



**SOUTH CAROLINA  
LAW ENFORCEMENT DIVISION**

**January 2014**

*Forensic Services Laboratory*

**Evidence  
Submission  
Manual**

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# INTRODUCTION

The South Carolina Law Enforcement Division (SLED) Forensic Services Laboratory is a full service crime laboratory that serves criminal justice agencies throughout South Carolina. The laboratory began operation in the early 1950s and has steadily grown during ensuing years. Pursuant to Section 23-3-15, 1976 South Carolina Code of Laws, as amended, SLED is given exclusive statewide jurisdiction to operate a comprehensive forensic laboratory on behalf of the State. Services are provided to local, state, and federal agencies for cases involving suspected criminal activity. The laboratory's operating hours are 8:30 A.M. to 5:00 P.M., Monday – Friday (excluding state holidays). All departments have staff on call for responses after normal business hours.

Since 1994, the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) has accredited the laboratory. To obtain ASCLD/LAB accreditation, specific standards/criteria must be met and confirmed by an external inspection. Accreditation is maintained through annual internal and periodic external inspections. Additionally, the DNA Casework and DNA Database Departments meet all criteria set forth by the FBI's *Quality Assurance Standards for Forensic DNA Testing Laboratories* and *Quality Assurance Standards for Forensic DNA Databasing Laboratories*.

The laboratory is composed of an administrative component (Forensic Administration) and the following departments: DNA Casework, DNA Database, Drug Analysis, Evidence Control, Firearms, Latent Print/Crime Scene, Questioned Document, Toxicology, and Trace Evidence. Each department has specific capabilities and services in its area of responsibility. The Implied Consent Department regulates the breath testing program for the State of South Carolina. This department certifies, inspects, repairs and maintains the Datamaster DMT Program. Laboratory staff, working in conjunction with the investigating officer, determines specific capabilities and services that are applied to a case based on the totality of the circumstances.

## Forensic Services Laboratory – Objectives

1. To provide the criminal justice system in South Carolina with a full-service forensic laboratory.
2. To employ persons of the highest possible ethical and educational standards and furnish them with the necessary training.
3. To perform work with a high degree of accuracy, quality, and efficiency.

## FORENSIC SERVICES LABORATORY LOCATION

***Physical Address:***

SLED Forensic Services Laboratory  
4416 Broad River Road  
Columbia, SC 29210

***Mailing Address:***

SLED Forensic Services Laboratory  
P.O. Box 21398  
Columbia, SC 29221-1398

***Directions:***

From Greenville/Spartanburg: On I-26W, take exit 106, St. Andrews Road. Turn left at the stop light onto St. Andrews Road. Follow St. Andrews Road 0.7 miles. Turn left onto Broad River Road. Continue 1 mile. SLED Forensic Services Laboratory is located on the right.

From Charleston: On I-26E, take exit 106B, St. Andrews Road, East. Merge onto St. Andrews Road. Follow St. Andrews Road 0.6 miles. Turn left onto Broad River Road. Continue 1 mile. SLED Forensic Services Laboratory is located on the right.

## LABORATORY CONTACT INFORMATION

Forensics Switchboard	803-896-7300
Administration	803-896-7381
After normal business hours	803-737-9000

DNA Casework	803-896-7383
DNA Database (CODIS)	803-896-7383
Drug Analysis	803-896-7269
Evidence Control	803-896-7302
Evidence Processing	803-896-7369
Firearms - (IBIS and Evidence Examination)	803-896-7399
Implied Consent	803-896-7362
Latent Print/Crime Scene	803-896-7299
Photography	803-896-7295
Questioned Document	803-896-7298
Toxicology	803-896-7385
Trace Evidence	803-896-7347

## GENERAL EVIDENCE SUBMISSION INFORMATION

The SLED Forensic Services Evidence Submission Manual has been developed to provide law enforcement with information concerning procedures for the collection, preservation, and submission of physical evidence. As an ASCLD/LAB accredited laboratory, every effort has been made to ensure its accuracy. However, the Manual is not intended to address all situations or to supersede agency policies or procedures. Although the laboratory intends to make periodic updates and changes to this Manual, it is recommended that users keep abreast of changes that will inevitably occur over time due to changes in technology within the specific disciplines.

As a result of the cooperative efforts of this laboratory, these guidelines are set forth to maximize analytical results and to encourage the optimal use of the services offered.

Submitted evidence must be accompanied by certain documentation. This documentation includes a SLED Forensic Services Request form and a SLED Evidence Inventory form OR an iLAB Packing Slip. An Incident Report is also required except for Drug cases.

All items of evidence should be properly sealed and marked with the initials and date of the sealing official. Evidence which is not properly sealed upon submission may be returned to the submitting agency without analysis or the evidence will be appropriately documented as “not sealed”.

In the event of a request that is outside of the case acceptance guidelines, it is essential to make contact and receive approval via phone or email with laboratory management prior to delivering the evidence to SLED. The Evidence Control department cannot accept requests that are outside the case acceptance guidelines without documented approval.

If any questions arise concerning the collection, preservation or submission of forensic evidence, customers are encouraged to contact Forensic Services at (803) 896-7300 to obtain assistance from the appropriate laboratory department.

## USING THE LABORATORY IN THE JUDICIAL PROCESS

In addition to conducting examinations and comparisons of various types of physical evidence, analysts are available to present expert testimony concerning their findings before the courts. In order to be of maximum assistance, the following procedures should be followed:

- Notify laboratory personnel, as far in advance of the trial as possible, so that time will be available for proper court preparation.
- When using email as the form of notification please keep in mind that some laboratory personnel do not have access to SLED email after normal business hours.
- Due to the number of cases being handled by each analyst and/or technician, it is critical to issue subpoenas as early as possible. If conflicts exist with multiple subpoenas, it may be necessary for court officials to communicate with each other to resolve them.
- The SLED laboratory case number should be referenced on any subpoena issued to laboratory personnel.
- For all cases, in addition to the subpoena to appear in court, information should be furnished as to the actual date and approximate hour when the analyst and/or technician will be needed. Time spent waiting outside of courtrooms while juries are being selected, motions are being heard, or other witnesses are being examined is unwarranted. The waiting time precludes more constructive work at the laboratory and interferes with other court appearances.
- Immediately notify the appropriate analyst and/or technician of any change in trial or appearance dates, such as continuances or guilty pleas.
- Normally, there is no fee for expert testimony or any other laboratory service; however, in specific situations, such as civil trials which do not involve the State as a part of interest, a witness fee may be charged.

When scheduling laboratory personnel for court who are chain of custody witnesses **only** keep in mind the South Carolina Court of Appeals ruling, *State v. Hatcher*, which states:

- “a complete chain of custody as far as practicable must be established”
- “each person who handled the evidence is not required to testify.” When “other evidence establishes the identity of those who have handled the evidence and reasonably demonstrates the manner of handling of the evidence”
- “the chain of custody is only required to be established as far as is reasonably practicable, South Carolina courts have consistently held that all persons in the chain of custody must be identified and the manner of handling the evidence must be demonstrated”

A verified chain of custody may be obtained prior to trial by contacting Sharon Hunt at (803) 896-7381.

## DNA CASEWORK DEPARTMENT

### I. CAPABILITIES AND SERVICES

The DNA Casework Department performs scientific analysis on biological evidence such as blood, semen, and saliva. Technicians and analysts evaluate available information to understand the nature of the case and what questions need to be addressed. They then examine submitted evidence items to locate and identify probative biological samples.

The DNA Casework Department performs three functions related to the analysis of biological evidence:

Evidence Processing – Examination of items of evidence for the potential presence of biological stains (such as blood, semen, and saliva), hairs, fibers, or other informative evidence. If potential evidence is identified, it is carefully collected and forwarded to the appropriate department or section for further analysis.

Serology – Testing to indicate or identify the presence of body fluids. When body fluids or other biological evidence such as hairs are identified and are suitable, the sample is prepared for DNA analysis.

DNA Analysis – Performs DNA analysis on samples forwarded from Evidence Processing, Serology, or samples submitted from outside agencies.

DNA analysis is performed on evidentiary samples and known DNA standards using Short Tandem Repeat Polymerase Chain Reaction (STR-PCR) DNA technology. The DNA profile developed from the sample(s) is compared to DNA profiles developed from individuals involved in the case to determine inclusion or exclusion of the person identified as a possible source of the profile in question. When it is determined that a profile developed from probative evidence matches an individual associated with the case, a statistical probability is calculated to give weight or meaning to the match.

The DNA Casework Department provides Sexual Assault Evidence Collection Kits and Suspect Evidence Collection Kits to law enforcement agencies and medical facilities throughout South Carolina to aid in standardizing collection of evidence. All kits were developed in conjunction with the medical, legal, and law enforcement communities.

When necessary in criminal cases, the DNA Casework Department can assist in arranging for private laboratories to perform additional types of DNA testing such as mitochondrial DNA testing. The cost of testing performed by a private laboratory is the responsibility of the requesting agency.



## II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES

### *Evidence Collection and Packaging*

DNA evidence can be collected from a wide variety of sources. Great care must be taken in the collection and preservation of DNA evidence due to the potential for cross contamination and degradation.

Personal Protective Equipment (PPE) should be worn when collecting biological evidence to minimize the risk of exposure to hazardous pathogens such as the human immunodeficiency virus (HIV) and the hepatitis B virus.

Investigators and DNA laboratory staff should work together to determine the most probative evidence and establish priorities.

The following are some general guidelines for evidence collection, preservation, and submission; however, officers should always contact the DNA Casework Department when questions arise.

### **General guidelines:**

1. Properly document and label all evidence (i.e. description of item; date, time and location of collection; identity of the collector; etc.).
2. Properly seal all evidence and initial and date the seal.
3. Submit only potentially probative evidence. Items that cannot be used to associate the victim or subject with the crime should not be submitted.
4. Maintain a chain of custody on all evidence beginning at the time of collection.
5. Wear disposable gloves and change them often while collecting or handling evidence.
6. Instruments such as scissors or tweezers should be disposable or cleaned thoroughly before and after collection of each sample.
7. Avoid talking, sneezing, and coughing over evidence. Avoid allowing sweat to drip onto evidence.
8. Avoid touching your face, nose, mouth, and hair when collecting and packaging evidence.
9. It is preferred that the entire item be submitted. If this is not possible or practical, stains may be cut out or swabbed. Swabs must be completely air-dried prior to packaging. Care must be taken to minimize potential contamination.
10. When submitting clothing, indicate the probable owner or source of the clothing. A name and/or the designation of suspect or victim is preferred. If an item is submitted that may belong to the suspect (i.e. a shirt left behind at a scene that does not belong to the victim), please indicate as such.

## DNA Casework

11. Generally, items should be packaged separately (especially those items that may contain DNA from different sources) into new paper bags or envelopes, not plastic bags. Items packaged in the same inner container will be treated as one item.
12. Do not use staples to seal the packaging, as they have the potential to tear gloves and/or injure the skin of the person opening the package.
13. When collecting dried blood (or other body fluids), the use of a double-swab technique is recommended:
  - a) use a swab moistened with sterile water to collect the stain
  - b) using a second dry swab, go back over the same area and collect any remaining sample. Submit both swabs in the same container.
14. When collecting hairs, do not use tape for collection and transport. It is recommended that hairs be placed on or across the adhesive area of a piece of sticky note paper. The sticky note paper should then be carefully folded and placed into an appropriate outer envelope. Make sure all hairs are affixed to prevent them from flying out when the outer container is opened.
15. Do not submit ashes and other debris along with cigarette butts.
16. Air-dry evidence thoroughly before packaging into paper bags or envelopes. Avoid moisture and air-tight packaging, as this allows mold to grow and may affect our ability to obtain DNA results. Avoid folding items while wet, as this may cause the transfer of stains from one area of the item to another.
17. Dry items out of direct sunlight in a manner that prevents cross-contamination. SLED Evidence Processing has large hoods that may be utilized if limited space or equipment is an issue. Any evidence unable to be dried must be submitted as soon as possible. **If evidence is being submitted damp or wet, please notify the Evidence Control personnel when the evidence is being submitted so they can make arrangements for the evidence to be properly dried.**
18. Direct sunlight and extreme heat are harmful to DNA. Avoid storing evidence in locations that may get hot, such as a room with no air conditioning or trunk of a police car.
19. Avoid storing biological evidence in areas prone to high humidity. Generally, temperature and humidity controlled environments are acceptable for long-term storage of properly dried and packaged DNA evidence. Long term refrigeration without humidity control can introduce damp conditions from condensation and encourage mold.
20. Sexual Assault kits should be refrigerated prior to submission if there are any liquid components collected (i.e. blood or urine for Toxicology testing); if there are no liquid components collected, room temperature storage is preferred. When the kit is returned from SLED to the submitting agency it may be stored at room temperature.
21. **In most cases, buccal swabs are the preferred sample for known standards.** Blood spotted and dried on filter paper is generally the preferred known standard from autopsy submissions. If liquid blood must

## DNA Casework

be submitted, the tubes containing liquid blood should be refrigerated prior to submission; and they should be packaged in a separate container to prevent possible contamination of other items due to leakage. (Sexual Assault kits are the exception.). Do not freeze liquid blood.

22. If inadvertent contact with a surface that may be subjected to DNA testing occurs, it may be necessary for the officer to submit a known sample in the form of a buccal swab in order for the analyst to be as certain as possible that any results obtained are related to the crime. False exclusions may occur when a DNA profile is obtained that does not match the suspect. Known samples submitted for this purpose usually should not be logged in as part of a case.

### ***Evidence Submission Procedures and Information***

It is imperative that information accompanying all case submissions for DNA analysis be as accurate and complete as possible. Improper submissions create additional work and can unnecessarily delay analysis of the case or completion of a report. Please verify evidence descriptions and ensure that names are spelled correctly.

Information accompanying case submission must be sufficient for examiners to determine the proper analysis procedures. Occasionally, an incident report may not contain adequate information to determine the significance of the evidence that is submitted. Submitters are encouraged to utilize the comment section for packing slips to convey information that may be pertinent to analysis of the case. *If required information does not accompany the submission of the case, it may not be accepted until this information is properly provided.*

In most cases, reference samples (known standards) from both the victim and subject(s) are required to initiate DNA testing. The type and number of items accepted per submission is based on case type and is outlined below. If necessary known standards are not submitted, the evidence will be stored at SLED for approximately 90 days. A letter requesting the appropriate known standard(s) will be sent to the submitting agency. If after 90 days, no standard has been received or no additional requests have been made, the evidence will be returned to the submitting agency. If additional evidence is submitted after a letter requesting standards has been issued, and no communication has been received regarding the case in response to the previously issued letter, the new assignment will be administratively closed and the additional evidence returned without analysis. If known standards are obtained, the evidence may be resubmitted for analysis. If case circumstances change and/or analysis prior to submission of standards is necessary, please contact the DNA laboratory prior to re-submission.

Additional evidence or known standards submitted for previously submitted cases *must* be submitted under the original case number. Generally, known standards will not be accepted without accompanying evidence unless prior arrangements

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have been made with the DNA Casework Department (an exception is standards submitted for criminal paternity testing). When a known standard is submitted for comparison to multiple cases, submit the standard with one of the cases and be sure to indicate all related cases appropriately on submission forms.

A request to compare a known standard from one case to evidence in another case that has not previously been indicated as related will require a written request on the part of the submitting agency or the Solicitor's Office. A request noted on laboratory submission paperwork or an email from the agency will suffice.

### **Known Standards:**

Known Standards may be in the form of buccal swabs (preferred), liquid blood collected in a lavender-stoppered tube (containing EDTA), or a small amount of blood spotted on filter paper and allowed to dry (preferred sample from autopsies).

Buccal swabs are 1 – 2 sterile swabs rubbed firmly on the inside of the cheek to collect skin cells. When collecting these swabs, roll the swab around to collect cells on all sides. After collection, allow swabs to dry thoroughly. These swabs may be packaged together and should be submitted as one item. Known standards from persons suspected to be involved or who may have deposited DNA on the evidence should be submitted when relevant. For example, in sexual assault cases; if recent voluntary sex (within 1 week) is indicated, a known sample from the consenting partner is also necessary.

For decomposed bodies, the preferred options for known standards include intact molars (removed from the jawbone), or a portion of the femur. These samples should be stored frozen. Please ensure that tools used to collect these samples are clean, as mixed DNA profiles can result from samples collected using tools that have not been decontaminated. Samples preserved in formaldehyde (formalin) are unsuitable for DNA. If the remains are very old and/or dried out, analysis will likely be referred to a laboratory that specializes in analysis of these type samples.

### **Alternate Known Standards:**

If a known standard cannot be obtained, an alternate known standard may be submitted. Items that can *definitively* be attributed to the subject can be used as an alternate known standard. Typically, these are items an officer witnessed the subject discard and then promptly collected (i.e. bandages removed from subject, cigarette or drink bottle discarded by subject, etc.) Items of clothing often yield mixtures and are not generally acceptable as an alternate known standard. When an alternate known standard is used for comparison, results will usually be reported as: "If the profile developed from item 1 is from John Smith, then ..."

Alternate known standards should be submitted in missing person cases when possible. Preferably, items should be identified by a family member or roommate

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as belonging to the missing individual. Toothbrushes, hair brushes, and razors are examples of items commonly submitted in missing person cases.

### **Evidence:**

Cases with no known subject will be tested and appropriate data will be entered into the Combined DNA Index System (CODIS). In order to be entered into CODIS, the profile must meet the following criteria: a) contain a minimum amount of genetic information, b) be from a probative piece of evidence in the case for which it is being submitted and must be believed to contain DNA attributable to the suspect, and c) cannot be a complex mixture.

