identifying and preserving key scientific and technical skills over the long-term as a part of the wider skills programme;
- investing in strategic facilities;
- delivering value for money by optimising the
Identifying current and future technology needs

While investing in key R&D projects is crucial to the success of our strategy, we need to develop a clear understanding of current programmes and likely future needs.

In general, we will not seek to duplicate the roles of existing research bodies. Neither will we invest in speculative, high risk and expensive research unless there are compelling reasons to do so. Rather, we will analyse the LCBLs to establish “technology insertion points” where an injection of funding in R&D could, potentially, bring about incremental changes to existing technologies, systems or practices capable of delivering net cost or time savings. We will make use of the Waste Management and Decommissioning Research Board to prioritise which technology insertion point investments should be funded and to advise on how, and where best, the necessary work could be undertaken. We are also co-operating with the Health & Safety Commission’s Nuclear Safety Research Programme, which covers nuclear safety and radioactive waste management research for all our sites.

We are working closely with our contractors and are actively encouraging the supply chain to develop novel and innovative solutions to traditional problems. We see R&D activities carried out by Nirex as complementary to these arrangements.

We will publish annually the ’Technology Needs, Risks and Opportunities’ we have identified and invite innovative proposals to resolve them.

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**Research and development**

- return on facilities and intellectual property development;
- collaborating internationally to share and benefit from technical advances; and
- utilising national and international experience to assess independently and contribute to R&D.

We have set up a Waste Management and Decommissioning Research Board, comprising the Scottish Executive, DTI, DEFRA, NII, EA, SEPA, and two independent members, to consider UK and international developments and opportunities for collaboration. We will seek to introduce an international representative onto the Research Board.

We will continue to monitor the likely effect of research into nuclear fusion by UKAEA on the subsequent decommissioning of the JET facility, and the work carried out by Nirex in relation to ILW disposal issues.

We have contracted with Nexia Solutions Ltd. (the former research arm of BNFL) to continue a number of waste, nuclear materials and decommissioning related R&D projects.

We are encouraging the development of the wider use of the new Technology Centre at Sellafield. We support, in principle, the Northwest Regional Development Agency’s initiative to consider a US-type National Nuclear Laboratory, especially as it can be located in West Cumbria. This is dependent on Government policy decisions on the need for a National Nuclear Laboratory.

We are working closely with our contractors and are actively encouraging the supply chain to develop novel and innovative solutions to traditional problems. We see R&D activities carried out by Nirex as complementary to these arrangements.

We will publish annually the ’Technology Needs, Risks and Opportunities’ we have identified and invite innovative proposals to resolve them.
We recognise the key role that current employees play in the safe operation of nuclear sites and in the delivery of decommissioning and clean-up programmes. In taking forward workforce and competition issues, we do not intend to achieve cost savings at the expense of employees’ terms and conditions. Existing TUPE regulations currently provide for those to be protected on transfer as a matter of law.

Whilst recognising the proper relationship between the contractors and their workforce, we will continue to liaise closely with the trade unions and employers on national workforce issues, including the detailed design of the new industry wide pension scheme (see below), the makeup and operation of national health, safety and environment committees, codes of conduct to ensure site safety in the event of disputes and broad arrangements for bargaining on pay and conditions.

The NDA is committed to delivering the pensions protections for the nuclear decommissioning workforce as set out in the Energy Act 2004, Government policy and Ministerial statements, including the letter from the Secretary of State to the trade unions of 13 February 2004.

To help deliver those protections we are developing a new Nuclear Decommissioning Industry Wide Pension Scheme to look after the needs of staff if, on a future transfer to the private sector, they are no longer able to continue with their existing arrangements (as would be the case for those in the UKAEA Combined Pension Scheme).

The design and coverage of the pension scheme will be informed by a detailed consultation with stakeholders, in particular with the unions representing the workforce, and subject to final approval by the Secretary of State for Trade and Industry.

A key requirement is that the pension scheme will meet the obligations set out in the Energy Act to enable staff transferred for NDA purposes to continue to accrue benefits that are no less favourable than those they already enjoy. Staff who transfer could, if they wished, transfer their past service to the industry-wide scheme on the basis of year-for-year or broadly equivalent, service credits. Alternatively, they could leave their past service in their old scheme.

We expect the industry-wide pension scheme to be available from August 2006.

Terms and Conditions

We are keen to encourage an environment in which ideas can be explored between our contractors and national and local trade union representatives to amend workers' terms and conditions, rewarding workers for accelerating clean-up, encouraging flexibility across our sites and improving skills.

We recognise that workers will need to be reequipped with the skills necessary to enable them to move from one decommissioning project (location) to another within the UK or elsewhere. Relocation facilities will also be required to help those that want to move their families and homes.
We will continue to maintain data on workforce radiation exposure.

**Context**
Records of the nuclear industry workforce exposure to radiation, especially at Sellafield, have been maintained for many years. The data are owned by the workforce and provide essential material for epidemiological research studies into the longer-term trends associated with dose exposure.

**Issue**
It is imperative that this data continues to be systematically collected, maintained and managed - and made available, with the permission of the workforce - to appropriate professional researchers and that the results of these studies are made available to the workforce.

**Our approach**
We are contributing £5m to support the creation of a new academic position of Chair of Epidemiology, in partnership with the University of Central Lancashire, to enable the development of a greater understanding of the long-term effects of radiation dose. This will provide a unique pool of expertise and assure the future of a world-leading research team in West Cumbria and also help to underpin the sustainability of the decommissioning and clean-up industry in the North West.

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**Nuclear Industry Compensation Scheme for Radiation Linked Diseases**

**Context**
British Nuclear Group and UKAEA participate in the Nuclear Industry Compensation Scheme for Radiation Linked Diseases, which was introduced in 1982 as a joint initiative between BNFL and the trades unions.

The aim of the Scheme is to make an assessment of claims made for radiation related injuries brought by Company employees without the need for legal proceedings that are lengthy and expensive for the employer and the unions and which are stressful for the claimants and their families. UKAEA and the trades unions representing its staff joined the Scheme in 1987. Other UK nuclear operators have joined the scheme subsequently. The Scheme now covers the employees of 12 major civil and defence nuclear employees.

**Our approach**
We intend to continue to support the involvement of our M&O contractors in the Nuclear Industry Radiation Compensation Scheme and will discuss the appropriate approach to achieve this with our contractors and, if necessary, with the administrators of the Scheme.
Financial requirements for delivering our remit

The NDA is funded by the Government. Our funds are a combination of general Government spending and revenue from commercial activities on NDA sites. We need to ensure that we allocate a significant part of our funding to decommissioning and clean-up, prioritise our spending and ensure that risks are both managed and mitigated.

Key Issues

Funding Requirements
- Our estimates, based on the 2005 Life Cycle Baseline (LCBL), show the estimated costs of delivering the NDA’s remit (decommissioning, clean-up and commercial operations) to be £62.7bn undiscounted (£35.4bn discounted). Neither of these figures have been audited.

Funds for Decommissioning & Clean-up
- The correct balance of expenditure between site operations and decommissioning and clean-up of those sites, without prejudicing safety, security and the environment.

Prioritisation
- Prioritising the allocation of funds within and between sites and managing risks on a national basis.

Our Approach

Funding Requirements
- We will consider the best allocation of funds between sites using the prioritisation process and other mechanisms.
- We have initiated a LCBL improvement process with the aim of developing a more robust baseline by 2008.
- We also have a PSA target of delivering annual efficiency gains of 2% from 2006/7. We have begun this process by asking our contractors to make savings of 7% this year (2005/6) and a similar amount in each of the next two years.

Funds for Decommissioning and Clean-up
- We will set a target of spending at least £1bn per year on hazard reduction decommissioning and clean-up.

Prioritisation
- In allocating funding by site, we will strive to achieve a balance between early wins and longer-term success and between reducing hazards and earlier site clearance.
- We will determine how best to spend our money through an agreed prioritisation process.
The NDA needs to increase spending on decommissioning and clean-up in the short-term.

**Context**
The NDA’s budget for 2005/8 is around £2bn per annum. A relatively small proportion of our funds is currently spent on decommissioning. This is likely to continue for some years as money is legitimately spent on retrieving radioactive waste and putting it into passively safe forms in preparation for decommissioning and site clean-up. That being so, we need to work with our contractors to find ways of spending a greater proportion of our budget on actual decommissioning and clean-up activity rather than on, for example, overhead costs.

**Issue**
The NDA needs to tie in work schedules and budgets to the Spending Review process so that our plans are compatible with the agreed level of funding.

Over the next five years, we will aim to allocate significantly more of our budget to decommissioning and clean-up.

The uncertainty over the future of THORP and SMP, and any earlier-than-foreseen Magnox closure, could lead to a significant shortfall in commercial revenues.

**Implications**
The NDA needs to increase spending on decommissioning and clean-up from the current level so that it can address a number of its short-term priorities: for example, final site clearance at sites such as Winfrith and Harwell.

**Our Approach**
We plan to work with our contractors to find innovative ways of financing our decommissioning and clean-up programmes.
**Context**

The total undiscounted cost of delivering the NDA’s mission, based on the 2005 LCBL is £62.7bn at current prices (£35.4bn discounted\(^1\)) subject to audit. This represents an increase of £5.1bn over the 2004 LCBL figure. The biggest contributor to this rise is the removal of assumed efficiency savings that had been included in the 2004/5 LCBL. It was decided, in the 2005 LCBL, that these assumed efficiency savings, which related to the planned future treatment of the higher hazard legacy facilities, were unlikely to be achieved and that level costing for these years of the baseline would not be appropriate. For a summary of estimated life cycle costs (rounded) see Diagram 8; for details of estimated life cycle costs per site, see Appendix 3.

**Issue**

The total estimated cost of operations, decommissioning and clean-up has increased by £5.1bn at current prices to £62.7bn. The main reason for this increase is a rise in cost estimates for the Sellafield site. \(^1\) Discounted at 2.2%

However, there are other costs, not currently included in the LCBL, that will need to be funded. These include R&D directly funded by the NDA, the cost of any new LLW disposal facilities and potential costs for the long-term management of contaminated land. Including these items in the LCBL would add £7.5bn to the cost of decommissioning and clean-up.

This higher figure still does not include costs associated with the long-term management arrangements for ILW or the treatment and disposition of plutonium and uranium materials, should they be reclassified as waste. Adding these would add billions to the liabilities. We are confident, however, that by introducing competition and introducing innovation, we can, over time, deliver better value to the taxpayer. The figure below illustrates the expected lifecycle cost trend of a typical site.

**Implications**

The total cost of operations, decommissioning and clean-up has risen significantly and may rise further as we get to grips with the real cost of decommissioning and clean-up. We have initiated a LCBL improvement process with the aim of developing a more robust baseline by 2008 in line with our PSA target.

Commercial income will decline as our commercial facilities cease to operate and we will need, therefore, to work closely with the Government on funding in the longer term.

Diagram 8: Total operations, decommissioning and clean-up cost of all sites

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**The total cost of operations, decommissioning and clean-up could increase significantly**
8.3 Our Criteria for Strategic Decision Making

We believe this Strategy is challenging but deliverable. In putting it forward, we have used the following criteria to test and assess its credibility:

- the achievement of decommissioning and clean-up (including hazard reduction, site closure, and so forth) more quickly, more cost-effectively, more safely and in a more environmentally-friendly manner;
- the promotion of competition, skills, research, good practice and socio-economic development;
- the likelihood of achieving the Government’s support, allowing for changes in Government Policy;
- the likelihood of securing regulatory approval;
- the likelihood of achieving support from external stakeholders;
- the impact for cost/revenue; and
- the impact on public confidence.

8.4 Our Prioritisation Process

We and other key stakeholders are committed to developing a national system for prioritising decommissioning and clean-up that supports and communicates the basis for decisions - although this system does not actually make these decisions.

We are developing this process through the Prioritisation Working Group (PWG), which comprises a broad range of stakeholders, including the regulators, SLCs, local authorities and representatives from the Non Governmental Organisations (NGOs) (The PWG Report April 2005 available on NDA website). For individual facilities or inventories the process involves comparing three factors:

- the hazard level of the stored material;
- the age and condition of the facility in which the material is stored and how well we understand the behaviour of the material; and
- the ongoing environmental effects of the facility or inventory if we do nothing.

Our priority is to address facilities with a large hazardous inventory, which have passed their intended design lives, where the waste form is changing and where there are likely to be significant environmental implications if no action is taken. The value of undertaking a project is assessed by comparing the rate at which these individual factors will improve against time and costs.

An assessment of the above factors provides an initial view of project priorities and funding allocations. However, other factors are also taken into account, including regulatory requirements, the availability of resources, the engineering logistics, the requirement to put in new infrastructure and the effects on local communities. Site Licence Companies (SLCs) address these factors in preparing their Near Term Work Plans and LCBLs.

The prioritisation process supports decision making and will assist in determining how funding is allocated.

More detailed information on the NDA’s prioritisation and strategic decision making process is available on the NDA website at www.nda.gov.uk.

We are still developing some of the metrics used to facilitate decisions on prioritisation. At present, all factors are weighted equally pending the outcome of full scale testing of the process during the delivery of the next LCBL. This could result in additional refinements as appropriate.
The NDA faces many challenges over the coming years. The key to successful delivery of our programme will be effective risk management.

The NDA is establishing an Enterprise Risk Management Framework encompassing all aspects of the organisation’s activities. The framework will follow the Government’s standards and will be aligned with best practice requirements of the National Audit Office.

Risk management is embedded within the culture of the NDA and in the annual objectives of our staff.

The NDA has developed an internal risk register covering all NDA activities. This register will be constantly updated with mitigation actions being controlled and monitored by risk owners.

This framework is managed via an Executive Risk Management Committee and supported by a Risk Management Forum made up of staff members representing each department and each of the four regional offices.

Risk management is also an important operational feature of management by SLCs operating the nuclear sites under the control of the regulators. The SLC remains solely responsible for managing site risks in compliance with regulatory requirements.

Each site is responsible for having and operating its own risk management procedures and in addition reports its highest risks to the NDA each month.

The NDA reviews the SLCs’ site risk management and contingency procedures and site risk registers annually, or when the NDA deems a separate submission is appropriate.

Where we consider risks are not under the direct control of the SLC, the NDA includes and manages these risks on a national basis.

The NDA ensures that SLCs manage risks using this approach.

Both the NDA and SLCs provocatively manage the risk associated with work schedules.
We will invest in socio-economic initiatives that underpin our mission. We are committed to open and transparent engagement with stakeholders.

### Key Issues

#### Socio-economic development
- How to define clearly and gain common understanding of the NDA’s role in socio-economic development with key stakeholders.
- How best to give encouragement and support to activities that benefit the social or economic lives of communities living near our sites - and measure the results.

#### Stakeholder relations
- How to ensure we are an open and transparent organisation
- How we engage with local communities around our sites and at national level.

### Our Approach

#### Socio-economic development
- Draft and publish an NDA socio-economic strategy by the end of 2006 that addresses national priorities, as well as local need, as identified through consultation and research.
- Guide our contractors to address socio-economic issues that contribute to a strategic agenda, developed in consultation with local stakeholders.
- Engage proactively with our stakeholders to define the long-term socio-economic framework.
- Continue to act as the focal point for industry stakeholder engagement, where appropriate, and act as facilitator, catalyst and partner where others are best placed to lead on or implement plans for socio-economic development.

#### Stakeholder relations
- We will protect information that is genuinely commercially or personally sensitive or could prejudice national security.
- We commit to a stakeholder charter to ensure we practice what we preach.
- We commit to listen to, and take into account, stakeholder views on our Strategy.
- We meet regularly with Site Stakeholder Groups (SSGs) and other interested parties to assess the effects of our proposed plans.
- We have established a UK National Stakeholder Group, including two Issue Groups examining specific issues, and will convene that group biannually.
- We will develop proactive and positive relations with the media.
- We will maintain the NDA’s website as a primary vehicle for communication with stakeholders.
Socio-economic Development

**Context**
We are required by the Energy Act to provide encouragement and other support to activities that benefit the social or economic lives of communities living near our sites. While we are not the lead agency for socio-economic development, we fully accept our responsibility to work with the Regional Development Agencies (RDAs), Local Enterprise Networks and others in helping to create a sustainable future for affected communities. Sustainable communities make effective use of natural resources, protect the environment, promote social cohesion and strengthen the economy while contributing to a higher quality of life and offering opportunity for advancement. In short, a sustainable community is a place where people want to live and work - now and in the future.

