



Harwell Review 2005/06



Introduction by John Wilkins, Head of Site



The Harwell site is being transformed and recreated as part of a world-class centre for science and innovation.

UKAEA's aim, with its partners at Harwell, is to bring together major national and international science and related facilities, and to develop commercial property and other amenities on site, forming a centre where research, learning and innovation can grow and, through collaboration at the highest levels, flourish.

For more than 60 years, Harwell has enjoyed a well-earned reputation as a site of scientific, engineering and technical excellence. As its role as a centre for nuclear research and development reduced, it has established itself as a world-leader in the related fields of decommissioning, waste management and environmental restoration.

This phase in the site's lifecycle is now moving ahead and we are looking forward to a new transformation, as plans for the Harwell Science and Innovation Campus develop.

This report covers the work UKAEA is doing at Harwell and our progress in the period from April 2005 to March 2006.

Where we are today

UKAEA's task at Harwell is to manage environmental restoration programmes on site. This includes the decommissioning of redundant nuclear facilities, the management of radioactive wastes from past programmes of work and decommissioning projects, the remediation of any contaminated land, and the management and development of land and property assets on site. These programmes are progressing well and gathering pace.

Since April 2005, this work has been carried out under contract to the Nuclear Decommissioning Authority, (NDA), the body set up by the government to take overall responsibility for Britain's 20 civil nuclear sites, including Harwell.

At Harwell so far, more than a million square feet of buildings and research facilities have been decommissioned and removed from the site. We are investing in new technologies to ensure we continue to manage and store radioactive wastes efficiently and safely. We are also pioneering new methods of cleaning up contaminated areas of land and restoring the environment.

A number of major project achievements have been delivered during the period, including:

- Demolition of two former RAF hangars in the site's Eastern Area.
- Progress on retrieving and repackaging waste cans from existing stores.
- Accelerated progress on planning and design work for a plant to encapsulate radioactive waste.
- Decommissioning of plant associated with the Liquid Effluent Treatment Plant (LETP).

Our vision for the future

With our partners at the Council for the Central Laboratory of the Research Councils, Health Protection Agency and the Medical Research Council, the creation of a major UK campus for science and innovation is at the heart of UKAEA's vision for Harwell.

Land released through decommissioning will help to expand the thriving campus. Some 30 acres at the eastern end of the currently licensed site will soon be released to the campus as a result of UKAEA's decommissioning programme.

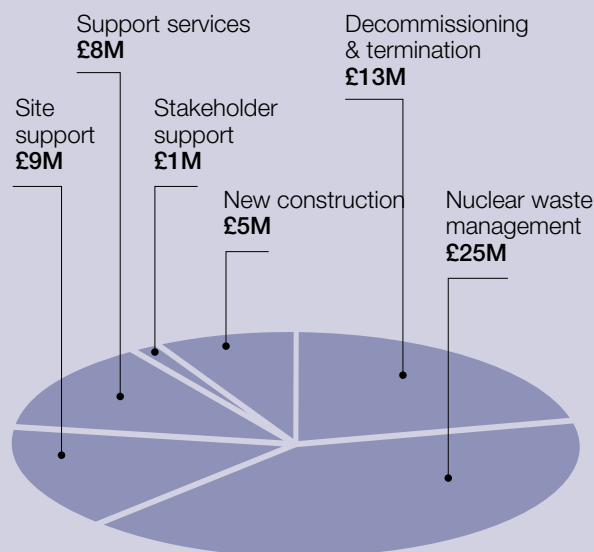
With the support of Government, UKAEA is also seeking a private sector development partner with whom it will enter into a joint venture to attract investment and further promote development of the campus. This is expected to be in place during 2007.

Harwell's global reputation as a centre of scientific excellence has been established over decades. Plans for the continued transformation of the campus will further enhance its reputation in the future.

Message from Peter Brazier, NDA Regional Director



Major areas of expenditure at Harwell for 2005/06



Front cover picture: Remediation work at the Eastern Area in Summer 2005.

