11 January 2007

Update on public health issues related to Polonium-210 investigation

The Health Protection Agency is continuing to provide expert advice on the public health issues surrounding the death of Mr. Alexander Litvinenko.

We have carried out an extensive monitoring programme of people and places identified by the police investigation. Our investigations have confirmed there is no public health concern in the open public areas. The monitoring results received so far show that the risk to the general public from any exposure to Polonium-210 (Po-210) is likely to be very low.

As part of our monitoring programme we carried out **radiation dose assessments** of the urine samples provided to the Agency. Today we are publishing a description of the methods and criteria used by the Agency to assess the radiation dose. This information will be of value to health protection colleagues across the world for planning purposes, and will also provide the public with a fuller understanding of the procedures we developed as part of our commitment to protect the public. The dose assessment document is available on our website.

To date we have released data on doses of public health concern – so far the Agency has identified **13** people having received doses which are not significant enough to result in any illness in the short term and any increased risk in the long term is likely to be very small.

We are now in a position to provide a more extensive outline of all the results we have found so far and the three categories of exposures we have used.

Category 1

- **480** people had results ‘below reporting level' - below 30 millibecquerels (mBq) per day (natural levels of Po-210 in urine are typically in the range 5-15 mBq per day). It is therefore unlikely that any of these people had been exposed to Po-210

Category 2

- **73** people had results above 30 mBq per day in their urine, but with a dose less than 1mSv indicating no public health risk, and no health concern to the individual, but probable contact with Po-210

Category 3a

- **30** people had results above 1 millisievert (mSv), but below 6mSv indicating no public health risk, and no health concern to the individual, but probable contact with Po-210

There are **583** results in categories 1, 2 and 3a and these are **NOT** of health concern.

Category 3b

- **13** people had results above 6mSv which are not significant enough to result in any illness in the short term and any increased risk in the long term is likely to be very small

The poisoning of Mr Litvinenko with Po-210 was an unprecedented event in the UK that presented some unique public health issues. The Agency has carried out an extensive monitoring programme to assess the extent of public exposure to Po-210 and to assess radiation doses. Priority has been given to people who clearly had close contact with Mr Litvinenko, such as his family and those medical staff who cared for him, but also to people who were in locations that have been found to be contaminated with Po-210. The dose assessment procedure published today has been an important part of this. The Agency's aim has been to provide a systematic measure of radiation exposure and a rational basis to set priorities for further health monitoring.

Notes for Editors

1. The document describing the dose assessment procedure in more detail can be found on the Agency's website at http://www.hpa.org.uk/polonium/Dose_Assessment.pdf
2. We all have traces of Po-210 in our bodies because it is a naturally occurring radioisotope present in water, food and plants. So the Agency needed to distinguish between natural levels of Po-210 in urine and any elevated levels indicating exposure to Po-210 associated with the incident.

3. Natural levels of Po-210 in urine are typically in the range 5-15 millibecquerels (5-15 mBq) per day and the Agency has assumed that a level in urine measured above 30 mBq per day suggests some measurable exposure to Po-210 from the

incident. If people have such levels in their urine, an assessment of their extra radiation dose is made.

4. The first stage of this assessment is to convert the measured level in urine (mBq per day) into a radiation dose (in millisieverts, mSv). If the urine measurement indicates a dose less than 1 mSv, this is classified as being of *no concern* . This is because the average radiation dose to a UK citizen from natural sources is about 2 millisieverts (mSv) each year and this can vary up to more than 10 mSv per year depending on for example, local geology. So far, **596** samples have been analysed in total and **480** of these were below the reporting level of 30 mBq per day in a urine sample, and do not indicate exposure to Po-210. Of the remainder, **73** have been assessed as a dose of less than 1 mSv, which indicates some exposure to Po-210, but the dose is of no concern for the reasons given above.

5. For doses found to be above 1 mSv, a more sophisticated calculation of radiation dose is carried out using data based on individual parameters for the person concerned and how they may have been exposed to Po-210. If the dose is found to be less than 6 mSv using this method, it is also judged to be of *no concern* for two main reasons. First, an annual dose of less than 6 mSv is within the range of variations in natural background radiation and second, this level of dose is used to decide when radiation workers should routinely require medical surveillance. So far **30** results have been between 1 and 6 mSv.

6. Doses of 6 mSv or more from the Litvinenko incident are judged to be of *some concern* and warrant further urine monitoring and medical surveillance. Agency medical staff are providing on-going special support to the needs and concerns of this group. So far the Agency has identified **13** people having received doses above 6 mSv, including one adult member of Mr Litvinenko's family. (The 13 includes a new result from a further guest who visited The Pine Bar, at the Millennium Hotel London Mayfair, on 1 Nov 2006).

7. The process of collecting urine samples requires time, not least because people are required to provide urine over a full 24hrs to give sufficient material to test for Po-210. Following receipt of the sample, measurement of Po-210 in urine can then take a few days to complete because a slow evaporation and concentration process is required to transfer the material into a form suitable for measurement in an alpha radiation spectrometer. Then the dose assessment procedure based on this measurement takes further time, especially when relatively elevated levels of Po-210 have been found. Furthermore, a quality assurance scheme has been employed when recording and reporting results, which adds yet more time to the procedure. Given this, the dose assessment can take several days to complete, particularly when large numbers of people are providing samples.

8. Some comparisons of doses received from natural sources of radiation have been mentioned above. Some further information on radiation exposures from other sources may be useful for comparison.
    - Return flight (London – New York) 0.1 mSv

- Standard chest x-ray 0.02 mSv
- CT scan of head 2 mSv
- UK annual national natural background exposure (average) 2.2 mSv
- Living for a year in parts of the South West of England (radon) 8 mSv
- CT scan of pelvis 10 mSv

9. We advised that any member of the public in The Pine Bar on Oct 31 and Nov 2 (in addition to Nov 1) contact NHS Direct on 0845 4647 who will pass on their details to the HPA for further assessment.
   Our advice has also been that anyone who was in The Pine Bar on Nov 1, who has not yet contacted NHS Direct, is invited to do so.

10. The Agency has written to offer further advice to those people who were in The Pine Bar on Nov 1 and who had already contacted NHS Direct. A special helpline, staffed by experienced HPA staff, was set up. If requested by people in this group, a urine sample was tested. Arrangements were made for information to be provided to international guests.

11. Overseas visitors who were in the Pine Bar of the Millennium Hotel on Oct 31, Nov 1 and Nov 2 should email the Health Protection Agency for advice: overseasadvice@hpa.org.uk. If you do not have access to email you can contact NHS Direct on 00 (44) 845 4647 but only via a mobile telephone if you are calling from abroad. (If this does not connect you please try 0845 46 47 instead – again only from a mobile).

12. Further information is available on http://www.hpa.org.uk/polonium/default.htm

13. For the latest information on locations go to the London Resilience Team website at www.londonprepared.gov.uk

14. Media enquiries to HPA London press office on 020 7759 2824 or to HPA CRCE press office on 01235 822 744 or 01235 822 745. If you are calling out of hours please call 020 8200 4400.