

OREGON STATE POLICE FORENSIC SERVICES DIVISION

FORENSIC FIELD GUIDE

FORENSIC FIELD GUIDE



OREGON STATE POLICE FORENSIC SERVICES DIVISION

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OREGON STATE POLICE FORENSIC SERVICES DIVISION

FORENSIC FIELD GUIDE

PREFACE

PREFACE

The purpose of this document is to give information to our customers within the criminal justice system regarding services provided by the Oregon State Police Forensic Services Division (OSP FSD) and recommended methods for collecting and preserving physical evidence. Additionally, this manual contains evidence acceptance criteria for items submitted for forensic examination. These recommendations and the criteria help to ensure the integrity and security of the evidence, the safety of lab staff members, and optimal quality of the analytical results.

All agencies are encouraged to keep in regular contact with their local laboratory to stay abreast of changes to lab services or submission requirements. This Forensic Field Guide is accessible via the Oregon State Police website:

<https://www.oregon.gov/osp/programs/forensics/Pages/Law-Enforcement-Resources.aspx>

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1.0 INTRODUCTION

1.0 INTRODUCTION

OSP has five laboratories across the state located in Bend, Central Point, Clackamas (Portland Metro), Pendleton and Springfield. The labs provide services in the scientific examination of physical evidence, collection and preservation of evidence, crime scene response and expert testimony regarding scientific examinations. In addition, the OSP FSD manages and administers the CODIS database and the State of Oregon's breath-testing instruments and officer certification.

All five OSP laboratories are accredited by the ANSI National Accreditation Board (ANAB) to the ISO/IEC 17025:2017 and ANAB AR 3125 standards. Additionally, the DNA Unit is accredited to the FBI Quality Assurance Standards (QAS) for forensic DNA testing and databasing laboratories.

The services of the laboratories are available to all local, state, and federal law enforcement agencies in Oregon for the purpose of rendering assistance in criminal investigations and judicial proceedings. Analyses will also be conducted for the defense upon court order.

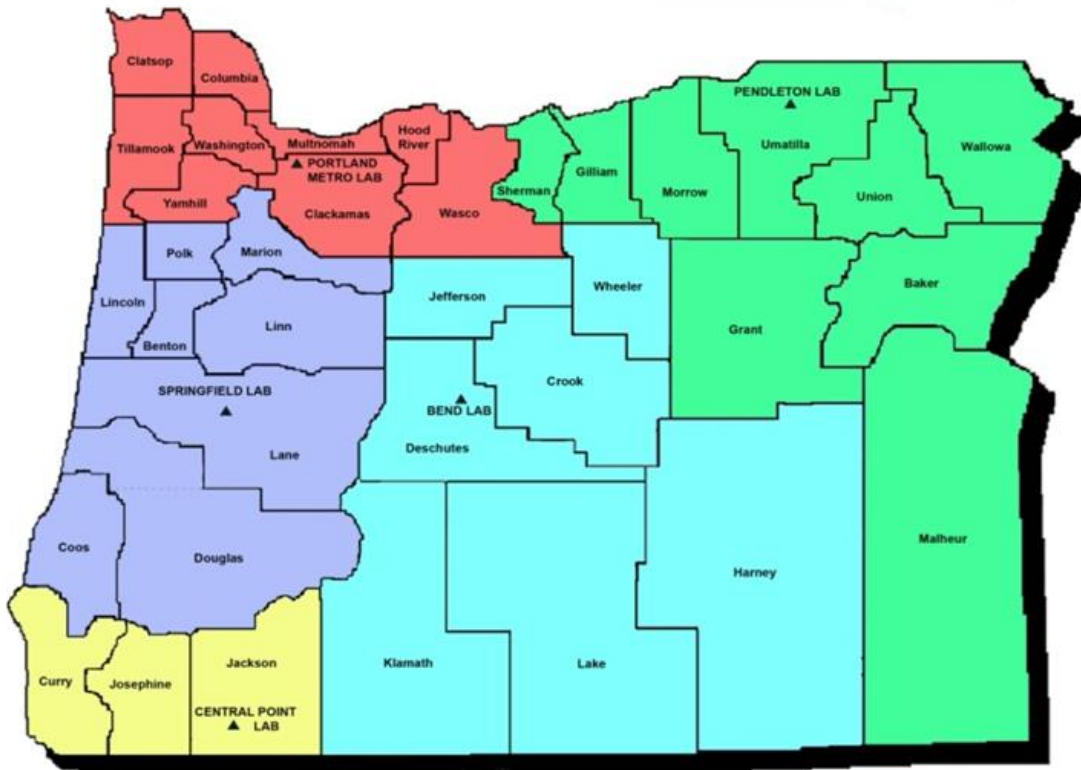
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FORENSIC FIELD GUIDE
2.0 LABORATORY LOCATIONS AND SERVICES

