

CCME/CEA Mercury Laboratory Round Robin Project Synopsis (2002 – 2004)

The Canadian Council of Ministers of the Environment (CCME) Mercury Canada-wide Standards (CWS) Development Committee (DC), the Canadian Electricity Association (CEA), and Canadian coal-fired electric utilities are working cooperatively to refine the atmospheric mercury (Hg) emissions inventory from this sector for Canada. CCME member regulatory agencies and utility CEA stakeholders are carrying out a multi-year data-gathering program relating to the emission of mercury from utility coal-fired boilers. A laboratory quality assurance assessment program, to evaluate the uncertainty in the analysis and measurement of mercury in coal in Canada, was an integral part of this program.

The mercury laboratory round robin project used a multi-stage approach. A commissioning test phase was used at the start to determine each laboratory's capability to analyze a standard coal sample for mercury and other parameters.

In Phase I, participating laboratories were sent Certified Reference Materials (CRMs) and Reference Materials (RMs) for analysis. The primary objective of Phase I was to obtain an indication of the ability of Canadian laboratories to determine mercury (Hg) in a wide range of coal, as well as materials derived from, or related to, coal combustion. Eight of thirteen participating laboratories produced results consistent with the Phase I requirements. Phase I demonstrated that Canadian laboratories can produce mercury results for coal and coal related materials with a level of quality equivalent to any other testing community worldwide.

Phase II benchmarked selected coals used in Canada for mercury and other coal-specific properties, and provided on-going quality assurance for the two-year data collection program. During Phase II quarterly samples were sent out to the CCME/CEA approved laboratories identified in Phase I. Seven of the eight laboratories produced results consistent with the study requirements. Phase II demonstrated that Canadian laboratories continue to produce mercury results for coal consistent with quality assurance and control requirements specified in recognized international standards. It also showed that the CCME/CEA coals can be used as calibration and/or control samples for the determination of mercury.

The results of the round robin study serve only as an indicator of performance. Ongoing laboratory competence can only be established and monitored through a properly conducted quality assurance program, which should be verified by an independent audit of the laboratory operations consistent with the requirements of ISO 17025-2000, General Requirements for the Competence of Calibration and Testing Laboratories.