

**C206 – Specific Checklist: Environmental Lead Testing Laboratory Accreditation Program**

**(May 2006)**

The following pages present the criteria from *R207 – Specific Requirements: Environmental Lead Testing Laboratory Accreditation Program* in a checklist format. The laboratory’s policies and procedures must meet these requirements. Quality system documentation and supporting records must be available for the assessor’s review.

**Laboratory Instructions:** If the requirements include the need for a written policy, procedure or arrangement, that requirement statement in this checklist is shaded. *The laboratory should complete the document reference identifiers in the checklist’s second column (labeled ‘reference’) for each shaded requirement.* The appropriate ‘reference’ can include quality manual, laboratory manual, SOPs, records, etc. references. The references provided should specify procedure number, page number and section number, where possible. *Completion of this checklist serves to help both the laboratory and the assessor prepare for the assessment and may save a significant amount of assessment time and cost.*

**Assessor Instructions:** Review the laboratory’s documented quality system to verify compliance with the applicable Environmental Lead (Pb) Program documentation requirements. Assess to verify that the documented quality system is indeed implemented as described. **Every checklist item should be accompanied by a tick mark in the yes, no or n/a space.** Record comments related to any requirement in the space provided and sign on the appropriate line on page 2. Assess the laboratory’s technical competence to perform specific tests or specific types of tests. Record comments related to tests on the Test Method Matrix. Additional comments can be noted on the draft scope. All deficiencies must be identified and explained in the assessor deficiency report.

Laboratory Name: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

Date: \_\_\_\_\_

Lab Code: \_\_\_\_\_

Assessment ID: \_\_\_\_\_

Certificate #(s): \_\_\_\_\_

Assessor(s) Name(s): \_\_\_\_\_

**C206 – Specific Checklist: Environmental Lead Testing Laboratory Accreditation Program**

**I, hereby, attest that all laboratory document references below as well as actual laboratory practice have been assessed for compliance with R207 – Specific Requirements: Environmental Lead Testing Laboratory Accreditation Program. Any areas of noncompliance have been fully described in the Assessor Deficiency Report.**