2.0 LABORATORY LOCATIONS AND SERVICES

General Service Areas for the Oregon State Police Forensic Services Division Laboratories are shown in the coverage map below. This map indicates your local laboratory. Coverage for field investigations differs; see next page.



- **Bend Forensic Laboratory: 541-388-6150**
 - Crook, Deschutes, Harney, Jefferson, Klamath, Lake, Wheeler
- **Central Point Forensic Laboratory: 541-776-6118**
 - Curry, Jackson, Josephine
- **Pendleton Forensic Laboratory: 541-276-1816**
 - Baker, Gilliam, Grant, Malheur, Morrow, Sherman, Umatilla, Union, Wallowa
- **Portland Metro Forensic Laboratory: 971-673-8230**
 - Clackamas, Clatsop, Columbia, Hood River, Multnomah, Tillamook, Wasco, Washington, Yamhill
- **Springfield Forensic Laboratory: 541-726-2590**
 - Benton, Coos, Douglas, Lane, Lincoln, Linn, Marion, Polk

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2.0 LABORATORY LOCATIONS AND SERVICES

FIELD INVESTIGATION RESPONSE COVERAGE

Field Investigation (i.e., crime scene) response regions differ from the coverage map above. The service area counties for crime scene response only are as follows:

Bend Forensic Laboratory: 541-388-6150

Crook, Deschutes, Harney, Jefferson, Klamath, Lake, Wheeler

Central Point Forensic Laboratory: 541-776-6118

Curry, Jackson, Josephine

Pendleton Forensic Laboratory: 541-276-1816

Baker, Gilliam, Grant, Malheur, Morrow, Sherman, Umatilla, Union, Wallowa

Portland Metro Forensic Laboratory: 971-673-8230

Benton, Clackamas, Clatsop, Columbia, Hood River, Lincoln, Marion, Multnomah, Polk, Tillamook, Wasco, Washington, Yamhill

Springfield Forensic Laboratory: 541-726-2590

Coos, Douglas, Lane, Linn

Agencies submitting evidence collected during the course of an OSP FSD response should contact the primary Field Investigator that responded to the scene **prior to submitting any evidence**. Evidence associated with a scene to which FSD Field Investigators responded will be submitted to the agency's regional laboratory as shown on the coverage map above, even if the response team was dispatched from another region.

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2.0 LABORATORY LOCATIONS AND SERVICES

LABORATORY SERVICES

Services provided by each laboratory in the Forensic Services Division are shown below. Evidence may be transferred between labs to complete work.

Portland Metro Lab

Biology Processing

Chemistry

- Controlled Substances
- Clandestine Lab Analysis
- Meth Quant (Purity)
- Cannabis Determination

DNA

- Autosomal DNA analysis (STR)
- Y-STR analysis
- CODIS

Field Investigations

Firearms/Toolmark analysis

Implied Consent Program (Breath Alcohol Calibration)

Latent Print and Impressions Analysis

Toxicology

- Postmortem Drugs/Poisons
- Postmortem Blood Volatiles (ethanol, acetone, inhalants)
- Antemortem Urinalysis
- Antemortem Blood Toxicology

Trace Evidence analysis

- Arson
- Fibers
- Glass
- Hairs
- Miscellaneous
- Paint
- Physical Fit

Bend Lab

Biology Processing

Chemistry (Controlled Substances)

Field Investigations

Latent Print Analysis

Central Point Lab

Biology Processing

Chemistry

- Controlled Substances
- Clandestine Lab Analysis

Field Investigations

Firearms Processing

Latent Print Analysis

Pendleton Lab

Biology Processing

Chemistry (Controlled Substances)

Field Investigations

Firearms Processing

Latent Print Processing

Springfield Lab

Biology Processing

Chemistry

- Controlled Substances
- Cannabis Determination

Field Investigations

Firearms Processing

Latent Print Analysis

Toxicology

- Antemortem Blood Volatiles (ethanol, acetone, inhalants)

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3.0 CASE COMMUNICATION AND LABORATORY REPORTS

3.0 CASE COMMUNICATION AND LABORATORY REPORTS

Customers of the OSP FSD should be aware of these routine laboratory policies. Additionally, by submitting evidence for analysis or receiving lab reports, customers agree to certain information regarding confidentiality, reporting, and selection of methods (agreement available at https://www.oregon.gov/osp/Docs/FSD_Customer_Communication.pdf).

