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## Section 1: Introduction

For the purposes of this manual, a crime scene may be defined as an area, object, or person, from which evidence is identified, documented, collected and/or processed. A crime scene may be the actual location where a crime took place or a secondary location such as a car or dwelling or any other object which may yield physical material of value to the case. Locations of a crime scene may include offsite locations not under the laboratory's control.

It is recognized that all crime scenes are unique and requires crime scene analysts to continuously evaluate how to proceed with processing in a manner that is safe and best preserves the evidence. All decisions made by crime scene analysts before, during, and after a scene is processed should consider legal considerations, personnel safety, scientific reliability and validity, preserving context, maintaining evidence integrity, transparency, and managing bias. Because of this, it is not our intention to detail a specific list of procedures to be used at every crime scene. Instead, the goal is to provide a framework of available procedures which may be utilized for the processing of a crime scene.

The purpose of these guidelines is to ensure that all crime scenes are documented properly, and physical evidence is detected and collected using appropriate methods. Crime Scene Analysts shall conduct themselves with the expectation that their work may be used in every step of the legal process. Crime Scene analysts should refrain from performing tasks for which they are not qualified, based on training, education, and experience.

One of the most important duties at a crime scene is the collection of physical evidence. It is neither practical nor desirable to collect everything at a crime scene and it is the responsibility of the Forensic Scientist or Forensic Technician to understand the probative value of evidence to recover physical material of potential forensic relevance.

The overall approach to the collection of evidence should be systematic, objective, and thorough. Coordinate with the reporting officer or lead investigator on what needs to get done and how to proceed. Collecting evidence should begin after thorough documentation has been completed when possible. All efforts are made to collect probative evidence, and representative sampling is left at the discretion of the responder. Each item of evidence collected should maintain evidence integrity by preventing contamination, tampering, alteration, or loss of evidence and from being damaged during transport. In most circumstances, all evidence will be left in the custody of the officer in charge of the scene. The disposition of evidence will be documented in the Analysts notes.

When evidence is collected by the Forensic Scientist or Forensic Technician, it will be placed in an appropriate container and marked with the following:

- Lab or agency number, Item or placard number, Item Description, Location, Date and Initials

Note: The container utilized at the scene may be a temporary container.

**Proficiency Testing:** All fully trained Crime Scene analysts will participate in yearly proficiency testing.

**Performance Monitoring:** In order to monitor the breadth of processes routinely seen at a crime scene and in addition to yearly proficiency testing in Scene Investigation, each competent Forensic Scientist or Forensic Technician in the discipline will undergo additional performance monitoring activities once per accreditation cycle from the following:

- Direct Observation of a Crime Scene
- Internal proficiency testing

If a Forensic Scientist or Forensic Technician instructs a Crime Scene Processing / Advanced Crime Scene Processing Course or successfully completes any of the International Association for Identification Crime Scene Certification or Recertification tests, it will be in lieu of the additional internal scene investigation proficiency test for that accreditation cycle.

**Reference Documents** can be found on the laboratory [SharePoint document library](#).

## Section 2: Call Out and Travel Procedures

Crime scene processing is an analysis performed in the physical discipline. The intent of the service is to aid law enforcement agencies with non-routine detection, enhancement, and recovery methods at major crime scenes. Forensic Scientists or Forensic Technicians that are proficient in crime scenes will communicate with law enforcement to determine if attendance is necessary. To ensure appropriate use of resources non-major crime scene attendance is at the discretion of the Physical Discipline Supervisor or Crime Scene Technical Lead. In instances where expertise is required then assistance will be rendered. Where travel is required all relevant state policy (such as time accounting and travel) shall be followed.

It is the sole responsibility of the requesting agency to evaluate and secure the scene before the arrival of the Forensic Scientist or Forensic Technician. The requesting agency is also solely responsible for maintaining the integrity and security of the scene, and to provide safety of laboratory personnel throughout the entire investigation. The search warrant is the responsibility of the investigating agency and/or scene officer. It is common to have an incident briefing by the requesting agency before processing begins. A lead investigator or case officer will be identified to field questions, provide direction, and maintain responsibility of the scene.

Upon arrival to the incident location, a secure and safe pathway into and away from the scene should be selected. If possible, establish a safe zone away from the scene where equipment and evidence may be placed while the scene is being processed.

All crime scene analysts will keep a folder on their laboratory issued computer desktop containing current copies of the crime scene procedure manual and documentation forms in the event there is no internet service at the scene location.

**Call Logs:** Calls regarding crime scene response or consultations from trained crime scene Analysts shall be logged with at minimum the date, who called, and the request. It is the responsibility of the Analyst who received the call to update the log within a timely manner.

The call log is stored in the laboratory [SharePoint document library](#).

### Section 3: Documentation

**LaunchPad** is an automated note-taking document written in Adobe Acrobat PDF. The document was created by the Alaska Scientific Crime Detection Laboratory (ASCDL) staff to contemporaneously document a crime scene. The form is continually being updated and revised; the most current version approved for use is controlled by the Quality Assurance Manager and located on the laboratory SharePoint document library. See [Appendix A](#) for LaunchPad Work Instructions.

Crime Scene Analysts will complete notes and reporting in LaunchPad. Once complete, all pages will be exported and saved as JPG file format, named with "CSI + Page Number" prefix and uploaded to LIMS under the Attachments Request Type.

#### Notes:

Notes may be recorded in ink, pencil may be used if cold weather prevents the use of an ink pen. When utilized, all written notes will be scanned as an attachment in the LaunchPad document.

The analyst's notes will include the following information:

- Start and end dates for the crime scene
- Page numbers
- Agency name, agency case number and laboratory case number
- Name of the requesting officer/investigator and type of request
- Location and description of the crime scene
- Name of the officer or investigator that was provided a copy of the photos
- Name of the officer or investigator who took custody of scene evidence
- Chemicals used, if any, including lot number, expiration date, and control test results

The evidence list and photo log summarize all evidence documented at the scene. Items that were given a designation or unique identifier will be recorded on the evidence list and include a brief description and location. "Photos only" will be recorded on the evidence list if the item was photographed but not collected. Evidence items which are only photographed and not collected or photographed and collected but not packaged by the Forensic Scientist or Forensic Technician will be documented in the notes.

Information provided to the crime scene analyst should be objectively documented and continuously evaluated within the context of the evidence. The crime scene analysts should remain open to all hypotheses and potential evidence.

#### Vehicle Processing

Vehicles should be processed in a secure garage or other indoor location but may be processed in other locations depending on circumstances. The following information should be recorded in the notes:

- Make, Model, Vehicle Identification Number (VIN), License plate number of vehicle
- Tire Information (if applicable): Department of Transportation (DOT) number, make, model, and size
- Any damage observed on arrival and departure (if applicable)

#### Reviews:

All Technical and Administrative reviews will be documented within LIMS. All original and corrected version(s) of the analysts' original observations are stored in LIMS. Any changes to be made by the original analyst will be noted in the "Reject Findings" reviewer box. Rejected data is retained in the technical record through LIMS Audit Trail or the attachments.

#### Technical Records:

Technical records relating to the Crime Scene discipline are stored at the laboratory either in the LIMS, or in the Digital Asset Management System (ADAMS). Original and corrected data will be maintained in LIMS.

## Section 4: Software

### **Laboratory Information Management System (LIMS)**

This system houses evidence tracking, chain of custody, case assignment and reporting among other features. Crime Scene Analysts will complete notes and reporting in LaunchPad and upload the final documentation into LIMS, which will serve as the permanent record. The current LIMS manual can be found on the laboratory SharePoint document library.

The requesting agency will receive a report and the LaunchPad document that will include a summary of processing after a technical and administrative review is complete. The requesting agency should receive this in a timely manner of one to two weeks.

### **Authenticated Digital Asset Management System (ADAMS)**

ADAMS is a digital asset software program made by FORAY Technologies. ADAMS serves as the repository for digital images taken during casework for the Physical Discipline (including: Latent Prints, Crime Scene, Firearms and Footwear). Access to ADAMS and the Digital Assets are limited to staff members who work in the Physical Discipline.

ADAMS Web can be accessed here: <https://adams.dps.alaska.gov/AdamsWeb/Default.aspx>

See [Appendix A](#) for ADAMS Work Instructions.

## Section 5: Photography

All digital photographs must be retained and uploaded to ADAMS at the soonest available opportunity. The first photograph should be of a completed photo sheet and be updated and re-photographed for each scene location or new day.

The photo sheet will contain the following information:

- The Agency, Agency number, Photographer, Date and Location

It is recommended to verify camera settings such as time and date, image file format, and image size prior to photographing on scene. Take overall exterior, interior, and establishing photographs to show the location using street signs, addresses or other geographical information when possible.

An identifier should be used for items of evidence or areas of interest and photographs taken that include these identifiers. Any ridge detail evidence denoted with a unique identifier should follow the labeling guidelines as seen in [Appendix B](#). Close up photographs for examination purposes shall include a scale and should be photographed with the camera lens parallel to the plane of the evidence of interest in the highest image resolution (such as RAW and the use of a macro lens). If an item of evidence has been moved or removed, do not place it back into the scene, document the item with photographs and make a note of what occurred.

If there is a decedent present, overall photos should be taken from all sides with additional mid-range photographs. Close-up photographs should be taken of wounds or injuries with and without scales. After the body is removed, re-photograph the area and denote the approximate time the body was removed from scene or original location.

A crime scene image item will be created in LIMS under the evidence tab. The item number should be "Crime Scene Photos" and the description will include the location and date of the scene response (vehicle information will also be added if applicable). The evidence type should be "Digital evidence". The chain of custody will start from the analyst uploading the images to Foray and end at the "Digital Imaging Server".