**Assessor Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
4. <u>Management Requirements</u>					
4.1 <u>Organization</u> (No Additions)					
4.2 <u>Quality System</u> (No Additions)					
4.3 <u>Document Control</u> (No Additions)					
4.4 <u>Review of Requests, Tenders and Contracts</u> (No Additions)					
4.5 <u>Subcontracting of Tests</u>					
4L.5.1 Lead testing included in a laboratory's A2LA Scope of Accreditation shall be sub-contracted only to other NLLAP-approved laboratories.					
4.6 <u>Purchasing Services and Supplies</u> (No Additions)					
4.7 <u>Service to the Client</u> (No Additions)					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
4.8 <u>Complaints</u> (No Additions)					
4.9 <u>Control of Nonconforming Testing</u> (No Additions)					
4.10 <u>Improvement</u> (No Additions)					
4.11 <u>Corrective Action</u>					
4L.11.1 If the reported values of QC samples fall outside of the acceptance limits stated in the method, samples associated with the batch are to be reanalyzed including a new set of QC samples; no sample values are to be reported unless the QC samples are within the acceptance limits. Laboratories shall document, investigate and take corrective action for all episodes where the QC data shows an out-of-control situation. No data shall be reported until the cause of the problem is determined and corrected, or the laboratory demonstrates the cause was a random event and no longer affects data. The laboratory shall keep records of all out-of-control events, the determined cause(s) and corrective actions taken. Laboratories shall respond to client quality complaints and maintain records of corrective action.					
4.12 <u>Preventive Action</u> (No Additions)					
4.13 <u>Control of Records</u>					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
The laboratory shall establish and maintain a records system ensuring that:					
4L.13.1 All observations and calculations are recorded in a permanent manner (such as laboratory/field notebooks, pro-forma work sheets, or magnetic media) at the time they are made and that the units of measurement in which observations are recorded are stated;					
4L.13.2 When Chain of Custody records are utilized or required (e.g., by the state or client), they shall establish an intact, contiguous record of the physical possession, storage and disposal of collected samples and shall include signatures of all individuals (including laboratory personnel) who had access to individual samples.					
4L.13.3 Original records are uniquely identified and traceable to the tests or test items to which they refer and to any test reports based upon them;					
4L.13.4 Records contain sufficient details of any significant departures from test specifications or other specified procedures including authorizations for such departures;					
4L.13.5 Records identify the person or persons involved in sampling, preparation, calibration, analysis and final reporting as well as those responsible for checking data transcriptions and calculations;					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
4L.13.6 A log is maintained of names, initials and signatures for all individuals who are responsible for signing or initialing any laboratory record;					
4L.13.7 Corrections or amendments to test records are made with a single-line strike-through in a manner that does not obliterate the original data and are signed or initialed by the person responsible.					
4L.13.8 Test records shall be protected from loss, damage, misuse or deterioration and shall be retained for an appropriate period in a manner that permits retrieval when required. Test records that are created and/or retained on magnetic media (e.g., computer disks) or photographic media (e.g., microfiche) shall be stored in a manner that protects them from the hazards that affect such media and provision shall be made for the printing of such records when required.					
4L.13.9 The laboratory shall maintain records related to environmental lead (Pb) analyses a minimum of 10 years. All hardware and software necessary for the historical reconstruction of data must be maintained by the laboratory. Alternatively, it is acceptable to utilize novel hardware and/or software to recreate historical files. However, the performance of the novel hardware/software must be demonstrated on historic files before they are substituted for the original system.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
4L.13.10 The records system shall provide for retrievability and traceability of the sample source, the methodology of analysis/testing, results (including calibration and instrument checks), the person performing the analysis, the date, (in the case of mobile laboratories the location where the analytical work was performed);					
4L.13.11 A secure archive is maintained where access, deposit and removal of records are controlled and documented.					
4L.13.12 In instances where the laboratory is going out of business, clients of Pb analyses done under the NLLAP, are to be notified 60 days in advance of the closure of the laboratory. The laboratory shall have a plan for ensuring that records are maintained or transferred according to the client's instructions and applicable regulations. All final test reports generated by the laboratory as required in section 13 are to be submitted to the clients if not previously done.					
4.14 <u>Internal Audits</u> (No Additions)					
4.15 <u>Management Reviews</u>					
4L.15.1 The quality system shall be reviewed at least once a year by the laboratory management to ensure its continuing suitability and effectiveness and to introduce any necessary changes or improvements,					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5. <u>Technical Requirements</u>					
5.1 <u>General</u> (No Additions)					
5.2. <u>Personnel</u>					
5L.2.1 Technical Manager. The technical manager (however named) shall possess a college degree in chemistry or a related science and have at least 3 years of non-academic analytical laboratory experience of which at least 2 years shall be metals analysis experience. The technical manager shall be available during at least 50% of the laboratory operating hours to address technical issues for laboratory staff and customers. The technical manager position must be held by a laboratory employee and may not be contracted out.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
