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1 SCOPE

This manual follows the requirements specified by American Society of Crime Laboratory Directors/Laboratory Accreditation Board—International (ASCLD/LAB-International) Program, which is based on the ISO/IEC 17025:2005 standards and the 2011 ASCLD/LAB-International Supplemental Requirements.

1.1 INTERNATIONAL STANDARD: GENERAL REQUIREMENTS

The International Standard (ISO/IEC 17025:2005) specifies the general requirements for competence to carry out sampling and testing. It covers testing using standard methods, non-standard methods, and laboratory developed methods.

1.2 INTERNATIONAL STANDARD: SCOPE

The International Standard is applicable to each discipline performing tests, regardless of the number of personnel or the extent of the scope of testing activities. When the laboratory does not undertake one or more of the activities covered by the International Standard, then the requirements of those clauses do not apply.

1.2.1 ASCLD/LAB-INTERNATIONAL PROGRAM

As part of the ASCLD/LAB-International Program, ASCLD/LAB includes supplemental requirements to the International Standard to address items specific to forensic science testing. “Forensic science testing” refers to the examination of crime scenes, recovery of evidence, laboratory examination/analysis, interpretation of findings, and presentation of the conclusions reached for investigative or intelligence purposes or for use in court. The broad field of forensic science involves the examination and/or analysis of a wide range of items and substances.

The Arkansas State Crime Laboratory is accredited through the ASCLD/LAB-International Program in the disciplines and categories of testing listed in the following table.
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*Table 1: Disciplines and Categories of Testing*
2 NORMATIVE REFERENCES

The following referenced documents were used to prepare this manual, in order to meet the ASCLD/LAB-International Program requirements. Each document's location is referenced in brackets.

- **International Vocabulary of Metrology- Basic and General Concepts and Associated Terms (VIM)**, 2008. [Qualtrax®]
- **Arkansas Code Annotated (A. C. A.) §§ 12-12-301 through 12-12-313** [Qualtrax®]
- **Quality Assurance Standards for Forensic DNA Testing Laboratories**, 2009 [Qualtrax®]
- **Quality Assurance Standards for Forensic DNA Databasing Laboratories**, 2009 [Qualtrax®]
3 TERMS AND DEFINITIONS

The following list defines words used in this manual. These definitions may also be located in the appropriate section(s).

ADJUSTMENT
The process performed to correct a measuring system in order to meet the required specifications.
*Example: Daily adjustment of a balance, using a certified reference mass, before use.*

ADMINISTRATIVE SAMPLING
An application of sample selection, in which samples are selected for testing in order to meet statutory guidelines.

APPROVAL AUTHORITY
Personnel who are authorized to approve controlled documents.

CALIBRATION
A process (with established measurement uncertainty) which establishes a relation between the response of a measuring instrument and known quantity values (e.g., from certified reference standards), which may be used to obtain a measurement result from an instrument response. This should not be confused with the routine adjustment of a measuring system (see “adjustment”).
*Examples: Calibration of micropipettes or balances to a NIST-traceable standard by an outside vendor.*

CAN
“Can” indicates a possibility or a capability. The antecedent is allowed, but not required.
*See also: shall, should, and may.*

CHAIN OF CALIBRATIONS
An unbroken sequence of calibrations from the measuring system in question to a national (or international) measurement standard, where each calibration contributes to the total measurement uncertainty.

CHEMICAL
A substance or compound used for its constant chemical composition or characteristic properties.
*Examples: Acidic or basic solutions, Davidow solvent*

CONTRACT
An agreement between the laboratory and the customer.
*Example: Acceptance of a submission sheet from a customer by the ASCL.*

CONTROL
A substance or compound used to determine whether a method and/or instrument is responding as expected.
*Examples: Positive and negative controls*
**CONTROLLED DOCUMENT**
A document with a specified revision, approval authority, and revision approval date, distributed in a manner which ensures that the recipients of controlled copies receive subsequent revisions and replace previous revisions.

*Examples: Forms required for use by management, Quality Manuals, Training Manuals, administrative policies, and organizational charts.*

**CRITICAL**
A critical consumable, supply, or service is one which must meet one or more crucial specifications to ensure the quality of test results.

**DOCUMENT**
Information in any medium including, but not limited to: paper copy, computer disk or tape, audiotape, videotape, photograph, overhead, or photographic slide.

**DOCUMENT CONTROL**
The process for ensuring that controlled documents (including revisions) are reviewed, approved, and issued by authorized personnel, and distributed to personnel performing the prescribed activities. Additionally, document control ensures that the current revision is readily available for use and archived copies are stored appropriately.

**ISSUING AUTHORITY**
Personnel who are authorized to publish approved controlled documents.

**LABORATORY-DEVELOPED METHODS**
Laboratory-developed methods are new methods, or modifications of standard or non-standard methods, created by the laboratory.

**MAY**
“May” indicates a permission. The antecedent is allowed, but not required.

*See also: shall, should, and can.*

**MEASURAND**
A quantity or object to be measured.

**MEASUREMENT**
The process of experimentally obtaining one or more results that describe a property of the measurand.

**NON-STANDARD METHODS**
Non-standard methods are methods or procedures published by reputable technical organizations, such as Scientific Working Groups (SWGs), Technical Working Groups (TWGs), relevant scientific texts or journals, or the manufacturer of the equipment.
PERFORMANCE VERIFICATION
Objective confirmation that the performance requirements of a measuring system have been achieved.

Examples: balances, internal IR polystyrene compared to a known polystyrene reference to confirm that the instrument/equipment is fit for service.

PRACTICABLE
Able to be successfully put into practice (i.e., possible).

QUALITY RECORDS
Quality records include any documents that record conformity to the quality management system.

Labwide records include, but are not limited to: reports from internal audits, controlled document review and approval, management reviews, and records of corrective and preventive actions.

Discipline-specific records include, but are not limited to: method and equipment verification records, reagent and chemical QC logs, training records, proficiency and competency test records, courtroom testimony monitoring records, chemical inventory records, reference collection records, and audit records.

REAGENT
A substance or compound added to a system to cause a chemical reaction or to determine whether a reaction occurs.

Examples: Marquis, Duquenois-Levine, ninhydrin, phenolphthalein, sodium rhodizonate solution

RECORD
A document that contains analytical results or documentation of performed activities. These records include, but are not limited to:

- analytical notes (e.g., instrumental data, analytical worksheets, and packaging notes),
- logs (e.g., equipment, reagent, chemical, training, proficiency, competency, and testimony), and
- quality control documents (e.g., corrective action requests, preventive action requests).

REFERENCE
A reference standard or a reference material. It may also be referred to as a measurement standard.

REFERENCE MATERIAL
A traceable material used for the calibration, performance verification, or adjustment of a measurement device. These materials are normally accompanied by documentation issued by an authoritative body.

Examples: Drug standards, instrument tuning compounds (e.g., PFTBA, polypropylene glycol)
REFERENCE STANDARD
A standard (traceable through a chain of calibrations) used for the calibration, performance verification, or adjustment of other measurement devices.
Examples: NIST traceable weights and rulers

REQUEST
The process used by a customer when seeking analysis by the laboratory.
Example: The customer completes an evidence submission sheet and provides associated evidence to the ASCL for analysis.

SAMPLING
Taking only a part of an item for testing in order to reach a conclusion, make an inference about, and report on the whole. Sampling shall only be used when there is a reasonable assumption of homogeneity of the whole.
Example: Testing a portion of white powder and reporting the results for the whole sample.

SAMPLING PLAN
For an item that consists of a multi-unit population (e.g., tablets, baggies, bindles), a sampling plan is a statistically valid approach to determine the number of subitems that must be tested in order to make an inference about the whole population.

SAMPLING PROCEDURE
A defined procedure used to collect a sample (or samples) from the larger whole, designed to ensure that the value obtained in the analysis is representative of the whole. The sampling procedure may include details about size and number of samples to be collected, locations from which to collect the samples, and a method to ensure the homogeneity of the larger whole (or to make it so).

SAMPLE SELECTION
A practice of selecting items (or portions of items) to test, based on training, experience, and competence. There is no assumption of homogeneity of the whole, so analytical results pertain only to the actual items (or portions of items) tested.
Example: For a pair of pants with four stains: one stain is chosen to be tested, based on the analyst’s experience.

SHALL
“Shall” indicates a requirement. “Shall” is synonymous with “will” and “must”.
See also: should, may, and can.

SHOULD
“Should” indicates a recommendation. The antecedent is encouraged, but not required.
See also: shall, may, and can.
| **STANDARD METHODS** | |
| Methods published in international, regional or national standards. |
| **Example:** ASTM 1412-12 *(Standard Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Passive Headspace Concentration with Activated Charcoal)* |

| **TECHNICAL ORGANIZATIONS** | |
| Groups of subject-matter experts who develop and promulgate consensus documentary standards and guidelines intended to ensure that a sufficient scientific basis exists for each discipline. |
| **Examples:** Scientific Working Groups (SWGs), Technical Working Groups (TWGs), Organizations of Scientific Area Committees (OSACs) |

| **TECHNICAL RECORDS** | |
| Technical records (i.e., case records) include all examination and administrative documentation as part of individual laboratory case files. |
| **Note:** Technical records for CODIS are in the CODIS Hit Verification Packet and CODIS Sample Packet. |

| **TENDER** | |
| The laboratory’s response to the customer, regarding their request. |
| **Example:** The ASCL initials the submission sheet to indicate the receipt of evidence and enters the case information into the LIMS. |

| **TRACEABILITY** | |
| A property of a measurement whereby the result can be related to a reference through a documented and unbroken chain of calibrations, each contributing to the measurement uncertainty. |

| **UNCONTROLLED COPY** | |
| A copy of a controlled document provided for informational purposes only. |
| **Examples:** A copy provided to an external assessor, or a copy required for legal discovery. |
4.1 ORGANIZATION

4.1.1 LABORATORY ESTABLISHMENT
Act 517 of 1977 established the Arkansas State Crime Laboratory (ASCL) via A. C. A. § 12-12-301.

4.1.2 LABORATORY ACCREDITATION
It is the responsibility of the ASCL to carry out all activities in a manner that meets the requirements of the ASCLD/LAB-International Accreditation Program and satisfies the needs of the customer, criminal justice community, and others as authorized by law.

4.1.3 LABORATORY FACILITIES
The management system shall cover all work carried out in the ASCL, including the Little Rock laboratory, the Hope laboratory, and sites away from these facilities.

4.1.4 LABORATORY STATUS
The ASCL is an independent state agency. The Governor of Arkansas is responsible for approving our biennial budget and providing funding accordingly.

4.1.4.1 PERSONNEL QUALIFICATIONS, AUTHORITIES AND RESPONSIBILITIES

4.1.4.1.1 EXECUTIVE DIRECTOR
QUALIFICATION
The Governor of the State appoints the ASCL Executive Director. The ASCL Board shall prescribe the duties, responsibilities, compensation, and qualifications for the Executive Director.

AUTHORITIES AND RESPONSIBILITIES
The Executive Director has the overall authority and responsibility to make and enforce decisions. The Executive Director:

- Oversees the operation of the laboratory, through executive and legislative direction
- Monitors the financial status of the biennial budget
- Liaises between the Criminal Justice System and the laboratory
- Maintains a professional relationship with statewide media
- Serves on the Alcohol and Drug Abuse Coordinating Council and the Integrated Justice Information System Program (by statute)
4.1.4.1.2  SCIENTIFIC OPERATIONS DIRECTOR

QUALIFICATION
The position requires a minimum of a baccalaureate degree in one of the physical sciences, with a minimum of five years’ experience in a forensic laboratory. A master’s degree can substitute for two years of experience in a forensic laboratory.

AUTHORITIES AND RESPONSIBILITIES
- Oversees the analytical sections of the laboratory
- Assists with purchasing equipment and supplies for the laboratory
- Assists with the inventory of supplies and equipment
- Oversees new hires for the analytical sections of the laboratory
- Provides administrative assistance to the Executive Director with regard to budgeting for laboratory personnel, equipment, and supplies
- Writes or assists with grant proposals, and maintains the budget, payouts, and equipment purchases for such grants
- Supervises the Section Chiefs for Forensic DNA, CODIS, Forensic Chemistry, Forensic Toxicology, Physical Evidence, Latent Prints, Firearms/Toolmarks, and Digital Evidence

4.1.4.1.3  ASSISTANT DIRECTOR

QUALIFICATION
The Executive Director of the State Crime Laboratory appoints the Assistant Director.

AUTHORITIES AND RESPONSIBILITIES
- Oversees all construction, renovation, and remodeling of the laboratory
- Assists with payroll, timekeeping, and personnel administration
- Assists with purchasing, invoice payment, and in the preparation of professional service contracts
- Manages all paper records maintained by laboratory
- Liaises between laboratory and other state agencies for contract services (e.g., janitorial, security, security guards, waste hauling)
- Liaises with public utilities
- Assists with the state budget preparation
- Assists with the IT plan
- Maintains vehicle records and reports

4.1.4.1.4  QUALITY ASSURANCE MANAGER

QUALIFICATION
The position requires a minimum of a baccalaureate degree in one of the physical sciences, with a minimum of five years’ experience in a forensic laboratory. A master’s degree can substitute for two years of experience in a forensic laboratory.

AUTHORITIES AND RESPONSIBILITIES
- Maintains and updates the labwide quality manual
- Monitors laboratory practices to verify continuing compliance with policies and procedures
- Evaluates instrument calibration and maintenance records
- Periodically assesses the adequacy of report review activities
- Ensures the validation of new technical procedures
- Investigates technical problems, proposes remedial action, and verifies implementation
- Administers proficiency tests and evaluates results
- Selects, trains, and evaluates internal auditors
- Schedules and coordinates quality system audits
- Ensures that laboratory personnel training records are maintained
- Recommends training to improve the quality of laboratory staff
- Proposes corrections and improvements to the quality system
- Ensures compliance with the ASCLD/LAB accreditation standard
- Assumes Scientific Operations Director's authorities and responsibilities in his or her absence

4.1.4.1.5 HEALTH AND SAFETY MANAGER

QUALIFICATION
The State Crime Laboratory Executive Director appoints the Health and Safety Manager.

AUTHORITIES AND RESPONSIBILITIES
- Effects a standardized safety program within the laboratory
- Provides health- and safety-related educational materials
- Assists supervisors in teaching safety rules regulations and procedures to their employees
- Conducts safety surveys and ensures that proper practices and procedures are being followed
- Reviews and evaluates the effectiveness of the safety manual, in concert with Section Safety Officers
- Recommends changes in safety policies and procedures to the Executive Director and implements approved changes
- Assists supervisors in resolving safety incidents and maintaining records of such incidents
- Coordinates with a registered nurse for the administration of employee immunizations and maintenance of inoculation records for employees
- Monitors the procurement, use, and disposal of chemicals used in the lab
- Maintains safety auditing procedures
- Helps project directors develop precautions and maintain adequate facilities
- Maintains a current copy of all Safety Data Sheets (SDSs)
- Provides regular, documented formal chemical hygiene and housekeeping inspections, including routine inspections of emergency equipment
- Keeps abreast of current legal requirements regarding regulated substances
- Seeks ways to improve the safety program
4.1.4.1.6 **HUMAN RESOURCES MANAGER**

**QUALIFICATION**

The position requires the formal education equivalent of a baccalaureate degree in public administration, general business, or a related field, plus three years’ experience in planning, research, or a related field. Other job-related education or experience may be substituted for all or part of these basic requirements.

**AUTHORITIES AND RESPONSIBILITIES**

- Provides consultation and information to agency management and staff regarding matters such as grievances, discipline, classification and compensation issues, staffing, legal requirements, career counseling, and salary administration
- Evaluates the need for personnel policy or program changes by monitoring changing legal requirements and reviewing data and management reports to identify possible issues
- Assists with asset management
- Maintains agency personnel records
- Maintains agency leave records
- Performs payroll functions to ensure accuracy of records and disbursements
- Ensures supervisory training
- Reviews performance evaluations for accuracy and completeness

4.1.4.1.7 **FISCAL OFFICER**

**QUALIFICATION**

The position requires a minimum of a baccalaureate degree in accounting, with a minimum of five years’ experience as an accountant. A master’s degree can substitute for two years’ experience.

**AUTHORITIES AND RESPONSIBILITIES**

- Establishes procedures for the receipt, processing, and deposit of funds received by the ASCL.
- Reconciles all bank accounts
- Establishes and implements agency procedures for compliance with all accounting laws and regulations
- Conducts personnel and salary surveys or special studies
- Prepares reports, proposals, and correspondence pertaining to personnel matters
- Prepares annual financial reports
- Assists the Executive Director with the preparation of the biennial personnel budget, including advice on the proper classification of positions
- Assists the Executive Director, Assistant Director, and Scientific Operations Director in advertising vacancies and recruiting applicants
- Provides accounting for all Federal Grants
- Maintains all ASCL Board records
- Accesses the Arkansas Administrative Statewide Information System (AASIS) to reconcile agency funds and funding
- Participates in the development and implementation of departmental policies and programs, with top and/or key management
- Advises the Executive Director regarding the agency’s financial status, program priorities, changes in laws or regulations, and other factors affecting overall operation

4.1.4.1.8 CHIEF FORENSIC PATHOLOGIST (STATE MEDICAL EXAMINER)

QUALIFICATION
The Executive Director, with the approval of the State Crime Laboratory Board, shall appoint and employ the Chief Forensic Pathologist. A. C. A. § 12-12-307 lists the qualifications for this position. The State Crime Laboratory Board has further required the following qualifications:
- Must obtain a license to practice medicine in the State of Arkansas
- Must have a minimum of five years’ experience in the field of forensic pathology
- Must be board certified in Forensic Pathology by the American Board of Pathology

AUTHORITIES AND RESPONSIBILITIES
- Plans and oversees the day-to-day operations of forensic pathology, involving medico-legal investigations using laboratory and medical procedures to determine the cause, manner, and mechanism of death as prescribed by Arkansas Code
- Performs thorough postmortem examinations, with certifications of the cause, manner, and mechanism of death
- Consults with toxicologists, analysts, examiners, physicians, and law enforcement officers to establish medical evidence and to obtain expert opinions regarding unexplained deaths
- Testifies as an expert witness to provide information concerning findings, evaluations, and autopsy results in accordance with state and federal law
- Develops and supervises in-service training for Medical Examiner staff and other laboratory personnel to ensure qualify performance within the Medical Examiner Section and the laboratory
- Provides consultation and recommendations to the Executive Director for administrative or legislative changes needed to improve the delivery of services provided to the public
- Responsible for maintaining the necessary records required for the Medical Examiner Section

4.1.4.1.9 GENERAL COUNSEL

QUALIFICATION
The position requires a law degree from an accredited law school. The General Counsel must be licensed in the State of Arkansas to practice law.

AUTHORITIES AND RESPONSIBILITIES
- Provides legal analysis, assistance, and representation to the laboratory
- Researches case law, state law, and federal law to prepare for potential mediation, litigation, conciliation agreements, or settlements
- Communicates with the Office of the Attorney General, as needed
- Evaluates legal communications to determine the laboratory’s response
• Writes legal briefs, motions, and other pleadings as needed

4.1.4.1.10 OTHER STAFF

Qualifications, authorities, and responsibilities for Section Chiefs and analysts are included in each Discipline Quality Manual.

Technical Support staff may perform duties in a discipline even if they do not have the educational qualifications to be an analyst in the discipline. Technical support job descriptions and duties performed will be in agreement with one another. Job descriptions will be kept in their Employee History Binder. Technical Support must have adequate knowledge of the techniques and methods used in their assigned tasks. Any data generated by technical support must be interpreted by a case-qualified analyst.

4.1.5 LABORATORY RESPONSIBILITIES

The ASCL shall:

a) Have managerial and technical personnel who, irrespective of other responsibilities, have the authority and resources needed to carry out their duties, including the implementation, maintenance, and improvement of the management system, and to identify the occurrence of departures from the management system or from test procedures, and to initiate actions to prevent or minimize such departures.

b) Strive to ensure there is no undue influence on the professional judgments of management and personnel. The following policies/arrangements insulate the staff from financial, personal, or other pressures that may affect their work:

1) The Arkansas State Legislature sets the annual budget for the laboratory. This budget is apportioned to each section based on laboratory needs. The ASCL Fiscal Officer is the point of contact for the ASCL on budget matters with the state.