The Nuclear Decommissioning Authority (NDA) is a new organisation set up to deliver cost-effective clean-up of the nation's civil nuclear legacy. Since April 2005 we have provided oversight management of the Harwell site and have worked with our principal contractor, UKAEA, to ensure that the remediation of Harwell continues in a way that meets our core values of safety, security and environmental responsibility whilst providing value for money for the UK taxpayer.

The past year has been a time of change as UKAEA has had to adapt to the requirements of the NDA as its customer and the rigour of working to a performance based management control system. I am pleased with the responsiveness of John Wilkins and his team to the needs of the NDA with the introduction of new processes and procedures required to manage the clean-up work.

The main focus of current Harwell site activities is to deal with the historic arisings of radioactive waste to ensure they are stored in a passively safe state. In addition, and in parallel, the site is engaged in the continued decommissioning and demolition of redundant facilities and in the remediation of contaminated land. I am pleased to say that Harwell were able to deliver against the 2005/06 programme agreed between UKAEA and NDA in an efficient manner and were able to rise to the additional challenges set by the NDA with regard to accelerating additional work scope into the period, within the allocated budget.

Particular successes achieved by the end of the year include:

- The accelerated demolition activities including Hangar 8 in the Eastern Area Facility, which with the demolition of Hangar 7 within the existing work scope, has meant the full and early clearance of the eastern area of the site.
- Earlier processing, recovery and shipment of intermediate level waste.
- Accelerated demolition of the Trade Effluent Tanks.

Harwell have built up a good working relationship with the NDA Harwell Site Team and I encourage John and his team to continue to accelerate the clean up of Harwell in a way that meets our expectations to protect the safety of the workforce and those around the site, that meets the needs of National security and that demonstrates our commitment to protect the environment.

I look forward to working with the site over the next year as we focus on the twin challenges of continuing the decommissioning and clean-up and the development of the plans for the Harwell Science and Innovation Campus.

The message that underlines all that we do



UKAEA works to the highest of safety, security and environmental standards in the management of its activities at Harwell. We work hard to protect ourselves, our colleagues, our neighbours and the environment, and to continually introduce innovations and initiatives that will improve our performance.

Safety

We were particularly pleased to note the total number of safety events reported was down on last year. There are no grounds for complacency, however. We are determined to build and improve on this record. A number of safety awareness initiatives were held during the year, to ensure the message stays fresh in the minds of everyone - staff and contractors - on site.

External assessments

A comprehensive safety audit was carried out by independent certification body Det Norske Veritas (DNV) during February 2006. This resulted in the site maintaining its Level 7 (out of a maximum rating of 10) International Safety Rating System award with improved scores, an excellent outcome.

UKAEA's management system as a whole was recertified as compliant with both ISO 9001:2000 and ISO 14001:2004 quality standards.

Safety performance

The overall number of events reported during the period reduced to four compared with ten during the previous period. We believe this improvement resulted from more effective management and a programme of safety awareness initiatives. The level of unusual occurrences (UNORs) reported for the period showed a slight increase compared with the previous year, indicating a good reporting culture.

Of the four safety events during the year, three were reportable under the RIDDOR regulations as they involved three or more days' lost time. The other event occurred when radiological protection instrumentation was isolated during an operation to remove other redundant equipment, and caused no harm to employees or the environment.

A total of seven Lost Time Accidents, including three reportable under RIDDOR noted above, were reported during the period, compared with 13 during the previous period.

Top: A new safety store on site includes improved systems for ordering personal protective equipment.



Safety improvement initiatives

UKAEA held a number of proactive safety initiatives. These included:

- Behavioural safety workshops attended by 320 people.
- Hazard awareness safety sessions attended by 250 people.
- Development of a Safety, Health and Environment improvement plan.
- Distribution of monthly Safety and Environment Bulletins to employees.

Emergency planning

UKAEA issued an information leaflet to local residents, with advice on what people should do in the unlikely event of an incident involving the release of radioactive or toxic material, as well as outlining the safeguards in place to ensure the safety of individuals and protect the environment.