A copy of all scene photos will be provided to the agency after the completion of scene processing via ZendTo [Alaska ZendTo \(state.ak.us\)](https://alaska.zendto.com/state.ak.us) and the date sent will be recorded in the crime scene notes.

Any video recording of the crime scene will be the responsibility of the requesting agency or the lead investigator and will not be performed by laboratory personnel.

## Section 6: Sketching

Crime scene sketches serve to establish spatial relationships, potential paths and movement of impression evidence, provide a general overall scene view, and assist with preparation of demonstrative aides for court. Sketches are not required but are useful and may be utilized on a case-by-case basis at the discretion of the Forensic Scientist or Forensic Technician. If utilized, a rough sketch will be on paper, scanned, and attached to the LaunchPad document.

The sketch shall be labeled with a magnetic or referenced north direction and may include measurements.

### Types of Sketches:

- Perspective (3-Dimensional): A perspective sketch contains a vanishing point and depicts objects of evidence, as they would appear to the eye with reference to relative distance and depth.
- Projection (Bird's eye view): Usually one viewpoint and depicts objects on one plane. This is the most common type of sketching.
- Exploded: Contains more than one viewpoint and can be used in modeling. It can show relationships of items in location, depth and height. The walls are folded down and on the same plane as the floor.

### Types of Measurements:

- Triangulation method: Uses two fixed permanent objects within the crime scene. The measurements are taken from each fixed point to each evidence item.
- Coordinate method: Measuring the distance to an object from two perpendicular objects, such as walls.
- Baseline method: Useful in outdoor scenes or large scenes. This method is performed by laying a measuring tape down in a straight line so that it crosses the entire area to be measured. Measurements are taken along the baseline paralleling the evidence items and then another measurement is taken from the baseline to the evidence item. If at an outdoor scene, the baseline may have to be fixed with a stake or some permanent marker at both ends.

## Section 7: Latent Print Evidence

Latent print development techniques will follow generally accepted methods and be determined by conditions at the scene. Factors to be considered may include but are not limited to environmental conditions, surface texture and composition, matrix, availability of processing materials, and the nature of the case. It is left to the discretion of the Forensic Scientist or Forensic Technician to determine and proceed with the most appropriate methods for the preservation and documentation of evidence in each case although all responsibility remains with the requesting agency or the lead investigator.

### Processing Techniques:

- Powders (plain and magnetic)
- Amido Black
- Leuco Crystal Violet (LCV)
- Small Particle Reagent (SPR)

### Methods of Collection:

- Lift Cards and lifting tape
- Hinge Lifters
- Gel Lifts of contrasting background
- Photography (include a scale and Identifier)

Photography of latent print evidence is the preferred method of collection and recovery and should be captured with a macro lens using RAW and JPEG format. The use of RAW format will be documented in the notes. Any ridge detail assigned a unique identifier should follow the labeling guidelines.

Any developed latent or visible ridge detail on an appropriate surface for lifting that is not able to be photographed should be lifted using tape and placed on a contrasting background. Hinge lifters, gel lifters, and other methods of lifting may be used. It is left to the discretion of the Forensic Scientist or Forensic Technician if recovery methods are attempted. All lifts collected as evidence from the scene should be packaged together.

### Latent Print Examination

If latent print evidence is photographed at a scene, those photographs will be uploaded to ADAMS under the laboratory case number with the appropriate category, and a latent print examination request and "LP Image" evidence item will be created in LIMS. A case activity utilizing the Case Management category will also be created in LIMS to document the request for service. Documentation shall include the requesting agent and what services were requested.

### Known Fingerprints and Palm Prints

Known fingerprints and palm prints will only be taken of individuals potentially involved in an incident upon request of the agency. The known prints will be packaged and labeled with the full name of the individual and their date of birth.



## Section 8: Biological Evidence

Biological evidence should be identified and preserved prior to further scene processing when possible. This type of evidence should be thoroughly dried and then packaged in an appropriate container, avoiding cross contamination. It is left to the discretion of the Investigator and Forensic Scientist or Forensic Technician to determine and proceed with the most appropriate methods for the preservation and documentation of possible biological evidence. Chemical enhancement methods are chosen based on environment, availability, and surface factors.

**Sampling** may be performed at crime scenes for the selection and possible collection of biological evidence. All areas containing labeled stains shall be documented with photography and in the Analysts evidence log. When selecting specific stains, the Analyst will take into consideration the substrate, stain size, and overall shape. At least one representative stain within separate areas should be appropriately labeled and documented. Presumptive field tests (Hemastix) may be utilized at the discretion of the examiner. These areas may be collected by swabbing, cutting, or collecting the entire item (see biological evidence for further collection procedures). Deviations from this sampling method must be documented in the analysts notes.

**Stain Documentation and Collection** should document each "pattern", distribution of individual stains, orientation and size of stains with labeled scale, and void patterns. Each stain that will be photographed and swabbed should follow the labeling guidelines. If the stain is wet, swab it and allow it to air dry. If the stain is dry, moisten the swab with approximately 2 drops of sterile water, swab the stain and allow it to air dry. The lot number and the expiration date for sterile water will be recorded in the notes. Each swab package should be labeled appropriately.

**Trace Evidence** may include hair, fibers, soil, glass, foliage, metal fragments, paint, wood fragments, etc. These items vary and should be packaged appropriately for preservation.

**Touch/Contact DNA** will be collected by moistening a swab with approximately 2 drops of sterile water, swab the area of interest, let air dry and package appropriately. The swab package should denote "Contact DNA" and be designated with a unique identifier following the labeling guidelines.

**Known Buccal** swabs will only be taken of individuals potentially involved in an incident upon request of the agency. The swab will be packaged and labeled with the full name of the individual and their date of birth. All known buccal swabs will be packaged separately from scene swabs.

### Processing Techniques:

- Hemastix®
- Bluestar©
- Amido Black
- Leuco Crystal Violet (LCV)
- Alternate Light Source (ALS)

### Methods of Collection:

- Entire item: Package in paper or breathable evidence bag
- Cuttings/Gauze: Package in a bindle or glassine envelope and place into an outer breathable package
- Swab: Package separately and place into an outer breathable package
- Photography
  - Results of chemical enhancements should be photographed at the scene
  - Include a scale and identifier
- Tape Lifts: 4" fingerprint tape and parchment paper or similar
- Hand Picking: Use sterile tweezers or similar tool to collect evidence

Note: Consult the lead investigator before using any chemicals. If approved, the Lab is released from all liability of any damage caused from the use of chemicals. Upon request a Safety Data Sheet can be left at the scene or provided to the agency.

## Section 9: Impression Evidence

The methods included in this document may not cover all conditions and situations. Areas or items suspected of containing impression evidence should be secured or protected from contamination or disturbance. Alternate routes of travel within the scene should be established when possible.

One or more of the following procedures should be used in a sequential process with the least destructive methods used first (visual using ambient light or a flashlight and photography). Photograph any impressions observed before attempting further enhancement methods. The determination of which methods to be utilized will be up to the analysts discretion taking into consideration the substrate, components of the impression, and environmental conditions. Impression evidence may also have limitations due to environmental factors, lighting, substrate features, and overall quality of the impression(s). Limitations, when known, should be noted and recorded in the analysts notes.

Evaluate the scene and all available information to determine locations of potential impression evidence. Searching for two and three-dimensional impressions utilizes oblique lighting. When searching using oblique lighting, impressions may only be visible when illuminated from a particular angle(s), necessitating the need for a thorough search.

Items of evidence that contain impression evidence and can easily be collected should be labeled and photographed in place, then collected and submitted to the laboratory for further processing. If an item cannot be removed it should be processed at the scene utilizing photography and/or recovery methods listed below.

The goal of physical and chemical development of Impressions is increased contrast/visualization. When utilizing chemical enhancement methods, it is recommended that a separate area of the substrate be tested with the reagent to evaluate potential processing limitations such as poor de-staining, degradation of the substrate, or substrate reaction with the reagent.

### Enhancement Techniques:

- Flashlight
- Spray Paint
- Amido Black
- Leuco Crystal Violet (LCV)
- Powder

### Recovery Methods:

- Entire Area/Item
- Photography
- Lifting
- Casting

### Photography:

Overall and mid-range photographs should be taken from multiple angles showing the labeled impression(s) in relation to other features and items within the scene. Close up photographs of impression evidence shall contain a scale and identifier, should utilize a tripod, and keep the film plane should be parallel to the impression. The camera should be set to a low ISO (ex: 100-400) and the image quality should be set to capture images in an uncompressed or lossless format (ex: RAW). Photography is not a substitute for casting or lifting of impression evidence.

- An "L-shaped" scale should be placed next to and along the length of the impression on the same plane as the lowest part of the impression.
- If a zoom lens is used, set the focal length as close as possible to a normal lens (50 mm) to prevent distortion.
- Set the camera f-stop to an appropriate setting to ensure sufficient depth of field to capture the entire impression in focus. (Aperture priority may be useful when utilizing a tripod).
- Fill the camera frame with the impression and scale.

- The impression should be photographed with a light source (flashlight) held at an oblique angle approximately 4 ft to 5 ft away and direct it at the impression from at least three different positions around the impression. Note: A deeper impression will require a higher angle of light and a shallower impression will require a lower angle (oblique lighting).
  - The analyst may need to use an object to block bright sun or ambient light from striking the impression.
- It may be necessary to utilize spray paint to enhance the contrast of impression evidence in snow. The paint should be applied by spraying obliquely 8 inches to 12 inches away from the impression. The impression should be re-photographed after enhancement attempt.