Currently, Site Licence Companies (SLCs) provide socio-economic support on our behalf worth approximately £5m a year. We intend to ensure that this funding is spent in line with our remit.

**Issues**
Our arrival marks a significant shift for the civil nuclear industry away from a primary focus on operations to decommissioning and clean-up. While this change will bring opportunities, it also has the potential to have an adverse impact on the social and economic wellbeing of many communities. Our sites are located predominantly in geographically remote areas. Consequently, a number of sites have become the dominant employer in the local area, inextricably linked to its wider social and economic wellbeing. This is particularly acute, though not exclusively felt, in Cumbria, Caithness, South West Scotland and North Wales.

Decommissioning and clean-up activities can also have broader social effects on local communities: for example, disruption due to increased transport movements and increased demand for public services, resulting from the employment of greater numbers of contractors. We do not, therefore, see socio-economic issues in isolation. The socio-economic impact of our plans form an integral part of our decision-making process and are closely linked to skills development, R&D and stimulating innovation, which are discussed in Chapter 7: Innovation.

**Our approach**
We are seeking and finding efficiency savings that could, over time, provide significant amounts of money for socio-economic support. We are particularly concerned to give local people the opportunity to take advantage of decommissioning work. On this basis, there is the potential to invest in a range of projects to benefit the whole community, which may include investing in the skills base and retraining. Although these areas are primarily the responsibility of the UK Government, the Devolved Administrations and local government and we would want to work in partnership with the lead organisation, we believe, that our contribution could make a real difference to whether a particular scheme is developed or not.

We will take account of the socio-economic effects of our activities and work with relevant stakeholders to develop a coherent strategy that supports the maintenance of sustainable communities in areas affected by decommissioning.
The NDA will support activities that benefit the social and economic lives of local communities

We have begun preparatory work with local stakeholders to generate a comprehensive picture of socio-economic need and have commissioned several socio-economic studies of key locations in order to understand fully the impact of our activities on local communities. Their results will inform our strategic approach, thereby ensuring that resources are directed appropriately, proportionately and on the basis of sound evidence. The SLCs will also be required to take these studies into account in drawing up their own socio-economic plans. We will make the socio-economic studies we commission publicly available and ensure that they are updated on an appropriate basis.

We will draw on workforce profile data, generated through the Life Cycle Baselines (LCBL), to highlight opportunities. We will also work with relevant agencies and, where possible, smooth projected job losses. In addition, we will ensure through our site contracts that contractors continue to train and reskill their workforces, thus promoting both sustainable employment and the maintenance of high levels of marketable skills.

We will continue to explore options for preserving key aspects of our industrial heritage, such as the preservation of Calder Hall Reactor 1 and the development of a National Nuclear Archive. These initiatives are discussed in Chapter 7: Innovation.

Over the next 12 months, we will:

- **Draft and publish an NDA socio-economic strategy that:**
  - addresses national priorities yet is tailored to local need and takes account of the availability of extra funding through efficiency savings;
  - is based on regional and sub-regional economic strategies; and
  - specifies how we will evaluate spending opportunities, how we will manage and prioritise expenditure and defines the evaluation criteria (which we will make available in advance).
- **Guide our contractors to address socio-economic issues that contribute to a strategic agenda, developed in consultation with local stakeholders by:**
  - ensuring that all sites produce and publish an annual socio-economic plan that reflects local need;
Socio-economic Development

9.1

The NDA will support activities that benefit the social and economic lives of local communities.

- issuing guidance to each site that ensures our contractors involve local stakeholders in the development of socio-economic plans and report on the results;
- specifying that our contractors make funding decisions on the basis of sound socio-economic evidence, supporting either regional or sub-regional strategies; and
- developing, in partnership with site operators and local agencies, methods to measure, monitor and record the outcomes of sites' socio-economic activity (e.g. using KPIs).

- Engage proactively with our stakeholders to define the long-term socio-economic framework by:
  - continuing to support and sponsor appropriate research to identify the socio-economic baseline at regional and sub-regional levels; and
  - continuing to work with stakeholders to assess the long-term effects of decommissioning on communities living near our sites.

- Continue to act as the focal point for industry stakeholder engagement, where appropriate, and act as facilitator, catalyst and partner where others are best placed to lead or implement plans by:
  - providing opportunities for those agencies responsible for socio-economic development to develop a cohesive response to the effects of decommissioning;
  - developing Memoranda of Understanding (MoU) between the NDA and key regional partners, defining the accountabilities of each signatory;
  - encouraging the co-ordination of socio-economic plans and resources to maximise effectiveness, particularly in relation to funding opportunities; and
  - establishing mechanisms to facilitate the sharing of good practice on socio-economic issues.
9.2 Stakeholder Relations

We are committed to open and transparent communication and engagement with stakeholders

Context
We consider a stakeholder to be any person or organisation that has a declared interest in our work. As a result, we have a wide range of stakeholders, from a variety of backgrounds and with a variety of interests. These include national and local Government, Devolved Administrations, Foreign Governments, the regulators, our contractors, the wider supply chain, the trades unions, NGOs and local communities. We are committed to open and transparent engagement with stakeholders and will continue to take account of their views in determining our actions.

Issues
The nuclear industry has opened up in recent years, but has previously had a history of secrecy. To succeed in our mission, we must build strong relationships with our stakeholders and develop a comprehensive understanding of the needs of those communities affected by our work. It is only with the trust, confidence and respect of our stakeholders that we can develop robust and fully informed plans. We will need to work in partnership with stakeholders to bring about cultural change needed to enable us to tackle the task that we have set. Consequently, transparent decision-making and accessibility of information will be essential to enable stakeholders to participate in a constructive and inclusive way.

Our approach
We will operate openly and transparently with stakeholders at local, national and international levels and engage with stakeholders in developing our Strategy and Annual Plans. Our aim is to make it as easy as possible for stakeholders to make their views known to us and to provide timely and courteous responses. In addition, our staff will seek opportunities to attend appropriate conferences, workshops and other meetings to explain and discuss issues relevant to our business. Subject to adequate notice, we will attempt to respond positively to invitations to attend such events.

We have established a National Stakeholder Group (NSG) to discuss strategic and other issues and which will meet twice annually. We will continue to:

- **support the UK NSG, its Issues Groups and the Scottish Stakeholder Forum, both financially and with expert advice;**
- **engage closely with the two UK NSG Working Groups on Waste Management and Nuclear Materials in developing our approaches to waste management and in our review of spent fuel management options; and**
- **ensure that reports from the UK NSG and its Working Groups are made publicly available;**

We will continue to engage regularly with the Site Stakeholder Groups (SSGs), of which 16 (the West Cumbria SSG covers Sellafield, LLW Repository, Calder Hall and Windscale) have been established, to ensure that issues of concern to communities living near our sites are fed back to us. We are committed to strengthening the membership of, and communication with, the SSGs so that they become:
Stakeholder Relations

- the main engagement vehicle for local stakeholders, including consultation on site end states and end dates; and
- more effective at feeding back issues that we need to take into account.

Stakeholder Charter
Our commitment to stakeholders is described in our stakeholder charter as follows:

- the NDA is committed to the establishment of an open and transparent relationship with its stakeholders. It will strive to set the highest standards in openness and transparency to inspire public confidence;
- the NDA will adopt a proactive communications style, making information freely accessible by means of a website, routine publications and reports. It will respond promptly to individual requests and ensure that any information is provided in plain English;
- the NDA will welcome and listen to comments from stakeholders on the activities, performance and achievements of the organisation and its contractors;
- the NDA will engage with stakeholders and consult widely to ensure there is ample opportunity to understand, comment on and influence its strategies and plans; the NDA will establish a UK National Stakeholder Group (now established) to enable stakeholders to explore issues and submit proposals for consideration by the NDA and/or its contractors;
- at local (site) level the NDA will require its contractors to establish and support engagement processes to satisfy stakeholder needs. Stakeholders will be able to review performance, comment on strategies and plans as well as inform the NDA’s decision making. These processes will include the ability to establish local working groups and to hold public meetings as necessary;
- to ensure stakeholders are able to engage effectively, the NDA and its contractors will ensure that relevant briefing, training and information is provided to support stakeholder involvement and enhance levels of understanding. Due consideration will also be given to requests for access to specialist inputs and advice; and
- to minimise barriers to engagement, the NDA and its contractors will hold meetings in public places, including some held outside normal business hours. They will respond positively to any requests for additional information or dialogue. Due consideration will be given to any claims for reimbursement of reasonable expenses incurred as a result of engagement.

The NDA is committed to open and transparent communication and engagement with stakeholders.
Proposed National Nuclear Archive

Context
Both BNFL and UKAEA have archives that store information relating to the development of the UK’s nuclear energy programme. The information contains records of the design, construction and operation of the main nuclear facilities and includes public records as well as private information assets. There is a danger that, with the restructuring of BNFL and the UKAEA, this information could be lost. Safeguarding this information is key to preserving national corporate intelligence and complying with the requirements of nuclear site licences.

Issues, including those identified in consultation
The information held by BNFL and UKAEA - as well as by some other organisations, including regulators, private nuclear companies, universities and other public bodies - is potentially of value to a range of users. Our consultation indicates interest by academic and educational bodies, local communities, environmental organisations and others; as well as the NDA itself, regulators and nuclear clean-up organisations.

Information is currently held in various locations and under various conditions: ranging from formally recognised ‘places of deposit’ for public records, through live information management systems, to unsorted collections acquired following industry restructurings. It includes documents, film, video and CDs, as well as items of hardware and materials samples.

We have been pleased to learn of initiatives to preserve for the future significant records not required for immediate operational purposes: an example is the history of the design and development of fast reactor systems which, although not leading to UK deployment at the time, may now be of renewed interest to the international R&D community. Also welcome are efforts to use ‘exit’-type interviews to capture personal recollections of key development, construction and operational activities.

Consultation with The National Archives (TNA) confirms the timeliness of considering a National Nuclear Archive (NNA), given recent changes in legal requirements to keep and share information originating in the public sector. Key changes include specific obligations placed on us by the Energy Act 2004 (and, indirectly, on companies with which we sign contracts) to maintain suitable records; as well as the Freedom of Information Act 2000, the Environmental Information Regulations and Directive EC/2003/98 on the Reuse of Public Information (which seeks to expand substantially the wider commercial use of public records.) Also, there is interest in developing a stronger science and technology theme within public records. Meanwhile, the Office for Civil Nuclear Security has supported NDA leadership of an NNA, to help to ensure that the goal of expanded public access can be reconciled with maintaining rigorous confidentiality, where required, for security reasons.

Developments in information technology provide exciting new opportunities for preserving important information, while enabling - subject to the Freedom of Information (FOI) exemptions, including security and commercial...
Proposed National Nuclear Archive

Considerations - much wider and more convenient access: locally, nationally and internationally. Consultees have stressed the need for interaction between elements in an archive that might, depending on the strategy we adopt, be 'owned' by a variety of organisations and physically retained at several locations, managed to ensure availability and swift retrievability. Also important will be the selection of digital and other storage media to ensure due longevity; this is key in relation to the management of long-lived waste materials.

Coordination with Radioactive Waste Management Strategies:
Through our membership of the Radioactive Waste Policy Group (RWPG), chaired by the Department of the Environment, Food & Rural Affairs (DEFRA), we have been co-operating closely with other interested parties to develop a strategy to provide an Inventory of Radioactive Wastes, which is essential to support their management. Linked to this, we have been working with the RWPG sub-group to develop a National Radioactive Waste Information Management Strategy (NRWMIS). Meanwhile, responses to the consultation on our Draft Strategy suggest strong benefits in using common information recording and management systems and suitable connectivity to ensure cost-effectiveness, safety and security.

Implementing the NNA proposal: feasibility study and way forward:
We are currently conducting a feasibility study - through site visits and discussions with potential NNA users, as well as TNA and others with expertise on records management systems - to develop options for consideration by the NDA Board. Issues to be addressed include scope, location, ownership, access arrangements and costs. Among other matters, the Board will need to weigh carefully the relative costs and benefits as between a centralised archive, and a more 'distributed' system affording greater local access to digitally-retrievable information.

We will need to co-ordinate NNA implementation planning carefully with work in progress to develop an ‘information asset register’ for each designated site, in co-operation with the Site Licence Companies for completion by October 2006.

Subject to this, we envisage the following path forward:
- review broad options for an NNA and approve path forward, including any further consultation by Spring 2006.
- approve NNA implementation plan and budget by Autumn 2006; and
- Implementation of an NNA subject to preceding stages but the goal is to be operational Spring 2009.
9.4 Preservation of Calder Hall Reactor 1

We will consider the feasibility of preserving Reactor 1 at Calder Hall as a museum.

**Context**
Calder Hall was opened in 1956 as the world’s first commercial nuclear power station. It ceased operation in 2003. The reactor and its associated Turbine Hall are currently in a preserved state awaiting the removal of the nuclear fuel. The remainder of the site is being prepared for decommissioning.

**Issue**
The defuelling and dismantling of the four reactors and Turbine Halls are due to begin in the next 12 months. A decision on whether or not to preserve one of the reactors for posterity therefore needs to be taken soon.

**Our approach**
The design and condition of the reactor and Turbine Hall are such that it would be possible to convert them into a museum for future generations to visit. However, the preservation of Reactor 1 at Calder Hall will be expensive and some may see it as a distraction from our main decommissioning focus.

We therefore intend to commission a project to evaluate the feasibility and cost of preserving Reactor 1 at Calder Hall.
## Appendices

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### ANNEX 1- Environmental Assessment Statement

### ANNEX 2- Response to Comments made by Respondents to Consultation

### ANNEX 3- Acronyms
Appendix 1: The Life Cycle of a Typical Reactor Site

Consent to construct

Construction

Commissioning

Operations

Removal of spent fuel and nuclear waste

- Delicensing/closure
  Happens once HSE is satisfied that there is no remaining danger from ionising radiations in line with requirements of the Nuclear Installations Act 1965

- Dismantling
  This is when the reactor buildings and empty ILW store are dismantled.

- Care & maintenance*
  Begins when the only significant buildings left on site are the reactor buildings and an ILW store - these will be removed at the dismantling stage

- Decommissioning
  This includes all clean-up of radioactive and other material and progressive dismantling of the site

* This process would be eliminated at a non-reactor nuclear site
Appendix 2: The Nuclear Fuel Cycle

Raw material

- Enriched uranium
- Uranium enrichment
- Magnox

Fuel manufacture (Springfields)

- Fuel
- Uranium oxide from Springfields

Power generation

- National Grid
- AGR
- Magnox

Spent fuel

- Low Level Waste Repository (LLWR)
- Intermediate Level Waste (ILW)

Waste

- Stored on-site until long-term storage or disposal solution found

- Magnox reprocessing (To close by 2012)

Sellafield

- PLUTONIUM OXIDE, depleted uranium
- High Level Waste (HLW) in the form of Highly Active Liquor (HAL)

Fuel manufacture

- Mixed Oxide Fuel (MOX)
- Uranium oxide from Springfields

Power generation (overseas customers)

- AGR
- Magnox

Intermediate Level Waste (ILW)

- Returned to overseas customers
- Vitrification Lines (encase in glass)

Spent fuel

- Magnox
-Returned to overseas customers

ILW

- Reprocessing at Thermal Oxide Reprocessing Plant (THORP)

Storage

- Storage
- Storage
- Storage

- Magnox
- Fuel manufacture (SMP - Sellafield Mixed Oxide Fuel Plant)
This section provides a brief one page life cycle description of each site for which the NDA is responsible or, in the case of Culham, expects to assume responsibility. This includes the key decommissioning milestones from the 2005 Life Cycle Baseline (LCBL) and the end states and end dates for each site. These include:

- **unrestricted re-use after de-licensing by NII**;
- **restricted re-use after de-licensing by NII** e.g. for industrial purposes;
- **Institutional control: all or part of the site remains under the nuclear licensing regime indefinitely**;

We have also included key information concerning the environment surrounding the sites (more detailed information is contained in the Environmental Assessment).
Located near Berkeley in Gloucestershire, this was one of the UK’s first nuclear power stations and has a total site area of 27 hectares covered by the nuclear site licence, including the Berkeley Centre laboratories and offices that lie adjacent to the power station site. The station operated from 1962 until 1989 when it ceased electricity generation. Defuelling was completed by 1992. The area around the site is environmentally sensitive and is designated as SPA, SAC, RAMSAR AND SSSI. The nearby Berkeley Gazebo is a Grade 2 listed building, constructed in 1754. The Berkeley Nuclear Licensed Site is licensed to Magnox Electric Ltd.

