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### REVISION HISTORY

Effective Date	Brief Description of Change(s)
1/21/2020	Original Issue Previous revision history for individual chapters included in archived documents

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## 01 CRIME SCENE OVERVIEW

### CSR-01-01 CRIME SCENE RESPONSE OVERVIEW

#### 1 Scope

The laboratory system will provide crime scene response assistance for local, state, and federal law enforcement entities. Services include overall photography of crime scene environments as well as the processing, collection, preservation, and documentation of evidence items related to crime scenes. Crime scene response may be requested as described below or as part of a larger coordinated effort depending upon the needs of the requesting agencies.

The laboratory system may also maintain capabilities to perform advanced collection techniques and analysis at a crime scene in an effort to provide investigative information during the early stages of an active investigation.

#### 2 Practice

##### 2.1 Crime Scene Response Services

- A. The laboratory may receive requests for crime scene assistance from internal DPS entities (CID, Texas Rangers, etc.) or other local, state, and federal law enforcement entities.
- B. The DPS Crime Laboratory System defines a crime scene to be any location, property, dwelling, vehicle or other item that is processed outside of the crime lab as well as vehicles processed in the crime lab.
- C. Crime scene response services provided for vehicle processing and scene investigations:
  1. Friction Ridge
  2. Trace Evidence
  3. Biology/DNA
  4. Firearms & Toolmarks
  5. Forensic Document Examination
  6. Digital/Multimedia, including
    - a) *Audio/Video*
    - b) *Photography*
- D. Limited crime scene assistance may also be provided in other situations including, but not limited to,
  1. Arson investigations
  2. Explosives scenes
  3. Buried remains
- E. Availability for response to crime scenes will be determined by Laboratory resources and type of scene.

## 2.2 Crime Scene Response Team

- A. To ensure that the laboratory system is providing the best response to clients while also maintaining consistent, in-depth, and continuing training to crime scene team members, a Crime Scene Response Team (CST) will be maintained. The team is composed of forensic scientists and/or technicians from across the laboratory system. Team members are trained as generalists for the purposes of crime scene response. A generalist is a crime scene team member who can perform a variety of crime scene response techniques within and outside of their discipline-specific training.
- B. From the Crime Scene Response Team, a smaller team is selected to form the Major Crime Scene Response Team (MCST). This group may receive additional in-depth crime scene training in order to lead, direct, and coordinate the training and response activities of the crime scene team members.
- C. Team Member Selection Process
  1. Individuals interested in applying to the CST and/or MCST should consider the following:
    - a) *Schedule availability – ability to respond to scenes during and outside of normal work hours with short notice, ability to effectively balance normal work duties with crime scene responsibilities*
    - b) *Long-term commitment – because of the investment in training, members are expected to serve for a minimum of three years, but preferably longer*
    - c) *Adaptability – ability to effectively manage time, tasks, scene situations, and performance under stress and/or physically demanding situations*
    - d) *Teamwork – ability to interact and communicate effectively with other team members, agencies, and others*
    - e) *Training – willingness, flexibility, commitment, and ability to attend training (short-term and long-term) and ability to become an expert in crime scene response outside of applicant's discipline*
  2. An application process is utilized to select candidates for the CST and MCST. Application packets shall include the following:
    - a) *Personal Statement – statement indicating why the applicant is interested in participation on the CST and/or MCST and highlighting the attributes they possess that make them most qualified*
    - b) *Resume/SOQ – a detailed account of the applicant's educational and professional history and achievements, making special note of previous crime scene training and work*
    - c) *Supervisor/Manager Recommendation Letter – an in-depth evaluation of the applicant documenting their achievements as a forensic scientist or technician, previous performance as a crime scene responder, and comments on the attributes that make them suited for crime scene processing. This letter should also indicate supervisor/manager support of the necessary time commitment to participate in this program.*
  3. Applications are submitted to the Chair of the Crime Scene Response Committee.
  4. Applications may be accepted on a continuing basis, or solicited as needed.

5. Applications are reviewed by the Crime Scene Response Committee and recommendations are made to the Laboratory Director.

D. Team Member Evaluation

1. Team members are evaluated as needed to determine their effectiveness in areas such as:
  - a) *Schedule availability*
  - b) *Technical competency*
  - c) *Interpersonal interactions and teamwork*
  - d) *Administrative responsibilities*
  - e) *Adaptability*
  - f) *Stress management*
  - g) *Scene management*
2. Evaluations of team members can come from other team members, laboratory management, and outside agencies and are provided to the Crime Scene Response Committee.
3. Evaluations are reviewed by the Crime Scene Response Committee Chair and/or MCST and recommendations for action are made to the Laboratory Director.

**2.3 Crime Scene Response Committee**

- A. The Crime Scene Response Committee is responsible for creating, evaluating, and proposing crime scene response procedures, policies, and training programs of CST and MCST members. This committee also response to inquiries concerning validation studies and technical issues related to crime scene response.
- B. The Crime Scene Response Committee is composed of all Major Crime Scene Team members. Other members may be added at the discretion of the Laboratory Director to ensure disciplines and regions are adequately represented.

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## CSR-01-02 CRIME SCENE PROCESSING

### 1 Scope

These crime scene processing practices are intended to be used by the Crime Scene Team and other forensic scientists within the Texas DPS Crime Laboratory Service in order to examine, document, preserve, and collect physical evidence at crime scenes when called upon for assistance.

While it is recognized that differences may exist between jurisdictions, crime scene types, and environmental circumstances, the primary goal is to provide consistency in crime scene processing which includes forms, documentation, equipment, and overall searching and processing techniques.

### 2 Related Documents

Vehicle Processing (CSR-01-03)

Crime Laboratory Service Manual

- Receipt and Review of Laboratory Requests for Service
- Submission and Receipt of Evidence
- Evidence and Database Sample Integrity
- Evidence Processing
- Return of Evidence
- Laboratory Records
- Laboratory Reports, Letters, and Certificates

LIMS Manual – Crime Scene Response Report

Discipline-specific SOP for relevant evidence processing methods

### 3 Safety

Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous materials and other safety hazards encountered at crime scenes.

- A. Personnel have the ultimate responsibility to recognize chemical, biological, physical, and weather hazards while processing a crime scene. The threat level should be continually assessed by the team when processing scenes.
- B. Wear appropriate clothing and gloves.
  1. At a minimum, gloves must be worn at crime scenes.
  2. Biological materials, bodies, and other biohazardous waste may require additional personal protective equipment.
- C. If potential explosives or other extreme dangers are present, the team should wait until the scene has been determined to be or has been rendered safe by the appropriate expert.
- D. Use proper lifting techniques for heavy and/or bulky items.
- E. Check structural integrity before climbing into and/or onto objects.
- F. Consider hazards of confined spaces.
- G. There shall be no eating, drinking, or use of tobacco products by personnel within secured crime scenes.

## 4 Equipment and Materials

While required equipment may vary by incident, case circumstances, offense types, and participating disciplines, the following list provides some guidance to general equipment that may be needed by a crime scene response team.

- A. Personal Protective Equipment (PPE)
  - Gloves
  - Face masks and nuisance masks
  - Safety glasses/goggles
  - Shoe covers
  - Coveralls (as applicable)
- B. Basic Equipment
  - Pens/markers
  - Note pads/sticky notes
  - Hand washing gel
  - Insect repellent
  - Crime Scene forms
- C. Evidence Collection Equipment
  - Flashlight with extra batteries
  - Measuring device(s)
  - Tweezers, scissors and scalpels
  - Cotton swabs/cotton gauze
  - Kimwipes/paper towels
  - Weigh paper
  - Large paper rolls
  - Paper envelopes
  - Paper bags
  - Re-sealable plastic bags (various sizes)
  - Pistol and rifle boxes
  - Plastic ties
  - Tape and report cover
  - Distilled water
  - Presumptive reagents, as needed
  - Alcohol wipes
  - 70% ethanol/DNAaway/other cleaning solution
  - Trash and biohazard bags
  - Evidence tape
  - Padding material (e.g. cotton)
  - Surveyor's flags/scene markers

- Camera (including lenses, filters, other accessories) with extra batteries and memory/media cards

D. Additional Equipment

- Portable lighting
- Extension cords
- Hand tools
- Metal detector
- String
- Push pins
- Pipettes and bulbs
- Casting material
- Forensic light source
- Electrostatic lifter
- Individual breathing apparatus
- Portable table
- Canopy

## 5 Responsibilities

The following duties may be performed by any member of the crime scene team with proper authorization. One individual may be assigned multiple duties.

