New Brunswick Laboratory
U.S. Department of Energy

Certificate of Analysis
CRM U005-A
Uranium Isotopic Standard
10 mg Uranium as U_3O_8

	^{234}U	^{235}U	^{236}U	^{238}U
Atom Percent:	**0.00340**	**0.5064**	**0.00118**	**99.4890**
Uncertainty:	**±0.00007**	**±0.0003**	**±0.00001**	**±0.0003**
Weight Percent:	**0.00334**	**0.5000**	**0.00117**	**99.4955**

This Certified Reference Material (CRM) is primarily intended for the calibration of mass spectrometers used to perform uranium isotopic measurements. The specific purpose of this isotopic standard is for the determination of mass discrimination effects for uranium isotopes being measured under similar analytical conditions. Each unit of CRM U005-A consists of approximately 10 milligrams of uranium, in the form of highly purified U_3O_8, contained in a glass bottle.

The indicated uncertainties for the isotopic composition of the CRM are 95% confidence intervals for the mean. For the minor isotopes (^{234}U and ^{236}U), these uncertainties take into account the uncertainties associated with separated and spike isotopes used in this certification work.

This CRM was originally issued in 1984 by the National Bureau of Standards (NBS) as Standard Reference Material (SRM) U-005a. The measurements made at NBS leading to the certification were performed by J.W. Gramlich, L. A. Machlan, and J.R. Moody, under the direction of E.L. Garner. The statistical analyses were performed by W. S. Liggett, NBS. In 1987, the technical and administrative transfer of NBS Special Nuclear SRMs into the NBL CRM Program was coordinated by the NBS Office of Standard Reference Materials and N. M. Trahey, NBL.

The certified isotopic abundance values were determined using a solid-sample thermal ionization mass spectrometer equipped with a Faraday cup detection system. The measured $^{235}U/^{238}U$ values were corrected for mass discrimination effects by intercomparison with synthetic calibration mixtures of similar ^{235}U levels, prepared from high-purity ^{235}U and ^{238}U separated isotopes. The $^{235}U/^{238}U$ value for this standard, 0.005090, is known to at least 0.03%.

The ^{234}U and ^{236}U abundances were determined by isotope dilution mass spectrometry using high-purity ^{233}U as the spike.

March 30, 2008
Argonne, Illinois

Jon Neuhoff, Director
New Brunswick Laboratory

(Editorial revision of Certificate dated October 1, 1987)