

**IRR99 Requirements**

**HSE NOTIFICATION LEVEL:** for work ..... **100 kBq**  
 for inadvertent release or spill ..... **10 GBq**  
 for loss or theft ..... **1 MBq**

**CONTROLLED AREA needs to be considered:**  
 in relation to internal hazard if activity exceeds .....**186 MBq**  
 in relation to external hazard when the dose-rate exceeds 7.5 microsieverts per hour.

**SUPERVISED AREA** will be required if activity exceeds ..... **1 MBq**

**Supervised Area Limits (taking into account external hazard considerations -see below)**

Grade C lab - non-volatile work - up to 74 MBq  
 - volatile work in FC - up to 18.5 MBq

Grade B lab - non-volatile work - up to 740 MBq  
 - volatile work in FC - up to 185 MBq

**ANNUAL LIMIT OF INTAKE (ALI)** ..... **6.2 MBq**  
 (equivalent to dose of 20 mSv)

**Determining the need for a Controlled Area**

NRPB model in M443\* shows that when non-volatile materials are being used upto 120 ALIs can be handled in a Grade 'C' lab and 1200 ALIs in a Grade 'B' lab and be within a dose constraint of 0.2mSv i.e. a controlled area would not be required on the grounds of the internal hazard.

However, the external hazard considerations are more restrictive. Experience would indicate that provided screens and handling tools are used people can work safely from the stock pot with 37 MBq quantities without receiving significant doses. People have also worked with 370-740 MBq quantities of orthophosphate in a FC without receiving significant doses. We will therefore work to 1/10 of the levels described in M443 for the internal hazard and make these the maximum for a supervised area. Therefore, in a Grade C lab for typical work with non-volatile materials and with the work carried out behind screens, up to 74 MBq can be handled at any one time, and, in a Grade B lab for typical work with non-volatile materials and with the work carried out in a FC or a perspex enclosure, upto 740 MBq will be the maximum permitted quantity. A controlled area will only be required if these levels are exceeded (or the lower levels indicated above if work involves volatile materials).

Irrespective of the amount of P-32 in use, there is the obligation to keep doses as low as reasonably practicable. Strict adherence to the laboratory rules is essential, and monitoring should be performed on a regular basis to ensure that contamination is being kept below 37 Bq cm<sup>-2</sup>. Expected monitor responses at this level are as follows:-

Approx	Old Mini E	New E	EL	EP15
Counts above bg	46	59	159	140
( 37Bq cm <sup>-2</sup> )				

Dose-rate measurements can be estimated with a Mini E - approximately 20 cps representing 7.5 µSv<sup>-1</sup>.

\* NRPB-M443 Categorisation and designation of working areas in which unsealed radioactive materials are used. AP Hudson and J Shaw