NIST QUALITY ASSURANCE PROGRAMS FOR ENVIRONMENTAL MONITORING AND RESEARCH

The National Institute of Standards and Technology (NIST) coordinates quality assurance (QA) activities for environmental monitoring and research programs involved in the analysis of biological and environmental materials for chemical contaminants. Two programs for which NIST coordinates QA activities are the National Oceanic and Atmospheric Administration (NOAA) National Status and Trends (NS&T) marine monitoring program and the Marine Mammal Health and Stranding Response Program (MMHSRP).

The NIST QA programs for contaminant measurements consist of: (1) interlaboratory comparison exercises among laboratories; (2) the preparation, analysis, and distribution of analytical control materials; (3) the development of Certified Reference Materials (CRMs). All three of these components are important to provide the tools necessary to assess the accuracy and comparability of chemical contaminant measurements among laboratories and to maintain the quality of the analytical data. A major activity to determine and improve the comparability of analytical results among laboratories is the interlaboratory comparison exercise, which is the main component of the NIST QA programs. Control materials should be analyzed in conjunction with the regular samples, and the results of these analyses monitored to determine whether the analytical methods are in control. In all cases the control materials of most value are those similar to the matrix of interest (e.g., fresh frozen mussel tissue, a natural sediment, or fresh frozen whale blubber and liver). In addition, several CRMs have been developed for use in the analysis of specific environmental matrices (e.g., oyster tissue, mussel tissue, sediments, fish muscle, and marine mammal blubber).

The NS&T QA program was started in 1986 with seven laboratories conducting inorganic and organic contaminant analyses for the NS&T Benthic Surveillance and Mussel Watch projects. The NS&T QA program has separate organic and inorganic intercomparison exercises administered by NIST and the National Research Council Canada, respectively. This QA program has expanded beyond the laboratories originally involved in the NS&T program to include participation in the organic or inorganic intercomparison exercises of more than 60 state, federal, and private laboratories.

NIST in collaboration with NOAA National Marine Fisheries Service (NMFS) also administers a QA program for the measurement of organic and inorganic contaminants in marine mammal tissues. This QA program began in 1991 with interlaboratory comparison exercises among five laboratories analyzing marine mammal tissues for PCBs, chlorinated pesticides, and trace elements. Exercises have continue since then with laboratories involved in NOAA's MMHSRP, as well as other research projects that are analyzing marine mammal tissues for contaminants. This QA program will soon expand to include all U.S. laboratories measuring contaminants in marine mammal tissue as part of NOAA supported programs.

Both of the QA programs described above are part of the newly developed concept of a NIST National Marine Analytical Quality Assurance Program, the goals of which are: (1) to assess and improve the quality of analytical measurements in the marine environment through interlaboratory comparisons and reference material development, and (2) to improve the capabilities to assess trends in marine environmental quality by expanding environmental specimen banking activities, presently conducted by the National Biomonitoring Specimen Bank at NIST in Gaithersburg, Maryland. The National Marine Analytical Quality Assurance Program will be centered at the planned NIST facilities in Charleston, South Carolina, as part of the Marine Environmental Health Research Laboratory (MEHRL), a cooperative research facility that includes NIST, NOAA, the South Carolina Marine Resources Laboratory, the University of Charleston, and the Medical University of South Carolina. The MEHRL will be completed in 2000.

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