

Briefing Note – Enhanced beach monitoring for radioactive particles near Sellafield site – June 2008 update

Background

Monitoring the environment for radioactivity around nuclear sites is very important. It helps us to assess the impacts of nuclear sites on the environment and on people. That is why we require environmental monitoring as a condition of authorisations issued to nuclear site operators.

In previous reports we have explained how we have required Sellafield Ltd to seek to improve on the existing techniques to monitor local beaches for small radioactive objects and particles. This is in line with our continuing drive to improve techniques used for environmental monitoring around nuclear sites wherever possible. Two successful trials were carried out in November 2006 and February 2007, using improved and more effective radiation detection equipment mounted on a tractor-like vehicle (see photograph below). Routine monitoring using this new specialised equipment began in May of 2007.



The monitoring carried out to date has focussed on areas close to Sellafield itself, but has also included areas as far south as Drigg Point and also north to the Solway Firth. To date, an area the size of about 400 football pitches (over 200 hectares) has been monitored. Monitoring along the Cumbrian coast is continuing throughout 2008 and into 2009, with around a further 200 Ha to be surveyed by April 2009 as part of the environmental monitoring programme that Sellafield Ltd is required to carry out.

The current situation

The highly sensitive equipment that is being employed to detect radioactive particles continues to identify a range of small items containing or contaminated with radioactivity. This is not entirely surprising, given the occurrence of past events such as the beach contamination incident in 1983, and the recent work to remove redundant sea pipelines.

Since the improved monitoring started in November 2006, just over 370 items (small particles, pebbles and stones) have been found and removed from the beaches. We have asked the Health Protection Agency (HPA - the principal advisory body in the UK for radiation risks) about the implications of the radioactive items found and recovered so far, and they have said:

“On the basis of information provided by the Environment Agency on 6 July 2007 on the finding of radioactive particles on beaches near the BNG Sellafield site, the Health Protection Agency (HPA) considers that no special precautionary actions are necessary at this time regarding access to or use of these beaches. However, HPA will continue to work with relevant authorities to keep the situation under investigation.”

The HPA continues to be kept informed of the particle find information since this advice was first given. For all finds, including those identified since this advice was first provided, the advice remains valid.

Information on the finds to date

A summary of the key information about the finds is given below. Further detail on the monitoring data compiled so far, and a map of the locations of the finds, can be obtained from Sellafield Ltd – 019467 77856, or see

<http://www.sellafieldsites.com/page/what-we-do/case-studies/beach-monitoring>.

- Roughly 70% of the finds are less than 1cm in size, with many being around the size of grains of sand. The rest are stones and pebbles.
- The majority of the finds have been found buried at depths of up to 20cm in sand in the stretch of beach extending around 3km north from the Sellafield site. The finds in other areas are:
 - 9 at St Bees
 - 5 at Braystones
 - 10 at Seascale
 - 5 at Barnscar
 - 2 at Drigg
 - 0 at Whitehaven
 - 0 at Kirkcudbright or Southernness (Dumfries & Galloway coast)
- These numbers include the results of repeat surveys carried out in April and May 2008 at St Bees and Seascale. The most recent surveys in these areas found fewer items than were identified the first time these areas were monitored (approximately half as many).

- One of the main radioactive substances involved is caesium-137. Most finds appear to have sufficiently low levels of caesium-137 radioactivity to mean that they would be classed as 'minor' under a scheme agreed by the Dounreay Particles Advisory Group (DPAG) to classify radioactive particles found around the Dounreay site in Scotland¹. Fewer than 20 of the finds have higher levels, corresponding to 'relevant' under the DPAG scheme, and none have activities above 1000kBq, the level in the DPAG scheme above which particles would be classed as 'significant'.
- Particles or pebbles contaminated with high levels of caesium-137 could cause temporary skin reddening or minor ulceration. However, the levels of caesium-137 found so far are such that only prolonged contact in exactly the same area of skin would be necessary to cause these effects. The chances of coming into contact with such a particle, and then for it to remain in prolonged contact with the skin, are estimated to be very low.
- One particle found in an earlier survey in 2003 has been shown to contain predominantly the radionuclide strontium-90. This material, if present at sufficiently high levels, could also give rise to reddening or blistering if in prolonged contact with the skin. However, although this substance is more difficult to detect than caesium-137 using the new equipment, no further particles of this nature have yet been identified.
- Americium-241 and isotopes of plutonium have also been identified in or on some items. Although these substances are of little health concern if outside of the body, they could cause an increased risk of cancer if swallowed. Only around 30 particles have been found with appreciable levels of americium and plutonium. While a minority of these could possibly give a significant radiation dose in the long term if they were to be accidentally swallowed, the chances of encountering, and of swallowing, such a particle are considered to be extremely low.
- Following consultation with the HPA, we consider that the health risks to the public from contact with the majority of the items recovered are unlikely to be significant.
- We are still working on identifying the precise origin of these contaminated items, but it is highly likely that the vast majority, if not all, of the finds are related to past events and incidents at Sellafield.

¹ assuming that the particle had a similar radionuclide composition of those at Dounreay.

What next?

We are continuing to build on the success of the improvements to the monitoring, in order to obtain a more complete picture and to reduce the remaining uncertainties. We have put in place a detailed programme of work, which will involve contributions from both the Sellafield site operator and also a number of partner organisations. This programme includes requirements on Sellafield Ltd to:

- continue with beach monitoring, and to consider how it can be improved even further – including carrying out monitoring of the seabed, and developing improved, more sensitive monitoring equipment;
- investigate potential sources of the finds;
- ensure that best techniques are used to control existing site operations so that further releases of particles are prevented or minimised;
- undertake detailed laboratory analysis aimed at providing much more information on the source, nature, hazard, composition and radioactive content of the finds. This programme is well underway, and continues to provide important information on particle properties.

The Environment Agency continues to focus on inspecting and auditing the company's arrangements for ensuring that potential releases of particles are adequately prevented or minimised.

In addition, we have commissioned the Centre for Environment Fisheries and Aquaculture Science (CEFAS) to advise on possible mechanisms for transport of particles in the marine and near-shore environment, in order to understand the range and locations of possible movements of particles offshore.

We have worked, and will continue to work, closely with other interested parties and agencies as appropriate, including the relevant local authorities.

We keep the implications of all types of environmental monitoring results under constant review, working with others such as the Health Protection Agency and the Food Standards Agency.

Getting in touch with us

If you need any more information please do not hesitate to contact Andy Mayall, Team Leader in our Nuclear Regulation Group on 01768 215705. The Food Standards Agency can be contacted on 0207 2768749, or the Health Protection Agency (Radiological Protection Division) on 01235 831600.