- Evidence is typically returned to the submitting agency after lab analysis is complete.
- Selection of testing methods is at the discretion of the laboratory.
- Analytical lab reports will be provided in a simplified format. If more complete information about the analysis in a specific case is required, contact the laboratory.
- The OSP FSD complies with guidelines in the release of reports and case information to appropriate law enforcement agencies, district attorney's offices, and other entities as dictated by discovery requests, public information requests, and court orders.

Laboratory Online Information System (LOIS)

Electronic lab reports and case status updates are accessible through the Laboratory Online Information System (LOIS). LOIS may also be utilized to contact analysts assigned to lab requests. A final report is released electronically through LOIS to the agency/customer that made the request for service. An automatic notification of the report availability is also sent to a designee at the District Attorney's office that serves that jurisdiction.

Any member of an agency served by the Oregon State Police Forensic Services Division who needs access to the work done on behalf of their agency may request LOIS access. The help button at the following website contains the procedure for accessing LOIS: <https://xn.osp.state.or.us/LOIS/Login.aspx>

For detailed instructions on the LOIS system, please see the LOIS help pages located at: <https://xn.osp.state.or.us/LOIS/help/help.htm>

Forensic Laboratory Evaluation Form and Surveys

Periodically, the Forensic Services Division will send evaluation forms or surveys to its service agencies. These evaluations and surveys provide valuable feedback on our goal of providing quality and timely scientific, technical, and investigative support. Should you receive an evaluation form or survey, please take the time to provide your feedback. Evaluations may be related to any of the following categories:

- Court Room Testimony via this link: <https://www.surveymonkey.com/r/FSDCourt>
- Laboratory Analysis and Reports (sent via LOIS)

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4.0 REVIEW AND CANCELLATION OF LAB REQUESTS

4.0 REVIEW AND CANCELLATION OF LAB REQUESTS

The Law Enforcement Agency or District Attorney’s Office may cancel a lab request at any time and should notify the laboratory as soon as possible. If at the time of the cancellation, the evidence has been opened or is in the process of analysis, a report describing the work completed to date will be issued.

OSP FSD may cancel a request for analysis and return the evidence to the submitting agency. Reasons for canceling a request for analysis may include but are not limited to the following:

- Notification from the prosecutor (or via online court documentation) that the case has been adjudicated/resolved by dismissal, plea, diversion, etc.
- The lab is unable to perform the work requested or there is no indication of a crime
- A Sexual Assault Forensic Evidence Kit that meets the definition of an anonymous kit (refer to ORS 181A.323 and 181A.324)
- Use of an obsolete version of the Form 49 submission request. The current version is found here: https://www.oregon.gov/osp/Docs/Form_49-General.pdf
- Omission of required incident narrative or police report for all physical evidence cases except Chemistry, certain Toxicology, and DNA HTPC requests.

Chain of custody or packaging problems such as:

- Evidence was received by certified carrier and did not include a list of the contents sent to the lab
- Evidence is not properly sealed
- Sharp objects are not packaged in a puncture-resistant container
- The description of the evidence on the submission paperwork is too vague or substantially different than the evidence that is received (e.g., missing evidence; dramatic difference in count, color, size, or shape; incorrect caliber or make of weapon; more cartridge cases were received than described; wrong name or case identifiers on evidence)

For additional causes of cancellations related to drug evidence submissions, refer to the Drug Chemistry section of this guide.

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5.0 GENERAL EVIDENCE HANDLING AND COLLECTION GUIDELINES

5.0 GENERAL EVIDENCE HANDLING AND COLLECTION GUIDELINES

It is important that evidence be collected, handled, and stored in a way that will ensure its integrity.

