

Bay Area Air Quality Management District

Manual of Procedures

Volume III

Laboratory Policy and Procedures

Prepared by:

Laboratory Section

October, 1996

Manual of Procedures
Volume III
Laboratory Policy and Procedures

Table of Contents

- 1) Introduction**
- 2) General Provisions**
 - 2.1 Laboratory Quality Assurance Program**
 - 2.2 Objectives of Quality Assurance Program**
 - 2.3 Accomplishing the Quality Assurance Program**
 - 2.4 Representative Sampling**
 - 2.5 Sample Submission and Continuity**
 - 2.6 Reagents**
 - 2.7 Distilled Water**
 - 2.8 Gas Chromatography**
 - 2.9 Atomic Absorption Spectroscopy**
 - 2.10 Spectrophotometers**
 - 2.11 Volumetric Glassware**
- 3) Applicability to Regulations**
- 4) Methodology**
 - 4.1 Equivalence**
- 5) Laboratory Procedures**
 - Procedure No. - Analytical Procedure**

1) INTRODUCTION

This volume of the Manual of Procedure specifies the analytical methods used for the determination of compliance to the Regulations of the Bay Area Air Quality Management District. As new methods are developed and found acceptable, they may replace or be added to the existing methods in this manual.

2) GENERAL PROVISIONS

2.1 Laboratory Quality Assurance Program: The goal of these procedures is to provide accurate and precise analyses, and it is essential that a laboratory assurance program be established and maintained.

2.2 Objectives of the Laboratory Quality Assurance Program are:

2.2.1 To provide ongoing information for monitoring unsatisfactory performance of personnel, equipment or procedures.

2.2.2 To provide prompt detection and correction of conditions which contribute to the generation of inadequate data.

2.2.3 To collect and supply information necessary to describe the quality of the data.

2.3 Implementation of the following elements will produce data of acceptable precision and accuracy.

2.3.1 Routine monitoring of the known variables which may affect the quality of data.

2.3.2 Routine training and evaluation of analysts.

2.3.3 Corrective action.

2.4 Representative Sampling

2.4.1 Analytical results, regardless of the accuracy and precision of the procedure, can not be better than the representativeness of a submitted sample.

2.5 Sample Submission and Continuity

2.5.1 All samples will be identified and the identification carried forth with the analytical results.

2.6 Reagents

2.6.1 Reagent grade or better chemicals shall be used. Lesser grades may be used provided it is first ascertained that their use will not degrade the accuracy of the determination.

2.6.2 Unless otherwise specified, inorganic reagents used in the preparation of standards shall be dried at 105°C for two hours and kept desiccated until used.

2.7 Distilled water or its equivalent shall be used for reagent preparations.

2.8 Gas Chromatography

2.8.1 Gas chromatographic units used shall have the required systems and sensitivities as specified in the procedure.

2.8.1.1 Each chromatograph will be equipped with a recorder which provides permanent charts for record purposes.

2.8.1.2 All carrier gases, fuel gases and air supplies will be free of interfering substances.

2.8.1.3 Analytical columns are specified in this manual for each procedure. The separation characteristics of an alternate column must be comparable to those specified.

2.9 Atomic Absorption

2.9.1 Atomic absorption spectrophotometers utilized should have the following minimum specifications:

- a) Analytical wavelength coverage of 1937A to 7800A.**
- b) Less than 0.3% light scatter at 3000A.**
- c) Less than 1% noise at full gain.**
- d) Slit system to provide 5A resolution.**

2.9.2 Acetylene, nitrous oxide, and air supplies used will be those commonly used for best analytical results.

2.10 Spectrophotometers

2.10.1 Spectrophotometers employed for colorimetric and turbidimetric procedures should be capable of operation in the 340 to 700 nm range.

2.10.2 Spectrophotometers should have a grating or prism system capable of ± 25 nm reproductivity of wavelength settings.

2.10.3 Spectrophotometers should be checked for wavelength accuracy once per year using a didymium filter or comparable system.

2.11 Volumetric Glassware

2.11.1 Class A glassware shall be used for all volumetric flasks, pipettes and burets employed in the procedures. Class A specifications are identical to those found in the National Bureau of Standards publication "Circular 602".

3) APPLICABILITY

3.1 Each analytical procedure is applicable to a specific regulation, division and section. The designated numbering system applying to the regulation appears on the upper left corner of each procedure.

