QUARTERLY REPORT TO
WEST CUMBRIA SITES STAKEHOLDER GROUP

1 JULY TO 30 SEPTEMBER 2009

This report provides a summary of the outcome of our regulatory activities at Sellafield, Windscale, Calder Hall and the Low-Level Waste Repository (LLWR) at Drigg during July to September 2009.

Our nuclear regulators attend meetings of the WCSSG and most of its sub-committees. We are happy to respond to questions raised there, or you can contact us at our Penrith office:

Team Leader (Sellafield), Nuclear Regulation Group (North), Environment Agency, Ghyll Mount, Gillan Way, Penrith, Cumbria, CA11 9BP. Email: nrg.north@environment-agency.gov.uk. Tel: 01768 215705.

We are always looking to improve our reporting and would be happy to hear your views on the format and content of this report.

1. INTRODUCTION

This report presents a summary of our work at Sellafield, Windscale, Calder Hall and the Low-Level Waste Repository (LLWR) at Drigg over the three months to the end of September 2009.

The report covers progress against our regulatory strategy which steers our work at nuclear sites. Our strategy sets out, among other things:

- our long term objectives;
- our expectations of the operator;
- how our strategy connects with the Environment Agency vision and goals.

Our role
We aim to prevent pollution, harm to the public, to protect and enhance the environment, and to contribute to the sustainable development of the UK.

Operating and cleaning up nuclear sites generates radioactive and non-radioactive wastes. Our role as the environmental regulator is to ensure that the management and disposal of those wastes have little or no impact on people and the environment both now and in the future. We do this by both direct regulation and close working with other interested parties.

We inspect nuclear sites and assess operator's proposals, to ensure that the limits and conditions of the authorisations we issue under the Radioactive Substances Act 1993 (RSA 93), the Environmental Permitting Regulations 2008 and other relevant legislation and policy are complied with. We do this by both direct regulation and partnership, working with the operators, the Nuclear Decommissioning Authority (NDA) and the Nuclear Installations Inspectorate (NII) to solve problems jointly. If you want to know more about our role in regulating nuclear sites, please follow this link on our website.

2. AUTHORISATIONS & PERMITS

2.1 Radioactive Substances Act 1993 (RSA93)
Disposal of radioactive wastes is only permitted subject to strict limits and conditions under an RSA93 authorisation.

Authorisation reviews
Releases of antimony-125 (Sb-125) to air from the decanning of spent Magnox fuel continued to run close to the current authorised site limit and the limit is expected to exceed the limit by around the end of this reporting period. For more background see our two previous quarterly reports and our briefing note on the issue on the WCSSG website.

We have been in discussions with Sellafield Ltd about an application from the company for an increased limit as part of Sellafield's forthcoming annual periodic review submission in October – this application will update the submission on the issue made in October last year and takes into account further developments including improved predictive modelling which relates Magnox fuel decanning activity to future discharges. The further work that

has been carried out this summer has indicated that the limit to be applied for needs to be greater than originally proposed to cover the likely range of predicted discharges. The original proposal was for a new limit of 11.6 gigabecquerels per year (GB/y); it is likely that the revised proposal will be for 30 GBq/y.

Limits in the certificate of authorisation are not 'safety levels', but are set at levels to make sure that releases are no more than is needed to allow normal operation of a facility, and to ensure that any radiation exposure that results is well below legal limits. Discharging at or around the limit does not mean that the radiation exposure of the public would exceed the legal radiation dose limit.

On occasions it is necessary to review and revise limits (up and down), for instance to reflect changes in operating practice. EA routinely considers requests from site operators for revisions to discharge limits, but we will only grant such requests where the need for change is clearly justified, and crucially where the proposed change would not result in harm to human health or to the environment.

The limit on aerial discharge of antimony-125 is just one of 15 limits on releases of radionuclides to the air from Sellafield site. The implications of increasing the limit have been assessed, and we are satisfied that any impact would be very small; the estimated increased radiation dose to a member of the public from discharges at the increased limit is only a tiny fraction of the dose that the public receives every year from 'natural background' sources of radiation (i.e. over 2,000 times less). None of the other radionuclides for which limits are in place have increased, and no increases to these other limits are being considered.