- Protect yourself and others by using gloves and personal protection, and using sharps-appropriate containers for blades, syringes, and broken glass.
- Protect the evidence from loss, damage, or contamination by packaging it appropriately. Refer to packaging recommendations in the next section.
- Consider collecting all types of forensic evidence that may be meaningful in an investigation, even if it may not initially be submitted to the laboratory. With complicated scenes, it is strongly recommended to triage the evidence with lab staff to decide what to test first.
- Before evidence is collected, document its location and condition with notes, sketches, and/or photographs. This establishes chain of custody and the condition of the evidence as it was recovered.
- Obtain appropriate standards, when needed, for comparison to evidence. Examples include DNA standards victim elimination fingerprints or palm prints, comparison standards of hair, paint, glass, and fibers.

Packaging

Appropriate packaging depends on the type of evidence, the condition of the evidence, and the laboratory examination(s) requested. Use the information in the table below (or consult the section of this guide specific to the type of evidence) to select the proper way to package items of evidence. All packaging types should be clean and unused (e.g., no grocery bags that have previously been used.).

- Use packaging that is appropriate for the specific type of evidence, such as paper bags, envelopes, plastic bags (for non-biological evidence), cardboard boxes, sharps tubes, metal cans, glass jars, etc. For packaging specific to blood, urine, or tissue samples for toxicological testing, refer to the toxicology section of this guide.
- Choose packaging that is large enough to allow the item to be re-sealed after examination; lab staff often must add additional layers of packaging after analysis. Conversely, avoid oversized packaging when submitting small quantities of evidence (e.g., residues or small quantities of paint, glass or fibers).
- Ensure a proper seal, to prevent evidence loss and/or access.
- Mark the evidence and/or packaging with case identifiers (i.e., case number and item number), description of evidence, name/initials, and date.
- Package each item of evidence separately, with the exception of latent lift cards, and fingerprint standards. See the section on Firearms Evidence for specific guidance on that evidence type.
- Allow wet biological stains to air dry before packaging.

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Evidence Packaging	
Packaging Type	Uses
Paper bags or envelopes	Most biological material and clothing (blood or semen-stained items, condoms, etc.), except clothing submitted for Arson analysis. Items for latent print processing. <i>If unable to air dry prior to packaging, submit to the laboratory as soon as possible and notify them that it is a wet sample.</i>
Plastic bags or Ziplocs	Dry, non-biological material such as Drug evidence. Fresh plant or fungal material should be dried or packaged in paper.
Metal cans, specialized plastic bags, static-proof bags	Arson evidence, some Trace samples
Plastic buckets	Samples from clandestine laboratories that are individually packaged in glass vials and set in an absorbent material (e.g., vermiculite, kitty litter, etc.) in the plastic bucket. Caustic or corrosive liquids.
Leak-proof container (glass or plastic)	Liquid drug samples, syringe contents, samples from clandestine laboratory (glass containers only), miscellaneous trace samples, etc.
Paper folds and Post-It notes, then placed into a clean envelope	Small pieces of trace evidence, hairs, fibers, minute glass particles, paint chips, etc. Place inside a larger paper envelope. Use of Post-It notes: use gloved fingers or a tool (e.g., forceps, tweezers, etc.) to collect the trace evidence, place it on the adhesive of a post-it note, and then fold the note over on itself and label.
Cardboard boxes	Firearms, knives, large pieces of plate glass, tools such as prybars or golf clubs, a piece of flooring with a shoeprint, etc. Offers protection from sharp edges and the depth protects one surface of the evidence from rubbing.
Sharps tube	Syringes, broken glass, blades

Evidence Seals

Evidence must be sealed in such a way that any attempt to tamper with the seal is visibly apparent. Acceptable types of tamper-evidence seals are heat seals, tamper-evident adhesive seals, tamper-evident tape, and a combination of packing tape (for strength) and tamper-evident tape. Gummed-seal bags are also accepted but not preferred. A proper seal ensures that evidence has not been accessed, altered, compromised, or lost during storage/transportation. A complete and tamper-evident seal is required except for large items that cannot be reasonably sealed (e.g., bicycles, furniture) or items that need to be dried (e.g., marijuana, bloody clothing). Sealed evidence must be initialed (or marked with an equivalent unique identifier) and, when possible, the initials/identifier should cross over the seal in such