In September 2005 a new emergency text message service - City Alert Texting System (CATS) - was launched for the site. In the event of an incident, local residents very close to the site would be automatically sent a text alert to their mobile phones, as well as being alerted by landline telephone.

Top: Recycling clean waste material from site decommissioning work.
Right: Environmental monitoring teams survey the Eastern Area.

2005/06 saw reductions in safety events and accidents, and Harwell retained ISRS Level 7 with improved scores.



Regulators from the Environment Agency inspected the site in February 2006 and confirmed their satisfaction with environmental management at Harwell.



Emergency exercises

The Harwell Site Emergency Exercise was held during October 2005. The Nuclear Installations Inspectorate was satisfied that the exercise was an adequate demonstration of emergency arrangements.

Following the successful exercise, planning began for the Level 2 demonstration exercise scheduled for June 2006. The exercise, in table top format, tests the response from external services, including local and national government bodies.

Safety indicators: 2005/06	
Lost Time Accidents	7 (UKAEA - 2; Contractors/tenants - 5)
Safety events	4
Accident Frequency Rate	0.24 per 100,000 hours worked
Average annual radiation dose to workers	0.13mSv (5% of average dose received by the public)
Maximum annual radiation dose to workers	4.33mSv (22% of dose limit)
International Nuclear Event Scale incidents	None
International Safety Rating System	Level 7 retained

Security

Our security arrangements are designed to safeguard protectively marked information and nuclear materials. There were no breaches of security during the year. The annual site-based counter-terrorism exercise was held in June 2005. The exercise involved a full team in the site emergency control room and the Head of Site Operations Cell. The exercise met with regulatory approval.

Environmental management

The decommissioning and waste management programme is geared towards environmental improvement.

Most of the core work on site delivers benefits to the environment - whether that is the demolition of buildings in the Eastern Area for sustainable redevelopment, soil vapour venting trials carried out in the Western Storage Area, or other projects mentioned elsewhere in this report.

Key achievements

A week-long scrutiny by four inspectors from the Environment Agency in February 2006 gave confirmation that the regulators are pleased with the environmental management of the Harwell site. Each year, UKAEA sets itself a challenging Environmental Improvement Programme. Harwell met all aspects of its improvement objectives during the year. A new set of challenges has been formulated for 2006/07.

Environmental monitoring

Regular environmental monitoring is carried out on the site, in accordance with statutory requirements. Air, rain, grass, soil, vegetables and milk are among the items checked.

Levels of contamination on site were found to be consistently low and discharges continue to be well within authorised limits.

Reportable events

During the reporting period there were no reportable environmental events on site and no enforcement actions taken.

Ecology

Harwell is located in an Area of Outstanding Natural Beauty within the Vale of the White Horse district. The site plays a role in encouraging native plant and animal species, and four eco-sites have been earmarked as specific projects.

In the management of the site, UKAEA takes care to preserve areas of particular richness and ensure new landscaping is in harmony with the natural environment.

Top: UKAEA strives to carry out its work taking care for the environment.



Environmental indicators: 2005/06	
Energy consumption:	Electricity - 11,401 MWhr Gas - 18,836 MWhr
Water usage	36,087 m ³

Radiological discharges calendar year 2005:			
	Alpha	Beta	Tritium
Gaseous (Rolling twelve month figure as a % of Authorisation)	6.8%	8.1%	4.1%
Liquid (Rolling twelve month figure as a % of Authorisation)	22%	7.1%	1.4%
Solid transfer (Total amount for year)	14 GBq	7500 GBq	120 GBq

Top: Harwell environmental team checking waste from hangar demolition.
Right: Reviewing restored land at the Liquid Effluent Treatment Plant.



Clean-up gathers pace

A £900 million programme to clean up the Harwell site is well underway. The main programme will be complete by 2020 and the site totally restored by 2025 - a major acceleration on original targets.

As well as decommissioning and removing redundant reactors and other research facilities, any areas of land that have been contaminated are being remediated, and radioactive waste resulting either from the clean-up process or from past operations are being safely dealt with.