However, we are unable to make the necessary change to SL's certificate of authorisation until an opinion on the change has been received from the European Commission (EC), in line with the UK's obligations under Euratom Article 37. This is not likely to be received before April 2010.

Transfers of low level radioactive waste (LLW)

The LLWR authorisation was varied in July to allow metallic LLW transfer to the Studsvik Metals Recycling Facility (MRF) at Lillyhall (which received its first consignment in early September). In parallel we reached a decision following consultation to vary all nuclear site authorisations in England and Wales to allow metallic LLW to be transferred directly to the MRF and for LLW to be transferred to LLWR for onward transfer elsewhere for treatment or alternative disposal in more appropriately engineered facilities (e.g. landfills). These changes will be made to each site authorisation over the coming months. The changes are being made to help encourage and facilitate improved waste segregation, treatment and recycling, along with preservation of LLWR capacity.

A Decision Document outlining our conclusions, and responses to views and comments received was published in July. We have drafted a Variation Notice to the authorisation held by Sellafield Ltd, and a number of

Environment Agency Requirements (EARs) that specify what needs to be done to comply with any new or amended conditions.

Disposal of high volume, very low level radioactive waste (HV-VLLW)

We are continuing to review Waste Recycling Group's application for disposal of HV-VLLW to landfill at their Lillyhall site. During the period we requested some further information to support the application. We have received most of this additional information and await some further data before we issue the full package of information for consultation. LLWR have completed a number of strategic studies into the disposal of LLW and VLLW, which would support any case they make for transferring waste to other facilities such as specified landfill.

2.2 Environmental Permitting Regulations (EPR)

We met with SL in July to review the status of the improvement programmes required by the Environmental Permit, provide feedback on SL's preliminary assessment of the impact of chromium (Cr) discharges from future processing of legacy ferric floc, and review other issues for consideration in a submission for the variation to the permit planned for Autumn 2009.

Both RSA Authorisation and EPR permit issues will need progressing over the next year to address active commissioning work in the **Separation Area ventilation project** (see WCSSG report for Oct - Dec 2008), alongside decommissioning and demolition of the ageing stacks, currently expected to be complete in 2014.