<p>5L.2.2 <u>Quality Manager</u>. The quality manager (however named) shall possess a college degree in a basic or applied science and have at least 1 year of non-academic analytical chemistry experience and training in statistics. Alternatively, the quality manager can have a college degree in other than the basic or applied sciences, with at least 4 years of non-academic analytical chemistry experience and training in statistics. The technical manager may also function as the quality manager so long as he/she does not act in the position as the sample analyst/technician analyzing the samples or act as the immediate supervisor of the analyst/technician involved with the analysis of the samples. The quality manager may be employed by the laboratory on a part-time basis or as a consultant in order to meet the external monitoring function of the position.</p> <p>(NOTE: The "training in statistics" requirement can be met through an in-house training course sponsored by the laboratory or chemistry courses including a discussion and application of statistics.)</p>					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
<p>5L.2.3 <u>Laboratory Supervisors</u>. These individuals shall have a bachelor's degree in chemistry or related field with a minimum of one year of non-academic experience in metals analysis. Successful training in specific metals methods used in the laboratory shall be verified and documented using reference materials of the matrices of concern. Proficiency testing results must be documented. Individuals without a degree in chemistry or a related field can be recognized as laboratory supervisors as long as they meet the training and proficiency testing requirements stated above and have demonstrated to be proficient in metals analyses over a period of at least three years.</p>					
<p>5L.2.4 <u>Analyst/Technician</u>.</p> <p><u>Analyst</u>: an individual who performs sample analyses and possesses a bachelor's degree in chemistry or a related science.</p> <p><u>Technician</u>: an individual who performs sample analyses who does not have a degree in chemistry or a related science.</p> <p>Analysts and technicians shall have a minimum of 30 calendar days of hands-on experience conducting analyses in an inorganic/metals laboratory before initiation of work on NLLAP-related samples.</p>					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.2.4.1 Prior to performing analyses on NLLAP samples, Lead (Pb) analysts/technicians shall have completed an external and/or internal training course for Lead or applicable metals analysis and have demonstrated ability to produce reliable results through accurate analysis of standard reference materials (SRMs), proficiency testing samples, or in-house quality control samples. Their performance must be documented.					
5L.2.4.2 Analysts/Technicians in training shall complete a minimum of four independent test runs of sample preparation and/or instrumental analysis. Independent runs are defined as analytical runs consisting of at least five samples, one of which is a certified reference material or proficiency testing material, separated by a period of time sufficient to evaluate the performance of any previous independent runs.  (NOTE: The reference/proficiency test samples utilized shall: 1) be similar to matrices the analyst will encounter during routine sample analysis, 2) cover the sample mass range for which the analytical SOP has been designed and 3) cover the Lead (Pb) concentration for which the analytical SOP has been designed. In cases where there are several matrices of potential concern, four independent runs will not be sufficient to provide adequate demonstration of performance.)					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.2.4.2.1 For sample preparation training, the recoveries of the associated reference materials or proficiency training samples for each run must be within $\pm 20\%$ of the certified value, 75% of the time.					
5L.2.4.2.2 For instrumental analysis training, the recoveries of the associated reference materials or proficiency training samples for each run must be within $\pm 10\%$ of the certified value, 75% of the time.					
5L.2.5 Analysts/Technicians involved in Lead (Pb) analyses shall periodically demonstrate their ability to adequately analyze samples for Lead (Pb) based on standard reference materials (SRMs) or certified reference materials. This demonstration shall be done at a minimum of every six months and can be a part of the analysis of proficiency testing materials or quality control samples associated with routine sample runs.					
5L.2.6 The laboratory shall have documented evidence contained in their training records of analyst/technician initial and ongoing proficiency for each test method or activity performed on the matrices of concern. The documentation shall include a description of the training program content, the duration of the training, qualifications of the trainer and evidence that the analyst/technician has successfully performed the number of required test runs and successfully analyzed unknown reference samples of the matrices of concern within the specified acceptance criteria.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.2.7 The following additional training requirements shall be met for all mobile and field testing personnel:					
5L.2.7.1 All mobile and field operation laboratory personnel involved in the designation of sampling areas as part of a Lead-based paint risk assessment in target housing and/or child occupied facilities shall be certified by the EPA or an authorized state or tribal program as a risk assessor pursuant to Section 402 of the Toxic Substance Control Act (TSCA).					
5L.2.7.2 All mobile and field operation personnel shall have the capability to communicate with their supervisor or technical manager while on site at a field job location.					
5L.2.7.3 All mobile or field operation technicians shall be accompanied by a qualified supervisor for their initial two NLLAP-related job sites.					
5L.2.8 The criteria and training requirements for all laboratory personnel (including field and mobile laboratory personnel) shall be clearly defined and documented in the laboratory's quality system documentation.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5.3 <u>Accommodation and Environmental Conditions</u>					
5L.3.1 <u>Contamination Control</u> . For fixed-site and mobile laboratory facilities, laboratory dust wipe sampling and analysis shall be conducted at least quarterly to determine surface concentration levels of lead in the laboratory. Sample preparation and analysis is not to proceed until surface contamination is less than the specified maximum allowable concentration of 40 micrograms per square foot. For field testing, appropriate contamination control blank samples shall be analyzed in order to monitor potential Lead contamination.					
5L.3.1.1 Labware cleaning procedures shall be specified by the laboratory in a written SOP. The procedure must include a periodic monitoring of lead concentrations in cleaning baths, where applicable, or the monitoring of glassware contamination during the analysis of reagent or other blanks. The monitoring frequency must be at least once a month.					