Regardless of whether there is a known suspect or not, any profile generated from evidence that meets the above criteria will be entered into CODIS. **It is imperative that sufficient information regarding the origin of the evidence items be provided so that a determination regarding CODIS eligibility can be made about any profiles developed. In the absence of sufficient information, the profile will not be entered into CODIS.**

Once entered, profiles remain in CODIS and are not removed unless additional information is developed that indicates it is not a qualifying profile. Profiles from victims, witnesses, or bystanders, as well as profiles from evidence that is not directly associated with a crime are not entered into CODIS. Also, evidence likely to contain the suspect's profile that was removed from his person, home, car, or any location where he would normally be may not be entered into CODIS.

Entry of a profile into CODIS may result in a hit to a previously convicted offender (Offender hit) or to an evidentiary profile from another case (Forensic hit). If an Offender hit is generated by CODIS, a known standard from the individual identified by the hit report is required in order for DNA Casework to report a match between that person and the evidence in question. We cannot report a statistical match between evidence and an offender profile in CODIS.

DNA testing may be performed on hair if specific criteria are met. If probative forensic results are obtained from body fluids on evidentiary samples, DNA testing on hair may not be performed.

DNA testing will be considered complete when an association is established from probative evidence. For example, an association is established between a subject and victim or a subject and a crime scene.

Stains will not be tested when the source of the stain is known.

If DNA testing of an item will not add valuable information to the questions in the case, it will not be analyzed. Examples of this may be the analysis of a suspect's bed sheets in a sexual assault case, or a cigarette butt collected in a public area when there is no corroborating information that it is related to the crime. If a

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suspect and victim live together, proving the suspect was at the scene is typically of no value since we cannot determine when the DNA was deposited.

Generally, DNA testing is not necessary for suicides; however, in cases involving questionable circumstances it may be indicated. Samples where the source is known will not be tested. For multiple samples collected from a single item of evidence or from a crime scene, initial testing will be limited to a representative sample, unless circumstances of the case dictate otherwise.

For all case types, known reference standards from the victim(s), suspect(s), or those submitted for elimination purposes are not counted against the number of items that may be submitted.

When pre-logging a case into iLAB prior to submission to the laboratory for DNA analysis, careful consideration of the *analysis request* for each item is strongly encouraged as this is vital information for the examiner. The available requests and a brief explanation of the proper usage of each are listed below (occasionally, more than one request will be appropriate on an individual item):

DNA-Known standard: Item is a known sample collected from a victim, suspect, or for elimination purposes. Always indicate the name of the person from whom it was collected. This request will apply whether the known standard is a buccal swab or a tube of blood.

DNA-Alternate Known Standard: Item can be definitively associated with a person. Typically, the DNA Casework Department should be contacted prior to use of this request.

DNA-Blood: Evidence item has suspected blood stain(s) on it.

DNA-Semen: Evidence item has suspected semen stain(s) on it.

DNA-Saliva: Evidence item likely contains saliva left behind by user. This request is typically used for cigarette butts, chewed gum, drink bottles or cans, straws, or any area or item that a person would have licked or placed in their mouth.

DNA-Touch: Evidence item was handled by or came into contact with the suspect or victim in such a way that there is a high degree of likelihood that their DNA may have been deposited.

DNA-Hair: Item is a hair or hairs submitted for DNA testing.

DNA-Ownership: Evidence item was likely worn repeatedly or most recently by a person involved in the case (sometimes termed “wearer DNA”). This request will typically apply to clothing.

DNA-Fingernails: Item is fingernails.

DNA-Other: Item does not clearly fit into another category. Typical examples are: bones from unidentified remains and alternate known standards. Clarification should be added in the comments section of the submission packing slip when this request is used.

**Good communication between the forensic scientist and the evidence submitter is strongly encouraged.**

### **Sexual Assaults**

- The first submission is limited to a Sexual Assault Evidence Collection Kit plus one pair of underwear.
- If no DNA profile foreign to the victim is developed from the kit, additional items such as clothing or bed linens may be submitted in a subsequent submission-limited to 5 items per submission.
- If a DNA profile matching the subject or a DNA profile eligible for CODIS is developed, no additional items will be examined unless circumstances (such as multiple perpetrators) suggest the need for additional processing.
- Suspect's clothing will not be examined unless there is reason to believe the victim's blood may be present on the clothing and no association has been made with analysis of the sexual assault kit.
- Sexual assault kits with a known subject submitted without a proper DNA standard from the subject will be stored at SLED for approximately 90 days. A letter requesting the appropriate known standard will be sent to the requesting agency. If after 90 days, no standard has been received or no additional contact has been made, the evidence will be returned to the submitting agency. If known standards are obtained or circumstances change, this evidence may be resubmitted for analysis. A known standard from the victim is required, as well.
- Sexual assault cases where the suspect is unknown will be analyzed provided a proper known sample from the victim is submitted.

### **Homicides/Violent Crimes (robbery, assault, etc.)**

- Evidence is limited to 5 evidence items per submission.
- If probative DNA profiles are obtained, no additional items will be examined, unless special circumstances indicate the need for processing additional items.
- If no probative DNA profiles are developed on the first submission, 5 additional items may be submitted for processing.

### **Burglary/Property crimes**

- First submission is limited to 2 items - typically blood sample(s) from the scene, or items left at the crime scene by the perpetrator (i.e. cigarette butt, item of clothing, drink container).
- If a DNA profile matching the subject or a DNA profile eligible for CODIS is developed, no additional items will be examined, unless circumstances (i.e. multiple perpetrators) suggest the need for additional analysis.

### **Criminal Parentage Cases**

- When necessary, parentage testing can be done in cases of sexual assault. In cases where the questioned father cannot be excluded as a possible biological father of the child, paternity statistics will be reported. Submissions must include all of the following: a) known DNA standard from the mother or alleged mother,

## DNA Casework

b) a known DNA standard from the father or alleged father, and c) a known DNA standard from the child.

We can also perform reverse parentage analysis and identify a child as the possible offspring of two individuals. Cases that involve an abandoned baby or a missing person are examples of situations where this testing may be useful.

If all three required standards are not available, arrangements for statistical analysis by an outside lab must be completed prior to initiating testing.

Testing done to establish similar relationships in other type cases is subject to the same requirements. If you have questions regarding this testing, please contact the DNA Casework Department.

### **“Touch DNA” Evidence**

- “Touch” or “contact” DNA evidence is evidence which has no visible staining and would contain DNA that results from an item being touched or handled. *Touch DNA evidence can sometimes provide useful information, but very often yields profiles that have little or no value.* Touch evidence does not include cigarette butts, swabbing from cans, bottles, straws, envelopes or other items in which the substance being tested for is most likely saliva. Touch evidence also does not include items submitted for wearer (ownership) such as shirts, shoes, hats, gloves, mask etc. where a probability of prolonged contact is suspected.
- Touch evidence will be accepted for possible DNA analysis only when there is a high degree of probability that the evidence will provide results or investigative leads. A high degree of probability may be established by witness corroboration, visual monitoring systems, or sound deductive reasoning.
- Touch evidence will be processed on violent crimes only.
- Touch evidence will be processed only when no other probative evidence exists.
- The number of items submitted for touch DNA analysis will comply with the number of items that may be submitted based on case type. (For example: aggravated assault - 5 items)
- Elimination standards should be submitted when appropriate.

### **III. SPECIAL CONSIDERATIONS**

The following are some limitations of DNA analysis:

1. The age of a dried blood or semen stain cannot be determined at this time. The forensic scientist may sometimes be able to use his or her experience to offer an opinion in court regarding age (i.e., a blood stain that appears to have been washed multiple times or a drop of blood on a floor that was very dark brown and difficult to remove may not have been deposited recently), but cannot state the age of a stain with any scientific certainty.
2. The race of the source of the DNA cannot be determined using current STR-PCR DNA technology.



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3. The identification of semen and subsequent development of a DNA profile does not indicate whether intercourse was consensual or forced.

**If it is determined that DNA analysis is no longer needed on a case, please notify the DNA Casework Department as soon as possible.**

### IV. REPORT INTERPRETATION

All sections of the DNA Casework Department (see introduction) normally generate independent reports. Under some circumstances, a Serology report may incorporate Evidence Processing results; and a DNA report may incorporate Serology results.

The top of the report will contain the report date, agency identification information, SLED and agency case numbers, incident date, and victim and subject names.

When a DNA analysis report contains both Serology analysis and DNA analysis results, the body of the report will be divided into the Serology Analysis section and the DNA Analysis section.

#### **Serology Analysis**

- **Items Submitted** – lists the items submitted for Serology analysis
- **Results of Examinations** – indicates what body fluid was identified/indicated and whether DNA analysis was attempted

#### **DNA Analysis**

- **Items Analyzed** – lists the items analyzed for DNA
- **Examinations** – indicates the technology (STR-PCR DNA analysis) used and where to find the results (in tables)
- **Results** – lists the DNA conclusion for each item tested based on interpretation of analytical data by the DNA analyst

### V. CONTACT INFORMATION

DNA Casework telephone number - (803) 896-7383

## **DNA DATABASE DEPARTMENT**

### ***COMBINED DNA INDEX SYSTEM (CODIS)***

#### **I. CAPABILITIES AND SERVICES**

The DNA Database Department manages the COmbined DNA Index System (CODIS) to promote the exchange and comparison of forensic DNA evidence from crime investigations. The DNA Identification Act of 1994 formalized the FBI's authority to establish a National DNA Index System for law enforcement purposes. Today, 200 public law enforcement laboratories participate in CODIS across the United States. Internationally, more than 40 law enforcement laboratories in over 25 countries use the CODIS software for their own database. A search of the database from other countries is possible through INTERPOL.

The development and expansion of databases that contain DNA profiles at the local, state, and national levels have greatly enhanced law enforcement's ability to solve cases with DNA. DNA offender databases store hundreds of thousands of potential perpetrator DNA profiles against which DNA profiles developed from crime scene evidence can be compared.

CODIS generates investigative leads in cases where biological evidence is recovered from the crime scene. Matches made among profiles from different crime scenes can link crimes together, possibly identifying serial offenders. Based upon a match, police from multiple jurisdictions can coordinate their investigations and share leads. Given the recidivistic nature of many crimes, it is likely that the individual who committed the crime being investigated was convicted of a similar crime and already has their DNA offender profile in a DNA database. Matches made between crime scene evidence and offenders provide investigators with the identity of a suspected perpetrator. This provides an investigative lead for the agency and depending on the probative value of the evidence can provide probable cause for an arrest. Once an offender is arrested for a crime, through a CODIS hit, another known standard must be collected from that individual with a documented chain of custody to be used for court purposes. Currently SC law authorizes the collection and storage in the DNA database of samples from persons arrested for or convicted of certain crimes pursuant to South Carolina Code of Laws Section 23-3-620.

DNA technology can also be used in Missing Person and Unidentified Person cases. A DNA profile of a missing person can be generated from items used exclusively by the missing person (i.e., toothbrush, razor). Biological known standards from relatives of the missing person should be submitted for inclusion in CODIS. These relatives should be as close a relative as possible (parents, siblings, offspring). STR DNA analysis, Y-STR DNA analysis and mitochondrial DNA analysis will be performed as appropriate. A consent form must be signed

## DNA Database - CODIS

by each relative who submits a known standard. This form is available from the DNA Database or DNA Casework department. The profiles from relatives of missing persons are only searched against unidentified persons and are not searched against crime scene evidence. An unidentified person refers to the recovered deceased (including body parts) and an individual who is unidentified (children who can't and others who can't or refuse to identify themselves).

### **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

The DNA Database Department provides all supplies necessary for collection of offender samples to the agency with offender jurisdiction. Submission of these samples to SLED and obtaining supplies is the responsibility of each agency. Offender samples may be mailed in, using a DNA Collection Kit, or hand delivered to the Forensic Services Laboratory. Liquid blood samples should be collected in a lavender top tube. Blood or saliva samples preserved on FTA cards and buccal specimen collected using sterile swabs are also acceptable. If the submission was not pre-logged, the SLED DNA Database Collection Card must accompany the sample.

### **III. SPECIAL CONSIDERATIONS**

#### **S.C. Statutes**

State Deoxyribonucleic Acid (DNA) Identification Record Database (State DNA Database), <http://www.scstatehouse.net/code/t23c003.doc>, Title 23, Chapter 3, Article 9, 23-3-600 – 23-3-700

#### **Code of Regulations**

Chapter 73, Article 5, 73-61 <http://www.scstatehouse.net/coderegs/c073.doc>

### **IV. REPORT INTERPRETATION**

When a CODIS hit is generated in a case, the investigating officer is notified by letter that a forensic hit (case to case), an offender hit (offender matches an evidence stain) or a Missing Person (Offender or Relative matches an unidentified person) has occurred. The officer is given investigating agency contact information and/or offender information. The information provided is for investigative purposes only. If a suspect is apprehended a known standard with a documented chain of custody must be submitted for court purposes.

### **V. CONTACT INFORMATION**

DNA Database telephone number - (803) 896-7383

## DRUG ANALYSIS DEPARTMENT

### I. CAPABILITIES AND SERVICES

The Drug Analysis Department is responsible for the analysis of evidentiary items to establish the presence, identity and quantity of controlled substances. In cases involving the possession, distribution, and manufacture of controlled substances, laboratory analysis is often a major element of the case. Chemical spot tests, published reference materials, and/or microscopic analyses may be used as indicative or screening tests. These tests are performed prior to confirmatory testing through scientific instrumentation. The department has a wide array of instrumentation including: Gas Chromatograph/Mass Spectrometer (GC/MS) and Fourier Transform Infrared Spectrometer (FTIR). These types of instrumentation are utilized for confirmatory testing prior to the issuance of a laboratory report. The Drug Analysis Department conducts analysis on non-biological submissions only. The analysis of biological samples such as bodily fluids or tissue samples for controlled substances is performed by the Toxicology Department. The Drug Analysis department conducts limited marijuana testing for outside agencies. It also provides training and certification programs for the identification of marijuana to law enforcement personnel from outside agencies.

Various South Carolina statutes and regulations impact this department's work. Drug Analysis reports reflect the proper controlled substance scheduling under applicable South Carolina and/or Federal statutes. The duties of SLED in matters related to controlled substances are detailed in Section 44-53-120, 1976 South Carolina Code of Laws, as amended. Regulations 73-70 through 73-150 of the South Carolina Code of Regulations sets forth regulations concerning the uniform procedures for the handling of controlled substances. Rule 6 (Rule for Chemical Analysis and Chain of Custody) of the South Carolina Rules of Criminal Procedure also impacts this department. If the requirements of Rule 6 are met, a laboratory report concerning controlled substances may be accepted in court without the presence of the chemist.

1. Qualitative analysis to determine the presence, identity and aggregate quantity or absence of controlled substances
2. Clandestine laboratory sample analysis
3. Training and certification of law enforcement staff in marijuana analysis
4. Provide expert witness courtroom testimony in the field of Forensic Drug Analysis

## II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES

### *Evidence Collection and Packaging*

1. All evidence should be dry prior to final packaging and submission to the laboratory for analysis.
  - a. Fresh plant material/hallucinogenic mushrooms should be air dried and sealed with evidence tape in a paper container prior to being submitted to the laboratory. Wet plant material results in moldy or decomposed evidence which is usually not analyzed.
  - b. Submissions containing whole plants, which are to be treated as separate plants during analysis, should be packaged and labeled separately to prevent cross-contamination between plants.
  - c. In cases involving seizures of less than 100 plants, all plants should be photographically documented. The leaves and buds from each plant should then be removed from the stalks and packaged separately to prevent cross-contamination. This type of case will be based on weight.
  - d. In cases involving 100 plants or more, all plants should be photographically documented. Once documentation is completed, a representative sample from each plant should be taken and packaged separately to prevent cross-contamination. This type of case will be based on the number of plants.
2. In cases involving multiple subjects and multiple items, if certain items were actually seized from a specific individual or location – the item’s container should be marked with the name of the subject or location and further notated in the item’s description on the request form.
3. All packaging must prevent evidentiary leakage and be tamper evident. SLED provides B.E.S.T. (Best Evidence Sample Testing) kits for small item cases. Paper bags, boxes and manila envelopes that are used for larger items must be properly sealed using evidence tape and including the initials of the individual sealing the container along with the date.
4. Evidence items of a fragile nature (e.g. glass jars) must be appropriately packaged or wrapped to avoid breakage.
5. All drug evidence which may have come in contact with biologically hazardous material should be marked with a biohazard sticker and the nature of the suspected biohazard should be indicated. This biohazard notation should also be made on the item of evidence and be further notated on the request form. The drug chemist, in conjunction with the drug analysis supervisor, will determine what analyses, if any, are possible.
6. Field test kits contain chemicals that may compromise the integrity of the packaging and of the controlled substances and should not be submitted/packaged with the evidence.
7. Only a representative sample of liquid seized from clandestine laboratories will be accepted for analysis. These samples must be first placed in individual sealed glass vials which are then further secured in individual sealed plastic bottles and

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- then ultimately secured in sealed plastic bags to prevent leakage. The large, original containers from the site should not be submitted to the laboratory.
8. The SLED Drug Analysis Request Form (with B.E.S.T. submissions) or Forensic Services Request Form (with non-B.E.S.T. submissions) should be completed prior to submission.
  9. Complete Chain of Custody Form or your agency approved departmental chain of custody forms prior to submission.