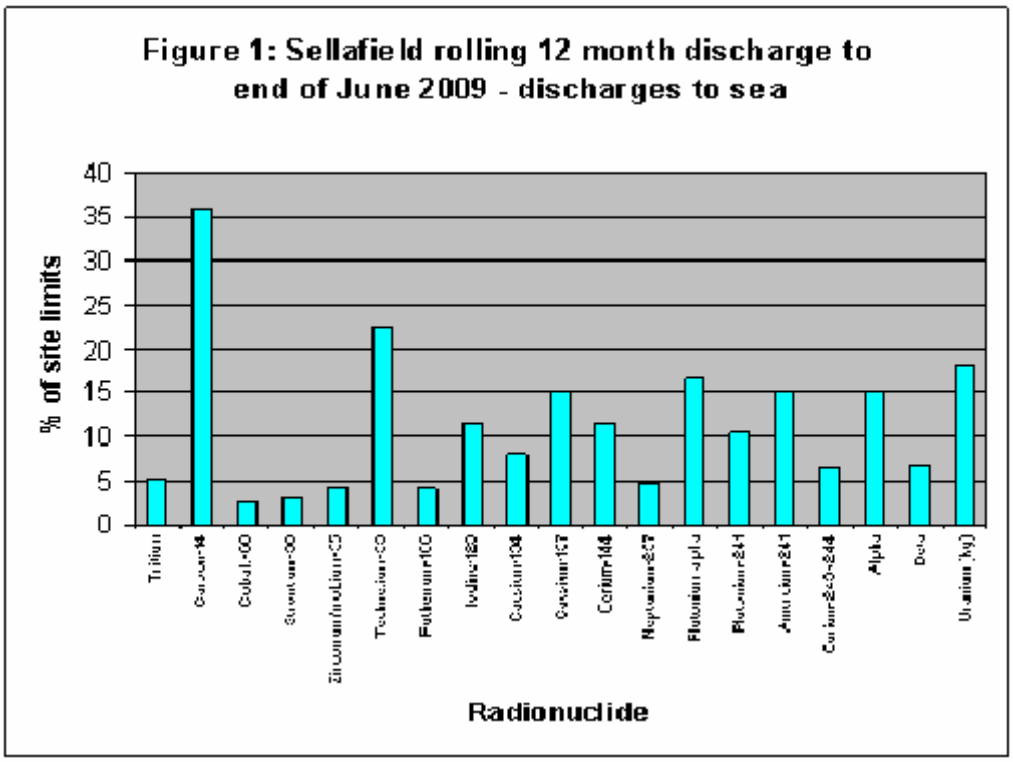
3. DISCHARGES & THEIR IMPACT ON THE ENVIRONMENT

3.1 Radioactive discharges

We aim to ensure that the public and the environment are protected from the radiation exposure that may result from the discharge of radioactive waste. There were no breaches of the authorised site limits on radioactive discharges to land, sea or air this quarter at any of the West Cumbria sites.

Discharges to sea

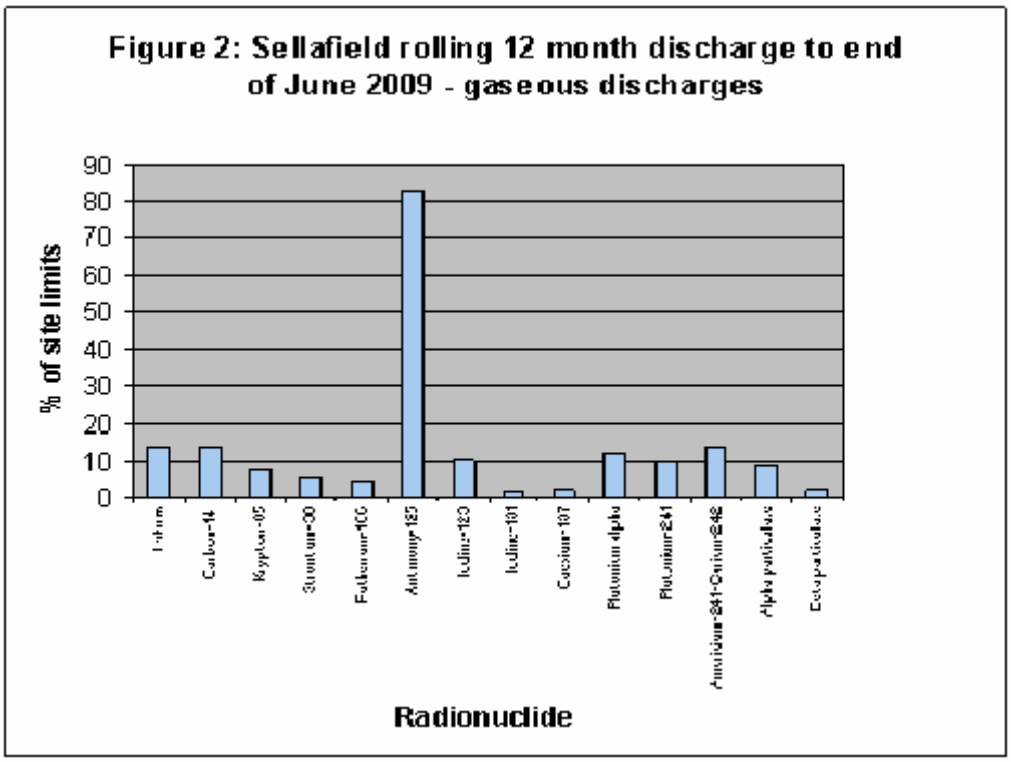
Radioactive discharges to sea from Sellafield over the 12 months to the end of June 2009 are shown as a percentage of the authorised site limits in Fig. 1. All discharges were well below the authorised limits. Note that for certain radionuclides the site limits for calendar years relate to the amount of spent fuel reprocessed ('throughput related limits').