Note: For long sections of possible tire impressions to be captured with photography, a tape measure should be utilized next to and along the length of the impression on the same plane as the lowest part of the impression. Once placed down this tape measure should not be moved until the entire series of images are captured. Close up photographs filling the camera frame of the entire length of the tire impression with an identifier should be taken through a series of overlapping photographs. Each image should overlap by at least 1 inch of the previous image.

**Gelatin lifters** may be used for lifting two-dimensional impressions (ex: dust, residue, blood, and wet origin impressions, as well as impressions developed with fingerprint powder) from a variety of surfaces. A gel lift of contrasting background should be used when possible (ex: black powder/white gel lift).

- Black lifters provide greater contrast with light colored powders and residue impressions.
- Gelatin lifters may stretch when the clear cover is removed. Care should be taken when removing the cover to limit the stretch. The lifter should be allowed to rest until it returns to the original size, before applied to the impression.
- Gelatin lifts of impression evidence should be photographed as soon as possible after collection prior to packaging and/or replacing the acetate cover for preservation.
- When replacing the clear cover, place the clean side of the clear cover in contact with the gelatin lift or use a new acetate cover. The side previously in contact with the gel lift should not be replaced on the impression to prevent re-deposition of the residue.
- Multiple lift attempts may be necessary.
- Multiple gelatin lifts may be packaged together and should be submitted for further examination as soon as possible.

**Casting material** such as dental stone, can be used to lift three-dimensional impressions (ex: mud, dirt, and snow).

- The mixed dental stone viscosity is dependent upon the scene circumstances (location, substrate, etc.) of the impression; most impressions will require a viscosity like pancake batter. The viscosity of the mixture may need to be adjusted based upon the nature of the impression.
  - To ensure the dental stone mixture is as cool as possible when it is applied to snow impressions, techniques such as cooling the dental stone and the water may be necessary.
  - When impression(s) in snow are excessively wet, is melting quickly or has standing ground water, sift two to three fine layers of dry dental stone onto the impression prior to casting.
- Carefully pour casting material outside the perimeter of the impression and direct the flow into the impression. Ensure the impression is filled and/or covered evenly. If the casting material does not flow completely into the impression, the top surface of the casting material can be carefully agitated to help it flow and fill in the space. If necessary, additional casting material may be poured over the top of the original cast to complete the cast and/or add thickness.
  - Casts should be marked with identifying information (Ex: Item number, description, date, initials) prior to lifting from the substrate.

- Allow the casting material to sufficiently set and harden to prevent damage prior to lifting.
- Once lifted, debris that was part of the impression or that was present when the impression was made should not be removed. The dental stone casts should also not be cleaned and should be packaged in breathable containers that prevent damage and continued drying (ex: cardboard box).
- Larger quantities of dental stone can be mixed to cast large segments of tire or multiple impressions.
  - Tire casts should be long enough to capture the entire tire impression. If it is not practical to make one long cast, multiple 3 ft long segments should be made to allow for an optimum comparison during the examination process.

**Impressions in Standing Water:** Sift or sprinkle an even layer of dry casting powder over the impression until the bottom is covered. Then mix and pour wet casting material into the impression.

- If the impression has water in it and is not fully submerged, casting material can be mixed and poured from the outside edge of the impression, allowing the casting material to flow into the impression, which may displace the water.

## Elimination Impressions

Any elimination impressions should be clearly marked as to where they came from. Recovery methods include but are not limited to:

- Photography: Take a well-lit scaled photograph of the impression
- Inkless pad and paper kit: Press the area onto the yellow side of the pad and then onto the treated side of the provided paper
- Lubricant and powder method: Coat the area with a small amount of lubricant such as spray butter, press the area onto a piece of paper to create an oil impression and lightly dust the impression with contrasting fingerprint powder

## Footwear Intelligence

If footwear impression evidence is photographed at a scene, those photographs will be uploaded to ADAMS under the laboratory case number with the appropriate category and a footwear intelligence request and "FW Image" evidence item will be created in LIMS. A case activity utilizing the Case Management category will also be created in LIMS to document the request for service. Documentation shall include the requesting agent and what services were requested.

## Section 10: Firearm and Toolmark Evidence

The defects and holes caused by projectiles from firearms can provide information about the projectile, the firearm, intermediate objects in the path of the projectile, direction of travel (entrance or exit), order of shots, and other information. Shooting incidents are dynamic and varied, as is the evidence produced during such an event.

Note: A qualified official, such as the scene officer or investigator, should ensure a weapon is safe before handling and be responsible for the unloading process.

Regarding firearms, additional information should be documented in the case notes when possible such as make, caliber, serial number, and if the weapon was discovered loaded or unloaded.

Locations of cartridges or discharged cartridge casings should be documented and photographed. The extent of this documentation does not allow for analysis or conclusion-based statements such as to flight path or trajectory determination. As such, Forensic Scientists or Forensic Technicians will not be utilizing materials to establish trajectory and only assisting with basic photography documentation unless they have been through proper training, completed a training module, and shown to be competent to perform at crime scenes. Otherwise officers on scene or investigators will utilize materials, such as rods, and request assistance with the documentation and photography. If investigators placed rods, this will be documented in the crime scene notes. If the officers on scene or investigators take measurements or any other type of data, this information can be documented in the crime scene notes.

Defect characteristics vary greatly and are affected by numerous factors including intermediate objects and the type of surface impacted. Descriptions may include the approximate size and shape of the defect, and any trace material that may have been transferred by the projectile from an intervening object or from the projectile itself. Defects should be documented using notes, photography, and may include sketches. Defects should be given an identifier, photographed with a scale, and be reflected in the notes and evidence list. If the area or item containing the defect is collected (per the scene officer or lead investigator) it will be removed by the officers and documented in the notes and evidence list. Photographs will be taken of any damage done in the process of removing a defect, such as cutting out a portion of a wall.

### Laser Trajectory Photography

Photography of trajectory lasers can be used in the documentation of shooting reconstruction. A neutral density lens filter may be necessary in an area that is too bright.

### Toolmark Evidence

A toolmark is any impression, scratch, gouge, cut or abrasion made when a tool is brought into contact with an object leaving a mark. Overall, mid-range, and close-up photographs should be taken of the toolmark. Where possible, submit the entire item that contains the toolmark. Any tools collected should be packaged to prevent any additional damage from occurring.

### Recovery Methods:

- Entire Area or Item
- Photography - Include a scale and Identifier
- Silicone Based Casting Material (Mikrosil) - Packaged in a separate container

## Section 11: Fire Scene Evidence

Fire scenes are hazardous environments as burnt floors, ceilings, and walls may be weakened. Generally, fire scenes are processed by the State Fire Marshal Investigators. However, situations may arise where they cannot be present or they request assistance on scene processing and evidence collection.

As a fire burns, it can create patterns on surfaces in its surrounding environment that can indicate its origin as well as sources to find remnants of ignitable liquids that were used to accelerate the combustion process. These patterns can assist in the identification of evidence.

Notes and photographs should document areas of interest. Packaging of fire evidence will not be filled more than approximately 70% volume to allow for testing of air space.

### Collection Materials:

- Non breathable heat-sealed bag made of a hydrocarbon free material. Note: the use of a C clamp may be used but is a temporary seal and the bag should be heat sealed as soon as possible.
- Metal Arson cans are a specific type of paint can with a lid that has been tested and certified uncontaminated. The can should be double lined.
- Tools: Any tools used to collect fire debris evidence should be cleaned between samples with an appropriate chemical as deemed acceptable by a State Fire Marshal.

**Soil samples** should remain at refrigerator temperatures. Ensure the scene officer or lead investigator on scene is aware of the importance of this.

**Spoliation** refers to the loss, destruction, or alteration of an object which is evidence (or potential evidence) in a legal proceeding or insurance claim. It is an issue of particular importance to the field of fire investigation and will likely become increasingly significant as courts are called to decide the consequences of lost or altered physical evidence in fire litigation cases. Ask all interested parties before disturbing potential origin-type evidence.

### Control Samples

When possible, while collecting Area of Origin carpet, tile, or linoleum, take a “*Control Sample*” from another area not involved. Control samples can eliminate glues or material used in the flooring which is useful in determining what accelerant was used and give a more accurate result. Record this in the notes and evidence list to distinguish the item is a control sample.

### Taking Sample from a Lower Point

When taking a sample to be tested for accelerants generally do not “take from the top” but dig down to where the liquid has not been burned off yet. Example would be to get in the crevasses or cracks of flooring or under the top layer of soil.



## Section 12: Equipment

**Validation and Performance checks:** Validation and Performance checks for equipment can be found on the laboratory [SharePoint document library](#). Performance checks will be performed after any maintenance has been performed. Performance checks are not required for digital cameras. There are no instrumental analyses in the Crime Scene Discipline.

**Maintenance:** Maintenance for Crime Scene Equipment will be performed as needed and documented in the equipment maintenance log that can be found on the laboratory [SharePoint document library](#). The Equipment manuals can also be found on the [SharePoint document library](#). Balances used for chemical preparation in the Crime Scene Discipline are checked and calibrated yearly by an approved outside vendor. Normal maintenance includes keeping the balance clean and level.

If a piece of equipment is taken out of service, the Physical Discipline Supervisor will be notified, a notice will be sent to affected staff, and a sign will be placed on the equipment stating it is out of service, the date, and the Analyst's initials. Once the equipment has been repaired but prior to use, the Analyst is responsible for checking the maintenance logs to verify the equipment was fixed and a new performance check was completed.

Additional sets of keys for the evidence storage lockers within the crime scene hallway are locked in a key box in the latent case file archive room. Access to this room is limited to Latent Print Discipline Analysts, and the Physical Discipline Supervisor. The key box can only be opened by the Physical Discipline Supervisor or designee who can then transfer possession of the key to an analyst. If an evidence locker key is lost, the Physical Discipline Supervisor must be notified immediately.