4) METHODOLOGY

4.1 Alternate analytical procedures may be used provided that such procedures have established equivalency to an accepted reference method. Any questions relating to equivalency may be referred to the Chief of Laboratory Services.

4.1.1 Appropriate ASTM and EPA approved methodologies will be deemed equivalent procedures.

5) LABORATORY PROCEDURES

- Meth 1** **Determination of Ammonia in Effluents.**
- Meth 2** **Determination of Beryllium in Effluent & Atmospheric Particulate Matter.**
- Meth 3** **Determination of Dimethylsulfide in Effluents.**
- Meth 4A** **Determination of Lead Content in Atmospheric Particulate Matter.**
- Meth 4B** **Determination of Total Lead in Effluents.**
- Meth 5** **Determination of Total Mercaptans in Effluents.**
- Meth 6** **Determination of Particulate and Gaseous Mercury Emissions.**
- Meth 7A** **Determination of Oxides of Nitrogen in Effluents (Alkaline Permanganate Procedure).**
- Meth 7B** **Determination of Oxides of Nitrogen in Effluents (Grab Sample Procedure).**
- Meth 8** **Determination of Phenols in Effluents**
- Meth 9** **Determination of Compliance of Solvents, Coatings, and Related Products.**
- Meth 10** **Determination of Sulfur in Fuel Oil.**
- Meth 11** **Determination of Sulfur Dioxide in Effluents.**
- Meth 12** **Determination of Sulfur Dioxide, Sulfur Trioxide, and Sulfur Acid Mist in Effluents.**
- Meth 13** **Determination of the Reid Vapor Pressure of Petroleum Products.**
- Meth 14** **Determination of Trimethylamine in Effluents.**
- Meth 15** **Standardization of Carbon Dioxide Calibration Gas.**
- Meth 16** **Standardization of Carbon Monoxide Calibration Gas.**

- Meth 17** Standardization of Hydrocarbon Calibration Gases.
- Meth 18** Standardization of Hydrogen Sulfide Calibration Gas.
- Meth 19** Standardization of Nitric Oxide Calibration Gas.
- Meth 20** Standardization of Sulfur Dioxide Calibration Gas.
- Meth 21** Determination of Compliance of Volatile Organic Compounds for Water Reducible Coatings.
- Meth 22** Determination of Compliance of Volatile Organic Compounds for Solvent Based Coatings.
- Meth 23** Determination of Volatile Emissions from Polyester Resins.
- Meth 24** Determination of Total Fluoride in Effluents.
- Meth 25** Determination of Hydrogen Sulfide in Effluents.
- Meth 26** Determination of Volatile Weight Loss of Gel Coats.
- Meth 27** Determination of Vinyl Chloride in Effluent.
- Meth 28** Determination of Vapor Pressure of Organic Liquids from Storage Tanks.
- Meth 29** Determination of Ethanol in Bakery Effluents.
- Meth 30** Determination of Volatile Organic Compounds (VOC) in Solvent Based Non-heat Set Inks.
- Meth 31** Determination of Volatile Organic Compounds in Paint Strippers, Solvent Cleaners and Low Solids Coatings.
- Meth 32** Determination of Hydrogen Sulfide in Process Water Streams.
- Meth 33** Determination of Dissolved Critical Volatile Organic Compounds in Wastewater Separators.
- Meth 34** Determination of Hexavalent and Total Chromium in Effluent Samples from Electrolytic Chrome Plating Operations.

- Meth 35** **Determination of Volatile Organic Compounds (VOC) in Solvent Based Aerosol Paints.**
- Meth 36** **Determination of Volatile Organic Compounds (VOC) in Water Based Aerosol Paints.**
- Meth 37** **Determination of Perchloroethylene in Dry Cleaning Filtration Wastes.**
- Meth 38** **Determination of Petroleum (Stoddard) Solvent in Dry Cleaning Filtration Wastes.**
- Meth 39** **Determination of Styrene Monomer Contents of Polyester Resin Material.**
- Meth 40** **Determination of Volatile Organic Compounds in Adhesives.**
- Meth 41** **Determination of Volatile Organic Compounds in Solvent Based Coatings and Related Materials Containing Parachlorobenzotrifluoride.**
- Meth 42** **Determination of Ammonia in Coatings, Inks and Related Materials.**
- Meth 43** **Determination of Volatile Methylsiloxanes in Solvent Based Coatings, Inks and Related Materials .**