APPENDIX B

SIMPLIFIED PROCEDURE FOR CERTAIN USERS OF SEALED SOURCES, SHORT HALF-LIFE MATERIALS, AND SMALL QUANTITIES

A large number of users of radioactive materials may use a simplified procedure to demonstrate regulatory compliance for decommissioning, avoiding complex final status surveys. Sites that qualify for simplified decommissioning procedures are those where radioactive materials have been used or stored only in the form of: non-leaking, sealed sources; short half-life radioactive materials (*e.g.*, $t_{1/2} \leq 120$ days) that have since decayed to insignificant quantities; small quantities exempted or not requiring a specific license from a regulatory authority; or combinations of the above.

The user of a site that may qualify for implementation of a simplified procedure should provide the regulatory authority with a minimum of: (1) a certification that no residual radioactive contamination attributable to the user's activities is detectable by generally accepted survey methods for decommissioning; and (2) documentation on the disposal of nuclear materials, such as the information required in Form NRC-314 (Certification of Disposition of Materials). This minimum information may be used by the regulatory authority to document protection of both the public health and safety and the environment, based on the transfer, decay, or disposal of radioactive material in some authorized manner.

Normally, the absence of radioactive contamination can be demonstrated by: (1) documenting the amounts, kinds and uses of radionuclides as well as the processes involved; (2) conducting a radiation survey of the site; and (3) submitting a report on this survey. More specifically, a user of a qualified site should document from process knowledge and the nature of the use that either no or unmeasurable quantities of radioactive material remain onsite—whether on surfaces, buried, imbedded, submersed, or dissolved. The submittal to the regulatory authority should include possession history, use of the radioactive materials, and, if applicable, results of all leak tests. Where only small quantities or short half-life materials were handled, the regulatory authority may consider the documentation on a case-by-case basis.

For those sites where a simple final status survey is conducted to demonstrate compliance with the release criterion, the following information should be included in the final status survey report:

- basis for selecting the instrumentation used for the survey
- nature of the radionuclides surveyed
- measurement techniques and instruments used, including references for procedures and protocols used to perform the measurements

- minimum detectable concentrations (MDCs) of the instruments and measurement systems used to perform the measurements
- calibration, field testing, and maintenance of the instrumentation
- qualifications of the personnel using the instrumentation
- methods used to interpret the survey measurements
- qualifications of the personnel interpreting the survey measurements
- measurement results and measurement locations including the operator's name, instrument model and serial number, date the measurement was performed, and traceability of the measurement location

The number of measurements in each survey unit and each reference area can be determined using Table 5.3 for sites where the radionuclide of potential interest is present in background. The number of measurements for each survey unit where the radionuclide is not present in background can be determined using Table 5.5. Values for acceptable decision error levels (α and β) and the relative shift (Δ/σ) can be determined as described in Section 5.5.2. For sites where the simplified approach in this appendix is appropriate, reasonably conservative values for these parameters would be $\alpha = 0.05$, $\beta = 0.05$, and $\Delta/\sigma = 1$. After increasing the number of measurements by 20% to ensure adequate power for the statistical tests, Table 5.3 and Table 5.5 list a value of approximately 30 measurements for each survey unit and each reference. Therefore, 30 measurements may be used in place of the guidance in Section 5.5.2 at sites that qualify for the simplified survey design process.

The results of the survey should be compared to derived concentration guideline levels (DCGLs) using an appropriate statistical test, such as the Student's *t* test or Wilcoxon test. If all measurements are less than the $DCGL_W$, then the statistics do not need to be addressed because the conclusions are obvious. If the mean of the measurements exceeds the $DCGL_W$, the survey unit obviously fails to demonstrate compliance and the statistics do not need to be addressed.

Radiation levels and concentrations should be reported as follows:

- For external dose rates, units of:
  - milli-Sieverts (micro-rem) per hour at one meter from surfaces;

- For levels of radioactive materials, including alpha and beta measurements, units of:
  - Bq/m^2 (dpm/100 cm^2, pCi/100 cm^2) (removable and fixed) for surfaces;
  - Bq/L (pCi/mL) for water;
  - Bq/kg (pCi/g) for solids such as soils or concrete.