Non-laboratory equipment will not be used by Laboratory personnel, such as FARO or a metal detector.

**Handling, Transport, Storage, Use:** Equipment will be stored and transported in appropriate containers to ensure integrity and functionality when possible. Alternate Light Source controls are performed with each use and the results will be documented in the analysts case notes.

Crime Scenes can present a wide variety of physical, biological, chemical, and situational hazards with a level of personal risk of injury, illness, or exposure almost always present. Personal protective equipment (PPE) considerations should include, but are not limited to, protection of eyes and face, head, foot and leg, hand and arm, body, respiratory system, and hearing, and protection against falls, and drowning.

To ensure that the crime scene analysts are not exposed to an unreasonable level of risk to personal safety they shall be provided with appropriate PPE and training or information necessary to assess the hazards and mitigate risks presented by the scene and by any processing tools, equipment, or reagents used. Transport.

### Laboratory Equipment for Crime Scene Processing Use:

- Digital Cameras
  - Canon EOS-5D Mark II or newer
- Alternate Light Source (ALS)
  - 455nm Flashlight
  - Foster and Freeman Crime-Lite 82s

## Section 13: Processes

Chemical reagent preparation for crime scene processing is not dependent upon exact measurements. Balances used for chemical preparation do not need to be calibrated. Normal maintenance includes keeping the balance clean and level. A quality control is performed at the time the new reagent lot is prepared and with each use during scenes. For crime scene evidence processing, reagents used at scenes are discarded after each scene. All reagents in the crime scene discipline are non-critical reagents and are not critical consumables. Prepared chemicals at the laboratory are documented using the [Crime Scene Chemical Reagent Template](#) and a copy of the batch information will be saved and stored on the laboratory [SharePoint document library](#). Single use chemicals prepared on scene will be documented in the analysts notes with the name of the reagent and lot number.

The following processes are the approved methods for Crime Scene Processing. Refer to [Appendix A](#) for work instructions on these processes. Processing methods used on scene are at the analyst's discretion.

If any new methods or techniques are to be tested, the Technical Lead will consult with the Physical Section Supervisor and Quality Assurance Manager and present the purpose and plan for the new method. A validation will be performed and if successful, approved by the Technical Lead. Each Analyst will complete a training module prior to use at crime scenes.

Note: The application of chemicals may destroy or degrade biological material. Swab and collect biological evidence before the application of chemicals when possible.

### Approved Processes:

- Hemastix®
- Leuco Crystal Violet (LCV)
- Lifting Recovery Methods
  - Gel Lift
  - Lift Cards and Lifting Tape
  - Hinge Lifters
- Alternate Light Source (ALS)
- Silicone Casting Material (Mikrosil)
- Bluestar©
- Amido Black
  - Water Based
- Known Tire Tread Impressions
- Powder
- Casting Material
  - Dental Stone
  - Snow Print Plaster
- Small Particle Reagent (SPR)



## Appendix A: Working Instructions

If requested, Safety Data Sheets of chemicals used at a crime scene should be provided to the lead investigator. This action should be recorded in the notes.

The crime scene discipline does not have critical reagents. Exact measurements and proportions are desirable for consistent quality, but successful results are not dependent upon unequivocal accuracy. Measurement of uncertainty does not apply to the Crime Scene Discipline.

### **Presumptive Test for Blood (Hemastix®)**

Hemastix® are reagent strips originally designed for use in testing for blood in urine. This test has been found to be applicable as a presumptive test for the presence of blood for crime scene use. Hemastix reacts with the heme component in blood causing a color change of the strip. This test is not human specific and therefore cannot differentiate between human and animal. When the stain is in very limited quantities a presumptive test prior to collection may not be performed. If collected, presumptive test results should also be indicated on the swab packaging to easily identify the item has been tested.

Hemastix® is purchased and not prepared at the laboratory. Hemastix can have false positive results that can include but are not limited to saliva, potato, tomato, tomato sauce with meat, red onions, some metal ions, bleach, some dyes, ketchup, and other compounds.

#### **Materials:**

Hemastix®  
Sterile Water  
Swabs  
Synthetic Blood

#### **Procedure:**

1. Label and photograph stains prior to swabbing.
2. Apply one drop of sterile water to the tip of the control swab containing synthetic blood.
3. Touch the dampened swab end to the test strip pad.
4. Note the color change (within 60 seconds).
5. Apply approximately two drops of sterile water to the tip of a new sterile swab.
6. Swab the stain or area of interest and let dry.
7. Collect and package.

#### **Quality Control**

The control will consist of dried synthetic blood on a swab or non-porous surface. A control will be performed with each use per lot per scene and the results will be recorded in the notes.

Positive Control – Color Change to Green (collect and package tested stain area)

Negative Control – No Color Change (do not collect unless requested by lead investigator/scene officer)

#### **Safety Considerations**

When dealing with biological samples and chemical reagents, suitable protective clothing and gloves should always be worn. Care should be taken not to touch the Hemastix® yellow test pad area or contaminate surrounding areas. The bottle should remain tightly closed when not in use. Avoid contact with skin and eyes.

Note: This test should only be administered when sufficient sample exists for testing and collection. Most animal blood will produce a positive reaction.

## **Bluestar©**

Bluestar© is typically used as a screening tool to locate possible trace blood. Bluestar© reacts with the heme component of blood resulting in a blue chemiluminescent glow.

Bluestar can have false positive results from a variety of sources that can include but are not limited to household detergents, chlorine, copper, strong oxidizing materials, oil-based paints, Alkyd varnish, turnip, banana, radish, leek, black winter radish, green bean, ginger, carrot, manganese sulfate, copper sulfate, iron sulfate, and potassium permanganate, bleach, and other cleaning agents. Some false positives are able to be differentiated by the white chemiluminescence produced, which does not last as long in brightness or duration compared to a true positive "blue" result.

Bluestar© is purchased from a vendor and not prepared at the laboratory.

### **Materials:**

Bluestar© Reagent

Distilled or Sterile Water

Spray Bottle with adjustable spray nozzle

Swabs

Synthetic Blood

Darkened environment for application of the reagent

### **Mix Instructions:**

1. Remove the nozzle from the spray bottle and add 4 oz. of distilled or sterile water.
2. Take one tablet from each tube and add both to the spray bottle.
3. Return the nozzle to the spray bottle and swirl gently (DO NOT SHAKE) in a circular motion until both tablets are fully dissolved (about 1-2 minutes).

### **Procedure:**

1. Adjust the spray nozzle to obtain the finest mist possible.
2. Spray over the tip of the control swab containing synthetic blood.
3. Note if a reaction occurs.
4. Apply to the area of interest. If a positive reaction occurs, stop spraying, label and photograph before (lights on) and after positive Bluestar© reaction.
5. Swab, collect and package the area with the strongest reaction.

Note: Once Bluestar© reagent is mixed the brightness of a positive reaction will start to decrease after 3 hours and another mixture and control test will need to be performed for continued use.

### **Quality Control**

The control will consist of dried synthetic blood on a swab or non-porous surface. A control will be performed with each use per lot per scene and the results will be recorded in the notes.

Positive Control – Blue Chemiluminescence

Negative Control – No Reaction

### **Safety Considerations**

When dealing with biological samples and chemical reagents suitable protective clothing and gloves should always be worn. Avoid contact with skin and eyes.

Note: Bluestar© may dilute possible biological evidence.

### **Leuco Crystal Violet (LCV)**

Leuco Crystal Violet reacts with the heme component in blood resulting in a violet color. Its application can be used to enhance and develop ridge detail, footwear, and tire tracks deposited in suspected blood on porous and non-porous surfaces. It can also be used as a searching tool for trace blood in areas not suitable for Bluestar, such as areas that cannot be made dark enough. LCV can have false positive results which can include but are not limited to plant materials, and metals such as iron or copper.

LCV components are purchased from a vendor but prepared on scene.

#### **Prepare the following four containers:**

- Bottle A – 473 mL bottle of 3% Hydrogen Peroxide
- Bottle B – a bottle containing 10 g of Sulfosalicylic Acid
- Bottle C – a dark colored bottle (at least 40 mL capacity) containing 1.1 g of Leuco Crystal Violet
- Bottle D – a bottle (at least 40 mL capacity) containing 4.4 g of Sodium Acetate

#### **Mix Instructions:**

1. Add bottle B to bottle A, shake well.
2. Add approximately 30 mL of bottle A to bottle C, shake well. Add back to bottle A.
3. Add approximately 30 mL of bottle A to bottle D, shake well. Add back to bottle A.
4. Place solution in a spray bottle or attach a spray top to the hydrogen peroxide for application.

#### **Procedure:**

1. Photograph any ridge detail or impression evidence prior to application.
2. Adjust the spray nozzle to obtain the finest mist possible.
3. Spray over the tip of the control swab containing synthetic blood.
4. Note the color change (within 60 seconds).
5. Apply to the area of interest. If a positive reaction occurs, stop spraying, label and photograph.
6. If needed, cut out and collect the area.

Note: Store in a dark bottle, or in the dark. Shelf life is 30 days but can be extended to 3 months if solution is refrigerated. The 3% hydrogen peroxide will be purchased locally rather than through a commercial vendor. LCV will keep reacting with the exposure of sunlight and may stain certain surfaces. LCV may dilute possible biological evidence.

#### **Quality Control**

The control will consist of dried synthetic blood on a swab or non-porous surface. A control will be performed with each use per lot per scene and the results will be recorded in the notes.

Positive Control – Color Change

Negative Control – No Color Change

#### **Safety Considerations**

When dealing with biological samples and chemical reagents suitable protective clothing and gloves should always be worn. Avoid contact with skin and eyes.