### ***Evidence Submission Procedures***

1. All evidence should be submitted for analysis as soon as practical.
2. Cases should not be submitted to the SLED Drug Analysis Department for analysis when any one of the following circumstances exists:
  - a. The case has already been disposed of within the proper judicial channels
  - b. There is no defendant associated with the evidence
  - c. The evidence is not properly sealed
3. Drug evidence must be submitted in person. It will not be accepted through the mail.
4. List all submitted items separately on the SLED Drug Analysis Request Form.
5. Because of the risk associated with their analysis, sharp items such as razor blades should not be submitted to the Drug Analysis Department.
6. Liquids from hypodermic syringes will be accepted for analysis. Liquids from syringes which contain body fluids should be submitted to the Toxicology Department only after consultation with personnel in that department.
7. Syringes will be accepted by the Drug Analysis Department only if **all** of the following criteria are met:
  - a. The syringe is the only evidence in the case
  - b. Needles are removed or properly capped
  - c. The syringe does not contain blood or any other biological fluids
  - d. The syringe is packaged in a safety container
  - e. No liquid can be removed from the syringe for submission and a “wash” to check for residue is required.
8. Minor discrepancies recorded in the evidence inventory will be corrected by the Forensic Scientist and verified by another member of the department and denoted by his or her initials upon examination of the evidence and reflected on the Analysis Request form included in the case documents. Evidence as it was found by the SLED analyst will be reflected on the official report. In cases where there are major discrepancies recorded in the evidence inventory, contact will be made with the submitting case officer.
9. Please call the SLED Drug Analysis Department prior to submitting evidence from clandestine laboratory seizures, in order to get guidance on what will be accepted for analysis, as well as the quantity (of liquids) required.
10. Requests for latent print analysis on items of drug evidence must be articulated to the Evidence Control staff at the time of submission to the laboratory and clearly documented. Proper procedures for submitting latent evidence should be followed. The drug evidence will be removed from the original packaging for

## Drug Analysis

analysis and the packaging will be routed to the Latent Print/Crime Scene Department for latent print processing.

11. Only drugs which substantiate the highest penalty for each schedule will be analyzed per the SLED B.E.S.T. evidence sampling plan. Based on the nature of the submission, a statistically based or weight threshold based sampling plan may be implemented if necessary.
12. Routine analysis of suspected controlled substances consists of a determination of the controlled substance and weight of the controlled substance as dictated by statute. Any other special requests should be made to the drug analysis supervisor for consideration.

### III. SPECIAL CONSIDERATIONS

SLED uses a drug testing system called-BEST EVIDENCE SAMPLE TESTING (B.E.S.T.). The B.E.S.T. system incorporates the most innovative evidence handling and drug testing techniques available.

The B.E.S.T. system was designed to deal with the majority of cases which carry possession and possession with intent to distribute (PWID) charges. B.E.S.T. protocol is useable on practically all levels of drug charges, but it was not intended to be used in trafficking cases. Per departmental protocol, additional analysis may be required in addition to B.E.S.T. practices.

The evidence submitted in each drug case will be carefully examined, counted and weighed, but only enough drug evidence to prove the best (highest) charge may receive a confirmatory analysis. The B.E.S.T. protocol is not a sampling system whereby a small number of samples are tested and the results inferred for the whole case. Sufficient samples by weight are tested to absolutely prove the most serious charge per substance. The remaining samples are weighed including the innermost packaging, but not tested. If there is a need to analyze all items of evidence submitted, the submitter can request that this be done on a case-by-case basis.

The SLED Drug Analysis Department does utilize a statistically based sampling plan when certain conditions are met. When this plan is used in testing, the result will reflect the portion of the sample tested and the amount of remaining untested material.

#### **DO**

- Read the directions on the front of the B.E.S.T. manila envelope. Call SLED Drug Analysis Department if there are any questions.
- Compare the control number on the plastic security envelope to the number on the manila envelope. If these two numbers do not match DO NOT USE THE B.E.S.T. KIT. Mark these "VOID" and return them to SLED.
- Use ball point (indelible) pen.

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- Securely seal the containers of suspected drugs placed inside the plastic security envelopes. Evidence should never be loose within the plastic security envelope.
- Separate evidence according to the subject if it is possible to do so. Use separate security envelopes for multiple subjects when possible.
- Keep all evidence and custody forms together in the manila envelope.
- Place the back manila copy of the Drug Analysis Request form inside the plastic security envelope, positioned so that the analyst can read the form without breaking the seal of the envelope.
- Remove the adhesive strip liner before attempting to seal the blue plastic security envelope. Once the envelope is sealed, be sure to sign and date the envelope where indicated.
- Return any damaged or defective plastic security envelopes to SLED (DO NOT USE THEM TO SUBMIT EVIDENCE FOR ANALYSIS).
- Thoroughly mark and initial all items of drug evidence before placing them in the plastic security envelope.
- Dry all drug evidence prior to placing in the plastic security envelope. Not doing so may result in moldy material.
- Compare the evidence placed in the plastic security envelope with that listed on the drug analysis request form and chain of custody forms.
- Keep track of the control numbers.

### **DO NOT**

- DO NOT place chain of custody forms INSIDE the plastic security envelope.
- DO NOT use B.E.S.T. kit if the control numbers do not match on the manila envelope and the plastic security envelope. Mark these “VOID” and return them to SLED.
- DO NOT submit wet powders, wet tablets or other wet suspect materials in a B.E.S.T. kit.
- DO NOT submit hypodermic syringes in the plastic security envelope. If syringes need to be submitted, use a plastic safety tube designed for this purpose.
- DO NOT submit paraphernalia, extraneous non-evidentiary items, or sharp objects unless absolutely essential to the case.
- DO NOT submit latent print evidence in the plastic security envelope along with the drug evidence if only latent prints analysis is needed. If possible, separate items going to Drug Analysis and Latent Prints.
- DO NOT place hot items in the plastic security envelope. Allow to cool first.
- DO NOT overstuff the plastic security envelope. Use more than one if necessary or submit by Non-BEST packaging.
- DO NOT destroy a damaged plastic security envelope. Return to SLED.



#### IV. REPORT INTERPRETATION

- Unless otherwise noted, all weights given in drug reports reflect the weight of the material minus the measurement of uncertainty. The reported weight obtained and recorded on the official SLED Report is the only weight recognized by the Drug Analysis Department.
- A forensic scientist may occasionally report a controlled substance as “found, no weight obtained”. This means that a controlled substance was confirmed but it was not feasible to take and/or report a weight for the item.
- A forensic scientist may occasionally report that no analysis was performed on an item of evidence. The following circumstances may result in this outcome.
  - There were other items analyzed in the case which the forensic scientist deemed the best items of evidence in the case.
  - The quality of the evidence was low (such as moldy plant material, etc.).
  - The evidence was biohazardous in nature (razor blade, needle, sharp items, etc.).
- If the submitting agency receives a report on an item in which no analysis was performed and there is a question as to the reason, please contact the supervisor of the Drug Analysis Department.
- Residue evidence suspected of being Cocaine base (Crack) will be reported as Cocaine when there is insufficient sample to perform the analysis required to distinguish the Cocaine base (Crack) form.
- Reports stating that a substance is found will normally be followed by a schedule (classification) for that substance in accordance to the Controlled Substances Act or other applicable classification. The following is a list of frequently used classifications and their interpretations:
  1. C-I (SCHEDULE I SUBSTANCE)
  2. C-II (SCHEDULE II SUBSTANCE)
  3. C-III (SCHEDULE III SUBSTANCE)
  4. C-IV (SCHEDULE IV SUBSTANCE)
  5. C-V (SCHEDULE V SUBSTANCE)
  6. RX (PRESCRIPTION SUBSTANCE)
  7. OTC (OVER THE COUNTER SUBSTANCE)
- Reports that state a substance is indicated will normally be used to denote pharmaceutical preparations which are identified through comparisons with reference literature or markings on containers but are not actually analyzed. This notation will also be used to denote substances which were not analyzed using confirmatory instrumentation or where compounds were analyzed and no standard for comparison is available.

## V. DESTRUCTION OF EVIDENCE

Drug evidence may be submitted to the South Carolina Law Enforcement Division (SLED), Drug Analysis Department for destruction by incineration using one of the following two procedures:

1. For submissions containing no more than five boxes (maximum size of 24inx24in, ideally the size of a paper ream box) and/or no more than 200 pounds total weight:
  - Evidence will be logged in as a “Drugs for Destruction” case.
  - A separate inventory sheet is required for **EACH** container being submitted. The inventory should adequately identify the contents of the container and it is highly recommended that it contain the submitting agency case number and corresponding evidence for each case. **SLED Drug Analysis accepts any submissions for drug destruction on a “said to contain” basis. The more descriptive and specific the associated inventory sheets are, the more SLED can attest to should a question arise later. SLED WILL NOT PERFORM AN INVENTORY OF ANY SUBMITTED CASES FOR DESTRUCTION.**
  - Once the evidence is submitted, the submitting officer must complete the required portions of the Authorization for Destruction form. Without proper completion of this form, SLED will not dispose of any part of the submission.
  - The submission will remain in a queue for destruction until an internal drug burn is performed.
  - Once the submission is destroyed, SLED will send a letter of destruction to the agency noting the date of destruction and assigned SLED lab number.
2. For submissions of more than five boxes and/or over 200 pounds total weight:
  - Call the Drug Analysis Department at **803-896-7355** to schedule a date and time to perform the destruction
  - No paperwork will be required by SLED using this procedure. The submitting agency will be solely responsible for the inventory and custody of all evidence. There will be **NO TRANSFER OF CUSTODY**. A certified operator will be present only to operate the incinerator and dictate how the burn will proceed.
  - Each burn cycle will destroy approximately 50 pounds of substance and takes approximately 30 minutes to complete, so plan accordingly and allow enough time to complete the burn.
  - Submitting agency should plan to provide security and supervision for all evidence to be destroyed at all times. SLED will not be responsible for the security of the items and will not store the items at any time.

### **What CAN be destroyed using the SLED incinerator:**

- Drug Evidence (Plant material, powders, etc.), associated paperwork, and non-metal immediate packaging

## Drug Analysis

### What **CANNOT** be destroyed:

- Anything other than drug evidence, associated paperwork, and non-metal immediate packaging including, but not limited to:
  - Metal, glass, or heavy plastic objects
  - Sharps such as syringes, needles, knives, scissors, etc.
  - Containers which may have contents under pressure
  - Containers containing liquid chemicals that may be combustible or highly flammable such as ethyl ether, gasoline or diesel, or other solvents.
  - LIVE OR SPENT AMMUNITION
  - Pharmaceutical Products (tablets, capsules, liquid bottles or syringes, etc.)
  - If any of the above items are contained within the immediate packaging with drug evidence, they **MUST** be removed prior to submission for incineration.

## VI. CONTACT INFORMATION

Drug Analysis telephone number - (803) 896-7269

## EVIDENCE CONTROL DEPARTMENT

### I. CAPABILITIES AND SERVICES

The Evidence Control Department is responsible for the acceptance and storage of all evidence submitted to the Forensic Services Laboratory. In this section, Forensic Technicians assist law enforcement staff with the overall submission process as well as offer information on the types of services provided by the various laboratory departments.

All evidence room operations are coordinated by Evidence Control Forensic Technicians. Upon completion of forensic analyses, the evidence remains secure in the evidence room until it is returned to the submitting agency or other authorized official.

The Evidence Control Department is responsible for the distribution of Evidence Collection Kits such as Sexual Assault Kits, Suspect Kits, Blood/Urine Collection Kits, B.E.S.T. Evidence Kits and GSR (Gun Shot Residue) Kits.

Evidence Control Forensic Technicians also provide court testimony on departmental procedures and Chain of Custody as it relates to specific cases.

### II. EVIDENCE COLLECTION, PACKAGING AND SUBMISSION PROCEDURES

All evidence received by the Evidence Control Department is maintained in virtually the same manner in which it is received by the submitting agency. All containers are accepted and all items are described in accordance with the “Said to Contain” policy.

Submitting agencies are encouraged to pre-package evidence in separate containers if they know in advance that the items will be routed to different departments. This commonly applies to evidence going to DNA and Toxicology. This procedure is also necessary when personal belongings are submitted as part of a case and have the potential to be returned to an agency/officer other than the initial submitting agency (i.e. Police Officer Involved Shootings). The Evidence Control staff will have limited involvement in sorting items prior to securing packaging at the submission level. At the point of evidence return, Evidence Control Forensic Technicians have no authority to open containers for the purpose of returning select items within a single container.

Please notify the Evidence Control Forensic Technician if the evidence being submitted is an additional submission to a previously submitted case or if it is related to another case. **If evidence is being re-submitted, please keep all**

## Evidence Control

**evidence in the original SLED packaging for identification purposes during the re-submission process and to facilitate court room testimony.**

At the time of submission, specific packaging guidelines are followed depending on the type of evidence and the department designated to receive the items. Boxes, heat sealable pouches, and envelopes are most commonly used to secure evidence for transfer. **When practical, each package containing evidence should be sealed with evidence tape prior to submission to the laboratory for analysis.** However, in instances where packaging is not suitable due to the size/type of evidence, the Evidence Control staff will contact a Forensic Scientist/Technician to receive the evidence immediately at the time of submission. Please avoid the use of staples to secure evidence containers. It is also critical at the time of submission to alert the technician if any of the evidence is wet. Without proper packaging or drying procedures, the risk of destroying evidence is increased.

During the submission process, the Evidence Control Technician will do the following:

1. Review laboratory forms to verify submitting agency/officer, case information and examination requests
2. Enter all data into the Laboratory Information Management System (LIMS)
3. Scan all forms/documents presented/related to each case
4. Provide secure packaging of evidence
5. Provide submitting agency with receipt of items submitted
6. Transfer evidence to the evidence room and/or to the appropriate Forensic Scientist/Technician

### **iLAB Submission Process and Procedures:**

The iLAB system was designed to allow law enforcement agencies to “pre-log” evidence prior to submission at the Forensic Services Laboratory. Access to iLAB is located on the SLED website which is [www.sled.sc.gov](http://www.sled.sc.gov). The submitting agency will access iLAB with the username and password provided to them by the SLED Forensic Technology Manager. The Forensic Technology Manager sets forth the guidelines and procedures regarding iLAB and the LIMS system. The Forensic Technology Manager has provided detailed iLAB tutorials on the SLED website. These tutorials provide an introduction to iLAB’s features, guidelines on how to use iLAB, and instructions on how to properly input the case information into the system (i.e. item descriptions and the requested analysis). When entering an item description in iLAB, only describe the specific item that is being submitted for analysis. All comments or special considerations should be listed in the Comment section located on the Case Info Tab or the Submission Tab.

## Evidence Control

When the submitting agency inputs the information into iLAB, a Packing Slip is generated detailing the case information, items of evidence, and analysis requested. The evidence submitter will print and sign the bottom of the Packing Slip. The Packing Slip contains a barcode which the Evidence Control Technician will scan when the agency arrives at the Forensic Services Laboratory to submit evidence. When this barcode is scanned, the information is populated into the LIMS system. The Evidence Control Technician will then verify that all information is correct in the LIMS system. Any corrections will be made by the Forensic Technician in the LIMS system and the evidence submitter will correct the information on the Packing Slip. If an item needs to be added, the item will be added manually to the Packing Slip by the Evidence Control Technician or the evidence submitter. Any information deleted or added to the packing slip must be appropriately initialed. All documents presented during the submission process are scanned into the electronic case file. All original copies are returned to the evidence submitter. In addition to pre-logging evidence via iLAB, system users can check on case status, download completed reports and download evidence receipts.

### **III. SPECIAL CONSIDERATIONS**

The Evidence Control Department requests that all evidence submitters arrive at SLED no later than 4:30 P.M. to begin their submission process.

The submission process can be expedited when the submitter either has all documents accurately prepared at the time of arrival or has sufficient knowledge of the case(s) and/or item(s) being delivered.

As each agency arrives to submit evidence for analysis, the Evidence Control staff will search the LIMS system for evidence that is ready for return to the agency. If an agency does not regularly visit the laboratory, periodic contact with the Evidence Control Department is requested to determine if any evidence is ready for return.

If biological evidence is submitted by mail, please ensure that all evidence is securely packaged and that the submission information is complete. Submitting agencies will be notified of all evidence not received in the proper condition. Failure to submit evidence properly may result in delayed analysis.

The Preservation of Evidence Act is outlined in SC Code of Laws, Title 17, Chapter 28, Article 3. This act states that all physical evidence and biological material must be maintained if an individual is convicted or adjudicated of one or more of the offenses listed in the act. If your agency has evidence in which an individual was convicted or adjudicated in one or more of the offenses listed in the act, the Custodian of Evidence must register this evidence with the South Carolina Department of Corrections or the South Carolina Department of Juvenile Justice. The registration process for the South Carolina Department of

## Evidence Control

Corrections can be completed at the following website: <https://sword.doc.state.sc.us/jail/>. If your agency needs to register evidence with the South Carolina Department of Juvenile Justice, contact the Office of the SC Inspector General at (803) 896-9595 for further details. Contact your local Solicitor's Office for information regarding the destruction of evidence or for a more detailed interpretation of this act.

### **IV. REPORT INTERPRETATION**

The Evidence Control Department does not issue reports.

### **V. CONTACT INFORMATION**

Evidence Control telephone number - (803) 896-7302

## FIREARMS DEPARTMENT

### *FIREARMS EVIDENCE EXAMINATION*

#### I. CAPABILITIES AND SERVICES

The Firearms Department is responsible for the examination of firearms, ammunition components, ammunition, tools, and related evidence. The department utilizes forensic microscopes to examine evidence and make comparisons. The department utilizes a vertical water tank to facilitate the recovery of test specimens used in firearms examinations. The Firearms Department also maintains a firing range that is used for test firing and related purposes.

The Firearms Department maintains the SLED Integrated Ballistics Identification System (IBIS), which is linked to the National Integrated Ballistics Information Network (NIBIN). The IBIS is a searchable computerized national forensic database of images of the microscopic markings found on fired bullets and cartridge cases. The IBIS is an evidence screening tool that provides *possible* links between fired specimens (from various crime scenes), therefore providing *possible* links between crimes not previously known by law enforcement to be connected.

The following describes the examinations commonly performed, the evidence you should submit, the information you may see in our reports, and/or some of the information we may need from you to conduct our examinations:

##### A. Firearms

###### 1. Function testing

- a. Does the firearm work?
- b. Are there any obvious defects or damage that could make it unsafe?
- c. Are the safeties working properly?
- d. Did the firearm function properly during test firing?