Discharges to air

Radioactive discharges to air from Sellafield over the 12 months to the end of June 2009 are shown as a percentage of the authorised site limits in Fig. 2.

Discharges of all radionuclides apart from Sb-125 were well below the authorised limits. SL has notified us that the site aerial discharge limit for Sb-125 is likely to be exceeded for the rolling 12 month period to the end of August 2009 (the formal accountancy results to confirm the actual discharges will not be available until late in this reporting period). We have already briefed on the likelihood of a breach.



Disposals to land

These figures are compiled an annual basis, please refer to the last report for 2008/09 totals.

3.2 Radiation doses

Radiation doses to the most exposed groups of people from liquid and gaseous discharges from the Sellafield and Windscale sites continue to be well below the statutory public dose limit of 1 milliSievert (mSv) per year.

We estimate that the annual radiation dose to the most exposed group of the public was around 19 microSieverts (μSv) for liquid discharges made in the 12 months to the end of July 2009. This is less than 4 per cent of the constraint on dose from discharges from a single site (500 μSv per year) and less than one per cent of the average dose from natural background radiation in the UK. The radionuclides which contribute to this dose are highlighted in Fig. 3 overleaf. Radiation doses from gaseous discharges are lower than those from liquid discharges.

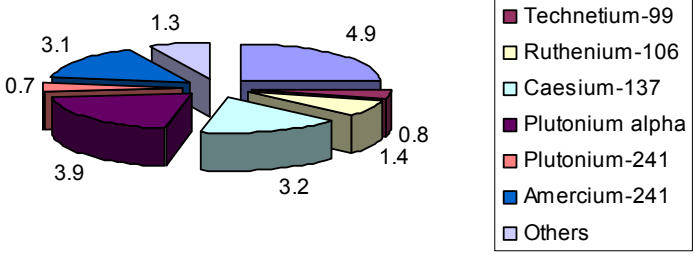
3.3 Environmental monitoring

Radioactive particles in the environment

A total of 9 stones and 18 particles were retrieved in July and August over an area surveyed of around 150ha. All finds are within the ranges of activities and radionuclide contents that have been seen previously. In August, the enhanced vehicle-mounted FIDLER-based monitoring system, known as the Synergy system, was deployed on Seascale beach, in addition to the existing Groundhog detector. The Synergy system is expected to provide improved sensitivity for radionuclides such as plutonium, americium-241 and strontium-90. No finds using this system had been detected up to the end of August. A meeting was held with the Health and Protection Agency's (HPA) Radiological

Protection Division to review the package of work on developing the Sellafield particles hazard & risk assessment, which is proceeding broadly to schedule.

Figure 3: Annual dose (microsieverts) to most exposed group from Sellafield 12 month discharges to sea to end June 2009



An 'intervention strategy' for responding to particle finds is being further developed, in consultation with HPA and others on the basis of risk factors and dose thresholds.

The second habits and occupancy survey has been agreed and contracted to the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and work is now underway. An independent expert view on the wider particles programme review we undertook earlier in the year has highlighted a number of additional considerations in relation to the approach to risk assessment and particle analytical work. HPA and SL have been asked to comment on whether any further such investigations may be practicable.

A meeting was held between EA, SL and NDA to review the status of the particles programme of work, and to discuss the likely future programme including resourcing issues.

4. COMPLIANCE ASSESSMENT

4.1 Site inspection & assessment

Gaseous waste management at Sellafield
A gaseous waste management inspection of Magnox reprocessing operations was undertaken early in September.

LP&S ventilation inspections
As a follow-up to our June 2007 gaseous waste team inspection (details in the April - June 2007 WCSSG report) and the warning letter issued in June 2009 in relation to open ductwork penetrations, we undertook a ventilation inspection, which did not highlight any further compliance issues.

