



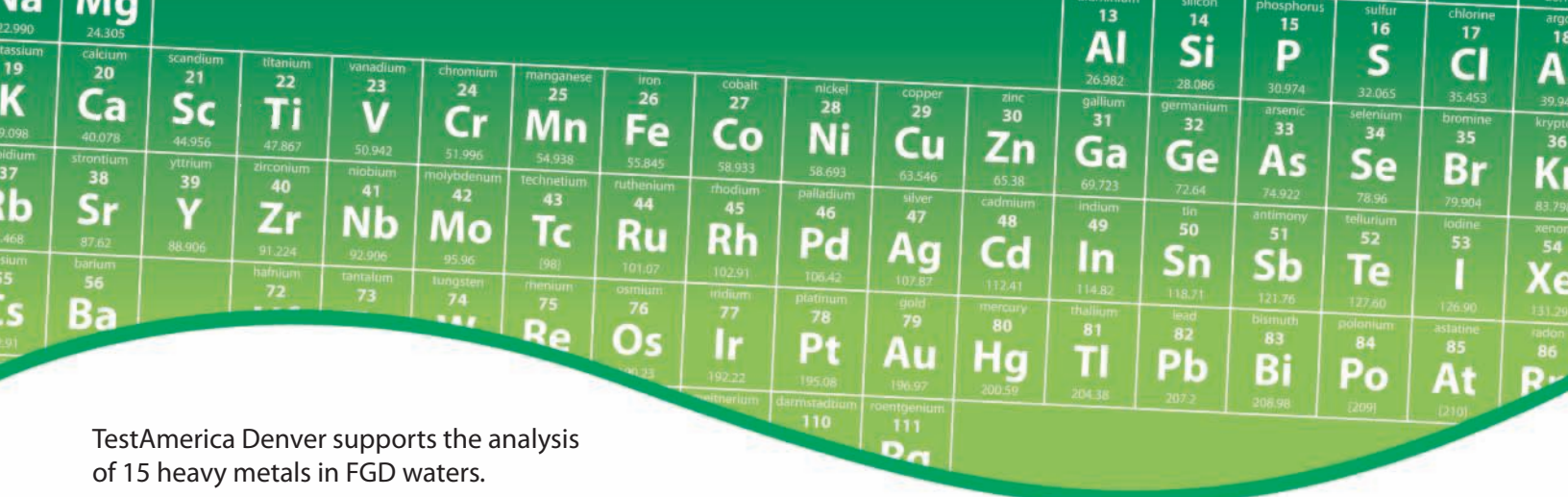
Flue Gas Desulfurization (FGD)

Wastewater Heavy Metals Testing by ICP-MS

Flue Gas Desulfurization wastewaters can have highly variable concentrations of boron, calcium, chloride, magnesium, manganese, nitrate, potassium, sodium, sulfate, and total dissolved solids. Concentrations of these elements present analytical challenges due to interferences.

TestAmerica supports these complex analyses for our clients utilizing:

- A method based on the draft U.S. EPA SOP developed for this matrix. Our SOP recommends the use of an ICP-MS with the instrument configuration and/or accessories designed to accommodate samples with high Total Dissolved Solids levels.
- Instrument modifications that operate the instrument in collision cell mode with a high matrix dilution system and a discrete sampling system for the complex FGD matrix.
- Without utilizing analytical techniques to mitigate interferences, decisions regarding FGD wastewaters could be made with inaccurate data.
- TestAmerica utilizes a synthetic FGD wastewater as the matrix for our Method Detection Limit (MDL) study.
- Additional method requirements of analyzing both a FGD interference check solution and a synthetic FGD wastewater sample have been incorporated to mitigate matrix interferences within our QC program.



TestAmerica Denver supports the analysis of 15 heavy metals in FGD waters.

Analyte		CAS Number	RL - ug/l
Silver	Ag	7440-22-4	1.00
Arsenic	As	7440-38-2	2.00
Barium	Ba	7440-39-3	1.00
Cadmium	Cd	7440-43-9	2.00
Cobalt	Co	7440-48-4	1.00
Chromium	Cr	7440-47-3	4.00
Copper	Cu	7440-50-8	2.00
Molybdenum	Mo	7439-98-7	1.00
Nickel	Ni	7440-02-0	2.00
Lead	Pb	7439-92-1	1.00
Antimony	Sb	7440-36-0	1.00
Selenium	Se	7782-49-2	2.00
Thallium	Tl	7440-28-0	1.00
Vanadium	V	7440-62-2	5.00
Zinc	Zn	7440-66-6	5.00



Have a Question About Flue Gas Desulfurization Metals Testing?



Dr. Richard Burrows
Method Development
Corporate Technical Director,
TestAmerica

Dr. Burrows was involved in the EPA's Method 1638 SOP and would be happy to help you with your questions. You may contact him through the TestAmerica website at:
<http://www.testamericainc.com/services/asktheexpert/experts/richard-burrows/>

TestAmerica Pioneered the Development of the U.S. EPA FGD ICP/MS Standard Operating Procedure: Inductively Coupled Plasma/Mass Spectrometry for Trace Elements Analysis in Flue Gas Desulfurization Wastewaters

FGD wastewater can vary significantly from plant to plant depending on the type and capacity of the boiler and scrubber, the type of FGD process used, and the composition of the coal, limestone, and make-up water. As a result, FGD wastewater represents the most challenging of samples for ICP-MS; it is very high in elements known to cause matrix interferences and also highly variable. To address this difficult analytical challenge, in 2009 the EPA commissioned the development of a new ICP-MS method specifically for FGD wastewaters. This method was developed and validated at TestAmerica Laboratories, Inc.

References:

Burrows, R. et al. (2011) Analysis of Flue Gas Desulfurization Wastewaters by ICP-MS. Spectroscopy 26(11) November 2011, 30-35.

U.S. EPA (2001) FGD ICP/MS Standard Operating Procedure: Inductively Coupled Plasma/Mass Spectrometry for Trace Element Analysis in Flue Gas Desulfurization Wastewaters 30 pp (Draft, May 2011)
http://water.epa.gov/scitech/wastetech/guide/steam-electric/upload/ICPMS_FGD_SOP_draft_5-10-2011.pdf

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