2) The ASCL prepares, in accordance with State of Arkansas personnel policy, performance expectations for each employee outlining the job expectations for the coming year. Managers evaluate each employee on their individual performance as compared with their individual expectations.

3) Section 2.1 of the ASCL Personnel Handbook (ASCL-DOC-02) contains specific guidelines on the acceptance of gifts or gratuities.

4) Managers have the responsibility and authority to receive and take action on employee concerns within their discipline. Section 2.4 of the ASCL Personnel Handbook contains provisions for employee grievances that cannot be resolved at the manager level.

5) All cases may be prioritized based upon a system that allows for a timely response. Unless priority requests are made, cases should be analyzed in chronological order. Priority may be made for the following reasons:

   (i) Request from an Investigating Officer

   (ii) Request from a Court Official (including court dates and court orders)

   (iii) Threat to public safety (homicides, rapes, violent crimes, etc.)
6) Other cases or types of cases may be prioritized at the request of the Section Chief, Scientific Operations Director, Medical Examiner, or the Executive Director. All priority requests for individual cases will be documented in the LIMS under the “Request” tab with a brief description of the prioritization request. Case type prioritization documentation will be maintained by the Discipline.

7) These issues are covered by the laboratory’s *Code of Ethics Policy* (ASCL-DOC-06) and the *ASCLD/LAB Guiding Principles for Professional Responsibility for Crime Laboratories and Forensic Scientists* (ASCL-DOC-11), which must be read annually by all personnel.

c) Have policies and procedures (see § 0) to ensure the protection of its customers’ confidential information, including procedures for protecting the electronic storage and transmission of results. All employees are required to keep confidential all information obtained in their official capacities. Except where legally authorized, employees will not disclose any confidential information. Every employee has the responsibility to safeguard all confidential information obtained in his or her official capacity from unauthorized distribution.

d) Have policies and procedures to avoid involvement in any activities that would diminish confidence in its competence, impartiality, judgment or operational integrity (see the *ASCL Code of Ethics Policy* and the *ASCLD/LAB Guiding Principles for Professional Responsibility for Crime Laboratories and Forensic Scientists*);

e) Define the organization and management structure of the laboratory and the relationships between quality management, technical operations, and support services. See the following organizational charts for the Little Rock and Hope laboratories.

f) Specify the responsibility, authority and interrelationships of all personnel who manage, perform, or verify work affecting the quality of the tests. Qualifications and job descriptions for Section Chiefs and analysts are included in each Discipline Quality Manual.

1) Each subordinate shall be accountable to only one immediate supervisor for each category of testing.

g) Have adequate personnel for supervising testing, including trainees, by individuals familiar with the methods and procedures, the purpose of each test, and with the assessment of the test results.

h) Have a Section Chief in each discipline with overall responsibility for the technical operations and the provision of resources needed to ensure the required quality of laboratory operations. Each Section Chief or designee will have appropriate technical training and experience in the discipline. In addition, the Scientific Operations Director oversees each Section Chief and their discipline (see *ASCLD/LAB Supplemental Requirements* § 4.1.5.h.1).

i) Have a Quality Assurance Manager with defined responsibilities and the authority (see § 4.1.4.1.4) to ensure that the quality management system is implemented and followed at all times. The Quality Assurance Manager shall have direct access to the highest level of management at which decisions are made on laboratory policy or resources.

j) Appoint deputies for key management personnel when the individual will be absent for three days or longer. All affected personnel shall be notified.
k) Ensure that employees are aware of the relevance and importance of their activities and how they contribute to the achievement of the objectives of the management system. This is accomplished through effective communication from management to all employees.

Figure 1: Labwide Organizational Chart
4.1.6 COMMUNICATION
ASCL methods of communication include regular Section Chief meetings, Discipline meetings, email, telephone, and personal meetings. Managers will determine the appropriate means of conveying information concerning the quality system.

4.1.7 HEALTH AND SAFETY
The ASCL has a Health and Safety Manager with defined responsibility and the authority (see § 4.1.4.1.5) to ensure that the health and safety program (documented in the Health and Safety Manual (ASCL-DOC-08)), is implemented and followed at all times.

4.1.8 MANAGEMENT
Key Management includes the Scientific Operations Director, Chief Medical Examiner, Section Chiefs, and the DNA Technical Leader.

Top Management includes the Executive Director, Assistant Director, Scientific Operations Director, Quality Assurance Manager, and the Fiscal Officer.
4.2 MANAGEMENT SYSTEM

4.2.1 ASCL QUALITY MANUAL

The *ASCL Quality Manual* (ASCL-DOC-01) is a compilation of policies and procedures governing ASCL operations. The Quality Manual is readily available on Qualtrax® to all ASCL personnel. ASCL personnel are responsible for knowing and using these policies and procedures. The quality manual is reviewed annually by the Quality Assurance Manager, Scientific Operations Director, and Executive Director. It is updated as needed to reflect changing organizational, technical, and procedural information.

Unforeseen circumstances may arise which require immediate deviations from the policies and procedures of this manual. In such situations, a written request for an exception to policy will be submitted to the Scientific Operations Director (or designee). This written request shall include:
1) an adequate description of the circumstance requiring the action,
2) a statement of the proposed alternative policy and/or procedure, and
3) the expected duration of the exception.

The Scientific Operations Director will maintain documentation of the approved policy exception.

Each discipline of the laboratory has a Discipline Quality Manual and Discipline Training Manual. The purpose of these manuals is to:
- Promote the efficient and effective operation of the ASCL
- Assist the laboratory staff in performing their assigned duties and tasks
- Document the policies and procedures established for each discipline

All personnel are responsible for knowing and using the policies and procedures in their Discipline Quality Manual. Each Discipline Quality Manual and Discipline Training Manual are reviewed annually by the appropriate Section Chief and updated as needed.

4.2.2 MISSION AND QUALITY POLICY STATEMENT

The mission of the Arkansas State Crime Laboratory is to provide the highest quality scientific services to the criminal justice community and the State of Arkansas. This is accomplished through a team of skilled and dedicated employees using scientific equipment and appropriate validated methodologies. The laboratory strives to provide these services in a timeframe amenable to our customers.

The missions for the respective disciplines are:

**CODIS**

Process all convicted offender samples and felony arrest samples utilizing DNA technology to input into the National DNA Index System (NDIS). Convicted offender samples and casework samples are searched both locally in the State DNA Index System (SDIS) and on the national level to help solve criminal cases.
DIGITAL EVIDENCE
The Digital Evidence section is responsible for analyzing computers, mobile devices, digital storage devices, and video evidence for the criminal justice system. This may include systematic retrieval of digital data that may be of evidentiary value and video enhancement as well as technical support to law enforcement agencies. This analysis is performed in a chain-of-custody environment using validated and appropriate procedures in order to ensure the most accurate and relevant analytical results.

FIREARMS/TOOL MARKS
Perform examinations which include the following: the comparison of bullets, cartridge cases and shot shells to one another and/or with suspect weapons; the comparison of tool marks to one another and/or with suspect tools; firearm function testing; distance determination; restoration of obliterated serial numbers; image cartridge cases and bullets into the National Integrated Ballistics Information Network (NIBIN).

FORENSIC CHEMISTRY
Utilize various scientific methodologies and instrumentation to perform analyses to identify controlled substances. Included are drugs of abuse controlled under Act 590 of 1971 and addenda thereafter. Illicit laboratory chemists also assist law enforcement agencies to dismantle suspected illicit laboratories, collect representative samples of evidence, submit the samples to evidence receiving on behalf of the law enforcement agency, and analyze evidence associated with illicit laboratories.

FORENSIC DNA
Analyze biological evidence utilizing PCR technology in order to determine its source. This evidence is used to include or exclude individuals from having deposited the evidence in the commission of a criminal act. Samples will be entered into CODIS when appropriate.

FORENSIC TOXICOLOGY
Analyze samples from the State Medical Examiner, law enforcement officers, and county coroners. Use various scientific methodologies and instrumentation to perform analysis on biological specimens to determine the presence and levels of drugs and/or alcohol.

LATENT PRINTS/AFIS
Develop latent fingerprints using a full range of physical, chemical, and alternative light source methods and compare to prints of subjects in order to identify or eliminate. Compare footwear and tire impressions to suspect footwear and tires. Utilize the computer-based Automated Fingerprint Identification System (AFIS) for searching, matching and storing fingerprints and related data.

PHYSICAL EVIDENCE
SEROLOGY
Utilize scientific methodologies and instrumentation to examine physical evidence for the presence of blood, semen and/or transfer DNA. Collect and store tape lifts for possible further testing.
TRACE EVIDENCE
Utilize scientific methodologies and instrumentation to examine physical evidence for the presence of fibers, hairs, paint, glass, tape, fire debris, lamp filaments, primer gunshot residue from suspects and physical comparisons. Perform other miscellaneous analysis when appropriate. Compare questioned samples to known samples to determine if a common origin exists.

STATE MEDICAL EXAMINER
Perform post mortem examinations and determine the cause and manner of death, in cases subject to the jurisdiction of the State Medical Examiner as set out in A. C. A. § 12-12-315. The Medical Examiner shall include the general application of the medical sciences to assist the criminal justice system in the State of Arkansas.
QUALITY POLICY STATEMENT

The goal of the Arkansas State Crime Laboratory (ASCL) is to provide the highest quality forensic services to our customers. The ASCL has defined its customer base as the Judicial System, which includes law enforcement agencies, prosecutors and defense counsel, and regulatory and other public service government agencies. The ASCL is committed to meet the needs and expectations of our customers through a dedication to quality and service.

The ASCL standard of quality requires that all forensic conclusions, both written and oral, are scientifically valid, accurate, consistent, and reliable. This standard of quality serves as the guiding principle for all technical and strategic decisions involving work undertaken by the ASCL.

This guiding principle is shared by all employees of the ASCL.

The objectives involved in meeting our quality goal are:

- Ensuring the use of validated procedures that are reliable, reproducible, and which serve their intended purpose with respect to precision, accuracy, sensitivity, and specificity
- Providing laboratory reports that are clear, accurate, objective, and readily understood by our customers
- Providing relevant, professional, and impartial testimony in judicial proceedings
- Participating in a proficiency testing program that monitors the capabilities of the analysts/examiners and the reliability of our analytical results
- Participating in annual audits of the quality system
- Providing a system to ensure the integrity and security of evidence from its receipt to its return
- Complying with ASCLD/LAB-International Accreditation Standards
- Continually improving the effectiveness of the ASCL Quality Management System
- Identifying opportunities for improvement related to quality in all areas of operation, taking corrective action to remediate non-conforming work, and striving to prevent recurrence
- Providing continuing employee education and training

The entire staff of the ASCL will adhere to the spirit and intent of the quality assurance program, as well as to the directives of this Quality Manual and its supporting documents, which include the Personnel Handbook, the Health and Safety Manual, and the Discipline Quality and Training Manuals. All members of the staff will strive to improve customer satisfaction for every service provided by this laboratory.

We are committed to a strategy of continuous improvement: constantly determining the needs and expectations of our customers and striving to meet them.

I personally affirm these commitments and support the established comprehensive quality assurance system, which will allow our agency to meet all of the requirements of the ASCLD/LAB-International Accreditation Standards.

Kermit B. Channell, II
4.2.2.1 ASCLD/LAB GUIDING PRINCIPLES

The ASCLD/LAB Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists (ASCL-DOC-11) is located in Qualtrax®.

4.2.2.2 REVIEW

The ASCL Code of Ethics Policy (ASCL-DOC-06) and The ASCLD/LAB Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists (ASCL-DOC-11) are reviewed annually with all personnel in labwide meetings. All personnel must acknowledge that they have read and fully understand the prohibited activities and their professional ethical-conduct responsibilities as an employee of the ASCL. These reviews and the employee’s acknowledgement of them will be tracked using Qualtrax®. The Human Resources Manager will keep a list of employees completing this process.

4.2.3 MANAGEMENT COMMITMENT

Top Management is committed to developing, implementing, and continually improving the effectiveness of the management system. This is demonstrated by management’s involvement in monitoring the quality system through a variety of means, including the annual management review, internal and external audits, procedure reviews, proficiency testing, re-examination of casework and corrective/preventive action requests. The Quality Assurance Manager monitors activities to improve the quality system and recommends actions needed to improve the quality system’s effectiveness.

4.2.4 MEETING REQUIREMENTS

Top Management communicates the importance of meeting customer, statutory, and regulatory requirements during regular Section Chief and labwide meetings. Pertinent items from the Section Chief meeting minutes are emailed to laboratory personnel. Managers shall review this information with their employees, document attendance, and take minutes.

4.2.5 SUPPORTING MANUALS

Laboratory quality policies are included in this quality manual, which generally follows the same outline as the ISO/IEC 17025:2005 and ASCLD/LAB Supplemental Requirements documents. Quality policies and technical procedures which apply only to a particular discipline are included in their Discipline Quality Manual. Discipline Quality Manuals shall not contradict this quality manual and will be outlined similarly to this manual. The DNA and CODIS Quality Manuals will be outlined similarly to the FBI Quality Assurance Standards.

Other supporting manuals include:
- Discipline Training Manuals: contain the training program for each discipline.
4.2.6 TECHNICAL MANAGEMENT

The roles and responsibilities of Sections Chiefs and the DNA Technical Leader, including their responsibility for ensuring compliance with the ASCLD/LAB-International requirements, are documented in each Discipline Quality Manual. The Scientific Operations Director and Quality Assurance Manager’s responsibilities and authority is documented in § 4.1.4.1.4.

4.2.7 INTEGRITY

Top Management will assess the effect of proposed procedural changes prior to implementation to ensure that the change does not contradict or conflict with other procedures.

4.3 DOCUMENT CONTROL

4.3.1 GENERAL

Definitions

**DOCUMENT**

Information in any medium including, but not limited to: paper copy, computer disk or tape, audiotape, videotape, photograph, overhead, or photographic slide.

**DOCUMENT CONTROL**

The process for ensuring that controlled documents (including revisions) are reviewed, approved, and issued by authorized personnel, and distributed to personnel performing the prescribed activities. Additionally, document control ensures that the current revision is readily available for use and archived copies are stored appropriately.

**ISSUING AUTHORITY**

Personnel who are authorized to publish approved controlled documents.

**APPROVAL AUTHORITY**

Personnel who are authorized to approve controlled documents.

**CONTROLLED DOCUMENT**

A document with a specified revision, approval authority, and revision approval date, distributed in a manner which ensures that the recipients of controlled copies receive subsequent revisions and replace previous revisions.

**UNCONTROLLED COPY**

A copy of a controlled document provided for informational purposes only.

The ASCL’s labwide quality manual, administrative procedures, discipline quality manuals, training manuals, and quality assurance documents and forms are controlled using Qualtrax® software to ensure that they are adequate, approved for use, and that only the current versions of the document are in use. This section provides instructions concerning the creation, revision, and distribution of these controlled documents.

**CONTROLLED DOCUMENT PREPARATION**

Internally generated documents shall be prepared by personnel with adequate expertise in the subject. The level of detail of the document shall be commensurate with the complexity of the activity and the background of the intended user of the document. The document must include
enough detail and specificity to ensure that the activity conforms to quality specifications and/or expectations.

### 4.3.2 CONTROLLED DOCUMENT REVIEW AND APPROVAL

#### 4.3.2.1 OVERVIEW

Each new or revised internally-generated controlled document is required to be reviewed and approved by appropriate personnel prior to issuance, as detailed in the following table. The current and archived versions of all controlled documents will be maintained on Qualtrax®.

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Executive Director</th>
<th>Scientific Operations Director</th>
<th>Quality Assurance Manager</th>
<th>Section Chief</th>
<th>Health and Safety Manager</th>
<th>DNA Technical Leader</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Labwide controlled documents</td>
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<tr>
<td>Personnel Handbook</td>
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<tr>
<td>Health and Safety Manual</td>
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<td></td>
</tr>
</tbody>
</table>

Table 2: Document Approval Matrix

After the review and approval process is complete, the document is published on Qualtrax®. All appropriate personnel will be notified by email and have access to these official electronic documents. Individuals may print hardcopies of internal documents as needed for personal use—however, these copies are unofficial.

Only the current revision of a document is visible on the document tree in Qualtrax®. This precludes the use of invalid and/or obsolete documents. The revision history of controlled documents is maintained in Qualtrax®.

### CONTROL OF EXTERNAL DOCUMENTS

External documents, software, or any other document in which a particular revision/version is required will be referenced in the appropriate internally-generated controlled document (e.g., Quality Manual, Training Manual) or as an attachment to the appropriate document. The reference

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1 For the DNA and CODIS sections only.
shall identify the current revision/version and location of the document. These documents will be available at each location where related work is conducted.

4.3.2.2 DOCUMENT CONTROL

Documents shall be available at all locations where operations essential to the effective functioning of the laboratory are performed (e.g., crime scenes).

Controlled documents shall be reviewed at least annually (from the initial creation date or last revision date) and revised whenever necessary to ensure that they reflect current policies, practices, and technology. With the exception of quality manuals, the Personnel Handbook, and the Health and Safety Manual, documents that have been edited within the year will not require an additional review. This document review will be performed by appropriate personnel and tracked in Qualtrax®.

Employees will destroy outdated documents upon receiving updated documents. It is the employee’s responsibility to verify that they are using the current revision of any document.

Retired controlled documents are maintained in Qualtrax®, and only the Quality Assurance Manager has access to view these documents. When archived documents are requested, they will be watermarked appropriately before being released.

4.3.2.3 CONTROLLED DOCUMENT FORMAT

Each internally generated controlled document follows these format requirements.

Each controlled document has a footer on each page containing, at a minimum:

4) The unique document identifier, in the format DISCIPLINE-TYPE-INDEX NUMBER
   a) Discipline abbreviations are as follows:
      i) ASCL = Labwide
      ii) CODIS = Combined DNA Index System
      iii) DE = Digital Evidence
      iv) DNA = Forensic DNA
      v) DRG = Forensic Chemistry
      vi) ER = Evidence Receiving
      vii) FA = Firearms/Tool Marks
      viii) HRL_ER = Hope Regional Laboratory - Evidence Receiving
      ix) LP = Latent Prints
      x) SER = Physical Evidence–Serology
      xi) TOX = Toxicology
      xii) TR = Physical Evidence–Trace
   b) Type abbreviations are as follows:
      i) DOC = document
      ii) FORM = form
c) Index numbers will be unique to each document/form, and may be subdivided further as needed
5) Revision date
   a) The date the document is effective. The effective date will not be prior to the approval date.
6) Approval authority (same as issuing authority)
7) Page x of y

4.3.3 DOCUMENT CHANGES

4.3.3.1 REVISED DOCUMENTS
Revised documents are subject to the same review, approval, documentation, and issuance requirements of the original document, as stated above.

4.3.3.2 REVISION SUMMARY
When a controlled document is revised, the editor of the document must give a general summary of the changes made in Qualtrax®. All substantive changes must be individually listed. Minor and non-substantive changes may be listed en masse (e.g., formatting update, spelling corrections).

4.3.3.3 MINOR CHANGES
Any change to a controlled document, even a minor one, requires a revision to the document.

4.3.3.4 REVISION METHODS
There are two ways to revise documents:
 By checking out a controlled document in Qualtrax®, editing this version of the document, and checking it back in to Qualtrax®, or
 By creating a new version of a controlled document and replacing the version in Qualtrax®.

The original document, the revised document, and a summary of changes will be maintained in Qualtrax®. The Qualtrax® system tracks who made the revision, the reviewers and approvers, and who was notified of the revision.

RESPONSIBILITIES
The Preparer of the document is responsible for:
 Preparing the document in the proper format
 Addressing or resolving comments from reviewers
 Submitting the document in Qualtrax®

The Section Chief (and Technical Leader, if applicable) is responsible for:
 Ensuring that reviews are completed annually on all documents in their section
 Reviewing and approving all discipline-specific controlled documents
 Ensuring that the documents are scientifically suitable for issue
Ensuring that the documents contain the required quality assurance elements (e.g., controls, measurement of uncertainty, traceability)

The Quality Assurance Manager is responsible for:
- Ensuring that all documents meet QA requirements as outlined in the ASCLD/LAB-International accreditation standards
- Ensuring the annual review of Quality and Training Manuals by appropriate Section Chiefs (and the Technical Leader, if applicable) to determine if a revision is needed
- Maintaining the official electronic controlled documents on Qualtrax®
- Properly issuing and distributing documents through Qualtrax®
- Maintaining review documentation in Qualtrax®
- Reviewing and approving all controlled documents
- Issuing all controlled documents and ensuring all appropriate employees are notified of new or revised documents
- Updating the uncontrolled version of documents on the ASCL website

The Scientific Operations Director is responsible for:

The Executive Director is responsible for:

4.4 REVIEW OF REQUESTS, TENDERS, AND CONTRACTS

DEFINITIONS

REQUEST
The process used by a customer when seeking analysis by the laboratory.