Decommissioning
We attended a strategy meeting with SL, NDA & NII on future decommissioning strategy. This was the inaugural meeting at which the terms of reference were discussed. Further information, including a presentation on

the development of a Best Practicable Environmental Options (BPEO) assessment, can be found in the Decommissioning sub-group report.

Low Level Repository (LLWR) and Vault 9

In August an inspection was undertaken at the LLWR covering management of LLW generated at the site. No issues were identified and some good practice was evident in terms of on site LLW minimisation.

Vault 9 construction continues to make progress. We regularly inspect construction activities and monitor the quality assurance of construction activities. We have been paying close attention to methods proposed for the construction of the vault sidewalls which represent a new and unique engineering challenge. We believe reasonable approaches have been identified, but we will be closely monitoring trials to demonstrate the efficacy of the proposed approach. In July we were informed that the first area of the new vault was handed over for the storage of LLW ISO containers.

Sellafield - *COMAH Inspection of Inactive Tank Farm*

The principal aims of the inspection were to review the progress in improving the accessibility of (Control of Major Accident Hazards) COMAH information on the Sellafield site and assess the implementation of COMAH Regulations at the Inactive Tank Farm (a facility which stores and handles non-radioactive chemical reagents for the site's processes).

Along with the HSE, we are not entirely satisfied that SL has adequately reviewed the safety cases of all plants carrying a COMAH (non-radioactive) inventory, and undertaken an audit to identify any gaps in management arrangements. We have requested SL undertake such an audit in a joint letter in April 2009 and are awaiting a formal response. We are also awaiting a comprehensive list of major accident scenarios for non-radiological hazards.

4.3 Enforcement

Follow-up on previous enforcement actions

Fellside Combined Heat and Power Plant (CHP)

We met with representatives from SL and their contractor to assess progress made in closing out the recommendations arising from an Enforcement Notice. The Notice had been issued in September 2008 for breaches of the Environmental Permit due to inadequacies in the inspection and maintenance regimes which ultimately led to severe corrosion developing at the base of all three gas turbine stacks to the extent that collapse was a possibility.

We inspected the gas turbines, new stacks and their cladding. We noted the considerable amount of maintenance work undertaken on the turbines and elsewhere on plant, and the general re-focus of staff on delivering asset management and the appropriate level of inspection and maintenance. We are currently considering whether the actions will enable us to close out the Notice. The recommendations that refer to the wider Sellafield installation and the inspection and maintenance of site wide utilities will take longer to implement, and we will close-out those recommendations at a later stage.

4.4 Environmental events & incidents

Condensate leaks

An Enforcement Notice was issued to SL in August in relation to the condensate leak on a ventilation system serving the Magnox Reprocessing Plant, that was reported to us in January (see last report). The notice requires SL to review and, where necessary, identify and schedule improvements to its arrangements for plant asset management, for reporting incidents, and for the design, installation, maintenance and inspection of ventilation system condensate drain lines. The notice also requires a programme of remediation to be put in place for the area contaminated by the leak. The wider formal investigation into the incident continues.

Magnox Swarf Storage Silos

There continues to be an increase in liquid arisings in the cavity sump between the primary and secondary containment of some of the silos, although these have been reducing recently (see last report). Sellafield continue to investigate the source and to monitor the situation. We are challenging SL to widen the scope to cover other areas of potential leakage.

Low Level Repository (LLWR)

We were informed of two events needing further investigation. Camera inspections had identified the possible collapse and damage to a drainage pipe under Vault 8, leading to some of the pipework becoming flooded. We are closely monitoring this to determine the cause and implications of the failure. Initial indications are that this will not have led to any environmental impact, and will simply require remedial work to repair the damaged pipework.

We were also informed of elevated suspended solids analysis results for discharges from a settling pond used to handle water from the Vault 9 construction area. Investigations have been undertaken and additional samples taken, early indications are that some of the results may be spurious and due to inappropriate sampling techniques or ingress of other water run-off into the sampling area. Additional measures to prevent the elevated discharges have also been implemented such as installation of additional settlement ponds and 'siltbusters' used to remove suspended solids from the water. We have visited the site and discussed options with the operators and agreed that rainwater run-off from the construction area can be handled via other, non-consented routes which will help ease flows through the settling pond and may help to reduce suspended solids levels further. There is currently no reason to believe these elevated levels have caused any environmental harm. We continue to monitor progress at the site to resolve this issue.

