

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

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EHS Circular Letter # 2014-20

DATE: May 7, 2014

TO: Asbestos Laboratory Directors

FROM: Dermot Jones, Environmental Laboratory Consultant/Certification Officer
Environmental Laboratory Certification Program (ELCP)

RE: Minimum air Sample Collection Volume Necessary for PCM Analysis of
Re-occupancy/Clearance Samples

The basis for granting certification to environmental laboratories for testing asbestos in air is in the laboratory analyst's ability to properly apply the NIOSH 7400 (issue 2, 1994) method in sample fiber counting. The Environmental Laboratory Certification Program (ELCP) has been recently asked to clarify the minimum sample volume that is necessary to be collected for analysis of re-occupancy or air clearance samples.

Section 19a-332a-1-12(g) of the Regulations for Connecticut State Agencies establishes fiber count reporting criteria. The regulation references the NIOSH 7400 method by indicating that "the concentration of fibers for each of the five samples collected for post abatement re-occupancy must be less than or equal to a limit of quantitation for PCM (0.010 fibers per cubic centimeter (0.010 f/cc) of air)." When reading this regulation there is an inference that suggests that the 0.010 f/cc is a reliable concentration at the limit of quantitation. However, the 0.010 f/cc concentration documented in the NIOSH 7400 method is a limit of detection for the method.

Understanding the difference between the regulation reference and the NIOSH method reference for the 0.010 f/cc concentration is important to establish a minimum air sample volume with regard to re-occupancy or clearance samples. The equation $C = (E) (Ac) / V * 1000$ is used for calculating airborne fiber concentrations where C is the concentration of fibers in f/cc, E is the fiber density, Ac is the collection area of the filter @ 385 mm² for a standard 25 mm filter and V is the air volume sampled. It can be determined in solving for V, the minimum air volume of interest, that **3,850** liters of air would be necessary to sample if 100 f/mm², which is at the minimum point of the optimal filter loading range (100 – 1300 f/mm²), is substituted for E and the target limit criterion of 0.010 f/cc is substituted for C. Theoretically, sampling 3,850 liters of air *may* achieve a filter loading of 100 f/mm² so that quantifiable fiber count results could be reported, but realistically that sample volume would overload a filter in most abatement settings.

Referring back to the 7400 method, it is documented that the quantitative working range of the method is based on a sample volume of 1000 L of air. Therefore, in **order to report reliable fiber count concentration results, it is necessary to collect a minimum volume of 1000 L for all re-occupancy and/or air clearance samples.**

cc Suzanne Blancaflor, MS, MPH, Section Chief, Environmental Health
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