



Bioassay Requirements

Excerpt of Radiation Safety Manual

3.4.3.5 Bioassay Requirements

Bioassay for a given radionuclide is required for any person who uses, in any one month, more than ten times the most restrictive Ingestion Annual Limit on Intake (ALI) that is specified for that radionuclide in Table 4B1 of Part 4 appendix B of the *Colorado Rules and Regulations Pertaining to Radiation Control*. The resulting monthly usage limits above which bioassay is required is shown in the table below. In this context, the word “usage” shall be construed to include total amounts contained in any vessels (e.g., stock vials) that the worker opens for removing smaller quantities.

Table of Usage Limits Requiring Bioassay

Radionuclide	Monthly Usage Limit Requiring Bioassay (mCi)
³ H	800
¹⁴ C	20
²² Na	4
³²P	** 6 **
³³ P	60
³⁵ S	60
³⁶ Cl	20
⁴⁵ Ca	20
⁴⁶ Sc	9
⁵¹ Cr	400
⁵⁷ Co	40
⁵⁹ Fe	8
⁶⁵ Zn	4
⁸⁵ Sr	30
⁸⁶ Rb	5
⁹⁰Y	4
¹¹¹ In	40
¹¹³ Sn	20
¹²⁵I	0.4
¹³¹I	0.3

As the statutory requirement for bioassay states that bioassay is required for “adults likely to receive, in one year, an intake in excess of 10 percent of the applicable ALI...” this criterion amounts to equating 120 ALI’s of usage (per year) with one tenth of an ALI of intake. This is equivalent to assuming that trained laboratory workers using good hygienic practices and working with non-volatile forms of radioactive materials do not take into their bodies more than 1/1200 of the radioactive material with which they work. The CIR has determined that this assumption is appropriately conservative for the stated conditions.