**Site End State**

Under current plans, the assumed end-point for the site is a delicensed site with removal of all surface structures and subsurface structures down to 1m. Residual man-made contamination will be removed to the clearance criteria defined by the regulator, thus allowing the site to be released from regulatory control (i.e. delicensed).

**Current Key Milestones**

- **2006:** Delicensing of part of site (Berkeley Centre), reducing the licensed area to 10 hectares
- **2007:** Commence processing of accumulated ILW in vaults
- **2009:** Site enters care and maintenance – site in passively safe condition and period of care and maintenance begins
- **2040 - 2049:** Transport of ILW packages off-site
- **2079:** Mobilisation for final site clearance
- **2083:** Final site clearance and closure
Located at Bradwell in Essex and with an area of 20 hectares covered by the nuclear site licence, this power station operated from 1962 until 2002 when it ceased electricity generation. Bradwell Power Station is licensed to Magnox Electric Ltd.

**Site End State**

The current assumed end state is a delicensed site, with all surface structures and all subsurface structure to 1m removed. It is assumed that removal of residual contamination in the ground down to a very low level of 0.4 (Bq/g) Becquerel per gram total radionuclides is required to meet the clearance criteria defined by the regulator.

**Current Key Milestones**

- **2006:** Defuelling completed – all fuel has been removed from reactors 1 and 2 and sent to Sellafield
- Site has NII approval to instigate decommissioning staffing structure
- **2010:** Safestore – reactors 1 and 2 Safestore preparations complete
- **2015:** Waste operations complete – all LLW and ILW retrieved and in newly built store, retrieval equipment de-planted/demolished
- **2016:** Care and maintenance – site in passively safe condition and period of care and maintenance begins
- **2095:** Final site clearance begins – end of period of care and maintenance and commencement of final clearance
- **2103:** Final site clearance and closure
Calder Hall is located on the Sellafield site in Cumbria. It was the world's first commercial nuclear power station and started generating electricity in 1956. Generation ceased in 2003. Calder Hall Power Station is licensed to British Nuclear Group Sellafield Ltd. (See the entry on Sellafield for further information about the site and surrounding area).

Site End State

Site cleared for potential delicensing.

Current Key Milestones

- **2006**: Cooling Tower demolition
- **2008**: Completion of defuelling – vast majority of the radioactive inventory being removed from the site
- **2020**: Start of care and maintenance phase – all fuel removed and all plant, facilities and buildings other than reactor buildings fully decommissioned
- **2105**: End of care and maintenance phase - commencement of final decommissioning of reactor buildings
- **2112**: Demolition of all four reactor buildings completed - site ready for final clearance, ground remediation and landscaping
- **2117**: Final site clearance and available for potential re-use
Capenhurst is located near Ellesmere Port in Cheshire, adjacent to Urenco (the Uranium Enrichment business), and has an area of 32 hectares covered by the nuclear site licence. It was home to a uranium enrichment plant and associated facilities that ceased operation in 1982. Capenhurst is licensed to BNG Sellafield Ltd.

### Site End State

The current assumed end state is a licensed site with the potential for restricted reuse. Demolition of redundant buildings to slab level (for potential future use by Urenco), top-dressed with soil and sown with meadow grass.

### Current Key Milestones

- **2007:** Enriched uranium operations – All EU waste processing completed
- **2010:** Diffusion Plant – decommissioning complete
- **2010:** Site reaches care and maintenance status
- **2020:** Hex deconversion plant – construction and operation of hex deconversion facility
- **2120:** Uranic storage – uranium storage operations cease
- **2120:** Final site clearance and closure

*This date corresponds with the information contained in LCBL3*
Chapelcross Power Station is located near Dumfries in southwest Scotland and has an area of 96 hectares covered by the nuclear site licence. It was the first nuclear power station in Scotland. Electricity generation started in 1959 and ceased in June 2004. Chapelcross Power Station is licensed to Magnox Electric Ltd. The area around the site is environmentally sensitive.

**Site End State**

The end state of the site is currently undetermined and will await the outcome of the site end state consultation. However, it is envisaged that the site will be decommissioned for industrial reuse.

**Current Key Milestones**

- **2007:** Cooling Tower demolition
- **2009:** Completion of defuelling – vast majority of the radioactive inventory being removed from the site
- **2021:** Start of care and maintenance phase – all fuel removed and all plant, facilities and buildings other than reactor buildings fully decommissioned
- **2116:** End of long-term care and maintenance phase - commencement of final decommissioning of reactor buildings
- **2128:** Final site clearance and available for potential re-use.
The Joint European Torus (JET), located at Culham in Oxfordshire, is the world’s largest fusion research machine. The JET facilities occupy 35 hectares of the 73 hectare UKAEA owned Culham Science Centre. JET is operated by UKAEA through a contract placed by Euratom under the framework of the European Fusion Development Agreement (EFDA). Culham is not a nuclear licensed site and the JET Facilities are currently not designated to the NDA. The NDA is required to advise the Government on the decommissioning of JET and understands that the current intention of the Government is to designate that part of Culham site occupied by the JET Facilities as a full NDA site from the date when JET operations cease. This date will depend on the continuation of European funding. The key milestones are based on the assumption that JET operations will end at the end of December 2008.

### Site End State

All the JET facilities will be removed and this area of the Culham site will be landscaped in accordance with the local authority temporary planning consents.

### Current Key Milestones

- **2008:** JET operations cease (at the end of December 2008)
- **2009:** Decommissioning commences (January 2009)
- **2011:** Complete removal of specific buildings (as required by the temporary planning consents)
- **2015:** Complete removal of JET machine and associated equipment in the Torus Hall
- **2018:** Complete removal of the tritium handling plant
- **2019:** All packaged ILW and LLW sent off-site for storage and/or disposal
- **2019:** Complete demolition of all the remaining JET buildings
- **2020:** Final site clearance (at the end of 2020) - JET facilities decommissioned
Dounreay is located in Caithness, Scotland and has a total site area of 55 hectares. It was established in the mid-1950s as a research reactor site with fuel production and processing facilities. There were three reactors, the last of which ceased operation in 1994. Dounreay is licensed to UKAEA and, after Sellafield, is our second largest site.

### Site End State

- **2036**: Interim end state – site passively safe; conditioned ILW and any remaining nuclear material in storage; LLW in disposal facility.
- **2036**: Areas of site will become available for other potential uses, with the possibility of releasing clean buildings earlier, depending on site licence issues.
- **2036**: Radiological and industrial brown field

### Current Key Milestones

- **2008**: Shaft isolation – construction of an effective hydraulic barrier from water and protect against contamination spread
- **2012**: Completion of new LLW facilities
- **2018**: Shaft waste retrieval head-works – a facility that uses remote-handling equipment to remove waste for transfer to the waste treatment plant (WTP)
- **2018**: ILW removed from shaft – all waste removed and transferred to the WTP
- **2036**: Interim site end state achieved
Dungeness A

Appendix 3: Life Cycle Overview Per Site

Located at Dungeness in Kent and with an area of 20 hectares covered by the nuclear site licence, Dungeness A Power Station started generating electricity in 1965. Dungeness A Power Station is licensed to Magnox Electric Ltd. The area around the site is environmentally sensitive, is designated as SPA, SAC and SSSI, is proposed as RAMSAR and is home to the largest shingle peninsula in Europe. Continuous shingle replenishment is in progress to maintain the reactor site and British Energy's Dungeness B power station.

**Site End State**

Current plans are for the site to be decommissioned, cleared and landscaped to return back to the shingle foreland by 2111.

**Current Key Milestones**

- **2006:** Generation ceases - both reactors shut down
- **2009:** Defuelling completed - removal of vast majority of radioactive inventory from site
- **2010:** Demolish Turbine Hall - Turbine Hall removed to free the land for other decommissioning facilities
- **2014:** Completion of ILW store - new waste processing plant erected in place of the Turbine Hall
- **2021:** Care and maintenance begins - all plant and buildings except reactor containment will have been removed
- **2103:** Remove ILW store - ILW store removed ready for final site clearance
- **2111:** Final site clearance and closure
Harwell

Harwell is located in Oxfordshire and was established in 1946 as Britain's first Atomic Energy Research Establishment. The campus, of which the designated site forms a part, is home to a wide range of research organisations and businesses. The NDA has responsibility for 110 hectares of land - approximately one-third of the total area. The nuclear site licence is held by UKAEA.

Site End State

Land will be delicensed when clean-up is complete and released for redevelopment for science, technology and innovation uses as part of the campus.

Current Key Milestones

- **2006:** Eastern area of site restored
- **2010:** Liquid effluent treatment plant discharge to River Thames ceased
- **2015:** Building B462 waste stores complex - remote handled intermediate level waste (RHILW) operations complete
- **2016:** Liquid effluent treatment plant remediated
- **2017:** Building B459 active handling facility - decommissioning complete
- **2020:** Building B220 radiochemistry facility - decommissioning complete
- **2022:** Reactors - decommissioning complete
- **2025:** Final designated site clearance
Hinkley Point A Power Station is located at Hinkley in Somerset and has an area of 19 hectares covered by the nuclear site licence. It started electricity generation in 1965 and ceased operations in 2000. Hinkley Point A Nuclear Licensed Site is licensed to Magnox Electric Ltd. Several SSSI, NNR, SPA and NRA are situated around the site.

**Site End State**

Current plans are for the site to be delicensed.

**Current Key Milestones**

- **2012:** Complete decommissioning and backfill of Turbine Hall
- **2013:** Complete decommissioning of Magnox vault
- **2016:** Complete processing of historic ILW
- **2017:** Start of safestore care & maintenance
- **2095:** Reactor buildings decommissioning complete
- **2104:** Final site clearance and closure
Hunterston A Power Station is located in Ayrshire, South West Scotland and has an area of 15 hectares covered by the nuclear site license. It started electricity generation in 1964 and ceased production in 1989. Hunterston A Power Station is licensed to Magnox Electric Ltd. The surrounding area of coastal mudflats is designated as SSSI.

Site End State

Current plans are all waste to be sent off site for disposal, all buildings to be cleared from the site and the site delicensed, landscaped and available for alternative reuse.

Current Key Milestones

- **2006**: Construction of the ILW store complete
- **2014**: All operational ILW retrieval/processing complete
- **2017**: Entry into care and maintenance stage
- **2090**: Final site clearance and closure
The Low Level Waste (LLW) Repository is located near Drigg in Cumbria and has an area of 98 hectares covered by the nuclear site licence. It has operated as a disposal facility since 1959. Wastes are compacted and placed in containers before being transferred to the facility. The LLWR is licensed to British Nuclear Group Sellafield Ltd. The area around the site is environmentally sensitive and is designated as SAC and SSSI.

**Site End State**

Institutional control following closure of the disposal vaults in 2050. Final closure likely to be determined by radionuclide inventory, not waste volume.

**Current Key Milestones**

- **2006:** Plutonium contaminated materials, (PCM) inventory removal – significant hazard reduction achieved by removal of all PCM items and drums from the site by end December 2006
- **2010:** Removal of PCM facilities – decommissioning of all associated PCM facilities (typically magazines, stores and related infrastructure)
- **2007 to 2050:** Engineered vaults construction – progressive construction and operation of seven new engineered vaults for disposal of LLW, each phased to come on line as required providing total LLW disposal capacity of 1.7 million cubic metres
- **2150:** Final site clearance and closure
Oldbury Power Station is located at Oldbury in Gloucestershire and has an area of 51 hectares covered by the nuclear site licence. It started electricity generation in 1967. Oldbury Power Station is licensed to Magnox Electric Ltd. The area around the site is environmentally sensitive and has been designated as SPA and SSSI locations.

**Site End State**

The current assumption is that the site will be delicensed and returned to its former use as agricultural land.

**Current Key Milestones**

- **2008:** Cease generation
- **2009:** Commence defuelling
- **2010:** Complete defuelling
- **2010:** Care and maintenance preparations begin
- **2023:** Care and maintenance commences
- **2109:** Final site clearance begins
- **2118:** Final site clearance and closure
Sellafield

Appendix 3: Life Cycle Overview Per Site

Sellafield is located in Cumbria and has an area of 262 hectares covered by the nuclear site license. It is a large, complex nuclear chemical facility that has supported the nuclear power programme since the 1940s, and has undertaken work for a number of organisations including UKAEA and MoD. Operations at Sellafield include processing of fuels removed from nuclear power stations; Mixed Oxide (MOX) fuel fabrication; and storage of nuclear materials and radioactive wastes. Sellafield is licensed to British Nuclear Group Sellafield Ltd. The area around the site is environmentally sensitive.

Site End State

Site decommissioned to passively safe state with plutonium and uranium stored on site.

Current Key Milestones

- **2008**: Commencement of return of Vitrified High Level Waste (VHLW) to overseas customers
- **2011**: THORP reprocessing - Current commitments completed
- **2012**: Magnox reprocessing - Current commitments completed
- **2016**: Vitrification of liquid HLW complete
- **2025**: Commercial operations - current and expected MOX fuel manufacture complete plus AGR spent fuel in long-term storage
- **2040**: All ILW retrieved and stored, commencement of transfer of stored ILW to ILW repository
- **2075**: All ILW transfers complete, commencement of transfer of stored VHLW to HLW repository
- **2120**: Final site clearance and closure
Located at Sizewell in Suffolk and with an area of 14 hectares covered by the nuclear site licence, Sizewell A power station started generating electricity in 1966. Sizewell A Nuclear Licensed Site is licensed to Magnox Electric Ltd. The area around the site is environmentally sensitive and is designated SPA, SAC, RAMSAR, SSSI and NNR.

**Site End State**

Current plans are for the complete removal of all contamination, removal of structures to 1 metre below ground level and delicensing.

**Current Key Milestones**

- **2006:** End of operations - cessation of electricity generation
- **2009:** Defuelling - end of defuelling, all irradiated fuel elements delivered to Sellafield
- **2013:** ILW store complete - waste store constructed to house Sizewell A's waste
- **2015:** Turbine Hall demolition - major redundant plant & building demolished
- **2018:** Initial decommissioning phase complete - care and maintenance preparations complete
- **2048:** Removal of ILW store - waste store removed prior to final site clearance
- **2110:** Final site clearance and closure
Springfields is located near Preston in Lancashire and has an area of 81 hectares covered by the nuclear site licence. It manufactures nuclear fuel and fuel products for the UK's nuclear power stations and for international customers. The site is licensed to Springfields Fuels Ltd. Several environmentally sensitive and protected areas are situated close to the site, including the Ribble Estuary.

### Site End State

Current plans are for the site to be delicensed for unrestricted reuse by March 2031, in line with perceived stakeholder expectations and to provide a prudent assumption on which to base decommissioning estimates and their associated financial provision.

### Current Key Milestones

- **2006**: Magnox uranium plant production operations cease
- **2007**: Magnox Metal and fuel assembly plants close - production operations cease and (POCO) Post operational clean out (POCO) starts
- **2008**: Magnox decommissioning programme starts
- **2008**: Natural residue recovery plant ceases operations and POCO starts. Recovery of enriched residue "backlog" completed
- **2009**: Enriched residue plant ceases operation and POCO starts
- **2010**: Magnox fuel assembly plant final decommissioning complete
- **2011**: Enriched residue recovery plant final decommissioning complete
- **2012**: Magnox metal and rod plants final decommissioning complete
- **2016**: Hex/Kiln plant production operations cease and POCO starts
- **2020**: Hex/Kiln plant final decommissioning complete
- **2023**: Oxide fuel production operations cease and POCO starts
- **2028**: Oxide fuel complex final decommissioning complete
- **2031**: Assumed site end point - final site clearance and ground remediation
Trawsfynydd Power Station is located at Trawsfynydd in Gwynedd, North Wales and has an area of 15 hectares covered by the nuclear site licence. It started electricity generation in 1965 and ceased generating in 1991. Trawsfynydd Nuclear Licensed Site is licensed to Magnox Electric Ltd. The site is situated in the Snowdonia National Park near to a number of SSSI, NNRs and SACs. The NDA also has designated powers to manage and operate the Maentwrog hydro-electric power station, which was opened in 1928 and is situated near the site.