TENDER
The laboratory’s response to the customer regarding their request.

CONTRACT
An agreement between the laboratory and the customer.

4.4.1 GENERAL

The ASCL provides its customers with information regarding available services and testing through various means, such as:
- Presentations at law enforcement and prosecutor meetings
- Publications
- Training courses provided to law enforcement
- The ASCL website

Any request for service (either written or oral) submitted by a customer agency serves as a contract for service, once that request has been accepted by the laboratory. The laboratory will employ
testing methods described in the Discipline Quality Manuals. The ASCL Evidence Submission Form (ASCL-FORM-12_WD or ASCL-FORM-63) shall normally be used to record the request, tender, and contract with the customer. Older revisions of this form (or other alternative documentation) may be used if necessary.

Any difference between the request or tender and the contract shall be resolved before any work commences. Each contract shall be acceptable both to the ASCL and the customer.

By completing and submitting the submission sheet, the customer relinquishes to the ASCL all decisions regarding analytical processing and choice of methods.

4.4.2 REVIEW OF REQUESTS

The laboratory maintains records related to the customer request within the casefile, including the ASCL Evidence Submission Form (ASCL-FORM-12_WD or ASCL-FORM-63) and case-related discussions with the customer (which are documented on an Agency Contact Form (ASCL-FORM-06), e-mail, or equivalent).

The initial review of the customer's request is conducted by an Evidence Technician to determine if it appears to be within the scope of normal laboratory services. If so, the Evidence Technician will accept the evidence and initial and date the ASCL Evidence Submission Form. The Evidence Technician will then enter the request into the LIMS and route it to the appropriate discipline.

Requests for non-routine work must be reviewed by the appropriate Section Chief. The Section Chief must initial and date the ASCL Evidence Submission Form next to the request.

The Medical Examiner Section is considered an internal customer. Reviews of Medical Examiner requests, tenders, and contracts may be performed in a more simplified way (as detailed in the appropriate Discipline Quality Manual).

4.4.3 SUBCONTRACTED WORK

The ASCL may find it necessary to transfer evidence to an outside laboratory for testing. This decision will generally be made by the affected discipline. This decision may occur after a review of the contract or it may be discovered during the testing process. Documentation stating the reason for subcontracting will be in the case record.

4.4.4 DEVIATIONS

When the customer agrees to the contract, the customer agrees that the ASCL may make deviations as deemed necessary. However, the customer will be notified (e.g., iResults, phone call, e-mail) if the ASCL goes outside its scope of testing.

4.4.5 AMENDMENTS

If the contract needs to be amended after work has begun, the contract shall be reviewed (as stated above) by the discipline making the amendment, and all affected personnel shall be notified.
4.5 SUBCONTRACTING OF TESTS AND CALIBRATIONS

4.5.1 GENERAL
If the Arkansas State Crime Laboratory finds it necessary to transfer evidence to an outside laboratory (e.g., FBI, NMS), an Inter-Laboratory Evidence Transfer Form (ASCL-FORM-07) must be completed and entered into the case file. The Inter-Laboratory Evidence Form may be waived for items funded out of a grant and/or items under a contract. Any cost incurred by the laboratory must be approved by the Fiscal Officer.

Any external laboratory performing casework for the Arkansas State Crime Laboratory (whether contracted or not) must be an accredited laboratory. This accreditation must be from an accrediting body recognized by the Arkansas State Crime Laboratory. These laboratories must provide the Arkansas State Crime Laboratory with documentation of accreditation.

See § 5.6.2.1 for external calibration laboratory requirements.

4.5.2 SUBCONTRACTOR APPROVAL
By completing and submitting the submission sheet, the customer agrees to any subcontracting arrangement the ASCL deems necessary. The customer will be notified in writing if testing will be subcontracted (e.g., using email or iResults). If a cost is incurred by the customer, then the customer must approve of the arrangement. This approval must be documented in the case record.

4.5.3 SUBCONTRACTOR RESPONSIBILITY
The ASCL is responsible to the customer for the work of the subcontractor, except in the case where the customer or a regulatory authority specifies which subcontractor is to be used.

4.5.4 SUBCONTRACTOR COMPETENCY
The Quality Assurance Manager maintains a register of all subcontractors used for testing and/or calibrations and maintains documentation of their competency and compliance, as described in § 4.5.1.

4.6 PURCHASING SERVICES AND SUPPLIES

4.6.1 GENERAL
The ASCL Procurement Policies and Procedures document (ASCL-DOC-07) specifies policies and procedures for the purchase, receipt, and storage of materials relevant to testing. When the material or service must meet certain specifications in order to perform adequately, then these items and their specifications (e.g., manufacturer, type, grade, or other technical data relevant to the supply or service) must be defined in the Discipline Quality Manual, purchasing documents, or a discipline document.
4.6.2 INSPECTION AND VERIFICATION OF SUPPLIES RECEIVED

Supplies, reagents, and consumable materials that affect the quality of tests are not used until they have been inspected or otherwise verified as being in compliance with specifications defined in the Discipline Quality Manual, purchasing documents, or a discipline document.

The Procurement Section inspects all received materials to ensure agreement with what was ordered. Any inconsistencies are reconciled before materials are distributed to the appropriate section for use in casework. The appropriate Section Chief or designee will verify (if applicable) that the materials meet the required specifications. This approval will be documented in Qualtrax® in the External Supply Request workflow.

Chemicals and reagents are to be initialed and dated with a “Received Date” by the Procurement staff. As chemicals and reagents are requested and received, the analysts are responsible for initialing and dating containers with the “Open Date”. Supplies, reagents and consumable materials shall be stored in accordance with the manufacturer’s recommendations, if any.

4.6.3 PURCHASING DOCUMENTS

The Qualtrax® External Supply Workflow is used to request the purchase of items. Alternate forms may be used with permission from the Procurement Section. This workflow includes the following information:

- Vendor Name
- Date
- Part Number (if known)
- Description
- Quantity
- Price
- Total
- Justification

The description shall define the specific item being requested, including any required type, class, grade, precise identification, or other technical data, if appropriate. The approval of the Section Chief, Scientific Operations Director, and Fiscal Officer are necessary.

4.6.4 VENDOR EVALUATION

Critical consumables, supplies, and services (i.e., those which affect the quality of testing) will be obtained from reliable suppliers. Discipline Quality Manuals shall contain a list of any critical supplies. The following policies will be used to evaluate suppliers to determine the reliability of services and/or supplies they provide:

- Critical consumable materials are obtained from a source that has a minimum of ISO 9000 accreditation, whenever possible.
- Calibration and testing services and supplies are obtained from vendors accredited to ISO/IEC 17025 or from vendors who meet nationally certified standards (for calibration services refer to § 5.6.2.1, and for subcontracting of testing refer to § 4.5.1), whenever possible.
- If a source is used that does not meet the above criteria, the source will be evaluated against the intent of ISO/IEC 17025. This may be done by obtaining documentation of the QA program/protocol or by completing a Vendor Evaluation Form (ASCL-FORM-61).

A list of approved vendors and sub-contractors is maintained by the Quality Assurance Manager. Supporting documentation (e.g., copy of certification, QA protocol) is maintained on the Q: drive.

### 4.7 SERVICE TO THE CUSTOMER

#### 4.7.1 CUSTOMER SERVICE

The ASCL maintains open channels of communication with customers, and cooperates in providing a timely response to concerns and questions regarding requests for services and the status of ongoing work.

In order to ensure confidentiality of case information, limit the potential for contamination, ensure the security of evidence and case records, and provide the best service possible to all customers, the ASCL does not routinely permit the customer to be present during the testing process. Any requests for an exception to this policy should be communicated to the Executive Director or Scientific Operations Director. Requests for viewing autopsies will be evaluated by the Chief Medical Examiner. Refer to the Personnel Handbook (ASCL-DOC-02, § 3.23) for the policy regarding court officials viewing and/or photograph evidence. Also refer to the Personnel Handbook § 3.24 (Witnessing the Examination of Evidence).

#### 4.7.2 CUSTOMER FEEDBACK

The ASCL seeks feedback from customers in several ways, including personal communications, attendance at meetings, and surveys. A link to the ASCL Survey is located on the Law Enforcement Login page of the ASCL website. Surveys may also be sent to customers.

Customers are asked for comments regarding subjects such as examination services, turn-around time, the clarity of the test report, interactions with ASCL employees, overall satisfaction, and suggestions for improvement. Customers (if identified) may be contacted regarding their responses. The results of these surveys shall be reviewed by ASCL Top Management and communicated with appropriate personnel.

### 4.8 COMPLAINTS

#### EXTERNAL COMPLAINTS

Any staff member receiving an external complaint shall notify their supervisor in writing. The supervisor shall then forward this written complaint to the Scientific Operations Director, who will investigate the situation and determine what response is most appropriate.
If the complaint regards the quality system, then the supervisor will investigate the situation and forward all information to the Quality Assurance Manager. The Quality Assurance Manager will make every effort to investigate and resolve the complaint and to determine if a Corrective Action Request shall be initiated.

If the complaint regards the courtroom testimony, demeanor, or dress of an analyst, then the analyst’s immediate supervisor will investigate the matter. This investigation should include communication with the involved parties, which must be documented on an *Agency Contact Form* (ASCL-FORM-06), email, or equivalent document. The analyst will document their response to the complaint. If the supervisor's investigation finds the complaint to be groundless, the Section Chief shall document the findings and present them to the Scientific Operations Director, for review and closing. If the supervisor's investigation finds the complaint to be valid, then the Section Chief will discuss these findings with the analyst. The Section Chief shall initiate a Corrective Action Request in Qualtrax® and forward all information to the Quality Assurance Manager. The Section Chief shall monitor the analyst's courtroom appearances until the analyst demonstrates the problem has been resolved.

The general workflow is as follows:

![Figure 3: External Complaint Workflow](image)

- **External Complaint**
  - Quality
  - Other
  - **SOD Investigation**
  - **QAM Review**
  - Valid
  - **Supervisor Investigation**
  - Groundless
  - **Actions Taken**
  - **Top Management Notified**
  - **CAR Opened**
  - **Process Closed**

The Quality Assurance Manager shall maintain a customer complaint log that contains the following information:

- Name and organization (if applicable) of complainant
- Date complaint registered
- Reason for complaint
4.8.1 INTERNAL COMPLAINTS

Employees are encouraged to notify the Section Chief, Quality Assurance Manager, or Scientific Operations Director if they have complaints or concerns regarding the quality system. If a serious problem is revealed, then the Quality Assurance Manager must be notified and a Corrective Action Request initiated.

Policies and procedures for internal complaints regarding grievance and sexual harassment are found in the *Personnel Handbook* (ASCL-DOC-02).

### 4.9 CONTROL OF NONCONFORMING TESTING

#### 4.9.1 GENERAL

Nonconforming testing is testing in which ASCL procedures are not followed or the agreed-upon requirements of the customer (e.g., testing of standards and controls, test precision and accuracy, the care and handling of evidence, instrument performance) are not met. All laboratory staff, including analysts and supervisory personnel, must be vigilant for any indication of nonconforming testing.

Nonconformities, deficiencies, or departures from accepted quality standards may be identified or brought to the attention of laboratory management through a variety of means, including the following:

- Technical case review
- Administrative case review
- Quality control checks
- Instrument performance verification or calibration
- Proficiency testing
- Testimony evaluation
- Case re-examination
- Internal audits
- External assessments
- Employee or customer complaints
- Quality System reviews
- Staff observation or supervision

There are three key levels of non-conforming work, each of which may require a different response:

- Simple corrections
- Level 2 nonconformities
- Level 1 nonconformities
4.9.1.1 SIMPLE CORRECTION
The nature of the non-conforming work is limited in scope and significance. The problem identified is easily corrected and does not cast doubt on the overall reliability of results.

If the nonconforming test or work is an isolated incident and easily resolved by a quality control adjustment, the correction can be taken immediately and documented in the case file or the discipline’s quality control records, when appropriate.

4.9.1.2 LEVEL 2 NONCONFORMITY
The nature of the non-conforming work does not, to any significant degree, affect the fundamental reliability of the work product of the laboratory or the integrity of evidence, but it may continue to occur without a proper root cause analysis and appropriate corrective action. While corrective action is necessary, there is still no doubt regarding the overall reliability of test results.

The Section Chief and Quality Assurance Manager will be notified immediately for consultation and to evaluate the significance of the nonconforming testing or work. A Corrective Action Request will be initiated.

4.9.1.3 LEVEL 1 NONCONFORMITY
The nature of non-conforming work is such that the reliability of test results is questioned. There is potential that erroneous or invalid results have been reported.

The Section Chief and Quality Assurance Manager will be notified immediately for consultation and to evaluate the significance of the nonconforming testing or work. A Corrective Action Request will be initiated, but it is imperative to first address suspension of work and recall of reports. It may be necessary to notify the customer of any affected cases. The Section Chief, DNA Technical Leader (if applicable), and Scientific Operations Director have the responsibility and authority to immediately suspend any observed non-conforming work activity that could result in erroneous reports or unreliable testing data. Resumption of work may only be authorized by agreement between the Section Chief, DNA Technical Leader (if applicable) and Quality Assurance Manager.

4.9.2 CORRECTIVE ACTION
If the Quality Assurance Manager’s evaluation indicates that nonconforming testing or work could recur, or that there is doubt about the compliance of the laboratory’s operations with either accreditation standards or laboratory policies and procedures, then the corrective action procedures described in § 4.11 shall be promptly followed.

A common sense approach must be employed in determining the appropriate response to nonconformity in testing or other work. For example, a minor departure from accepted policy regarding a strikeout on a document would not normally rise to the level of being considered a nonconformity. The error would require correction, but not the initiation of a formal corrective action procedure. Continued non-compliance, however, might result in the need for formal corrective action implementation.
Supervisory discretion must be used in determining the need for corrective action or whether other remediation could be employed. The Quality Assurance Manager shall be involved to ensure that standards are applied evenly throughout the laboratory and that any actions taken are both consistent with prior corrective actions and in compliance with quality assurance standards.

4.10 IMPROVEMENT

The laboratory shall strive to continually improve the effectiveness of the Quality Management System. Opportunities for improvement are identified through various means, including:

- Corrective and Preventive Action Requests
- Customer surveys
- Annual management reviews
- Internal and external audits
- Employee suggestions

4.11 CORRECTIVE ACTION

4.11.1 GENERAL

The laboratory corrective action process is used whenever Level 1 or Level 2 nonconformities (as described in § 4.9) are indicated. The Quality Assurance Manager is authorized to oversee the corrective action process. The Quality Assurance Manager consults with the Scientific Operations Director, directs the corrective action process, and actively involves the appropriate Section Chief (and, if applicable, the DNA Technical Leader).

A simplified flowchart of the corrective action process is listed here, with detailed descriptions of the full process in the next sections.

4.11.2 CAUSE ANALYSIS

Corrective action cannot be implemented without first determining the root cause(s) of the nonconformity. Cause analysis is critical in ensuring that nonconforming work is prevented from reoccurring, and is sometimes the most difficult part in the corrective action procedure. The root cause is often not obvious, requiring a careful analysis of all potential causes of the problem.

The Section Chief shall start the investigation to determine the root cause of the problem. The root cause analysis shall examine all possible sources of the nonconforming work, and may include the evaluation of case records, technical...
methods, equipment, supplies, training, customer agency needs, work environment, etc.

4.11.3 SELECTION AND IMPLEMENTATION OF CORRECTIVE ACTIONS

A Corrective Action Request (CAR) may be initiated through Qualtrax® by any employee. This request will be sent to the Quality Assurance Manager for an initial review to determine if a CAR is warranted. If so, then the Quality Assurance Manager will send the CAR to the appropriate Section Chief for root cause determination and recommendation of appropriate corrective action. This recommendation shall be appropriate to the magnitude and the risk of the problem.

The response from the Section Chief will then be sent to the Quality Assurance Manager, Scientific Operations Director, and (for DNA or CODIS CARs) the DNA Technical Leader to determine whether the issue is a Level 1 or Level 2 nonconformity, management’s response to the corrective action recommendation, and a CAR completion date. If corrective action is required, the CAR will then be sent back to the Section Chief to initiate the corrective action.

Once the corrective action has been successfully completed, the Quality Assurance Manager, Scientific Operations Director and DNA Technical Leader (if applicable) must approve closure of the CAR. The Executive Director will approve and close the CAR.

The corrective action process is documented and maintained using the Qualtrax® system. The CAR shall include a description of the nonconforming work, the effect of the discrepancy, root cause findings, the respective corrective action(s), and after-action monitoring requirements to avoid recurrence. In addition, the Quality Assurance Manager will keep a log on the Q: drive documenting the CAR number, section(s) affected, a brief description of the issue and any supporting documentation (if applicable).

LEVEL 2 NONCONFORMITY

Corrective Actions:
- Take appropriate corrective action to minimize the chance of a recurrence of the nonconformity
- Casework review, whenever necessary
- Depending on the circumstances of the nonconformity, the examiner may be required to successfully complete a proficiency test or work under supervision for a period of time

LEVEL 1 NONCONFORMITY

Corrective Actions:
- Halt the casework of the individual, procedure, discipline, or laboratory (as appropriate) until the appropriate corrective action is taken, in order to minimize the chance of a recurrence of the nonconformity
- Notify the customer agency (if necessary)
- Review all relevant casework
- If the nonconformity is not systemic, but instead isolated to an individual, then the examiner must successfully complete a proficiency test before resumption of casework
- Remedial training or a period of supervised casework may also be required
- Other actions as deemed necessary
4.11.4 MONITORING OF CORRECTIVE ACTIONS

One of the goals of the corrective action process is to prevent recurrence of the nonconformity. A period of monitoring may be necessary before a CAR is closed.

Upon a determination that the monitored corrective action was effective, the Executive Director will conduct a final review of the CAR, and indicate that the corrective action process is closed by his or her concurrence with the findings.

During the internal audit process, CARs will be reviewed for effectiveness.

4.11.5 ADDITIONAL AUDITS

A serious nonconformity may necessitate additional audits of the appropriate area(s), or of the entire quality system, if it brings compliance with established policies and procedures or ASCLD/LAB accreditation requirements into question. These additional audits may be from an external source or conducted internally.

4.12 PREVENTIVE ACTION

4.12.1 GENERAL

Preventive action is a proactive process to identify opportunities for improvement, rather than a reaction to an existing issue. All employees are encouraged to identify opportunities to improve quality and to prevent potential nonconformities.

4.12.2 PREVENTIVE ACTION PROCEDURES

A Preventive Action Request (PAR) may be initiated through Qualtrax® by any employee who identifies a potential source of a nonconformity or a way to improve the quality system. This request will be sent to the Quality Assurance Manager for an initial review to determine if a PAR is warranted.

The evaluation of the PAR may include:

- Consulting a wide range of lab employees to determine if the preventive action could have an unforeseen negative impact on the quality of work or operations in other areas of the laboratory
- Consulting with members of top and/or key management to determine whether the preventive action is aligned with laboratory policies and goals
- Determining whether the improvement will require any revisions of ASCL policies and procedures

![PAR Flowchart](Figure 5: PAR Flowchart)
- Determining if the improvement is in place at other laboratories
- Determining the fiscal impact of the proposed improvement
- Discussing the plan with customers to determine if the preventive action would affect their needs and/or be viewed as a quality improvement

If a PAR is warranted, then the Quality Assurance Manager will assign an individual to lead a team to develop a plan for improvement. Once the plan has been developed, the plan will be submitted to the Quality Assurance Manager. Appropriate measures shall be taken to ensure that the recommended actions are reasonable and address the potential problem.