## **Amido Black**

Amido Black, also known as naphthol blue-black, is a protein stain used for the development or enhancement of ridge detail or impression evidence in suspected blood. Amido Black stains the proteins in blood turning the print a dark blue or black color. The background of porous substrates may also stain.

Amido Black is prepared in the laboratory and not purchased as a working solution. Amido Black can be used as a methanol-based or water-based stain on porous and non-porous items, however, only the water based Amido Black is approved for commercial air travel to crime scenes.

### **Mix Instructions – Water Based (Makes 1000 mL Batch):**

#### **Developer Solution**

- Amido Black..... 2 g
- Citric Acid ..... 20 g
- Distilled or Sterile Water..... 1000 mL

Combine the ingredients in the order listed above and stir for at least 30 minutes until dissolved. Shelf life is approximately 1 year.

#### **Rinse Solution**

- Distilled or Sterile water (if not available tap water can be used) 1000 mL

### **Procedure:**

1. Label and photograph ridge detail or impression evidence prior to application.
2. Apply the Developer on the control tile containing an impression in dried synthetic blood then rinse.
3. Note the development or enhancement and color change of the fingerprint (within 60 seconds) on control tile.
4. Apply the Developer on the area containing possible ridge detail or impression evidence in possible blood. If necessary, the Developer can be re-applied to achieve sufficient clarity.
5. Note the development or enhancement and color change of the impression evidence (within 60 seconds).
6. Apply the Rinse to the same area. Use additional rinses if necessary and let dry.
7. Label and photograph any developed ridge detail or impression evidence.

Note: Always consider the surface type and amount of solution applied to preserve impression detail. The area or item where Amido Black is applied to may stain. Amido Black may dilute possible biological evidence.

### **Quality Control**

The control will consist of a dried impression in synthetic blood on a non-porous surface. A control will be performed with each use per lot per scene and the results will be recorded in the notes.

Positive Control – Development or Enhancement of ridge detail turning dark blue or almost black in color

Negative Control – No Development of ridge detail

### **Safety Considerations**

When dealing with biological samples and chemical reagents suitable protective clothing and gloves should always be worn. Avoid contact with skin and eyes.

### **Lifting Recovery Methods**

Residue or impressions in dust are best collected by lifting, or by collecting the entire item. Gelatin Lifters may be used for dust impression recovery. Photograph all impressions with scale and identifier prior to attempting any recovery methods.

**Gelatin and (Gel Lift) and Adhesive Lifting:** Black gel lifts offer excellent contrast with light dust and dry residue, and wet origin impressions once powdered.

**Procedure:**

1. Before using gel lifts ensure the lifter is at room temperature.
2. Slowly peel back clear acetate cover sheet and allow gel to settle from any stretching that may occur during cover removal (one minute).
3. From one direction lay the gel lift over the impression and gently roll out any air bubbles.
4. Leave the gel lift on the impression for approximately 10 minutes then slowly peel back from one end.
5. Photograph immediately with scale and identifier.
6. Place the clear acetate back over the lift and collect and package in the appropriate container.

It is left to the discretion of the Forensic Scientist or Forensic Technician if recovery methods are attempted. All lifts collected as evidence from the scene should be packaged together.

Note: The performance and adhesion of gel lifts is affected by excessive cold and excessive heat which can destroy the gel lifter. It is important to photograph the gel lift shortly after lifting as they can completely absorb the lifted residue over time. Gel Lifts may also be used to recover ridge detail in dust.

**Safety Considerations**

Suitable protective clothing and gloves should always be worn. Avoid contact with skin and eyes.

### **Alternate Light Source (ALS)**

The Alternate Light Source (ALS), also referred to as a forensic light source, may be employed in a wide range of functions in a forensic capacity. The ALS is typically used in conjunction with filter goggles of differing colors. Evidence that may be visualized includes latent prints, fibers, other trace material, and biological fluids. Materials that naturally luminesce will appear as a different color from the surrounding area or background. Numerous wavelengths of light may be necessary to achieve the greatest contrast with the background material.

Biological fluid stains are sometimes difficult to see under room light conditions. It is best to collect any item on which possible biological fluid stains have been detected and submit it to the Laboratory for further examination. The light source will work best in a darkened environment as the contrast viewed through the appropriate filter and goggles will be greater.

#### **Procedure:**

1. Label and photograph any visible areas of interest.
2. Wear appropriate goggles and turn the forensic light source on.
3. Shine the light source over the control and document the results.
4. Search for biological fluids and document if any fluorescence is observed or not.
5. Label and photograph any areas of fluorescence.

Additional information regarding which goggles to use for various wavelengths of light can be found with each of the ALS units.

#### **Safety Considerations**

Suitable protective clothing and gloves should always be worn. Alternate Light Sources emit high- intensity light which can be harmful with extended exposures. Never look directly into the light or the optical ports of an instrument. Goggles should always be worn when using the ALS. In addition, wear gloves, long sleeves, and/or laboratory coats as protective clothing.

#### **Quality Control**

The control will consist of a known semen standard, examined while wearing appropriate goggles. A control will be performed with each use and the results will be recorded in the notes.

Positive Control - Fluorescence

Negative Control – No Fluorescence

Note: ALS photography, if necessary, may be accomplished by attaching the appropriate filter to the front of the camera. The filter must be the same color as the goggles being worn.

## **Powders**

Powder is used for developing ridge detail on various surfaces. There are multiple types of powders to include various colors, magnetic powders, as well as fluorescent powders that may require the use of an Alternate Light Source (ALS) and appropriate filters. Powder processing can be used at the Forensic Scientists or Forensic Technicians discretion. If other processes are to be used on the same piece of evidence, powder should be applied last.

All powders are purchased and not prepared in the laboratory.

### **Procedure:**

1. Photograph any visible ridge detail prior to powder application.
2. Choose a type of powder and appropriate brush:
  - a. Plain/Fluorescent powder – Fiberglass or Nylon, Feather Duster, Short Bristle Brush
  - b. Magnetic Powder – Magnetic Wand
3. Apply the powder by lightly dusting over the surface. Only the tips of the brush or metal shavings should come in contact with the surface.
4. Use oblique light or intense light to better visualize developed ridge detail.
5. Label and photograph ridge detail of potential value. If necessary, there are circumstances where lifting the ridge detail of potential value would be beneficial but is not routinely performed.

### **Recovery:**

After powder application and photography is complete, attempt recovery by:

1. Apply a single strip of tape (or overlapping tape depending on the size of the area) directly over the area of interest.
2. Apply pressure evenly, avoiding air bubbles.
3. Lift the tape off from one side and place on an appropriately sized lift card with a contrasting background.
4. Fill out appropriate information.
5. Collect and package all lifts together.

Note: Fluorescent powders can be very faint and easily overlooked. It is recommended the lift card/gel lift be examined utilizing the ALS with the appropriate filter. If an ALS is used for visualization it will be documented in the notes.

### **Safety Consideration**

Suitable protective clothing, mask, and gloves should always be worn. Avoid contact with skin and eyes.

### **Small Particle Reagent (SPR)**

Small Particle Reagent is a liquid suspension powder in water with detergent used for the development and enhancement of latent print evidence on non-porous and semi-porous surfaces that have previously been wet. The powder particles adhere to the oily or fatty components of fingerprint residues. There are two basic colors: black and white. These reagents will not permanently stain most painted surfaces and an application of soap and water should remove any residue present.

SPR is purchased and not prepared in the laboratory.

#### **Procedure:**

1. Label and photograph any visible ridge detail prior to application.
2. Choose a contrasting color depending on the surface of the item or area to be processed.
3. Shake vigorously before each use.
4. DIP (Preferred Method):
  - a. Submerge the item in SPR for a minimum of 2 minutes. A longer processing time may be necessary. Continuously agitate the liquid.
  - b. Dip the item of evidence in clear tap water. Repeat if necessary.
  - c. Allow to dry at room temperature.
  - d. Label and photograph any ridge detail of potential value.

#### **OR**

#### **SPRAY:**

- a. Spray the SPR solution on the item from the top and work towards the bottom.
- b. If development occurs, continue spraying the area until maximum contrast is achieved.
- c. Spray the area with clear tap water.
- d. Allow to dry at room temperature
- e. Label and photograph any ridge detail of potential value.

It may be necessary to repeat treatment if the development of ridge detail is faint. There are circumstances where lifting the ridge detail of potential value would be beneficial using a gel lift of contrasting background but is not routinely performed.

#### **Safety Consideration**

Suitable protective clothing, mask, and gloves should always be worn. Avoid contact with skin and eyes.



## **Silicone Casting Material (Mikrosil)**

Silicone based casting material can be useful in the collection and preservation of a variety of three-dimensional impressions encountered at crime scenes. If an item cannot be submitted for tool mark examination, a cast should be made using a flexible casting material, such as Mikrosil. The resulting casts preserve the details of the various marks and can be used for comparative examinations. Silicone based casting materials may also be used for lifting powder processed prints from rough surfaces. Select a color of casting material which contrasts the color of the powder.

The following directions are for the use of Mikrosil. Other brands of silicone-based casting material may be used and should follow the manufacturer's instructions for preparation and use.

Label and photograph the area prior to utilizing casting material.

Prior to application it is recommended to prepare a label with the appropriate identifier and orientation for the cast since it is difficult to write on the hardened silicone rubber.

### **Procedure (Mikrosil):**

1. Squeeze out equal length lines from the two tubes (Mikrosil and Hardener Catalyst).
2. Thoroughly mix the two lines together using a tongue depressor, spatula, or similar item (approximately 30 to 60 seconds).
3. Spread the Mikrosil over the area of interest (avoid trapping air bubbles).
4. Place the previously prepared label in the Mikrosil and allow the cast to set.
5. Let dry (3-15 minutes):
  - a. Drying time varies with temperature and amount of hardener used.
6. Once dry, remove the cast and package appropriately.