**Site End State**

Current plans are to delicense the site for reuse in future recreational purposes to reflect its location within the Snowdonia National Park.

**Current Key Milestones**

- **2007**: Completion of ILW store for storage of processed operational waste
- **2011**: Demolition of ponds complex
- **2012**: Enters care and maintenance
- **2040**: Packaged ILW transported to repository
- **2046**: Demolition of waste store in line with local planning permissions and public enquiry findings
- **2088**: Start of final site clearance
- **2096**: Final site clearance and closure
Windscale is a separate licensed site located on the Sellafield site in Cumbria. The site area is 14 hectares. It comprises three reactors, two of which were shutdown in 1957. The third was closed in 1981. Windscale is licensed to UKAEA. A fire damaged one of these reactors (Pile 1) in 1957, making its decommissioning a significant challenge.

<table>
<thead>
<tr>
<th>Year</th>
<th>Milestone</th>
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<td>2013</td>
<td>Pile 2 care and maintenance - removal of isotopes and replacement of building with low containment structure</td>
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<tr>
<td>2015</td>
<td>Removal of WAGR and associated buildings - dismantling and demolition of B50 and B52</td>
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<tr>
<td>2015</td>
<td>Demolition of redundant buildings - buildings demolished to ground level with foundations remaining</td>
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<tr>
<td>2015</td>
<td>Pile 1 care and maintenance - removal of fuel and isotopes and replacement of building with low containment structure</td>
</tr>
<tr>
<td>2020</td>
<td>Completion of tenant operations in B13 - Nexia’s current lease expires (may be extended)</td>
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<tr>
<td>2025</td>
<td>Demolition of B13</td>
</tr>
<tr>
<td>2040</td>
<td>Transfer of ILW to final storage, removal of waste from B64 ILW store, commence dismantling of the piles safe store</td>
</tr>
<tr>
<td>2065</td>
<td>Final site clearance and closure</td>
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Winfirth is located near Poole in Dorset and has a total site area of 88 hectares. It was established by the UKAEA in 1958 as an experimental reactor research and development site. Winfrith is licensed to UKAEA. The coast south of Winfrith is a World Heritage Site and the surrounding heathland and chalk ridges are environmentally sensitive.

**Site End State**

Current plans are for the site to be decommissioned, cleared and delicensed.

**Current Key Milestones**

- **2007:** Complete decommissioning of active handling building
- **2009:** Complete remediation of B2/B3 complex
- **2012:** Complete decommissioning of Dragon reactor complex
- **2014:** Complete decommissioning of on-site effluent systems and sea tanks
- **2017:** Complete decommissioning of steam generating heavy water reactor (SGHWR) complex
- **2020:** Final site clearance and closure
Wylfa Power Station is located on Anglesey in North Wales and has an area of 21 hectares covered by the nuclear site licence. It was the last and largest power station of its type to be built in the UK. It started electricity generation in 1971. Wylfa Power Station is licensed to Magnox Electric Ltd. Consequently, radioactive doses during decommissioning are considered to be lower than at other sites. The area around the site includes several areas of environmental importance.

Site End State

Current plans are for the site to be completely cleared of all buildings and structures, the site area excavated to 1 metre below ground level and backfilled and the entire site re-graded and planted to match the surrounding area. Land drains will be installed where necessary. The area will then be classified as a 'brownfield site' i.e. land on which development has previously taken place.

Current Key Milestones

- **2010:** End of generation
- **2012:** Completion of defuelling
- **2025:** Enter care and maintenance
- **2040:** Packaged ILW transported to repository
- **2116:** Start of final site clearance
- **2125:** Final site clearance and closure
## Appendix 4: Estimated Life Cycle Financials Per Site

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<th>Total Cost D (A + B + C)</th>
<th>Commercial Revenue E</th>
<th>Other Income* F</th>
<th>NET COST G (D - E - F)</th>
<th>Total Costs Discounted at 2.20%</th>
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<td></td>
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<td>Running Cost B</td>
<td>Capex C</td>
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<td><strong>Magnox</strong></td>
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* Other income includes receipts from tenants and property, services provided by the NDA to external customers, etc.

Note: ES&T (Electricity Sales and Trading) includes the electricity generation income from the operating Magnox power stations it is not a separate site. Source: Figures above based on 2005/6 Life Cycle Baseline (LCBL)
Preparing Plans
Key among the tools we employ to implement our strategy are the Life Cycle Baseline (LCBL) and the Near Term Work Plan (NTWP) for each site.

These define the specific scope of work to be completed and the associated estimated costs and schedule when the work will be completed.

For each site, the LCBL and its more detailed NTWP lay out our plans in an open and transparent way. We will publish summaries of these documents on our website.

There is a cyclical relationship between the NDA Strategy and LCBLs/NTWPs.

The Strategy identifies our national priorities and approach to cleaning up the nuclear legacy.

The LCBL establishes a long-range plan to implement the Strategy and the NTWP provides the tool to measure the performance of the Site Licensee Companies (SLCs) in implementing the plan.

We then use the information in the LCBLs and NTWPs to inform our Strategy.

Both the short and long-range plans are produced by the SLCs with the input and guidance of the regulators and funding guidance from the NDA.

Monitoring and Reviewing Plans by our Regional Teams
In addition to staff at its headquarters in West Cumbria, the NDA has staff based in regional offices in Abingdon, Warrington and Thurso who interface closely with the sites.

We require SLCs to produce plans using a common format that allows us to group, summarise, evaluate and report the scope, cost and schedule performance data for all the NDA sites as required by the Energy Act 2004.

In year changes to the agreed NTWP for each site are agreed between NDA staff and SLCs in compliance with the NDA’s ‘Change Control Procedure’.

The LCBL costs submitted by each SLC are combined and summarised by the NDA to provide a national baseline.

The first year of the NTWP is used for performance management by the site contractor and monitoring by the NDA.

The NDA combines the NTWPs into a national cost summary.

The scope, cost and schedule information from the second year of the NTWP are the basis for our Annual Plan.
Annex 1

environmental assessment statement
Introduction and Background

The Nuclear Decommissioning Authority (NDA) is a new organisation. We have been set up by the Government to provide a Strategy for dealing with the UK’s civil public sector nuclear legacy. We are, therefore, in the business of environmental restoration, with a mission to deliver a world-class decommissioning programme that is safe, secure, cost-effective and environmentally responsible. We will achieve this through working in an open and transparent manner and with due regard to the social and economic impacts our decisions may have on local communities.

The environmental aspects of our proposals played an important role in the development of our Draft Strategy. We therefore carried out an environmental assessment to inform the emerging Strategy.

We consulted on our Draft Strategy and the accompanying Environmental Report from 11 August 2005 until 11 November 2005. During the consultation period, we were active in hosting and attending meetings and events to explain our thinking and to answer questions. This included holding the first UK National Stakeholder Group meeting on October 17 and 18, as well as presenting to the 16 Site Stakeholder Groups around the UK.

The Draft Strategy we issued for public consultation was the catalyst for comments, which we have used in producing this Strategy. It is a requirement of the Energy Act 2004 that we review our Strategy at least every five years. However, we plan to review our Strategy in the light of Government’s decisions on the outcome of the Committee on Radioactive Waste Management’s (CoRWM) review of options for the long-term management arrangements for the UK’s higher level radioactive wastes and the Government’s Low Level Waste policy review.

This Statement describes how we have integrated environmental considerations into our Strategy; how we have taken account of the report of our environmental assessment on the Draft Strategy for Consultation; how we have taken account of the views of respondents to the consultation; why we have decided on the Strategy; and how we intend to monitor the environmental implications of our Strategy.
Integration of Environmental Considerations into the Draft Strategy

This statement describes how we have integrated environmental considerations into our Strategy.

Environmental considerations are integral to the NDA’s Strategy because of the overriding expectation that nuclear sites will be operated and decommissioned in an environmentally responsible way. In fulfilling our duties under the Energy Act 2004, we have particular regard for:

- safeguarding the environment;
- protecting people from risks to their health and safety; and
- preserving nuclear security.

Our Strategy must cover how we intend to deliver the full range of our functions, including:

- our approach to the decommissioning and clean up of sites for which we have been designated responsibility;
- our approach to the management of ongoing commercial operations until their closure;
- how we propose to ensure the UK develops and maintains a skilled workforce to deliver our remit;
- how we promote competition for contracts to manage and operate our sites;
- how we ensure that good practice is shared between our sites; and
- how we encourage and support activities that benefit the social or economic lives of communities living near our sites.

It is crucial that the Strategy addresses all these duties.

With the environmental aspects of our proposals being an important factor in the development of our proposed Strategy, we carried out an environmental assessment to inform it.

This environmental assessment has covered all of the potential receptors listed in the SEA Directive: “… biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the inter-relationship between the above factors.” The objectives and criteria used in this assessment are described in the Environmental Report itself.

The findings of the environmental assessment have been incorporated into the Strategy.
There is a wealth of data collected by the UK’s environment agencies, the Food Standards Agency and our contractors concerning the current and past environmental performances of our sites. However, projections and estimates of their future environmental footprint are not consistently available. As a new organisation, we have had little time to collect additional information. It is not surprising, therefore, that in the timescales available for the production of our first Strategy (as specified by the Energy Act) we were not able to collect all of the information we would have liked. We plan to work with our contractors and the regulators to ensure that consistent information is available to support future reviews of our Strategy. However, we feel that our Environmental Report covers the information that may reasonably be required, taking account of:

- current levels of knowledge and methods of assessment; and
- the contents and level of detail in the plan or programme.

The Environmental Report was taken into account when preparing the consultation draft of our Strategy and, in the light of issues it raised, we have taken particular account of:

- proposing separate consultations to review site end states and the time taken to reach them;
- undertaking further work to understand the potential long-term impact of climate and coastal change at our sites;

- the need for a faster process for characterising contaminated land at our sites and the timely development of long-term management plans; and
- the need to support the work of UKAEA and SEPA to identify the best way to manage radioactive fuel fragments at Dounreay.

The Environmental Report also reinforced the need for:

- optimised and integrated waste strategies to be developed for each of our sites, considering current and future wastes and discharges; and
- the NDA to be proactive in addressing the socio-economic issues resulting from potential job losses at our sites as decommissioning progresses.

The consultation responses we received relating to the Environmental Report, and our responses to them, are described in Section 4.2 while Section 5 of this statement describes why we have selected the proposals set out in our Strategy, based on the assessment described in our Environmental Report.
Taking into Account the Views from Consultees

Listening to people we consulted
We consulted on our Draft Strategy and the accompanying Environmental Report from 11 August 2005 until 11 November 2005. During the consultation, we issued over 6,000 copies of both documents and received over 270 sets of comments, in addition to hosting a live ‘web chat’ where members of the public were invited to participate in an interactive discussion on the Draft NDA Strategy. NDA staff also attended or hosted meetings and gave almost 50 presentations on the Draft Strategy and Environmental Report to a variety of stakeholders, including: the UK National Stakeholder Group; the Site Stakeholder Groups (SSGs), which represent the communities living near NDA sites; Trades Unions; workforces at several sites; Local Authorities; representatives of the supply chain; special interest groups; officials representing the Governments of the Irish Republic and the Isle of Man; and an all-party group of Members of the Scottish Parliament (MSPs).

The rest of this section outlines how we have taken into account the comments we received on the key environmental issues identified in our Draft Strategy and Environmental Report together with the comments we received on the Environmental Report itself.

A description of our response to the comments we received on all areas of our Draft Strategy for consultation is included in Annex 2 of our Strategy.
Responses to the Environmental Issues

This section describes in summary the comments we received on the environmental aspects of the proposals we made in our Draft Strategy and how we have responded to each of these points.

End States

We concluded in our Draft Strategy for consultation that we need to review the site end states in consultation with stakeholders, including the potentially significant impact of climate and coastal change in determining end states.

We received general support for our proposals to consult separately on site end states and end dates. However, we received a number of valuable comments on this area:

- Several respondents asked to be involved in the proposed stakeholder consultation on site end-states and to be reassured that these consultations would be genuinely broad and inclusive. We have moved to address this concern by issuing appropriate guidance to NDA Site Programme Managers on how the consultation process should be carried out and by making this clear in the Strategy.

- Several respondents also suggested that any end states determined by the consultation exercise should be periodically reviewed. They argued that Government policy and legislation are still developing, as is our own knowledge of issues such as contaminated land. We agree, and have made this clear in our Strategy.

- Several respondents felt that descriptions such as ‘green field’ and ‘brown field’ were misleading. We have, where possible, replaced the terms green and brown field with clearer descriptions in our Strategy.

Several respondents also indicated their preferences for site end states, although this is a matter for separate consultation.

We also received strong support for accelerating the decommissioning of Magnox and other Reactor Sites and for the early decommissioning of the legacy plants and facilities at Sellafield and Dounreay. However, several respondents commented on the need for the NDA’s strategy to be consistent with the UK National Radioactive Discharge Strategy and also for the NDA to consider fully the financial and non-financial implications of acceleration. We have sought to make this clearer in our Strategy.
Responses to the Environmental Issues

Climate and Coastal Change
A number of responses agreed that we should consider the potential implications of climate and coastal change, including flooding, when reviewing the end states for our sites and the period over which they will be reached. Several respondents said we should factor in the potential effects of scenarios that could lead to more rapid climate change and a rise in sea level. We envisage that the research we have initiated with Nexia Solutions Ltd. to draw together and review the current information about our sites will identify what further work in this area may be required. Based on this, we intend to publish a report describing the current understanding of climate and coastal change issues affecting our sites during 2006.

Contaminated Land Management Strategies
We indicated in our Draft Strategy for consultation that while contaminated land assessment work has been undertaken on a number of sites their remains more work to be done to develop agreed contaminated land management strategies.

There was general support for the proposed work to further reduce the current uncertainties surrounding contaminated land identified in the Environmental Report. However, we are also mindful of the warning from one respondent that we could spend large sums of money trying to gain a greater understanding than we actually need in order to manage this hazard responsibly.

Radioactive particles and contaminated sediment
We identified in our Draft Strategy for consultation that contaminated sediments and radioactive fuel fragments are present as a result of past activities on our sites and that there are no easy solutions.

One respondent expressed a strong preference to see the removal of the radioactive fuel fragments found near Dounreay. Our Strategy proposes that the BPEO is used to identify the best approach for managing this difficult issue. This will be the subject of a separate consultation process carried out by UKAEA.

Another respondent asked us to clarify the distinction between the accumulations of radioactive substances from past authorised discharges - such as those identified in the Irish Sea, Solway Firth, Ribble Estuary and Trawsfynydd Lake - and the discovery of radioactive fuel particles found near Dounreay. We have attempted to make this important distinction clear in our Strategy.

Another respondent wanted us to emphasise that the Solway Firth, where material from historic discharges has
Responses to the Environmental Issues

accumulated in marine sediments, is a Special Protection Area. We have done so in our Strategy.

Solid Waste Management Strategies

We stated in our Draft strategy that the assessment of future waste arisings and discharges from our sites will need further consideration in the development of site waste strategies.