A. **Crime Scene Coordinator** is responsible for:

1. Acting as the laboratory's point of contact for the requestor and/or agencies assisted
2. Assessing scope of incident and scene to determine personnel and equipment necessary

**Note:** Any member of the crime scene team may act as Crime Scene Coordinator.

B. **Crime Scene Team Leader** is responsible for:

1. Providing team leadership at the scene
2. Overseeing crime scene search
3. Ensuring notification of chain of command regarding crime scene response request.
  - a) *Regional Directors and Ranger Major of relevant Ranger company should be notified if the request for assistance comes from a non-DPS agency prior to departure for scene. In the event that notification is not possible prior to scene response, notification should be made as soon as possible.*
  - b) *Documentation of notification should be included in the case file.*
4. Ensuring proper documentation by crime scene personnel, including completion of (as applicable). This review will be documented by the Team Leader by initialing all paperwork or using an electronic equivalent.
  - a) *Crime Scene Response Reporting Form (LAB-CSR-01),*

- b) *Crime Scene Sketch Form (LAB-CSR-02),*
  - c) *Evidence Recovery Log (LAB-CSR-03), and*
  - d) *Photographic documentation.*
5. Ensuring entry of collected evidence into LIMS
  6. Generating the Crime Scene Response Report
- C. **Forensic Scientist/Team Member** is responsible for:
1. Evaluating the nature and probative value of possible evidence
  2. Documenting, collecting, and preserving evidence
  3. Communicating relevant information and decisions to the Team Leader
- D. **Photographer** is responsible for:
1. Photographing the scene in its entirety
  2. Photographing specific items of evidence
  3. Providing contact sheet for case folder
  4. Uploading photographs to DIMS or transferring to other media
- E. **Evidence Custodian** is responsible for:
1. Ensuring collected evidence is properly packaged, labeled and sealed
  2. Maintaining the integrity and security of the collected evidence
  3. Compiling evidence recovery logs at completion of scene search
- F. **Requesting Officer** is responsible for:
1. Securing the scene
  2. Obtaining the appropriate search warrant of the scene
  3. Cleaning of the crime scene
  4. Transporting hazardous waste to temporary storage trailers and the notification of hazmat company
  5. Transporting large quantities of drug evidence and bulky evidence from the scene to a secure storage location.

## 6 Practices

### 6.1 Scene Response

- A. Upon contact by an agency for a crime scene response by the Crime Lab Service, the initial communication will be documented.
- B. The Crime Scene Team Leader should ensure:
  1. A search warrant or authorized search has been granted
  2. The scene is secure and maintained by the requesting agency
- C. The Crime Scene Coordinator will determine the nature of the assistance required, including the crime scene response team, equipment, transportation, and other case specific needs for the response.

- D. The crime scene team will be briefed by the lead investigator, other agency designee of the crime scene, or the Crime Scene Coordinator.
- E. The Crime Scene Team Leader may conduct a preliminary walk-through of the crime scene with the lead investigator/agency designee.
- F. In instances where fragile or transitory evidence is located, this evidence should be collected as soon as possible to reduce the risk of losing evidence. Photographs can be taken of the evidence and then the evidence can be collected prior to completion of other scene documentation.
- G. The Crime Scene Team Leader, in consultation with team members, will determine the plan for processing the scene based on the assessment of criteria in each case, including scene photography.
- H. The Crime Scene Team may conduct a final walk-through (with or without the officer in charge) of the scene to recover equipment, inventory evidence, prepare the scene for release, and determine the necessity for processing additional locations.
- I. The appropriate chemical SDSs should be given to the officer in charge of the scene or left at the scene when chemical processing is performed. Examples of chemical processing include Luminol and Amido Black.
- J. Consult with the officer in charge to see if a copy of the preliminary evidence recovery log and/or crime scene photographs will be needed.

## 6.2 Evidence Considerations

Evidence collected from a crime scene shall be protected from loss, cross transfer, contamination, and/or deleterious change, whether in a sealed or unsealed container, during transportation to the laboratory for submission or to the agency for storage.

- A. Personal protective equipment shall be worn when appropriate to avoid contamination.
- B. A search pattern for evidence will be established.
  - 1. This includes at least one of the following patterns:
    - a) *Grid*,
    - b) *Strip/lane*,
    - c) *Zone*,
    - d) *Spiral*, or
    - e) *Line*.
  - 2. The search proceeds outside to inside working toward the center of activity.
  - 3. All entrances and exits will be searched.
  - 4. "Safe walkways" will be established and used until all evidence has been collected.
- C. Items are photographed and/or documented. (Documentation on the evidence recovery log is separate from sketching/photographing.)
- D. All trace and biological evidence should be collected in an area before latent print powder or any other destructive test or collection procedure is used.
- E. If evidence is to be collected from a victim/suspect/elimination, the appropriate authorization may be necessary.

- F. General categories of evidence may include:
1. Imprints/Impressions: shoeprints and tire tracks
  2. DNA sources: blood, semen, and other biological fluids
  3. Fingerprints, palm prints, and footprints
  4. Handwriting, documents, and equipment (computers, answering machines, etc.)
  5. Fibers and cloth
  6. Gunshot residues and explosive residue
  7. Hair
  8. Fracture matches
  9. Glass
  10. Firearms, projectiles, cartridges, and cartridge cases
  11. Toolmarks
  12. Paint
  13. Plastic
  14. Soil and plant matter
  15. Building materials
  16. Other items as indicated by case circumstances
- G. In order to preserve the evidence, it should be properly segregated into unused containers so that contamination does not occur. The proper method of packaging is dependent upon the condition of the evidence.
1. Various Types of Packaging Materials:
    - a) *Paper bags (various sizes from small to large)*
    - b) *Envelopes (various sizes from small to large)*
    - c) *Cardboard boxes (Various sizes from small to large)*
    - d) *Metal tins*

**Note:** *Never use plastic to package items to be submitted for DNA Analysis. However, plastic containers may be used to transport evidence to the laboratory.*
  2. Recovered evidence must be secured and packaging marked with:
    - a) *Laboratory case number*
    - b) *Unique item number*
    - c) *Date*
    - d) *Initials of collector*
- H. Uncommon evidence types may have their own special considerations (e.g. tape, filaments, and physical match evidence).
- I. Documentation of all recovered evidence must also include
1. Location of item,

2. Time of collection, and
3. Description.

### 6.3 Documentation

- A. Notification of a request for crime scene response assistance will be made through the appropriate chain of command up to Assistant Laboratory Director (Operations) and documented in the case record as soon as practical.
- B. The LAB-CSR-01 is completed.
- C. General documentation shall be detailed and show a chronological sequence of events. Notes shall include:
  1. Scene observations,
  2. Items collected,
  3. Processing information, and
  4. Other relevant information such as:
    - a) *Time of call*
    - b) *Arrival time and location*
    - c) *Areas and manner of search, photographs taken and evidence collected*
    - d) *Conditions at the scene*
    - e) *Time victims were removed*
    - f) *Departure time*
    - g) *List of all lab personnel at the scene and non-lab personnel encountered*
- D. Crime Scene Sketch Form (LAB-CSR-02)
  1. Overall perspective of the crime scene
  2. General placement of objects and items of evidence
  3. If no sketch is prepared, photographs may be used
- E. Photographs
  1. Take overall crime scene photographs before any evidence is collected.
  2. Transitory evidence should be photographed and collected prior to completing overall photographs
  3. Photograph original condition of crime scene and subsequent scene processing
  4. Photograph condition and position of evidence before recovery.
  5. Take overall, mid-range, and close-up photographs of items of importance.
  6. Provide contact sheet for case folder
- F. If evidence is recovered, the Evidence Recovery Log (LAB-CSR-03) will be used. If no evidence is recovered, it must be noted on the LAB-CSR-03.
- G. Other relevant information will be documented as indicated by case circumstances.

- H. A Crime Scene Response Report will be completed as per the *Laboratory Reports, Letters, and Certificates* chapter of the CLS Manual.
1. No testing results (such as presumptive tests) from a crime scene will be communicated to the customer on the Crime Scene Response Report.
  2. Testing results will be communicated to the customer in a discipline-specific laboratory report.

#### **6.4 Technical Review**

- A. All crime scene documentation must be reviewed by an individual trained and qualified in Crime Scene Response to ensure the completeness, accuracy, and clarity.
- B. The Crime Scene Response Technical Review Checklist (LAB-CSR-07) will be referenced. This checklist is only required to be in the case record if the checklist is marked.
- C. The review must be documented in LIMS.

#### **6.5 Administrative Review**

- A. All crime scene documentation must be reviewed by an individual trained and qualified in Crime Scene Response or laboratory supervisor/manager to ensure the completeness, accuracy, and clarity.
- B. The review must be documented in LIMS.

### **7 Records**

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Crime Scene Response Report

Additional Examination Notes

Contact Sheet of Images

Crime Scene Response Technical Review Checklist (LAB-CSR-07), as applicable

### **8 Literature References and Supporting Documentation**

DPS Crime Laboratory Safety Manual

DPS General Manual

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## **CSR-01-03 VEHICLE PROCESSING**

### **1 Scope**

This procedure outlines specific guidance for crime laboratory processing of vehicles.

### **2 Related Documents**

Crime Scene Processing (CSR-01-02)

CLS Manual – Laboratory Records

CLS Manual – Laboratory Reports, Letters, and Certificates

Discipline specific SOP for relevant evidence processing methods

### **3 Safety**

Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous fluids, chemicals, weapons, and other potential safety hazards encountered at crime scenes.

### **4 Equipment and Materials**

While required equipment may vary by case circumstances and participating disciplines, the following list provides guidance to general equipment that may be needed by a crime scene response team. CSR-01-02 also provides a list of equipment that may be relevant.