An extra £2 million was allocated by the NDA to accelerate decommissioning work. This has been used to step up the pace of work on detailed designs for the Waste Encapsulation Plant, plant enhancements in the Solid Waste Complex and various demolition projects.

Decommissioning

Much progress was achieved during 2005/06 and Harwell is on target to meet the schedule for its clean-up programme and make substantial savings on its budget.

Key project achievements included:

Eastern Area

During 2005/06 15 acres of land was cleared and remediated, following the demolition and removal of two former RAF hangars from the 1930s. Work was completed in November 2005, ahead of schedule. This will release 30 acres of land for redevelopment.



Liquid Effluent Treatment Plant

Excellent progress is being made towards the goal of eventually closing the Liquid Effluent Treatment Plant (LETP).

The sewage treatment plant has been decommissioned and work begun on the final phase of decommissioning the former chemical treatment building. Facilities including trade waste tanks and filter beds - equivalent in area to two football pitches - have been decommissioned, two years ahead of schedule and at a considerably reduced cost.

A project to commission and install a specially designed plant to remobilise sludges in the LETP tanks, in readiness for them to be immobilised in cement and safely stored, is underway.

Top: Innovative techniques were used in decommissioning a remote handling facility.



Fifteen acres at the Eastern Area were cleared ahead of schedule, following demolition of 1930s RAF hangars.

Other projects:

- The final phase of the decommissioning of Building 393.6, a former remote handling facility from the 1950s, has been reached, with the dismantling of a suite of concrete shielded cells.
- An accelerated programme to strip out and decontaminate a medical and health physics facility was completed in March 2006.
- A rolling programme to clear redundant laboratories is going well in the radiochemical facility. Decommissioning of four laboratories has been completed five months early and work has begun on others.
- A 1980s building to house experimental rigs used for examining properties of hydrocarbon liquids has been demolished.

Top: Controlled demolition of Hangar 8 in July 2005.

Right: Liquid Effluent Treatment Plant restoration work.



Waste processing targets were achieved and the Active Waste Retrieval Programme continued to make good progress.



Waste management

UKAEA is investing in innovative techniques and new facilities to ensure waste is securely, safely and efficiently managed and stored.

Active Waste Retrieval Programme

Harwell's Active Waste Retrieval Programme, a major series of projects aimed at providing the equipment to recover and immobilise all wastes from the tube stores on site by 2015, has made good progress.

The offsite construction of the second retrieval machine has started and the design of a cementation plant is complete.

ILW retrieval

Over 1,000 drums of intermediate level waste (ILW) have been retrieved from the Harwell tube stores and loaded into stainless steel drums. ILW is being recovered, characterised and loaded into 500 litre stainless steel drums for long-term safe storage and eventual disposal.

The target for processing cans of ILW through the Head End Cell line in the Solid Waste Complex was achieved well ahead of schedule.

Top: NDA Regional Director Peter Brazier marks the processing of the 1,000th waste can from the tube stores.

Waste Encapsulation Plant

Full planning consent has been received for a new Waste Encapsulation Plant, a key part of Harwell's waste management strategy. The plant will enable holdings of solid ILW to be rendered passively safe for interim storage and ultimate disposal. The new facility will encapsulate waste within a cementitious grout before it is transferred to the existing Vault Store for storage.

With the design stage accelerated, we expect that construction work will begin during the summer of 2006. The plant is scheduled to be fully operational by March 2009.

Land remediation

As nuclear facilities are decommissioned and removed, land is being restored, decontaminated and ultimately released for re-use. Decontamination plans focus mainly on the north east of the site. In cleaning up the land, UKAEA is pioneering the use of new technologies.

Western Storage Area

Various novel approaches to decontaminating groundwater at the Western Storage Area, an old chemical waste disposal site, are being trialled. Soil vapour venting and thermally enhanced vapour extraction - both methods of extracting volatile contaminants - are two of the methods being tried out. Full-scale trials will be implemented and should speed up timescales for the clean-up of this area.