We received many comments on our proposals for the management of solid wastes. These are described more fully in section 3 and 4 of our Strategy but the key themes identified were:

- **There were split opinions on commercial operations, especially THORP, Magnox reprocessing and SMP. Some commentators are keen to see these plants running well into the future while others want to see these activities closed down immediately to minimise the arisings of radioactive wastes and nuclear materials and to reduce discharges.**

- **While several respondents supported our proposed approach to the management of ILW, several others questioned our stated support for deep geological disposal of ILW; the Committee on Radioactive Waste Management (CoRWM) is yet to make recommendations on the long-term management arrangements for ILW and HLW.**

- **We do not seek to pre-empt the CoRWM review, but believe that transparency requires us to express our preference in this area.**

- **There were relatively few responses on the interim storage of ILW, although some respondents felt there was a need to keep stakeholders informed of any ILW storage proposals. There was a general reluctance by local stakeholders to accept the storage of wastes generated by sites in other areas, although there seemed to be more willingness to accept the storage of wastes that were generated locally. We will ensure that stakeholders are fully engaged in the development of any ILW interim storage plans.**

- **There was acceptance that new, additional disposal facilities are required to take the large volumes of Low Level Waste (LLW) arising from decommissioning and clean-up activities. There was some agreement from respondents that LLW arising on individual sites could be disposed of there but this would not run to taking other sites LLW. We will ensure that stakeholders are fully engaged in the development of any plans for on site disposal of LLW.**

- **There was strong support for finding ways to reduce LLW arising although some respondents were opposed to specific**
Responses to the Environmental Issues

approaches such as decontamination, incineration and the disposal of Very Low Level Waste (VLLW) in landfill sites. We intend that the development of integrated and optimised waste strategies will reduce the arisings of all types of radioactive and non-radioactive wastes and have sought to make our aims in this area clearer in our Strategy. We feel that radioactive waste management options should be identified according to the BPEO principal.

- A number of respondents were concerned that a more flexible policy for disposing of LLW should not open the door to lower standards of environmental protection. We agree: the benefit of increased flexibility is being able to tailor disposal options to the characteristics of specific waste types, rather than any compromise on the protection of people or the environment.
- In response to comments received we have also clarified our intentions regarding the LLW Repository at Drigg and the proposed facility at Dounreay.

Socio-economic Implications of Decommissioning

We identified in our Draft Strategy that the socio-economic implications of site closures in remote areas were potentially significant and needed to be considered in developing decommissioning programmes.

There was strong interest from respondents in this section of our Draft Strategy and a clear recognition that socio-economic considerations are important to the local communities and economies near our sites.

- Many respondents who live near to existing nuclear sites expressed concern at the impact of decommissioning on employment levels. A number of respondents living near reactor sites expressed support for the development of new nuclear reactors on these sites, should the Government decide to commission a new generation of nuclear power stations. A high priority for many respondents was the possibility of new employment opportunities, including new jobs arising from the proposed National Nuclear Archive and subject to Government deciding on the need for one, a National Nuclear Laboratory.
- Many respondents wanted more detail on our socio-economic Strategy. We have therefore amended Section 9 of our Strategy to respond to these comments,
Responses to the Environmental Issues

including how we will:
- define clearly and gain common understanding of the NDA’s role in respect of socio-economic development with key stakeholders;
- determine what is a valid socio-economic investment for the NDA; and
- work with others to promote both sustainable employment and sustainable employability in local communities in order to maximise the opportunities available to local economies.

As well as having:
- recognised that, in planning activities at our sites, our contractors should take into account the broader social impact of our activities: e.g. disruption caused by increased transport movements and increased demand on local infrastructure resulting from an upswing in the numbers of contractors; and
- awareness of the unique opportunities and diverse needs of the communities near our sites, e.g. harnessing the Welsh language as a cultural asset at Trawsfynydd and Wylfa.

● Some respondents suggested that if their communities were required to host radioactive waste storage or disposal facilities on behalf of the nation then they should be ‘compensated’ accordingly. We have noted this issue.

● We received a largely favourable reaction to our idea of turning Calder Hall, the world’s first commercial nuclear reactor, into a museum. However, several respondents felt that the site would be better used for new nuclear build. We propose to evaluate the museum proposal, as described in section 9.4 of the Strategy. In a similar vein, several respondents suggested that the Dounreay Fast Reactor site, like Calder Hall, could be suitable as a museum. Although we do not intend to pursue this idea, we are planning to retain Dounreay’s distinctive spherical pressure vessel.

● A number of concerns were raised by local communities, and others, about transport. In response, we have included additional information, where possible, on domestic and international transport arrangements in our Strategy.
Responses to the Environmental Report

Listening to views on the Environment Report
This section addresses the comments on the environmental Report itself – these relate largely to the content of the Environmental Report, the environmental assessment process and the links between the Environmental Report and the Draft Strategy for Consultation.

Links between Environmental Report and Draft Strategy
Several respondents suggested that it was not clear how the Environmental Report supported and informed the Draft Strategy for Consultation. We hope that the Strategy, together with this Environmental Assessment Statement, achieves that clarity. In particular, we have provided more information in our Strategy on:

- the relationships between the NDA and the regulators;
- our environmental policy expectations;
- Integrated Waste Strategies;
- decommissioning programmes and timescales for each site; and
- monitoring of competition and contractor environmental performance.

We were also asked by one respondent to provide information on the link between the NDA's Strategy, Annual Plans and the site plans. We feel that this relationship is better described elsewhere and that, future Annual Plans and the site Life Time Plans will be consistent with our Strategy (subject to regulatory and planning approval where required).

Environmental Baseline
As we prepared the environmental baseline and site-specific data, we aimed to use the information we were given to provide a clear description of the key issues under each environmental heading and to identify the key issues facing each site. However, several respondents said they would have liked to see more quantitative information and hoped that the gaps in data discussed in the Environmental Report will be filled in time for future Strategy reviews. This is our intention.

We intend to work with all the consultation bodies, and especially the UK's independent environmental regulators, to build on our first Environmental Report and to improve the environmental assessment of reviews of our Strategy. In Scotland, we will make use of the SEA gateway to bring about a co-ordinated consultation with the relevant bodies. This will enhance the direct discussions with organisations such as Scottish Natural Heritage, Historic Scotland and SEPA we undertook as part of this assessment process.

A number of respondents felt that by focusing on environmental effects at a national level, the Environmental Report played down the importance of local and, indeed,
Responses to the Environmental Report

international effects arising from the activities of decommissioning and the value of relevant environmental assets as well as public access to these. This was not our intention, local and international issues form a key part of our overall commitment to safeguarding the environment.

One respondent wanted us to be clearer when using statements such as “there is no evidence…” in the Environmental Report. They asked whether this meant that we had no evidence of the effects described or that we had evidence showing that there was no effect. Our intended meaning was that we had no evidence of effects from the historic activities on the sites for which we are now responsible. In certain cases, for example, we do have evidence indicating no effect for some - but not all - of the sites for which we are responsible.

One respondent, while agreeing with the key issues identified by the Environmental Report, felt that the links between them were not fully explored. We have tried to make these clearer in the Strategy and will bear this in mind in any future environmental assessments.

Site-specific Environmental Baseline
Several respondents provided additional information, or corrected minor errors, relating to the site-specific information in the Environmental Report relating to Dounreay, Harwell, Hunterston A, Springfields and Trawsfynydd. This will be reflected in future environmental assessments but did not affect the conclusions of our assessment.

The comments on Hunterston A have also caused us to reconsider our conclusion that “there are no known cases of protected habitats and species being affected by past or current activities”. Our amended view is that, with the exception of past development within, and contamination of, the Portencross Coast Coastal SSSI at Hunterston, there are no known cases of protected habitats and species being affected by past or current activities.

One respondent also wanted more information on the decommissioning timescales for all sites and their main phases. We have amended the lifecycle overviews for each site to make this information clearer in our Strategy.

The general comments mentioned above, regarding the desire for more quantitative environmental information, also apply to site-specific information.

Environmental assessment
As we describe in the Environmental Report, we have assessed the different options proposed, and realistic alternatives, by applying expert judgement to each of the key environmental headings identified in the Draft Strategy. Several respondents suggested that we should develop a clearer decision-making mechanism to support the process, which we will consider in future assessments.

We agree with the respondents who felt it was important to understand the full environmental implications of our Draft Strategy, as well as the relative effects of specific strategic actions and their realistic alternatives. We intend to engage with all the consultation bodies, and especially
Responses to the Environmental Report

the UK’s independent environmental regulators, to improve the environmental assessment of reviews of our Strategy.

Several respondents felt that we should have focused more on the implications of continuing to operate the Magnox power stations, Magnox reprocessing plant, THORP and SMP; their environmental and economic effects; and possible alternatives. One respondent felt it important to highlight that the closure of THORP would require alternative solutions for the management of AGR fuel, resulting in their own environmental effects.
Decommissioning & Clean-up

**Site end states**
The assumption used to be that decommissioned nuclear sites would ultimately be returned as ‘green field’ sites, ready for a new use without any restrictions. However, following the Government’s decommissioning policy review in 2004, it is now envisaged that there could be a variety of site end states, ranging from indefinite institutional control (remaining within the nuclear licensing regime) to the release of sites for any further use.

Each of these options will have advantages and disadvantages, depending on the nature of specific sites, the nature of any contaminated land present and their potential for alternative uses. By definition, then, end states can only be defined on a site-by-site basis and we, therefore, propose to review site end states and end dates with stakeholders as part of a separate consultation.

**Higher-hazard legacy facilities**
We feel that in accelerating the remediation of high-hazard facilities, the benefits of long-term hazard reduction will outweigh any short-term potential penalties of increased handling and discharges. However, any increases in discharges will need to be robustly assessed to ensure they represent BPEO and are consistent with the UK National discharge Strategy. We do not consider there to be any alternative to the reduction of hazards posed by these facilities, which is our top clean-up priority.

**Climate and coastal change**
Looking at the longer-term, we need to be mindful of the possible challenges that both potential climate change and coastal erosion could pose to our proposed plans for decommissioning and clean-up and waste management, as well as for site end states and end dates. If these challenges look likely to increase, we need to be ready with effective measures that have been designed on a site-by-site basis and which do not have unacceptable environmental consequences. We therefore propose to gain a national understanding of the potential threats from climate and coastal change. We will continue to work with our contractors, the environment agencies and other relevant organisations to make sure we have robust coastal and flood defences for as long as we need them.

**Contaminated land**
There are varying degrees of radiological and chemical contamination at all of our sites which, in some cases, extend beyond the site boundary. In collecting baseline data, we obtained estimates of the quantities of land which has been contaminated at each of our sites but not a complete understanding of the nature and extent of the contamination on our sites. There are a number of options for the management of this contaminated land which will need to be evaluated by our management & operations contractors for each site in developing long-term optimised management plans. We are therefore seeking further information, as a first step to accelerating the evaluation of contaminated land and the development of these long-term management plans.

**Radioactive particles**
The contamination of the seabed near Dounreay with radioactive fuel fragments is a key local issue. For this reason, it is discussed in our Strategy, although the
Scottish Environmental Protection Agency (SEPA) and UKAEA are undertaking a major study to examine the options for addressing this issue. We will work closely with UKAEA to ensure that monitoring continues to the satisfaction of the environmental regulator (SEPA) and to implement the selected Best Practicable Environmental Option (BPEO) for managing this issue following a separate consultation on the potential management options. We expect this to begin in 2006.

**Reactor decommissioning**

When reactors have ceased generating, the baseline plan is to take them into ‘Safestore’. This means removing all of the nuclear fuel, and much of the ancillary equipment, but leaving the bulk of the reactor and any Intermediate Level Waste (ILW) in two or three storage buildings on the site. The Safestore strategy is then to leave the radioactive contents for 80 to 125 years to take advantage of radioactive decay. However, there are realistic alternatives to this approach:

1. **An accelerated programme to care and maintenance.**
   - as little as five years to reach the care and maintenance phase;
   - up to 100 years in care and maintenance.
2. **Prompt decommissioning and clean-up:**
   - defuelling, decommissioning and closure of the site in 25 years or less.

Certainly, prompt decommissioning presents a number of challenges in terms of waste management, differing discharge profiles and the non-negotiable priority of worker safety. However, we feel that the potential benefits are worth exploring: it would use the existing, highly skilled workforce and bring socio-economic benefits for the local area and it would free the site earlier for other uses. We therefore believe that the argument for prompt reactor decommissioning within 25 years warrants serious evaluation and we propose to work with the industry and regulators to progress it.
**HLW Management**

There are around 2,000 cubic metres of HLW in the UK, approximately two thirds of which is held in storage tanks (in liquid form) and is waiting to be treated. There are now three vitrification lines in operation to encapsulate the wastes in glass as part of the process to achieve passive safety. We do not consider there to be a realistic alternative to the timely vitrification of liquid HLW as untreated liquid HLW needs to be put into passively safe conditions and further vitrification lines could not be delivered in time to meet the regulator’s timescale for achieving this.

**Return of wastes**

When fuel is reprocessed in the UK on behalf of overseas customers, the question of whether the resulting waste should be disposed of here is a matter for Government. Therefore, although we recognise that international movements of waste concern some stakeholders, we have not evaluated or proposed options for disposing of overseas wastes in the UK. In line with Government Policy we therefore propose to pursue the return of overseas wastes with the aim of completing this programme of returns in accordance with the reprocessing contacts.

**ILW Management**

Large volumes of Intermediate Level Waste (ILW) will be generated through operations and future decommissioning of our sites. Current estimates put existing and anticipated volumes of ILW in the range of 350 thousand cubic metres. However, the Committee on Radioactive Waste Management (CoRWM) is currently studying options for the long-term management of intermediate and higher level radioactive wastes (ILW and HLW) and will make its recommendations in July 2006. The current management approach is for this waste to be stored on the sites where it is created and several sites are now building, or planning to build, new stores to deal with existing conditioned waste and anticipated future volumes.

It is essential that the long-term arrangements for the management of higher level wastes are available as early as is practicable. We are in favour of the direct disposal of ILW in a deep geological repository; we believe that the potential environmental and financial benefits commend it as the right long-term solution. Until then, we plan to investigate the options for ILW interim storage, including the potential for regional or national solutions, rather than site storage where the ILW is generated. As described in our Strategy, we intend to review our Strategy in the light of Government’s decisions on the outcome of the CoRWM review and the LLW policy review.

**LLW management**

Large volumes of Low Level Waste (LLW) – some two million cubic metres, according to estimates - will be generated by decommissioning our sites. Even if the current facility at Drigg is extended as proposed, there will still not be enough capacity to dispose of all LLW in the UK. The UK Government and the Devolved Administrations, supported by the NDA, are currently reviewing the long-term policy for LLW management and disposal, which is expected to conclude by Summer 2006. In advance of the LLW policy review we propose to continue to evaluate a number of options including:
Radioactive Waste Management

- extending the LLW facility at Drigg as planned;
- building a national facility similar to the LLW facility at Drigg;
- building new regional LLW disposal facilities at some of our sites; and
- each site hosting its own LLW disposal facility.

We also propose to continue to require the production of optimised and integrated waste strategies (IWS) for our sites, in order to:

- avoid creating wastes;
- reduce waste by designing appropriate processes and equipment;
- re-use and recycle wastes under appropriate regulatory control;
- use the Best Practicable Environmental Option to manage residual wastes; and
- deliver value for money.

Commercial Operations

As well as having the responsibility for decommissioning, the Energy Act requires the NDA to ensure that commercial operations are run efficiently and effectively. The operation of these facilities is independently regulated under the Radioactive Substances Act 1993 and other relevant environmental legislation. Our Strategy sets out the criteria we will use to evaluate any potential new commercial opportunities and our proposals for the operation of current activities. However, the final decision on the future operation of these nuclear facilities lies with the Government.

Nuclear Materials

The UK has significant quantities of uranics (materials containing uranium) and plutonium, all stored on NDA sites. The plutonium, and some of the uranic material, has been regarded as having strategic value as, for example, a future energy source. We plan to continue to store these materials safely and securely and discuss alternative options with the Government. Our assessment indicated that there were no significant environmental effects associated with the continued storage of these materials. However if they are designated as wastes, this would result in environmental effects due to the treatment and conditioning of such wastes for disposal.
We did not assess in the Environmental Report alternatives to the Strategy for competition as this was not required. The Energy Act requires the NDA to encourage competition, however, we recognise that some people may be concerned that keen competition could lead to a reduction in safety and a lowering of environmental standards. Our Strategy describes how we intend to ensure that safety, security and environmental performance is maintained and enhanced.

**Innovation**

We did not assess in the Environmental Report alternatives to the Strategy for innovation as this was not required. The Energy Act gives the NDA responsibilities in a number of areas including maintaining a skilled workforce, encouraging the adoption of good practice and innovation and research and development.