- Flashlight
- Photographic equipment
- Lifting tape
- Forceps
- Scalpel/razor blades
- Clear plastic cover
- Large paper rolls
- Silicone spray, petroleum jelly, or equivalent
- Fingerprint powder
- Black ink
- Portable table
- General mechanics toolset and creeper
- Canopy

### **5 Practices**

#### **5.1 Vehicle Information**

Information about the vehicle that must be recorded if information is available

- A. State license plate number
- B. Vehicle Identification Number (VIN)
- C. Make, color, and model

## 5.2 Exterior of Vehicle

### A. General Considerations

1. Trace evidence is usually collected from the exterior of a vehicle to show contact between the vehicle and a person or an object, or to determine if the lights were on/off.
2. In instances where fragile or transitory evidence is located, this evidence should be collected as soon as possible to reduce the risk of losing evidence. Photographs can be taken of the evidence and then the evidence can be collected prior to completion of other scene documentation.
3. In vehicle to vehicle accidents, paint is often transferred from each vehicle to the other vehicle. This transferred paint should be collected from each vehicle, along with a known sample from an area near the damaged area of each vehicle for comparison purposes. Additional exemplars may be collected as deemed necessary.
4. Two-way transfer may also apply when a vehicle forcibly contacts a painted object, such as a sign or building. Transferred and known paint should be collected from the vehicle and the object.
5. Evaluate the need for latent print processing and the collection of biological material such as blood, saliva, and sweat. This type of evidence may require extra precautions to prevent loss or deterioration and may impact the sequence in which the scene is processed.
6. Loss of evidence (i.e. bullets, tissue, casing, hair, glass, biological material, and broken auto body parts, etc.) from a shifting or moving vehicle
7. Glass considerations should be documented and glass secured prior to moving a vehicle.
8. If trajectory determination is necessary, it should be evaluated at the scene by a qualified individual.

### B. Search and Collection

1. Search for and collect any transferred hair, fibers, paint, glass, and broken auto body parts from exterior impact points. Photograph prior to collection.
2. Collect known glass and all layers of known paint from exterior impact points.
3. Evaluate broken automobile parts to compare to any broken parts recovered at the scene.
4. Lamps
  - a) *When case appropriate, all lamps within and closest to the damaged area of the vehicle should be collected and submitted to the lab.*
  - b) *Mark on the lamp its orientation as found on the vehicle. Record the location and function of each lamp collected.*
  - c) *Collect and preserve any lamp components/assembly units if appropriate.*
5. Collect known tire prints; reference Collection and Preservation Shoe/Tire Impression Evidence (CSR-03-03) as applicable.

6. Perform biological material testing and collection as applicable.
  - a) *Search for visible blood, body fluids, or other potential DNA sources.*
  - b) *Chemical enhancement and/or alternate light source may be required based on case circumstances.*
7. Perform latent print processing as applicable.
8. Collect any firearms/toolmark evidence as applicable.
9. Complete visual inspection and documentation for bullet holes and/or trajectories as applicable.

### 5.3 Interior of Vehicle

#### A. General Considerations

1. The interior of a vehicle, including the trunk, is generally processed to show who may have been in the vehicle and/or their location within the vehicle.
2. Evidence collected from vehicle interiors may include, but is not limited to, the following:
  - a) *Trace evidence*
  - b) *DNA (blood, sweat, saliva)*
  - c) *Latent prints*
  - d) *Firearms and toolmarks*
  - e) *Cell phones and other media*

#### B. Search and Collection

1. Recover hair/fibers from interior as appropriate (windshield, seats, seat belts, floor, trunk, air bag, etc.).
2. Perform biological material testing and collection as applicable.
  - a) *Search for visible blood, body fluids, or other potential DNA sources.*
  - b) *Chemical enhancement and/or alternate light source may be required based on case circumstances.*
3. Perform latent print processing as applicable.
4. Collect known samples of the upholstery, carpet (including trunk, if appropriate), headliner, etc.
5. Collect or swab any deployed air bags and/or seat belts as applicable.
6. Examine and photograph the brake and accelerator pedals for shoeprints as applicable. If potential shoeprints are detected, photograph the impressions and then remove the pedals or pedal covers for examination in the laboratory.
7. Collect any firearms, fired components, ammunition, tools, and toolmark evidence, as applicable.

## **6 Records**

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Contact Sheet of Images

## **7 Literature References and Supporting Documentation**

DPS Crime Laboratory Safety Manual

DPS General Manual

Scientific Working Group for Materials Analysis, Trace Evidence Recovery Guidelines, Federal Bureau of Investigation, 1998.

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## 02 CRIME SCENE PHOTOGRAPHY

### CSR-02-01 CRIME SCENE PHOTOGRAPHY

#### 1 Scope

The purpose of Crime Scene photography is to provide a true and accurate visual record of evidence, crime scene, and related areas. Examples of various types of photographed crime scenes may include death scenes, sexual assault, residential and commercial burglaries, hit and run, narcotics search and autopsy.

#### 2 Related Documents

LIMS Manual – Storage of Evidentiary Images in DIMS

#### 3 Safety

Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous fluids, chemicals, weapons, and other various potential safety hazards encountered at Crime Scenes.

#### 4 Equipment and Materials

While required equipment may vary by incident, case circumstances, offense types, and participating disciplines, the following list provides some guidance to general equipment that may be needed by a crime scene response team.

- Digital camera
  - Appropriate memory cards or disks
  - Appropriate batteries, adapters, accessories, and power cords
- Various Lenses as appropriate
- Tripod and cable releases
- Light Sources
  - Detachable Automatic flash unit, cords, and batteries
  - Alternate Light source
  - Flashlights and batteries
- Measuring Device(s)
- Set of stand-up crime scene markers
- Miscellaneous items
  - Owner's manuals for cameras and flash
  - Collapsible reflector
  - Lens tissue
  - Blower brush
  - Gray card
  - Other

## 5 Practices

### 5.1 Scene Photo Documentation

- A. Types of photographs taken at the scene:
  - 1. Overall scene photographs
  - 2. Evidence orientation photographs (overlapping), if collected
  - 3. Identification photographs (medium range and close-up), if evidence collected
- B. Photographing the Evidence:
  - 1. Take photographs of evidence prior to its collection.
  - 2. Photographs may be taken from different angles to show different perspectives.
  - 3. Photographs may include: scale, case identifier, directionality, or other pertinent information as required by the evidence.
  - 4. Indicate photographs taken on the Evidence Recovery Log (LAB-CSR-03).

### 5.2 Documentation

- A. Photographs
- B. Contact sheets – small or thumbnail-size images to be saved in the case record as documentation summarizing the pictures taken at a scene.

### 5.3 Itemization of crime scene photographs in LIMS

- A. Photograph itemization should be grouped based on storage location
  - 1. DIMS
    - a) *Itemize the crime scene image(s) and enter “Image(s) in DIMS” in the evidence description field (this can represent more than one image). **Hot key:** DIMS*
    - b) *Register or generate a barcode for the image(s) in LIMS and transfer it to the “DIMS” storage location (This can be found under “Special Locations” in the storage location list).*
  - Note:** This is done to indicate that the evidence is being tracked in both LIMS and DIMS.
  - 2. Media
    - a) *Itemize the crime scene image(s) and enter “Image(s) on (type of Media)” in the evidence description field (this can represent more than one image). Example: Images on DVD*
    - b) *Register or generate a barcode for the image(s) in LIMS.*

## 6 Records

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Contact Sheet of Images

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## 7 Literature References and Supporting Documentation

Goddard, K. W. 1997. Crime Scene Investigation. Reston Publishing Company, Inc.

Lee, H. C., T. Palmbach, and M. T. Miller, 2001. Henry Lee's Crime Scene Handbook. Academic Press

Forensic Science Training Unit, FBI Laboratory. Fundamental Principles and Theory of Crime Scene Photography.

Fisher, B. A. J. 2000. Techniques of Crime Scene Investigation, Sixth Edition. CRC Press.

Robinson, E. M. Crime Scene Photography. 2<sup>nd</sup> ed. Amsterdam: Academic Press, 2010.

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## 03 TRACE EVIDENCE

### CSR-03-01 COLLECTION AND PRESERVATION OF TRACE EVIDENCE

#### 1 Scope

These are collection procedures that will be utilized by the laboratory. The examiner will be given flexibility to determine an appropriate course of action in regard to the collection of evidence to attain the ultimate goal of quality and efficiency.

Persistence and transfer studies prove that debris on clothing surfaces is easily lost if garments are handled, shaken, etc. Items being collected for trace evidence examination must be handled as little as possible to minimize loss of the trace evidence and to limit exposure of the items to contaminants until the trace evidence has been collected and preserved.

#### 2 Related Documents

Trace Evidence SOP

#### 3 Safety

Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous fluids, chemicals, weapons, and other various potential safety hazards encountered at crime scenes.

