

## In-situ Management of Radioactive Material in the UK

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In common with any industrial restoration project, decommissioning nuclear sites involves both removing the redundant plant and buildings and remediating the land. If contamination is present in buildings and plant it is likely to be necessary to treat it as radioactive waste for disposal. Similarly, contaminated material in the ground can be excavated for disposal. However, this can be disruptive and very costly, particularly where there are large amounts of soil, rock or below-ground structures that have very limited amounts of radioactivity. Furthermore, the disposal facility is quite likely to be a landfill, which does not offer substantially greater containment of the radioactivity than simply leaving it in place.

An alternative approach is to manage the material in-situ. This might involve placing some additional protection over or around the material, which could be combined with the process of landscaping the restored site. The residual radioactivity could then remain under surveillance for a period of time while the hazard decreases due to radioactive decay, and costly space in national radioactive waste disposal facilities would be freed up. The decision on whether this is appropriate is framed by two questions:

- \* Is it sensible to excavate the material and transport it for disposal elsewhere if the risk it poses is very low?
- \* What concentrations of radioactivity could remain in-situ and meet the relevant safety targets?

The first question is one of optimisation. In general terms, as NDA conclude, the answer to the question would appear to be “no” for material with very low concentrations of radioactivity. But a site-specific study will always be needed.

The second question is one of proportionality. The problem is that situations that are very unlikely, but cannot be completely discounted, drive down generic concentration limits to a point at which in-situ management appears to have limited applicability. However, regulatory guidance for radioactive waste disposal provides alternative criteria for such scenarios. If these are applied then in-situ management has a much wider scope for application.

The importance of these points is emphasised by actual reported estimates of radionuclide concentrations in contaminated soil. A simple analysis of four major waste streams in the 2013 UK Radioactive Waste Inventory indicates that all would fail to meet simple and cautious screening values for in-situ management. The costs for disposing of these wastes alone could run into billions of Pounds. The same analysis shows that if more realistic criteria are used then most, possibly all, could be managed in-situ with substantial cost savings.

### Country or International Organization

United Kingdom

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