**Finance**

We did not assess in the Environmental Report alternatives to the financial strategy as this was not required. The finance section of our Strategy describes the arrangements in place for long-term funding, short-term funding, and risk management. It also describes the criteria identified for strategic decision-making and our proposed prioritisation process.

The Energy Act requires us to take account of the social and economic impact that decommissioning may have on neighbouring communities. Our sites are largely in remote locations – reflecting, in part, the sensitivities of the Government's historic nuclear research programmes. Consequently, many sites have become the dominant local employer, inextricably linked to the wider social and economic well-being of each community. This is particularly acute, though not exclusively felt, in Cumbria, Caithness, South West Scotland and North Wales.

Historically, site operators have provided local community support. Our contractors currently provide support worth approximately £5m a year on our behalf.

The alternatives centre on whether to:

- **provide support at local (i.e. site) and national/strategic level**;
- **act as a direct delivery agent, taking the place currently held by regeneration agencies**; and
- **increase or reduce funding**.

We do not feel it is appropriate for the NDA to take on the role of Regional Development Agencies (RDAs) and equivalent bodies in Scotland. We propose to work with the RDAs and others in developing a coherent socio-economic strategy that determines how best to give encouragement and support to activities that benefit the social and economic lives of communities living near our sites. We also intend to find additional funds for social and economic support through efficiency savings gained by our contractors.
Monitoring the Significant Environmental Effects of the Draft Strategy

There are extensive arrangements in place to monitor the environmental performance of our nuclear sites, including:

- **The environment agencies, which require our contractors to monitor their radioactive and non-radioactive discharges to the environment and the disposal of radioactive and non-radioactive wastes from their sites.** Each year, operators are also required to submit summary information on annual discharges and waste disposals to the pollution inventories, which are run by each agency. This information is available from: [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk) and [www.sepa.org.uk](http://www.sepa.org.uk).

- **In addition to the information above, the Environment Agency, the Environment and Heritage Service ([www.ehsni.gov.uk](http://www.ehsni.gov.uk)), the Food Standards Agency ([www.food.gov.uk](http://www.food.gov.uk)) and the Scottish Environment Protection Agency publish a report on radioactivity in food and the environment. This report contains the results of radiological monitoring throughout the United Kingdom, the Channel Islands and the Isle of Man. This represents a comprehensive summary of results across the United Kingdom from programmes sponsored by all the organisations involved in producing the report. The report is available on their websites.**

- **The Environment Agency also launched the first three voluntary sector plans on 14 December, agreed with key sectors. These included a Nuclear Sector Plan agreed with all of the key UK nuclear operators. The reporting of information on milestones and indicators within this plan will provide the NDA with a further source of information on the environmental performance of our sites in England and Wales. These indicators and milestones cover discharge of radioactive and non-radioactive substances, waste arisings, resource usage and the development of biodiversity and site restoration plans. More information on the nuclear sector plan is available from:** [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

- **All of our nuclear sites are independently certified to the ISO14001 international standard of environmental management. Among the requirements of this standard our sites are required to operate systems to identify their significant environmental aspects and relevant requirements and to operate programmes for continual improvement.**
In addition to using these sources of information to monitor the environmental footprint of our activities and any unexpected environmental effects, we are developing a set of environmental indicators to be introduced in 2006, focusing on two areas:

- **The control of activities to prevent unintended environmental effects – this will be based on compliance performance and significant events and near misses**
- **The control of the environmental footprint of planned activities – we intend to use site lifetime plans to monitor contractors’ environmental performance against these plans**

Should we identify any unforeseen environmental effects associated with the implementation of our strategy we will discuss the appropriate action with our contractors and the environmental regulators.

We intend to use the information described above, together with information from our assurance activities and relationships with the environment agencies to monitor the environmental effects of our activities. We will also use this information to inform future reviews of our Strategy at least every five years, as required by the Energy Act 2004. As described in our Strategy we envisage a review of our strategy once CoRWM and low level waste policy reviews are completed.
environmental assessment statement
Taking into Account the Views from Consultees

Listening to the people we consulted

We consulted on our Draft Strategy and the accompanying Environmental Report from 11 August 2005 until 11 November 2005. During the consultation, we issued over 6,000 copies of both documents and received over 270 sets of comments, in addition to hosting a live ‘web chat’ where members of the public were invited to participate in an interactive discussion on the Draft NDA Strategy. NDA staff also attended or hosted meetings and gave almost 50 presentations on the Draft Strategy and Environmental Report to a variety of stakeholders, including: the UK National Stakeholder Group; the Site Stakeholder Groups (SSGs), which represent the communities living near the NDA’s sites; Trades Unions; workforces at several sites; Local Authorities; representatives of the supply chain; special interest groups; officials representing the Governments of the Irish Republic and the Isle of Man; and an all-party group of Members of the Scottish Parliament (MSPs).

The responses we received indicated broad stakeholder support for the direction of travel proposed by our Draft Strategy. A brief summary of the responses to the consultation indicates:

- widespread support for the acceleration of reactor decommissioning and earlier reactor site clearance and the high priority we attached to cleaning up the higher hazard legacy facilities at Sellafield and Dounreay;
- acceptance of the need for new facilities to take the large volumes of Low Level Waste (LLW) that will arise and strong support for ways of minimising the amount of waste generated;
- few comments on the interim storage of Intermediate Level Waste (ILW) but strong support for the NDA’s intention to encourage the Government to make early and firm decisions on the long-term management arrangements for Intermediate and High Level Wastes (HLW) following the outcome of the CoRWM review – and concern that delays to these decisions being made would hinder the delivery of our Strategy;
- divided opinions on the operation of commercial plant, particularly THORP and SMP, between respondents who supported their continued operation and those who wanted to see their immediate closure;
- a small majority in favour of the retention of strategic stocks of nuclear materials, but some strongly in favour of their categorisation as wastes – and strong opposition to the sale of UK plutonium to overseas;
- mixed views on the rationale for site management competition, including concerns about its possible adverse effect on safety and environmental protection, and conflicting views on the proposed competition schedule;
Taking into Account the Views from Consultees

and

- concerns about whether sufficient finances would be available to fund the NDA's proposed Strategy.

This Appendix describes our response to the comments we received on the Draft Strategy. Comments on the Environmental Report are included in the Environmental Assessment Statement in Annex 1 of our Strategy.

General comments on the Draft Strategy

Several respondents felt that the NDA should review its Strategy much sooner than the five years required by the Energy Act. They cited the general uncertainty caused by the ongoing reviews of Government policy in a number of key areas, most notably of the long-term policy for radioactive waste management, and the fact that some proposals – such as faster reactor decommissioning - remain under development. As described in the Executive Summary of our Strategy, we plan to review our Strategy following the outcome of the CoRWM and low level waste policy reviews.

One respondent felt that transport should be recognised as a strategic issue in its own right. We have amended our Strategy to highlight the importance of safe, secure and environmentally responsible transport that also recognises the social effects of transport movements. We have included a specific discussion on transport in Section 4 of our Strategy.

One respondent felt that we should press for a ban on the development of airports near nuclear sites. We feel that it would be inappropriate to set out our position in respect of airport development in the Strategy and would expect to be consulted, along with the site licence companies (SLCs) and the regulators, during the planning application process for any proposed airport development.

Comments on Decommissioning & Clean-up

Our Draft Strategy and Environmental Report mentioned that certain decommissioning activities will result in short-term increases in discharges to the environment. We agree with a number of respondents that such increases will need to be robustly justified as the Best Practicable Environmental Option (‘BPEO’), and be consistent with the UK National Radioactive Discharge Strategy for the period 2000 to 2020. This is important in delivering the UK’s obligations under the OSPAR Convention on the protection of the marine environment of the North East Atlantic.
We received general support for our proposals to consult separately on site end states and end dates. However, a number of respondents commented on how to define end states, the need for a periodic review of end states and how stakeholders should be involved in this process. We describe some of these comments below.

Several respondents suggested that descriptions such as ‘green field’ and ‘brown field’ were misleading. They suggested that we provide more information on the final condition of sites assumed in current plans and on the key site decommissioning processes that will deliver this position. We agree that the terms ‘green field’ and ‘brown field’ are not sufficiently clear, particularly because they over-emphasise differences between assumed end states for different Magnox sites. We have, where possible, attempted to replace the terms green and brown field with clearer descriptions in our Strategy.

Several respondents also suggested that any end states determined by the consultation exercise should be periodically reviewed. They argued that Government policy and legislation are still developing, as is our own knowledge of issues such as contaminated land. We agree and have made this clear in our Strategy.

Several respondents asked to be involved in the proposed stakeholder consultation on site end states and to be reassured that these consultations would be genuinely broad and inclusive. We have moved to address this concern by issuing appropriate guidance to NDA Site Programme Managers on how the consultation process should be carried out and by making this clear in the Strategy.

Several respondents indicated their preferences for site end states, although this is a matter for the separate consultation.

**Climate and Coastal Change**
A number of responses agreed that we should consider the potential implications of coastal and climate change, including flooding, when reviewing the end states for our sites and the period over which they will be reached. Several respondents said we should factor in the potential effects of scenarios that could lead to more rapid climate change and a rise in sea level. We envisage that the research we have initiated with Nexia Solutions Ltd. to draw together and review the current information about our sites will identify what further work in this area may be required. Based on this, we intend to publish a report describing the current understanding of climate and coastal change issues affecting our sites during 2006.
**Higher hazard legacy facilities clean-up**

There was general support that we should make the task of identifying higher hazard facilities our number one priority. However, a number of respondents were keen that this did not mean diverting resources from other sites or a reduction in the pace of decommissioning other facilities. Our Strategy and revised prioritisation process recognises the difficult balance that must be struck between addressing higher hazard facilities and maintaining progress in other areas. It also recognises that, if a lack of commercial and Government funds constrains our work programme, we will need to make difficult choices in the absence of additional Government support.

Several respondents questioned whether we had received detailed plans from British Nuclear Group for dealing with the higher-hazard legacy facilities at Sellafield and whether they were adequate. We have received the required plans and are currently reviewing them to assess whether or not they are adequate, a process that is likely to take some time. One respondent suggested that, without these plans, our Strategy would be incomplete and suggested that we should consult separately on these plans. We disagree: our Strategy is clear on the priority we attach to dealing with higher hazard facilities at Sellafield and the plans from British Nuclear Group simply underline this.

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**Radioactive particles and contaminated sediments**

One respondent expressed a strong preference to see the removal of the radioactive fuel fragments found near Dounreay. Our Strategy proposes that the BPEO is used to manage this difficult issue. This will be subject of a separate consultation process carried out by UKAEA.

Another respondent asked us to clarify the distinction between the accumulations of radioactive substances from past authorised discharges - such as those identified in the Irish Sea, Solway Firth, Ribble Estuary and Trawsfynydd Lake - and the discovery of radioactive fuel particles found near Dounreay. We have attempted to make this clear in our Strategy.

Another respondent wanted us to emphasise that the Solway Firth, where material from historic discharges has accumulated in marine sediments, is a Special Protection Area. We have done so in our Strategy.
Contaminated Land
There was general support for the proposed further work to reduce the current uncertainties surrounding contaminated land identified in the Environmental Report. However, we are also mindful of the warning that we could spend large sums of money trying to gain a greater understanding than we actually need in order to manage this hazard responsibly. While not explained explicitly in our Draft Strategy for Consultation, we recognise the importance of managing non-radioactive as well as radioactively contaminated land responsibly. We have made it clear in our Strategy that our proposals relate equally to radioactive and non-radioactive contaminants.

One respondent suggested the development of an environmental liabilities register to prevent disputes between the NDA and successive management & operations (M&O) contractors over the source of liabilities present on sites. We are working to gain a better understanding of contaminated land and associated liabilities on our sites but recognise that a degree of uncertainty is likely to persist for some time.

Reactor decommissioning
There was widespread support for the proposal to accelerate the decommissioning of Magnox reactors and the application of this approach to other reactors for which we are responsible. However, several responses recommended that we be more explicit in our Strategy on the possible safety and environmental implications of accelerated decommissioning caused by reducing the time allowed for radioactivity to decay. We have aimed to recognise these potential drawbacks and the technologies that can be adopted to mitigate their affects in the Strategy.

Several respondents felt it unlikely that there would be a dedicated Intermediate Level Waste (ILW) disposal facility available in the next 25 years and that limitations in ILW and LLW infrastructure would mean that sites could only be decommissioned promptly by using interim ILW stores. In turn, this would increase the need for double-handling of waste. A number of respondents told us that prompt reactor decommissioning should not be linked to the availability of a long-term waste management facility. We have reflected on the comments and have concentrated on the availability of a solution for graphite wastes in the Strategy, which we believe is of greater importance in determining a business case for accelerated decommissioning. Several respondents questioned the case for spending potentially substantial sums of public money to speed up the removal of defuelled reactors and associated facilities that actually present a relatively low hazard.
Comments on Decommissioning & Clean-up

Several responses proposed that Chapelcross should be used as a pilot site for prompt reactor decommissioning. Our aspiration remains to achieve the accelerated reactor decommissioning and earlier reactor site clearance, preferably within 25 years. However, we do not feel it would be appropriate to set out a definitive schedule for the accelerated decommissioning of reactors until the CoRWM review has concluded and until our business case has been approved.

Comments on Radioactive Waste Management

Several respondents asked for more information on the principles we will use to ensure that wastes arising from our sites are minimised and managed. We have provided additional information in sections 3 and 3.3 of our Strategy.

Some also felt that our Draft Strategy did not pay sufficient attention to non-radioactive or conventional wastes and contamination. We agree that our approach to the management of wastes needs to address non-radioactive as well as radioactive wastes and that the integrated waste strategies we intend for our sites minimise the generation, and optimise the management, of wastes of all kinds. In our Strategy, we commit to drawing this information together to identify and progress opportunities for improved waste management at every site.

We also recognise that our strategy must be consistent with the UK Radioactive Waste Discharge Strategy and thus the UK’s obligations under the OSPAR Convention on the protection of the marine environment of the North-East Atlantic.

**High Level Waste (HLW)**

A number of respondents were opposed to activities that generate HLW, such as reprocessing spent nuclear fuel and the operation of Magnox power stations. This is discussed under the revised section on Commercial Operations in this statement and in section 4 of our Strategy.

**Intermediate Level Waste (ILW)**

While several respondents supported our proposed approach to the management of ILW, several others questioned our stated support for deep geological disposal of ILW; the Committee on Radioactive Waste Management (CoRWM) is yet to make recommendations on the long-term management arrangements for ILW and HLW. We do not seek to pre-empt the CoRWM review. However, we think that transparency requires us to express clearly our preference in this area.

There were relatively few responses on the interim storage of ILW, although some respondents felt there was a need to keep stakeholders informed of any ILW storage proposals. There was a general reluctance by local stakeholders to accept the storage of wastes generated by sites in other areas, although there seemed to be more willingness to accept the storage of wastes that were...
Responses to the Environmental Report

generated locally. We will ensure that stakeholders are fully engaged in the development of any ILW interim storage plans.

Several Cumbrian respondents felt that we should recognise the socio-economic effects of radioactive waste management and disposal. We have informed the Government of these concerns.

**Low Level Waste (LLW)**

A number of respondents were concerned that a more flexible policy for disposing of LLW should not open the door to lower standards of environmental protection. We agree: the benefit of increased flexibility is being able to tailor disposal options to the characteristics of specific waste types, rather than any compromise on the protection of people or the environment.

Several respondents were opposed to specific radioactive waste management approaches, such as incineration, decontamination and the disposal of very low level waste (VLLW) in landfill facilities. We feel that radioactive wastes should be managed according to the BPEO principle and that, if the regulators are satisfied that people and the environment are protected, the choice of disposal options should not be unnecessarily constrained.

Respondents felt there was a need to keep stakeholders informed of any proposals to dispose of LLW. While there was broad acceptance of the practice of storing low level wastes in the area in which they were generated, there was not consensus on this issue and local stakeholders expressed a general reluctance for their local areas to receive wastes generated elsewhere. We will ensure that stakeholders are fully engaged in any plans for on site disposal of LLW.