5L.3.1.2 Where the laboratory is responsible for taking dust sample wipes in the field, the laboratory must evaluate blank wipes representative of the lots to be used in the field for lead contamination analysis prior to field sampling.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
The laboratory shall:					
5L.3.2 Use distilled/demineralized water that it can demonstrate to be free of interferents at detection limits;					
5L.3.3 Routinely check and record the conductivity of distilled/demineralized water (for a continuous system, check should be per batch or daily);					
5L.3.4 Provide exhaust hoods for volatile materials (per 29 CFR 1910.1450, Occupational Exposure to Toxic Substances in Laboratories and ANSI/AIHA Z9.5-1992, American National Standard for Laboratory Ventilation);					
5L.3.5 Have written detailed procedures and facilities in place for collection, storage, and disposal of chemical wastes (40 CFR 261);					
5L.3.6 Appropriately store corrosive, reactive, or explosive chemicals safely in conformance with 29 CFR 1910; and					
5L.3.7 <u>Laboratory Safety</u> . Laboratory personnel should apply general and customary safety practices as a part of good laboratory procedures. Each laboratory must have a safety and chemical hygiene plan (per OSHA rule 29 CFR 1910.1450) as part of their standard operating procedures. Where safety practices are included in an approved method, they must be strictly followed.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5.4 <u>Test Methods and Method Validation</u>					
The laboratory shall:					
5L.4.1 Have documented procedures to check the validity of reported analysis values;					
5L.4.2 Use at least ACS reagent grade chemicals to prepare standards;					
5L.4.3 Use primary standard and QC reference materials;					
5L.4.4 Prepare fresh analytical standards at a frequency consistent with good laboratory practices unless otherwise stated in the method (frequency is a function of concentration and type of matrix; generally, the lower the concentration the less stable the standard);					
5L.4.5 Properly label reference materials/reagents with concentrations, date of preparation, expiration date and the identity of the person preparing the reagent; and					
5L.4.6 Have standards preparation documentation such as a preparations record book.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.4.7 SOPs for test methods shall supply or refer to information addressing the following areas:  Interferences Instrument Calibration Scope and Application Applicable Matrix or Matrices Summary of the Method Applicable Sample Mass Range Definitions Applicable Pb Concentration Range Safety Considerations Quality Control Procedures Apparatus and Equipment Detailed Step-by-Step Procedure Reagents and Supplies Sample Calculations Sample Preservation and Storage Method Performance (Accuracy and Precision) Sample Preparation Method Detection Limit Sample Collection (as applicable) Data Acceptance Criteria Corrective Actions for Out-of-Control Data Contingencies for Handling Out-of-Control Data References					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.4.8 <u>Acceptable Methodology</u> . Procedures published by federal agencies (e.g., USEPA, NIOSH), nationally or internationally recognized technical authorities are acceptable to use once the laboratory has demonstrated and documented adequate performance of the method for each particular matrix as well as for the sample mass range and concentration of interest. The method performance procedures used must be documented.					
5L.4.8.1 Methods under consideration for analytical testing shall demonstrate a quantitation limit equal to or less than 20% of the lowest relevant action level or regulatory limit of interest.					
5L.4.8.2 Alternative or modified analytical methods may be used by a laboratory if they have been validated by the laboratory as meeting the minimum performance requirements specified in this document. The method validation must be documented.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.4.9 <u>Method Performance Evaluation</u> . Linear calibration ranges (or working calibration ranges) shall be established and routinely verified for each method. Method detection limits (MDLs) shall be established and statistically verified at least annually for each method and matrix of concern (paint chips, soil, and/or dust). For methods with stated MDLs, the laboratory shall demonstrate and document its ability to achieve such MDLs. MDLs shall be determined using procedures published or recognized by federal agencies (e.g., US EPA, NIOSH) or nationally or internationally acknowledged technical authorities (e.g., ISO, IUPAC).					
5L.4.10 Where subsampling (obtaining sample aliquots from a submitted sample) is carried out as part of the analytical method, the laboratory shall use documented procedures and appropriate statistical techniques to obtain representative subsamples.					
5.5 <u>Equipment</u>					
For analytical balances/pan balances:					
5L.5.1 Analytical balances shall be capable of weighing to 0.1 mg.;					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.5.2 Records of balance calibration shall be kept for at least two ranges (no more than two decades apart) using weights that conform to at least Class 3 tolerances;					
5L.5.3 Records showing functional/calibration checks each day of use for analytical balances and monthly for other balances shall be maintained; and					
5L.5.4 The balances shall undergo metrological calibration at least annually.					
For labware and sample collection devices:					
5L.5.5 All such devices shall be cleaned in a manner appropriate for the analytical procedures for which it is to be used.					
For ovens:					
5L.5.6 Thermometers shall be graduated in increments no larger than 1°C;					
5L.5.7 If oven temperature cannot be read without opening the door, the bulb of the thermometer shall be immersed in a sand bath; and					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.5.8 Oven temperature shall be adequately monitored and controlled (e.g., beginning and end of each use cycle).					
<u>For hot plates:</u>					
5L.5.9 Maintain the center of the hot plate at a temperature sufficient to sustain a mild reflux.					
<u>For microwaves ovens:</u>					
5L.5.10 Calibrate the power available for heating weekly (This quality control function is performed to determine that the microwave has not started to degrade and that absolute power settings (watts) may be compared from one microwave unit to another).					
<u>For thermometers:</u>					
5L.5.11 The laboratory shall have access to a NIST (NBS)-traceable thermometer for use in verifying working thermometers;					
5L.5.12 The calibration of working mercury-in-glass thermometers shall be checked at least annually against a NIST (NBS)-traceable certified thermometer; and					

