

# Health Risks from Radioactive Objects on Beaches in the Vicinity of the Sellafield Site in West Cumbria

(Study funded by the Environment Agency)



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Likelihood that beach users come into contact with radioactive objects on the beaches  
+  
evaluation of health risks  
=  
overall risks to health for a beach user



## Estimates of Radioactive Objects on the Beaches

A programme of monitoring carried out since 2006 has found radioactive objects on beaches near the Sellafield site in West Cumbria.

Numbers of radioactive objects found and the detection capability of the monitoring equipment used to estimate

- numbers of radioactive objects on the beaches
- depth of objects



Based on currently available information, the overall health risks for beach users are very low, and significantly lower than other risks that people accept when using the beaches.

The ingestion of particles with high actinide content has the greatest potential to give rise to significant health risks.

However, the very low likelihood of ingestion occurring means that the overall health risk remains very low in comparison to the levels of risk of death that the Health and Safety Executive (HSE) regard as being acceptable (below  $10^{-6}$  per year).

## Characteristics of Objects

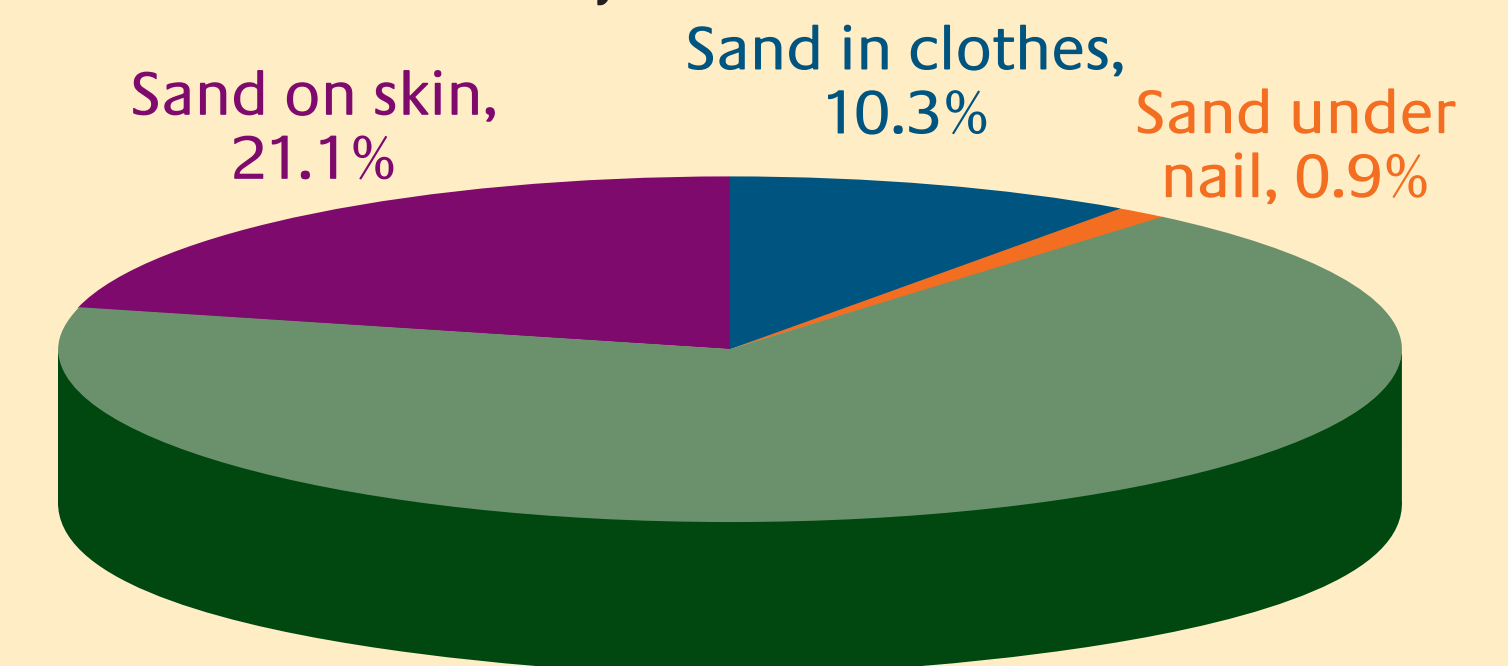
- Size of objects
- Radionuclide content ( $\alpha$ -rich,  $\beta$ -rich and cobalt-60 rich)
- Activity content

## Exposure Pathways

How could people become exposed to radioactive objects?

- inadvertent or deliberate ingestion of sand
- inhalation of air in which sand is suspended
- skin contact - object on the skin, trapped in clothes, shoes, under nail or in a wound

## Relative Contributions of Exposure Pathways for Beach Walkers



## Beach Use

Activities grouped into

- walking
- leisure – playing in sand, paddling, rock pooling etc
- bait digging and fishing



## Habit Surveys

Used to determine time spent on the beaches for

- typical beach user
- people who spend the most time on the beaches
- different age groups and beach uses



## Radiation Doses

Evaluation of health risks that may arise if an individual does come into contact with a radioactive object

- inhalation of an object
- ingestion of an object
- external irradiation from an object in stationary contact with the skin

Health risks identified for different object types, age of individual, activity content

HPA has updated its formal advice to the Environment Agency taking into account the findings of this study and recommends three criteria for prompting an urgent review of health risks to beach users. HPA also makes recommendations about continued regular monitoring of beaches in the area.

This study is being used to inform the development of HPA guidance on the assessment of exposure from land contaminated with heterogeneously distributed radioactive material.