Delicensing

Applications for delicensing areas near the North Gate and the Main Gate of the site - to remove them from the nuclear site for unrestricted use - have been completed and submitted to the Nuclear Installations Inspectorate. UKAEA is awaiting a decision on these.

Decommissioning and waste management: 2005/06	
Buildings demolished	5
Area of land restored	13 acres
Liquid intermediate level waste processed	7m ³
Solid intermediate level waste processed	17.7m ³
Solid low level waste processed	162m ³
Clean and exempt waste processed	10,100m ³
New construction expenditure	£5M
Decommissioning and termination expenditure	£13M
Waste and nuclear materials expenditure	£25M

Top: Drilling boreholes during remediation work at the Western Storage Area.

Right: Land restoration at the eastern end of the site will pave the way for delicensing.



Communicating and consulting

Staff at Harwell work hard to build good relationships with stakeholders, communicating and consulting with them about work underway on site and plans for its future development.



Local Stakeholder Group

The long-established Local Liaison Committee was re-constituted as a Local Stakeholder Group (LSG) with renewed terms of reference and an independent Chair with meetings held in public.

Harwell site end state consultation

UKAEA is engaging with the LSG on the end state for the site - what this should be and when it should be achieved. An information pack was issued in March 2006. The LSG has been asked by the NDA to consider the various options, express its views by July 2006, and make recommendations by the end of 2006.

HVLA consultation

The site is consulting on the management of its High Volume Low Activity (HVLA) waste. Work to restore Harwell will generate some of this material. Although it contains little radioactivity, we need to identify safe and acceptable techniques for dealing with the waste. Harwell has launched a public consultation to help determine the Best Practicable Environmental Option for its management.



Visits

We welcomed many visitors to the Harwell site during the year. Among them:

- Members of the NDA Board, including Chairman Sir Anthony Cleaver and Chief Executive Dr Ian Roxburgh.
- A group from the Nuclear Installations Inspectorate, including Director of Nuclear Safety and HM Chief Inspector of Nuclear Installations, Mike Weightman.
- Dr John Hood, Vice Chancellor of Oxford University, who saw how links are being forged between academic and commercial interests at Harwell.
- Senior officials from the Department of Trade and Industry.
- A wide range of local stakeholders.

Freedom of Information

The introduction of the Freedom of Information Act on 1 January 2005 gives everyone the right to access information held by UKAEA. During 2005, Records Management at Harwell dealt with 142 requests for archive reports and other records relating to UKAEA.

Top: NDA staff view restoration progress in May 2005.

Left: Visitors in 2005/06 included the Vice Chancellor of Oxford University.

Strong community links

Working closely with the local community has always been a characteristic feature of life at Harwell. As a major employer in the area, UKAEA Harwell has forged strong community links.



Sponsorship

Harwell has supported a wide range of local projects over the past year - from equipment for nearby schools to fundraising for Oxford Children's Hospital - and events including the World Poohsticks Championship at Little Wittenham, Hendreds Family Show and Wantage & Faringdon Triathlon.

Getting their hands dirty

For the past four years, Harwell staff have been working with the British Trust for Conservation Volunteers (BTCV) on local environmental projects. In July 2005, local MP Ed Vaizey and TV presenter Chris Packham joined us to celebrate the completion of our latest project - a sensory garden and outdoor stage for pupils at Chilton Primary School.

Fundraising

Community-minded Harwell staff have collected money and raised funds for a wide variety of good causes during the year, including BBC Children in Need, Charles Clore Macmillan Day Therapy Unit at Newbury, National Deaf Children's Society, National Genes for Jeans campaign and Sargent Cancer Care.

Left and right: Joining pupils at Chilton School to celebrate the opening of their sensory garden, created with help from UKAEA employees.



A world centre for science and innovation



UKAEA's regeneration of the nuclear research site is helping to create a major campus for science and innovation at Harwell. The vision for the campus has been endorsed by Government and UKAEA is working with its neighbours to implement it.