#### 4 Equipment and Materials

- Alternative light source
- Tape
- Clear plastic covers
- Etching pencil, Scribing tool
- Tweezers, scalpel, scissors, probe, and other implements as necessary
- Plastic bags, paper envelopes, paper bags, card board boxes, or other appropriate containers
- Cotton swabs/cotton gauze
- Alcohol wipes, Kimwipes/paper towels
- Weigh paper
- Distilled water
- Presumptive reagents and appropriate positive and negative controls as needed
- Trash and biohazard bags

#### 5 Practices

##### 5.1 Approved Collection Methods

- A. Picking – Used to collect trace evidence which is visible on the surface of an item when the trace evidence may become dislodged and lost.
- B. Tape lifts – Used to collect trace evidence (hair/fiber) from the surface of an item such as clothing, automobile seats, etc.
- C. Scraping – Scraping is usually reserved for use within the laboratory to dislodge paint/glass particles adhering to clothing and is not generally recommended for use at a scene.

- D. Combing – Combing involves the use of a comb to trap and collect trace evidence, such as hairs, fibers and glass, from the hair of an individual.
- E. Trace Evidence Vacuum – An evidence vacuum is the method of choice in certain situations where large areas, such as a room floor, must be screened for trace evidence.
- F. Direct – Collect entire item or portion containing potentially useful information if it does not impact or alter the evidence/pattern.

## 5.2 Fibers/Fabric

- A. The possibility of physically matching a torn or cut portion of fabric to its source should always be considered. The entire questioned item and its possible source should be collected. When the possibility of a physical match exists, the necessity of maintaining all items separately to prevent contamination should not be overlooked.
- B. Victim and suspect clothing should be recovered and handled as little as possible to prevent loss of any transferred hair/fiber evidence. It is preferable that tape lifts of the deceased victim's clothing be done at the scene.
- C. Samples of textile items at the scene which the suspect/victim may have contacted (carpet, upholstery) should be collected for comparison.

## 5.3 Hair

- A. It is important that a sufficient number of hairs be obtained to adequately represent the variations in the hair of a person.
  - 1. Head hair- It is recommended that a known head hair sample consist of at least 25 full length hairs collected from different areas of the scalp (center, front, back, and both sides) by pulling and combing.
  - 2. Pubic hair- The known sample should consist of at least 25 full-length hairs obtained by pulling and combing from different areas of the pubic region.
  - 3. At autopsy, have samples of the victim's head hair, pubic hair and blood taken. If sexual assault is suspected, combings of the victim's pubic area can be taken.
- B. Since DNA analysis may be possible on a hair, the investigator should consider obtaining a known sample along with the hair sample.

## 5.4 Paint

- A. Photograph all areas on the vehicle showing fresh damage.
- B. Collect known paint samples from areas near the damaged area(s).
  - 1. If the paint can be flaked off in chips, remove it in this manner; if not, remove the paint using a clean knife or razor, making sure all layers are collected.
  - 2. Known samples from different areas should be placed in separate containers.
- C. Broken lenses, paint chips, or other vehicular parts collected from the scene may be useful in identifying the type of vehicle involved.
  - 1. In some cases, it may be possible to physically match paint chips, broken lenses, and other vehicular parts recovered at the accident scene with the vehicle.
  - 2. Collect and protect these type of items from further damage.

- D. Tools used to gain entry into buildings, cars or safes often contain traces of paint, safe insulation, wood, etc. Care must be taken that this evidence is not lost.
  - 1. Wrap the end of the tool in paper and seal with tape to prevent loss.
  - 2. Do not attempt to fit the tool into marks or impressions found at the scene.
- E. If necessary, collect the damaged area of the evidence (e.g. building door, window or safe).
  - 1. This area may contain paint for comparison to any paint on the tool or transferred from the tool. The damaged area can be used for toolmarks comparison.
  - 2. Collected items should be packaged in a manner that will preserve any toolmarks and will prevent loss of the paint.

### **5.5 Other Trace Evidence**

- A. Examples of other types of trace evidence may include, but are not limited to, Soil, Glass, Foliage, Metal, Wood, Cosmetic smears, plastic trash bags, etc.
- B. Collect and document other types of trace evidence using approved collection methods, or contact the laboratory for instruction.

## **6 Records**

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Contact Sheet of Images

## **7 Literature References and Supporting Documentation**

Goddard, K. W. 1997. Crime Scene Investigation. Reston Publishing Company, Inc.

Lee, H. C., T. Palmbach, and M. T. Miller, 2001. Henry Lee's Crime Scene Handbook. Academic Press

Forensic Science Training Unit, FBI Laboratory. Fundamental Principles and Theory of Crime Scene Photography.

Fisher, B. A. J. 2000. Techniques of Crime Scene Investigation, Sixth Edition. CRC Press.

Scientific Working Group for Materials Analysis, Trace Evidence Recovery Guidelines, Federal Bureau of Investigation, 1998.

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## CSR-03-02 GUNSHOT PRIMER RESIDUE COLLECTION

### 1 Scope

The purpose of this procedure is to obtain gunshot primer residue (GSR) samples from the hands of persons suspected of recently discharging a firearm, and clothing or surfaces that may have been near a firearm discharge. Analysis of the samples provides for the identification of GSR particles based upon morphology and composition. These particles may be deposited on the shooter's hands and surrounding surfaces in varying amounts depending on the type and caliber of the weapon and ammunition used, the environmental conditions at the time of the shooting, and the activity of the individual between the time of the shooting and time of collection.

Certain circumstances exist where the significance of GSR results is ambiguous. It is laboratory policy that samples collected under these circumstances will not be examined without proper justification and will be run at the discretion of the Laboratory.

- A. It is DPS Laboratory policy to not perform analysis for gunshot primer residue if the hand samples were collected **more than four hours after the shooting**. Any gunshot primer residue deposited on a living person as a result of the shooting will be reduced by normal activity so that after four hours no meaningful conclusion can be obtained from the analysis of the samples. The subject's clothing may be collected as an alternative to hand samples.
- B. It is DPS Laboratory policy to not perform analysis for gunshot primer residue on samples from **shooting victims**. The strength of a GSR test is to associate an individual with a firearm discharge who has not already otherwise been so associated. A shooting victim clearly has been associated with a firearm discharge, and the results of a GSR test usually cannot offer any more information than what is already known. Since more gunshot primer residue escapes from the barrel than from near the handle, the majority of both homicide and suicide victims have gunshot primer residue on their hands. Conversely, a small percentage of both homicide and suicide victims have no gunshot primer residue on their hands. Therefore, neither the presence nor the absence of gunshot primer residue on a victim's hands would provide definitive interpretation of either homicide or suicide.

### 2 Related Documents

Crime Scene Processing (CSR-01-02)

CLS Manual – Instructions for Gunshot Residue (GSR) Kit Collection

Trace Evidence SOP

### 3 Safety

Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous fluids, chemicals, weapons, and other various potential safety hazards encountered at crime scenes.

### 4 Equipment and Materials

- Commercial 2-Stub SEM-EDS GSR kit
- Individual pre-made or commercial SEM-EDS GSR stubs

## 5 Practices

### A. General Considerations

1. It is very important that proper procedure be followed when collecting GSR samples. Ideally, samples should be taken immediately upon contact with the subject.
2. The subject should not wash or wipe his hands or be fingerprinted before sampling.
3. When the cap is removed from the clear plastic vials containing the SEM stubs, the adhesive collecting surface is exposed and care must be taken to not drop the stub or contaminate the collection surface by allowing the surface to come in contact with an object other than the area that is to be sampled.
4. Heavily soiled or bloody areas should be avoided if possible.

### B. Sampling Procedure for Subject's Hands

1. Remove the stub from the package labeled RIGHT HAND or use a blank stub, being careful not to touch the stub surface.
2. While holding the vial cap, press the collecting surface of the stub on to the subject's right hand until the back and palm area around the thumb and forefinger are covered, including the web area.
3. After sampling the subject's right hand, return the cap, with metal stub, to the RIGHT HAND vial.
4. Label the vial with the case number, item number, examiner initials, and date, as appropriate. Return the stub to its package.
5. Repeat steps 1-4 for the LEFT HAND.
6. Mark all packages for identification and seal them in the kit.
7. Fill out a Gunshot Residue Kit Information Form (LAB-211) with information related to the incident. At a minimum, the following case information must be supplied to the laboratory:
  - a) *Investigating Officer/Agency*
  - b) *Agency Case Number*
  - c) *Subject's Name*
  - d) *Date and Time of Shooting*
  - e) *Date and Time Samples Collected*

### C. Sampling Procedure for Inanimate Objects

1. Clothing items and other inanimate objects that are small enough to process in the laboratory, should be packaged as-is and submitted to the laboratory for GSR collection. Document the way that the clothing item was worn to assist the analyst in determining the areas needed for processing.
2. Vehicles and other objects too large to process inside the laboratory can be processed at the scene. When possible, process the object in a location not known to present a contamination issue (such as near a firing range).

3. Sample the object by dabbing SEM stubs on each surface of interest of the object. Use as many stubs as appropriate to collect samples from each individual area of interest on the object.
4. Place the SEM stub in its plastic vial, and label the vial with the case number, item number, area sampled, examiner initials, and date, as appropriate.
5. Seal the vials in an appropriate container.