Requirement	Reference	[RESERVED FOR ASSESSORS ONLY]			
		Compliance			Comments
		Y	N	NA	
5L.5.13 The calibration of dial-type thermometers shall be checked at least quarterly against a NIST(NBS)-traceable thermometer.					
<u>For autopipetors/dilutors:</u>					
5L.5.14 The apparatus shall have sufficient sensitivity for the intended use; and					
5L.5.15 Records shall be kept showing delivery volumes are checked gravimetrically at least monthly.					
<u>For reagents and standards, the laboratory shall:</u>					
5L.5.16 Specify their requirements in its documented quality system;					
5L.5.17 Use ACS reagent grade or the quality specified by the analytical methods in use;					
5L.5.18 Inspect, verify concentration (if appropriate), date, assign expiration date, and initial upon receipt;					
5L.5.19 Not use reagents and standards beyond their expiration dates.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5.6 <u>Measurement Traceability</u>					
The laboratory shall, as appropriate:					
5L.6.1 Use quality control materials and calibration standards that are traceable to NIST standards;					
5L.6.2 Document the frequency, conditions, and standards used to establish calibration of all analytical/testing methodology; and					
5L.6.3 Verify and document all working standards versus primary (reference) standards.					
5L.6.4 Instrument performance checks shall be carried out before use for analysis of samples. Such checks shall include, as appropriate, evaluation of instrument sensitivity, noise levels and absorbance/emission levels versus historical values. Acceptance criteria shall be stated.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.6.5 Calibration curves shall be prepared daily (before the analysis of samples) to adequately cover the expected concentration ranges of the samples using at least 3 calibration standards (except for ICP) and one blank, unless otherwise specified by the method employed. Acceptance criteria shall be stated. New curves shall be prepared whenever an out-of-control condition is indicated and after new reagents are prepared. All calibration curves shall be dated and labeled with applicable method, instrument identification, analysis date, analyte concentration and instrument response information.					
5L.6.5.1 When used, the axes of the calibration curve shall be labeled. For electronic data processing systems that automatically compute the calibration curve, the equation for the curve and the correlation coefficient must be recorded. The equation for the line and the correlation coefficient shall also be recorded when the calibration is prepared manually.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.6.5.2 A new curve shall be determined if two consecutive analyses of one continuing calibration check sample are outside acceptable limits. When the continuing calibration check limit is exceeded high (i.e., high bias) and there are non-detects for the corresponding analyte in all environmental samples associated with the continuing calibration check, then those non-detects may be reported. Otherwise, the samples affected by the unacceptable check shall be reanalyzed after a new calibration curve has been established, evaluated and accepted. Additional sample analysis cannot occur until a new calibration curve is established and verified.					
5L.6.6 For ICP analyses, where possible, a minimum of a two-point calibration plus a blank shall be performed each day of use before the analysis of samples. Linearity shall be confirmed by the calibration standards, their concentrations encompassing the concentration range of interest for the samples to be analyzed. Analysts using instruments with software utilizing only a single high standard for calibration, are to perform a calibration check using a reference sample with a concentration at the low end of the range of interest. In addition, an interference check standard shall be analyzed each day of use. Acceptance criteria shall be stated (see below).					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.6.7 Calibration blanks must be successfully analyzed before and periodically with the analysis of samples. The calibration blank solutions consist of the same reagents used to digest samples. Performance criteria are stated in section 5L.8. Prior to analyzing samples, an initial calibration verification (ICV) standard must be analyzed. The source of the ICV standard must be independent from the instrument calibration samples and NIST traceable. Performance criteria are stated in section 5L.8. Continuing calibration verification (CCV) standards shall be analyzed in accordance with the analytical SOP. The CCV standard may be prepared from independent reference standards or from the same standards used to prepare the instrument calibration curve. Acceptance criteria shall be stated.					
5L.6.8 Field testing devices shall be calibrated as required by the testing procedure. Acceptance criteria shall be stated. In the absence of a requirement in the testing procedure, calibration shall be in accordance with the manufacturer's specification.					
<u>Sampling (No Additions)</u>					
<u>Handling of Test Items</u>					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
The laboratory shall:					
5L.8.1 Have documented procedures for the collection, shipment, receipt, unique identification (including multiple samples and subsamples), storage and disposal of samples as appropriate.					
5L.8.2 Give samples an unambiguous sample number when collected and/or logged;					
5L.8.3 Maintain a permanent record for sample collection and log-in data;					
5L.8.4 Store samples in such a way as to maintain their identity, integrity, stability, and concentration and document the manner and duration of sample retention;					
5L.8.5 Follow documented chain-of-custody procedures, when required.					

