Procedure for Chemistry Technician Training

1.0 Purpose - The purpose of this procedure is to provide a training program for a Chemistry Technician, in the Forensic Biology Section, at the North Carolina State Crime Laboratory. This program shall provide individuals with the theoretical background and the working knowledge to conduct independent instrument calibrations and maintenance. Heavy emphasis shall be placed on quality assurance of all tests performed (data integrity via documentation). Upon completing the training program, the technician shall demonstrate the following:

- Ability to assist with evidence transfers through the section.
- Ability to perform routine safety maintenance.
- Ability to order supplies for both body fluids and DNA.
- Ability to perform all preventative/post maintenance and repair checks on instrumentation.
- Ability to perform all quality control procedures for both body fluids and DNA.
- Ability to assist the state CODIS Administrator.

2.0 Scope - This training program applies to Chemistry Technician in the Forensic Biology Section.

3.0 Definitions – See specific technical procedures.

4.0 Equipment, Material, and Reagents - See specific Body Fluid and DNA technical procedures.

5.0 Training- Blocks may be completed independently of each other and the completion will be documented and approved on the Training Log. Authorization may be granted to perform portions of the training program according to the Procedure for Personnel Training.

6.0 Procedure

6.1 Training of Experienced Chemistry Technicians - In the event a Chemistry Technician with previous training and/or experience in body fluid and DNA is hired, the Body Fluid and DNA Technical Leaders shall assess the Chemistry Technician's knowledge, skills, and abilities based on any written training documentation provided by the Technician's previous employer. The Chemistry Technician's training program may be modified based on the Technical Leaders' assessments.

6.2 Safety

6.2.1 The Chemistry Technician shall receive power point presentations as well access to policy and procedures related to safety and building evacuations for the section and building.

6.2.2 The Chemistry Technician shall demonstrate the ability to perform the routine maintenance required to keep the Forensic Biology Section compliant with laboratory and section procedures.

6.3 Ethics

6.3.1 The Chemistry Technician shall attend lecture(s).

6.3.2 The Chemistry Technician shall read policies and procedures related to ethics.

6.3.3 The Chemistry Technician shall read policies and procedures related to Alcohol and Drug Free workplace.

6.3.4 The Chemistry Technician shall read policies and procedures related to the Use of Social Media.

6.4 Forensic Advantage

6.4.1 The Chemistry Technician shall attend lecture(s).

6.4.2 The Chemistry Technician shall read policies and procedures related to FA.

6.4.3 Demonstrate knowledge of FA.

6.5 Evidence Handling

6.5.1 The Chemistry Technician shall attend lecture(s).

6.5.2 The Chemistry Technician shall read policies and procedures related to evidence.

6.5.3 Forensic Biology evidence shall be received from the Evidence Control Unit. The Chemistry Technician shall demonstrate the ability to retrieve forensic biology evidence.

6.5.4 The Chemistry Technician shall ensure the evidence packaging is in a properly sealed condition. If the packaging seal does not meet policy, the technician shall remediate the seal and document the remediation in FA (Forensic Advantage) Laboratory Information Management (LIMS) software.

6.5.5 The Chemistry Technician shall demonstrate the ability to work with evidence.

6.5.6 The Chemistry Technician shall work with the evidence technician assigned to the Forensic Biology Section.

6.5.7 The Chemistry Technician shall attend demonstration of the inventory process for Sexual Assault Evidence Colletion Kits (SAECK) received by Forensic Biology.

6.5.8 The Chemistry Technician shall demonstrate the proper inventory process, including the use of FA.

6.6 Aseptic Technique

6.6.1 The Chemistry Technician shall attend lecture(s).

6.6.2 The Chemistry Technician shall read policies and procedures related to aseptic technique.

6.6.3 The Chemistry Technician shall be able to demonstrate proper aseptic technique and contamination controls.

6.6.4 The Chemistry Technician shall attend demonstration of handling of DNA extracts and the proper aseptic technique for drying down these extracts.

6.6.5 The Chemistry Technician shall complete a competency test for handling of DNA extracts including evaluation of the proper procedure for drying down extracts and packaging for return to the investigating agency.

6.6.5.1 The competency test shall consist of a set of at least 3 DNA extracts with 2 control samples. The extracts containing DNA shall have at least one sample of high DNA concentration (e.g. buccal swab extraction) and one sample of low DNA concentration.

6.6.5.2 The Chemistry Technician shall dry down the extracts using the most current section procedure.

6.6.5.3 The Chemistry Technician shall then package and give the dried extracts to a qualified analyst. The qualified analyst shall reconstitute the extracts and analyze them.

6.6.5.4 To successfully complete the competency test, the extracts must yield consistent results with no indication of contamination.

6.7 Body Fluid Identification

6.7.1 The Chemistry Technician shall attend lecture(s).

6.7.2 The Chemistry Technician shall read policies and literature related to body fluid identification.

6.7.3 The Chemistry Technician shall demonstrate proper identification of body fluids to the degree required for use in the job.