As suggested, we have amended our reference to the recent Direction from the Scottish Executive to the Scottish Environmental Protection Agency. This concerned the decision of the former not to grant an authorisation to transfer waste from Dounreay to the Low Level Waste Repository at Drigg. Our revised wording more closely reflects the text of the Direction.

We have also clarified, in section 3 of our Strategy, that the proposed Low Level Waste facility (LLWF) at Dounreay is intended to be a site-specific facility.

One respondent suggested that we should be clearer about our intended use of the LLW facility at Drigg. There were also several suggestions that this facility should be reclassified as a storage site. We have clarified our plans for the LLW facility at Drigg in section 3.3 of our Strategy.

We also received several comments doubting the value of including cost comparisons of waste disposal between the UK and the US. Given the differences in circumstances and in waste classification, we have removed this data.
Sealed Sources
We have added information on sealed sources to our Strategy, as suggested by one respondent.

Several respondents felt that the NDA’s commercial operations presented a distraction from decommissioning activities. However, our designated responsibilities include the effective and efficient operation of the commercial facilities for which we are responsible. Decisions on the duration of these facilities are for the Government.

Comments on Commercial Operations

A number of others asked for more detail on the rationale and criteria we intend to use when assessing further commercial business opportunities. We have described these in the revised section on Operations in the Strategy.

Magnox power stations
Opinion was divided on the continued operation of our Magnox power stations. Some felt that the operational lifetimes of the Magnox sites should be reduced in order to minimise further radioactive discharges and waste generation; others felt that our Strategy should take into account the role of these power stations in generating power with low CO\textsubscript{2} emissions. Other respondents felt our Strategy should give more thought to the potential for new nuclear build. The continued operation of the Magnox stations and future energy policy generally, are matters for the Government. However, we will make sure that the Government is informed of the comments we have received. While some respondents felt that our Strategy should include a detailed financial, environmental and socio-economic analysis of continuing the operation of the Magnox sites, we feel this is outside the scope of our Strategy and Environmental Report.

One respondent raised concerns regarding the graphite safety case for Reactor 1 at Oldbury. This is a site specific issue that is subject to discussion between the NDA, the SLC and the Nuclear Installations Inspectorate. However, we will only support the continued operation of the Magnox power stations so long as it is safe to do so.
Some respondents were concerned about the discharges and waste (especially HLW) arising from reprocessing and felt that we should consider alternative options for the management of spent fuel. As we describe in Section 4.2 of this Statement, we do not currently think there are any realistic alternatives to Magnox reprocessing. However, we intend to consider in more detail alternative options for the management of Magnox fuel, within a broader review of spent fuel management options, which is described in Section 5.1 of our Strategy. We will engage stakeholders in this review, including the Nuclear Materials Sub-Group, established by our UK National Stakeholder Group.

THORP
There were similarly divided views on the future operation of THORP. Some respondents felt that operations at THORP should not resume due to the discharges and waste (especially HLW) generated by reprocessing. Others felt that we should have given a firm commitment to return the site to service, recognising the commercial potential of new reprocessing contracts and THORP’s importance to local employment. The continued operation of THORP is a matter for the Government and we will be passing on the views we have received. While some respondents felt that our Strategy should include a detailed financial, environmental and socio-economic analysis of continuing the operation of THORP, we feel this is outside the scope of our Strategy and Environmental Report. We will, however, review the options open to us regarding the immediate future of THORP against a number of criteria that we set out in the Strategy. We intend to include a more detailed consideration of AGR fuel within a review of spent fuel management options described in Section 5.1 of our Strategy. We will engage with stakeholders, including the Nuclear Materials Sub-Group, established by our UK National Stakeholder Group, during the review.

Sellafied Mixed Oxide Fuel Plant (SMP)
There were further differences of opinion on the continued operation of SMP. Some respondents favoured shutting down the facility while others felt the plant could make a positive contribution to the management of plutonium. The continued operation of SMP is a matter for the Government and we will make sure that they are aware of the comments we received. While some respondents felt that our Strategy should include a detailed financial, environmental and socio-economic analysis of the continued operation of SMP, we feel this is outside the scope of our Strategy and Environmental Report. We will, therefore, continue to scrutinise closely the performance of SMP through a structured monitoring regime and report any signs to the Government that the plant may not achieve its production targets.
Responses to the Environmental Report

**Springfields**
Several respondents felt we should have provided a stronger commitment in our Draft Strategy for options to extend the life of Springfields. They argued that AGR reactors depend on Springfields for the manufacture of their fuel and that there would be socio-economic impacts if manufacturing were to end. However, other respondents felt that the NDA should not be operating a fuel fabrication facility that supplies nuclear fuels due to their concerns about the environmental effect of nuclear power generation. We recognise the crucial importance of the Springfields site to the continued operation of British Energy’s AGRs in the Strategy and will continue to ensure the safe, effective and environmentally responsible management of the Springfields site in line with our designated duties, while discussing with the Government the longer-term commercial future of the site.

**British Energy**
Several respondents felt that the management of British Energy’s liabilities, and activities that may affect the magnitude of our liabilities, should be addressed in our Strategy in a similar way to our own sites. Several respondents also wanted more information on our relationship to British Energy and the funding of its decommissioning liabilities. Our role in respect of British Energy is purely as an adviser to the Government on BE’s liabilities provisions and decommissioning plans; it is therefore quite different from the designated responsibilities we have for our own sites. We have therefore tried to make clear, in our Strategy, that BE remains responsible for its own decommissioning and uncontracted liabilities, although we will make sure that its operations and plans are in line with the NDA strategy.

**Direct Rail Services (DRS)**
Several respondents felt that the Strategy should make clear that the NDA owns Direct Rail Services and therefore has direct responsibility for the continued safe, secure and environmentally responsible operations of the company. We have sought to address this in our Strategy.

**Pacific Nuclear Transport Ltd (PNTL)**
As requested, the Strategy makes clear that the NDA’s ships are used for both nuclear and non-nuclear cargoes and that the ships that are operated by PNTL are also used for third party nuclear cargoes.

**Non-operational Property**
Several respondents felt that the NDA should consult local communities before it disposes of non-operational assets to make sure they have the chance to receive any potential benefits from them. We have sought to address this in our Strategy while making clear that the Government would expect us to manage all of our assets cost-effectively.
Comments on Nuclear Materials

Uranics
We received a number of views on the appropriate designation of uranic material. The majority of our respondents felt that it should be regarded and stored as a strategic stock, while others held a clear opinion that it should be reclassified as a waste. We have begun our discussions with the Government on this topic and will inform them of the views we have received. This topic will also be considered by the ‘Nuclear Materials Issue Group’, established by our UK National Stakeholder Group.

There was general support for the conversion of Hex tails to a passively safe state, although one respondent was concerned that this material should not be used for energy production. We feel that storage of Hex tails in their current form is unsustainable and any future decisions on the future use of any converted uranium hexafluoride will depend on our discussions with Government.

Respondents local to the Capenhurst site stated that they would prefer MDU to be stored at a different site. We intend to address the possible storage of uranic materials at an alternative site, such as Sellafield.

Plutonium
Plutonium is another subject where respondents’ views were polarised: the majority felt that plutonium has strategic value, while others see it as a waste that needs careful management and disposal. We have begun our discussions with the Government on this topic and will inform them of our respondents’ views. This topic will also be considered by the ‘Nuclear Materials Working Group’, established by the UK National Stakeholder Group.

Plutonium also raises security questions and several respondents were opposed to the notion of selling UK plutonium overseas. We have noted the opposition to the potential sale of UK plutonium to an overseas manufacturer of MOX fuel.

One respondent asked if, and when, the results of our proposed research on plutonium management would be published. In line with our publications policy, we will make publicly available all information except where we believe that the publication of material would damage commercial or personal confidentiality or prejudice national security.

We also make clear in the Strategy that consideration of the long-term management of Plutonium is within CoRWM’s remit. We have begun discussions with the Government on long-term storage, in response to comments we received.
Comments on Nuclear Materials

Spent Fuel Management
A number of respondents were opposed to the continued reprocessing of spent fuel, as described under Commercial Operations.

Again, some felt that spent fuel is an important national asset while others were clear that they regarded it as a waste that needs careful management and disposal. As we describe in section 5.1 of our Strategy, we have begun talks with the Government on this topic and will pass on the views we have received. We are also planning to review the management options for spent fuel and engage stakeholders including the ‘Nuclear Materials Sub Group’, established by our UK National Stakeholder Group in this review. We make clear in the Strategy that the long-term management of spent fuel is also being considered by CoRWM.

We will also focus on the options for AGR fuel in our review of spent fuel management. Several respondents said they preferred specific options, such as dry storage, or voiced concerns about other options such as long-term wet storage. We note these comments but have not discussed specific management options due to our proposed comprehensive review of spent fuel management.

However, there was general support that plutonium arising from reprocessing overseas waste should be returned, although there were also concerns about the security of international transport and the potential implications for non-proliferation.

A number of respondents wanted more information on the timetable for the return of material to overseas customers. We have tried to address these comments in Section 4.4 of our Strategy, where we provide an update on the vitrified residue return. We also state that security arrangements will continue to be regulated by the Office of Civil Nuclear Security and the safeguards under the Euratom Treaty will continue to apply to the movement of all nuclear materials.

Several respondents supported our proposal for further research on management options for AGR spent fuel. However, most also wanted us to make clear that organisations other than Nexia Solutions Ltd. may have a role to play in this work. We have sought to address this in our Strategy.
Ensuring Safe, Secure and Environmentally Responsible Operations
Some respondents saw a tension between our proposed timetable for competing site management and the safe, secure and environmentally responsible management and operation of NDA sites. The former, they believed, could jeopardise the latter. Several others also asked how we would make sure that these key areas are considered in our competition process. We continue to expect competition to bring improvements in safety, security and environmental performance and have sought to make clearer in our Strategy how we will provide assurance that our competition and contract model will bring about the improvements we seek to achieve without prejudicing safety, security or environmental protection.

We note that site security plans relate to a particular site, and would be binding on any future site operator until changes are agreed with the Office of Civil Nuclear Security.

One respondent proposed that the NDA should continue to support site operators’ involvement in the World Association of Nuclear Operators (WANO). We feel it is a matter for the relevant SLCs as to whether they wish to continue their membership of WANO and would not object in principle to their continued membership of WANO.

Contract Bundling and Competition Schedule
The comments we received regarding the competing of our sites prompted us to revise our planned timescales. This section touches on some of those comments and how we have responded to them. Our amended competition schedule is described in section 6 of our Strategy.

A number of organisations drew our attention to the significant volume of work that would need to take place before competition could begin. Our Draft Strategy would have required a substantial programme of restructuring, relicensing and authorisation transfers in order to establish the Site Licence Companies that would then compete to run as Parent Companies. These respondents were keen to emphasise that this programme would require considerable regulatory and operational resources and close working between the current site operators, the regulators and the NDA. They also expressed a strong preference that the reformation of Site Licence Companies should be completed well before the start of competition in order to demonstrate a track record in safety, security and environmental performance. They also stressed that the indicative timescales for these processes may well be optimistic; the schedule could overrun for a number of reasons and, as a result, have an impact on the NDA’s planned competition schedule. We have sought to address these comments in our Strategy.
Concerns about resources were not only focused on the operators and regulators; several respondents questioned the resources of the NDA and of the bidders and the implications for the proposed competition schedule. We have sought to take these comments into account in drawing up our revised competition schedule and will work closely with the regulators and others in order to ensure that there is a common understanding of the resource requirements for implementing the approved competition schedule.

Several respondents advised against competing two blocks of Magnox sites at the same time, as there would be less competition for whichever site was seen as less attractive to the market. We have revised the competition schedule in our Strategy to compete the two packages of Magnox sites at different times.

A number of respondents felt that Sellafield, as the site which accounts for the highest proportion of NDA expenditure and has the largest overall liabilities, should be competed earlier than we originally proposed. We agree and favour an early competition for Sellafield.

Although we heard from a few respondents suggesting that the Sellafield site should be split up, a larger number were worried about the impact this might have on safety, security and environmental performance. We are not, therefore, making any proposals in our Strategy to split up the management and operation of the Sellafield site.

One respondent proposed competing Sellafield, Calder Hall, Chapelcross and Drigg as a single group (possibly with the addition of Windscale) to reflect current organisational arrangements however we do not agree with this proposal.

Several respondents wanted the NDA’s competition bundles to be aligned with our regional structure. A number of Scottish respondents also suggested a Scottish bundle of sites so that regulatory and waste issues could be dealt with under a single legislative authority. A few respondents also opposed the inclusion of Trawsfynydd in any site package arrangements that included non-Welsh sites. However, we do not feel there is a compelling reason to arrange our competition schedule along these lines.

Several respondents welcomed proposals to exclude Capenhurst and Springfields from our current competition schedule. This remains the case: we have not included any plans for the competition of Capenhurst or Springfields in the Strategy. However, we also state in the Strategy that we will consider whether, and in what form, Capenhurst should be competed.
Comments on Competition

**Contract Model**
We had several requests for further information on the respective responsibilities of the Site Licence Company, the Parent Company and the NDA in ensuring safety, security and environmental performance. They also asked how these standards would be achieved and maintained under the proposed contract model. We have provided additional information in the Competition section of our Strategy.

Several respondents suggested the use of contracts based on clear physical deliverables - such as closure contracts or contracts based on reaching a set end-state - rather than the current form of ‘allowable cost plus fee’ contracts. A number of responses also warned that the current fee levels would be too low to attract the most capable bidders. We have provided additional detail in the Competition section of our Strategy on the likely incentive fee for M&O contracts.

One respondent wanted more information on how the NDA saw the structure of each contract bundle, as well as our expectation of the relative sizes of the different levels of the supply chain for each of the proposed site bundles. Given that these issues will depend on the specific contract, we feel that it would be more appropriate to provide details on these issues during the tendering process.

**Using the Supply Chain**
A number of suppliers wanted more information on the timescales we have set for the competition of a range of specific major projects. These were projects that were already being undertaken by Tier 1 companies and their affiliates when responsibility for the sites was transferred to the NDA on 1 April 2005.

We agree with respondents who argued that there are significant potential benefits from developing a more vibrant mix of Tier 1 and supplier organisations in our supply chain. With this in mind, we have attempted to focus more attention on lower tier companies in our Strategy.

Several respondents wanted more information on how we intended to make effective use of the local supply chain. We will work with our Tier 1 contractors to ensure that they properly publicise such opportunities openly and transparently in advance, in accordance with the EU procurement rules on competition.

A number also suggested we could be creative in using Public/Private Partnership and Private Finance Initiative models. This is addressed in the ‘Financial Requirements for Decommissioning and Clean Up’ section of our Strategy.
**The Benefits of Competition**

Several respondents wanted more information on the relative costs incurred, and the benefits we expect to be gained, through competition. We believe that introducing competition into the decommissioning and clean-up market will bring about innovation and improvements to contractor performance. In particular, we would expect to see more work done for the same amount of money, while retaining high standards of safety, security and environmental performance.

One respondent wanted more information on whether the cost savings resulting from the formation of the NDA would outweigh our operating costs. We are confident that the net cost savings that will result from competition and from innovation will greatly exceed the NDA's operational costs. We have already asked our contractors to make efficiency savings of 7% in 2005/6 and a similar amount in 2006/7, which if achieved would be many times greater than our operating costs.

**Comments on Innovation**

We found broad agreement with our view that there does not appear to be a skills shortage in the nuclear industry at present but that a shortage could develop in the next few years unless we take action to prevent it. However, some respondents also questioned whether there are enough skilled staff available now to achieve accelerated timescales for reactor decommissioning.

Our respondents strongly supported the view that we need a programme to make sure that skills are available to meet all of the NDA's functions, not just decommissioning. We have amended section 7 of our Strategy to try to address the many useful comments we received on this area and to make our proposals clearer.

These amendments include:

- **Making clear that our remit for skills development and maintenance covers all the areas of our responsibility - not just decommissioning**;
- **Making clear that we see leadership project management and other non-technical skills as being part of our skills development activities**;
- **Making clear our intent to work with both the Welsh Assembly and Scottish Executive on skills development and maintenance**;
Comments on Innovation

- Recognising the value of establishing national skills standards and, potentially, qualifications;
- Recognising the need for a long-term commitment and a long-term, engaging programme of work to recruit and retain skilled people;
- Recognising the challenges of the differing age structures in different parts of the industry;
- Recognising the value of working on different sites to develop skills and experience;
- Recognising existing skills development activities such as apprenticeship schemes, Caithness Horizons and others.