## 6 Records

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Gunshot Residue Kit Information Form (LAB-211)

Contact sheet of images

## 7 Literature References and Supporting Documentation

Gialamas, D. M., et al. 1995. Officers, their weapons and their hands: an empirical study of GSR on the hands of non-shooting police officers. *Journal of Forensic Sciences*.

Zeicher, A., et al. 1993. Collection efficiency of GSR particles from hair and hands using double-side adhesive tape. *Journal of Forensic Sciences*.

Aaron, R. W. 1991. Gunshot primer residue: the invisible clue. *FBI Law Enforcement Bulletin*.

Schwoeble, A. J., and D. L. Exline. 2000. Current methods in forensic gunshot residue analysis. CRC Press, p. 5-8.

## **CSR-03-03 COLLECTION AND PRESERVATION OF SHOE/TIRE IMPRESSION EVIDENCE**

### **1 Scope**

The purpose of this procedure is to provide guidance on the collection and preservation of impression evidence

### **2 Related Documents**

Crime Scene Processing (CSR-01-01)

Trace Evidence SOP

### **3 Safety**

Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling bio-hazardous fluids, chemicals, weapons, and other various potential safety hazards encountered at crime scenes.

### **4 Equipment and Materials**

- Photographic equipment
- Electrostatic dust print lifter kit
- Gel Lifter
- Flashlight
- Casting materials (dental stone, water)
- Butcher paper (or equivalent)
- Silicone spray, petroleum jelly, or equivalent
- Magnetic fingerprint powder and applicator
- Black ink
- Measuring device(s)
- Appropriate chemical processing reagents
- Scales

### **5 Practices**

- A. As with all evidence, overall photographs should be taken showing the general location of the impression. When possible, the direction of any impression should be documented.
- B. On hard surfaces, such as floors, doors, etc., the use of oblique light will enable the investigator to detect impressions otherwise invisible.
  1. Turn the overhead lights off.
  2. Shine a flashlight at a low angle over the floor in front of you.
  3. Impressions that are visible should be marked and photographed.
- C. Photography is a valuable way to document impressions for later comparison. It is critical that examination quality photographs be taken of each impression.
  1. The use of a tripod is recommended.

2. The photograph must include a scale and identifying information (case number, item number, etc.). The scale must be in focus and at the same depth as the impression.
  3. The camera must be oriented in such a way that it is perpendicular to the impression. If the camera is at an angle to the impression, the photograph will distort the actual size and details of the impression.
  4. Using a light source, light the impression at a low angle from several different directions. Varying the direction of the light will allow different areas of detail to be visible within the photographs.
- D. After photography, impressions in soil, snow, etc. may be cast using dental stone or its equivalent.
- E. After photography, bloody impressions can be chemically processed.
1. It is strongly recommended that every attempt be made to retrieve the original items bearing the bloody impression so that they may be processed in the laboratory.
  2. Blood chemical processing techniques include the following:
    - a) *Amido Black (non-porous surfaces)*
    - b) *Luminol*
    - c) *Leucocrystal violet*
- F. After the photography, impressions in dust can be collected using an electrostatic dust print lifter and/or gel lifter. If possible, submit the entire item bearing the impression to the laboratory. If that is not possible, the impression in dry dust or dry impressions on relatively clean surfaces may be lifted using an electrostatic dust print lifter and/or gel lifter.
- G. Known Footwear
1. The footwear of the victim, suspect and any person who entered the scene should be collected and submitted to the laboratory.
  2. Photographic documentation with a scale may be sufficient for elimination purposes.
- H. Known Tire Prints
1. Collect known test prints of the tire tread and/or wheel width measurements as necessary.
  2. Document the manufacturer, size, DOT #, position of each tire, direction of travel and one revolution, as appropriate.
  3. If necessary, after collection of the known test prints, collect the known tires to confirm any randomly acquired characteristics on the questioned impressions.
  4. The tire orientation between outside and inside tires on dual tire vehicles should be marked before they are removed.
  5. Photographic documentation of the tire tread with a scale may be sufficient for elimination purposes.

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## 6 Records

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Contact Sheet of Images

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## 04 BIOLOGY/DNA EVIDENCE

### CSR-04-01 COLLECTION AND PRESERVATION OF BIOLOGY/DNA EVIDENCE

The ability to perform successful DNA analysis on biological evidence recovered from a crime scene depends greatly on what types of samples were collected and how they were preserved. Therefore, the techniques used to collect and document such evidence, the quantity and type of evidence that should be packaged, and how the evidence should be preserved, are some of the critical points the Crime Scene Team Member must consider.

Various types of biological evidence recovered for DNA analysis at crime scenes may include blood, semen, teeth, bones, hair, saliva, skin, tissue, and other biological materials.

The following is a list of potential items from a crime scene that may contain biological evidence that DNA could be recovered from:

Bandana	Used cigarette	Hat
Bedding	Used condom	Mask
Baseball bat or similar type of weapon	Knife, or similar type weapon	Bite mark
Tools	Used drinking containers	Envelope, stamp
Clothing and laundry items	Cotton swab, facial tissue	Hair brush, cosmetics
Vehicle steering wheel	Eyeglasses	Fingernail, partial fingernail
Ligature, tape	"Through and through" bullet	Toothpick
Chewing gum	Firearm	Cell Phone

#### 1 Related Documents

DNA SOP

#### 2 Safety

- A. All biological stains should be treated as potentially hazardous. These samples could potentially expose the handler to HIV, Hepatitis B, or other pathogens. To protect the Crime Scene Team Member and the integrity of the evidence, wear the proper personal protective equipment.
- B. Refer to the DPS Crime Laboratory Safety Manual for additional information regarding the proper universal precautions to be followed when handling biological evidence and other potential safety hazards encountered at crime scenes.

#### 3 Equipment and Materials

- Tweezers, scissors and scalpels
- Cotton swabs/cotton gauze
- Kimwipes/paper towels
- Weigh paper
- Distilled water
- Presumptive Reagents including positive and negative controls as needed

- Decontaminate
- Alternate light source
- Face Mask
- Measuring device(s)

## **4 Practices**

### **4.1 Collection and Preservation methods**

The two main methods for collecting potential DNA evidence are collecting the stained item directly or removing the stain onto a more suitable or easier to handle substrate.

#### **A. General Considerations**

1. When collecting potential DNA evidence, wear gloves and change them often while processing the scene.
2. The use of a face mask is required when collecting potential DNA evidence and is recommended for others in the area.
3. Use disposable instruments or clean them thoroughly before and after each sample is collected.
4. Avoid touching any area where DNA might exist and avoid talking, sneezing, or coughing over the evidence.
5. Avoid touching one's own nose, mouth, and face when collecting and packaging the evidence.

#### **B. Direct Collection**

1. Collecting the item directly is the most preferred method because there is less chance of sample loss or contamination.
2. The item is picked up and placed directly into a suitable container and packaged.

#### **C. Stain Removal**

1. The stain can be removed from an unsuitable substrate and placed on a more suitable substrate by taking a sterile cotton swab with sterile distilled water and swab the item. Let the sample air dry in a controlled environment and package.
2. When collecting wet stains from fabrics such as car seats and bedding, swab or cut out the questioned stain, air dry, and package.

#### **D. Documentation and Preservation of Blood Spatter Patterns**

1. Potential blood spatter patterns should be photographed with a scale.
2. The relative location of the blood spatter pattern within the scene should be recorded.
3. If a portion of the blood spatter pattern is collected, a representative sample should be collected
4. Chemical processing techniques may be necessary for additional documentation of the patterns observed.

## **5 Records**

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Contact Sheet of Images

## **6 Literature References and Supporting Documentation**

Rudin, N., and K. Inman, 2002. An Introduction to Forensic DNA Analysis, Second Edition. CRC Press.

Butler, J. M., 2001. Forensic DNA Typing-Biology & Technology Behind STR Markers. Academic Press.

Lee, H. C., R. E. Gaensslen, D. Bigbee, and J. J. Kearney. Guidelines for the Collection and Preservation of DNA Evidence. FBI, U.S. Department of Justice.

FBI, 1999. FBI Handbook of Forensic Services

NIJ Journal, Issue No. 249.

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## 05 FRICTION RIDGE EVIDENCE

### CSR-05-01 COLLECTION AND PRESERVATION OF FRICTION RIDGE EVIDENCE

#### 1 Scope

Evidence should be handled as little as possible prior to processing. Conduct search for friction ridge evidence in a logical manner using a light source at various angles throughout the scene. Latent prints often require a development technique to make them visible so they can be preserved for examination.

#### 2 Related Documents

Friction Ridge SOP

#### 3 Safety

Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous fluids, chemicals, weapons, and other various potential safety hazards encountered at crime scenes.

#### 4 Equipment and Materials

- Photographic equipment
- Lift Cards
- Gel Lifter
- Flashlight
- Various Powders
- Brushes/ magnetic applicators
- Magnifier
- Black Ink
- Fingerprint Cards
- Lift tape
- Alternate light source
- Appropriate chemical processing reagents
- Scales

#### 5 Practices

##### 5.1 Evidence Collection

- A. As with all evidence, overall photographs should be taken showing the general location of the latent print impression.
- B. The use of oblique and direct light will enable the Crime Scene Team Member to detect latent print impressions otherwise invisible. Latent print impressions that are visible should be marked and photographed.