###### 2. Restoration of obliterated serial numbers and other data

This is normally conducted through the application of acidic reagents. Normally, the Firearms Department will not conduct restoration examinations on evidence which has already been subjected to such examinations by others.

###### 3. Determine the trigger pull weight

Normally we do not publish trigger pull weights in our reports. This information is recorded in the case notes, and is available upon request. We normally will report whether the trigger pull weight is unusually light or unusually heavy.

###### 4. Has the firearm been modified or altered?

- a. Are the barrel(s) and/or overall length too short?
- b. Will it fire as a fully automatic firearm?



- c. Are there any obvious modifications that would make the firearm unsafe?
- 5. What do we need?**
  - a. A firearm

## **B. Ammunition and Ammunition Components**

### **1. Fired Bullet(s), Cartridge Case(s), Shotshell(s) or Unfired Cartridge(s) or Shotshell(s) – Common Examinations**

- a. Determine the caliber or gauge, possible manufacturer, and suitability for identification.
- b. Microscopic comparison to other similar specimens (evidence or test specimens) to determine common origin. (Was it fired by a specific firearm or not?) (Were they fired by one or more firearms?)
- c. Examination of similar unfired cartridge(s) or shotshell(s) for cycling or mechanism marks and subsequent comparison, if appropriate.
- d. Is the item the same caliber, type, construction, etc. as the unfired cartridges collected from the suspect, found at a scene, etc.?
- e. We **cannot** determine if a specimen originated from a particular box or lot of ammunition.

### **2. Fired Bullet(s) – Additional Examination**

- a. General Rifling Characteristics (GRC) examination.
- b. Determine the caliber and possible manufacturer of the bullet.
- c. Provide a list of firearms that could have fired the bullet based on the GRC.
- d. What do we need? Fired bullet(s).

### **3. Misfired Cartridge(s) or Shotshell(s) – Additional Examination**

- a. Was it struck by the firing pin of a particular firearm?
- b. What do we need? A misfired cartridge(s) or shotshell(s); a firearm, if available.

### **4. Shotshell Projectiles – Birdshot or Buckshot Pellet(s), Rifled Slug(s), Wad(s)**

- a. Determine pellet size and type.
- b. Determine the gauge, type, and possible manufacturer of rifled slug(s) or wad(s).
- c. In rare instances, determine if a projectile(s) or wad(s) was fired by a particular shotgun.
- d. What do we need? Projectile(s) or wad(s); a shotgun if available.

## **C. Muzzle to Target Distance Determination for Shot Pellet Patterns**

Please contact the Firearms Department for information regarding this type of analysis.

## **D. Fracture Comparison**

- 1. Determine whether two or more items were once joined as a single item. Example: Broken tip of screwdriver to a screwdriver, tip of knife blade to a knife, etc.

2. What do we need? Two or more fractured or broken items (Tools, knives, firearm parts, etc. The Firearms Department typically does not conduct fracture comparisons on paper, cloth, plastic, glass, etc.)

#### **E. Tool marks**

1. Determine whether a tool mark was made by a specific tool.
2. What do we need?
  - a. An item bearing a suspect tool mark or multiple casts of the tool mark(s) if the item cannot be submitted (e.g.: Door frame, large safe, etc.).
  - b. A tool that can be connected to a suspect by possession, fingerprints or DNA.
3. If you cannot connect the tool to a suspect, please do not submit the evidence for examination.

#### **F. Destruction Cases**

1. We destroy firearms, knives, metal tools, small arms ammunition, etc. for various agencies in South Carolina.
2. Please see section **V. Case Acceptance Guidelines number 19** below for submission instructions.
3. We do not destroy chemical munitions (i.e. OC, Mace, explosives, etc.).

## **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

The following information describes some suggested procedures for collection and packaging of typical firearms evidence and other related evidence. These procedures should not conflict with the methods used by crime scene personnel in collecting evidence for latent print processing. If they are in conflict with standard evidence collection methods, please contact the Firearms Department to resolve the issue.

#### **A. Firearms**

1. **LOADED FIREARMS** - **MAKE SURE ALL FIREARMS ARE UNLOADED!!!!** **Safety should be your primary concern when handling firearms and ammunition!!!** Please do NOT submit loaded firearms to SLED or the Firearms Department without first contacting Evidence Control and/or the Firearms Department. If you transport a loaded firearm to SLED, leave it in your car. If for some reason you are not able to unload the firearm, if you are not familiar with how to unload a particular firearm, or if you are unsure about its loaded status, please contact the Firearms Department for assistance.
2. **LATENT PRINTS/DNA/TRACE EVIDENCE** - Firearms may be examined for potential latent prints, DNA, and/or trace evidence, which may be easily lost. In some cases you may want to protect potential latent prints, DNA, and/or trace

## Firearms – Evidence Examination

evidence by not unloading the firearm; however you must evaluate the potential evidentiary value of lost latent prints, DNA, or trace evidence versus safety. **If in doubt, safety must be the deciding factor!** If prudent to do so, collect such evidence and package separately.

3. **DOCUMENTATION** - Prior to handling a firearm or manipulating any of its safeties, decocking levers, etc., document the positions of these controls in your notes and/or by photography. Photography, with scale, is a good way to document the specimen's condition and location. The cylinder's position in the revolver's frame should be carefully marked prior to opening or rotating the cylinder. Please document the location of any ammunition and/or ammunition components in a revolver's cylinder prior to removing the specimens. Documentation of the position of any ammunition and/or ammunition components that are stuck or "jammed" in a firearm may be important. **Remember the concern for personal safety and the need to notify SLED personnel of a loaded firearm!**
4. **MARKING** - Firearms for submission may be carefully marked for documentation purposes by the collecting officer being mindful of any potential latent print, DNA, and/or trace evidence. Initials and/or other identification marks should be neatly and unobtrusively marked on the firearm. The safest way to mark a firearm, without causing undue damage to the firearm, is with a permanent marker (e.g. Sharpie, Sarstedt, etc.). If using a permanent marker, initials and/or other marks may be placed on a convenient location on the firearm, other than the grip area. During our examinations, any identifying markings may be damaged by the routine handling of the firearm.
5. A tag bearing the case and/or item numbers, initials, date, description of the firearm, serial number, etc. also may be attached to the firearm for documentation purposes.
6. Some personnel use a scribing or engraving tool. If such a tool is used, the markings must be placed in an area that will not damage the bore, breech, firing pin, and related areas. Also, permanent markings should not be placed in a manner that will unnecessarily damage any intrinsic value the firearm may possess.

Some examples of the areas scribed by examiners in the Firearms Department are listed below. This information is being provided to explain the types of markings that may be made by SLED personnel during their examination of a submitted firearm.

- a. Revolvers: Under the topstrap or on the bottom of the frame
- b. Pistols:
  - i. Side of barrel when slide is locked to rear
  - ii. Bottom of slide at rear when slide is locked to rear
  - iii. Inside of magazine well
  - iv. Side of magazine
- c. Derringer:
  - i. Bottom of the barrel hidden when barrels are closed
  - ii. Frame covered by barrel when barrels are closed

## Firearms – Evidence Examination

- d. Long Guns:
  - i. Barrel or barrel lug
  - ii. Side or bottom of bolt
  - iii. Receiver (normally inside loading or ejection port)
  - iv. Magazine (if applicable)

These examples may not apply to all firearms due to differences in design features.

7. **FIREARMS IN WATER** - All firearms should be submitted to the laboratory as soon as practical. This becomes very important if the firearm is wet or is recovered from water. As a general rule, you should leave a submerged firearm in the same water in which it was recovered. If a firearm is recovered in salt water, it may be beneficial to rinse the firearm with fresh water and submerge it in fresh water for transportation to the laboratory. Please note that latent print examinations can be conducted on wet firearms. Please contact the Latent Print Department if you have any questions regarding those procedures. In some cases, the firearm may have to be protected with a rust preventative, especially if the firearm can't be submitted to SLED quickly. Remember, once a ferrous metal firearm is removed from water, it will start to rust rapidly, which may cause irreversible damage to the areas of the firearm that are needed for future microscopic examinations. Try to submit the firearm in the same condition as found unless safety considerations preclude this. If you have to submit a firearm that is wet or has been transported in water, please have the Evidence Control personnel notify the Firearms Department. If you have any questions regarding this information, please contact the Firearms Department.
8. **PACKAGING** - Firearms should be submitted to the Firearms Department in a sturdy box, if possible. Please don't use glassine window envelopes. If using the plastic heat-sealable packaging material, please leave enough room at one end of the container so that the Firearms Examiner can open and reseal the container. Also, you may have to place additional padding material around the muzzle of the firearm to protect it from damage. Please do not place loose ammunition in the container with a firearm. Loose ammunition should be secured in a Zip-Lock bag, a heat sealed pouch, or similar sealable container. Please try to secure the firearm and ammunition to limit potential contact between the two. Firearms and ammunition should not be loose in the same container.
9. **DO NOT DO'S** - There are several things that normally should not be done with a firearm prior to submission for firearms examination. Some examples follow:
  - a. Please do not clean the bore, chamber or cylinder. In some cases, it may be necessary to remove debris to determine the firearms loaded status or to obtain data for documentation. This should be carefully done.
  - b. Do not cycle the action of a firearm any more than necessary.
  - c. Do not disassemble a firearm prior to submission.
  - d. Do not pick up a firearm by placing an object into the barrel.
  - e. Do not place cable ties, paper clips, or wads of paper, etc. in the barrel, ejection port, etc. in an attempt to make the firearm safe.
  - f. Do not test fire the firearm prior to submission.

## B. Ammunition and Ammunition Components

1. **EVIDENCE RECOVERY** - Removal of bullets, pellets, wads, and other projectiles from their resting place should be done without the use of metal forceps, metal tweezers, pliers, or other similar tools whenever possible. These instruments may cause further damage to evidence specimens, especially lead projectiles. After removal, the specimen should be examined for potential trace evidence, which may be easily lost. If prudent to do so, collect such trace evidence and package separately. Be aware that fired bullets and bullet fragments may have sharp edges that could injure the person collecting the evidence. Please use the proper personal protective equipment.
2. If a projectile is embedded in wood or some other hard material, it should be carefully removed. Please do not pry on the projectile. If you cannot easily remove the projectile from the material, carefully cut around the projectile including at least one inch of the surrounding material. Then package and submit the material and projectile for extraction and examination by firearms staff.
3. **DOCUMENTATION** - Photography, with scale, should be conducted to document the specimen's condition and location. Projectiles removed from bodies at autopsy should be gently rinsed to remove excess blood and tissue, while observing the requirements for the protection of potential trace evidence. If possible, wet projectiles should be stored in breathable paper-type containers (i.e. paper bag, box).
4. **MARKING** - Fired bullets, fired cartridge cases, misfired and/or unfired ammunition, which will be submitted for microscopic examination, normally should not be marked by the collecting officer. There is a strong possibility of obliterating or damaging microscopic markings which may be present on the evidence and are not readily detected by casual observation. Rather, the proximal container should be properly marked with the case number, item number, item description, recovery location, initials, etc. If necessary, misfired and/or unfired ammunition and fired cartridge cases may be carefully marked with a permanent marker (Sharpie, Sarstedt, etc.) on the body of the cartridge case. If you must mark a fired bullet, it should be done on the nose or base. You must avoid marking the areas of the bullet that have been marked by the inside of the firearm barrel. Please avoid using a scribe or engraver for marking ammunition or ammunition components. Photography with scale should be conducted to document the specimen's condition.
5. **PACKAGING** - Each fired evidence specimen normally should be placed in a separate container, being careful to wrap or cushion the specimen with paper towels, paper tissue, gauze, or similar non-abrasive material. Do not use cotton balls. Small pasteboard boxes, metal tins, film canisters, or other similar containers will provide optimum protection to the specimen and allow room for descriptive information. Sturdy envelopes and plastic bags may also be used. If using plastic heat-sealable packaging material, please leave enough room at one end of the container so that the Firearms Examiners can open and reseal the container. Please do not place wet evidence in airtight containers. If possible,

wet projectiles should be stored in breathable paper-type containers (i.e. paper bag, box).

6. Shot pellets and/or bullet fragments recovered from a single impact site may be packaged together. Try to collect as many pellets or projectiles as practical from impact sites and along the projectiles path. Don't forget that jacketed bullets may shed their jackets when traveling through a target. Also, shotgun shells may contain several wad components that may be found along the projectiles path, or may be found some distance from the path.
7. Unfired ammunition recovered at the scene or in a suspect's possession that is the same type as used in the crime may have to be submitted for firearms examination or for test purposes. Quantities of unfired ammunition may remain in its original ammunition box (if applicable). Loose and/or large quantities of ammunition should be placed in a sturdy container.
8. Please do not use glass containers or glassine window envelopes to submit ammunition or ammunition components. Please do not place packaging tape or evidence tape directly on evidence specimens.
9. Please contact Firearms Department personnel if you have any questions regarding this information.

### C. TOOLS and TOOL MARKS

1. **POTENTIAL TRACE EVIDENCE** - Tools and tool marked specimens should be examined for potential trace evidence, which may be easily lost. If prudent to do so, collect such trace evidence and package separately.
2. **DOCUMENTATION** - Photography, with scale, should be conducted to document the specimen's condition and location. Written documentation of the specimens should also be conducted.
3. **PACKAGING** - Tools and specimens bearing tool marks should be wrapped separately so that one does not contact, contaminate, or otherwise damage the other in transit. The working area of the tool may also be further protected with a zip lock bag to prevent any loss of trace evidence. With large heavy tools, it is prudent to use a sturdy box for packaging along with cable ties to secure the tool in the box. If using plastic heat-sealable packaging material, additional protective material may need to be placed around the working parts of the tool to protect them. In addition, please leave enough room at one end of the container so that the Firearms Examiner can open and reseal the container.
4. **CASTS** - If recovery and submission of the tool marked specimen is impractical, overall and close-up scale photographs of the specimen and tool marked areas should be taken. Then, casts of the tool marked areas can be made with Mikrosil, Forensic Sil, or other similar products. Such casts may be placed in envelopes, metal tins, small pasteboard boxes, etc. Please note that it is very difficult to write on a silicone cast. Certain types of backing paper from adhesive labels (evidence tape) will adhere to the casting material, if applied to a convenient part of the cast prior to curing or hardening. You can then write on this paper. Most tools may be marked with a permanent marker or scribing tool. Please do not mark on or near the tools working surfaces (i.e. the parts that make the tool marks).

5. **PARTIAL ITEMS** - When submitting pieces of wire, cable, pipe, hose, etc., where officers must cut one end of a specimen to remove it from a larger “parent” item, wrap the “OFFICER CUT END” with tape and label it as such. The evidence “cut” end should be wrapped with tissue, paper towel, or similar material and secured so that the microscopic tool marks and any trace evidence will not be disturbed. Do NOT place tape on the suspected tool marked areas.
6. **RESTRICTIONS** - Due to the inordinate amount of time required to conduct most tool mark examinations, please do not submit recovered tools for comparison, unless these tools can be positively associated with a suspect through fingerprints, DNA, possession, etc. Please do not submit suspect tool marks for examination unless a suspect tool is recovered that can be positively associated with a suspect.

#### **D. OBLITERATED SERIAL NUMBERS or DATA**

- Firearms or other firearm-related items with obliterated or partially obliterated serial numbers or data may be submitted for restoration purposes. Such firearms should be submitted and packaged in the normal manner. Follow the safety, trace evidence collection, documentation, photography, marking, and packaging procedures for firearms discussed in section A.

#### **E. FRACTURE OR PHYSICAL COMPARISONS**

1. **POTENTIAL TRACE EVIDENCE** - The fractured specimens (knives, tools, firearms, and related items only) submitted for fracture comparison should be examined for potential trace evidence, which may be easily lost. If prudent to do so, collect such trace evidence and package separately.
2. **DOCUMENTATION** - Photography, with scale, should be conducted to document the specimen’s condition.
3. **PACKAGING** - The fractured specimens should be packaged separately to prevent contact between the specimens. Possible damage, change of characteristics, and transfer of trace evidence may occur if this is not done. It is suggested that the specimens be wrapped in paper tissue, paper towels, or similar material and then placed in an envelope, small box, or other suitable container. After being individually wrapped and packaged, multiple specimens may then be secured in a larger container for transportation and/or submission.
4. **MARKING** - Please be sure that each item is properly marked (permanent marker), if possible. In some instances, you may not be able to mark a fractured item due to its size. Please do not mark on or near the broken or fractured areas. Detailed information should be placed on the proximal container in the event that the item itself cannot be marked.

The Firearms Department personnel should be contacted if you have any questions regarding the above procedures or any other firearm or tool mark related issues.

### III. SPECIAL CONSIDERATIONS

Occasionally there is some confusion regarding the Integrated Ballistics Identification System (IBIS) and requests for IBIS entry. Please note that all appropriate firearm test specimens and fired ammunition components will be routinely and automatically entered into the IBIS database. Please see the section regarding the IBIS for further information.

If a situation is encountered that does not fit any of the scenarios described in this document, please contact the Firearms Department at **(803) 896-7399**.

### IV. REPORT INTERPRETATION

When firearms evidence has been submitted and the examinations have been completed, the assigned Firearms Examiner will normally issue a formal report containing information regarding the results of the examinations and any related IBIS entry. Some of our typical results are as follows:

1. Identification or positive - Example: “Microscopic comparisons revealed that the Item 1 bullet was fired by the Item 2 firearm.”
2. Elimination or negative - Example: “Microscopic comparisons revealed that the Item 3 fired cartridge case was not fired by the Item 4 firearm.”
3. Inconclusive - Example: “Results of the comparisons of Item 5 with Item 6 were inconclusive.” This means the forensic scientist could not positively conclude whether a specimen was or was not fired by a particular firearm or whether two or more specimens were or were not fired by one firearm. This may be due to damage, a lack of sufficient markings, inconsistent test specimens, etc.
4. Unsuitable for Identification - Example: “Microscopic examination revealed that the Item 7 fired bullet was unsuitable for identification with a specific firearm.” This means the specimen displayed such limited or inconsistent markings that it could not be identified with a specific firearm or another like specimen. In some instances, there may be general class characteristics visible that can be used to eliminate a firearm or another similar specimen.

