QUALITY ASSURANCE 1
Quality Assurance Audit Samples

A. Procedure

Quality Assurance Audit Samples are prepared by EPA's Atmospheric Research and Exposure Assessment Laboratory, Quality Assurance and Technical Support Division, Mail Drop 77A, Research Triangle Park, North Carolina 27711.

1. Only when making compliance determinations, obtain a quality assurance audit sample set from the Quality Assurance Management Office at each EPA regional office or the responsible enforcement agency. Make this request at least 30 days prior to the test date to allow sufficient time for sample delivery.
2. The same analysts, analytical reagents, and analytical system must be used for both compliance samples and the EPA audit samples; if this condition is met, auditing of subsequent compliance analyses for the same enforcement agency within 30 days is not required.
3. An audit sample set may not be used to validate different sets of compliance samples under the jurisdiction of different enforcement agencies, unless prior arrangements are made with both enforcement agencies.
4. Concurrently analyze the audit samples and a set of compliance samples.
5. Calculate the concentrations as specified in the audit instructions.
6. The concentrations of the audit samples obtained by the analyst must agree within the prescribed specifications. If the specification is not met, reanalyze the compliance samples and audit samples, and include initial and reanalysis values in the test report.
7. Failure to meet the specification may require retests until the audit problems are resolved. However, if the audit results do not affect the compliance or noncompliance status of the affected facility, the Administrator may waive the reanalysis requirement, further audits, or retests and accept the results of the compliance test. While steps are being taken to resolve audit analysis problems, the Administrator may also choose to use the data to determine the compliance or noncompliance status of the affected facility.
8. Indication of acceptable results may be obtained immediately by reporting the audit results in the units specified by the QA instructions and compliance results by telephone to the responsible enforcement agency.
9. Include the results of all audit samples, their identification numbers, and the analyst's name with the results of the compliance determination samples in appropriate reports to the EPA regional office or the appropriate enforcement agency. Include this information with subsequent compliance analyses for the same enforcement agency during the 30-day period.

B. Methods 6/6A/6B/8 Audit Samples

1. Each set will consist of two vials having sulfate solutions of unknown concentrations.
2. Specification: ±5% of actual concentrations.
3. For *Method 6B* only:
   a. Analyze the audit samples at least once for every 30 days of sample collection.
   b. If more than one analyst performed the sample analyses during the 30-day sampling period, each analyst must perform the audit analyses and all audit results must be reported.

C. Methods 7/7A/7B/7C/7D Audit Samples

1. Each set will consist of two vials having nitrate solutions of unknown concentrations.
2. Specification: ±10% of the actual audit concentrations.
3. For *Method 7B* only: Analyze the audit samples with each set of compliance samples or once per analysis day, or once per week when averaging continuous samples.
4. For *Method 7C* only: When requesting audit samples, specify appropriate concentration range.

D. Method 16A Audit Samples

1. Each set will consist of two vials having sulfate solutions of unknown concentrations.
2. Specification: ±5% of actual concentrations.

E. Method 15A Audit Samples

1. Each set will consist of two vials having sulfate solutions of unknown concentrations.
2. Specification: ±5% of actual concentrations.

F. Method 18 Audit Samples

1. Each set will consist of two audit cylinders or vials.
2. Specification: ±10% of the actual audit concentrations.
3. Analyze the audit samples prior to the sample analyses.
4. Perform the analysis audit described in 40CFR, Part 61, Appendix C, Procedure 2: "Procedure for Field Auditing GC Analysis."
5. Audit cylinders obtained from commercial gas manufacturers may be used provided:
   a. the manufacturer certifies the audit cylinder, and
   b. an independent analysis of the audit cylinder is performed yielding a concentration within ±5% of the reported concentration.

G. Method 23 Audit Samples

1. Each audit sample contains unknown quantities of tetra through octa isomers of PCDD and PCDF.
2. Analyze one audit sample with each set of compliance samples.

H. Method 25 Audit Samples

1. Each set will consist of two vials having organics of unknown concentrations.
2. Specification: ±20% of the actual audit concentrations.
3. Calculate the concentration of the audit samples in ppm.

I. Method 26/26A Audit Samples

1. Each set will consist of two vials having chloride solutions of unknown concentrations.
2. Specification: ±10% of the actual audit concentrations.
3. Calculate the concentration of the audit samples in mg/dscm.

J. Method 106 Audit Samples

1. Each set will consist of two cylinders containing vinyl chloride in nitrogen.
2. Analyze the audit samples prior to the sample analyses.
3. Perform the analysis audit described in 40CFR, Part 61, Appendix C, Procedure 2: "Procedure for Field Auditing GC Analysis."
4. The concentrations of the audit cylinders should be:
   a. 5 to 20 ppm vinyl chloride, and
   b. 20 to 50 ppm vinyl chloride.
5. Audit cylinders obtained from commercial gas manufacturers may be used provided:
   a. the manufacturer certifies the audit cylinder, and
   b. an independent analysis of the audit cylinder is performed yielding a concentration within ±5% of the reported concentration.

K. Method 108/108A/108B/108C Audit Samples

1. Each set will consist of two vials having arsenic solutions of unknown concentrations.
2. Calculate the concentration in g/dscm.

CALCULATIONS

Calculate the relative error (RE) for the QA audit samples in percent as follows:

$$RE = \frac{C_d - C_a}{C_a} \times 100$$

where:

C_d = Determined audit sample concentration.

C_a = Actual audit sample concentration.

***Note:** Determine the concentrations in the units specified in the audit instructions, i.e., ensure that both C_d and C_a are in the same units.*