

Mercury Measurement Services



TRC's National Air Measurements Practice is the largest source emission testing group in the United States with the broadest geographic coverage.

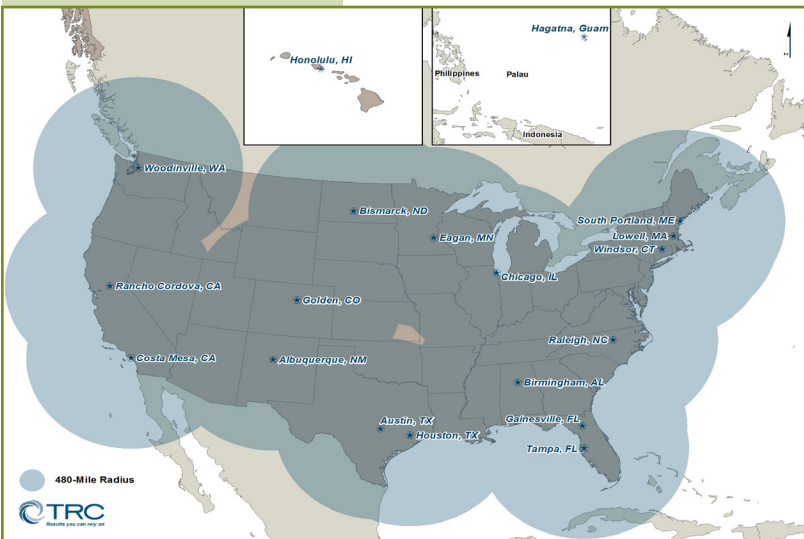
TRC's Air Measurement Services practice has assisted clients from every type of industry with air pollution measurements for over 40 years.

Companies that have to report mercury emissions are facing tough challenges in regards to reducing their mercury emissions and meeting the compliance limits. TRC utilizes the latest and most accurate methods to ensure our clients are reporting their emissions. Our air

measurements staff are highly experienced with the mercury testing methods including:

- Low Emitting Electrical Generating Unit (LEE) Testing
- EPA Reference Methods 29, 30B & 101A
- Real-time Continuous Mercury Monitoring Systems (CMMS)
- Turn-Key Sorbent Trap Mercury Monitoring Systems STMMS (formerly Appendix K Systems)
- RATAs on CMMS
- Temporary CMMS/STCMMS
- Speciated Mercury Sampling including Speciated Sorbent Traps & the Ontario Hydro Method (ASTM D-6784)
- On-site Mercury Analysis Thermal Desorption
- Inlet & Outlet Control Efficiency Sampling
- Ambient Air Monitoring

TRC has performed thousands of mercury test programs over the years. Our project experience includes electric generating units (EGUs), industrial boilers, independent power producers (IPPs), municipal and hazardous waste combustors, mining operations, cement kilns and control technology vendors. We regularly perform comprehensive mercury test programs including RATAs, across the country from our 17 regionally based offices. Complete RATA programs have been conducted on Tekran, Thermo and sorbent trap mercury monitoring systems.



About TRC's Air Measurement Services

A pioneer in groundbreaking scientific and engineering developments since the 1960s, TRC is a national engineering, consulting, and construction management firm providing integrated services to the energy, environmental and infrastructure markets. We serve a broad range of clients in government and industry, implementing complex projects from initial concept to delivery and operation.

A publicly-held corporation listed on the New York Stock Exchange (NYSE:TRR) – NYSE's oldest environmental firm– TRC includes 3,000 technical professionals and support personnel in more than 100 offices throughout the U.S. Our clients depend on TRC's multidisciplinary teams to design solutions to their toughest business challenges. We are one of the few firms capable of mounting multiple major field sampling efforts under unique, complex and difficult conditions with consistently dependable, high quality results. We provide the most thorough, precise and useful air measurement information to our clients through a combination of consulting engineering expertise/experience and proven measurement technology.

TRC is one of the world's largest providers of air measurement services. With more than 200 air quality scientists and engineers operating from a network of 17 offices, TRC's Air Measurement Services practice offers unparalleled breadth and depth of ambient monitoring capabilities within a day's drive of more than 90% of the emission sources in the US.

TRC has extensive experience with all mercury measurement methods and can help you design a mercury sampling strategy that satisfies your compliance planning or compliance demonstration objectives.



TRC utilized the Ontario Hydro Method for mercury testing at the Schiller and the Merrimack Stations in NH.



TRC conducted mercury emissions testing at the Salem Harbor & Brayton Point Generating Stations in MA.



TRC performed mercury testing at the coal-fired Four Corners Power Station in NM.



Safety is first at TRC; toolbox talks are performed at the beginning of each shift.

Our People:

- Implement superior technical solutions on highly visible projects
- Build customer loyalty
- Respond to our customers' specific needs in the most cost-effective manner
- Institutionalize success by using and passing along best practices

Mercury Measurement Primer

Mercury is challenging to measure because it can exist in three forms at stack conditions:

- Elemental mercury, represented as Hg⁰
- Oxidized mercury (e.g. HgCl₂, HgO), represented as Hg⁺²
- Particle bound mercury, typically represented as Hg^P

Source-specific regulations establish either total mercury (Hg^T) emission limits or vapor phase (Hg^{TG} for total gaseous) emission limits. Total mercury limits are based on the sum of all three forms. Vapor phase emission limits are based on the sum of only Hg⁰ and Hg⁺² emissions. Knowledge about the distribution of mercury in the source gas is important for demonstrating compliance with an emission limit and developing a control strategy. There are several reference methods that are used to measure mercury emissions, each yielding different information. Key mercury measurement methods and their application are summarized below:

The Ontario-Hydro Method, ASTM D6784, is the only mercury measurement method that provides discrete information about the distribution of mercury among the three phases. It is a complex and expensive test method; however, when the source is trying to develop a control and compliance strategy, it provides detailed data.

The Multiple Metals train, EPA Method 29, provides information about vapor phase and particle bound emissions. The method is not able to distinguish between elemental and oxidized mercury. Method 29 is also a complex method and expensive test method; however, it can serve as a reliable compliance demonstration method and is the method of choice when other metals of concern are present in the source gas.

EPA Methods 101 and 101A provide only information about total mercury emissions and are used on sources with a total mercury emission limit, such as chlor-alkali plants and sewage sludge incinerators.

EPA Method 30A is applicable to the measurement of total vapor phase mercury using an instrumental analyzer. Typically, Hg⁰ and Hg⁺² can be } quantified separately and then reported as the sum. Continuous mercury monitoring systems are based on EPA Method 30A and when used for compliance demonstration purposes, must meet the requirements of EPA Performance Specification 12A.

EPA Method 30B is also applicable to the measurement of total vapor phase mercury and relies on sorbent traps for sample collection. Importantly, EPA Method 30B is a performance-based method, meaning that it is self-validating when the performance criteria are achieved. Many sorbent trap manufacturers offer sorbent traps that can be recovered such that individual mercury species can be identified. It is important to note that because these samples are not collected isokinetically, the resulting mercury distribution information is applicable to the collected sample and may not be representative of the distribution of mercury in the source.