In tool mark reports, similar conclusions are used; however, the wording of the conclusions will differ somewhat. Example: “Microscopic comparisons revealed that the tool marks on Item 1 were made by the Item 2 tool.” In other reports, the conclusions are similar and self-explanatory.

**GLOSSARY** - The following list of terms is provided to help clarify the language encountered in reports generated by the Firearms Department. In order to enhance the consistency of terminology, please use these terms when describing evidence for submission.



## Firearms – Evidence Examination

- Bullet – A projectile or the part of a round of ammunition that travels down the barrel and towards the target.
- Cartridge – A complete round of unfired ammunition consisting of a bullet, cartridge case, gun powder and primer.
- Cartridge Case – The component of a round of ammunition that serves as the container for all the other components.
- Fired – This means that a bullet, cartridge case, etc. has been fired by a firearm.
- Misfired – This means that a cartridge or shotshell's primer was struck by a firing pin but failed to fire.
- Muzzle – The end of a firearm barrel from which the bullet or shot emerges.
- Shotshell – A complete round of ammunition designed to be fired in a shotgun and normally contains multiple projectiles. Shotshells are also called shotgun shells.
- Unfired – This means that the cartridge, shotshell, or ammunition component has not been fired by a firearm.
- Wad – An ammunition component(s) that is typically loaded in a shotshell between the gun powder and the projectile(s). Wads also are found in shot cartridges used in some handgun and rifle ammunition. Typically wads are composed of paper, fiberboard, plastic, etc. A single shotshell may contain one wad or multiple wad components.

## V. CASE ACCEPTANCE GUIDELINES

Please note that exceptions to these policies may be made on a case by case basis, at the discretion of the departmental supervisor and/or designee.

1. “RUSH” CASES - Requests for “RUSH” examinations of evidence must have a demonstrable need, such as, needing results for warrants, making an imminent arrest, or similar circumstances.
2. In cases where a “RUSH” request is made to examine evidence for imminent court proceedings, the Firearms Department requests to have fifteen (15) working days to complete such cases.
3. INTER-RELATED CASES - Firearms submitted for comparison to evidence in other cases will not be compared unless there is some demonstrable investigative link between the firearm and the evidence in the other case. If such a link is not present, firearms meeting the SLED guidelines for IBIS entry will be examined, test fired, and “entered” into the Integrated Ballistics Identification System (IBIS). Non-IBIS caliber firearms may be compared if a link is present. Non-IBIS caliber firearms will not be routinely compared if no link is present.
4. Routine inter-comparison of fired evidence specimens from different cases will not be conducted unless there is some demonstrable investigative link between the cases. If such a link is not present, fired specimens meeting the SLED guidelines for IBIS entry will be “entered” into the Integrated Ballistics Identification System (IBIS). Non-IBIS caliber fired specimens may be compared if a link is present. Non-IBIS caliber fired specimens will not be

## Firearms – Evidence Examination

- routinely compared if no link is present.
5. REVOLVERS - Fired cartridge cases found in and/or removed from the cylinder of a revolver or from the chamber of other types of firearms will not be routinely examined or compared microscopically.
  6. PROPERTY CRIME cases involving tool mark and/or fracture (physical comparison) requests will not be routinely accepted. Such cases with associated personal injury usually will be accepted. (See #2 below)
  7. TOOL MARKS/FRACTURE MATCH - Before any case involving a tool mark and/or fracture (physical comparison) request is accepted, there must be a suspect tool available that can be linked to a suspect via possession, latent prints, DNA, and/or demonstrable investigative information. If no such tool or link is available, the case will not be accepted.
  8. HUNTING/WILDLIFE related firearm cases will not be routinely accepted unless personal injury is involved.
  9. ANIMALS - Firearm cases involving crimes against animals will not be routinely accepted.
  10. SUICIDES - Firearm cases involving suicides, attempted suicides, or murder-suicides will not be routinely accepted.
  11. IBIS - Firearms submitted for IBIS entry only, which do not meet the guidelines for IBIS entry, normally will be returned without examination.
  12. Firearms and/or fired specimens submitted for IBIS entry must have been seized or collected in reference to a criminal act.
  13. Badly rusted, corroded, or non-functional firearms submitted for IBIS entry only, will not be restored to a functional condition for test firing unless this can be easily accomplished.
  14. Agencies having access to the Charleston County Sheriff's Office IBIS are encouraged to submit firearms and evidence for IBIS entry to that agency. SLED will continue to verify potential "hits" from their IBIS correlations.
  15. BB GUNS - Pellet guns, BB guns, and/or non-firearm replicas of firearms will not be routinely examined.
  16. EVIDENCE NOT REQUIRING EXAMINATION - Contributors should only submit evidence that requires examination. Extraneous items that do not require examination but are being submitted merely for the purpose of simplifying the chain of custody should not be submitted. Contributors also should strive to submit all of the evidence that requires examination at one time, if possible.
  17. RETURN OF EVIDENCE WITHOUT EXAM - Unexamined or partially examined firearm and/or tool mark evidence that is present in the Forensic Services Laboratory may be returned to the submitter if authorized by the Department Supervisor, unless the contributor has made contact with a forensic scientist and conveyed a vital need for examination.
  18. NON-STANDARD EXAMINATIONS - Cases with requests for any unusual or non-standard examinations such as ejection pattern testing or routine firearm function testing will not be routinely accepted. Please note that the Firearms Department does not conduct firearm traces and/or registration checks.

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19. DESTRUCTION CASES - Contributors submitting firearms, ammunition, and/or related items for destruction must contact a member of the Firearms Department to schedule a convenient time for submission of such items. The contributor also must follow the Firearms Department guidelines for submission of such items. These guidelines include, but are not limited to, the following:
- a. No more than fifty (25) firearms can be submitted at one time.
  - b. The firearms must be unloaded prior to submission to SLED. If a firearm is loaded or suspected to be loaded, the contributor must notify the Firearms Department prior to bringing the firearm into the Forensic Services Laboratory.
  - c. All of the firearms submitted should have “cleared” any legal proceedings, firearms traces, NCIC checks, etc. and are able to be destroyed. If firearms are submitted to SLED for destruction, you are assuring us that they are not subject to the Evidence Preservation Act of 2008 or any of the other above listed conditions and your agency is willing to assume sole liability and responsibility for their destruction.
  - d. The contributor must provide an accurate inventory of the firearms and items submitted, including the make, model, serial number, caliber, or a description of the item. There also must be a rapid way to link the items listed on the inventory list to the item itself. This can be done with alpha or numeric characters and labels or some other similar means placed on each item.
  - e. The contributor must be able to accompany the items for destruction to the Firearms Department during the evidence login procedure so that Firearms personnel can conduct an accurate inventory of the items before the contributor leaves. This applies mainly to large numbers of items that are not in sealed containers.
  - f. No explosive devices, chemical sprays, tear gas, or related items will be accepted.
20. OC SPRAY, TASERS, ETC. - The Firearms Department does not perform examinations on chemical spray containers, tasers, and similar devices.

## VI. CONTACT INFORMATION

Firearms telephone number - (803) 896-7399

## ***INTEGRATED BALLISTICS IDENTIFICATION SYSTEM (IBIS)***

### **I. CAPABILITIES AND SERVICES**

The Integrated Ballistics Identification System (IBIS), which operates on the National Integrated Ballistics Information Network (NIBIN), is provided to various state and local agencies by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (BATFE). The SLED IBIS is located in the Forensic Services Laboratory and is operated in conjunction with BATFE protocols.

- The IBIS is a searchable computerized national database of images of the microscopic markings found on test-fired bullets, test-fired cartridge cases, evidence bullets and evidence cartridge cases. The IBIS is a screening tool that provides *possible* links between fired specimens, therefore providing *possible* links between previously unconnected crimes.
- The IBIS does not identify or “match” fired specimens to each other. It provides *possible* links between specimens. If such a *possible* link is found, a qualified firearm forensic scientist must conduct microscopic comparisons of the evidence specimens in order to determine if the specimens were fired by a single firearm.

### **II. EVIDENCE COLLECTION, PACKAGING AND SUBMISSION PROCEDURES**

Always remember that safety is of primary importance and all firearms should be rendered safe before handling or transporting, if possible. If unsure about how to make a firearm safe, contact a qualified officer or Firearms Department personnel for assistance. The information in the Firearms Department section on Evidence Collection, Packaging, and Submission Procedures also applies for IBIS evidence submissions.

### **III. SPECIAL CONSIDERATIONS**

Occasionally there is some confusion regarding the Integrated Ballistics Identification System (IBIS) and requests for IBIS entry. Please note that all appropriate firearm test specimens and fired ammunition components are routinely and automatically entered into the IBIS database. The computerized system continually compares and screens the new entries in our regional database (North Carolina and South Carolina). SLED also has the capability to manually search any other IBIS region in the United States; however, you will need to provide a demonstrable investigative lead to justify the request.

Please note that not all firearms related evidence is entered into the SLED IBIS database. We limit what we enter based on BATFE protocols and the calibers

## Firearms – IBIS

commonly used in our region. Below are examples of the guidelines that we follow when evaluating the suitability of a specimen for IBIS entry.

### **SPECIMENS ENTERED INTO THE IBIS (BY CALIBER):**

#### **Cartridge Cases Only**

- 25 Auto
- 32 Auto
- 380 Auto
- 9mm Makarov
- 9mm Luger
- 357 Sig
- 40 S&W
- 10mm Auto
- 45 Auto
- 223 Remington
- 5.56mm NATO
- 30 Carbine
- 7.62x39mm Soviet

### **SPECIMENS NOT ENTERED INTO THE IBIS:**

- Bullets of any caliber
- Revolver cartridge cases
- Rimfire cartridge cases
- Badly damaged, poorly marked, unsuitable cartridge cases
- Shotgun shells
- Police firearms (unless they have been used in a crime)

If you have further questions about the SLED IBIS, please contact the Firearms Department at (803) 896-7399.

### **TWO YEAR RULE**

The SLED Firearms Department requests that any evidence (including firearms) that has been entered into the IBIS database, be retained by the submitting agency for a period of not less than two years from the date it was returned to your agency.

### **WHY?**

Two (2) years allows time for other agencies to submit their evidence and also for backlogged cases to be worked and entered into the IBIS database. If, at a later time, a high confidence correlation is found and evidence has been disposed of or destroyed, there may not be a way to confirm the link between the cases. Therefore, it is crucial to retain the evidence for at least two years from the date indicated on the IBIS label or from the date the evidence was returned to your agency.

**RELEASE/DESTRUCTION OF ITEMS ENTERED IN IBIS:**

If you decide to dispose of a firearm (return to owner, destroy, sell, trade for police equipment, etc.) or destroy fired bullets and/or fired cartridge cases that have been entered into the IBIS database, it is imperative that you contact the Firearms Department with this information. We need to update the database to show that the firearm has been released from police custody and is back in circulation (potentially committing new crimes) or mark it as destroyed.

**IV. REPORT INTERPRETATION**

**EVIDENCE SUITABLE FOR IBIS ENTRY:**

When firearms evidence is submitted and the examinations have been completed, the assigned forensic scientist/forensic technician will normally issue a formal report/letter containing information regarding the results of the firearms examinations and any related IBIS entry. The following is an example of an IBIS statement found in formal reports/letters:

*“A test fired cartridge case from the Item 4 pistol was entered into the Integrated Ballistics Identification System (IBIS). Should any “hits” be developed against this entry, you will be notified. Please retain Item 4 for a minimum of two years in order to maintain its availability for any future comparisons related to IBIS activity.”*

Generally, this paragraph means that the evidence item(s) met the basic criteria for IBIS entry and it was entered into the IBIS database. Also, the evidence should be retained by the submitting agency for a minimum of two years from the date it is returned to the agency or two years from the date indicated on the IBIS label which was placed on the evidence container. While you will be notified in a formal report that the item was entered into IBIS, you will not be notified of database search results unless a high confidence correlation is found.

**EVIDENCE NOT SUITABLE FOR IBIS ENTRY:**

If the evidence specimen (cartridge case and/or firearm) is the wrong caliber or if it is poorly marked, unsuitable for identification purposes, or if the firearm marks test specimens poorly, IBIS entry will not be performed. The following is an example of an IBIS statement that would be found in the formal report:

*“Item 4 was not entered into the Integrated Ballistics Identification System (IBIS) as it did not meet the current SLED criteria for entry.” Or “Item 4 was unsuitable for IBIS entry.”*

**TYPES OF COMMUNICATION FROM SLED OR ISSUANCE OF REPORT(S) AND OTHER COMMUNICATION FROM SLED**

1. Normally, a formal report or letter will be issued and posted on iLAB when the initial examinations have been completed. The IBIS continually and automatically searches against all new entries on a daily basis, and normally we will not be in contact with you (other than the original formal report) unless a high confidence correlation is found.
2. If a high confidence correlation is found, and if necessary, the submitting agency will be notified to resubmit the evidence for microscopic comparison to verify or negate the *possible* link.
3. Another formal report (supplemental) will normally be issued detailing the results of such microscopic comparisons.

**V. CONTACT INFORMATION**

Firearms telephone number - (803) 896-7399

## **LATENT PRINT/CRIME SCENE DEPARTMENT**

### ***AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM (AFIS)***

#### **I. CAPABILITIES AND SERVICES**

The Latent Print/Crime Scene Department utilizes AFIS technology. Latent fingerprints and palm prints collected from crime scenes are searched against the South Carolina criminal database, which also includes police officer application cards. An AFIS search may be conducted on suitable latent prints submitted to the Latent Print/Crime Scene Department once all other possible contributors have been eliminated. The Latent Print/Crime Scene Department also has the capability to search the FBI's Integrated Automated Fingerprint Identification System (IAFIS).

#### **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

Latent lifts obtained from crime scenes may be submitted to the Latent Print/Crime Scene Department for AFIS search. Latent evidence should be properly labeled to include the location lifted, date lifted, and the person who collected the evidence. Package the latent evidence in a sealed envelope and submit for examination. The AFIS operator will evaluate each latent to determine the suitability for AFIS entry. Latent prints of sufficient quality will be photographed and returned to the contributor as soon as possible. If latent lifts are not available, natural size (1:1) photographs of the latents may be substituted.

#### **III. SPECIAL CONSIDERATIONS**

If an agency has a ten-print card of an individual and the only concern is establishing and/or confirming the individual's identity, submit the ten-print card to SLED Crime Information Center for a ten-print search. The SLED Crime Information Center can be reached at 803-896-7005 or 803-896-7165.

#### **IV. REPORT INTERPRETATION**

In most instances, results from an AFIS request will be reported in one of the following formats:

- AFIS Suitable  
“No identifications were effected after the above items designated as AFIS Suitable were searched on the South Carolina Automated Fingerprint Identification System (SCAFIS) and/or the Integrated Automated



## Latent Print/Crime Scene – AFIS

Fingerprint Identification System (IAFIS). These items did not meet the criteria for storage in the unsolved latent file for continuous search against the database. You may request that these latents be re-searched at any time.”

- Using the AFIS suitable result indicates all suitable latents in a particular case were entered into the system and searched against the database without a person being identified. The contributor is encouraged to submit known fingerprints if suspects are developed during the course of the investigation.
  
- AFIS Suitable/Storage

**“No identifications were effected after the above items designated as AFIS Suitable/Storage were searched on the South Carolina Automated Fingerprint Identification System (SCAFIS) and/or the Integrated Automated Fingerprint Identification System (IAFIS). These items were stored in the unsolved latent file for continuous search. Your agency shall be notified of any identification that results from the continuous search.”**
- Unidentified latents may be stored in the unsolved latent file for continuous search against new fingerprint records entering the database. If a latent print is determined to be identified as a result of the unsolved latent file search, a comparison will be completed by a forensic scientist.
- If the submitting agency identifies a suspect to a latent which has been previously entered into AFIS, that agency should notify this department so the latent entry can be purged from the system.
  
- AFIS Not Suitable

”The above items designated as AFIS Not Suitable did not meet the criteria for search on the South Carolina Automated Fingerprint Identification System (SCAFIS) and/or the Integrated Automated Fingerprint Identification System (IAFIS).”
- Using the AFIS not suitable result indicates the latents do not meet the criteria for AFIS entry but may be suitable for further comparison. The contributor is encouraged to submit known fingerprints if suspects are developed during the course of the investigation.

## V. CONTACT INFORMATION

Latent Print/Crime Scene telephone number (803) 896-7299

## ***EVIDENCE EXAMINATION – Fingerprint Evidence***

### **I. CAPABILITIES AND SERVICES**

The Latent Print/Crime Scene Department utilizes various approved techniques for the development and enhancement of latent fingerprints on submitted physical evidence collected from crime scenes. Latent fingerprints are then compared to the inked prints of suspects, as well as to any other individuals who may have had legitimate access to the evidence (elimination). The Latent Print/Crime Scene Department may also attempt to identify unknown deceased persons through fingerprints.