### **Safety considerations**

Avoid contact with eyes, skin and clothing. Use in well ventilated areas and keep the container closed when not in use.

### **Limitations**

Newly recovered silicone casts may become stuck together. As such, package casts separately and/or in such a manner that multiple casts do not come into contact with each other in an appropriately sized container.

Note: If necessary, the procedure can be repeated. If multiple casts are made of the same mark, all the casts should be collected and packaged in order to preserve trace material that may have been associated with the area.

### **Casting Material (Dental Stone and Plaster)**

Casting may be used to recover and further document a 3D impression. The decision to cast is affected by the substrate conditions and is left to the discretion of the Forensic Scientist or Forensic Technician to determine and proceed with the most appropriate methods for the preservation and documentation of the impression evidence.

In preparation for use at crime scenes, approximately two pound zip-top bags of dental stone are prepared and stored. This amount will cast an average sized shoe impression. With premeasured bags, casting impressions at the crime scene only involves adding water. The required amount of casting material and water will vary depending on the size of the impression to be cast, therefore, variations are expected.

Label and photograph all impressions before attempting to recover with casting material. To enhance contrast, gray paint primer may be applied (especially useful for impressions in snow). If an impression has standing water within it, sift dry casting material into the impression prior to casting.

#### **Dental Stone Materials:**

Dental Stone (2 lb. bags)

Snow Print Plaster or SnowStone™

Water

#### **Dental Stone Mix Instructions:**

1. Add the appropriate amount of water to the bag containing Dental Stone and close the top.
2. Mix continuously for about 3 minutes or until you have the consistency resembling pancake batter.

Note: Potassium sulfate (K<sub>2</sub>SO<sub>4</sub>) may be added to the dry dental stone (about 1 tablespoon / 2 lb. bag) to accelerate the hardening time.

#### **Snow Print Plaster or SnowStone™ Mix Instructions:**

1. Sift a thin layer of powder over the surface of the impression.
2. Add water to the measure line on the mixing pail and stir (45-60 seconds) to thicken.

#### **Procedure:**

1. Start to pour the mixed casting material outside the impression and direct flow evenly into the impression. The casting material may be gently agitated to help the flow cover the entire impression area.
  - a. The cast should be marked with the case number, item number, date, and initials.
2. Let the cast completely set before attempting to lift it (time will vary, approximately 30 minutes). At low temperatures the impression may be covered with newspaper or paper to aide in setting time.
3. Do not remove any soil adhering to the cast after recovery and package cast in a cardboard box to protect against breakage and to allow for continued drying.

#### **Safety considerations**

Suitable protective clothing, mask, and gloves should always be worn. Avoid contact with skin and eyes.

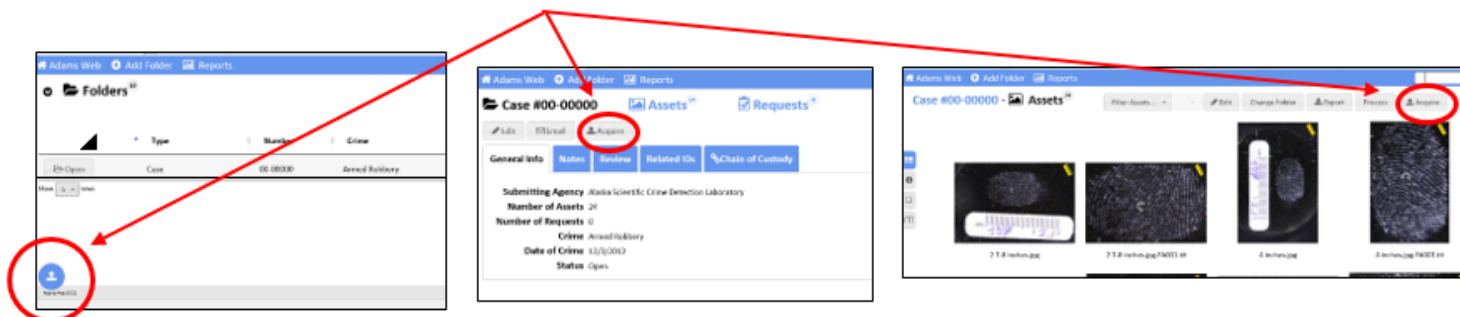
#### **Limitations**

All impressions should be labeled and photographed prior to casting. The age and condition of the casting material used should be considered prior to application as old or degraded materials may prevent use or have a negative impact on the quality of the impression.

## Authenticated Digital Asset Management System (ADAMS)

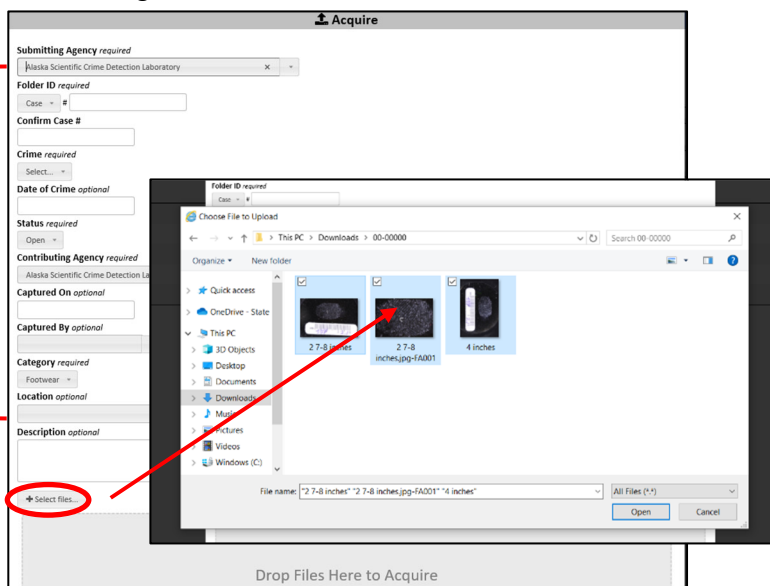
### DIGITAL ASSET ACQUISITION:

1. Open Adams Web
2. Acquisition can occur from one of three places. The main home page, inside the case page, or from the Asset tab inside a case.

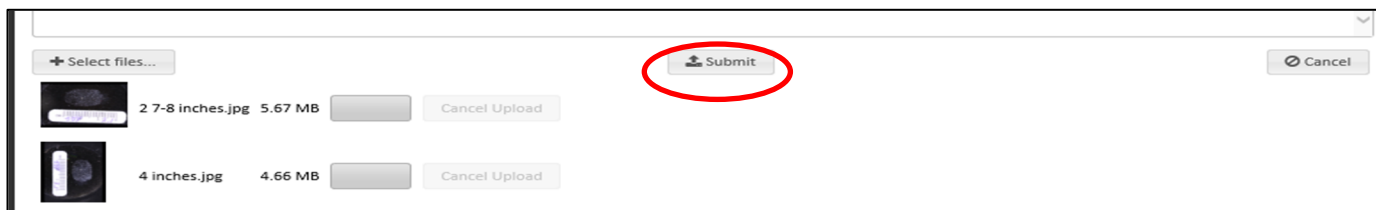


3. Fill out the Asset case information and click “Select files”. Choose the images to be acquired in this case and select “Open”. Multiple images from the same case can be selected at once.
  - a. Note: Prior to acquisition, insert the designated latent number in front of the File Name to display as: 90A.1 IMG\_1547.

- Lab Case Number
- Category
- Crime Type
- Date of Crime (optional)
- Captured on (optional)



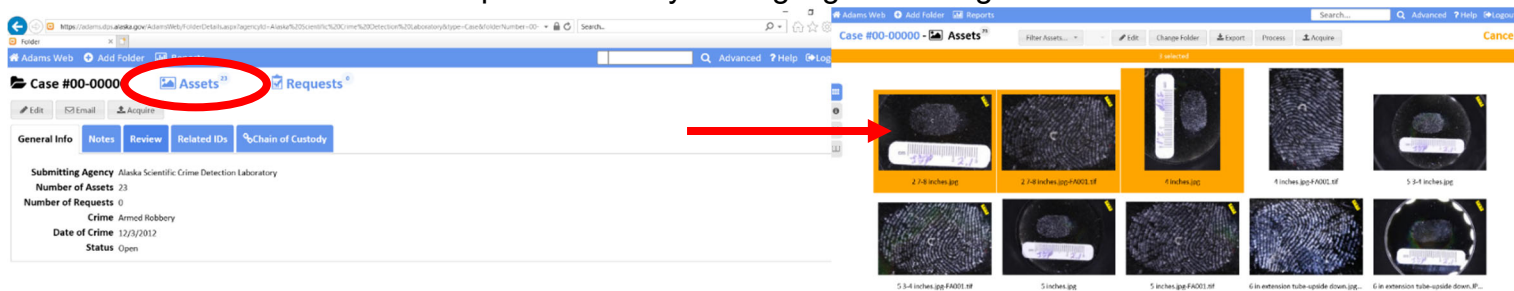
4. Wait for the images to finish uploading. Then select “Submit”



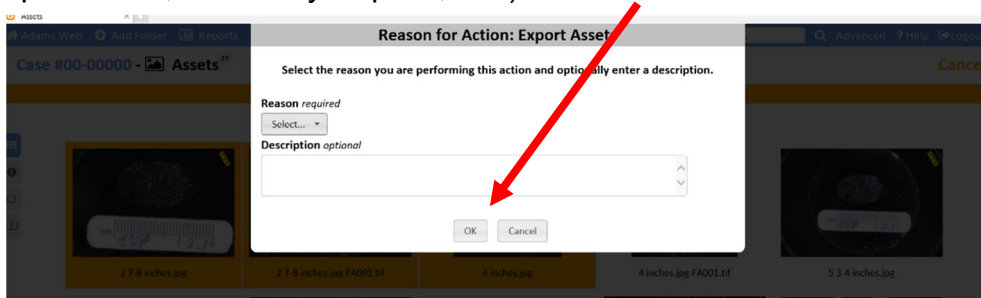
## Exporting Digital Assets:

### Single or Multiple Assets:

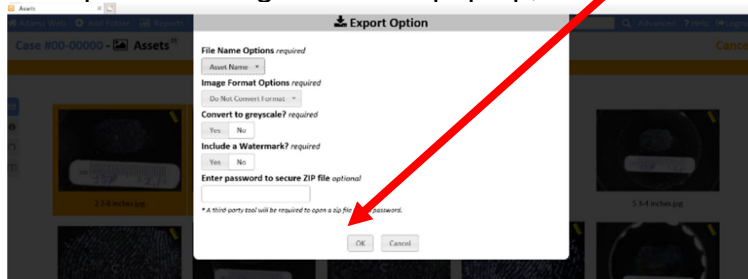
1. Open the Case Number and click Assets.
2. Select the assets to be exported so they are highlighted orange.