Requirement	Reference	[RESERVED FOR ASSESSORS ONLY]			
		Compliance			Comments
		Y	N	NA	
5L.8.6 The laboratory shall have a sample custodian who shall be responsible for the sample control/logging. The procedures involved include the control, identity, preservation, condition of samples, and sample handling, storage, and disbursement for analysis. An identification scheme shall be documented and utilized, when applicable, in order to designate sample extracts, split samples and duplicates. The laboratory shall have a person responsible for ensuring that all analyses are performed within any USEPA/HUD or method-specified holding times, where appropriate.					
5L.8.7 Along with a procedure for sample receipt, sample acceptance/rejection criteria shall be documented as well as procedures for advising field personnel and the client of problems with samples. The sample acceptance policy shall include, but is not limited to, the following areas of concern:					
5L.8.7.1 Proper, full and complete documentation which shall include sample identification, the location, date and time of collection, preservation type (where relevant), sample matrix and any special remarks concerning the sample;					
5L.8.7.2 Proper sample labeling that includes unique identification;					
5L.8.7.3 Use of appropriate sample containers;					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.8.7.4 Adequate sample mass in order to perform the analysis.					
5L.8.8 If the sample does not meet the sample acceptance criteria, the laboratory shall:					
5L.8.8.1 Retain correspondence and/or records of conversations concerning the final disposition of rejected samples or fully document any decision to proceed with the analysis of compromised samples. The condition of these samples shall, at a minimum, be noted on the chain of custody or transmittal form and laboratory receipt documents.					
5L.8.8.2 The analysis data shall be appropriately "qualified" on the final report.					
5L.8.9 The laboratory shall utilize a permanent chronological record to document receipt of all samples. The following information must be recorded in the laboratory log:					
5L.8.9.1 Date of laboratory receipt of sample;					
5L.8.9.2 Sample collection date (if known);					
5L.8.9.3 Unique laboratory identification code;					

