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Radioactive enriched uranium findings prompt call for immediate halt to Hinkley C clearance

Analyses of soil samples have confirmed the presence of enriched uranium on EDF's site for their proposed nuclear power station at Hinkley Point.

Enriched uranium is a man-made radioactive contaminant and does not exist in nature.

The samples were collected by members of the Stop Hinkley Campaign and sent to Green Audit, an independent environmental consultancy, who commissioned separate laboratories in Oxfordshire and Germany to undertake the tests.

Katy Attwater, Stop Hinkley's spokesperson, explained: "From the start we had no confidence in the work that EDF's contractors, AMEC, had done. For example, they wrongly stated in a report 'that a full radiological survey of the entire site would not be possible' and their reasons for not doing one were ludicrous. They said 'This was due to the fact that the oil seed rape had not been harvested making pedestrian access to large areas of the site impossible. In addition the wheat crop had not been harvested'." (1)

Now landscape contractors have started to clear the vegetation, rip out trees and slash down hedgerows across the site. "They will disturb the soil and their workers' radiological exposure has not been safely assessed. Enriched Uranium is an alpha-emitter and carries increased health risks if inhaled or ingested." (2)

Green Audit's full report is entitled 'Measurements of radiation dose rates, radionuclides and other contaminants on EdF Energy's site for the proposed Hinkley Point C Nuclear Power Station' (3) and can be found on the Stop Hinkley and Low Level Radiation Campaign websites.

Katy Attwater concluded: "West Somerset District Council and the Environment Agency need to act upon these findings. EDF need to demonstrate that safety is indeed their highest priority, as they so often claim, by undertaking more extensive soil testing to ensure they are not endangering the health of workers and local people. Until then, all work must cease immediately."

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NOTES TO EDITORS

(1) *'Baseline Radiological Survey'*, Ref: 15118/TR/00003, AMEC, 2008
http://www.programmeofficers.co.uk/posl/documents/HinkleyProject/CD11.7.pdf

Best practice when undertaking site characterisation investigations is to work to a grid pattern across an area. This was *not* followed on the largest parts of the application site - on areas given the unwieldy names Built Development Area West (BDAW), covered in this report, and the area to the south of it (collectively originally called the Southern Construction Phase Area).

- The wheat and oil seed rape crops "occupied approximately 75% of the total area". (page 1)
- It appears as if EDF weren't prepared to pay compensation for any damage to crops had AMEC accessed the site to undertake comprehensive investigations over the whole area.
- AMEC also appeared to be under pressure to do a quick job: "It was not possible to carry out a site visit prior to the preparation of the technical specification, due to the limited time frame available." (page 2) This may also explain why they didn't go back to grid the area once the crops had been harvested.

The soil sample locations were equally sparse and mirrored the survey points.

For the gamma radiation/dose rate surveys, Stop Hinkley believe AMEC were unprofessional in their choices of **natural** background locations, against which site readings were compared, and reject all of them. A natural background location should be a flat, undisturbed open space away from upright structures and sources of pollution with the same underlying geology as the study site. AMEC's locations, that Stop Hinkley considers shouldn't have been thought appropriate in the first place, were:

- Bridgwater Cemetery – Bridgwater has a *different* geology that is radon-affected. The cemetery is in an urban area beside a busy main road, full of contaminants and granite headstones with historical locations of old graves and excavated spoil heaps unknown.
- British Energy's nuclear power station visitor centre car park at Hinkley Point – It is in very close proximity to nuclear power stations from which radiation shine could be expected and was shielded by hard standing rather than bare earth and subject to human and industrial activity, car emissions and other contaminants
- "It was decided that the cemetery provides a more representative background to compare the field readings against." (AMEC report, page 6)

For investigations on Built Development Area East (BDAE) *('Radiological survey report for Hinkley Point'*, Ref: 15011/TR/00144, AMEC, 2010), AMEC chose to use Bridgwater Cemetery and Wick Park Covert as background locations, ruling out the latter because "Readings… were taken under a dense canopy of trees." – Trees are upright structures that take up radionuclides from the soil that will distort readings and the canopy blocks out cosmic radiation.
The readings taken at Bridgwater Cemetery using two separate instruments, taken 15 months apart, contradicted each other. One instrument showed radiation had gone UP from before, the other that radiation was DOWN. It is impossible for radiation to increase

and decrease at the same time!

