Eckert & Ziegler
Analytics

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CERTIFICATE OF CALIBRATION
Standard Reference Source

SRS Number: 113753
Source Description: 5 mL Liquid in Flame Sealed Ampoule
Product Code: 8131
Customer: LLNS/LLNL For the U.S. DOE/NNSA
P.O. Number: B636725, Item 2

This standard radionuclide source was prepared gravimetrically from a master solution calibrated with an ionization chamber. The ionization chamber was calibrated by the National Physical Laboratory (NPL), Teddington, U.K., and is traceable to national standards. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Reference Date: 27-August-2019 12:00 PM EST

Isotope	Half-Life, d	Activity, Bq	Uncertainty u_A, %	u_B, %	U, %*	Calibration Method**
I-131	8.025E+00	1.880E+06	0.1	0.7	1.4	IC

***Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." ****Calibration Methods:** 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

SRS Number: 113753

Comments:

5.00542 g of 0.1 M NaOH + 0.006 M Na_2SO_3 solution with approximately 30 µg/g I carrier.

Impurities:

γ-impurities < 0.1%

This source was wipe tested in its inactive areas with leak test results < 185 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by: _____

K. Eardley, Radiochemist

QC Approved by: _____ Date: 20-AUG-19

J. Lahr, Spectroscopist