Requirement	Reference	[RESERVED FOR ASSESSORS ONLY]			
		Compliance			Comments
		Y	N	NA	
5L.8.9.4 Field ID code supplied by sample submitter;					
5L.8.9.5 Sample matrix;					
5L.8.9.6 Requested analyses, including approved method number, if applicable;					
5L.8.9.7 Signature or initials of sample logger (where applicable); for electronic sample logging systems, the identity of the logging operator;					
5L.8.9.8 Comments resulting from inspection for sample acceptance or rejection.					
5.9 <u>Assuring the Quality of Test Results</u>					
5L.9.1 The laboratory shall comply with the quality control (QC) requirements of applicable federal or state environmental or public health agencies when testing specific matrices and the requirement as specified below:					
5L.9.2 <u>Quality Control Procedures.</u> The laboratory shall have QC procedures (SOPs) specific to each test technology addressing, as appropriate, the use of:					
5L.9.2.1 Reagent/method blank analyses;					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.9.2.2 Replicate/duplicate or "side-by-side" field sample analyses;					
5L.9.2.3 Spiked and blank sample analysis;					
5L.9.2.4 Blind samples;					
5L.9.2.5 Quality control samples;					
5L.9.2.6 Control charts or equivalent;					
5L.9.2.7 Calibration standards;					
5L.9.2.8 Reference material samples;					
5L.9.2.9 Internal standards; and					
5L.9.2.10 Split/spiked field sample analyses;					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.9.3 <u>Quality Control Practices.</u> The laboratory quality control program shall include the continual evaluation of its performance (system process control) for each matrix which includes the determination of accuracy and precision. The required minimum performance criteria and QC sample frequency are stated below for analytical SOPs employing AAS or ICP in the absence of QC sample frequency determinations based on the use of system process control data produced by the laboratory for the specific method utilized.					
5L.9.4 In the analysis of soil, dust (vacuum) and paint chip matrices, samples may be too small and difficult to homogenize and split in order to obtain samples for matrix spike evaluations or replicate analyses. For samples where such is the case, the laboratory must select alternative QC options such as the analysis of duplicate laboratory control samples per batch in order to monitor laboratory performance.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.9.5 <u>Accuracy and Precision Determinations for Paint Chip, Soil and Vacuumed Dust Samples.</u> Matrix spiked samples shall be analyzed with a minimum frequency of five percent (5%) of the samples for each matrix, per batch of samples (samples processed at a single time). If there are fewer than 20 samples in a batch, at least one spiked sample for each matrix, per batch shall be analyzed. Replicate (duplicate) samples shall be analyzed with a minimum frequency of five percent (5%) of samples for each matrix, per batch of samples. If there are fewer than 20 samples in a batch, at least one sample for each matrix, per batch shall be analyzed. In the event the analyte is not detected in the sample, replicate matrix spike samples may be analyzed.					
5L.9.5.1 Matrix spike samples shall be prepared using a split field sample (before any digestion process). When possible, the split sample chosen shall be one identified with the lowest concentration of Lead detected and the level of Lead spiked shall be enough to result in a final Lead concentration of the prepared sample of twice the sample's observed native Lead concentration or five times the method detection limit, whichever is greater.					
5L.9.5.2 For field samples too small and difficult to homogenize and split in order to obtain samples for matrix spike evaluation or replicate analyses, the laboratory shall select alternative QC options. One of these options is the analysis of duplicate laboratory control samples for each batch in order to monitor laboratory performance.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.9.6 <u>Accuracy and Precision Determinations for Dust Wipe Samples.</u> When analyzing wipe samples, method spike samples shall be prepared using blank collection media with a minimum frequency of 5%. If there are fewer than 20 samples per batch, at least one method spike/spike duplicate set shall be analyzed per batch. The matrix samples are to be prepared using a lead-based paint (NIST SRM traceable) applied directly to the wipe.					
5L.9.7 <u>Method Blanks.</u> When using methods requiring sample pretreatment not performed on calibration standards, a method blank containing all reagents and subject to all preparation steps shall be processed and analyzed along with the samples. Method blanks shall be analyzed with a minimum frequency of five percent (5%) of the samples for each matrix, per batch of samples. If there are fewer than 20 samples in a batch, at least one method blank for each matrix, per batch shall be analyzed. The use of method blanks provide a measurement of laboratory and/or reagent contamination. Method blanks shall not be used to correct sample results.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