Campus development

The Harwell campus is home to 100 organisations, employing over 4,000 people. Among them are the Council for the Central Laboratory of the Research Councils, the Medical Research Council and the Health Protection Agency. Major investment is now being made in new facilities, including Diamond Light Source - the UK's largest scientific installation for 30 years. Work on the futuristic doughnut-shaped building, which has been constructed on land partly leased by UKAEA, is almost complete and Diamond is on course to open in early 2007.

UKAEA plans to form a joint venture with a private sector partner to develop the campus and strengthen interactions with business. The partnership should be in place during 2007.

As part of this process, UKAEA entered into development agreements that have resulted in a range of facilities and infrastructure for business during the year. Among these, work has started on a new £4million headquarters for UKERNA and a new nursery has opened on site.

Site employment

UKAEA Harwell plays an important part in the economic life of the area. It employs almost 500 people directly and a further 150 through subcontractors, making it among the top 100 local employers. People who work at UKAEA Harwell are given wide access to training opportunities, to equip them with the skills necessary to carry out their work effectively and to help them in their own personal development.

Socio-Economic Development Plan

UKAEA has produced a Harwell Socio-Economic Development Plan for the NDA to make sure that the site acts as a responsible neighbour and minimises the impact of the end of the environmental restoration programme on the local economy. As Harwell is located within a buoyant economy, the negative effect of the eventual programme completion will be slight. The focus of the plan, therefore, is to ensure that the site programme supports the plans for developing the vision of a science and innovation campus. In the meantime, UKAEA will continue to support community activities on behalf of the NDA.

Left: The changing skyline reflects the rapid changes happening at the campus.

Continuing to raise standards

The performance of the site management and operations contractor is measured by delivery of a series of Performance-Based Incentives (PBIs) agreed with the NDA. Fee is dependent upon successful completion of PBIs. This table summarises the PBIs for Harwell.

a) LETP liquor and sludge processing:

PBI	Outcome
Complete the encapsulation of the remaining store liquids and processing of the associated waste	Achieved
Complete the installation of the LETP sludge remobilisation and conditioning plant	Achieved
Complete the integrated testing of the LETP sludge remobilisation and conditioning plant	Achieved

b) Eastern Area facilities demolition:

PBI	Outcome
Complete Eastern Area facilities (EAF) B3 mound demolition	Achieved
Hangar 7 demolition and removal of floor slab	Achieved

c) Operation of groundwater containment plant:

PBI	Outcome
To achieve an average extraction rate of not less than 1,000m ³ of groundwater per day	Achieved

d) Phase 1 demolition of B393.6 cell line:

PBI	Outcome
Design and construct concrete cell containment	Achieved
Removal of North Airlock	Achieved

e) B462 can recovery and processing:

PBI	Outcome
Recover 110 cans of remote handled intermediate level waste from B462 tube stores	Achieved
Process 375 cans of waste through the B462 Head End Cell line	Achieved

f) Detailed design for B462.9 retrieval system:

PBI	Outcome
Containment box	Achieved
Drum posting system	Achieved
Base plate	Achieved
Shielding system	Achieved

g) B459 waste processing:

PBI	Outcome
Re-packaging of 40 non strontium, remote handled NDS sources through the cells in B459	Achieved
Re-packing of 97 remote handled ILW waste cans received from Winfrith	97% achieved

h) B220 waste processing:

PBI	Outcome
Conditioning and/or repackaging, and shipping 20 remote handled ILW packages from B220 to B462	Achieved

i) Winfrith materials receipt and dispatch:

PBI	Outcome
Turnaround ILW shipments from Winfrith within six working days	Achieved

j) General:

PBI	Outcome
Develop and implement plan for enhancing the safety culture of the Harwell designated site	Achieved
Prepare for IT separation of the Harwell designated site	Achieved
Review the strategy for decommissioning of facilities at the Harwell designated site	Achieved
Issue conformant Lifecycle Baseline and Near Team Work Plan, review and report on performance	Achieved
Maintain designated site assets in accordance with maintenance schedule	Achieved
Implementation of UKAEA ACEP1100	Achieved
Ensure regular communication with regulators	Achieved
Demonstrate support to the local community	Achieved

For further information

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