The Quality Assurance Manager will evaluate the plan and provide a recommendation. Once approved, the PAR plan may be implemented. After the PAR plan has been fully implemented and monitored for a defined period of time, a summary of the implementation must be submitted to the Quality Assurance Manager. The Quality Assurance Manager will review the PAR implementation for effectiveness and closure.

The preventive action process is documented and maintained with the PAR using the Qualtrax® system. In addition, the Quality Assurance Manager will keep a log on the Q: drive documenting the PAR number, the section(s) affected, a brief description of the issue, and any supporting documentation (if applicable).

The effectiveness of preventive actions shall be examined in the Management System Review.

### 4.13 CONTROL OF RECORDS

#### 4.13.1 GENERAL

##### 4.13.1.1 OVERVIEW

Records include both quality and technical records. This policy provides procedures and practices for the identification, collection, organization, accessibility, filing, indexing, access, storage, maintenance, and disposal of records.

**DEFINITIONS**

**QUALITY RECORDS**

Quality records include any documents that record conformity to the quality management system.

**TECHNICAL RECORDS**

Technical records (i.e., case records) include all examination and administrative documentation as part of individual laboratory case files.

##### 4.13.1.2 RECORD STORAGE AND RETENTION

All records shall be legible, readily retrievable, and maintained in a manner that prevents damage, deterioration, or loss of the records. The storage location of physical records must be secure and have limited-access.
TECHNICAL RECORDS
Case files will be retained by the Arkansas State Crime Laboratory in either physical or electronic form. The Arkansas State Crime Laboratory uses the JusticeTrax® LIMS-plus software program. All case documentation will be stored electronically. Once reviewed, this electronic version is considered the official case record.

Storage for CODIS technical records is detailed in the **CODIS Quality Manual** (CODIS-DOC-01).

Historical non-electronic case files for the Little Rock laboratory are stored in the appropriate section, the evidence storage area in Evidence Receiving, the laboratory annex, or off-site storage. Historical non-electronic case files for the Hope Regional Laboratory are stored onsite. Whenever a case file is removed from an on-site file storage area by an authorized person, an “In-and-Out” card shall be inserted in its space citing the case number, date of removal, initials of the person removing the file, and initials of the person for whom the file is being retrieved.

QUALITY RECORDS
Labwide quality records will be stored as specified by the Quality Assurance Manager. Discipline quality records such as reagent and chemical QC logs, training records, etc., will be stored in a location designated by the Section Chief.

RECORD RETENTION
Case files will be stored indefinitely. The following items are required to be retained (either electronically or physically) for a period of eight years:

- Corrective Action Documentation
- Audit Records
- Training Records
- Continuing Education Documentation
- Proficiency Testing Records
- Court Testimony Reviews

All other quality records will be stored for at least one full ASCLD/LAB-International accreditation cycle (four years).

4.13.1.3 CONFIDENTIALITY OF RECORDS
Pursuant to A. C. A. § 12-12-312, the records, files, and information kept, obtained, or retained by the ASCL shall be privileged and confidential and released only under and by the direction of a court of competent jurisdiction, the prosecuting attorney having criminal jurisdiction over the case, or the public defender appointed or assigned to the case.

Customer agencies that have made the necessary arrangements with the ASCL are granted secure access to JusticeTrax® iResults, where they may check on the status of their laboratory requests and view completed reports for their agency.

Investigative information may not be released until after a technical review has been completed, although a Discipline Quality Manual may allow release after an independent verification.
results, conclusions, or reports will be released only after a technical and administrative review of the case file has been completed and documented.

<table>
<thead>
<tr>
<th>Requesting Party</th>
<th>Documentation Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Court of competent jurisdiction</td>
<td>Court order from the court</td>
</tr>
<tr>
<td>Prosecuting attorney having criminal jurisdiction over the case</td>
<td>Request from that prosecuting attorney's office</td>
</tr>
<tr>
<td>Public Defender appointed or assigned to the case</td>
<td>Request from that public defender's office, including the statement that they are the public defender of record in that case</td>
</tr>
<tr>
<td>The prosecuting attorney requesting for a designated party (e.g., other prosecutor's office, law enforcement agencies) to receive case information</td>
<td>Request from the prosecuting attorney's office having legal jurisdiction</td>
</tr>
<tr>
<td>Law enforcement agency other than the submitting agency</td>
<td>Request from the other law enforcement agency. The release of the requested information is made at the discretion of the submitting agency, Executive Director, or designee.</td>
</tr>
<tr>
<td>Private defense attorney in a criminal case</td>
<td>Request by the prosecuting attorney having criminal jurisdiction over the case, or a court order from a court of competent jurisdiction.</td>
</tr>
</tbody>
</table>

Table 3: Case Information Release

4.13.1.4 SECURITY AND PROTECTION OF RECORDS
Access to quality and technical records (both electronic and physical) is limited to those ASCL employees who require access to conduct analysis or assist customers. Physical records are kept in limited-access areas (refer to § 0). Access rights are assigned at the time of hire using the New Hire IT Information Form (ASCL-FORM-27), with the approval of the Section Chief. The Scientific Operations Director may review and change security roles at any time.

Access to electronic records is limited by the LIMS through the use of a user name and password, with appropriate permissions. Data is further controlled at a group and individual level so that only those personnel authorized for specific data-access management rights are assigned access to that data. Audit trails are established for LIMS transactions. In addition, access to case files in LIMS may be restricted when deemed necessary.

All electronic records are backed up and stored off-site.
4.13.2 TECHNICAL RECORDS

All case records are stored in the JusticeTrax® LIMS-plus software program. As a case is created in JusticeTrax®, request(s) will be added for disciplines with evidence to be processed. Each request has a set of milestones, including:

- Unassigned
- Assigned
- Findings Entered
- Draft Complete
- Tech. Reviewed
- Admin. Reviewed

In addition, each request has a storage location for images.

4.13.2.1 TECHNICAL RECORDS SUPPORTING INFORMATION

Each case record will contain enough information to enable reanalysis to be conducted under conditions as close as possible to the original, and to identify factors affecting uncertainty. The identity of all individuals who sampled evidence, conducted testing, or verified results will be specified in the case record.

4.13.2.2 DATA RECORDING

Observations, data and calculations shall be recorded at the time they are made and shall be identifiable to the specific task.

4.13.2.2.1 TESTING DATES

Dates shall be recorded to indicate when the work was performed. At a minimum, the starting and ending dates must be recorded. Each discipline’s Quality Manual must describe a dating procedure.

4.13.2.3 CORRECTIONS AND CHANGES

4.13.2.3.1 DOCUMENTING A CORRECTION

Any corrections made to existing hardcopy examination records will be made by an initialed, single strikeout (so that what is stricken can still be read) by the person making the change. All additions will be initialed. Correction fluid or correction tape may not be used.

4.13.2.3.2 AMENDED EXAMINATION RECORDS

When the analyst/examiner has completed a request, then they will set the milestone(s) in JusticeTrax® to draft complete. Examination records for a request will be considered completed at this time. If a change is subsequently made to the examination record, the original record will remain in the electronic case file and the changed record will be stored with a different name (e.g., amended notes). There shall be sufficient information to determine what was changed.
4.13.2.4 **EXAMINATION AND ADMINISTRATIVE RECORDS**

Examination records are any records generated by the analyst/examiner for a case file (e.g., notes, worksheets, photographs, spectra, printouts, charts, and other data). Examination records that are essential for the evaluation and interpretation of the data must be stored in the appropriate folder within the “Request” folder in the LIMS case file. When it is not feasible to incorporate the examination records in the LIMS case file, these records may be stored external to the LIMS case file. The location of these records must be specified in the Discipline Quality Manual or in the case file.

All other records contained in the case file will be considered administrative records and will normally be stored in the “Case Images” folder in the LIMS case file. It is acceptable to place an administrative memorandum in a “Request” folder after the draft complete milestone if (and only if) it does not serve as an examination record (i.e., it solely helps explain the administrative information contained within the examination record).

4.13.2.5 **SUPPORTING RECORDS**

Records to support conclusions shall be such that, in the absence of the analyst, another competent reviewer could evaluate what was done and interpret the data. Discipline Quality Manuals detail the required record documentation.

4.13.2.5.1 **LATENT PRINT RECORDS**

Latent print records shall meet all requirements listed in Appendix C of the ASCLD/LAB Supplemental Requirements, which are addressed in the Latent Print Quality Manual.

4.13.2.5.2 **OPERATING PARAMETERS**

Operating parameters used during instrumental analysis shall be recorded in the examination records or another appropriate location. The locations shall be specified in the Discipline Quality Manual.

4.13.2.6 **EXAMINATION RECORD DOCUMENTATION**

The unique ASCL case number (e.g., YYYY-#####, either handwritten or electronically generated) and the analyst’s handwritten initials or signature (or secure electronic equivalent) must be on all examination records in the case file.

4.13.2.7 **RECORD PREPARATION**

When examination records are prepared by an individual other than the issuing examiner, the initials of that individual(s) shall be on each page(s) of examination records representing their work. It shall be clear from the case record who performed each stage of the examination/analysis.

4.13.2.8 **ADMINISTRATIVE RECORD DOCUMENTATION**

The unique Arkansas State Crime Laboratory case number (e.g., YYYY-#####, either handwritten or electronically generated) must be on all administrative records in the case file.
4.13.2.9 DATA IDENTIFIER
When data from multiple cases are recorded on a single printout, kept in a single file, and referenced for the files for which data was generated, the case number for each case for which data was generated shall be appropriately recorded on the printout. When the printout is placed in each of the appropriate case records, only the individual case number is required.

4.13.2.10 DOUBLE-SIDED EXAMINATION RECORDS
When examination records are recorded on both sides of a page, each side shall include both the case number and analyst’s initials.

4.13.2.11 PERMANENCY OF EXAMINATION RECORDS
Handwritten notes and observations must be in ink. However, pencil may be appropriate for diagrams or making tracings. No handwritten information will be obliterated or erased.

4.13.2.12 DOCUMENTING VERIFICATIONS
Verification is an independent examination of evidence by another competent analyst to confirm the primary analyst’s conclusions. Verifications shall be performed by another analyst qualified in the same discipline/sub-discipline. Verifications must be documented in the case file, indicating the results of the verification, the identity of the verifier, and when the verification was performed.

If the individual draws a different conclusion from the primary analyst, both analysts shall attempt to come to a resolution. If a resolution cannot be achieved, the issue shall be brought to the attention of the Section Chief. The Section Chief shall consult with the involved parties and resolve the issue.

If verifications are performed in a discipline, the Discipline Quality Manual will detail verification and documentation requirements.

4.13.2.13 ABBREVIATIONS
Abbreviations may be used in examination records. Each discipline shall have a master abbreviation legend accessible to appropriate personnel. Commonly understood abbreviations (e.g., etc., mL, pos.) are not required to be included in this legend, but all uncommon or non-standard abbreviations must be included in the appropriate legend to be used in a case record.

4.14 INTERNAL AUDITS

4.14.1 INTERNAL AUDIT PROCEDURES
Internal audits of the laboratory will be performed to verify that laboratory operations comply with the requirements of the management system and accreditation requirements. Internal audits typically address all elements of the ASCL Quality Management System, although it may occasionally be necessary to conduct limited-scope internal audits.
The Quality Assurance Manager will schedule and coordinate the audit in each discipline of the laboratory. Such audits will be carried out by trained and qualified personnel who are (if resources permit) independent of the activity to be audited. Each audit team will be selected and led by the Quality Assurance Manager. The selection of auditors for a specific team will be primarily based on the expertise needed for that particular audit. The Quality Assurance Manager will preferentially select auditors who have the ability to relate in a professional, non-threatening, and non-judgmental manner with those whose work is being audited.

The auditors will be tasked with the following:

- Reviewing Employee History Binders (EHBs) to ensure that CVs are current, and that proficiency tests, testimony evaluations, and annual training is documented
- Reviewing case records to assess whether appropriate analytical protocols are being followed
- Observing laboratory areas to review instrument/equipment logs, perform spot checks of reagents/chemicals, and to assess laboratory cleanliness and compliance with health and safety requirements
- Having interviews/discussions with a subset of analyst(s)

During and/or after the auditing activities, each team meets with the Quality Assurance Manager to review their observations and any possible nonconformities. This meeting is intended to help clarify issues and correct possible misunderstandings that may have occurred during the audit.

The Quality Assurance Manager collects the written information developed by the auditors and develops an audit summary containing a statement of findings and general observations. The Quality Assurance Manager will provide a copy of each discipline's audit summary to the Section Chief. The Quality Assurance Manager and Section Chief will meet to discuss the audit summary. Each Section Chief receiving a finding must either appeal the finding or complete a Corrective Action Request (CAR) for each finding. These responses, along with supporting documentation, must be returned to the Quality Assurance Manager by the assigned deadline, if applicable.

General observations are considered to be opportunities for improvement and require a response by the Section Chief.

The audit summary will be reviewed by the Quality Assurance Manager, Scientific Operations Director, and the Executive Director.

4.14.1.1 AUDIT FREQUENCY

Internal audits shall be conducted each calendar year.

4.14.1.2 AUDIT DOCUMENTATION RETENTION

Records of internal audits shall be retained for at least two ASCLD/LAB-International accreditation cycles (i.e., eight years).
4.14.2 CORRECTIVE ACTION

If audit findings cast doubt on the effectiveness of operations or on the correctness or validity of test results, then timely corrective action shall be taken. The ASCL shall notify customers in writing if an investigation shows that laboratory results have been affected.

4.14.3 AUDIT DOCUMENTATION

The area of activity audited, the audit findings, and any corrective actions that arise from the audit shall be recorded and maintained by the Quality Assurance Manager.

4.14.4 AUDIT FOLLOW-UP

Documentation of the implementation and effectiveness of the corrective action will be recorded in the CAR.

A period of monitoring may be necessary before a CAR is closed. Upon a determination that the monitored corrective action was effective, the Executive Director will conduct a final review of the CAR and indicate that the corrective action process is closed by his or her concurrence with the findings. In addition, the CAR will be evaluated in the next internal audit for implementation and effectiveness.

4.14.5 PERFORMANCE DECLARATION

For years in which a Performance Declaration is required, it will be sent to ASCLD/LAB by the first day of the month immediately preceding the surveillance visit, or on another schedule determined by ASCLD/LAB.

4.15 MANAGEMENT REVIEWS

4.15.1 GENERAL REQUIREMENTS

In order to assess the effectiveness of the ASCL Quality Management System and to find opportunities to improve the quality of forensic services provided, ASCL Top Management will conduct a review of all components of the laboratory Quality Management System. This review shall take account of:

- the suitability of various ASCL policies and procedures
- reports from ASCL management
- the internal audit summary
- corrective and preventive actions
- external audit findings or other external assessments
- the results of proficiency tests
- changes in the volume and type of work
- customer feedback
- quality system complaints
- recommendations for improvements
the laboratory’s quality policy statement and mission statement
other relevant factors such as quality control activities, facilities, resources, and staff training

In addition, this review shall include goals, objectives, and action plans for the coming year.

4.15.1.1 MANAGEMENT REVIEW FREQUENCY
Management reviews shall be conducted quarterly. The components listed above will be covered annually through inclusion in one or more of these quarterly reviews.

4.15.1.2 DOCUMENTATION AND RETENTION
Records of management reviews shall be maintained by the Quality Assurance Manager and retained through one ASCLD/LAB accreditation cycle (four years).

4.15.2 ACTIONS
Findings from management reviews and the actions that arise from them shall be recorded. Top Management shall ensure that those actions are carried out within an appropriate and agreed-upon timeframe.
5 TECHNICAL REQUIREMENTS

DEFINITIONS

CHEMICAL
A substance or compound used for its constant chemical composition or characteristic properties.

REAGENT
A substance or compound added to a system to cause a chemical reaction or to determine whether a reaction occurs.

CONTROL
A substance or compound used to determine whether a method and/or instrument is responding as expected.

5.1 GENERAL

5.1.1 TEST FACTORS
Many factors determine the correctness and reliability of the tests performed by the ASCL. These factors include human factors, accommodation and environmental conditions, test methods, method validation, equipment, measurement traceability, and the handling of test items. These factors are discussed in detail in the following sections.

5.1.2 TEST RELIABILITY
The factors stated above shall be taken into account when developing test methods and procedures, in the training and qualification of personnel, and in the selection and calibration of equipment used in casework.

5.1.3 REAGENTS/CHEMICALS/CONTROLS
Reagents, chemicals and controls used by the disciplines of the Arkansas State Crime Laboratory are maintained and quality controlled by each discipline. The Discipline Quality Manuals, when applicable, shall have a procedure for ensuring the reliability of reagents. In addition, the following rules shall be followed:

- Items with a manufacturer-specified expiration date may not be used after that date without documentation to support continued reliability
- For items without a manufacturer-specified expiration date, expiration dates will be based on experience, industry standard, or scientific consensus
- Appropriate logs must be maintained within each discipline for reagents and standards used
- Each analyst must ensure that the controls, reagents and/or chemicals used in their analysis are of satisfactory quality
- Controls, reagents, or chemicals which are determined not to be reliable must be immediately removed from use
5.1.3.1 DOCUMENTATION AND LABELING

Reagents may be purchased or prepared. Minimum requirements for quality control of reagents are outlined below.

PURCHASED REAGENTS/CHEMICALS
Containers must be labeled with the following:
- Lot number
- Date opened
- Expiration date (if applicable)
- Initials (upon opening)
- Date received and initials

PREPARED REAGENTS/CHEMICALS
Containers must be labeled with the following:
- Identity
- Date of preparation
- Date of expiration

PREPARED REAGENTS
Logbooks must include the following:
- Identity
- Date of preparation
- Date of expiration
- Instructions on preparation of reagent
- Lot numbers of solvents and/or chemicals used in preparation of reagent
- A method to verify the reagent’s reliability (if applicable)
- Initials of the person preparing reagent
- Initials of the person verifying reagent (if applicable)

Note: Non-routine reagents prepared for one-time use may be recorded with the above-listed items in the appropriate laboratory case notes, and any excess reagent discarded after use.

PREPARED CHEMICALS
Logbooks must include the following:
- Identity
- Date of preparation
- Date of expiration
- Instructions on preparation of chemical
- Lot numbers of solvents and/or compounds used in preparation of chemical
- Initials of the person preparing chemical

2 The reliability verification will occur before use or, if appropriate, concurrent with the test.
CONTROLS
The specification of appropriate controls is a part of each Discipline Quality Manual. The following characteristics shall be considered when designing controls:

- Similarity to the samples being tested
- Homogeneity
- Stability
- Significant variables in the analysis
- Quantitative controls shall be in the expected range of the assay

An appropriate logbook must be kept for controls, including the following:

- Source
- Lot number, when available
- Date received and/or prepared
- Expiration date, if appropriate
- Demonstration of quality

5.2 PERSONNEL

5.2.1 GENERAL
Section Chiefs shall ensure the competence of personnel who operate specific equipment, perform tests, evaluate results, or sign test reports. Personnel in training shall have appropriate supervision. Personnel performing specific tasks shall be qualified on the basis of appropriate education, training, experience, and/or demonstrated skills, as required.

At the conclusion of training, the Section Chief shall document (e.g., by memorandum) that the individual has been properly trained and that their ability to perform the specified testing has been assessed. This record shall be kept in the individual’s Employee History Binder. In addition, the Analyst and Technician Competency Authorization Documentation form (ASCL-FORM-62) must be completed (or updated) and placed in the individual’s Employee History Binder.

5.2.1.1 TRAINING PROGRAM
The ASCL New Analyst/Technician Training Manual (ASCL-DOC-03) must be completed by all new analysts and technicians. The purpose of this training program is to provide an introduction to laboratory policies, forensic science, and criminal court proceedings. Among the topics covered in this program are:

- Establishment of the ASCL
- Confidentiality of Records
- Ethics in Forensic Science
- General Knowledge of Forensic Science
- Criminal Law Procedures and Expert Testimony
- Quality Assurance/Quality Control
This training occurs concurrently with the discipline training program.

Each discipline shall have a training manual to facilitate training in the knowledge, skills, and abilities needed to perform the appropriate testing. Discipline Training Manuals shall have stated objectives and may specify required readings, tasks, and practical exercises. Each employee will be trained under the direction of an experienced analyst in each aspect of the duties they are expected to perform. Training records shall contain sufficient detail to confirm that individuals performing particular tasks have been properly trained and that their ability to perform these tasks has been assessed.