A National Nuclear Skills Academy
There was widespread support for establishing a National Nuclear Skills Academy. A number of respondents suggested specific locations where the facility should be based, or have a regional base. Given these comments, we have amended the text in section 7.1 of our Strategy to clarify our proposed model for the National Nuclear Skills Academy and to provide additional diagrams that describe how the proposed initiatives are intended to work. We propose that the Academy has a central base, with a number of linked facilities around the UK.

Good Practice
Several respondents requested more information on how the NDA intended to implement its aim to ensure that good practice is identified and shared. We make reference in the Strategy to our intention to develop a knowledge management policy and the principles that will guide it.

Innovation
We received a number of responses saying that our interpretation of 'innovation' was too tightly drawn, with too much focus on new technologies and not enough on simple, fit-for-purpose solutions and high quality project management to deliver improvement. Others wanted us to be more precise in our definition of innovation. We have amended section 7 in the light of these comments.

Several concerns centred on our proposed approach to Intellectual Property Rights. Some believed it could hold back innovation and result in a reluctance of companies to share their existing intellectual property because they would want to protect it. Some companies may also be unwilling to fund their own research for fear that competitors could gain access to information. Other respondents made the point that any intellectual property developed at the NDA's expense has been funded by the taxpayer and, as such, should be regarded as a wider national asset. We have amended section 7 in the light of these comments and are currently developing a knowledge management policy that addresses these issues.
One respondent asked whether the NDA would be open to funding innovative proposals, which might otherwise be beyond the reach of many supplier companies. We have sought to address this in the Innovation section of our Strategy.

**Research and Development (R&D)**
There was support for the Waste Management and Decommissioning Research Board, which we have established to coordinate our R&D activities with other organisations. We have amended section 7.4 of our Strategy to show our intention to pursue international representation to make effective use of international experience and research.

Respondents also suggested that the NDA should look to forge links with institutions that are not involved in its activities but which have significant nuclear expertise, such as the Ministry of Defence. We expect that our proposal to establish a Waste Management and Decommissioning Research Board will enable us to collaborate with a range of relevant bodies to support our decommissioning and clean-up research needs and to promote broader investment in decommissioning and clean-up R&D. However, we do not feel it would be appropriate for our Strategy to be prescriptive with regard to the bodies with which we collaborate.

There was received widespread support for the concept of a National Nuclear Laboratory. A number of respondents suggested specific locations where the facility should be based, or have a regional base. Some also said it was important to make sure that the Laboratory had a sustainable future in the long-term, free to seek non-nuclear work to develop its capabilities and to generate income to support its activities. We have made clear in the Strategy that it is for Government to decide on the need for a Nuclear Laboratory.

**Pensions**
There was general support for setting up an industry-wide pension scheme. Several respondents wanted more information about our plans and asked how we intended to involve trades unions in the development of this scheme. We have amended section 7.7 of the Strategy to take account of these comments and to provide more detail on establishing this scheme.

**Terms and Conditions**
Some respondents pointed to the valuable experience to be gained by working on a range of different sites and asked for more information on the opportunities for transfers between sites under the new arrangements. Several respondents also highlighted the importance of consistent terms and conditions of employment, which would promote the mobility of labour between different Site License Companies once competition is introduced. We recognise the importance of these issues and feel that steps such as the creation of an industry-wide pension scheme will help to facilitate the transfer of site workforce staff between SLCs; while under existing TUPE regulations, terms and conditions of employment are protected on transfer as a matter of law.
Comments on Innovation

**Epidemiology**
We received good support for our proposals on Epidemiology, with respondents agreeing that this work should play a key role in safeguarding the workforce against long-term dose impact or ionising radiation exposure. One respondent commented that the section should make clear the value of maintaining epidemiological data in monitoring long-term trends in workforce exposure data. We have amended the Innovation section of the Strategy to provide more assurance on the use of epidemiological data in long-term dose trends.

**Compensation Scheme**
Several respondents asked whether the NDA intended to continue to support its sites’ involvement in the Nuclear Industry Radiation Compensation Scheme. We are supportive in principle of the continued involvement of our contractors in this compensation scheme and will work with them and the Compensation Scheme officers to pursue this.

Comments on Finance

**Long-term Funding**
A number of respondents felt that the Government’s three-year Comprehensive Spending Review cycle was too short and that there should be long-term guarantees of financing for decommissioning. It is important to recognise that the NDA has no control over the timing of the Spending Review, which is the normal process of central Government funding.

Several respondents questioned the large sums of money that will be required, according to the NDA’s current plans. These estimates are based on the Lifecycle Baselines (LCBLs) provided by our current contractors and represent the current best estimate. These plans will be revised by the site operators and submitted for the NDA’s review annually until we come to a thorough understanding of future work programmes and their associated costs. While we expect these cost estimates to rise in the short-term, we expect to bring down the total costs significantly through measures such as innovation and competition.
Comments on Finance

There were also queries over the increasing lifecycle cost estimates identified in the Draft Strategy for Consultation, with respondents asking when these costs were expected to stabilise and begin to fall. We envisage these costs stabilising in around 2008, after which we expect to bring down the total life cycle costs of decommissioning and clean-up by introducing competition and the other approaches set out in our Strategy.

**Short term funding**
Several respondents queried whether there would be sufficient funding in place to support the priority objectives of decommissioning the higher-hazard facilities and the prompt decommissioning of reactor sites. If so, a number of respondents were keen that these priorities did not have the effect of reducing funding for other sites. We have amended the Finance section of our Strategy to try to illustrate more effectively our prioritisation process and will discuss our detailed funding requirements with the Government.

Several respondents expressed concerns about the NDA being dependent on commercial revenue and its vulnerability to unexpected downturns in income from commercial operations. The NDA derives its funding from commercial operations and Government funding established through the comprehensive Spending Review process. Our budget, therefore, is inherently vulnerable to potential fluctuations in commercial revenues. Section 8 of our Strategy describes how we propose to minimise our vulnerability to such fluctuations and how we would prioritise expenditure should they occur.

Others asked to see breakdowns of how our expenditure is split between decommissioning and other items. We show this in Appendix 4 of the Strategy.

**Decision-making**
Some respondents asked us to shed more light on the NDA's decision-making process. This is not an issue for the Strategy. However, information regarding the NDA's management and governance arrangements is available on our website, in the Energy Act 2004 and other publically available documents.

**Prioritisation**
Comments on the NDA's prioritisation process were generally supportive but we were asked to provide more detailed information. We have amended Section 8.4 to provide more information on our prioritisation process.

**Comments on Socio-Economic and Stakeholders**
There was strong interest in this section of the NDA's strategy and a clear recognition that socio-economic considerations are key to the local communities and local economies around our sites.

Many respondents who live near to existing nuclear sites expressed concern at the impact of decommissioning on employment levels. A number of respondents living near reactor sites expressed support for the development of new nuclear reactors on these sites, should the...
Government decide to commission a new generation of nuclear power stations. A high priority for many respondents was the possibility of new employment opportunities, including new jobs arising from the proposed National Nuclear Archive and subject to Government deciding on the need for one, a National Nuclear Laboratory.

Many respondents wanted more detail on the NDA's plans for socio-economic support. We have therefore amended Section 9 of our Strategy to respond to these comments, including:

- **How we determine what is a valid socio-economic investment for the NDA and examples of where the NDA might consider providing support;**
- **How to define clearly and gain common understanding of the NDA's role in respect of socio-economic development with key stakeholders, including central, regional and local Government and the Regional Development Agencies and their equivalents;**
- **Working with others to promote both sustainable employment and sustainable employability in local communities in order to maximise the opportunities available to local economies;**
- **Recognition that, in planning activities at our sites, our contractors should take into account the broader social impact of our activities: e.g. disruption caused by increased transport movements and increased demand on local infrastructure resulting from an upswing in the numbers of contractors;**
- **Awareness of the unique opportunities and diverse needs of the communities near our sites, e.g. harnessing the Welsh language as a cultural asset at Trawsfynydd and Wylfa.**

Several respondents suggested that if their communities were required to host radioactive waste storage or disposal facilities on behalf of the nation then they should be ‘compensated’ accordingly. We have noted this.

**Transport**

A number of concerns were raised by local communities, and others, about transport. In response, we have included additional information, where possible, on domestic and international transport arrangements in our Strategy. The comments we received related to:

- **Ensuring the ongoing safety and security of transporting radioactive materials, to protect people and the environment;**
- **Ensuring that we maintain the road and rail infrastructure to support the safe and secure movement of materials;**
- **The limited road infrastructure around some of our sites, which may result in disturbance to local communities;**
Comments on Socio-Economic and Stakeholders

- A preference for rail and sea transport, easing the load and impact on local communities and transport infrastructure;
- The desire to see limited transports between 8pm and 6am, to minimise disturbance.

National Nuclear Archive
We received a generally favourable response to our proposals to consider establishing a National Nuclear Archive, although one respondent felt that this was not a pressing need and that it should not divert attention or resources from other areas.

We have sought to revise the information in our proposed Strategy to take account of some very useful comments we received on the National Nuclear Archive, including:

- The National Nuclear Archive, while useful for academics, should be of value to a wider audience;
- The Archive should include a wide range of written, electronic and audio-visual information;
- We should make sure that, long into the future, its users will be able to find and retrieve the information they need;
- The archive should, consistent with security requirements, link to wider proposals to enable online access to archives by academics.

Calder Hall
We received a largely favourable reaction to our idea of turning Calder Hall, the world’s first commercial nuclear reactor, into a museum. However, several respondents felt that the site would be better used for a new-build reactor. We propose to evaluate the museum proposal, as described in section 9.4 of the Strategy.

In a similar vein, several respondents suggested that the Dounreay Fast Reactor site, like Calder Hall, could be suitable as a museum. Although we do not intend to pursue this idea, we are planning to retain Dounreay's distinctive spherical pressure vessel.

Stakeholder relations
We were concerned to hear that two respondents reported significant delays in the distribution of copies of our Draft Strategy and Environmental Report to members of Site Stakeholder Groups. We will endeavour to make sure that these delays are not repeated. One respondent felt that the NDA should be more active in engaging with stakeholders, in addition to consultations on its Strategy documents and with the Site Stakeholder Groups.

Where possible, we aim to respond positively to requests for further activities and to make sure that the SSGs engage as widely and inclusively as possible in areas around our sites. Some respondents also commented that there was no definition of ‘stakeholder’ in the Draft Strategy. Accordingly, we have included a definition of stakeholder in our Strategy.
# Annex 3  Acronyms

<table>
<thead>
<tr>
<th>Acronym/Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AGR</td>
<td>Advanced Gas-Cooled Reactor</td>
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<tr>
<td>BE</td>
<td>British Energy plc</td>
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<td>BNFL</td>
<td>British Nuclear Fuels Ltd</td>
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<td>BNG</td>
<td>British Nuclear Group</td>
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<tr>
<td>BPEO</td>
<td>Best Practical Environmental Option</td>
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<tr>
<td>CASE</td>
<td>Caithness &amp; Sutherland Enterprise</td>
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<tr>
<td>CoRWM</td>
<td>Committee on Radioactive Waste Management</td>
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<tr>
<td>DEFRA</td>
<td>Department of the Environment, Food, and Rural Affairs</td>
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<tr>
<td>DFR</td>
<td>Dounreay Fast Reactor</td>
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<td>DPAG</td>
<td>Dounreay Particles Advisory Group</td>
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<td>DRS</td>
<td>Direct Rail Services</td>
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<td>DTI</td>
<td>Department of Trade and Industry</td>
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<td>EA</td>
<td>Environment Agency</td>
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<td>EC</td>
<td>European Commission</td>
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<td>EDF</td>
<td>Électricité de France</td>
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<td>EFDA</td>
<td>European Fusion Development Agreement</td>
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<td>ESTL</td>
<td>Energy, Sales and Trading Ltd</td>
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<td>EU</td>
<td>European Union</td>
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<td>FOI</td>
<td>Freedom of Information</td>
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<td>HEU</td>
<td>Highly Enriched Uranium</td>
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<td>HIE</td>
<td>Highlands &amp; Islands Enterprise</td>
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<td>HLW</td>
<td>High Level Waste</td>
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<td>HSE</td>
<td>Health &amp; Safety Executive</td>
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<td>HSSE</td>
<td>Health, Safety, Security &amp; Environmental</td>
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<td>ILW</td>
<td>Intermediate Level Waste</td>
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<td>IPR</td>
<td>Intellectual Property Rights</td>
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<td>IWS</td>
<td>Integrated Waste Strategy</td>
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<th>Acronym/Abbreviation</th>
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<tr>
<td>JET</td>
<td>Joint European Torus</td>
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<td>KPI</td>
<td>Key Performance Indicator</td>
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<td>LCBL</td>
<td>Life Cycle Baseline</td>
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<td>LLW</td>
<td>Low Level Waste</td>
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<tr>
<td>LLWR</td>
<td>Low Level Waste Repository</td>
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<tr>
<td>M &amp; O</td>
<td>Management and Operations</td>
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<td>MDU</td>
<td>Magnox Depleted Uranium</td>
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<td>MOD</td>
<td>Ministry of Defence</td>
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<td>MoU</td>
<td>Memoranda of Understanding</td>
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<td>MOX</td>
<td>Mixed Oxide (Nuclear Fuel)</td>
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<td>MSP</td>
<td>Member of the Scottish Parliament</td>
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<td>NDA</td>
<td>Nuclear Decommissioning Authority</td>
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<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<td>NII</td>
<td>Nuclear Installations Inspectorate</td>
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<td>NLF</td>
<td>Nuclear Liabilities Fund</td>
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<td>NLFA</td>
<td>Nuclear Liabilities Funding Agreement</td>
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<td>NNA</td>
<td>National Nuclear Archive</td>
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<td>NNIRF</td>
<td>National NDA Industry and Regulators Forum</td>
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<td>NNR</td>
<td>National Nature Reserve</td>
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<td>NRA</td>
<td>National Rivers Authority</td>
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<td>NSG</td>
<td>National Stakeholder Group</td>
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<td>NTWP</td>
<td>Near Term Work Plan</td>
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<td>OCNS</td>
<td>Office of Civil Nuclear Security</td>
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<td>OESC</td>
<td>Operational Environment Safety Case</td>
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<td>OGC</td>
<td>Office of Government Commerce</td>
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<td>OJEU</td>
<td>European Union’s Official Journal</td>
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<td>Acronym/Abbreviation</td>
<td>Description</td>
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<tr>
<td>OSPAR</td>
<td>Oslo Paris Convention for the Protection of the Marine Environment of the North-East Atlantic</td>
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<td>PCM</td>
<td>Plutonium Contaminated Materials</td>
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<td>PSA</td>
<td>Public Service Agreement</td>
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<td>PCSC</td>
<td>Post-Closure Safety Case</td>
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<td>PFI</td>
<td>Private Finance Initiative</td>
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<td>PFR</td>
<td>Prototype Fast Reactor</td>
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<td>PNTL</td>
<td>Pacific Nuclear Transport Ltd</td>
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<td>POCO</td>
<td>Post Operational Clean Out</td>
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<td>PSA</td>
<td>Public Service Agreement</td>
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<td>PWG</td>
<td>Prioritisation Working Group</td>
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<td>R&amp;D</td>
<td>Research and Development</td>
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<td>RAMSAR</td>
<td>A wetland of international importance under the RAMSAR convention</td>
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<td>RDA</td>
<td>Regional Development Agency</td>
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<td>RHILW</td>
<td>Remote Handled ILW</td>
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<tr>
<td>SAC</td>
<td>Special Area for Conservation</td>
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<td>SEA</td>
<td>Strategic Environmental Assessment</td>
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<tr>
<td>SEPA</td>
<td>Scottish Environment Protection Agency</td>
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<td>SSSI</td>
<td>Site of Special Scientific Interest</td>
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<td>Thermal Oxide Reprocessing Plant</td>
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<td>UHI</td>
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