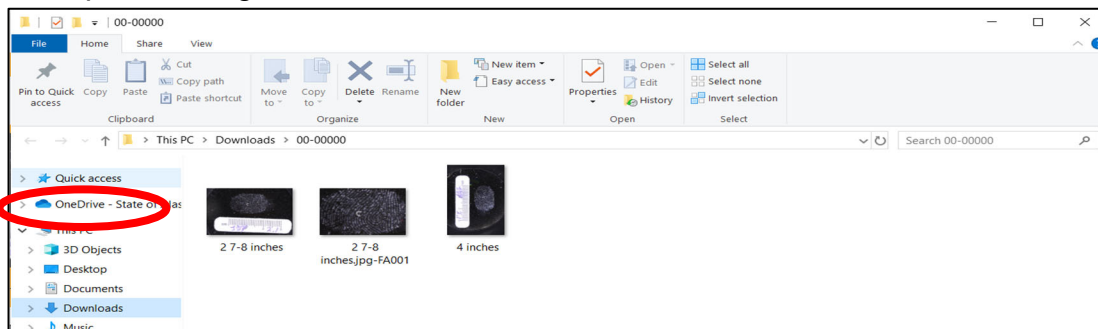
3. Click “Export” at the top of the page and fill out the dialogue box with the reason for exporting. (Example: Notes, Discovery request, etc.) Select “OK”



4. A second “Export Options” dialogue box will pop up, Select OK

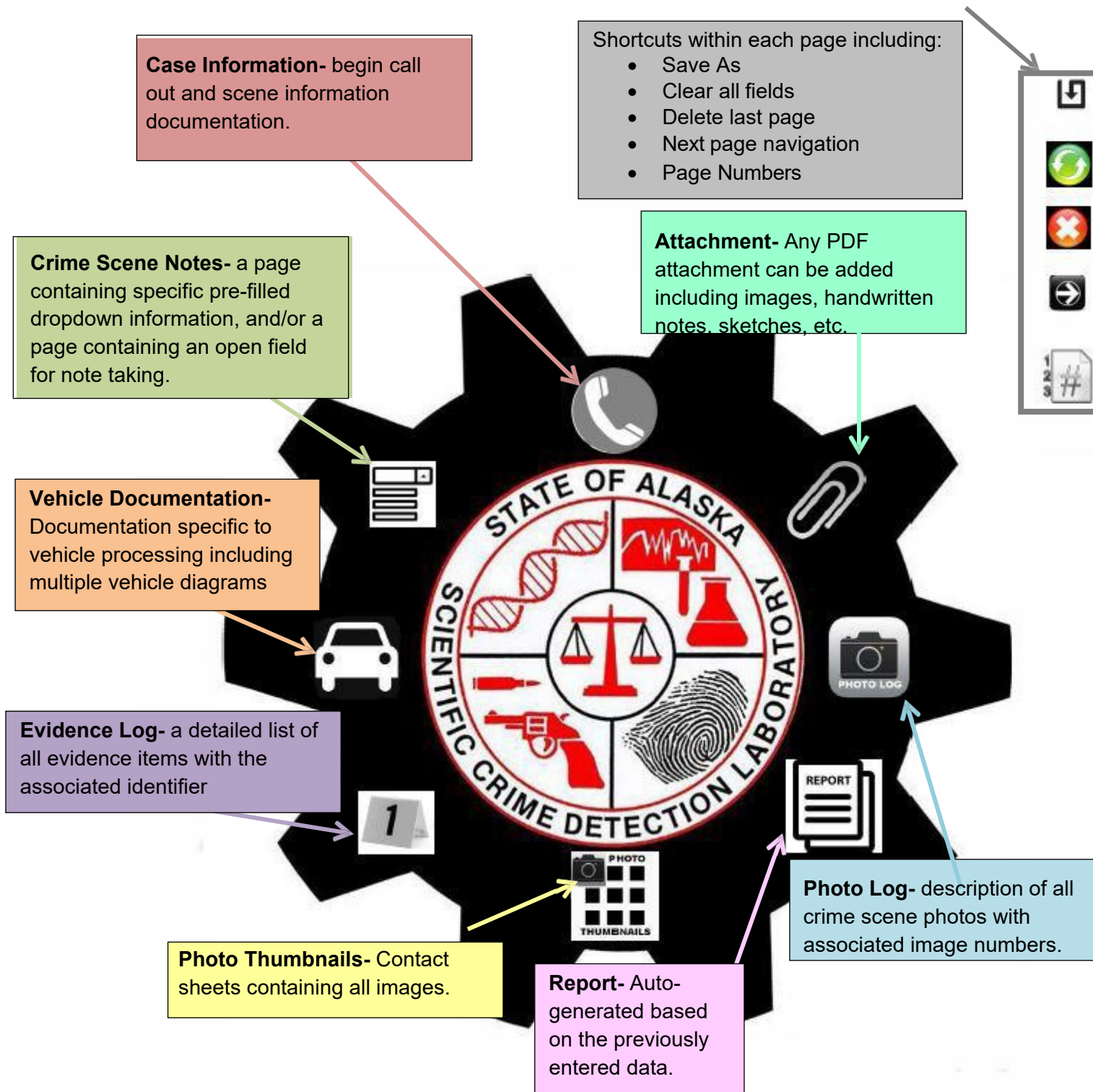


5. The exported images can be located inside the PC “Downloads” folder.



## Digital Documentation (LaunchPad)

The LaunchPad Workflow is push button automatic note taking document. Each button will spawn a new template page designed for data entry regarding that particular phase of the workflow.



## Appendix B – Labeling Guidelines

The intention of these guidelines is to create a unique identifier for evidence that allows it to be easily identifiable and tracked. It is recognized that all crime scenes are unique and may dictate alternative methods for identifying evidence, though the following should be considered.

Type of Evidence	Identifier/Placard	Packaged Together and Labeled as:
Swabs	S1, S2, S3, in order of processing	#S-(analysts initials)
Latent Prints	L1, L2, L3, in order of processing	#L-(analysts initials)
Footwear	A, B, C, in order of processing	Photos Only
Gel Lifts	A, B (impressions) to A-G1, B-G1 (Gel-Lift of impression)	#G-(analysts initials)
Casts	A, B (impressions) to A-C1, B-C1 (Cast of impression)	Packaged separately
Tape Lifts	T1, T2, T3, in order of processing	#T-(analysts initials)
Defects	A, B, C.... or D1, D2 (if path can be determined)	

**Appendix C - Abbreviations**

Abbreviation	Meaning
ABI	Alaska Bureau of Investigation
ADAMS	Authenticated Digital Asset Management System
AK	Alaska
ALS	Alternate Light Source
Approx	Approximately
ARMS	Alaska Records Management System
ASCDL	Alaska Scientific Crime Detection Laboratory
AST	Alaska State Troopers
ATV	All-Terrain Vehicle
Ave	Avenue
CJT	Criminal Justice Technician
Dr	Drive
DSLR	Digital Single Lens Reflex
E	East
Exp	Expiration
GIU	General Investigation Unit
GPS	Global Positioning Satellite
Hwy	Highway
Inv	Investigator
LIMS	Laboratory Information Management System
Lt	Lieutenant
Misc	Miscellaneous
MTR	Matanuska Towing & Recovery
N	North
NE	Northeast
NEG	Negative
NW	Northwest
PD	Police Department
PDF	Portable Document Format
RLS	Request for Laboratory Services
S	South
SN, S/N	Serial number
S&W	Smith and Wesson
SE	Southeast
Sgt	Sergeant
St	Street
SUV	Sport Utility Vehicle
SW	Southwest
TRP, Trp	Trooper
TIF (TIFF)	Tagged Image File
VIN	Vehicle Identification Number
VPSO	Village Public Safety Officer
W	West
+	Positive
-	Negative



## Appendix D – Revision History

Revision History	
Location	Revision Made
Section 1	<b>Added</b> It is recognized that all crime scenes are unique and requires crime scene analysts to continuously evaluate how to proceed with processing in a manner that is safe and best preserves the evidence. All decisions made by crime scene analysts before, during, and after a scene is processed should consider legal considerations, personnel safety, scientific reliability and validity, preserving context, maintaining evidence integrity, transparency, and managing bias.
Section 1	<b>Added</b> Crime Scene Analysts shall conduct themselves with the expectation that their work may be used in every step of the legal process. Crime Scene analysts should refrain from performing tasks for which they are not qualified, based on training, education, and experience.
Section 1	<b>Added</b> Each item of evidence collected should maintain evidence integrity by preventing contamination, tampering, alteration, or loss of evidence and from being damaged during transport. The disposition of evidence will be documented in the Analysts notes.
Section 2	<b>Added</b> All crime scene analysts will keep a folder on their laboratory issued computer desktop containing current copies of the crime scene procedure manual and documentation forms in the event there is no internet service at the scene location.
Section 3	<b>Updated</b> “Notes may be recorded in ink, pencil may be used if cold weather prevents the use of an ink pen and scanned as an attachment in the LaunchPad document when necessary.” <b>To</b> “Notes may be recorded in ink, pencil may be used if cold weather prevents the use of an ink pen. When utilized, all written notes will be scanned as an attachment in the LaunchPad document.”
Section 3	<b>Added</b> Information provided to the crime scene analyst should be objectively documented and continuously evaluated within the context of the evidence. The crime scene analysts should remain open to all hypotheses and potential evidence.
Section 5	<b>Added</b> A crime scene image item will be created in LIMS under the evidence tab. The item number should be “Crime Scene Photos” and the description will include the location and date of the scene response (vehicle information will also be added if applicable). The evidence type should be “Digital evidence”. The chain of custody will start from the analyst uploading the images to Foray and end at the “Digital Imaging Server”.
Section 7	<b>Added</b> Documentation shall include the requesting agent and what services were requested. – To the exam request statement.