Past work experience and training may be substituted for the training program (to the extent that they have been demonstrated to be relevant and sufficient) with the approval of the Section Chief and Scientific Operations Director.

Below are areas that shall be covered in the Discipline Training Manuals (when applicable):

- Evidence handling
- Sampling
- Test methods
- Equipment
- Controls, reagents, and chemicals
- Result interpretations
- Case records (technical and administrative record requirements)
- Report writing
- Technical and administrative reviews, independent verifications
- Moot court

The effectiveness of both the training received and the technical competence of analysts are monitored by the following mechanisms:

- 100% technical and administrative review (continuous mechanism) (see § 0)
- Proficiency testing (see § 0)
- Monitoring court testimony (see § 5.9.6)
- Annual internal audits and/or external assessments

Discipline-specific training programs can be modified to provide refresher or remedial training, as needed, for previously-experienced employees (e.g., if an analyst has been away from the bench for a period of time, or if an analyst has an inconsistency in a proficiency test or casework). The Section Chief will design the appropriately modified program. This modified training shall be documented.

5.2.1.2 MOOT COURT

When applicable, the training program shall include training in the presentation of analytical results in court (see § 0).
5.2.1.3 ADDITIONAL TRAINING
The training program shall include the application of ethical practices in forensic sciences, a general knowledge of forensic science, and applicable criminal and civil law procedures.

5.2.2 EMPLOYEE DEVELOPMENT PROGRAM
The laboratory prioritizes the continuing education of laboratory personnel. The ASCL encourages and supports employees to improve their knowledge and skills in order to grow as individuals and to fully develop their potential. The ASCL affords employees the opportunity to attend annual training and participate in professional forensic organizations. This training may include professional meetings, staff development seminars, technical training courses, in-house technical meetings, courses, seminars, and ASCL sponsored seminars and conferences. Travel procedures are detailed in § 3.21 of the ASCL Personnel Handbook (ASCL-DOC-02). This training shall be documented in the individual’s Employee History Binder.

The effectiveness of training events will be discussed in Discipline meetings.

5.2.3 PERSONNEL EMPLOYMENT
All analysts and technicians are employed by the ASCL.

5.2.4 JOB DESCRIPTIONS
Current job descriptions for personnel involved with testing shall be maintained in their Employee History Binder. Job descriptions shall include the following:
- responsibilities with respect to performing tests
- responsibilities with respect to the planning of tests and evaluation of results
- responsibilities for reporting opinions and interpretations
- responsibilities with respect to method modification and development and validation of new methods
- expertise and experience required
- qualifications and training programs
- managerial duties, if applicable

5.2.5 AUTHORIZATION DOCUMENTATION
The Section Chief (or the DNA Technical Leader for DNA and CODIS) shall authorize personnel to perform sampling, testing, issuing of reports, performing technical reviews, performing test methods, and operating particular types of equipment. This shall be documented on the Analyst and Technician Competency Authorization Documentation form (ASCL-FORM-62), signed by the Section Chief, and maintained in the individual’s Employee History Binder. Each Employee History Binder shall also contain a curriculum vitae or résumé that includes educational and professional qualifications, training, skills, and experience. The individual’s Training Binder will contain all completed training records.
5.2.6 TECHNICAL PERSONNEL QUALIFICATIONS

5.2.6.1 EDUCATION

5.2.6.1.1 FORENSIC CHEMISTRY AND PHYSICAL EVIDENCE
Analysts working in the Forensic Chemistry or Physical Evidence disciplines shall possess a baccalaureate or advanced degree in a natural science or a closely related field.

5.2.6.1.2 FORENSIC TOXICOLOGY
Analysts working in the Toxicology discipline shall possess a baccalaureate or advanced degree in a natural science, toxicology, or a closely related field.

5.2.6.1.3 FORENSIC BIOLOGY
Analysts working in the Forensic Biology discipline shall possess a baccalaureate or advanced degree in a natural science or a closely related field and, if performing DNA analysis (and where applicable), shall meet the educational requirements of the Quality Assurance Standards for Forensic DNA Testing Laboratories and Quality Assurance Standards for DNA Databasing Laboratories.

5.2.6.1.4 FIREARMS/TOOL MARKS, LATENT PRINTS, AND DIGITAL EVIDENCE
Analysts working in the Firearms/Tool Marks, Latent Prints, and Digital Evidence disciplines shall possess a baccalaureate degree with science courses. The educational requirement may be waived for analysts working in the Discipline prior to December 2004.

5.2.6.1.5 TECHNICIANS
Technicians working as technical support in any discipline shall meet the education requirements specified in their job description and Discipline Quality Manual.

5.2.6.2 COMPETENCY TESTING

5.2.6.2.1 GENERAL
All analysts and technical support personnel who generate analytical results, regardless of academic qualifications or past work experience, shall satisfactorily complete a competency test in each category of testing in which they intend to perform casework. This includes examining unknown sample(s) and achieving the intended results. Failure to achieve the intended results requires review and/or retraining until competency testing is satisfactorily completed.
5.2.6.2.2  COMPETENCY TESTING REQUIREMENTS

For laboratory personnel whose job responsibility includes report writing, a competency test shall include, at a minimum:

 Examination of sufficient unknown samples to cover the anticipated spectrum of assigned duties and evaluate the individual’s ability to properly perform analysis
 A written report to demonstrate the individual’s ability to properly convey results and/or conclusions and the significance of those results and/or conclusions
 A written or oral examination to assess the individual’s knowledge of the discipline, category of testing, or task being performed, and
 Moot court to demonstrate the individual’s ability to properly convey and present results of evidence in court

The requirement for moot court may be waived for employees receiving training in additional categories of testing within the same discipline.

5.2.7  LITERATURE

The ASCL maintains and provides access to literature resources such as relevant books, journals, and other literature dealing with each discipline. Each discipline shall have a system in place to encourage individuals to review appropriate new literature.

5.3  ACCOMMODATION AND ENVIRONMENTAL CONDITIONS

5.3.1  GENERAL

The ASCL facilities’ energy sources, lighting, and environmental conditions allow for the correct performance of the tests. The laboratory can ensure that environmental conditions do not adversely affect test results through the use of routine verifications performed on reagents, instruments and equipment. When appropriate, Discipline Quality Manuals shall address environmental conditions that can affect the results of the tests.

The ASCL provides adequate space for:

 the storage of supplies, instrumentation, and equipment,
 writing reports,
 maintaining records, reference works and other necessary documents,
 facilitating the operation of instruments and equipment, and
 storing accessories near instruments and equipment.

5.3.2  ENVIRONMENTAL CONDITIONS

When environmental conditions may reasonably be a factor affecting the quality of results, they shall be monitored, controlled and recorded. Testing shall be stopped when environmental conditions jeopardize the results of the tests.
5.3.3 LABORATORY SEPARATION

ASCL laboratory areas are designed to ensure effective separation between neighboring areas in which there are incompatible activities. Disciplines are responsible for taking the necessary measures to prevent cross-contamination.

5.3.4 ACCESS

Access to and use of areas where testing occurs and evidence is stored is controlled (see § 0 and subsections).

5.3.4.1 FACILITIES

The Arkansas State Crime Laboratory complex consists of a main building containing approximately 79,000 square feet of laboratory and administrative areas, and an annex containing approximately 3,000 square feet of storage and automotive processing space. The main building is located at #3 Natural Resources Drive, Little Rock, Arkansas, and the annex building is located across the street.

The buildings housing the ASCL are owned by the Arkansas Department of Finance and Administration, Division of Building Authority (DBA), with rent paid on the facilities every quarter. DBA is responsible for the physical plant and grounds.

In the event of commercial power failure, the laboratory complex has an emergency generator that is activated within ten seconds. The generator furnishes power to the laboratory’s security and emergency lighting systems. It is also used to power emergency circuits for critical refrigeration and some instrumentation. The generator is the responsibility of the DBA.

The Hope Regional Laboratory is located at 2500 South Main St., Hope, Arkansas, on the campus of the University of Arkansas Community College at Hope. The building contains approximately 2,200 square feet of laboratory and administrative areas.

In the event of a commercial power failure, the security system is equipped with a battery backup which is rated to provide twenty-four hours of continued functionality.

All laboratory personnel must pass a criminal background check.

5.3.4.1.1 SECURITY (MAIN LABORATORY)

DOORS

Exterior doors to the vestibule of the building are unlocked from 7:30 a.m. through 5:00 p.m., except on holidays and weekends. The interior vestibule doors leading into the lobby remain locked at all times, with all visitors required to sign in. Law enforcement officers must show their badges before being admitted into the laboratory. All other visitors must have an escort. All other exterior doors are to remain locked at all times and require a security fob to open. This includes the South and North doors on the first floor and the doors to the basement.
Doors to the Administrative section of the laboratory are open during weekday business hours and closed on weekends and holidays. Entry during non-business hours requires a security fob for access.

Assigned DBA employees have access to the exterior doors of the building and mechanical rooms inside the building.

**ELEVATORS**
A security fob is required to activate the elevators in the basement and on the first floor.

Only the central and west elevators go to all floors. The south elevator will not go to the basement—only to the first through third floors.

**STAIRS**
Access to stairwell entries from the basement and first floor require a security fob.

Only the central and west stairwells go to all floors. The south stairwell will only allow access to the first through third floors.

**CAMERAS**
Security cameras are located throughout the laboratory complex.

**LIGHTING**
Exterior pole and wall lights are photo-cell activated, and operate from dusk until dawn.

The interior lighting of the building is the responsibility of DBA.

**LABORATORY AREAS**
Access to all laboratory areas is restricted by security fob or key entry to those personnel authorized by the Executive Director.

Forensic DNA, CODIS and Physical Evidence laboratory areas are locked at all times and require a security fob or an escort to enter the section. No others, with the exception of the following people, are allowed access to the section:

- Executive Director
- Assistant Director
- Scientific Operations Director
- Quality Assurance Manager
- Health and Safety Manager
- CODIS Personnel
- Forensic DNA Personnel
- Physical Evidence Personnel
- Other personnel deemed necessary by the Executive Director

All employees are required to provide a DNA sample for the ASCL contamination database. Any person who enters the secure areas of the ASCL may also be required to provide a DNA sample for the ASCL contamination database.
FOB AND KEY ACCOUNTABILITY

Security fobs are required to access certain areas of the laboratory complex. Issuance to authorized personnel requires approval by the Executive Director using a Qualtrax® workflow.

The security fob access system is controlled by a computer placed in the Administrative Section. Access reports can be generated from the security fob access system software.

KEY BOXES

Firearms, Forensic Biology, Forensic Chemistry, and Physical Evidence sections have a key box containing cabinet keys and section door keys. The key to the section key box is kept by the appropriate Section Chief. A log must be kept when keys are added or removed from the section key box.

The ASCL has a Master Key Box containing master door keys, extra door keys, section key box keys, and/or section master cabinet keys. A Master Key Log is kept and an inventory conducted as needed. Keys removed or added to the Master Key Box are recorded on a logsheet maintained by the Quality Assurance Manager. Keys given out on a temporary basis (e.g., to make a new copy) will be recorded on a logsheet attached to the Master Key Box. Door keys are issued to authorized personnel in order to access certain areas of the laboratory complex. Issuance to authorized personnel requires approval by the Executive Director using a Qualtrax® workflow. This must be completed prior to giving a key from the Master Key Box to an employee (except for temporary transfers).

NON-BUSINESS HOURS

An outside security company furnishes security to the building during the off-hours as follows:

- Weekdays: before 7:00 a.m. and after 5:00 p.m.
- Weekends and holidays: twenty-four hours

The guard station is located in the lobby of the ASCL. The guard’s duties are as follows:

- Watch the monitors for cameras located around the perimeter of the building
- Report any unusual activity outside the building to the Little Rock Police Department
- Call someone on the emergency list if alarms activate or other emergencies exist at the laboratory
- Deny access to anyone without authorization from Administration, except emergency personnel.

EVIDENCE STORAGE AREAS

Evidence storage conditions prevent loss, deterioration, or contamination, and maintain the integrity and identity of the evidence. Proper security is achieved by storing evidence in locked cabinets, refrigerators, vaults, or rooms. Evidence storage space may be shared by laboratory personnel. It is not necessary to place locks on refrigerators and freezers which are maintained in rooms and/or areas which are secure and restricted. Each Discipline Quality Manual shall address evidence storage procedures.
The Evidence Receiving Section has limited access. Access requires a security fob and/or key. The following people have access to the evidence storage area:
- Evidence Receiving Section Chief
- Evidence Technicians

The following individuals have access to the evidence storage area, but only during regular work-hours. They must sign the log when entering and leaving the evidence storage area, but do not need to be escorted.
- Executive Director
- Assistant Director
- Scientific Operations Director
- Quality Assurance Manager
- Health and Safety Manager
- Information Technology Support
- Other personnel as deemed necessary by the Executive Director

**FIRE DETECTION SYSTEM**
A security company provides continuous monitoring of the fire alarm system, and notifies the fire department and DBA of alarms.

5.3.4.1.2 SECURITY (ANNEX)
The annex is monitored by the main laboratory’s security system and consists of motion sensors, door sensors, and key locks. If access is gained without disarming the system, an audible alarm will sound and the security guard’s station will be alerted. The annex consists of a solvent storage area, file storage area, supply storage area, and automotive processing area:
- Solvent storage: a four wall concrete-block area that is temperature-controlled for storage of solvents in flammable cabinets and is secured by key lock
- Miscellaneous supply storage: these areas are secured by key lock and motion detectors
- File storage: this area is temperature-controlled and secured by key lock
- Automotive processing area: this area is secured by motion detectors and key lock

CAMERAS
Security cameras are located throughout the laboratory annex.

DOORS
The annex’s gates are controlled by a fob access system, located in the Administration Section of the main laboratory building. All exterior doors require key access. Security fobs and keys are issued to authorized personnel, as determined by the Executive Director.

5.3.4.1.3 SECURITY (HOPE REGIONAL LABORATORY)

DOORS
The front entrance has a key lock and has a contact sensor for the security system. The compressed gas storage room entrance has a key lock and has a contact sensor for the security system.
CAMERAS
Security cameras are located in and around the laboratory building. These cameras are maintained by the Telecommunications Division of the University of Arkansas Community College at Hope.

LABORATORY AREAS
The exterior entrance to the laboratory examination area has a key lock, a magnetic lock, and has a contact sensor for the security system. The interior entrance to the laboratory examination area has a key lock, a magnetic lock, and has a contact sensor for the security system.

SECURITY FOB AND KEY ACCOUNTABILITY
Security fobs are issued to authorized personnel, as determined by the Executive Director, to provide access to the areas of the laboratory protected by the magnetic lock system. Distribution of all door keys (including security fobs) must have the approval of the Executive Director. This approval must occur before giving security fob or key access to an individual. This process must be completed for new hires, damaged/lost fobs, etc. Approval documentation will be maintained in Qualtrax.

KEY BOX
The laboratory has a key box containing security cards, door keys and cabinet keys. The key to the key box is kept by the Forensic Chemist Supervisor. A log must be kept when keys are added or removed from the section key box.

NON-BUSINESS HOURS
The Hope Regional Laboratory has an intrusion alarm system equipped with door contact sensors, motion detectors, and glass breakage detectors.

EVIDENCE STORAGE AREAS
The entrance to the evidence storage area has a key lock, a magnetic lock, and has a contact sensor for the security system. Each chemist has a personal evidence storage area with a key lock to secure the evidence during processing.

FIRE DETECTION SYSTEM
A security company provides continuous monitoring of the fire alarm system and notifies the fire department and University of Arkansas Community College at Hope of alarms.

5.3.5 HOUSEKEEPING
MAIN LABORATORY
Janitorial service to the building is the responsibility of DBA, who has contracted with an outside business. Janitorial employees are located in the building each workday during regular business hours and perform housekeeping duties in the discipline areas only when laboratory employees are present. The DNA and Physical Evidence disciplines are responsible for their own daily housekeeping duties. If additional housekeeping procedures are necessary, they shall be specified in the Discipline Quality Manual.
HOPE REGIONAL LABORATORY

The laboratory staff takes measures to ensure good housekeeping in the laboratory. If additional housekeeping procedures are necessary, they shall be specified in the Discipline Quality Manual.

5.3.6 HEALTH AND SAFETY PROGRAM

The ASCL is committed to providing a safe working environment for its employees. The laboratory’s Health and Safety Manual (ASCL-DOC-08) must be followed by all employees and guests. Employees not following the safety guidelines in the safety manual will be subject to disciplinary action. Guests will be asked to either conform to the safety regulations or leave.

5.4 TEST METHODS AND METHOD VALIDATION

5.4.1 GENERAL

Only appropriate methods and procedures will be used in casework. These include methods and procedures for sampling, handling, transport, storage and preparation of items to be tested, and where appropriate, an estimation of the uncertainty of measurement. Instructions are documented for the use and operation of all relevant equipment, and the handling and preparation of items for testing, where the absence of such instructions could jeopardize the results of tests.

Each discipline within the ASCL will maintain a quality manual containing a “Test Method” section. This section will contain a detailed procedure for each analytical method used in that discipline, available to all analysts who work in that discipline. There are often many acceptable procedures to accomplish a particular examination. The considerable variation that exists in actual casework requires a forensic scientist be free to exercise sound judgment in choosing the method most appropriate to the case at hand. The Section Chief ensures that those procedures which are contained in their Discipline Quality Manual meet acceptable scientific standards and that they are applied appropriately.

Each test method shall include the following, when applicable:

- the scope of the test method
- reagents, standards and controls
- sample preparation
- quality assurance/control measures
- the interpretation of results, which should include:
  - precautions to be taken
  - possible sources of error
  - applicable literature references
  - criteria for positive, negative, and inconclusive results
  - applicable disclaimers
- documentation requirements
- specifications for critical reagents and equipment (if applicable)
It is acceptable for laboratory procedures to specify where specific case record components (e.g., spectra of standards or calibration documentation) are maintained without a reference to the location of these records in the case file.

If it becomes necessary to make a deviation from a documented method and/or procedure, it must be technically justified and authorized by the appropriate Section Chief. The deviation will be documented in the case record. Each Section Chief will keep a log of method/procedure deviations.

### 5.4.2 SELECTION OF METHODS

The ASCL shall use test methods that meet the needs of the customer and are appropriate for the tests undertaken. By completing and submitting the submission sheet, the customer relinquishes all decisions regarding analytical processing and choice of methods to the ASCL.

Standard methods, laboratory-developed methods, or non-standard methods may be used in casework after the appropriate validation and/or performance verifications have been performed as described in this section. The most current version of the method must be documented and readily available to the analyst for reference unless it is not appropriate or possible to do so.

#### STANDARD METHODS

Standard methods are methods published in international, regional or national standards (e.g., the American National Standards Institute (ANSI)). Before using a standard method in casework, a performance verification must be performed to ensure the reliability of the method. Records of the performance verification shall be retained by the appropriate discipline. Standard methods do not need to be supplemented or rewritten as internal procedures if these standards are written in a way that they can be used as published. However, it may be necessary to provide additional documentation for optional steps in the method or additional details to ensure consistent application.

#### 5.4.3 LABORATORY-DEVELOPED METHODS

Laboratory-developed methods are modifications of standard or non-standard methods, or new methods, created by the laboratory. Laboratory-developed methods must be validated (see § 5.4.5) and a performance verification completed prior to use in casework.

#### 5.4.4 NON-STANDARD METHODS

Non-standard methods are methods or procedures that are published by reputable technical organizations (e.g., Scientific Working Groups (SWGs), Technical Working Groups (TWGs)), relevant scientific texts or journals, or the manufacturer of the equipment. Non-standard methods must be appropriate and contain a clear specification as to the intended use of the method. These methods must be validated (see § 5.4.5) and a performance verification completed prior to use in casework.

For new test methods, procedures shall be developed prior to the tests being performed which shall contain the information as described in § 5.4.1.
5.4.5 VALIDATION OF METHODS

5.4.5.1 GENERAL
Validation is the process used by the scientific community to assess the ability of a procedure to reliably obtain a desired result, to determine the conditions under which such results can be obtained, and to determine the limitations of the procedure. The validation process identifies the critical aspects of the procedure that must be carefully controlled and monitored. All validations must include successful testing of samples that are representative of what would typically be encountered in casework.