BDAE is the north-eastern corner of the site covering part of Hinkley Point B's site.

(2) The energy from alpha and beta emitters is highly concentrated due to the small ranges and is a different hazard to gamma radiation.
There is a large body of evidence showing detrimental health impacts from low level radiation.
In addition to already published studies, concern about the potential health risks from low level radiation and internal exposure have prompted international bodies to initiate further research programmes specifically to look into these. The UN Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) decided that their work on the biological effects of "selected internal emitters should focus on tritium and uranium". It was also decided to start preparatory work to look into "the epidemiology of exposures of the public to natural and artificial environmental sources at low doses and low dose rates". Furthermore, UNSCEAR state "there is emerging evidence from recent epidemiological studies indicating elevated risks of non-cancer diseases below doses of 1 to 2 Gy, and in some cases lower."
UNSCEAR 2010 Report
http://www.unscear.org/docs/reports/2010/UNSCEAR_2010_Report_M.pdf

(3) *'Measurements of radiation dose rates, radionuclides and other contaminants on EdF Energy's site for the proposed Hinkley Point C Nuclear Power Station'* by Prof. Chris Busby, Rosa Cato and Cecily Collingridge, Green Audit, 2012

Report available on Stop Hinkley website at www.stophinkley.org and on the Low Level Radiation Campaign website at www.llrc.org.

Gamma dose rate measurements on the site show much higher levels of radiation than are expected. A mean dose rate of 160nSv/h (SD 35) was obtained from readings taken at 1m above ground level during a walk-over survey of the site in Jan 2011 with a highest level of 210nSv/h measured. These compare with a mean expected level based on earlier reported measurements of between 70 and 90nSv/h and suggest the presence of radioactive contamination.

The Environment Agency was given this information in the presence of representatives of West Somerset District Council at a meeting last July 2011. As it became evident they were not going to go out to site and investigate themselves to follow this up, Stop Hinkley members felt they had no alternative but to do it themselves and collected some soil samples.

The samples were obtained approximately 10m inland from the coastline of BDAW and spaced 10m apart.

Gamma spectrometry showed significantly high concentrations of uranium (128 Bq/kg - outside the Environment Agency's estimated range of 24-31Bq/kg for the area*) with an isotope activity ratio between 6.01 and 17.95 compared to 21.3 expected for natural uranium. Two samples examined by Inductively-Coupled Plasma Mass Spectrometry (ICPMS) also showed the presence of enriched uranium.

Further findings were of elevated concentrations of iron, copper, chromium, manganese, nickel and arsenic that were unusual. The authors of the report suggest these may originate in stainless steel corrosion residues from the nuclear plants brought ashore by sea-to-land transfer. A high level of iodine found in the samples certainly indicates

seawater as does the high level of selenium.

These findings also support those in an earlier report published last year (**'**Evidence of significant enriched uranium atomic fuel contamination of the Hinkley Point proposed nuclear site in Somerset and its potential implications', Chris Busby, Cecily Collingridge, Green Audit, Jan 2011, http://stophinkley.org/Health/HinkContamJan2010.pdf) in which AMEC's reported results of laboratory examinations of soil samples from BDAW (Built Development Area West), that formed part of EDF's application documents for Site Preparation Works, were analysed. This evidence of enriched uranium was rejected by EDF, the Environment Agency and West Somerset District Council.

* Environment Agency. Science Report: SC030283/SR, 2007.
For the 5km x 5km square covering Hinkley Point, the estimated uranium concentration is 2 - 2.6 mg/kg (equivalent to about 24 - 31 Bq/kg).