

National Ambient Air Quality Standards



RTI International provides an integrated analytical approach to gravimetric determinations and chemical analysis for the National Ambient Air Quality Standards (NAAQS). These services are routinely used by state and federal agencies, as well as utilities, mining operations, and environmental consulting firms. Using state-of-the-art instrumentation in specially designed facilities, RTI performs rigorous analysis and provides logistical support tailored to client monitoring network needs.

Overview

For more than 20 years, RTI has provided logistical and laboratory support to air monitoring programs and emissions control projects, including environmentally controlled mass measurements and support of filter analyses. For regulatory, environmental, manufacturing, energy, and agrichemical clients, RTI uses controlled-environment robotic gravimetry and optical carbon, XRF, and ICP-MS analysis for particle characterization and air quality assessment. Based on its review of the air quality criteria and NAAQS for lead and particulate matter (PM), the U.S. Environmental Protection Agency (EPA) has made revisions to the primary and secondary NAAQS for lead and particulate matter to protect public health and welfare.

EPA has revised the lead level from $1.5 \mu\text{g}/\text{m}^3$ to $0.15 \mu\text{g}/\text{m}^3$ while retaining the current indicator of lead in total suspended particles (TSP). Under a work assignment from EPA, RTI developed, validated, and led an inter-laboratory comparison study for the new Federal Reference Method (FRM), 40 CFR Part 50. Appendix G was updated with this method in July 2013. RTI has managed the National Contract for Ambient Air Lead Analysis since 2010, analyzing filters for TSP and PM_{10} by XRF.

Areas of Expertise

RTI's laboratories have the expertise and instrumentation to provide rapid, high-throughput response for NAAQS gravimetric and chemical analysis:

- Reference method for PM determination
- Reference method for determination of lead in TSP
- Reference method for the determination of lead in particulate matter as PM_{10} collected from ambient air
- Interpretation of NAAQS for particulate matter and lead
- Laboratory audits for 40 CFR Part 50 compliance
- Low-level chemical analysis and characterization
- Robotic optical carbon analysis

RTI's gravimetry and chemical analyses laboratories are accredited by the National Environmental Laboratory Accreditation Program for the performance of reference method determinations of PM and metals in ambient air.

Project Highlights

Gravimetry Laboratory

Since the Clean Air Act resulted in the NAAQS, RTI's gravimetry laboratory has specialized in FRM and FRM-compliant data quality. This experience enables RTI to perform routine scheduled support for FRM and FRM-compliant clients, handle special studies, and respond to unexpected environmental or laboratory events. RTI has been the preferred gravimetry laboratory for many states and non-state agency clients for unanticipated natural events and other data excursions for FRM laboratories that require a prompt yet thorough response. With RTI's experience and robotic weighing system (RWS), we are capable of providing routine and unexpected event support.

RTI's particulate matter gravimetry laboratory provides analysis, quality assurance/quality control (QA/QC), and data validation/management/reporting based on meeting or exceeding the requirements set forth in 40 CFR Parts 50 (Appendix J and L), 53, 53; *Federal Register* Volume 78 (10): January 15, 2013; QA Handbook Volume II: Ambient Air Quality Monitoring Program: EPA-454/B-13-003, May 2013.

Data quality for the method is enhanced by RTI's environmentally controlled weighing chambers, which provide reliable performance to adhere to tight environmental specifications. The RWS provides increased redundancy and precision over conventional weighing methods with built-in QA and substantially reduces the effect of static charge on the mass measurement result. RTI's dedicated, well-established weighing chambers, robotic filter weighing procedures, and QA/QC experience provide cost-efficient, high-throughput filter weighing capabilities to state agencies and other clients for long-term and episodic filter weighing.



Chemical Analyses

RTI's ability to respond to expedited requests for known or suspected anomalous events is frequently needed by government agencies. In addition to the analysis of lead, RTI has the analytical capability to quickly assess all other elemental impurities present. Using advanced analytical tools such as XANES, we can even determine the composition of species on the filter. On multiple occasions, monitoring agencies have needed to know whether the elevated lead concentration on a filter was the result of $PbCl_2$, $PbSO_4$, or a different lead compound to verify the identity of the suspected source emitter. Knowing the actual compound present can aid in identifying the specific process area of the emission source. Multi-elemental analysis of anomalous filters can be employed to assist monitoring agencies in determining assignable causes of events, such as firework shows. RTI has multiple ED-XRF instruments that analyze a suite of 33 elements to assist in determining the source of the particulate matter collected.

More Information

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