### **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

#### ***Evidence Collection and Packaging***

- Exhibits submitted should be initialed and dated when practical. Do not place any markings in a location that could jeopardize potential fingerprint evidence. If insufficient space exists for these markings, the packaging should be properly marked.
- Porous items (i.e., wood, paper, cardboard, etc.) should be placed in a bag or envelope and sealed.
- Non-porous items (i.e. guns, knives, glassware, cans, etc.) should be packaged in a container that prevents the suspected area from contacting other surfaces. Proper packaging will prevent the print residue from being disturbed or obliterated by contact with these surfaces.
- It is recommended that prior processing of evidence to be submitted to the department not be conducted. If prior processing is conducted, the submitter should include the processing information with the submission documentation.
- In most instances, if other examinations (i.e., biological or trace evidence) are to be performed on the same item of evidence, latent print processing should be conducted only after these other examinations have been completed. The Latent Print/Crime Scene Department will conduct these examinations as part of their evidence examination. If visible prints are present in blood, grease, etc., the Latent Print/Crime Scene Department should be consulted prior to submitting to the laboratory. Photographing these visible prints prior to packaging or transport is recommended.
- When submitting latent prints for comparison, available suspect and elimination fingerprints should be submitted. Photocopies of inked fingerprints should only be submitted as a last resort and must be certified as true copies. Facsimile copies of inked prints are not acceptable. If inked fingerprints are unavailable to the submitting agency, biographical

## Latent Print/Crime Scene – Evidence Examination

information (i.e., name, date of birth, Social Security Number, SID number, etc.) should be provided.

- Latent prints developed at crime scenes will often include areas of the palms, second and third joints of the fingers, and the finger sides and tips. The investigator should obtain complete inked finger and palm prints (major case prints) of all persons of interest for comparison. Palm prints should always include the lower finger joints.
- In order to identify a deceased person, inked post mortem major case prints must be submitted for comparison. If applicable, barefoot impressions may also be necessary. If legible prints cannot be obtained, the hands, fingers or available skin from the fingers of a decedent may be submitted, upon permission of the Coroner of jurisdiction, to the department for possible identification. Human remains submitted to the department will be returned to the submitting agency upon completion of the examination.
- If submitting fingers only, each finger should be placed in an individual container and properly labeled. The department can be contacted for packaging recommendations if necessary.

### *Evidence Submission Procedures*

- Latent print examinations will be conducted with known fingerprints available to the examiner. Subjects will be checked for known standards on file with the SLED Crime Information Center and the FBI if the required personal information (DOB, SSN, SID#, and FBI#) is provided.
- For cases with a known or developed subject in which a large volume of latent prints exist, the examiner may cease examination of the latent prints once the subject is identified. In such cases, the laboratory report will indicate that latent print evidence in the case was not analyzed. The submitting agency shall be consulted prior to the issuance of the report. For such cases, the unexamined latent print evidence may be resubmitted at a later date if additional examination is necessary.
- All latent print cases submitted for an automated fingerprint search should include elimination prints of individuals who may have legitimate access to the evidence.
- Evidence being submitted for latent print processing that contains a suspected controlled substance should have the controlled substance removed prior to submission to the Latent Print/Crime Scene Department for analysis. Evidence Control must be notified upon submission if this cannot be accomplished.

### **III. SPECIAL CONSIDERATIONS**

- Evidence requiring latent print examination should be handled as little as possible.

## Latent Print/Crime Scene – Evidence Examination

- Gloves should be worn when handling items requiring latent print examination.
- Secure large items bearing latent prints to a rigid surface to prevent shifting and contact with other items.
- Latent lifts should be submitted in a sealed envelope.
- Known fingerprint standards should be treated as evidence when submitted to the laboratory.
- Do not wrap non-porous items in paper, cloth, or plastic wrap.
- Do not cover items to be examined for latent prints with evidence tape.
- Do not cover any developed latent prints with lifting tape or other clear tape.
- The use of a formaldehyde solution in storing severed hands that will be submitted to the laboratory may be detrimental to obtaining known fingerprint standards. It is recommended that the Latent Print/Crime Scene Department be consulted prior to collecting and submitting severed hands to the laboratory.

### **IV. REPORT INTERPRETATION**

- Positive identifications will be reported as “IDENTIFIED with Item #/name”.
- Eliminations will be reported as “NOT IDENTIFIED with Item #/name”.
- If the known prints are of insufficient quality for comparison, the result will be reported as “NO CONCLUSION will be rendered due to the quality of Item #/name”. Additional inked prints will need to be submitted.
- If no latent prints of value for identification are developed, the report will state “NO VALUE for identification” which means ridge detail was developed that was not suitable for comparison.
- If an item of evidence is processed and no fingerprint evidence was developed, the result will be reported as “No fingerprint evidence was developed.”
- Evidence may be processed for latent prints by a department employee that is not a fingerprint examiner. When such an examiner develops fingerprint evidence on an item of evidence, the following result will be used: “Possible fingerprint evidence was developed. Additional results may be provided in Supplemental Reports.”
- Latent prints determined to be from the palm of the hand will be reported as “PARTIAL PALM PRINT”. Inked palm prints will need to be submitted for further examination and comparison.

### **V. CONTACT INFORMATION**

Latent Print/Crime Scene telephone number - (803) 896-7299

## ***EVIDENCE EXAMINATION - Footwear/Tire Tread Evidence***

### **I. CAPABILITIES AND SERVICES**

The Latent Print/Crime Scene Department conducts examinations and comparisons of footwear and tire tread evidence. Identification of impressions made by a particular shoe or tire is based upon the correspondence of discernible individual characteristics (i.e., accidental or deliberate markings on the tread surface) sufficient in number and/or uniqueness to rule out coincidence. If insufficient characteristics are present, it will not be possible to make a positive identification.

The presence of corresponding class characteristics (i.e., basic outsole design, tread design, overall physical dimensions, etc.) may permit the conclusion that an impression could have been made by a particular shoe or tire. However, in these cases, the stipulation must be made that the impression could also have been made by any other shoe or tire possessing the same class characteristics. It should be noted that the size of questioned impression outsole does not necessarily correlate to the “shoe size”.

### **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

#### ***Evidence Collection and Packaging***

The Latent Print/Crime Scene Department will conduct examinations of footwear and tire tread impressions from photographs, gel lifts and casts.

All questioned footwear and tire tread impressions should be photographed with and without a scale. A flash should be used to provide oblique lighting when photographing three-dimensional impression evidence. The camera should be positioned at 90 degrees with the impression. Failure to do this will not allow for a 1 to 1 reproduction of the image and may limit the examiner’s ability to conduct an examination.

Shoes obtained by submitting agencies that need examination to unknown impressions should be submitted as soon as possible, preferably with the initial submission of the questioned impressions. Do not attempt to remove any debris from the shoe outsole but rather submit the shoes in the same condition as when they were acquired. If known shoes are not available at the time of the initial submission, it is imperative they be submitted as soon as they are secured. The longer a person wears the shoes after making the questioned impression(s), the more difficult it may be to associate the shoes with the impression(s).

Do not prepare test impressions of the known shoes in lieu of submitting the shoes. Examiners benefit from having the actual shoes and prefer to prepare their own test impressions.

If the agency has secured a vehicle of interest in the investigation for the purposes of a tire tread examination, secure the vehicle and contact the department. The case agent or on call crime scene agent will coordinate the collection of known tire standards. Submitting tires to the laboratory prior to obtaining proper test impressions may limit the examiner's ability to conduct an examination. Department personnel are trained and willing to assist with the creation of known tire standards.

### ***Evidence Submission Procedures***

All footwear and tire standards should be submitted with the original evidence submitted for comparison.

## **III. SPECIAL CONSIDERATIONS**

If known shoes or tires are not available for comparison purposes, consider retaining the questioned impressions until standards become available. If assistance is needed with attempting to identify the manufacturer of a shoe or tire represented in the questioned impression the Latent Print/Crime Scene Department should be contacted prior to submission of the evidence to the laboratory.

## **IV. REPORT INTERPRETATION**

- Positive identifications will be reported as "...identified with the Item #/shoe (tire)". This result means that the listed shoe (tire) is the source of the questioned impression to the exclusion of all other sources.
- Eliminations will be reported as "...not identified with the Item #/shoe (tire)". This result means that the listed shoe (tire) is not the source of the questioned impression.
- At other times, an association between the questioned impression(s) and known shoe (tire) may be determined, although this association will fall short of the positive identification. Results in these cases will state that the questioned impression corresponds in combined class characteristics, with further possible correspondence of wear and/or random characteristics, with the known shoe (tire). While this association may be significant, it does allow the possibility that another shoe (tire) may be the actual source, assuming it would exhibit the same correspondence in combined class characteristics, as well as wear and/or random characteristics, as applicable.
- Occasionally the quality of the questioned impression is insufficient for conducting a meaningful comparison. In these cases, the report will state that "No conclusion will be rendered due to the quality of Item #."
- If a questioned impression is submitted and known shoes (tires) are not available for comparison, the report will simply state a result of "Partial footwear (tire tread) impression. Please submit known shoes (tires) for further examination."

## Latent Print/Crime Scene – Evidence Examination

- If a questioned impression is submitted with no scale present, this may limit the result that can be reported. In these cases the report will state “...Due to the absence of a scale, no further conclusion can be rendered.”

### **V. CONTACT INFORMATION**

Latent Print/Crime Scene telephone number - (803) 896-7299

## ***EVIDENCE EXAMINATION – Bloodstain Pattern Analysis/Crime Scene Reconstruction***

### **I. CAPABILITIES AND SERVICES**

The Latent Print/Crime Scene Department provides bloodstain pattern analysis and crime scene reconstruction services when requested. It is recommended that the department supervisor be contacted prior to submission of such cases to the laboratory in order to ensure that necessary documentation and evidence is submitted for examination. Requests for crime scene assistance related to bloodstain evidence should be made through SLED Operations.

### **II. CONTACT INFORMATION**

Latent Print/Crime Scene telephone number - (803) 896-7299

## ***PHOTOGRAPHY***

Photographic documentation of all phases of evidence collection, handling, and analysis in support of SLED investigations is provided. These services are used to document the original condition of certain types of evidence (i.e. latent prints, questioned documents) as well as develop other types of evidence (i.e. impression evidence).

### **I. CAPABILITIES AND SERVICES**

Photographic assistance is provided to federal, state, and local law enforcement agencies. Examples of these services include:

1. Photography of evidential items submitted to the Forensic Services Laboratory
2. Specialized photographic procedures (i.e. alternate light sources and specialized lighting)
3. Aerial photography

### **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

#### A. SUBMISSION OF EVIDENCE

1. Items to be photographed must be submitted as evidence through the Evidence Control Department.

#### B. RESTRICTIONS

1. Processing and printing of film is limited to SLED Investigations.
2. Requests for specialized photographic services should be discussed with laboratory personnel prior to evidence submission.

### **III. CONTACT INFORMATION**

Photography telephone number - (803) 896-7295



## QUESTIONED DOCUMENT DEPARTMENT

A document is defined as anything upon which a mark is made for the purpose of conveying a message. The examination of questioned documents consists of the analysis and comparison of documentary evidence such as handwriting with known material in order to establish the authenticity of the contested material as well as the detection of alterations.

The Questioned Document Department has a wide array of equipment including cameras, microscopes, a Video Spectral Comparator (VSC-ink differentiation), and an Electrostatic Detection Apparatus (ESDA- indented writing detection). This department's examinations are multifaceted; incorporating microscopic examinations with instrumental analyses designed specifically for forensic document problems. Many types of examinations are necessary in order to resolve cases involving forgeries, election fraud, bank robbery notes, suicides, and threats to public officials.

### I. CAPABILITIES AND SERVICES

The Questioned Document Department conducts scientific examinations on evidence requiring a determination of authorship and authenticity. The following are examinations provided by the Questioned Document Department:

1. Identification and comparison of handwriting, hand printing, typewriting, check writers, rubber stamps, and various printing and duplicating processes
2. Identification and comparison of inks and paper
3. Detection of alterations and obliterations
4. Restoration of charred, water soaked, and shredded documents
5. Decipherment of indented writing on documents
6. Detection of obliterations or forgery of lottery tickets

### II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES

#### A. COLLECTION AND PRESERVATION OF EVIDENCE

1. All documents should be handled so that their condition, when acquired by the investigator, will be preserved. Generally speaking, documents should be placed in protective transparent folders. They should not be taped, folded, stapled, or creased, and should be handled as little as possible. If torn or mutilated, documents should be submitted in that condition with proper precautions to prevent further damage. Charred paper should be carefully packed in cotton or similar material and transported personally to the laboratory.

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2. In all cases, it is imperative that original documents be submitted for examination, if they are still in existence. Each standard should be marked for identification by the investigator.
3. If, in addition to a document examination, a latent fingerprint examination is desired, this information should be noted on the Forensic Services Request form. It is necessary to perform the document examination before conducting the chemical processing associated with the restoration of latent impressions, which may cause inks to bleed or feather.
4. Conclusions reached by the examiner are based solely upon examination of the documents involved; however, any information which may be of assistance in conducting the examination should be stated. Examples might be the abnormal physical or mental condition of the person who executed the writing, any unusual conditions, under which the document was allegedly produced, or the fact that a typewriter was recently repaired, etc.

### B. OBTAINING STANDARDS OF HANDWRITING FOR COMPARISON

1. The writing of every person will contain a certain range of variation, with some people having little variation and others a considerable range. Many factors cause individuals to vary their handwriting, but one of the most common causes of variation is intentional disguise. It is advisable to obtain some normal course of business writing of the suspect. Forms are available from the Questioned Document Department to facilitate collection of standards.

“Collected” writings are those executed during the normal course of business or social activities when the writer has no knowledge that they would later be used as standards. Obtain some collected writing even though it may also be possible to obtain standards written on request. Possible sources of “collected” handwriting may be:

- Affidavits
- Bank deposit slips
- Business license applications
- Credit Cards
- Driver’s licenses and titles
- Letters
- Utility company applications
- Passports
- Mail return receipts
- Rental or equipment contracts
- School and college papers
- Social security cards/papers
- Traffic tickets
- Voter registration cards

It is the responsibility of the submitting officer to authenticate suspects’ collected standards received from a business, school or social environment. Collected standards are accepted by the examiner as known

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writing of a particular writer. If at any point, it is revealed that one or more standards cannot be authenticated, the conclusion based on those standards becomes null and an examination must be conducted on the remaining evidence.

2. "Requested" writings are those executed at the request of the investigator. It is desirable to obtain standards produced by both the right and left hands of the subject. In all cases, indicate whether the subject normally writes with the right hand or the left hand.
3. It is imperative that a number of standards be submitted in order that the writing habits of the individual may be determined. In view of the fact that a person's writing varies under different conditions, these basic rules should be followed when obtaining handwriting standards:
  - Dictate all material. Do not let the subject see or copy the questioned writing.
  - Duplicate the writing conditions as closely as possible.
  - Duplicate the writing instrument and the space available for writing. If questioned writing was hand printed, request hand printing. If ruled paper was used, use ruled paper to obtain the writing standards.
  - Duplicate the text of the questioned writing as closely as possible.
  - Do not offer help in spelling.
  - Obtain an adequate quantity of standards (approximately 25).
4. Failure to obtain proper and adequate known standards for comparison with the questioned writing often results in a "qualified" or "inconclusive" opinion.
5. Obtaining "requested standards" of handwriting:
  - QUESTIONED** - handwriting on face of check
  - STANDARDS** - 25 blank checks of same size completed by suspect, using same text.
  - QUESTIONED** - endorsement on check
  - STANDARDS** - same signature (and address) written on back of 25 blank checks or separate slips of paper comparable in width.
  - QUESTIONED** - extended writing i.e., obscene letter, holdup notes, etc.
  - STANDARDS** - same signature or notation written 25 times on separate slips of paper (lined or unlined as the case may be). Writing should be confined in approximately the same area.

### C. OBTAINING STANDARDS OF COMPARISON FOR TYPEWRITING

Submit the suspect machine to the laboratory. If this is not possible, remove the ribbon and correcting tapes from the suspect machine for submission before taking any standards. Use a clean sheet of unlined paper and a new ribbon. Start typing on the machine using the same margins or spacing and reproduce the questioned text. Type text four to six times and place the make, model, and serial number of the typewriter being used on each sheet of paper. If typewriting standards of the machine in question are not available, original business correspondence or other materials produced on the machine at the

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same approximate time as the questioned material may afford satisfactory standards for comparison.

Make two standards of the entire keyboard on separate sheets of paper using double spacing. First type the lower case and then the upper case letters.

### D. GENERAL RULES FOR OBTAINING STANDARDS

1. Do not allow the subject to copy from the document in question. Dictate the words and/or phrases the subject should write.
2. Provide the subject with blank forms. Obtain standards from the subject in the same format as the questioned document.  
For example: blank checks or check forms if the allegation is a check forgery—blank gas slips for a forged gas ticket—blank sales invoice for a sales slip forgery, etc. Attempt to duplicate the form and conditions as much as possible.
3. Do not spell or give instructions on punctuation, arrangement, etc.
4. Obtain full text of questioned writing word for word including the endorsement, if questioned.
5. If the questioned document is handwritten, have the subject write; if printed, have the subject print. The examiner cannot compare handwriting to hand printing.
6. Observe the writer and note the form of the questioned document. You may have to request that the subject write; larger or smaller, with left or right slant, faster or slower. Remember the writer should duplicate the conditions as much as possible, preparing 25 standards for checks and 4-7 standards for extended writing such as a letter.
7. In forgery cases, the laboratory should be furnished with genuine signatures from the person whose name is forged.
8. The original questioned document should be obtained for examination.
9. If available, standards of non-dictated writing (collected) should be obtained for comparison (applications for employment, social or business correspondence, school papers, etc.).
10. The writer and investigator should initial and date each standard.
11. When obtaining typewriter standards, type exact questioned material using light, average, and heavy strikes if the typewriter is manual.
12. The typed material should be duplicated six to eight times.
13. If the ribbon is carbon, carefully remove it and submit it to the laboratory in person.
14. If the typewriter is dirty, broken, or has an accumulation of ink, do not allow the machine to be cleaned until after the complete forensic scientist's report has been received.
15. The machine name, model number, serial number, and type element and ribbon should be sent along with the questioned exhibit.
16. Standards from check writers should be on the same paper stock with approximately eight to ten standards taken.
17. Rubber stamps, pads, and sets should be sent along with the questioned exhibit. Do not disassemble or clean a stamp set.

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### E. SUMMARY

The ideal standards are those containing exact wording of the questioned material written by the suspect from dictation. The standards should be written on the same type of form with the same type of writing instrument, and confined to the same space as the questioned writing.