5. OTHER WORK AREAS

We work with the site licence companies (SLCs), parent body organisations (PBOs), NDA, NII and others to make sure the environmental impact of day-to-day operations and decommissioning activities on nuclear sites is minimised, and that the risks posed to our environment from the hazardous facilities at Sellafield are reduced. This section highlights some of the progress this quarter.

Hazard and Risk Reduction

SL has committed to developing a strategy and plans for the Sellafield Risk Reduction programme for high hazard plants. Legacy Ponds & Silos (LP&S) is now established as a national priority and we hope that the programme represents a major step forward in putting major clean-up on a firmer footing.

Integrated fuel management

We continue to press for a joined up and consistent strategy by the NDA, for dealing with spent fuel. We met with SL to discuss a draft environmental appraisal of options for the interim storage of AGR fuel.

Over 5te of corroded fuel has been processed in the Fuel Handling Plant (FHP) this year, with 7 consecutive weeks where a single skip has been processed. This is encouraging in respect of the required 50 skips per year target that will need to be achieved from December 2009.

We met with NDA and NII at a bi-monthly Topic Overview Group (TOG). The NDA have agreed to share with us their programme for the delivery of strategies for nuclear material and spent fuels. Once their programme is sufficiently developed it will allow us to produce a work plan to schedule our responses to submissions from SL such as option assessments, time our consultations and brief those who need to be involved.

We met with SL and NII for an update on the status of the Thorp pond furniture strategy. One third of the Multi Element Bottle (MEB) inventory in the pond can be categorised as LLW. The remaining MEBs, which are contaminated predominately by cobalt-60, will need to be decayed stored before they can be categorised as LLW. For some MEBs, the decay storage period exceeds the lifetime of the facility and SL are looking at other potential options for reducing the radioactive contamination of these MEBs.

Integrated Waste Strategy and Solid Waste management

We are planning a joint follow-up with NII later this year to a team audit of solid waste in 2006.

We have drafted a response to the NDA draft strategy on the management of solid LLW from the nuclear industry that closes on 11 September.

We are continuing to feed back issues to the current Integrated Waste Strategy (IWS) review project (see last report for objectives and scope). We are expecting that the recently formed Waste and Effluents Disposition Directorate at Sellafield will be in a strong position to strengthen accountability and responsibility on implementing strategic objectives coming out of the IWS (as well as delivering more central and co-ordinated support on solid waste management across site).

The Lifetime Plan 2010 (LTP10) reviews (see below) have highlighted the need for better co-ordination of Intermediate Level Waste (ILW) strategy across the site. There would appear to be opportunities for better integration and rationalisation of ILW treatment processes and stores.

LTP10 development

As explained in the last report, we are working with SL, NDA and NII to support the development of the new Lifetime Plan (LTP10). We have attended strategic reviews for the various programmes under this process, including SIXEP/MOP, PCM, End States and LP&S. The purpose of these reviews is to build on an understanding of current strategies and their key risks and to review alternative approaches and contingencies. There are a number of issues to be addressed in the LTP10 build process, for instance the uncertainties in terms of financial provision for SIXEP and the Magnox Operating Programme (including the need to establish the design requirements for the SIXEP contingency or replacement plant as soon as possible).

In LP&S, the reviews and LTP10 process, whilst incomplete, suggest that the clean up of the major legacy plants will take even longer than previously predicted. We remain concerned that the delays in clean-up and decommissioning will result in increased environmental impacts from further discharges, solid wastes and contamination of land and groundwater and increase the potential for incidents given the degraded condition of the major legacy plants. We continue to work with SL, NDA and NII to seek to ensure that sound strategies and plans are developed, implemented and where practicable accelerated. We will also continue to support work to ensure that appropriate contingency plans are in place and risks are mitigation as far as practicable.

