

**QUESTION:** I was researching a variety of documents while developing local training presentations at my place of employment. I believe I may have found a discrepancy in ANSI/HPS N13.49-2001, "Performance and Documentation of Radiological Surveys." Section 4.3.2.1 MDCs for Surface Activity Assessment-Static Measurements states in the MDC equation [equation (4), page 16] a term in the numerator which conflicts with other publications commonly available. Time-background under the radical and outside the  $(1 + \text{Time-sample}/\text{Time-background})$  I think may be in error and should be the sample count time and not the background count time. If the standard is correct, please direct me to the appropriate references. The other sources I checked were:

- Daniel J. Strom, "False Alarms, True Alarms, and Statistics: Correct Usage of Decision Level and Minimum Detectable Activity," Continuing Education Lecture, Health Physics Society, Minneapolis, Minnesota, July 15, 1998
- NUREG-1507. "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions," page 3-7
- Gollnick, Daniel A., Basic Radiation Protection Technology 4th Edition, Pacific Radiation Corporation, 2000 (page 526)
- Cember, Introduction to Health Physics 3rd Edition, McGraw-Hill Professional, 1996 (page 409)

Thank you, Jeffrey Cady

**ANSWER:** Jeffrey Cady is correct. Equation (4) on page 10 of ANSI/HPS N13.49-2001 should read:

$$MDC = \frac{3 \cdot 3.29 \sqrt{R_B T_S (1 + T_S / T_B)}}{T_S \cdot \frac{W}{1000}}$$

The value in the numerator is derived from first principles by Strom and Stansbury (1992). With  $R_B$  representing the background count rate, the product  $R_B T_S$  is the expected number of background counts that would be observed during the sample count time  $T_S$ .

Reference

Strom DJ, Stansbury PS. Minimum detectable activity when background is counted longer than the sample. PNL-SA-20589." Health Physics 63(3):360-361; 1992. Available at [http://www.pnl.gov/bayesian/strom/pdfs/Strom1992A\\_PNL-SA-20589\\_DL&MDA\\_when\\_Background\\_Is\\_Counted\\_Longer.PDF](http://www.pnl.gov/bayesian/strom/pdfs/Strom1992A_PNL-SA-20589_DL&MDA_when_Background_Is_Counted_Longer.PDF)

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