Validation studies can be conducted externally by the scientific community (as in the case of standard or published methods) or by the laboratory itself (as in the case of methods developed in-house or where significant modifications are made to previously validated methods).

5.4.5.2 VALIDATION PROCESS

VALIDATION PLAN
Prior to implementing a non-standard method, a laboratory-developed method, a standard method used outside its intended scope, or amplifications and modifications of a standard method, a proposal outlining a validation plan will be developed to confirm that the methods are fit for the intended use. This validation plan will be submitted to and approved by the appropriate Section Chief(s), Quality Assurance Manager and the DNA Technical Leader (when applicable) prior to conducting the validation. The validation plan shall be updated as necessary and communicated appropriately.

VALIDATION TECHNIQUES AND EVALUATION
The validation shall be as extensive as is necessary to meet the needs of the application. The validation will be conducted by qualified personnel equipped with adequate resources.

Whenever practicable and appropriate, validation procedures will be evaluated on the basis of accuracy, precision, sensitivity, and specificity. Whenever practicable, validation shall also involve the use of at least one of the following procedures: split samples, blind trials, or concordance testing. Validation guidelines promulgated by reputable technical organizations may alternately be used to determine the structure and extent of the validation process.

After the validation has been completed, a validation summary will be prepared by the personnel involved in the validation process. This will include the results obtained, the procedure used for the validation, and a statement as to whether the method is fit for the intended use. The validation summary will be reviewed and approved by the appropriate Section Chief(s), Quality Assurance Manager, DNA Technical Leader (when applicable), Scientific Operations Director, and Executive Director. The Discipline Quality Manual shall be updated appropriately.

Following approval of the validation, individuals will be trained by the personnel involved in performing the validation. This training will include the interpretation of results, quality assurance and quality control measures, and documentation requirements. The training will be performed
prior to use of the new analytical procedure in casework and must be documented in the individual’s Employee History Binder. All documentation supporting validation must be kept on record in an area located close to where the analysis occurs, and be readily available to each analyst who uses it.

For validations conducted outside of the laboratory, individuals will be trained appropriately prior to use in casework and this training shall be documented in the individual’s Employee History Binder.

Substantive changes to an analytical procedure (i.e., changes that may affect the outcome of a test) may require a performance verification or an additional validation prior to use in casework.

5.4.5.3 RELEVANCY OF THE VALIDATION

The laboratory shall ensure the range and accuracy of the values obtained from the validated methods are relevant to the needs of the customer (e.g., detection limit, selectivity of the method).

5.4.5.4 PERFORMANCE VERIFICATION

When implementing an internally- or externally-validated method new to the ASCL, a performance verification will be performed to ensure the reliability of the method prior to its use in casework. Records of this verification shall be retained in the appropriate discipline.

5.4.6 ESTIMATION OF UNCERTAINTY OF MEASUREMENT

5.4.6.1 GENERAL

The ASCL will assess the measurement uncertainty when quantitative values are reported for:

- the quantity (mass or volume) of a controlled substance
- the presence of a controlled substance when it is reported as a percentage (mass or volume fraction) of the whole sample
- values reported for blood alcohol or drug concentration in toxicology samples
- the barrel length of a firearm and/or the overall length of a firearm

The analytical protocols for estimation of the uncertainty of measurement for the affected disciplines will be contained either in the Discipline Quality Manual or a location specified in the manual. The Section Chief, or designee, shall be responsible for maintaining documentation of all uncertainty of measurement calculations. The estimated uncertainty of measurement shall be reported.
5.4.6.2 PROCEDURES

Reasonable estimation of the performance of the method shall be based on previous experience and validation data. It is important to keep in mind that the nature of certain test methods may preclude a rigorous, metrologically- and statistically-valid calculation of the uncertainty of measurement. Only those components under the control of the laboratory need to be considered when estimating the uncertainty of measurement. The basic procedure for estimating the uncertainty of measurement includes, but is not limited to, the following actions:

- Specify the measurand.
- Specify the measurement method, including the equipment or instrument used to take the measurement.
- Construct and document an appropriate uncertainty budget identifying and listing all potential sources of uncertainty, including those not used in the calculation.
- Gather the appropriate measurement data. Sources of measurement data could include method validation, QC data, proficiency tests, replicate testing data, calibration certificates, or scientific literature.
- Estimate the uncertainty of the measurement method in accordance with an appropriate formula.
- Document the estimated uncertainty of the measurement method, and have the results and supporting data readily available in the laboratory.
- Specify calculation and reporting guidelines, including the number of significant figures and/or decimal places in the estimated uncertainty of measurement.
- Re-evaluate the estimated uncertainty of measurement as the need arises (e.g., when a significant change occurs in the uncertainty budget). Each Discipline Quality Manual will contain procedures for recalculating the uncertainty of measurement, if applicable.

During calculations, the evaluator shall not round any components of the calculation before the final determination of the estimated uncertainty of measurement. The estimated uncertainty of measurement will be rounded up at the appropriate level of significance, rather than rounded down or truncated.

5.4.6.3 SOURCES OF UNCERTAINTY

When constructing the uncertainty budget, all uncertainty components which are of importance in the given situation shall be taken into account. Sources that may contribute to the uncertainty include, but are not limited to, the following:

- reference standards and reference materials
- methods and equipment
- environmental conditions
- properties and condition of the item being tested
- the individual conducting the measurement

Factors that do not impact the uncertainty of measurement to any significant degree (based on previous experience) may be dismissed, but must still be documented.
5.4.7 CONTROL OF DATA

5.4.7.1 CALCULATIONS AND DATA TRANSFERS
When a request has been draft completed, this indicates that the author has ensured that all calculations and data transfers are accurate and that the calculations conform to written procedures. By completing the technical review, the technical reviewer is confirming that they have checked the calculation(s) and data transfers for accuracy. If an additional check is required, this requirement shall be included in the appropriate Discipline Quality Manual.

5.4.7.2 ELECTRONIC DATA
Computers and automated equipment used for the acquisition, processing, recording, reporting, storage, or retrieval of test data will meet the following guidelines:

- Computer software developed by the ASCL will be documented in sufficient detail and suitably verified.
- Procedures will be established and implemented for protecting the data. These procedures include the integrity and confidentiality of data entry or collection, data storage, data transmission, and data processing (see § 4.13.1.3-4). Discipline-specific procedures can be found in the appropriate Discipline Quality Manual.
- Computers and equipment will be maintained to ensure proper functioning and will be provided with the environmental and operating conditions necessary to maintain the integrity of the data.
- Commercial off-the-shelf software in general use within its designed application range may be considered to be sufficiently validated. However, significant software configuration/modifications shall be validated as above.

5.4.7.2.1 DIGITAL EVIDENCE DATA
The ASCL has implemented appropriate measures to prevent unauthorized access to computer systems used for examining digital evidence. These measures are detailed in the Digital Evidence Quality Manual (DE-DOC-01).
5.5 EQUIPMENT

DEFINITIONS

**CALIBRATION**
A process (with established measurement uncertainty) which establishes a relation between the response of a measuring instrument and known quantity values (e.g., from certified reference standards), which may be used to obtain a measurement result from an instrument response.

**PERFORMANCE VERIFICATION**
Objective confirmation that the performance requirements of a measuring system have been achieved.

**REFERENCE STANDARD**
A standard (traceable through a chain of calibrations) used for the calibration, performance verification, or adjustment of other measurement devices.

**REFERENCE MATERIAL**
A traceable material used for the calibration, performance verification, or adjustment of a measurement device. These materials are normally accompanied by documentation issued by an authoritative body.

**ADJUSTMENT**
The process performed to correct a measuring system in order to meet the required specifications.

### 5.5.1 GENERAL

The ASCL has adequate equipment to perform all necessary testing. Routine maintenance of this equipment is performed by laboratory personnel. Details of specific quality control measures on equipment that has a significant effect on the quality of test results will be outlined in the appropriate Discipline Quality Manual.

If the ASCL must use equipment outside of its permanent control, the laboratory shall ensure that the equipment meets the requirements of this section.

### 5.5.2 CALIBRATION AND PERFORMANCE VERIFICATION

Before equipment is placed into service, a calibration or performance verification with traceable or certified reference standards/materials shall be performed to ensure that the equipment meets the specifications required by the appropriate method. Designated equipment will also be subject to a schedule of calibration or performance verifications.

Written procedures for the scheduled requirements will be detailed in the appropriate Discipline Quality Manual. All calibrations and performance verifications shall be properly documented in a log. This log shall be maintained and readily available to each analyst who uses it.

### 5.5.3 EQUIPMENT TRAINING

New employees shall be trained on the appropriate equipment during their training program, as stated in each Discipline Training Manual. Section Chiefs shall authorize personnel to operate...
equipment (documented on Analyst & Technician Competency Authorization Documentation, ASCL-FORM-62). This authorization documentation shall be signed by the Section Chief and maintained in the Employee’s History Binder. Only individuals who have been trained in the proper use of the equipment shall operate it.

When new equipment requires a validation, appropriate personnel will be trained in its use. This training will be documented and kept in each individual’s Employee History Binder.

Up-to-date instructions on the use and maintenance of the equipment shall be readily available for use.

5.5.4 EQUIPMENT IDENTIFICATION

All equipment (and its software) used for testing and significant to the result will be, when practicable, uniquely identified and traceable to its maintenance and calibration/verification records.

5.5.5 EQUIPMENT RECORDS

Each Discipline shall maintain readily-available records for equipment (and its software) having a significant effect on the quality of test results. The records shall include at least the following information:

a) the identity of equipment and its software and version
b) the name of manufacturer, model, serial number and asset number, if applicable
c) the date that the equipment was calibrated or verified prior to being placed into service
d) the location of the equipment (section and room number, if appropriate)

e) the manufacturer’s instructions, if available, or reference to their location
f) a calibration or performance verification log that includes the following, when applicable:
   1) dates of calibration or performance verification
   2) results of calibration or performance verification
   3) documentation of adjustments
   4) acceptance criteria
   5) due date of the next calibration or performance verification (or schedule)
   6) copies of calibration reports and certificates or reference to their location

g) a maintenance log that includes any damage, malfunction, modification or repair to the equipment

h) the LIMS instrument case number(s), if applicable
i) the identifier used to identify the equipment in case data, if applicable
j) the date the equipment was permanently removed from service, if applicable

When equipment is retired, the records shall be maintained and available for at least one full ASCLD/LAB-International accreditation cycle (four years).
5.5.6 HANDLING AND MAINTENANCE OF EQUIPMENT

All equipment will be maintained in a clean, orderly, and safe condition. Laboratory equipment shall be handled responsibly to ensure optimal performance and to avoid contamination and premature wear and damage. It is the Section Chief’s responsibility to ensure that proper planning and care is taken when equipment is initially placed or is subsequently moved. Care shall be taken to minimize the possibility of shipping damage if equipment is shipped outside of the laboratory's control for calibration or maintenance. Equipment that is infrequently used shall be stored per manufacturer's recommendations, if available (e.g., covered, powered-down).

Each discipline has maintenance policies and procedures for equipment having a significant effect on the results. The Discipline Quality Manual will document preventative maintenance steps designed to maintain optimum performance from the equipment.

5.5.7 EQUIPMENT OUT OF SERVICE

When equipment is not working properly, or potential problems are observed, it is the duty of the analyst to immediately take the appropriate steps to correct the problem or inform the appropriate individual of the problem. Both the issue and the response must be documented in the appropriate log.

Equipment that is not working properly must be clearly marked as being out of service to prevent inadvertent use of the equipment. The equipment will not be used in casework until appropriate repair or calibration, followed by a performance verification, is performed and documented.

When it is determined that test results have been obtained with improperly-functioning equipment, the Section Chief shall consider the effect the problem may have had on previous test results and determine whether there is an issue of non-conforming work (see § 4.9).

5.5.8 CALIBRATION STATUS

Whenever practicable, equipment requiring calibration shall be labeled (or otherwise identified) to indicate the status of calibration, including both the date of the last calibration and the date when recalibration is due.

5.5.9 OUTSIDE MAINTENANCE

A successful performance verification is required for any equipment that has gone outside of the direct control of the laboratory (e.g., for repair or preventive maintenance) before that equipment may be returned to service. Documentation of these verifications will be maintained.

5.5.10 INTERMEDIATE PERFORMANCE VERIFICATIONS

Where appropriate, periodic performance verifications shall be completed on equipment to maintain confidence in the calibration status of the equipment. The Discipline Quality Manual will define the schedule of these verifications and the location of the verification documentation.
5.5.11 EQUIPMENT ADJUSTMENTS

After a performance verification has been performed, it may be necessary to make adjustments to the equipment using certified or traceable reference standards/materials (e.g., balance, pH meter, GC-MS). These adjustments shall be documented in the calibration/performance verification log.

There are types of equipment that cannot be adjusted if they fail calibration specifications (e.g., liquid-in-glass thermometers). Correction factors may be used, but procedures are necessary to ensure that copies (e.g., in computer software) are correctly updated.

5.5.12 EQUIPMENT PROTECTION AND SECURITY

Equipment with calibration settings that can be adjusted by laboratory personnel will be safeguarded against unintentional changes which would invalidate the test results. This may be accomplished by, for example:

- Using positive and negative controls, standards, or known reference material at the beginning and end of instrumental runs/analytical sequences
- Placing tamper-proof seals over the adjustment points
- Specifying dedicated personnel as the only individual(s) authorized to make the adjustments

The Discipline Quality Manual shall indicate any such procedures necessary to safeguard equipment calibrations, when applicable.
5.6 MEASUREMENT TRACEABILITY

DEFINITIONS

CALIBRATION
A process (with established measurement uncertainty) which establishes a relation between the response of a measuring instrument and known quantity values (e.g., from certified reference standards), which may be used to obtain a measurement result from an instrument response. This should not be confused with the routine adjustment of a measuring system (see “adjustment”).

CHAIN OF CALIBRATIONS
An unbroken sequence of calibrations from the measuring system in question to a national (or international) measurement standard, where each calibration contributes to the total measurement uncertainty.

MEASUREMENT
The process of experimentally obtaining one or more results that describe a property of the measurand.

MEASURAND
A quantity or object to be measured.

REFERENCE
A reference standard or a reference material. It may also be referred to as a measurement standard.

TRACEABILITY
A property of a measurement whereby the result can be related to a reference through a documented and unbroken chain of calibrations, each contributing to the measurement uncertainty.

Each discipline shall be able to exhibit measurement traceability on measurements that have a significant effect on the accuracy or validity of the result of the test, including all measurements explicitly requiring a measurement uncertainty calculation (see § 5.4.6).

The following table lists examples of equipment used for testing that can be calibrated by external calibration laboratories using traceable reference standards.

<table>
<thead>
<tr>
<th>Type of Calibration Reference Standard</th>
<th>Type of Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>Balance</td>
</tr>
<tr>
<td>Mass-derived</td>
<td>Pipette (volume), trigger pull device (force)</td>
</tr>
<tr>
<td>Length</td>
<td>Caliper, ruler, tape measure</td>
</tr>
<tr>
<td>Temperature</td>
<td>Thermometer</td>
</tr>
</tbody>
</table>

Table 4: Calibrated Equipment

Below are examples of the Chain of Comparison for the calibration of equipment, reference standards, and reference materials. It is important that the ASCL contract calibration services and purchase reference standards and materials from providers following the listed chain of comparisons:
The following is the chain of comparison (with recalibration cycle) for reference standards:

- Reference standard manufacturer or supplier with reference standards following the above-listed chain of comparison
- Reference standard purchased by ASCL
- Reference standard used to conduct periodic performance verifications and adjustments on ASCL equipment
- Reference standard undergoes scheduled recalibration by an accredited calibration service provider

The following is the chain of comparison for reference materials (not required for reference materials used for testing):

- National Metrology Institute (NMI): NIST

Reference Material Provider

Reference Material used at ASCL to conduct Performance Verifications
The individual Chains of Comparison above can be combined to show an overall Chain of Comparisons (included below) to establish a connection from the measurement instrument/equipment to reference standards/materials, containing all of the information needed to objectively demonstrate these connections and comparisons. Records for each step in these chains shall be maintained by the appropriate discipline.

The Discipline Quality Manual will have defined intervals for re-calibration or performance verifications of measurement instrumentation/equipment and reference standards. Section Chiefs (or designees) will be responsible for ensuring that reference standards and measurement instrumentation/equipment meet appropriate specifications.

<table>
<thead>
<tr>
<th>Measurement Equipment</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Serial number/identifier</td>
<td></td>
</tr>
<tr>
<td>Measurand</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference Standard/Material</th>
<th>Serial number/identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturer specifications</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verification of Reference Standard/Material</th>
<th>Measurement result (with a reference to SI, if possible)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Documented uncertainty of measurement (with a description of the development process)</td>
</tr>
<tr>
<td></td>
<td>Calibration laboratory/personnel competence documentation</td>
</tr>
</tbody>
</table>

**Figure 9: Overall Chain of Comparisons**

### 5.6.1 EQUIPMENT CALIBRATION REQUIREMENTS

New equipment used for tests which has a significant effect on the accuracy or validity of the result of that test (see Table 4: Calibrated Equipment above), shall either be received with calibration documentation or an external calibration will be performed before use in casework.

### 5.6.1.1 PERFORMANCE VERIFICATION

The procedures for performance verification of instrumentation/equipment will be detailed in the Discipline Quality Manual. A performance verification is normally required after instrumentation/equipment maintenance has been performed. In general, performance verification intervals shall not be less stringent than the manufacturer’s recommendations.
5.6.2 SPECIFIC REQUIREMENTS

5.6.2.1 CALIBRATION

The Arkansas State Crime Laboratory is not a calibration laboratory and uses external calibration services for calibration of equipment.

There are two categories for equipment:

**CATEGORY 1:** The equipment has a significant effect on the accuracy or validity of sampling or a test result (e.g., measurements that require a measurement of uncertainty calculation, reported measurements).

**CATEGORY 2:** The equipment could have some effect on the overall quality of testing.

When Category 1 equipment requires a calibration, the ASCL shall use an external calibration laboratory accredited to ISO/IEC 17025:2005.

For Category 2 equipment, the external calibration laboratory does not have to be accredited to ISO/IEC 17025:2005, but the vendor shall be evaluated by the Quality Assurance Manager using the *Vendor Evaluation Form* (ASCL-FORM-61). The calibration documentation issued by the external calibration lab must confirm competence, measurement capability, and traceability to the appropriate National Metrology Institute (NMI).

For all equipment that requires calibration, the appropriate Discipline Quality Manual shall indicate which calibration category the equipment falls under and the calibration procedures (e.g., schedule) for the equipment.

5.6.2.2 TESTING

5.6.2.2.1 CALIBRATION UNCERTAINTY

If the associated contribution from the calibration of the equipment contributes little to the total uncertainty of the test result, the equipment does not require calibration. This assessment must be documented.

5.6.2.2.2 NON-SI UNIT TRACEABILITY

There are certain calibrations that currently cannot be strictly made in SI units. In these cases, calibration provides confidence in measurements by establishing traceability to appropriate measurement standards through methods such as:

- The use of certified reference materials provided by a competent supplier to give a reliable physical or chemical characterization of a material

- The use of specified methods and/or consensus standards that are clearly described and agreed by all parties concerned
5.6.3 REFERENCE STANDARDS AND REFERENCE MATERIALS

5.6.3.1 REFERENCE STANDARDS

Each discipline shall have a procedure for the calibration of its reference standards, if applicable. The ASCL shall use an external calibration laboratory (or manufacturer) accredited to ISO/IEC 17025:2005 for the purchase or calibration of reference standards if the standard has a significant effect on the accuracy or validity of sampling or a test result (e.g., reference standards used for performance verifications of Category 1 equipment). The calibration documentation issued by the external calibration lab must confirm competence, measurement capability, and traceability to the appropriate National Metrology Institute (NMI).

Such reference standards of measurement held by the laboratory shall be used for performance verifications and/or adjustments only and for no other purpose, unless it can be shown that their performance as reference standards would not be invalidated.

5.6.3.2 REFERENCE MATERIALS

Reference materials obtained from a provider accredited to ISO Guide 34:2009, in combination with ISO/IEC 17025:2005, are acceptable. If the provider does not have this accreditation, the Quality Assurance Manager shall evaluate the provider using the Vendor Evaluation Form (ASCL-FORM-61) to ensure that the provider has sufficient traceability.