Organisational change

We continued to monitor and assess SL's organisational changes (in collaboration with NII) to check whether it does not adversely affect its environmental performance and improves it wherever possible.

The new structure for Infrastructure Directorate was announced. The re-structuring of this Directorate is a promising development in pushing for a more co-ordinated effort to site wide asset management, and also strengthening its position given its pivotal role in enabling clean-up, both of which we have consistently advised on and supported. The change programme in this area includes important changes in the way that maintenance is managed, co-ordinated and implemented across the site.

LP&S is moving towards four major projects covering clean-up of the four main facilities, and we await confirmation of the details. We advised SL that it should provide the Decommissioning Sub Group with information on the formation of the new Decommissioning Directorate and its status.

Sellafield Ltd and NDA executive teams have developed a joint vision for Sellafield Ltd over the next 5 years in the Integrated Change Programme (ICP). The first regulatory forum for this was attended in August. We discussed various indicators which will be used to monitor potential impacts throughout the change programme which builds upon the learning and experience gained by all parties during the changes associated with the transition to the new PBO last year.

Consultations, events, publications and enquiries

1. UK Discharge Strategy

The new Strategy was published in July, and the associated Statutory Guidance to the EA from Government will become effective later this year. The Strategy was consulted on last summer, and builds on the 2002 Strategy published by Defra for 2001-2020 which demonstrates how the UK is implementing its obligations in respect of radioactive discharges under the OSPAR Convention (the Convention for the Protection of the Marine Environment of the North-East Atlantic). It also forms the UK's national plan on how we will achieve the overall and intermediate objectives of the OSPAR Radioactive Substances Strategy. The UK Government has committed to reduce discharges by 2020 such that additional concentrations of radioactive substances to the marine environment above historic levels resulting from these discharges are close to zero.

The Strategy now covers the period to 2030 and includes aerial as well as liquid discharges from operational and decommissioning activities and includes both the nuclear and non-nuclear sectors. The Strategy also signifies the move from the terms Best Practicable Means (BPM) and Best Practicable Environmental Options (BPEO) to Best Available Techniques (BAT). The move to BAT will deliver the equivalent level of environmental protection as BPM and BPEO but is consistent with the terminology of the environmental protection regimes of other industrial sectors and regimes in England and Wales.

2. Nuclear Sector Plan

The Nuclear Sector Plan was published in July and can be accessed here. This revised version of the plan (originally published in 2005), looks to challenges over the next few years, and reflects important changes in the nuclear industry. The plan details environmental objectives and indicators of performance of the industry that will help ensure environmental impacts of its activities are minimised and managed responsibly. We will continue to monitor and report annually against the plan's objectives in nuclear sector performance reports. We published the report of performance of the nuclear sector in 2007 in December 2008, and we will publish the next performance report with data from 2008 towards the end of 2009.

3. Environmental Permitting Regulations

Consultation on draft government guidance to the second phase of the Environmental Permitting Programme (EPP2) closed on 29 July. This widens the existing single system created by the first phase of the Environmental Permitting Programme – the Environmental Permitting Regulations (EPR) – to include water discharge consents, groundwater authorisations and radioactive substances regulation (the subject of the Consultation Document).

We have launched our fourth consultation on standard rules for the EPR, which will close on 27 November 2009. The consultation package is available on our website and reflects the proposals to widen the existing EPR regime.

4. Our New Corporate Strategy

In July, our Directors visited all Regions to present a snapshot of the National consultation feedback to our Corporate Strategy and re-emphasise what is different from our last Strategy. The strategy is underpinned by 10 supporting strategies including Climate Change and Energy, Internal Environment Management, Regulated Business and Waste and Resource Management.

5. Other

The DECC consultation on proposals for a future exemptions regime under RSA and EPR, which launched in June (see previous report), closed on 4 September.

We have recently published two science reports which detail the work we have done to ensure that the UK Natura 2000 sites are adequately protected from radioactive substances, in compliance with the EU Birds and Habitats Directives. The reports can be accessed through our publications catalogue.