Additionally, standards of the victim's writing (10-15 canceled checks in check cases) as well as collected writing of the subject should be furnished along with the original of the questioned item.

The Questioned Document Department is also available to provide training programs to officers regarding the benefits of questioned document examinations, as well as the recommended methods for the collection and preservation of standards and evidence.

If results are needed immediately, please notify the examiner when the case is submitted and every effort will be made to expedite the case.

### **III. SPECIAL CONSIDERATIONS**

The results of examinations are dependant upon the quality of writing standards submitted for comparison and the discernment of the questioned writing(s).

### **IV. REPORT INTERPRETATION**

There are ten categories of results given by the Questioned Document Department.

1. **IDENTIFICATION** (identified, wrote) – An unqualified conclusion. The agreement between the significant features of the questioned and known material is such that the examiner is absolutely certain that both have been prepared by the same writer.
2. **STRONG PROBABILITY** - A qualified conclusion. Based on the evidence examined, there is significant agreement between the questioned and known material, however; some critical feature is missing so that an identification is not in order. The examiner is virtually certain, yet not absolutely certain, that the questioned and known material were written by the same writer.
3. **PROBABLE** (probably) – A qualified conclusion. Based on the evidence examined, there is agreement between the questioned and known material, however; some critical features are missing so that an identification is not in order. This conclusion falls short of the “virtually certain” degree of confidence.
4. **INDICATIONS** – A qualified conclusion. Based on the evidence examined, there is some agreement between the questioned and known material, however; the agreement of the features falls short of an identification.

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5. NO CONCLUSION (can neither be identified nor eliminated) – The examiner was unable to locate adequate significant features pointing toward or away from the writer under consideration, and could not reach any conclusion regarding authorship of the questioned writings. The examiner is stating, “I don’t know.”
6. INDICATIONS DID NOT - A qualified conclusion. Based on the evidence examined, there are some significant dissimilarities between the features of the questioned and known material. The possibility that both were prepared by the same writer is considered very unlikely.
7. PROBABLY DID NOT (probable did not) – A qualified conclusion. Based on the evidence examined, there are many significant dissimilarities between the features of the questioned and known material. The possibility that both were prepared by the same writer is considered very unlikely.
8. STRONG PROBABILITY DID NOT - A qualified conclusion. Based on the evidence examined, the significant dissimilarities between the features of the questioned and known material are such that the examiner is virtually certain the writer of the known material did not prepare the questioned writing. The possibility that both were prepared by the same writer is considered extremely remote.
9. ELIMINATION (eliminated, did not write) - An unqualified conclusion. Based on the evidence examined, the significant dissimilarities between the features of the questioned and known material are to the extent that the examiner can reach absolute certainty that both have been prepared by different writers.
10. SIMULATION (simulated) – A qualified conclusion. Based on the evidence examined, the writing bears characteristics of a pictorial drawing or imitation made from a model or memory of the genuine signature of another writer.

## V. CONTACT INFORMATION

Questioned document telephone number - (803) 896-7298

## TOXICOLOGY DEPARTMENT

### I. CAPABILITIES AND SERVICES

The Toxicology Department is responsible for the analysis of biological fluids and tissues for the presence or absence of alcohol, drugs, and poisons. The department has a wide array of instrumentation including: Gas Chromatography/Mass Spectrometry (GC/MS), Liquid Chromatography/Tandem Mass Spectrometry (LC-MS/MS), Headspace Gas Chromatography, Headspace Gas Chromatography/Mass Spectrometry, and Enzyme Linked Immunosorbent Assay (ELISA). Additionally, the toxicologists interpret their findings in respect to impairment or toxicity of the compounds detected.

The department primarily handles postmortem and driving under the influence (DUI) investigations. In addition, the department also handles criminal sexual conduct cases, weapons of mass destruction cases, moonshine cases, investigations into potential poisonings and provides emergency analytical services in life or death situations. Rapid preliminary analysis is provided in cases involving child fatalities or officer involved shootings.

Typical toxicological analysis is based on case type and may include:

1. Analysis for volatiles (i.e. ethanol, methanol, acetone, isopropanol, difluoroethane, tetrafluoroethane, isoflurane and toluene)
2. Preliminary drug screen
  - a. Amphetamine
  - b. Methamphetamine
  - c. Benzodiazepines
  - d. Cocaine metabolite
  - e. Methadone
  - f. Tramadol
  - g. Zolpidem
  - h. Opiates
  - i. Oxycodone
  - j. Carisoprodol
  - k. Marijuana metabolite (only in cases where impairment is important)
  - l. Buprenorphine (only in urine)
3. General drug screen by GC/MS
4. General drug screen by LC-MS/MS
5. Confirmations and quantitations of present compounds where appropriate

## Toxicology

### Toxicology Department Summary – Capabilities and Services

1. Analysis of blood, urine, other biological fluids and tissues for:
  - Ethanol and other volatiles
  - Drugs – drugs of abuse and other clinically significant drugs
  - Poisons (i.e. carbon monoxide, arsenic, strychnine, cyanide, pesticides and herbicides)
2. Analysis of liquids (i.e. moonshine) for ethanol and other volatiles
3. Consultation and technical assistance in suspected or known poisoning cases.
4. Consultation with coroners, pathologists, investigators or attorneys concerning the results of analysis and interpretation of the toxicological significance of those findings.
5. Expert court testimony in cases providing results of analysis and interpretation of the toxicological significance of those findings.

## **II. EVIDENCE COLLECTION, PACKAGING AND SUBMISSION PROCEDURES**

### A. Suggested Collection and Submission of Samples for Death Investigation:

#### 1. Choice of Containers

- a) It is recommended that specimens be placed in containers which most closely fit the mass/volume of the specimen. For example, the small volumes of vitreous humor should be placed in pediatric vacutainers.
- b) Physiological fluids should be submitted in standard, non-expired vacutainers. Solid tissues should be placed in separate polypropylene type containers. The polypropylene type containers should be designed for biological sample storage and be leak proof in design. Please consult the SLED Toxicology personnel should there be any questions regarding specimen submission.

#### 2. Choice of Specimen

- a) Blood:
  - Whole blood – at least 7 mL in a gray top vacutainer. Please note that whole blood is preferred over plasma or serum for certain tests. It is requested in death investigation cases that multiple tubes be submitted to ensure sufficient sample with the preferred blood source being peripheral blood.



## Toxicology

- Serum – if possible, 7 mL in a gray top vacutainer. Serum tubes that are submitted wrapped in parafilm often leak. It is requested that if the container is not leak proof, that the liquid sample be transferred to a suitable sealed vacutainer.
- Plasma – 7 mL in a gray top vacutainer.

**NOTE:** Other types of vacutainers are accepted but the anti-coagulant and preservative in the gray top vacutainer make it the container of choice.

- b) Urine: The entire volume of urine present should be submitted in a leak resistant polyethylene type bottle and closed with a screw cap. Desired minimum sample volume is 20 mL.
- c) Ocular Fluid: Vitreous humor should be submitted in a leak proof tube. Pediatric sized tubes are recommended with a minimum sample volume of 1 mL.
- d) Bile: Bile may also be submitted in a leak proof tube.
- e) Gastric or Duodenal Lavage – Fluid Contents: Mix fluids well; transfer approximately 30 mL into a leak resistant polyethylene type bottle with a screw cap.
- f) Surgical/Post Mortem Specimens of Organ Tissues: Place each specimen type into a separate polypropylene type bottle. Optimal amounts are approximately 30 g of specimen. Transport specimens frozen if possible.
- g) Fixed or embalmed specimens: Place each specimen (no more than 30 g) into separate polypropylene containers. Place approximately 5 mL of fixative or embalming fluid into a separate polypropylene container.
- h) Decomposed Specimens: When possible, ship specimens frozen in polyethylene type containers. Maggots and insect casings may also be submitted for qualitative analysis.

**NOTE:** Urine blood collection kits are available through the SLED Evidence Control Department. These kits include two gray top vacutainers for blood submissions and a polypropylene bottle for urine submission. These kits may be returned to SLED by hand delivery or through mail services. Urine/Blood collection forms are available for download at any state breath testing facility from the Datamaster BAC station.

## Toxicology

- i) Medications/Drugs: In the event that drugs or medications are found on the scene of a death investigation and are not involved in a possession case, these substances may be submitted to the Toxicology Department along with biological specimens as supporting history.
- j) Bloody/Used Syringes: Syringes containing blood will not be accepted unless the needle is removed or the syringe is packaged in an appropriate, puncture resistant container. Given the small sample volume in a used syringe, if the identity of the contents is known, this should be provided upon submission. Syringes will only be analyzed to assist in attempting to ascertain the presence of drugs/poisons in biological specimens for death investigation studies.

### 3. Specimen Preservation

- a) Fluids should remain refrigerated or frozen until transported to SLED. Wherever possible, do not transport samples in a non-climate controlled vehicle or in an excessively hot vehicle trunk space. If possible, transport in an ice chest.
- b) Tissues should be frozen, if possible, prior to receipt by the SLED Evidence Control Department.

### 4. Processing of Specimens

- a) Accessioning: No specimen will be analyzed without a completed SLED Forensic Services Request Form or iLAB equivalent pre-logged submission. These forms are available through the Evidence Control Department at the Forensic Services Laboratory or are available online. Complete information should include: Subject/victim's name, date of birth, manner of death, preliminary autopsy results if known, date and time of specimen withdrawal (can be marked on the container), additional case history that may be helpful in determining time frames or pertinent clinical observations, and hospital lab findings. **Indicate names of all suspected drugs, poisons or compounds if known or suspected** in the appropriate area on the Forensic Services Request Form. Be as specific as possible. This is essential in order to provide a thorough investigation of the case submitted.

**NOTE:** Additional information obtained after sample submission that is revealed to the coroner, pathologist, or investigator should also be supplied to SLED Toxicology personnel. This information may be critical to the analytical

## Toxicology

approach taken as well as to the final Toxicology report and its interpretation.

- b) Chain of Custody: Each specimen container must be labeled with the specimen type and the subject's name. In the case of the blood specimen, the location from which the blood was drawn is needed (e.g. heart, aorta, iliac vein). Multiple subjects may be submitted simultaneously only if the containers/documents clearly indicate each name. Additional toxicological evidence submitted at a later date should be identified as such to ensure that all evidence is routed to the proper analyst and identified under the proper case number.

### 5. Unusual Specimens

Occasionally, the circumstances surrounding a death (e.g. fire, advanced decomposition, embalmed/exhumed body) may preclude submission of routine physiological specimens. Please remember that in these instances, it may not be possible to provide comprehensive toxicological analysis. Quantitation of an analyte may not be possible, therefore only qualitative information may be reported.

Unusual requests outside the normal scope of an investigation should first be directed to the Toxicology Department Supervisor prior to sample submission.

### B. Specific Case Types for Death Investigation

#### 1. Traffic Fatality

If an individual meets the following criteria they should be designated as a traffic fatality victim on the Forensic Services Request Form:

- a) dies as a result of a traffic accident within 4 hours of the accident
- b) is at least 16 years of age and
- c) is a driver, passenger, pedestrian, motorcyclist, bicyclist, or boat occupant,

At a minimum, blood and ocular fluid samples are requested.

#### 2. Child Fatality

If a child under the age of 18 dies:

- a) as the result of violence, neglect or any suspicious or unusual manner or
- b) when the death is unexpected and unexplained including, but not limited to, possible SIDS, an autopsy will be performed with toxicology analysis requested.

## Toxicology

The preliminary Toxicology results should be complete within 48 hours after submission. The suggested death investigation procedure should be followed in these cases. In addition, the child's medical records, description of the scene, postmortem interval, a list of any medications other family members or animals may have, will need to be submitted. It is requested that at a minimum, blood and ocular fluid be submitted in these cases. Supporting specimens may include gastric contents, urine and tissues samples. In cases where the suspected death of the child is by alcohol, drugs or poisons, all recently used baby bottles, baby food containers, drinking glasses or syringes should be submitted. (No analysis will be performed on these items unless toxicology results on the body fluids warrant their analysis.)

3. Unexplained Death, Possible Overdose Cases, Natural Death, Fire Death

It is requested that at a minimum, blood and ocular fluid be submitted in these cases. Supporting specimens may include urine, gastric contents and tissues samples. The latter may be particularly important when determining acute vs. chronic overdose.

4. Homicide/Suicide Victims

On homicide and suicide (not alcohol, drug or poison induced) the submission of blood and ocular fluid is requested at a minimum. Typically when the cause of death is known (e.g. gunshot, stabbing, strangulation), only a volatiles analysis and standard drug screen panel will be performed unless the history warrants further testing.

5. Homicide Suspects

No analysis will ordinarily be performed on homicide suspects unless the subject was apprehended at the crime scene and a witness verifies that the individual did not ingest any alcohol or drugs after the commission of the crime.

### C. Suggested Collection and submission of samples in DUI cases:

1. SLED has the statutory responsibility of chemical testing for alcohol and drugs and establishing procedures for collection of body fluid samples for Driving under the Influence (DUI) (Section 56-5-2930), Felony DUI (Section 56-5-2945), Boating under the Influence (BUI) (Section 50-12-112), DUI for Commercial Drivers (Section 56-1-2030) and 56-1-2180, DUI for Aircraft operators (Section 55-1-100), and Driving with Unlawful Concentration (56-5-2933).

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2. If a subject:
  - a) Has completed a breath test and the arresting officer has reasonable suspicion that the subject is under the influence of drugs other than ethanol; a **urine** sample may be requested.
  - b) Is unable to complete a breath test, because the subject could not be released from a licensed medical facility or is unconscious; a **blood** sample may be requested.

**\*\*NOTE\*\*** Failure to obtain the appropriate physiological sample may result in court exclusion of the toxicology results.
3. In Felony DUI cases, BOTH blood and urine can be requested and consent by the individual is not required. It is requested that both specimens be collected and submitted in Felony cases. These samples can be taken in addition to any breath analysis that has been performed in Felony cases.
4. Under certain circumstances, such as interference detected by a breath instrument, a blood sample may be requested for the analysis of ethanol or other interfering potentially impairing volatiles.
5. Should the subject request their own blood test, the arresting officer may take the individual to a licensed medical facility to have the sample drawn at the individual's expense and the officer may submit the sample to the SLED Forensic Services Laboratory for the individual for testing. SLED will not accept samples directly from civilians; the sample must be submitted through the law enforcement community.
  - a) The suggested procedures for obtaining blood and urine samples is referenced in the SC Code of Regulations, Section 73-2.1 (See section G below). All blood and urine samples will be obtained at a licensed medical facility, will be placed into the appropriate containers for transport to SLED. All fluids should remain refrigerated or frozen until transported to SLED. Wherever possible, do not transport samples in a non-climate controlled vehicle or in an excessively hot vehicle trunk space. If possible, transport in an ice chest.
  - b) In order for the sample to be accepted by SLED, a completed Forensic Services Request Form or iLAB equivalent should accompany the specimen. It is requested that a copy of the Urine/Blood Collection report also accompany the sample as it has important information including the date and time of arrest and the time of test.

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- c) If alcohol or drugs were present at the scene or if the subject states that they are currently taking medications, please list these in the appropriate space on the Forensic Services Request Form. Remember, the Toxicologist is working with limited sample volume and many substances require special separate analytical procedures for their identification. A complete history is necessary to ensure proper sample analysis.

### D. Criminal Sexual Conduct (CSC) Cases

Criminal Sexual Conduct cases are particularly sensitive to the time frame between when the incident occurred and when forensic samples were drawn. It is requested that officers request blood and urine specimens. A complete incident report is especially helpful in determining the scope of analysis in CSC cases. Analysis may be limited when the time between sample collection and the time of incident becomes extended. Testing will proceed in blood if it is available and the sample was drawn within 12 hours of incident. Testing will proceed in urine if available and the sample was drawn within 24 hours of incident. If time between draw and incident exceed these parameters, no testing will be performed without consent of the Toxicology Department Supervisor.

### E. Moonshine Cases

When analysis of moonshine is requested the samples should be submitted in an airtight container, often a jar with a secure screw lid works well. Only 20 mL of sample are requested however the sample volume should almost fill the submission container to prevent volatiles from evaporating into the headspace of the container.

### F. Sample Rejection

1. If prior toxicological testing has been performed, other than a breath test, any testing by the SLED Forensic Toxicology Department may be precluded or limited to specific testing not previously performed.
2. Samples considered contaminated or unsuitable for analysis may be rejected for toxicological analysis.
3. Samples may be rejected when the Forensic Services Request Form does not give sufficient information or is not filled out completely.
4. Samples may be rejected in any occurrence where a physiological specimen is not properly labeled with the victim's or subject's name or where the name is inconsistent with the Forensic Services Request Form.
5. Samples may be rejected if the outer packaging or samples themselves appears tampered with or otherwise compromised.

G. Regulations

Below is the Excerpt from Chapter 73 of the Regulations from the SC Code of Law pertaining to suggested procedures for Obtaining and Handling Blood and Urine Samples:

**73-2.1. Suggested Procedures for Obtaining and Handling Blood and Urine Samples.**

A. Obtaining and Handling Blood and Urine Samples. The South Carolina Law Enforcement Division (SLED) recommends the following procedures by which blood and urine samples are to be obtained and handled if such samples are taken from persons arrested for DUI (1976 Code 56-5-2930 or 56-5-2950, as amended) and are taken under authority of 1976 Code 56-5-2950, as amended. Other procedures that meet appropriate medical standards are acceptable as well.

B. Reimbursement Procedures. The cost for obtaining a urine or blood sample shall be set by the Chief of SLED. Reimbursement for obtaining samples shall be made by mailing a copy of the SLED Urine/Blood Collection Report form for each sample collected. More than one collection report may be submitted with each invoice.

C. Suggested Procedures for Obtaining and Handling Urine Samples by Individuals so Authorized, Using Appropriate Collection Materials.