All reference materials, whether prepared in-house or purchased from commercial sources, must be verified prior to use and, where possible, be traceable to SI units of measurement or to certified reference materials. A Certificate of Analysis will suffice for this verification.

5.6.3.2.1 REFERENCE COLLECTIONS

Both reference collections of data and items/materials encountered in casework which are maintained for identification, comparison, or interpretation purposes (e.g., mass spectra, motor vehicle paints, headlamp lenses, drug samples, bullets, cartridge cases, DNA profiles) shall be fully documented, uniquely identified, and properly controlled.

5.6.3.3 INTERMEDIATE CHECKS

The Discipline Quality Manuals shall contain policies and procedures (including a schedule) for the performance verifications needed to maintain confidence in the calibration status of reference, primary, transfer, or working standards and reference materials, when applicable.

5.6.3.4 TRANSPORT AND STORAGE

Reference standards/materials shall be handled in a manner that prevents contamination or deterioration and protects their integrity. It is the Section Chief or designee’s responsibility to ensure that proper planning and care is taken. The Discipline Quality Manual shall contain procedures for the safe handling, transport, storage, and use of reference standards and reference materials.
5.7 SAMPLING

The process of sampling evidence is unique for each discipline. Each Discipline Quality Manual will contain procedures for sampling, as appropriate. The sampling procedures shall be available at the location where the sampling is undertaken and shall address the factors to be controlled, if applicable, to ensure the validity of the test results. This section outlines guidelines for developing these procedures.

DEFINITIONS

**SAMPLING PROCEDURE**
A defined procedure used to collect a sample (or samples) from the larger whole, designed to ensure that the value obtained in the analysis is representative of the whole. The sampling procedure may include details about size and number of samples to be collected, locations from which to collect the samples, and a method to ensure the homogeneity of the larger whole (or to make it so).

**SAMPLE SELECTION**
A practice of selecting items (or portions of items) to test, based on training, experience, and competence. There is no assumption of homogeneity of the whole, so analytical results pertain only to the actual items (or portions of items) tested.

**SAMPLING**
Taking only a part of an item for testing in order to reach a conclusion, make an inference about, and report on the whole. Sampling shall only be used when there is a reasonable assumption of homogeneity of the whole.

**SAMPLING PLAN**
For an item that consists of a multi-unit population (e.g., tablets, baggies, bindles), a sampling plan is a statistically valid approach to determine the number of subitems that must be tested in order to make an inference about the whole population.

**ADMINISTRATIVE SAMPLING**
An application of sample selection, in which samples are selected for testing in order to meet statutory guidelines.

5.7.1 GENERAL

**USE OF A SAMPLING PLAN**
When testing a subset of a multi-unit population to reach a conclusion or inference about the whole population:
- The units must appear to be homogeneous
- A statistically-valid sampling plan must be used to determine the subset to be tested
- Each unit of this subset must be fully tested

**USE OF A SAMPLING PROCEDURE**
Sampling procedures must be documented in the Discipline Quality Manual and available at the location where the sampling is undertaken.
USE OF SAMPLE SELECTION
Sample selection is used in lieu of a statistically-valid sampling plan when the individual does not intend to report a conclusion about the whole population of a multi-item submission. The selection of items to test, and the portions of these items to test, may be based upon:

- The training and experience of the examiner
- Legal limits/charging guidelines (see Administrative Sampling)
- A non-statistically based plan

The Discipline Quality Manual shall state which of these sample selection methods are allowed. Testing requirements shall be applied to at least one unit of the sample.

GUIDELINES
 Discipline Quality Manuals must provide instructions on the following when a sampling plan or sampling procedure may be used:

- Homogeneous Materials
  - How to determine if a material is homogeneous
  - How the sample can be made homogeneous by the analyst
  - How to remove a sample from a homogeneous material

- Population Determination Guidelines for Multi-unit Populations (if a statistical sample approach will be used)
  - The population must be within a single item of evidence
  - The population determination shall take into account all typical forms and quantities in which evidence may appear
  - The “sampling unit” is the basic unit (e.g., tablet, baggie of powder, piece of glass, fiber, stain, blood sample)
  - A multiple-unit population usually consists of items which are similar in relevant visual characteristics

- Procedures to statistically determine the number of samples to be tested:
  - Various statistical models are acceptable (e.g., hypergeometric, Bayesian, other probability-based approaches)
  - Samples must be selected at random, without bias
  - The limits of inference that can be made about the population must be documented

ANALYSIS
Each unit comprising the sample shall be tested to meet all method requirements for that specific discipline.

5.7.2 DEVIATIONS
Deviations from the sampling plan and procedures may be requested by the customer or deemed appropriate by the analyst. Any deviations shall be approved in writing by the appropriate Section Chief and maintained in the case record.
5.7.3 RECORDS

If only one sampling process is used in routine casework, then this may be documented in the Discipline Quality Manual instead of individual case notes. The analyst, whenever appropriate, will document any deviations from, modifications to, or expansions of the selection and sampling process. The examination record will contain any observations, drawings, diagrams, or images made by the examiner that support the selection of test items by the examiner.

5.8 HANDLING OF TEST ITEMS

The Arkansas State Crime Laboratory receives, secures, analyzes and documents evidence submitted by duly authorized agencies. The ASCL processes evidence in a timely manner consistent with the need for quality services, preservation of the chain-of-custody, and protection of the integrity of the evidence. It is a system-wide priority to ensure that the necessary precautions are taken to maintain the integrity of the evidence, including proper collection and preservation techniques.

The Evidence Receiving Quality Manual (ER-DOC-01) contains policies and procedures for the transportation, receipt, handling, protection, storage, retention, maintenance, control, and disposition of test items, including all provisions necessary to protect the integrity of the test item. Additional policies may be implemented by individual disciplines in their quality manual.

RESPONSIBILITIES AND PROCEDURES

Those employees assigned to the Evidence Receiving Section will have primary responsibility for the receipt, storage, transfer, and return of evidence. All employees will be trained to recognize the need for taking precautions necessary to ensure the integrity of evidence and the safety of ASCL personnel.

All firearms will be handled as though they are loaded. If it is unclear whether a firearm is loaded, a Firearms Examiner (or an individual with firearms experience) will determine this by inspection. This may occur if the submission form is not properly completed or if the submitter of the evidence is unsure of the status of the firearm and requests the ASCL to inspect it.

All externally-submitted illicit lab evidence is inspected by a forensic chemist or an individual with the appropriate chemistry background and training. The Illicit Laboratory Safety Form (ER-FORM-01) is used to certify that the evidence has been inspected. The Forensic Chemistry Quality Manual (DRG-DOC-01) contains policies for inspecting this evidence.

Large and/or bulky submissions may be reviewed by an analyst or examiner to determine which items are most likely to be instructive and to eliminate unnecessary examinations or analyses. Whenever possible, this review will occur in coordination with a representative of the investigating agency (in person or by phone).

If there is evidence in a case involving a laboratory employee or their immediate family, including postmortem examinations, the employee must notify the Executive Director as soon as possible. The Executive Director or designee will determine the specific case management needs.
**EVIDENCE INVENTORY**

An evidence inventory will be conducted approximately every six months. This inventory will consist of an Evidence Receiving Inventory (all evidence stored in Evidence Receiving) and a Section Inventory (all evidence in the analysts’ possession). This inventory will not include those samples retained for future analysis or destruction (e.g., toxicology samples, DNA long term storage).

The Evidence Receiving Section Chief will schedule and coordinate the inventory with the Quality Assurance Manager. The Evidence Receiving Section Chief and Quality Assurance Manager will provide a written report to the Executive Director for the Evidence Receiving Inventory and the Section Inventory, respectively. The Quality Assurance Manager will maintain a copy of these reports.

At the Hope Regional Laboratory, the Forensic Chemistry Supervisor will schedule and conduct the inventory, and provide a written report to the Executive Director. This inventory will include all evidence held at the laboratory. The Quality Assurance Manager will maintain a copy of the report.

**EVIDENCE RETENTION**

Individual discipline retention policies are found in the appropriate Discipline Quality Manual.

If a private individual requests a sample be retained, a fee may be imposed by the ASCL to cover cost of storage, as determined by the Executive Director or designee.

**5.8.1.1 CHAIN OF CUSTODY**

Evidence within the laboratory is tracked by the LIMS. All internal transfers are tracked electronically from the time of receipt to the final disposition, providing a printable chain of custody. For each internal electronic transfer, the following information is recorded:

- The person, location, or state relinquishing the item of evidence
- The person, location, or state accepting the item of evidence
- An indication of the security of that transfer (i.e., a checkmark indicating if each person used a barcode and PIN)
- The date and time of the transfer

The LIMS database contains electronic signatures and initials for all analysts. In some cases, a combination of written and electronic chain of custody is used.

**INTRA-LABORATORY TRANSFER**

Cases may be transferred within the ASCL System as necessary in order to minimize the turn-around time and to provide the best overall service to our customers.

**INTER-LABORATORY TRANSFER**

If the Arkansas State Crime Laboratory finds it necessary to transfer evidence to an outside laboratory (e.g., FBI, NMS), an Inter-Laboratory Evidence Transfer Form (see ASCL-FORM-07) must be completed and entered into the case file. This form may be waived for analysis funded out of a
grant and/or under a contract. Any cost incurred by the laboratory must be approved by the Fiscal Officer.

EVIDENCE RETURN
When evidence is returned to Evidence Receiving after all necessary analyses are completed, the item is retained until it is released to an authorized representative of the submitting agency. Authorized representatives are either employees of the submitting agency, or have written authorization from the submitting agency on file in Evidence Receiving. If the evidence technician does not recognize the representative, then proper identification must be provided. The signature and printed name of the receiving representative is required to document evidence return.

Evidence will only be shipped after receipt of a written request from the submitting agency and the approval of the Executive Director or the Scientific Operations Director. When mailing or shipping evidence, the following requirements apply:

- Controlled substances, currency, or firearms cannot be mailed
- All other evidence may be mailed via U.S. Certified Mail (return receipt requested)
- When shipping any evidence by other than the U.S. Postal Service, the vendors must provide return receipt and be able to track shipment

When the Evidence Receiving Section supervisor deems necessary, he/she will notify submitting agency personnel (in writing) to pick up completed evidence.

5.8.1.1 SUBITEMS
Items which are subdivided in the laboratory shall be tracked through the documented chain of custody to the same extent that original items are tracked.

5.8.1.2 EVIDENCE SEALING
Evidence will be sealed so that the contents cannot readily escape, and that opening the container would result in obvious damage or alteration to the container or its tape seal. All evidence must bear a proper seal, including the initials (or other identifier) of the person sealing the evidence across the seal.

Whenever practical, the original seal will be left intact when opening a container. Instead, a new opening will be made to access the evidence. When the analysis (or examination) in complete, this new opening will be properly sealed as outlined above, leaving all original packaging seals intact and clearly marked.

If reusing the original container is impractical, a new evidence container may be used. It shall be marked and sealed according to the above procedures and the original evidence packaging shall be kept inside the second evidence container. If the original packaging cannot be kept, complete documentation and a picture of original packaging must be retained in the case record. (Toxicology samples only need a written description of the packaging.) Documentation of the change in packaging (with full description) must be included in the case record for future reference.
5.8.2 TEST ITEM IDENTIFICATION

A unique case number is assigned to every case when evidence is initially received by the laboratory. Each exterior container is labeled with a unique barcode. Agency evidence numbers will be used to identify the evidence whenever practical.

If uniquely-identified items must be subdivided, then appropriate subitem identifiers will be assigned and each subitem will be labeled with its identifier. This allows for the tracking of each subitem and the identification of its origin.

5.8.3 SUITABILITY OF TEST ITEMS

Evidence submitted to the laboratory must be properly packaged, labeled, and sealed to prevent contamination, loss, or deleterious change. All packaging deficiencies noted at the time of receipt must be corrected, preferably by the submitting customer. If the customer is not available, or if it is not expedient to call the customer back to correct the deficiency, then an Evidence Technician may take steps to correct the problem (e.g., provide a remedial seal). However, if the deficiency is serious enough to bring into question the integrity or identity of the test item, then the appropriate Section Chief and customer agency must be contacted to resolve the issue before the evidence is analyzed.

If a packaging deficiency is not apparent until the case is checked out by an analyst, the analyst may correct the deficiency. If there is any concern that the packaging deficiency has affected the integrity or identity of the test item, the analyst’s Section Chief and the customer agency shall be advised and consulted with for further instructions.

If the analyst discovers an inconsistency between the stated and actual contents of a package, or if there is doubt about the suitability of an evidence item for testing, then the analyst shall attempt to contact the customer before issuing a report. All contacts will be documented in the case record (e.g., using an Agency Contact Form (ASCL-FORM-06), by email). For minor inconsistencies, the analyst shall use their judgment on whether to contact the customer, but must make a note of the discrepancy in the case file.

All remedial actions taken to correct packaging or evidence deficiencies shall be noted in the case record (e.g., on the submission form or in analytical notes).

5.8.4 SAFEGUARDING THE INTEGRITY OF EVIDENCE

Evidence will be stored in the evidence storage area in accordance with the requirements of the Evidence Section’s Quality Manual, until transferred to a laboratory analyst or examiner, another laboratory, or the submitting agency. Storage of evidence in individual disciplines is addressed in each Discipline’s Quality Manual. Evidence shall be maintained under appropriate conditions to prevent deterioration, loss, or damage to the evidence during storage, handling, or the testing process.
Evidence requiring special consideration because of its potential for contamination, fragility, or hazardous nature shall be handled in accordance with the customer’s handling instructions and/or the requirements of the Evidence Receiving Quality Manual. If evidence has to be stored or conditioned under special environmental conditions (e.g., refrigeration or freezing), these conditions shall be maintained, monitored and recorded.

5.8.4.1 SECURING EVIDENCE
All evidence not in the process of examination/analysis shall be maintained in a secured, limited-access storage area under proper seal. This will normally be the evidence storage area in Evidence Receiving.

5.8.4.2 UNATTENDED EVIDENCE
Evidence in the process of examination may be left unattended for limited periods of time (e.g., lunch, short breaks) but must be in a secure, limited-access area. If the analyst needs to be away for a longer period of time, then the evidence shall be secured in a short term storage location, whenever practical. Otherwise, the analyst shall take reasonable precautions to protect the evidence from loss, cross-transfer, contamination, and deleterious change.

Evidence shall not be left unattended if it is not in the process of being examined or there is no expectation of frequent examination. Additional policies may be implemented by individual disciplines in their quality manual.

5.8.4.2.1 EVIDENCE IN THE PROCESS OF EXAMINATION
Items with an expectation of frequent analysis may be considered “evidence in the process of examination/analysis” and may be stored unsealed in a limited access area as long as the evidence is protected from loss, cross-transfer, contamination and deleterious change. After one-hundred twenty consecutive days of no analysis or new requests for comparisons, a case is no longer considered to be in the process of examination. Cases no longer in the process of examination shall be closed and the evidence properly sealed until analysis resumes or a new service request is received.

5.8.4.3 EVIDENCE MARKING
All evidence will be marked or identified with the laboratory case number (e.g., YYYY-########) to ensure that it is identifiable and traceable to the corresponding case. When the evidence does not lend itself to marking, then the proximal container must be marked or identified with the laboratory case number.

5.8.4.4 PHOTOGRAPHIC EVIDENCE
When evidence, such as latent prints and impressions, can only be recorded or collected by photography and the impression itself is not recoverable, then the photographic image must be treated as evidence.
5.8.4.5 CRIME SCENE EVIDENCE

Evidence collected from a crime scene by laboratory personnel shall be protected from loss, cross transfer, contamination, and deleterious change during transportation to the ASCL, whether in a sealed or unsealed container. Where appropriate, further processing to preserve, evaluate, document, or render evidence safe shall be accomplished prior to final packaging. The evidence shall be appropriately identified, packaged, and entered into the LIMS as soon as practical.

5.8.4.6 INDIVIDUAL CHARACTERISTIC DATABASES

The ASCL uses three individual characteristic databases. Employees using these databases must receive proper training and/or clearance through the appropriate organizations, as listed below:

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Database</th>
<th>Discipline</th>
<th>Approving Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFIS</td>
<td>Automated Fingerprint Identification System</td>
<td>Latent Prints</td>
<td>Arkansas State Police</td>
</tr>
<tr>
<td>CODIS</td>
<td>Combined DNA Index System</td>
<td>CODIS</td>
<td>CODIS-National Index System guidelines</td>
</tr>
<tr>
<td>NIBIN</td>
<td>National Integrated Ballistics Information Network</td>
<td>Firearms/Toolmarks</td>
<td>NIBIN-Forensic Technologies, Inc., and the Bureau of Alcohol, Tobacco, Firearms, and Explosives</td>
</tr>
</tbody>
</table>

Table 5: Individual Characteristic Databases

5.8.4.6.1 DATABASE SAMPLES

Individual characteristic database samples include ten print cards of known individuals (Latent Prints, AFIS), convicted offender/arrestee known biological samples (CODIS), and test fired ammunition produced at the ASCL (Firearms/Toolmarks, NIBIN). Ten print cards are treated as examination documentation. Test fired ammunition produced by the ASCL and convicted offender/arrestee known biological samples are treated as reference materials. Specific procedures concerning individual characteristic database samples are addressed in the appropriate Discipline Quality Manual.

<table>
<thead>
<tr>
<th>Database Sample</th>
<th>Discipline</th>
<th>Characterization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ten print card</td>
<td>Latent Prints (AFIS)</td>
<td>Examination documentation</td>
</tr>
<tr>
<td>Convicted offender/arrestee known biological sample</td>
<td>CODIS (CODIS)</td>
<td>Reference material</td>
</tr>
<tr>
<td>Test-fired ammunition generated at the ASCL</td>
<td>Firearms/Toolmarks (NIBIN)</td>
<td>Reference material</td>
</tr>
</tbody>
</table>

Table 6: Database Samples

5.8.4.6.2 DATABASE SAMPLE IDENTIFICATION

Individual characteristic database samples controlled by the ASCL must be uniquely identified. The appropriate Discipline Quality Manuals address identification requirements.
5.8.4.6.3 SAFEGUARDING DATABASE SAMPLES

Individual characteristic database samples controlled by the ASCL must be protected from loss, cross-transfer, contamination, and deleterious change. Specific requirements will be addressed in the appropriate Discipline Quality Manual.

5.8.4.6.4 DATABASE SAMPLE ACCESS

Access to individual characteristic database samples is restricted to those employees authorized by the Executive Director. The Section Chief of the respective section will keep an updated list of employees who have access to the database samples.

5.9 ASSURING THE QUALITY OF TEST RESULTS

5.9.1 GENERAL

Each discipline within the ASCL maintains a quality manual containing quality control procedures designed to monitor and ensure the validity of test results. Quality control data will be recorded in a way to allow trends to be detected and, whenever practical, statistical techniques will be used to review the data. The records shall be retained to show that all appropriate quality control measures have been taken and are acceptable.

The following is a list of quality control measures used at the ASCL to ensure that test results are of the highest quality. Procedures for these measures are located in this manual and the Discipline Quality Manuals.

- Regular use of certified reference materials and/or internally-generated secondary reference standards
- Where appropriate, the use of positive and negative controls and internal standards
- 100% technical and administrative review of case records before issuance of the laboratory report
- Competency testing of analysts before beginning casework
- Annual proficiency testing of all analysts and technicians
- Replicate testing using the same or different methods, where practical
- Independent verification of all latent print and firearm identifications and eliminations
- Re-analysis of casework
- Annual courtroom testimony monitoring for testifying analysts

5.9.1.1 CONTROLS AND STANDARDS

Appropriate controls and standards (e.g., drug reference materials) shall be specified in the methods and their use recorded in the case record.
5.9.2 QUALITY CONTROL DATA
When quality control data is found to be outside acceptable criteria, planned action shall be taken to correct the problem and to prevent incorrect results from being reported. The initiation of the corrective action process may be necessary (see § 4.11).

5.9.3 PROFICIENCY TESTING
The Arkansas State Crime Laboratory maintains a proficiency testing program designed both to provide independent evaluation of individual technical expertise and to monitor training needs and procedural weaknesses for individual analysts and disciplines within the laboratory.

5.9.3.1 PROFICIENCY TESTING METHODS
Analysis, technical review, verification, and administrative review policies shall be employed during proficiency testing as they are normally applied to casework. All parts of a proficiency test provided by an approved test provider shall be examined as completely as the discipline's procedures allow.

