

## Survey of Radionuclides around Nuclear Sites in England and Wales

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A survey of concentrations of selected radionuclides in grass and soil samples collected from around eighteen nuclear sites in England and Wales was carried out by the Institute of Terrestrial Ecology during 1993. The survey was intended to supplement the routine food sampling program performed by the Ministry of Agriculture, Fisheries and Food (MAAFF) and to discharge the UK's responsibilities for monitoring of nuclear installations under Article 35 of the Euratom treaty. The sampling sites around each installation were selected based on the windrose data for the previous year; three pairs of grass and soil samples were collected within 500 metres outside the boundary fence during two different sampling dates along the 3 most dominant wind directions on land. The samples were for  $^{137}\text{Cs}$ ,  $^{14}\text{C}$ ,  $^{35}\text{Sr}$ ,  $^{90}\text{Sr}$ ,  $^{239+240}\text{Pu}$  and  $^{241}\text{Am}$ .

Previous surveys throughout the UK provide soil data for  $^{137}\text{Cs}$ ,  $^{90}\text{Sr}$  and  $^{239+240}\text{Pu}$  which can be used to estimate background activity concentrations for these radionuclides close to each nuclear installation. Post-Chernobyl data for  $^{137}\text{Cs}$  are also available and were decay-corrected to 1993 to estimate background levels for this nuclide. The soil data from this survey were then compared to these background levels, and showed that four of the eighteen sites (Harwell, Winfrith, Dungeness and Trawsfynydd) have contributed measurable increases to both the  $^{137}\text{Cs}$  and  $^{239+240}\text{Pu}$  inventory, with two other sites (Capenhurst and Sellafield) showing slight increases above the expected background soil levels of  $^{239+240}\text{Pu}$ . However, when compared with the appropriate generalised derived limits (GDL) for these radionuclides as derived

by the National Radiological Protection Board (NRPB), the activity concentrations measured in all samples were significantly below the recommended limiting values. For example, the maximum  $^{137}\text{Cs}$  and  $^{239+240}\text{Pu}$  soil concentrations at Sellafield (which were the highest levels in the data set) corresponded to 31 % and 2.8 % respectively of the GDLs for these radionuclides. The maximum level for  $^{90}\text{Sr}$  in a soil sample from Trawsfynydd corresponded to 6.7 % of the GDL for this nuclide.

A more detailed description of the findings is given in: *The Science of the Total Environment*, 181 (1996) 51-63.

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