RADIOACTIVITY FIELD MONITORING REPORT

Dr. Paul Johnston
Greenpeace Research Fellow
Queen Mary College
University of London

RADIOACTIVE MONITORING- FIELDWORK REPORT (3 PAGES)

This report considers field results and observations from three primary sites and a number of subsidiary sites in the vicinity of these. The primary sites, subsidiary sites and protocols were as follows:

1) Sampling of stack emissions from the smelter operated by Capper Pass and Sons, North Ferriby.

A portable air-pump (Rotheroe & Mitchell Type L2SF Mk III) was converted to remote operation using a radio control mechanism and calibrated to draw 3 litres per minute with the filter head attached. The pump was fitted with a radioactive sampling head (Casella T.13032). The filter used was a Gelman GN-4 (66276) plastic membrane filter. The apparatus was lifted into the stack plume using a radio-controlled helicopter operated from outside the factory perimeter. The pump was activated in the plume and run for 3 minutes. The process was repeated three times and on each occasion the filters were removed and stored in petri-dishes. Analysis for Po-210 was conducted at St Bartholomews Hospital Radiation Biology Department and the filters determined as a composite sample gave the following result. (Sample C)

Sample C: 0.16 +/- 0.37 mBq (13-10-87)

When expressed as activity per cubic metre this gives a result of 5.9 mBq per cubic metre of stack gas. For a number of operational reasons it is likely that this is an underestimate of the Po-210 present. No direct conclusion concerning the absolute quantities of activity leaving the stack are possible since no data are available concerning total stack gas flux. Without doubt however, the exercise clearly indicates that Po-210 is discharged from this plant in appreciable quantities.

In addition two sites were sampled in the locality of the smelter using the same apparatus fitted with glass fibre filters (Whatman GF/A). The results from these filters were as follows:

Sample A (Wilson Street) Filter at 1.5m height above ground, Pump setting 2 litres per minute: (30-9-87)

0.52 +/- 0.59 mBq.

Given an operating time of 781 minutes this gives an activity of 0.33 mBq per cubic metre of air.

Sample B (Palmer Avenue) Filter at 2.5 m above ground Pump

setting 2 Litres per minute: (30-9-87)

0.81 +/- 0.31 mBq

Given an operating time of 734 minutes this gives an activity of 0.55 mBq per cubic metre of air.

These sub-site samples appear to be somewhat higher than the background figures for the Northern Hemisphere quoted by the NRPB. It is, however, impossible to attribute this directly to any particular operation without a much more extensive and far-reaching study. Po-210 can be discharged from a variety of processes and would in any case be expected to be slightly higher in urban areas.

In addition a sample of water was provided from the vicinity of this site (date, time and method of collection unknown) but stated to be snow meltwater from Farmer Nichols' farm. This contained some black particulate material which was digested separately after filtration.
The sample was analysed for lead using flame atomic absorbtion spectrophotometry and gave the following result.

Pb level (water fraction) 0.08 mg per litre
Pb level (Particulate fraction) 0.375%

This latter figureis subject to some inaccuracy due to the very small amounts of material involved but nonetheles indicates a significant deposition of lead on the land. This is supported by studies reported in the literature for arsenic.

2) Bishops Cleeve, Gloucestershire

The site surveyed was a spoil dumping ground which had clearly received input from a number of tipping operations. Over most of the site the background count as registered by a Mini Instruments Type 900 scintillation counter fitted with a sodium iodide crystal was in the region of two counts per second. The count rose noticeably to approximately 20 counts per second over an area of recently tipped loam soil. The tipped material included dead coniferous trees of the same variety as present on the nearby Smiths Industry site in an area subject to recent excavation suggesting that the material may have come from this site. In one area the registered count rose appreciably and shallow excavation revealed material counted in excess of 300 counts per second. Analysis of this material was carried out at St Bartholomews Hospital Radiation Biology Department and proved to contain Radium-226 and its daughter products at a level of 286 +/- 2.9 Kilo Bq per Kg. The substance in question was examined visually and appeared to have a layered, non homogenous

character and became partially fluid at room temperature. The appearance suggested that it could have been settled layered paint materials. (15-12-87)

3) The former Laporte Industries Site, Ilford.

The survey of this site revealed a general background count of between 5 and 10 counts per second using the apparatus detailed above. The background count, however, in a sector of the site rose to some 350 counts per second. Material removed from the site was analysed as detailed before. (20-1-88)

Sample 1 (soil sample)

3604 +/- 36 Bq per kilogram

Sample 2 (Gravel sample)

191 +/-2 Bq per kilogram.

These activities were attributable to Radium-226 and its daughters.No alpha analysis for Thorium 232 or 228 was carried out. In our view a significant portion of the elevated count on the site could be due to gaseous radon permeating through the soil from deeply buried material.

Paul Johnston

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