Section 8	<b>Added</b> Sampling may be performed at crime scenes for the selection and possible collection of biological evidence. All areas containing labeled stains shall be documented with photography and in the Analysts evidence log. When selecting specific stains, the Analyst will take into consideration the substrate, stain size, and overall shape. At least one representative stain within separate areas should be appropriately labeled and documented. Presumptive field tests (Hemastix) may be utilized at the discretion of the examiner. These areas may be collected by swabbing, cutting, or collecting the entire item (see biological evidence for further collection procedures). Deviations from this sampling method must be documented in the analysts notes.
Section 9	<b>Removed</b> An individual or vehicle may be associated to a crime scene through impressions left behind from footwear or tire tracks.
Section 9	<p><b>Added</b> The methods included in this document may not cover all situations. Areas or items suspected of containing impression evidence should be secured or protected from contamination or disturbance. Alternate routes of travel within the scene should be established when possible.</p> <p>One or more of the following procedures should be used in a sequential process with the least destructive methods used first (visual using ambient light or a flashlight and photography). Photograph any impressions observed before attempting further enhancement methods. The determination of which methods to be utilized will be up to the analysts discretion taking into consideration the substrate, components of the impression, and environmental conditions. Impression evidence may also have limitations due to environmental factors, lighting, substrate features, and overall quality of the impression(s). Limitations, when known, should be noted and recorded in the analysts notes.</p> <p>Searching for two and three-dimensional impressions utilizes oblique lighting. When searching using oblique lighting, impressions may only be visible when illuminated from a particular angle(s), necessitating the need for a thorough search.</p> <p>Items of evidence that contain impression evidence and can easily be collected should be labeled and photographed in place, then collected and submitted to the laboratory for further processing. If an item cannot be removed it should be processed at the scene utilizing photography and/or recovery methods listed below.</p> <p>The goal of physical and chemical development of Impressions is increased contrast/visualization. When utilizing chemical enhancement methods, it is recommended that a separate area of the substrate be tested with the reagent to evaluate potential processing limitations such as poor de-staining, degradation of the substrate, or substrate reaction with the reagent.</p>
Section 9	<b>Added</b> Photography: Overall and mid-range photographs should be taken from multiple angles showing the labeled impression(s) in relation to other features and items within the scene. Close up photographs of impression evidence shall contain a scale and identifier, should utilize a tripod, and keep the film plane should be parallel to the impression. The camera should be set to a low ISO (ex: 100-400) and the image quality should be set to capture images in an uncompressed or lossless format (ex: RAW). Photography is not a substitute for casting or lifting of impression evidence.

	<ul style="list-style-type: none"> <li>•An “L-shaped” scale should be placed next to and along the length of the impression on the same plane as the lowest part of the impression.</li> <li>•If a zoom lens is used, set the focal length as close as possible to a normal lens (50 mm) to prevent distortion.</li> <li>•Set the camera f-stop to an appropriate setting to ensure sufficient depth of field to capture the entire impression in focus. (Aperture priority may be useful when utilizing a tripod).</li> <li>•Fill the camera frame with the impression and scale.</li> <li>•The impression should be photographed with a light source (flashlight) held at an oblique angle approximately 4 ft to 5 ft away and direct it at the impression from at least three different positions around the impression. Note: A deeper impression will require a higher angle of light and a shallower impression will require a lower angle (oblique lighting).</li> <li>oThe analyst may need to use an object to block bright sun or ambient light from striking the impression.</li> <li>•It may be necessary to utilize spray paint to enhance the contrast of impression evidence in snow. The paint should be applied by spraying obliquely 8 inches to 12 inches away from the impression. The impression should be re-photographed after enhancement attempt.</li> </ul> <p>Note: For long sections of possible tire impressions to be captured with photography, a tape measure should be utilized next to and along the length of the impression on the same plane as the lowest part of the impression. Once placed down this tape measure should not be moved until the entire series of images are captured. Close up photographs filling the camera frame of the entire length of the tire impression with an identifier should be taken through a series of overlapping photographs. Each image should overlap by at least 1 inch of the previous image.</p>
Section 9	<p><b>Added</b> Gelatin lifters may be used for lifting two-dimensional impressions (ex: dust, residue, blood, and wet origin impressions, as well as impressions developed with fingerprint powder) from a variety of surfaces. A gel lift of contrasting background should be used when possible (ex: black powder/white gel lift).</p> <ul style="list-style-type: none"> <li>•Black lifters provide greater contrast with light colored powders and residue impressions.</li> <li>•Gelatin lifters may stretch when the clear cover is removed. Care should be taken when removing the cover to limit the stretch. The lifter should be allowed to rest until it returns to the original size, before applied to the impression.</li> <li>•Gelatin lifts of impression evidence should be photographed as soon as possible after collection prior to packaging and/or replacing the acetate cover for preservation.</li> <li>•When replacing the clear cover, place the clean side of the clear cover in contact with the gelatin lift or use a new acetate cover. The side previously in contact with the gel lift should not be replaced on the impression to prevent re-deposition of the residue.</li> <li>•Multiple lift attempts may be necessary.</li> </ul>

	<ul style="list-style-type: none"> <li>•Multiple gelatin lifts may be packaged together and should be submitted for further examination as soon as possible.</li> </ul> <p>Casting material such as dental stone, can be used to lift three-dimensional impressions (ex: mud, dirt, and snow).</p> <ul style="list-style-type: none"> <li>•The mixed dental stone viscosity is dependent upon the scene circumstances (location, substrate, etc.) of the impression; most impressions will require a viscosity like pancake batter. The viscosity of the mixture may need to be adjusted based upon the nature of the impression.</li> </ul> <p>oTo ensure the dental stone mixture is as cool as possible when it is applied to snow impressions, techniques such as cooling the dental stone and the water may be necessary.</p> <p>oWhen impression(s) in snow are excessively wet, is melting quickly or has standing ground water, sift two to three fine layers of dry dental stone onto the impression prior to casting.</p> <ul style="list-style-type: none"> <li>•Carefully pour casting material outside the perimeter of the impression and direct the flow into the impression. Ensure the impression is filled and/or covered evenly. If the casting material does not flow completely into the impression, the top surface of the casting material can be carefully agitated to help it flow and fill in the space. If necessary, additional casting material may be poured over the top of the original cast to complete the cast and/or add thickness.</li> </ul> <p>o Casts should be marked with identifying information (Ex: Item number, description, date, initials) prior to lifting from the substrate.</p> <ul style="list-style-type: none"> <li>•Allow the casting material to sufficiently set and harden to prevent damage prior to lifting.</li> <li>•Once lifted, debris that was part of the impression or that was present when the impression was made should not be removed. The dental stone casts should also not be cleaned and should be packaged in breathable containers that prevent damage and continued drying (ex: cardboard box).</li> <li>•Larger quantities of dental stone can be mixed to cast large segments of tire or multiple impressions.</li> </ul> <p>oTire casts should be long enough to capture the entire tire impression. If it is not practical to make one long cast, multiple 3 ft long segments should be made to allow for an optimum comparison during the examination process.</p> <p>Impressions in Standing Water: Sift or sprinkle an even layer of dry casting powder over the impression until the bottom is covered. Then mix and pour wet casting material into the impression.</p> <ul style="list-style-type: none"> <li>•If the impression has water in it and is not fully submerged, casting material can be mixed and poured from the outside edge of the impression, allowing the casting material to flow into the impression, which may displace the water.</li> </ul>
Section 9	<p><b>Added</b> Documentation shall include the requesting agent and what services were requested. – To the intelligence request statement.</p>

Section 12	<p><b>Added</b> Crime Scenes can present a wide variety of physical, biological, chemical, and situational hazards with a level of personal risk of injury, illness, or exposure almost always present. Personal protective equipment (PPE) considerations should include, but are not limited to, protection of eyes and face, head, foot and leg, hand and arm, body, respiratory system, and hearing, and protection against falls, and drowning.</p> <p>To ensure that the crime scene analysts are not exposed to an unreasonable level of risk to personal safety they shall be provided with appropriate PPE and training or information necessary to assess the hazards and mitigate risks presented by the scene and by any processing tools, equipment, or reagents used. Transport.</p>
Section 13	<p><b>Added</b> Balances used for chemical preparation do not need to be calibrated. Normal maintenance includes keeping the balance clean and level.</p>