- C. Photography is a valuable way to document latent print impressions for later comparison. It is critical that examination quality photographs be taken of each latent print impression :
1. The use of a tripod is recommended.
  2. At least one photograph of each latent print impression must include identifying information (case number, item number, etc.) All photographs must contain a portion of the scale that is in focus.
  3. The camera should be perpendicular to the latent print impression. If the camera is at an angle to the latent print impression, the photograph will distort the actual size and details of the latent print impression.
  4. Varying the direction of the light will allow different areas of detail to be visible within the photographs.
- D. After photography:
1. Latent print impressions in dust can be collected using a gel lifter.
  2. Latent print impressions not in dust can be powdered.
  3. Bloody latent print impressions can be chemically processed.
    - a) *It is strongly recommended that every attempt be made to retrieve the original items bearing the bloody latent print impression so that they may be processed in the laboratory.*
    - b) *Blood chemical processing techniques include the following:*
      - i. *Amido Black (non-porous surfaces)*
      - ii. *Leucocrystal violet*
    - c) *Latent prints visualized after processing should be photographed and collected.*

## 5.2 Processing Considerations

Items that are wet should be allowed to dry prior to processing.

## 5.3 Evidence Documentation

Any lift card shall include the following information:

- Case number
- Initials of examiner
- Date
- Location of lift
- Diagram showing location of the lift
- An arrow indicating orientation of lift, if applicable
- Unique Identifier

## 6 Records

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Contact sheet of images

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## 7 Literature References and Supporting Documentation

DPS Crime Laboratory Service Manual

Scott's Fingerprint Mechanics, Robert D. Olsen, Sr., 1978, by Charles C. Thomas

Advances in Fingerprint Technology, Henry C. Lee & R.E. Gaensslen, 1994 by CRC Press

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## 06 FIREARMS & TOOLMARKS EVIDENCE

### CSR-06-01 COLLECTION AND PRESERVATION OF FIREARMS EVIDENCE

#### 1 Scope

The collection, preservation, and proper documentation of firearm and toolmark evidence at a crime scene is important to ensure proper analysis and conclusions. Care should be taken to render safe any firearm found at a crime scene, properly document the condition of the firearm, and document and collect any fired evidence at the scene.

The collection of firearms is not dangerous if handled correctly and treated with respect. Quite often, loaded firearms are present at crime scenes and must be handled in a careful manner, but **ALL FIREARMS MUST BE TREATED AS THOUGH THEY ARE LOADED**. This rule cannot be over stressed and must be followed at all times, whether it is at the crime scene, during transport to the laboratory, or later during examination and analysis in the laboratory. The only way to prevent accidents is to practice safety at all times.

#### 2 Related Documents

Crime Scene Processing (CSR-01-02)

Firearms and Toolmarks SOP

Safety Manual – Firearm Safety

#### 3 Safety

- A. **TREAT ALL FIREARMS AS IF THEY ARE LOADED.**
- B. Render all firearms safe. If necessary the firearm may be rendered safe with the assistance of trained personnel.
- C. Never put anything down the barrel or in the trigger guard.
- D. Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous fluids, chemicals, weapons, and other various potential safety hazards encountered at crime scenes.

#### 4 Equipment and Materials

While required equipment may vary by incident, case circumstances, offense types, and participating disciplines, the following list provides some guidance to general equipment that may be needed by a crime scene response team.

- Pistol and rifle boxes
- Ziploc bags of various sizes
- Plastic containers or pvc pipe
- Plastic zip ties
- Casting material (e.g. Mikrosil, Forensicsil)
- WD-40 or equivalent
- Small diameter non-metallic dowel rod, such as wood, to check loaded condition of firearms that are unable to be opened

## 5 Practices

### 5.1 Firearms

1. Prior to checking the condition of the firearm, photograph or sketch the weapon in place.
2. Document the following (if possible most of the documentation should be done at the lab, so as not to disturb any evidence on the firearm)
  - a) *Make*
  - b) *Model*
  - c) *Caliber*
  - d) *Serial number*
  - e) *Loaded/unloaded and position of fired/unfired cartridge*
  - f) *Hammer cocked/uncocked*
  - g) *Safety on or off*
  - h) *Magazine inserted*
  - i) *Mark top position on cylinder with a permanent marker on top or back*
  - j) *Any other relevant information*
3. Render the firearm safe (refer to the *Firearm Safety* chapter of the Safety Manual) with consideration for friction ridge, biological, and trace evidence.
  - a) *Do not attempt to collect trace evidence unless the potential for loss is great.*
  - b) *Do not process firearm for latent prints at the scene (accomplished at the laboratory).*
4. Have qualified/trained personnel unload the firearm (utilize law enforcement personnel if necessary).
5. If the firearm is unable to be safely unloaded at the scene,
  - a) *render the firearm incapable of firing. This may be done in a number of ways:*
    - i. *Insert a barrier between the hammer and the firing pin, such as a pencil, and secure such.*
    - ii. *Other possibilities would include plastic ties or other objects inserted through the action of the firearm.*
  - b) *it must be noted boldly on the outside packaging, and the direction of the barrel must be shown.*
6. Place in a cardboard box or another appropriate container.
7. If possible, secure the weapon in the box to prevent movement; for instance, use plastic zip ties
8. Package the item for transit to the lab.
9. Label box with:
  - a) *Lab #*
  - b) *Item #*

- c) *Collector's initials*
- d) *Date*
- e) *If the firearm cannot be safely unloaded, use an arrow to mark the box indicating which way the muzzle is pointing*

## 5.2 Other Firearms Evidence

This includes fired bullets, cartridge cases, and ammunition.

1. Document location
2. Package in a Ziploc bag or other suitable container (i.e. paper bag, if the items may contain biological material)
3. Label packaging with:
  - a) *Lab #*
  - b) *Item #*
  - c) *Collector's initials*
  - d) *Date*
  - e) *Description of evidence*

## 5.3 Rusty Firearms and Firearms in Water

Rusty firearms or those found in water, etc., may be collected at crime scenes. Immediate attention must be given to prevent further damage to the firearm, with consideration for trace evidence.

1. Examine for trace evidence and collect, if deemed necessary.
2. Render the firearm safe, if possible.
3. Rusty firearm – If possible, the firearm should be thoroughly sprayed with a water-displacing product, such as WD-40, to prevent further deterioration.
4. Firearm in water – The firearm should be placed in a container of the water or other substance in which it was recovered. If this is not practical, then the firearm should be dried and then thoroughly sprayed with a water-displacing product, such as WD-40, to prevent further deterioration.

## 5.4 Distance Determination

- A. If a distance determination is needed based upon deposition of gunshot residue or shot pellet pattern, the evidence should be collected, packaged separate from the firearm and ammunition components, and transported to the lab for analysis.
- B. Caution should be used when tape lifting areas where distance determination may be requested.
- C. If based upon a shot pellet pattern and not practical to transport to the laboratory, the maximum width and length of the pattern should be documented and photographed with a scale.

## 5.5 Trajectory

Trajectory analysis should be done only by a qualified Firearms Examiner.

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## 6 Records

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Contact sheet of images

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## CSR-06-02 COLLECTION AND PRESERVATION OF TOOLS AND TOOLMARK EVIDENCE

### 1 Scope

The collection, preservation, and proper documentation of suspect tools and toolmark evidence at a crime scene is important to ensure proper analysis and conclusions.

### 2 Related Documents

Crime Scene Processing (CSR-01-02)

Firearms and Toolmarks SOP

### 3 Safety

Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous fluids, chemicals, weapons, and other various potential safety hazards encountered at crime scenes.

### 4 Equipment

While required equipment may vary by incident, case circumstances, offense types, and participating disciplines the following list provides some guidance to general equipment that may be needed by a crime scene response team.

- Pistol and rifle boxes
- Ziploc bags of various sizes
- Plastic zip ties
- Casting material (e.g. Mikrosil, Forensicsil)

### 5 Practices

#### 5.1 Tools

- A. Tools recovered during a crime scene investigation may contain trace evidence, DNA or latent prints. This foreign material may be in the form of blood, tissue, plaster, paint, hairs, fibers, glass, etc.
- B. Crime scene personnel should determine the need to collect this foreign material at the crime scene, or if the tool can be transported back to the lab for later collection.
  1. Document location and condition of tool.
  2. Package tool in such a manner to protect and preserve the tool cutting surfaces.
  3. Label the packaging with:
    - a) *Lab #*
    - b) *Item #*
    - c) *Collector's initials*
    - d) *Date*
    - e) *Description of evidence*

## 5.2 Toolmarks

In order to compare toolmarks with suspect tools, it is necessary to document, collect and preserve the toolmarks found at the crime scene.

