# Appendix D: Abbreviations, Conversions, Examples and Formulas

## Abbreviations

ALARA – As Low As Reasonably Achievable
Bq – Becquerel
Ci – Curie
cpm – counts per minute
DRS – Division of Research Safety
dpm – disintegration per minute
GM – Geiger-Mueller
Gy – Gray (unit of absorbed dose)
HPLC –
IEMA – Illinois Emergency Management Agency (formerly Illinois Department of Nuclear Safety (IDNS))
LDPE – low density poly ethylene
LSC – liquid scintillation count or liquid scintillation counter
mCi – millicurie
NaI – sodium iodide
PI – Principal Investigator
μCi – microcurie
R – Roentgen
Rad – radiation absorbed dose
DRS – Division of Research Safety
Rem – Roentgen equivalent man
Sv – Sievert

## Conversions

$2.22 \times 10^6$ dpm = 1 microcurie
1000 mirocuries = 1 millicurie
1000 millicuries = 1 Curie

## Formulas and examples

For determination of meter or wipe survey results, use:

$$\text{Activity (dpm)} = \frac{\text{(gross count rate – background count rate)}}{\text{instrument efficiency}}$$

Example: The GM meter response on a benchtop scan was 150 cpm. The background count rate was 40 cpm. For P-32, the GM efficiency is

approximately 50%. What is the amount of activity on the benchtop? Activity (dpm) = $\frac{(150 \text{ cpm} - 40\text{cpm})}{(0.50)}$ = 220 dpm

A survey instrument's efficiency can be determined for an individual radionuclide using a known standard (decay-corrected, if necessary) of the radionuclide. The standard is counted in a fixed geometry and the instrument count rate observed. The efficiency is then determined by the formula:

Efficiency (%) = $\frac{(\text{gross count rate} - \text{background count rate}) \times 100}{\text{Activity of standard (dpm)}}$