A case will be created in JusticeTrax® LIMS-plus for all proficiency tests. Under the “Offense” tab, “Proficiency Test” shall be selected. For external proficiency tests, the analyst shall complete the test and submit the results by the due date.

Some external proficiency tests (e.g., Firearms/Toolmarks, Latent Prints) may be taken independently by multiple analysts in succession. The first analyst taking the test will submit the results to the external provider before any of the succeeding analysts receive the test. This will be considered an External Proficiency Test. The remaining analysts will independently take the exam by the proficiency due date. These tests will be considered Internal Proficiency Tests. Precautions are taken to prevent the initial results from influencing subsequent examiners (e.g., each proficiency case record is restricted in JusticeTrax® so that the other analysts taking the test cannot access it).

The laboratory’s overall performance in proficiency testing is reviewed annually by top management as part of the management review (see § 4.15.1).

5.9.3.2 ASCLD/LAB PROFICIENCY REVIEW PROGRAM
The ASCL proficiency testing program shall comply with the ASCLD/LAB Proficiency Review Program document (available at www.ascld-lab.org).

5.9.3.3 PROFICIENCY TESTING FREQUENCY
Each analyst and technical support personnel engaged in testing activities shall successfully complete at least one internal or external proficiency test per calendar year in his or her discipline. Employees who perform casework in multiple disciplines will successfully complete at least one test in each discipline. Successfully completing a proficiency test means either obtaining the correct response or completing corrective actions pursuant to ASCL policy and/or directives from an ASCLD/LAB Proficiency Review Committee (PRC).
5.9.3.3.1 DNA PROFICIENCY TESTING

DNA analysts and technical support personnel performing DNA analysis shall successfully complete two external proficiency tests per year as specified in the current FBI Quality Assurance Standards (documents available at www.fbi.gov).

5.9.3.3.2 CATEGORIES OF TESTING

Each individual engaged in testing activities (both analysts and technical support personnel) shall be proficiency tested in each category in which they perform testing, at least once during each four-year accreditation cycle. Disciplines shall have a documented schedule of proficiency testing. Below are the categories of testing in the scope of the laboratory’s accreditation:

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Categories of Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug Chemistry</td>
<td>Controlled Substances</td>
</tr>
<tr>
<td>Drug Chemistry</td>
<td>Quantitative Analysis</td>
</tr>
<tr>
<td>Drug Chemistry</td>
<td>General Chemical Testing</td>
</tr>
<tr>
<td>Drug Chemistry</td>
<td>Clandestine Laboratory Analysis</td>
</tr>
<tr>
<td>Toxicology</td>
<td>Human Performance Forensic Toxicology</td>
</tr>
<tr>
<td>Toxicology</td>
<td>Post-Mortem Forensic Toxicology</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>Fire Debris</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>Gunshot Residue</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>Paint</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>Fibers and textiles</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>Glass</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>Hair</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>General Physical and Chemical Analysis</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>Tape</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>Lamp Filament</td>
</tr>
<tr>
<td>Biology</td>
<td>Body Fluid Identification</td>
</tr>
<tr>
<td>Biology</td>
<td>DNA–Nuclear</td>
</tr>
<tr>
<td>Biology</td>
<td>Individual Characteristic Database (CODIS)</td>
</tr>
<tr>
<td>Firearms/Toolmarks</td>
<td>Firearms</td>
</tr>
<tr>
<td>Firearms/Toolmarks</td>
<td>Tool Marks</td>
</tr>
<tr>
<td>Firearms/Toolmarks</td>
<td>Individual Characteristic Database (NIBIN)</td>
</tr>
<tr>
<td>Firearms/Toolmarks</td>
<td>Serial Number Restoration</td>
</tr>
<tr>
<td>Latent Prints</td>
<td>Latent Print Processing</td>
</tr>
<tr>
<td>Latent Prints</td>
<td>Latent Print Comparison</td>
</tr>
<tr>
<td>Latent Prints</td>
<td>Impression Evidence (Footwear/Tire Impression)</td>
</tr>
<tr>
<td>Digital and Multimedia Evidence</td>
<td>Computer Forensics</td>
</tr>
<tr>
<td>Digital and Multimedia Evidence</td>
<td>Video Analysis</td>
</tr>
</tbody>
</table>

Table 7: Disciplines and Categories of Testing

3 Also offered at the Hope Regional Laboratory location.
5.9.3.4 DISCIPLINE REQUIREMENTS
Each discipline will successfully complete at least one external proficiency test annually.
ASCLD/LAB-approved test providers shall be used where available. If there is not an ASCLD/LAB-approved test provider available, then the ASCL may use one accredited to ISO/IEC 17043, provided the test in question is listed in the provider’s scope of accreditation. Otherwise, the ASCL will locate and use a source of an external test in the discipline.

5.9.3.5 DOCUMENTATION REQUIREMENTS
Each Section Chief or designee shall maintain a log of proficiency testing in the individual’s Employee History Binder. This log shall contain the following:
- Individual’s name
- Date proficiency case file assigned
- Date test completed
- Unique ASCL case number
- Category of testing
- Type of test (i.e., internal, external)
- Evaluation (i.e., satisfactory, unsatisfactory)
- Date results reviewed with the analyst (however named)

A Proficiency Test Summary Form (ASCL-FORM-11) shall be completed and stored in the JusticeTrax® case file for each proficiency test. The case file shall contain:
- The identity of the proficiency provider and the distribution identifier (typically entered into JusticeTrax® as the agency case number) Proficiency test source/preparation, results, and evaluation
  - For internal proficiencies:
    - The preparation records and expected results
    - An evaluation of the analyst’s results by the analyst’s supervisor, listing any discrepancies
  - For external proficiencies:
    - The summary report (or equivalent) from the proficiency provider
    - An evaluation of the analyst’s results by the analyst’s supervisor, listing any discrepancies

Additionally, the JusticeTrax® case file will contain:
- All administrative and examination documentation
- Corrective Action Request documentation, when applicable

The proficiency testing record consists of the combination of the individual JusticeTrax® case records and the log of proficiency testing in each Employee History Binder.

Nonconformities identified at any point in the testing will be handled in accordance with § 4.9 (Control of Nonconforming Testing) and § 4.11 (Corrective Action).
Each Section Chief (or supervisor) is responsible for comparing the analytical results to the expected results, determining if the analytical results are acceptable, and reviewing these results with the analyst.

The following criteria shall be used for evaluating proficiency test results:

- No analyst may evaluate their own proficiency test
- Acceptability criteria should be determined before the evaluation takes place
- All tests are graded as satisfactory or unsatisfactory
  - A satisfactory grade is attained when the experimental results match the expected results
- If there is a discrepancy between the expected results and the experimental results, the Section Chief must notify the Quality Assurance Manager
- Minor discrepancies may be deemed satisfactory, based on the following factors, with approval of the Quality Assurance Manager:
  - Discipline interpretation guidelines
  - Consensus results

If the results are deemed to be unsatisfactory, the Section Chief must initiate a Corrective Action Request.

### 5.9.3.6 Proficiency Record Retention

Proficiency testing records will be retained for at least eight years.

### 5.9.4 Case Review

All cases will be technically and administratively reviewed prior to the release of the report. The review process must confirm that electronic versions of all necessary documentation are in the imaging module of LIMS.

The review process will be documented on a case review form: either the *ASCL Case Review Form* (ASCL-FORM-05) or a discipline-specific form. All discipline-specific case review forms must include all the fields in the *ASCL Case Review Form*, unless otherwise authorized by the Quality Assurance Manager. The Section Chief may add more information fields or requirements, if appropriate.

If a reviewer discovers an error in the case record, the reviewer must document the error on the *ASCL Case Review Form* and inform the analyst. If the analyst and the reviewer cannot reach consensus, then both the analyst and reviewer must meet with the Section Chief (or designee) for resolution.

All non-conforming work identified during review will be handled according to § 4.11 (Corrective Action).

### Technical Review

The technical review will include a thorough review of the analyst’s examination records to ensure that the records support the reported results.
The technical review does not shift the responsibility for the forensic findings to the reviewer, but the reviewer has the responsibility of ensuring that the case record provides an adequate basis for the conclusion.

It is the responsibility of the technical reviewer to report serious or repetitive deficiencies to the Section Chief. If the technical reviewer discovers a problem that raises an immediate concern regarding the overall quality of the analyst's work, the technical reviewer must promptly notify the Section Chief. The Section Chief will consult with the Quality Assurance Manager and Scientific Operations Director to determine whether a Corrective Action Request is warranted.

5.9.4.1 TECHNICAL REVIEW REQUIREMENTS

At a minimum, the technical review shall include a review of all examination records and the report to ensure that:

- All necessary analyses are performed and documented according to established guidelines
- The case data supports the results and/or conclusions in the report
- The report is accurate
- Associations and results are properly qualified in the report
- The report contains all required information

The technical review includes, but is not necessarily limited to: bench notes, spectra, graphs, external telephone conversation records, investigative reports, sketches, diagrams, and laboratory reports. The records must provide an adequate basis for any reported conclusions.

5.9.4.2 TECHNICAL REVIEWERS

Technical reviews must be conducted by individuals authorized by the appropriate Section Chief, based on expertise gained through training and experience in the discipline being reviewed. This authorization shall be documented on the Analyst & Technician Competency Authorization Documentation form (ASCL-FORM-62).

An individual conducting technical review does not have to be an active examiner or undergo proficiency testing. The reviewer must have sufficient knowledge of the discipline to verify compliance with the laboratory’s technical procedures and that the reported conclusions are supported by the examination documentation. For those individuals not currently competent in the reviewed discipline, the Section Chief shall write an authorization memo/letter which will be maintained in the individual’s Employee History Binder. Additional requirements pertaining to Forensic Biology and CODIS are detailed in the appropriate Discipline Quality Manuals.

Technical review of an examination record or report shall not be conducted by the author or co-author.

5.9.4.3 VERIFIERS AS TECHNICAL REVIEWERS

Verification of a critical finding does not constitute authorship, and does not disqualify the verifier from performing technical review.
5.9.5 ADMINISTRATIVE REVIEW

Administrative review includes a review of spelling and grammar, markings (i.e., case number, date, and initials on appropriate pages), descriptions of evidence and seals, and other appropriate documentation.

Administrative review may be conducted by any individual qualified to perform technical review. Administrative review shall not be conducted by the author of the report.

5.9.5.1 ADMINISTRATIVE REVIEW REQUIREMENTS

At a minimum, the administrative review shall include:

- A review of the report to ensure consistency with laboratory policy and editorial correctness
- A review of all administrative and examination records to ensure that they contain the unique ASCL case number and are stored properly in LIMS
- A review of the examination records to ensure dates are recorded to indicate when the work was performed, and
- A review of examination records to ensure that all corrections in the case file are made consistent with laboratory policy

5.9.6 TESTIMONY REVIEW

The Arkansas State Crime Laboratory monitors and evaluates personnel who testify as an expert witness. This annual review of courtroom testimony is intended to provide a mechanism for evaluating an analyst’s ability to present scientific information in an effective and understandable manner, and to ensure that the testimony is consistent with the findings documented in the case file.

This monitoring may be carried out by one or more of the following methods:

- Observation of the testimony by a supervisor or a peer
- Review of transcripts of testimony given by an examiner
- Having one or more officers of the court fill out and return a testimony evaluation form provided by the laboratory
- Telephonic solicitation by a laboratory director or supervisor to one or more officers of the court for responses to the evaluation form

Analysts are encouraged to provide a Testimony Evaluation Form (ASCL-FORM-04 or ASCL-FORM-04_PDF) to officers of the court and ask them to fill out and return the form to the laboratory. This may substitute for testimony review by supervisory personnel. However, testimony review by supervisory personnel is the preferred method.

A Testimony Evaluation Form will be completed by the reviewer, and signed by both the analyst and their supervisor. Feedback shall be given, both positive and in any area needing improvement. If the evaluation is less than satisfactory, the Section Chief will determine whether remedial actions are required, which may include the following:

- Re-training, including a mock trial
- Courtroom monitoring by the Section Chief for a designated period of time

Evaluation results will be maintained in the analyst’s Employee History Binder. If the analyst does not have a completed Testimony Evaluation Form for a calendar year, a letter from the Section Chief explaining the circumstances will be placed in the individual’s Employee History Binder.

### 5.9.7 TESTIMONY RECORD RETENTION

Records of testimony monitoring will be retained for at least eight years.

### 5.10 REPORTING THE RESULTS

#### 5.10.1 GENERAL

When analytical conclusions and/or opinions are generated, a “Report of Laboratory Analysis” will be issued to the investigating agency (including the ASCL Medical Examiner’s Office). The results shall be reported accurately, clearly, unambiguously, and objectively, and in accordance with any specific instructions in the test methods. Each analyst/examiner proofreads and signs their reports to indicate that the report is accurate and error-free. The LIMS allows the analyst to sign their reports electronically.

Reports are the same for internal customers.

#### 5.10.1.1 LABORATORY REPORT EXCEPTIONS

A laboratory report is not required in the following instances:

- Analytical work performed for research activities, training exercises, validation studies, quality assurance studies, or ten print record intercomparisons.
- When a case is adjudicated or the customer cancels the request before the work or report is completed.
- Activities for the purpose of constructing an individual characteristic database or maintaining the quality and/or effectiveness of information in such a database.
- Retesting which does not result in a different analytical result (e.g., reanalysis in response to a CAR to determine whether corrective action is required, re-examination proficiency testing).

#### 5.10.2 REPORTS

The laboratory report will contain the following information, except where an alternate location is named:

a) The title “Report of Laboratory Analysis”

b) The name “Arkansas State Crime Laboratory” and the address of the laboratory that performed the test

c) The unique ASCL case number (YYYY-####) and page number (x of y) on each page of the report

d) The investigator’s name, agency, and address
e) The tests performed will be documented in the analytical notes
f) An unambiguous identification and description of the item(s) tested, which may include the general condition of the item (e.g., wet, glass broken). A more detailed description of the condition of the item, if applicable, will be in the analytical notes.
g) The date the items were received by the laboratory will be documented on the Evidence Submission Form (ASCL-FORM-12 WD or ASCL-FORM-63). The date(s) of testing will be documented in the examination record.
h) When sampling is used, the report will be clear that the results are based on a sampling plan (refer to § 5.10.3.2 for case record requirements)
i) The results of testing and, where appropriate, the units of measurement
j) The name, title and electronic signature of the analyst
k) Each report will state that the listed results relate only to the items tested
l) Each report will state that it is only an official ASCL report when reproduced in full

5.10.3 REPORTS (ADDITIONAL REQUIREMENTS)

The information in § 0 is contained within the case record, except where an alternate location is named. This additional information will be included on the laboratory report whenever appropriate or required by the discipline for the interpretation of the reported test results.

The ASCLD/LAB accreditation symbol may appear only when the reported tests come under the laboratory's scope of accreditation. The laboratory's accreditation certificate number shall accompany the symbol.

5.10.3.1 DISCLAIMERS AND INTERPRETATIONAL STATEMENTS

a) Deviations from, additions to, or exclusions from the protocol and specific test conditions as necessary for the interpretation of the test results.
b) When relevant, a statement of compliance/non-compliance with requirements or specifications shall be included.
c) Estimated uncertainty of measurement shall be on the report for those reported measurements in which an uncertainty calculation has been performed. Records for the estimation of uncertainty of measurement will be maintained in the appropriate discipline and available on request.
d) Where appropriate, interpretations, conclusions, and opinions may be stated on the report.
e) Additional information, as appropriate, shall be included in the report and/or case record as required by the method or the customer.

5.10.3.2 SAMPLING STATEMENTS

If a sampling plan is used, the following information shall be included in the case record:

a) The date of sampling
b) Unambiguous identification of the material sampled
c) When applicable, the location of sampling (which may include any diagrams, sketches or photographs)
d) Sampling procedures in the Discipline Quality Manual shall be followed. If a different sampling procedure is used, it must be documented in the case record (and approved by the Section Chief). The case record shall be clear as to what was sampled.

e) Details of any environmental conditions during sampling that may affect the interpretation of the test results.

f) Any standard or other specification for the sampling method or procedure, and deviations, additions to or exclusions from the specification concerned.

5.10.3.3 RELEASE OF REPORT INFORMATION

Section 4.13.1.3 (Confidentiality of Records) details the procedures for the release of report information.

5.10.3.4 REPORT/TESTIMONY ON WORK OF OTHER ANALYSTS

ASCL analysts issuing a report based on examination records generated by another individual shall complete and document a review of all relevant pages of documentation in the case record (e.g., initialing each page of the examination record, the use of a review checklist or statement).

ASCL analysts offering testimony based on examination records generated by another individual shall complete a Court Case Review Form (ASCL-FORM-57) before testifying.

5.10.3.5 ASSOCIATIONS

When associations are made, the significance of the association shall be communicated clearly and qualified properly in the report.

5.10.3.6 ELIMINATIONS

When comparative examinations result in the elimination of an individual or object, the report shall clearly communicate the elimination.

5.10.3.7 INCONCLUSIVE RESULTS

When results are inconclusive, the reason shall be documented in the laboratory report.

5.10.4 CALIBRATION CERTIFICATES

The ASCL is not a calibration laboratory and does not perform calibration or issue calibration certificates.

5.10.5 OPINIONS AND INTERPRETATIONS

The following (or equivalent) statement will appear on all laboratory reports: “The results stated below relate only to the items tested and represent the interpretations/opinions of the undersigned analyst.” The case record shall support the basis for the interpretation/opinion.
5.10.6 **TESTING RESULTS OBTAINED FROM SUBCONTRACTORS**

If the laboratory report contains results of tests performed by subcontractors, these results shall be clearly identified. Subcontractors performing testing shall provide the results in writing or electronically.

5.10.7 **ELECTRONIC TRANSMISSION OF RESULTS**

The process of adding the analyst’s signature on the laboratory report is electronically secure, requiring two-factor authentication (scanning of an analyst’s barcode and entry of their private PIN number). After the case has been administratively reviewed, the document becomes a static PDF file.

Reports are normally made available to the customer through JusticeTrax® iResults. Facsimile or email may be used to transmit results to the customer, but the sender must follow the requirements of A. C. A. § 12-12-312 and the policy on Confidentiality of Records (§ 0).

5.10.8 **REPORT FORMAT**

ASCL reports are generated using the LIMS and are formatted in a manner designed to accommodate the types of tests conducted and to minimize the possibility of misunderstanding or misuse. Section Chiefs shall ensure that discipline report formats are optimized for the clear presentation of test results.

5.10.9 **SUPPLEMENTAL AND AMENDED REPORTS**

5.10.9.1 **SUPPLEMENTAL REPORTING**

A supplemental report is necessary when additional evidence is received after the original report has been issued, additional requests for analysis are made, or other additional testing is required in a case. A “supplemental request” will be created in the LIMS, and all administrative and examination records for the additional evidence will be added to the electronic case record. Administrative and technical reviews are required before a supplemental report is issued. The statement “SUPPLEMENTAL REPORT TO ORIGINAL [TYPE] REPORT ON [DATE]” (or equivalent) will appear below the header information and above the listing of the evidence and the results.

All original records will remain in the case record.

5.10.9.2 **AMENDED REPORTING**

An amended report is necessary if an error is found on the original report (including reports uploaded to iResults). An “amended request” will be created in the LIMS and all administrative and examination records for the additional evidence will be added to the electronic case record.

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4 When additional evidence is received on a case that has not been completed, the additional evidence may be analyzed and included in the original report.

5 The date of the original report must be entered in the “additional data” tab of the supplemental request.
examination records for the amended analysis will be added to the electronic case record. Administrative and technical reviews are required before an amended report is issued. When an amended report is necessitated by a change in analytical results, then the Section Chief or Section Quality Manager will perform the technical review on the amended request. Documentation of this review will be incorporated into the original case file.

The statement “AMENDED REPORT TO ORIGINAL [TYPE] REPORT ON [DATE]” (or equivalent) will appear below the header information and above the listing of the evidence and the results. The amended report will contain all of the items on the original report and any amendments. The original report shall be removed from iResults by the iResults Administrator and replaced with a placeholder document.

All original records will remain in the case record.

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6 The date of the original report must be entered in the “additional data” tab of the amended request.