1. Document the location of the toolmark, including orientation (up/down). If possible, a scaled photograph should be taken.
2. If possible, the underlying material (substrate) should be collected in a way to preserve the integrity of the toolmark.
3. If the underlying material is unable to be collected, the use of a casting material such as Mikrosil may be used to “collect” the toolmark. Again, the orientation of the toolmark should be documented, if possible.

## 6 Records

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Contact sheet of images

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## 07 DIGITAL/MULTIMEDIA EVIDENCE

### CSR-07-01 COLLECTION AND PRESERVATION OF DIGITAL/MULTIMEDIA EVIDENCE

#### 1 Scope

This procedure outlines the general processing of a crime scene and preservation of digital/multimedia evidence.

#### 1 Related Documents

Crime Scene Processing (CSR-01-02)

Digital/Multimedia SOP

#### 2 Safety

- A. Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous fluids, chemicals, weapons, and other various potential safety hazards encountered at crime scenes.
- B. Be aware of the potential of electrical shock.

#### 3 Equipment and Materials

- A. While required equipment may vary by incident, case circumstances, offense types, and participating disciplines, general equipment that may be needed by a crime scene response team are found in CSR 01-02.
- B. **DO NOT PACKAGE ITEMS IN MATERIAL THAT MAY CAUSE STATIC CHARGE (e.g., PLASTIC BAGS, FOIL AND STYROFOAM).**

#### 4 Practices

**Note:** The computer or other digital evidence should not be processed at the scene.

##### 4.1 Computers and Digital Video Recorders

1. If the device is on, photograph the active screen without touching any keys on the keyboard or clicking the mouse before power is terminated.
2. If the device is on but the monitor appears to be in sleep mode, bump the mouse (do not click) to wake the monitor up, then photograph what appears on the screen.
3. Check to see if the computer is encrypted or networked.
  - a) *Note the displayed time on the digital video recorders in relation to actual time.*
  - b) *Unplug the power cord from the back of the device (not the wall).*
  - c) *For laptops, hold the power button down until the computer shuts down. You may remove the laptop battery for good measure and to ensure the laptop turns off, however, be sure to package the laptop and battery together.*
  - d) *Do not do a normal shutdown.*
4. Photograph or document with diagrams the front and back of the device to include the power cable, monitor, printer and other accessory port connections.

5. If the device is off, or after unplugging power to a device that was on, disconnect power cables and any other cables from the back of the device.
6. Package all items in an oversized evidence bag or appropriately sized box to seal all electronic media.
7. Collect any documentation in close proximity to the device that may contain password and/or other account information, i.e., post-it notes containing writing or notebooks which may contain user information.
8. If collecting a laptop, also collect the laptop carrying case or briefcase that may contain power cords or additional accessories and/or digital media.
9. Computers and digital media collected for evidence analysis should never be transported in close proximity to electromagnetic radio, i.e., police car radios.

#### 4.2 Cell phones and PDAs

1. If the device is on and locked, photograph and document what appears on the screen.
  - a) *Put the device in airplane mode (if possible) and document on the Evidence Recovery Log.*
  - b) *Turn the device off. Keep the device turned off.*
2. If the device is on and unlocked, navigate through the settings and disable the passcode (if possible).
  - a) *Put the device in airplane mode (if possible) and document on the Evidence Recovery Log.*
  - b) *Turn the device off. Keep the device turned off.*
3. Document the date and time the device was turned off.
4. If the device is off, DO NOT power it on.
5. Remove the battery (if possible) to ensure the device turns off. Be sure to package the device and battery together.
6. Do not remove SIM cards or SD cards from mobile devices.
7. Collect any data cables or power cords associated with the device and package as any other computer equipment.
8. Digital media collected for evidence analysis should never be transported in close proximity to electromagnetic radio, i.e., police car radios.

#### 4.3 Other Devices

- A. In addition to computers, collect any other devices which may store digital media such as USB thumb drives, digital cameras and memory cards, floppy disks, external hard drives, and CD/DVDs.
- B. Be aware that digital evidence may be stored on unusual devices such as writing pens and pocket knives with USB connectivity.

## 6 Records

Consent to Search form or Search Warrant for electronic media  
Crime Scene Response Reporting Form (LAB-CSR-01)

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Crime Scene Sketch Form (LAB-CSR-02)

Evidence Recovery Log (LAB-CSR-03)

Contact sheet of images

## **7 Literature References and Supporting Documentation**

*Electronic Crime Scene Investigation*; USDOJ, Technical Working Group for Electronic Crime Scene Investigation; July 2001

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## 08 FORENSIC DOCUMENT EXAMINATION EVIDENCE

### CSR-08-01 COLLECTION AND PRESERVATION OF FORENSIC DOCUMENT EXAMINATION EVIDENCE

#### 1 Scope

This procedure outlines the general processing of crime scenes for collection of evidence items related to forensic document examinations and comparisons.

#### 2 Related Documents

Crime Scene Processing (CSR-01-02)

Forensic Document Examination SOP

#### 3 Safety

Refer to the DPS Crime Laboratory Safety Manual for the proper universal safety precautions to be followed when handling biohazardous fluids, chemicals, weapons, and other various potential safety hazards encountered at crime scenes.

#### 4 Equipment and Materials

While required equipment may vary by incident, case circumstances, offense types, and participating disciplines general equipment that may be needed by a crime scene response team can be found in CSR 01-02.

#### 5 Practices

Do not write on evidence items. For identification purposes place initials, date, item number, and laboratory case number on the evidence container PRIOR to placing evidence into the container.

##### 5.1 Handwriting

1. Collect questioned handwritten documents appearing to contain information relating to crime(s). Preserve handwritten documents for latent writing impression and latent prints.
2. Collect samples of course-of-business known writing of subject(s).
3. Collect blank documents for ESDA processing and/or physical match in laboratory (e.g. spiral notebooks, legal pads, remnants of cut or torn sheets) that are of same size and format as questioned document.

##### 5.2 Writing Instruments

Collect any writing instruments that may have been used in production of a questioned handwritten document.

##### 5.3 Photocopy Machine

1. Collect photocopy machine(s) suspected of having been used to produce questioned document(s).
2. If photocopy machine(s) cannot be submitted to laboratory, call the DPS Austin Lab Forensic Document Examination section for instructions regarding sampling process.

#### **5.4 Typewriters / Typewriter Ribbons / Typewriter Print Elements**

1. Collect typewriter (machine). DO NOT TYPEWRITE on evidence machine. Collect machine with installed ribbon and print device both intact inside typewriter.
2. If typewriter (machine) cannot be submitted to laboratory, call the DPS Austin Lab Forensic Document Examination section for instructions regarding sampling process.

#### **5.5 Envelopes**

Collect known envelopes of same size and format as questioned envelopes.

#### **5.6 Rubber Stamps**

1. Collect rubber stamps or seal impression devices.
2. Protect and DO NOT clean the impression face of the rubber stamp.

#### **5.7 Counterfeit Documents**

1. Collect any suspected counterfeit documents.
2. Collect any documents suspected as having been used as models to produce counterfeit documents.
3. Collect any mechanical equipment suspected as having been used to produce counterfeit documents.
4. Collect any offset printing plates or art work (camera-ready copy) suspected as having been used to produce counterfeit documents.

#### **5.8 Charred Documents**

1. If possible, the preferred method of preservation of the charred evidence is to package and collect in the container in which it was found. Do not transfer documents to another container.
2. If it is not possible to collect the evidence in the container in which it was found, place the evidence in a rigid container.
  - a) *Use light padding (e.g. cotton) as necessary to prevent shifting.*
  - b) *Label the container as containing fragile evidence and "THIS SIDE UP ↑".*

### **6 Records**

Crime Scene Response Reporting Form (LAB-CSR-01)

Crime Scene Sketch Form (LAB-CSR-02)

Evidence Log (LAB-CSR-03)

Contact sheet of images

### **7 Literature References and Supporting Documentation**

Scientific Working Group – Documents; FBI Laboratory

## 09 DETECTION AND ENHANCEMENT TECHNIQUES

### CSR-09-01 ENHANCEMENT OF IMPRESSIONS/FRICTION RIDGES BY AMIDO BLACK

#### 1 Scope

Amido Black is a protein stain that will react with blood to produce a dark blue-black color. This staining may cause a latent bloody impression/friction ridges to become visible and provide additional characteristics for comparison purposes.

It is strongly recommended that every attempt be made to retrieve the original items bearing the bloody impression/friction ridges so that they may be treated in the laboratory.

#### 2 Specifications

Amido Black-Methanol Based solution

Amido Black-Aqueous Based solution

Amido Black Rinse solution

#### 3 Related Documents

CLS Manual – Laboratory Equipment, *Laboratory-Prepared Reagents* section

#### 4 Safety

- A. Standard laboratory precautions
- B. Biohazard precautions, if applicable
- C. Good ventilation

#### 5 Equipment and Materials

- Balance
- Graduated cylinders
- Bottles
- Trays of miscellaneous sizes
- Wash bottle
- Amido Black (also known as Amido 10B or Naphthalene Black)
- Glacial Acetic Acid
- Methanol
- 5-Sulfosalicylic Acid
- Distilled water

#### 6 Standards, Controls, and Calibration

Known bloodstain

## 7 Procedure

### 7.1 Solution Preparation

#### A. Amido Black-Methanol Based solution

1. Mix 100 mL Glacial Acetic Acid with 900 mL Methanol in a 2 L bottle.
2. Dissolve 2 g Amido Black in the solution.

#### B. Amido Black-Aqueous Based solution

Dissolve 2 g Amido Black and 20 g 5-Sulfosalicylic Acid in 1 L distilled water.

