

STATE OF CALIFORNIA
AIR RESOURCES BOARD

AIR MONITORING QUALITY ASSURANCE

VOLUME V

AUDIT PROCEDURES
FOR
AIR QUALITY MONITORING

APPENDIX Q

PERFORMANCE AUDIT PROCEDURES
FOR LEAD ANALYSIS
(TOTAL SUSPENDED PARTICULATE (TSP) - LABORATORY AUDITS)

MONITORING AND LABORATORY DIVISION

AUGUST 2007

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FOR LEAD ANALYSIS
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PERFORMANCE AUDIT PROCEDURES
FOR LEAD ANALYSIS
(TOTAL SUSPENDED PARTICULATE (TSP) - LABORATORY AUDITS)

MONITORING AND LABORATORY DIVISION

AUGUST 2007

Q.1.0 INTRODUCTION

Q.1.0.1 GENERAL INFORMATION

The Inorganics Laboratory Section of the Air Resources Board's (ARB) Monitoring and Laboratory Division (MLD) participates in the United States Environmental Protection Agency (U.S. EPA) National Performance Audit Program (NPAP) for lead. An audit sample filter with accompanying data forms is sent to ARB's Quality Assurance Section (QAS) from U.S. EPA. QAS delivers the audit sample filter and data forms to the Inorganics Laboratory for processing and analysis. The laboratory uses atomic absorption spectrophotometry and follows their standard operating procedures (SOP) for processing and analysis to determine the amount of lead in suspended particulate matter. Analysis results are submitted to QAS for return to U.S. EPA for final calculations. U.S. EPA calculates the percent difference of the sample for lead and sends the results back to QAS. QAS then forwards the results with a cover letter to the Inorganics Laboratory with recommendations.

The purpose of the audit is to assess the accuracy of the laboratory's ability to determine the amount of lead in suspended particulate matter.

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PERFORMANCE AUDIT PROCEDURES
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Q.2.0 AUDIT PROCEDURES

Q.2.0.1 INITIATION OF AUDIT

Upon receiving U.S. EPA audit filters, QAS documents the receipt of the filter and accompanying data forms and forwards them to the Inorganics Laboratory for analysis.

Q.2.0.2 STANDARD OPERATING PROCEDURES

All U.S. EPA supplied filters being audited by the Inorganics Laboratory are processed using SOP 005, 10/16/2004.

Q.2.0.3 COMPLETION OF AUDIT

Upon completing filter processing and analysis, the Inorganics Laboratory shall return the audit datasheet (see Figure Q.2.0.1) containing raw data and any additional comments or information to QAS.



306002

Lead Audit (0406)

For optimum accuracy, it is recommended that characters be written block style without touching sides. Please use black ink only! See example below:

0 1 2 3 4 5 6 7 8 9

Date of Analysis 11 / 14 / 06

Sample Number

Results
µg/filter strip

1406

757.2

2406

203.2

The closing date for this audit is Dec 1, 2006



Figure Q.2.0.1
Lead Audit Datasheet

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PERFORMANCE AUDIT PROCEDURES
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Q.3.0 POST AUDIT CALCULATIONS

Q.3.0.1 RETURN RESULTS TO U.S. EPA

After reviewing the laboratory results for completeness, QAS shall send the raw data report to U.S. EPA for calculation of the results.

Q.3.0.2 CALCULATION OF PERCENT DIFFERENCE

U.S. EPA shall calculate the percent difference between ARB's laboratory results and U.S. EPA's expected results using the following equation:

$$\text{Percent Difference} = \frac{(\text{Measured Conc.} - \text{Assigned Conc.})}{\text{Assigned Concentration}} \times 100$$

Q.3.0.3 FINAL AUDIT REPORT

Upon receipt of U.S. EPA's audit results (see Figure Q.3.0.1), QAS will forward the results with a cover letter to the Inorganics Laboratory with recommendations (see Figure Q.3.0.2 Example Cover Letter).

Results of Lead (Pb) Audit

For Fourth Quarter 2006

Subject: Lead Audit results for 2006 audit
From: Peele.Janie@epamail.epa.gov
Date: Mon, 18 Dec 2006 16:54:56 -0500
To: mbueto@arb.ca.gov
CC: Brown.Catherine@epamail.epa.gov, kkronmiller@alionscience.com

These are your audit concentrations and our percent differences from your concentrations. If you have questions, please email, either me or Mark Shanis at: shanis.mark@epa.gov or you can call us. Mark: 919-541-1323 Janie: 919-541-3148

(Embedded image moved to file: pic06379.jpg) (Embedded image moved to file: pic10943.jpg)

Lab	High Conc (ug/filter)	High Error (%)	Low Conc (ug/filter)	Low Error (%)
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306002	757.2	11.11	203.2	6.53
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Figure Q.3.0.1
Final Lead Audit Results Report Sheet



Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov



MEMORANDUM

TO: Cliff Popejoy, Manager
Inorganics Laboratory Section

FROM: Merrin Bueto, Manager
Quality Assurance Section

DATE: December 20, 2006

SUBJECT: NATIONAL PERFORMANCE AUDIT PROGRAM FOR THE TOXIC METALS (LEAD) ANALYSIS – AUDIT RESULTS

Thank you for participating in the United States Environmental Protection Agency's (U.S.EPA) annual National Performance Audit Program (NPAP) for the analysis of lead (Pb) on quartz filter strips. The Inorganics Laboratory Section analyzed the audit materials using standard operating procedure MLD005. The audit results were within U.S. EPA's performance limits of $\pm 15\%$; however, Sample Number 1406 exceeded the warning limit of $\pm 10\%$. The Quality Assurance Section recommends the laboratory to investigate the cause of this difference. Below are the audit results for your review.

Sample Number	Reported Value *	Actual Value *	% Difference
1406	757.2	681.49	11.11
2406	203.2	190.74	6.53

* ug Pb/filter strip

If you have any questions regarding the laboratory performance audit, please contact Harnek Nijjar at 322-7317 or via email at hnijjar@arb.ca.gov.

cc: Jeff Cook
Mike Poore
Harnek Nijjar
Peter Samra