<p>5L.9.8 <u>External Reference or Laboratory Control Sample Analysis</u>. Prior to sample analysis, at least one independent lead reference or laboratory control sample (LCS) shall be analyzed with each matrix, per batch of samples with a minimum frequency of 5%. If there are fewer than 20 samples per batch, then at least 1 reference or control sample shall be analyzed per batch per matrix type. The concentration of the control sample shall be within the working range of the method and shall not require extensive pretreatment, dilution or concentration prior to analysis. Sources of these samples include but are not limited to: NIST Standard Reference Materials, proficiency testing samples from the ELPAT Program, commercially available certified reference samples, or samples prepared from different sources of analyte than calibration standards and whose concentrations were determined using definitive methods. All reference or laboratory control sample materials shall be NIST traceable.</p> <p>(Note: The LCS must be a sample provided in each batch of like matrix for the samples being analyzed. The LCS may not be a pre-digested sample used as a spiking standard solution.)</p>					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.9.9 <u>Acceptance Limits</u> . Acceptable performance limits for analytical instrumentation as well as each method shall be established based upon the continuing statistical evaluation of data generated by the analysis of quality control samples, unless specific minimum acceptance limits are established by the method. The laboratory's calculation procedures for statistically derived acceptance limits shall be documented. Some methods have listed acceptance criteria for applicable analytes based upon determinations by a single laboratory, the compilation of data from many laboratories, or limits that are assumed or expected. These limits may be too broad to define accurate acceptance criteria for routine use. These limits are best used as guidelines during the initial phases of method use and are superseded when the laboratory has collected sufficient self-generated data for proper statistical evaluation.					
In the absence of sufficient data for the statistical determination of adequate QC sample frequency, the following minimum QC sample frequencies are required (where applicable) for analytical SOPs employing AAS or ICP instrumentation:					
QC Sample / Frequency / Acceptance Limits					
(a) Initial Calibration Verification / Once per run after calibration / Within $\pm 10\%$ of known value.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
(b) Initial Calibration Blank / Once per run at the beginning of run / Absolute value not more than 10% of the regulatory limit or minimum level of concern.					
QC Sample / Frequency / Acceptance Limits					
(c) Continuing Calibration Verification / Before and at the end of a sample run as well as every 10 samples, or every 12 hours, or according to manufacturer's recommendations – which is most frequent / within $\pm 15\%$ of known value for ICP or FAAS; within $\pm 20\%$ for GFAA.					
(d) ICP Interference Check Sample / Beginning & end of each run or twice every 8 hours for ICP analysis / Within $\pm 20\%$ of known value.					
(e) Continuing Calibration Blank / After each ICS and CCV / Absolute value not more than 10% of regulatory limit or minimum level of concern.					
(f) Laboratory Control Sample / 1 per 20 samples or batch (5%) / Within $\pm 20\%$ of known value.					
(g) Matrix Spike / 1 per 20 samples or batch (5%) / Within $\pm 25\%$ of known value.					
(h) Duplicate Field Sample / 1 per 20 samples or batch (5%) / Within $\pm 25\%$ RPD for values $\geq 5$ times the detection limit.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
(i) Method Blank / 1 per 20 samples or batch (5%) / Absolute value not more than 10% of the regulatory limit or minimum level of concern.					
5L.9.10 <u>Control Charts</u> . Control charts or a quality control data base shall be used to record quality control data and track laboratory performance with the associated acceptance limits for each matrix and to evaluate instrument performance. Control charts shall specify warning and action limits for acceptance or rejection of QC data. In the absence of a statistically sufficient data base to determine the necessary frequency for QC samples, the laboratory must default to the frequencies outlined in Section 5L.8.					
5.10 <u>Reporting the Results</u>					
5L.10.1 Test reports must be reviewed and signed by the technical manager or his/her designee taking responsibility for the test. Test reports must conform to the documentation requirements of Appendix B when more than twenty (20) analysis results are reported.					
5L.10.2 The laboratory shall have documented procedures for data collecting, reducing, reporting and record keeping.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
5L.10.2.1 The data reduction and review process shall include, but not necessarily be limited to: comparison of quality control data against established acceptance limits, computation verification, transcription of data and adherence to the procedures established in the laboratory SOPs. The review process shall be documented.					
5L.10.3 All final test reports shall undergo the documented data review process before release to the client. All data reviews shall be conducted and signed by a qualified person not directly involved in the physical preparation and/or analysis of the samples in question. Qualified persons are defined as technicians, analysts, supervisors, technical managers and/or quality managers.					
5L.10.4 The laboratory shall have documented procedures for correcting erroneously reported results.					

Requirement	Reference	{RESERVED FOR ASSESSORS ONLY}			
		Compliance			Comments
		Y	N	NA	
<p>5L.10.5 <u>Method Quantitation Limit</u>. The reporting of zero concentration is not permitted. The laboratory shall establish a method of limiting the lower reported values to a positive finite Lead (Pb) level that is appropriate for the technology being utilized. Measured Lead (Pb) levels below this positive finite value shall be reported as "less than" ("&lt;") this positive finite value. The quantitation limit shall be reported as "less than" ("&lt;") a value no greater than 10 times the determined method detection limit.</p> <p>(NOTE: The term "ND" (Not Detected) can be used on test reports in place of "&lt;". However, if "ND" is used, it must be defined on the report as being a value below the quantitation limit of the method being used for analysis and the method quantitation limit must be stated on the report.)</p>					