#### C. Amido Black Rinse solution

Mix 100 mL Glacial Acetic Acid with 900 mL Methanol.

#### D. An existing preparation of Amido Black from the laboratory can be used.

#### E. Use the working solution with a known blood standard and follow the application procedure below in order to performance check.

### 7.2 Application

1. Examination quality photographs of the impression/friction ridges are taken before any enhancement is attempted.
2. Demonstrate that the Amido Black solution is working properly by testing a known bloodstain for a positive blue result. Document the results.
3. Test a small area of the item with the Amido Black-Methanol Based solution, away from the impression, to check for background staining and/or distortion. Document the results:
  - a) *If the background staining can be rinsed away by the Rinse solution, and if the paint on the item does not distort, proceed with the Amido Black-Methanol Based solution.*
  - b) *If background staining cannot be rinsed away by the Rinse solution, or if the paint on the item distorts, test another small area with the Amido Black-Aqueous Based solution.*
  - c) *If background staining cannot be rinsed away by water, use a different enhancement technique.*
4. Apply the selected Amido Black solution to the impression/friction ridges by immersion or by direct application. Keep the impression/friction ridges wet with the Amido Black solution until the impression/friction ridges fully develops (approximately 3 minutes).
5. Rinse the specimen thoroughly, using the Rinse solution for the Amido Black-Methanol Based solution or water for the Amido Black-Aqueous Based solution.
6. When dry, examination quality photographs of the enhanced impression/friction ridges are taken.

## 8 Testing, Storage, Expiration, and Disposal

Refer to the *Laboratory Equipment* chapter of the CLS Manual for additional requirements.

- A. Testing is addressed in the Procedure section
- B. Minimum labeling includes reagent name, initials, and date prepared.
- C. Store in a sealed bottle at room temperature.
- D. Discontinue use if performance check fails

## 9 Literature References and Supporting Documentation

Bodziak, William J., *Footwear Impression Evidence*, CRC Press, 1999.

Cassidy, Michael, *Footwear Identification*, Royal Canadian Mounted Police, 1980.

McDonald, Peter, *Tire Imprint Evidence*, CRC Press, 1993.

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## CSR-09-02 DETECTION OF BLOOD BY LUMINOL

### 1 Scope

Luminol is used to detect latent bloodstain patterns, footwear impressions, and latent prints. Luminol undergoes a catalytic reaction by the heme group of hemoglobin to produce luminescence. It is of sufficient sensitivity to luminesce in the presence of blood concentrations that are far more dilute than could be visually detected.

### 2 Safety

- A. Standard laboratory precautions
- B. Biohazard precautions
- C. Gloves, dust mask, and eye goggles

### 3 Related Documents

CLS Manual – Laboratory Equipment, *Laboratory-Prepared Reagents* section

### 4 Equipment and Materials

- Graduated cylinder, 250 mL
- Balance to weigh 0.5-25 g
- Beakers, 500 mL
- Sodium carbonate
- Sodium perborate
- 3% H<sub>2</sub>O<sub>2</sub>
- Luminol (3-aminophthalhydrazide; 5-amino-2,3-dihydro-1,4-phthalazinedione sodium)
- Deionized water
- Spray bottle (plastic fittings are preferred)

### 5 Standards, Controls, and Calibration

- A. A known bloodstain is used to demonstrate the luminol will properly luminesce with the blood.
- B. A ruler with fine copper wire spaced at one inch intervals can be used as a photographic scale.

### 6 Procedure

#### 6.1 Solution Preparation

- A. General Considerations
  - 1. The prepared reagents are unstable and must be prepared fresh immediately before use.
  - 2. The components can be measured for transport to the crime scene for preparation prior to use.
    - a) *Reagents A and B can be stored separately at 2-8°C for up to 8 weeks.*
    - b) *If stored, the label must include at a minimum, "Luminol, Reagent A" or "Luminol, Reagent B" as appropriate, initials, and the date prepared.*

3. Refer to the *Laboratory Equipment* chapter of the CLS Manual for additional requirements.

B. Method 1

1. Reagent A

- a) Dissolve 25 g sodium carbonate in 250 mL water.
- b) Dissolve 0.5 g luminol in the solution.

2. Reagent B

Dissolve 3.5 g sodium perborate in 250 mL water.

3. Luminol solution

Immediately prior to use, prepare and mix equal volumes of Reagent A and Reagent B. This mixture is stable for approximately one hour.

C. Method 2

1. Reagent A

- a) Dissolve 25 g sodium carbonate in 450 mL water.
- b) Dissolve 0.5 g luminol in the solution.

2. Reagent B

Combine 50 mL 3% H<sub>2</sub>O<sub>2</sub> and 45 mL water.

3. Luminol solution

Immediately prior to use, prepare and mix equal volumes of Reagent A and Reagent B. This mixture is stable for approximately one hour.

## 6.2 Examination

1. In near total darkness and after the eyes have become adjusted, spray a known bloodstain and observe for luminescence to ensure that the luminol formulation is working properly. Document the results.
2. Lightly spray the luminol solution on the items or areas to be examined for possible bloody impressions.
3. Photodocument any luminescent patterns, including a scale for reference.
4. Mark areas of possible impressions which may be enhanced with other techniques.

## 7 Literature References and Supporting Documentation

Bodziak, William J., *Footwear Impression Evidence*, CRC Press, 1999.

Lytle, L.T., "Chemiluminescence in the Visualization of Forensic Bloodstains", *Journal of Forensic Sciences*, 1978, 23(3), 550-562.

## **CSR-09-03 ENHANCEMENT OF IMPRESSIONS/FRICTION RIDGES BY LEUCOCRYSTAL VIOLET**

### **1 Scope**

Leucocrystal Violet (LCV) and hydrogen peroxide react with hemoglobin or its derivatives to produce a violet color. This staining may cause a latent bloody impression/friction ridges to become visible and provide additional characteristics for comparison purposes.

It is strongly recommended that every attempt be made to retrieve the original items bearing the bloody impression/friction ridges so that they may be treated in the laboratory.

Any developed impressions/friction ridges must be photographed as soon as possible because photoionization may occur, resulting in unwanted background development.

Amido black can be used after treatment with LCV to increase the contrast.

### **2 Specifications**

Leucocrystal Violet Solution

### **3 Related Documents**

CLS Manual – Laboratory Equipment, *Laboratory-Prepared Reagents* section

### **4 Safety**

- A. Standard laboratory precautions
- B. Biohazard precautions, if applicable
- C. Good ventilation

### **5 Equipment and Materials**

- Spray Bottle
- Weighing balance
- Graduated cylinder
- Light sensitive storage bottle
- Hydrogen Peroxide 3%
- 5-sulfosalicylic acid
- Sodium acetate
- Leucocrystal violet

### **6 Standards, Controls, and Calibration**

Known bloodstain

## 7 Procedures

### 7.1 Solution Preparation

Leucocrystal Violet Solution is made fresh for each use

1. Combine chemicals in the following order in a light sensitive storage bottle.
  - a) 1000 mL Hydrogen Peroxide 3%
  - b) 20 g 5-sulfosalicylic acid
  - c) 7.4 g Sodium acetate
  - d) 2 g Leucocrystal violet
2. Place bottle on stirring device for approximately 30 minutes.

### 7.2 Application

- A. Examination quality photographs of the impression/friction ridges are taken before any enhancement is attempted.
- B. Demonstrate that the Leucocrystal violet solution is working properly by testing a known bloodstain for a positive violet result. Document the results.
- C. Test a small area of the item with the Leucocrystal Violet, away from the impression, to check for background staining and/or distortion.
  1. Document results.
  2. If background staining occurs, a different chemical enhancement method should be considered.
- D. Spray the bloody impression/friction ridges with the Leucocrystal Violet solution using the finest mist possible. The development should occur within 30 seconds.
- E. If necessary, blot the area with a tissue or paper towel. When the area is dry, the preceding step can be repeated to possibly improve contrast.
- F. Photograph the enhanced impression/friction ridges as soon as possible to avoid background staining due to photoionization. Photographs must be examination quality.

## 8 Literature References and Supporting Documentation

*Processing Guide for Developing Latent Prints*. Federal Bureau of Investigation. 2000.

Bodziak WJ. *Footwear Impression Evidence*. CRC Press, 1999.

## 10 FORMS

### DIRECTORY OF FORMS

	Document Name	FRN
1	Crime Scene Response Reporting Form	<a href="#">LAB-CSR-01</a>
2	Crime Scene Sketch Form	<a href="#">LAB-CSR-02</a>
3	Evidence Recovery Log	<a href="#">LAB-CSR-03</a>
4	Crime Scene Response Technical Review Checklist	<a href="#">LAB-CSR-07</a>

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