6.7.4 The Chemistry Technician shall complete competency tests for body fluid identification to the degree required for use in the job.

6.8 DNA Analysis

6.8.1 The Chemistry Technician shall attend lecture(s).

6.8.2 The Chemistry Technician shall read policies and literature related to DNA analysis

6.8.3 The Chemistry Technician shall demonstrate the ability to obtain a DNA profile.

6.8.4 The Chemistry Technician shall complete competency tests for DNA analysis.

6.9 CODIS Operation

6.9.1 The Chemistry Technician shall attend lecture(s).

6.9.2 The Chemistry Technician shall read policies and procedures related to CODIS.

6.9.3 The Chemistry Technician shall assist the CODIS Administrator in assessing information.

6.9.4 Demonstrate the ability to use the CODIS procedures.

6.10 Quality Control for Body Fluid Identification and DNA Analysis

6.10.1 The Chemistry Technician shall attend lecture(s).

6.10.2 The Chemistry Technician shall read policies related to Quality Control for both body fluid analysis and DNA analysis.

6.10.3 The Chemistry Technician shall meet with the Quality Manager of the Crime Laboratory or designee for a session on accreditation, audits, and inspections.

6.10.4 The Chemistry Technician shall understand the current DNA Federal QAS Standards.

6.10.5 The Chemistry Technician shall demonstrate the ability to perform preventative/post/post-repair maintenance for instrumentation within the Forensic Biology Section.

6.10.5.1 The training program may be divided to authorize the Chemistry Technician to perform routine maintenance/tasks that do not involve the processing of samples prior to the completion of the training samples. The training samples and competency test shall be successfully completed prior to the Chemistry Technician perfoming any duties that involve sample processing.

6.10.6 The Chemistry Technician shall be able to demonstrate the documentation of QC processes using FA and section forms.

6.10.7 The Chemistry Technician shall be able to perform all tasks needed to assist the Forensic Biology Section, including but not limited to making aliquots, use of autolave, coordinating instrumentation services, and assessing new reagent lots.

6.11 Ordering

6.11.1 The Chemistry Technician shall be shown proper procedure for ordering technical supplies.

6.11.2 The Chemistry Technician shall demonstrate the ability to order technical supplies.

6.12 Competency Test - Individuals shall successfully complete a series of competency tests. These tests are to determine the technician's ability to obtain proper results for both body fluid identification and DNA analysis.

6.13 Additional Training

The training program shall, at a minimum, consist of a competency test. The training program may also consist of readings of relevant scientific publications; lecture(s) pertaining to any new technology advances and/or policy and interpretation changes; or wet lab scenarios where instruction on new laboratory techniques may be demonstrated and hands on practice of new laboratory techniques may be performed to the degree trained.

The competency test will be a demonstration of maintenance, validation requirements, and reagent assessments. For successful completion, the Chemistry Technician III shall obtain results within the expected requirements for reagent acceptance and instrument inspections that is in compliance with Section Quality Control policies.

The Chemistry Technician shall understand the ordering system and use of grant codes to effectively order supplies for caseworking analysts.

7.0 Limitations – Processing of casework samples.

8.0 Safety- There are many potential hazards that exist in the Laboratory. It is the responsibility of the Training Officer to ensure the Technician is aware of all potential hazards. These potential hazards include, but are not limited to, the following:

8.1 Infectious Agents

- Viral agents, including HIV and Hepatitis

- Bacteria, including sexually transmitted diseases
- Fungi
- Parasites

8.2 Hazardous Materials

- Caustic Agents (Acids and Bases)
- Carcinogens/mutagens
- Teratogens
- Organic chemicals
- Flammable materials
- Oxidizers

8.3 Electrical Hazards

- Electrophoresis units
- Laboratory equipment
- Grounding

8.4 Burn Hazards

- Autoclaves
- Thermal cyclers

8.5 Laboratory Safety Procedures

Individuals must be trained in laboratory safety by the Section Safety Officer prior to the commencement of training. Various manuals are provided that must be followed to ensure safety of all Laboratory personnel. The following manuals are to be used for reference and guidance for laboratory safety: SDS Notebook, the State Crime Laboratory Safety Manual, and the DOJ Safety Manual.

It is the responsibility of the Safety Officer to alert the technician to safety hazards specific to this Laboratory, including all items mentioned above.

9.0 References

- Listed within the Section and Laboratory Training Procedure

10.0 Records

- Training Logs and Notebooks

11.0 Attachments – N/A

Revision History		
Effective Date	Version Number	Reason
03/09/2020	2	Removed revision history, updated position title throughout; 6.5.7, 6.5.8 – add steps to train in kit inventory process; 6.6.4, 6.6.5 – add steps to train in handling of DNA extracts; 6.10.5.1 – add wording to allow authorization in routine tasks prior to completion of training