Note: Step 2 should be performed in view of subject and a witness of same sex.

1. Take an unused, uncontaminated container and remove cap or lid.
2. Hand the container to subject with instructions to fill container.
3. Have subject immediately return filled urine container. Replace cap or lid on container and tighten down to prevent leakage.
4. Label container with the following information: Name of subject, time and date of sample collection, and name of person collecting sample.
5. Place a piece of tape across cap or lid and seal to sides of container. Person sealing container should initial tape.
6. Fill out all information on Urine/Blood Collection Report Sheet.
7. As soon as possible after specimen collection, deliver sealed sample and Urine/Blood Collection Report to SLED Forensic Services Laboratory for analysis.

D. Suggested Procedures for Obtaining and Handling Blood Samples by so Authorized, Using Appropriate Collection Materials.

1. Clear venipuncture site with non-ethanol skin preparation.

## Toxicology

2. Withdraw blood and place in an unused, uncontaminated vial. Vials that contain both an anticoagulant and a preservative are preferred.
3. Cap vial securely.
4. Place following information on label: Name of subject, time and date of blood withdrawal, and name of person withdrawing blood.
5. Fill out information on Urine/Blood Collection Report.
6. Wrap blood vial securely in suitable material for transport.
7. As soon as possible after specimen collection, deliver sealed sample and Urine/Blood Collection Report to SLED Chemistry Laboratory for analysis.

### **III. SPECIAL CONSIDERATIONS**

Any questions regarding special requests for analysis should be directed to the Toxicology Department Supervisor for consideration. Analysis which extends beyond the routine testing outlined in this manual may be performed at special request. Please contact the department for sample collection procedures, packaging and the minimal sample volume requirements for these special submissions.

### **IV. REPORT INTERPRETATION**

Any questions pertaining directly to a particular case or signed report issued by the SLED Toxicology Department should be directed to the case analyst or in their absence the Toxicology Department Supervisor. The toxicologist can provide interpretation and explanation of any toxicological findings and their significance to the case.

The results portion of the official report is separated first by sample type. Any findings from a particular sample will be listed under that sample. Under each sample type, the results are further divided based on the analysis type and subsequent findings. Not all analysis types will be performed on all sample types. Header types are the same for each type of analysis and provide the following information: compound name, result, reporting units, and threshold.

Types of analysis and typical results for these sections are detailed as follows:

1. Analysis by Headspace Gas Chromatography (HSGC) and/or Headspace Gas Chromatography/Mass Spectrometry (HSGC/MS).
  - Results of volatiles analysis to include ethanol and other volatile concentrations can be found in this section.



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2. Screen by Enzyme Linked Immunosorbant Assay (ELISA).
  - Negative drug screens performed by this method will be listed in this section as well as any positive screens where there was insufficient sample for confirmation/quantitation.
3. Analysis by Gas Chromatography/Mass Spectrometry (GC/MS).
  - Results from drug quantitations in blood/tissues will be reported in this section.
  - Drugs confirmed in urine and/or gastric contents will be reported in this section.
  - If a general drug screen was performed using GC/MS only and no compounds of concern were identified, it will be reported in this section.
4. Analysis by Liquid Chromatography/Mass Spectrometry (LC-MS/MS).
  - Results from drug quantitations in blood and/or tissues will be reported in this section.
  - Drugs confirmed in urine and/or gastric contents will be reported in this section.

## V. CONTACT INFORMATION

Toxicology telephone number – (803) 896-7385

## TRACE EVIDENCE DEPARTMENT

### I. CAPABILITIES AND SERVICES

The Trace Evidence Department is a unique and diverse forensic discipline. The following types of evidence are analyzed by this unit.

- Gunshot Residue (GSR)
- Fire Debris
- Paint
- Fibers
- Glass
- Explosives
- MAAQ
- Pressure Sensitive Tape
- Physical Fit
- General Physical and Chemical Analysis

#### **Gunshot Residue**

Gunshot residue (GSR) analysis is performed on particle lifts collected from people suspected to have been in the vicinity of a gun when it was fired. Samples from clothing of non-victims and any other location/object (vehicle, door, etc.) where gunshot residue would have been deposited can also be analyzed.

#### **Fire Debris**

Fire debris analysis tests for the presence of ignitable liquids. Gasoline and other petroleum products may be identified by this analysis. It is extremely important to package this evidence properly.

#### **Paint**

Paint evidence is commonly encountered in vehicular hit and run accidents and burglary cases. Typically, a known paint standard is compared to an unknown paint sample to determine if they have a common source. Automotive paint can be found on the clothing or vehicles of hit and run victims. This paint can be in the form of paint smears or intact paint chips. It may be possible to provide a make, model and year range of the vehicle involved in the hit and run. Architectural

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paint can be found on tools used in a burglary. It is also possible to analyze paint from other sources as long as the unknown sample and a standard sample are submitted. This can include, but is not limited to: boats, bicycles, trains, safes and mailboxes.

### **Fibers**

Fiber evidence is commonly encountered in vehicular hit and runs, burglaries, homicides, and assaults. Typically, a known fiber standard is compared to an unknown fiber sample to determine if they have a common source. Fiber evidence may link a suspect to a crime scene or to a victim. For example, a hit and run victim may leave fibers from their clothing on the suspect's vehicle; fibers may be found on a knife used in the commission of a crime; a burglary suspect may rip their clothing while climbing in a broken window and leave fibers on the broken glass.

### **Glass**

Glass evidence is commonly encountered in vehicular hit and runs, burglaries, homicides and assaults. A known glass standard is compared to an unknown glass sample to determine if they have a common source. For example, a hit and run victim's clothing may contain glass from the windshield of the suspect vehicle; a burglary suspect's clothing or shoes may contain glass from a broken window at the crime scene.

### **Explosives**

Explosives evidence includes suspected explosive residue and exploded/unexploded devices. All devices **must** be rendered safe before submission to the laboratory. This evidence includes pipe bombs, chemical reaction bombs and improvised explosive devices.

### **MAAQ**

A special type of explosion involving bank dye packs can be analyzed for the presence of methylaminoanthraquinone (MAAQ). MAAQ can be identified on a suspect, on their clothing, on any money recovered or on any items in the vicinity of the explosion.

### **Pressure Sensitive Tape**

Tape evidence is commonly encountered in kidnappings, homicides and assaults. Typically, a roll of tape from a suspect is compared to unknown pieces of tape found on a victim or to pieces of tape left at a scene.

### **Physical Fit**

Physical Fit evidence is commonly encountered in vehicular hit and runs, burglaries, homicides and assaults. The purpose of this examination is to physically fit evidentiary materials back together along fractured edges. A suspect vehicle may leave automotive pieces at a scene that can be physically fit to the vehicle. This examination can be performed on different types of items (cloth, glass, paint, plastic, metal, tape, concrete, etc). When accomplished, this examination provides conclusive evidence that the materials were, at one time, a single item.

### **General Chemical and Physical Analysis**

Typically a known standard is compared to an unknown sample to determine if they have a common source.

## **II. EVIDENCE COLLECTION, PACKAGING, AND SUBMISSION PROCEDURES**

### **Gunshot Residue**

#### *GSR Collection from Hands*

1. Follow the directions that are included in the GSR kit. They explain collection, packaging and submission of GSR evidence. It is not necessary to collect swabs if your GSR kit contains them.
2. Collect the evidence as soon as possible.
3. Do not collect a kit on a living subject if more than six hours has passed from the time of the shooting incident. Kits collected beyond six hours on living subjects are not analyzed.
4. Complete ALL of the information on the collection sheet. The incident date/time and the collection date/time is important information that is required for analysis.
5. The collection time on the GSR paperwork refers to the actual time the kit was collected and not the time the paperwork was completed.

#### *Submission of GSR Evidence from Suspect's Clothing*

1. The clothing must have a definite link to the incident and be collected within a reasonable amount of time.
2. Package dry clothing in a sealed bag. Package all items separately. GSR samples will be collected by laboratory personnel.
3. If the suspect was wearing gloves, and the gloves are to be submitted to the laboratory, package each glove separately.

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### *GSR Collection from a Vehicle*

1. GSR evidence should be collected from the area the shooting occurred.
2. The make, model, and tag number of the vehicle should be noted as the 'subject's name'.
3. Please note whether other evidence collection took place prior to the GSR collection, i.e., DNA or fingerprints.

### **Fire Debris**

Each item of evidence should be packaged individually in an air tight container.

### *Liquid Samples*

1. Liquid samples include any suspected ignitable liquids found in containers at or near the fire scene. Pour the liquid sample from the container into a small sealable glass bottle or vial. This evidence can also be collected with gauze and packaged like a solid sample. One or two fluid ounces are more than sufficient for analysis.
2. Do not use polystyrene bottles.
3. Cushion glass bottles to prevent them from breaking during transport and make certain to secure all caps and lids.

### *Solid Samples*

1. Collect and seal the samples as quickly as possible. Most ignitable liquids are extremely volatile compounds and will evaporate quickly. Do not over fill the evidence containers. Leave at least one third of the container empty above the sample.
2. Use lined metal paint cans, canning jars, or heat sealable nylon bags. Do not use paper bags or other plastic bags to package this evidence.
3. If sample debris is too large for the container cut it into smaller pieces.
4. All soil samples should be frozen or refrigerated as soon as possible. Inform the laboratory that a soil sample is being submitted.
5. Non-burned (non-charred) control samples should be taken from carpet, tile, linoleum flooring, or any other synthetic material found at the scene.

### **Paint**

1. Paint samples should be collected by cutting the sample to the substrate. This includes automotive paint samples and architectural paint samples. A quarter size sample is sufficient for analysis but larger pieces may be submitted if necessary (bumpers, hoods, etc).
2. In hit and run cases, be very careful when collecting the victim's clothing. Paint chips may be loosely adhered to the clothing. Package each item

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- separately and include all articles of clothing. Also include any items the victim may have been carrying.
3. Always dry any wet clothing before submission to the laboratory.
  4. If a bicycle is involved in a hit and run case, submit the bicycle as well as the victim's clothing for analysis.
  5. If a moped is involved in a hit and run case, submit any broken pieces of the moped or the whole moped as well as the victim's clothing for analysis.
  6. Collect paint standards from each area of the suspect vehicle that exhibits possible damage. Paint can vary in composition from different areas of the vehicle. Clearly label each standard to indicate the area from which it was collected.
  7. Double paint transfers can occur in hit and run cases involving two or more vehicles. Collect all loose paint chips found at the scene. If unknown paint smears are present on a vehicle, collect them by cutting them out. Do not collect one sample to be used as a standard and as an unknown; collect separate samples. Cut out a section of paint from an area adjacent to the damaged area. This sample will serve as the paint standard from that vehicle. Collect samples in the same way for all vehicles involved.
  8. Package paint samples in envelopes or small tins. If the sample is too large for an envelope or a tin, it can be sealed in a paper bag or put in a box. For very small samples, enclose the sample in a folded piece of paper and then seal it in an envelope. Be very careful to tape all corners of the envelope to prevent unintentional loss of the evidence.
  9. For architectural paint samples, traces of paint may be found on the tools used to gain entry into a building or on the tool used to pry open a safe. Package tools in envelopes or boxes, but be sure to cover the areas of interest with bags. Cut out paint standards from the area that was damaged (usually window or door jambs).
  10. Contact the Firearms Department before collecting samples if you want a tool mark examination performed.

## Fibers

1. Collect unknown fiber evidence with tweezers and place in an envelope or appropriate packaging. If an envelope is used, carefully seal all edges with tape. Post it notes may also be used to package fiber evidence.
2. Submit appropriate standards (i.e. suspect/victim clothing, carpet, trunk liner, etc.) as standards for any unknown fiber evidence. Package each item separately. Handle this evidence as little as possible to prevent loss.
3. If fibers are imbedded in an item, submit the whole item to the laboratory. Do not try to remove the embedded fiber, this could destroy the evidence.
4. Always dry any wet clothing before submission to the laboratory.

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5. Do not let suspect and victim garments come into contact with each other. Make certain to package these items separately.
6. If an unknown fiber must be collected with tape, be certain to use water soluble tape for the collection. Any other tape will damage the fiber evidence and possibly render it useless for analysis. Contact the Trace Evidence Department for information on ordering water soluble tape.

### **Glass**

1. Collect glass evidence with non-metallic utensils and place any glass fragments in plastic containers or in folded paper packages within a sealed container.
2. Any evidence that may contain glass should be packaged separately.
3. Standards need to be collected from all potential glass sources. This may include mirrors, windshields, bottles, or any broken windows.

### **Explosives**

1. Make certain the device has been rendered safe before submission to the laboratory. The laboratory will not accept a device that has not been rendered safe.
2. When collecting bulk explosive samples please contact the Trace Evidence Department for collection instruction.
3. When possible, submit standards collected from the scene or from the suspect.
4. Identify the type of disruptor used and submit a standard if possible.
5. When submitting residue from a suspected chemical reaction bomb do not place it in sealed bottles or cans. Another chemical reaction could occur if enough of the residue is present. Use care when handling this evidence; the liquid is usually a strong acid or base which could burn the skin. It is recommended that this type of evidence be packaged in small plastic buckets or plastic containers.

### **MAAQ**

Any object or person that has been exposed to MAAQ will be red/pink in color.

1. If there is evidence suspected to contain MAAQ, submit it to the laboratory for analysis. Package the items in sealed paper bags or boxes.
2. If a sample needs to be collected from a person's skin, please call the laboratory for further instructions.

### **Pressure Sensitive Tape**

1. Proper collection and storage of tape evidence is essential to the analysis. Because tape has such a strong adhesive, do not package it so that the

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adhesive sticks to the packaging or to itself. Clear check sleeves are recommended for packaging tape evidence. Call the Trace Evidence Department to obtain ordering information on check sleeves. Rolls of tape can be packaged in paper or plastic bags.

2. Fingerprint analysis on this evidence can interfere with the Trace Evidence examination. Therefore, a decision should be made by the submitter, prior to submission to the laboratory, as to which examination is more probative to the case.

### **General Physical and Chemical Analysis**

Use basic rules of evidence collection. Do not package standards and unknown evidence together. Call the Trace Evidence Department with any questions.

## **III. SPECIAL CONSIDERATIONS**

1. The Trace Evidence Department does not perform soil, wood or hair analyses.
2. GSR found on a person's hands cannot be matched to a particular gun.
3. The time frame in which GSR was deposited on an inanimate object, including clothing, cannot be determined. Any GSR found on an inanimate object cannot be associated with a particular shooting incident.

## **IV. REPORT INTERPRETATION**

Due to the variety of evidence that the Trace Evidence Department analyzes, if you have a case specific question, please contact the case forensic scientist.

Regardless of the type of examination, a comparison between an unknown item and a standard item is an attempt to determine if the unknown item could have come from the standard item.

1. If the report states that the unknown item (glass, fiber, paint, tape, etc.) and the standard item are not the same, this means that the unknown item could not have come from the standard item.
2. If the report states that the unknown item (glass, fiber, paint, tape, etc.) and the standard item are the same in physical and chemical characteristics, and that the unknown item could have come from the standard item, this means that the two may have shared a common source. However, there was nothing unique about either the standard or the unknown that makes it an exclusive match. If the report states that the unknown item (glass, fiber, paint, tape, etc.) originated from the standard item, this means that characteristics of these items made an exclusive match possible.



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3. If the report states that the result of the examination is inconclusive, this means that there are some similarities between the unknown item and the standard item, but due to one or more factors, clear distinctions/similarities cannot be determined.

### **GSR Analysis Results**

GSR evidence is a very fragile and time sensitive type of evidence. Because there are so many factors that can affect GSR deposition, please contact the forensic scientist for case specific scenarios.

Gunshot residue particles are considered characteristic of primer residue. These particles are microscopic and molten, non-crystalline, particles that contain the elements lead, barium, and antimony.

Particles that are consistent with gunshot residue are spheroidal/spherical (round) particles with the following compositions:

- Barium, calcium, and silicon
- Antimony and barium
- Lead and antimony
- Lead and barium
- Barium and aluminum
- Lead, barium, calcium, and silicon

Particles that are associated with gunshot residue are spheroidal/spherical (round) particles with the following compositions:

- Lead with a trace amount of antimony
- Lead
- Antimony
- Barium with no sulfur

### **Fire Debris Results**

Fire debris evidence is a volatile type of evidence and must be packaged properly. A negative result does not necessarily mean that an ignitable liquid was not used to start the fire; it can mean that there were no ignitable liquids in the evidence collected. Positive results do not necessarily mean that an ignitable liquid was used to start the fire; the ignitable liquid found may have a legitimate reason for being present. If positive results are reported, then examples of common ignitable liquids or products will be provided in the results.

### **Explosives**

1. Positive results will state what type of explosive was found.
2. Negative results will state that no explosive material or residue was found.

## MAAQ

1. If the report states that no methylaminoanthraquinone (MAAQ) was found, this means that the forensic scientist did not find the dye that is used in bank security devices.
2. If the report states that methylaminoanthraquinone (MAAQ) was found, this means that the forensic scientist found the dye used in bank security devices.

## Miscellaneous Results

1. **No analysis performed due to improper collection of the evidence.** This means that the forensic scientist was unable to properly analyze the evidence due to the manner in which it was collected.
2. **No analysis performed due to improper packaging.** This result means that the forensic scientist was unable to properly analyze the evidence due to the manner in which it was packaged.
3. **No analysis performed due to lack of pertinent information.** This result means that the forensic scientist attempted to contact the investigating officer in order to obtain information needed for analysis, but was unsuccessful.
4. **No analysis performed due to the lack of standards.** This result means that the forensic scientist was unable to perform a comparison because the required standards were not submitted.
5. **Nothing of evidentiary value found.** This result means that using information from the investigator and from the submitted standards; the forensic scientist did not find any probative evidence on the unknown item.

## V. CONTACT INFORMATION

Trace telephone number - (803) 896-7347