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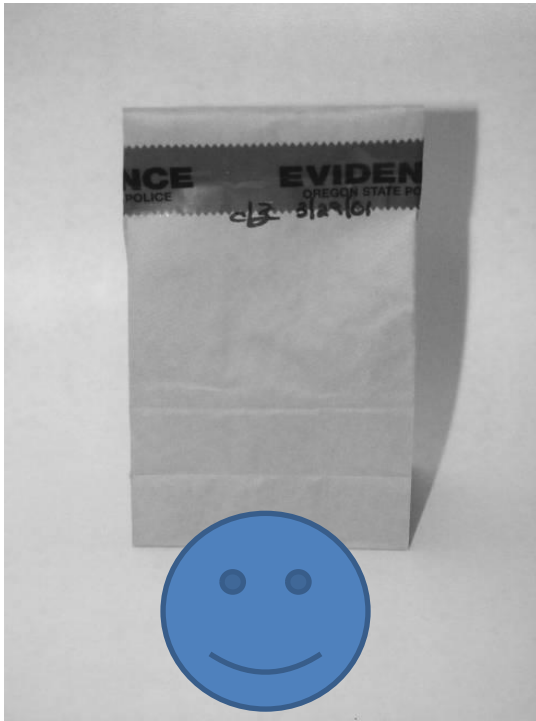
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5.0 GENERAL EVIDENCE HANDLING AND COLLECTION GUIDELINES

a way as to provide visual indication of entry into the evidence packaging if the seal is broken. Staples and other fastening techniques can be used in addition to the acceptable tamper-evident seal. See examples in the photos below.

Evidence submitted in person that is not properly sealed will not be accepted by the laboratory. Evidence that is not properly sealed and delivered via a Commercial Parcel Delivery Provider (UPS, FedEx, USPS) may be shipped back.

Acceptable



Not Acceptable



Note: If packing tape was used to seal the length of the paper bag, then evidence tape applied perpendicular to the packing tape and spans its entire width would be considered an acceptable seal.

Minimum Size for Evidence Packaging

To ensure easy handling and resealing of submitted evidence, it is recommended that all evidence be submitted to the laboratory using the appropriate package type (e.g., plastic bag, manila envelope).

Evidence Submission

Evidence should be submitted to your local regional laboratory, even if your local laboratory does not perform the service you are requesting, unless it falls under one of the exceptions listed below or there is prior supervisor approval to send the evidence directly to another lab. For example, although DNA

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analysis is only performed at the forensic laboratory in Portland, evidence needing DNA analysis, including standards, should be submitted to your local laboratory.

Exceptions: Arson evidence may be submitted directly to the Portland Metro Laboratory. Antemortem blood volatiles samples should be submitted to the Springfield Laboratory and antemortem urine and blood toxicology samples (i.e., testing blood for drugs) should be submitted to the Portland Metro Laboratory. DNA evidence collected as part of the DNA HTPC program and criminal paternity cases which include products of conception samples should be submitted to the Portland Metro Forensic Laboratory.

Prior to submitting a large quantity of evidence in a single case, a triage discussion with lab staff should occur. OSP Forensic Scientists are trained to manage the evidence in your case by ensuring that the evidence is referred to the appropriate section for examination. Submitted evidence may be transferred to another laboratory for appropriate analysis.

Methods of Evidence Submission

To ensure that a continuous chain of custody on all exhibits can be established and maintained, and to protect evidence from loss, damage, or contamination, the following evidence submission methods are allowed:

- Personal/Individual delivery (please contact the lab for an appointment)
- USPS Mail (recommend tracking and signature confirmation)
- Commercial Parcel Delivery Provider (e.g., FedEx, UPS)

Content List for Shipped Evidence

Shipped evidence must include a content list of the evidence being submitted so that the laboratory can verify that it has received the intended item(s). The content sheet must include the agency case number and description of the packages. Packages received without a content list may be returned.

Example:

Agency Case Number	Description (Agency Evidence #, Number and Type of Packages)	Lab Use Only
xx-xxx	#567 – One heat sealed plastic bag #568 – One tape sealed brown paper bag	

A pdf version of an example packing list can be found here:

<https://www.oregon.gov/osp/programs/forensics/Pages/Law-Enforcement-Resources.aspx>

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Required Submission Documentation

An agency report that describes the items of evidence submitted must be provided to the laboratory for most lab requests. This report should include necessary context about the collection location, associated persons, and other details that clarify the request for lab services. Reports are required for all requests except toxicology, blood volatiles, controlled substance analysis, methamphetamine quantitation, anonymous analysis, and HTPC DNA analysis. If an agency report is not provided with the evidence, lab work may be significantly delayed or canceled.

- For general requests for analysis, a current version of a signed and properly completed Forensic Services Request Form (Form 49) must be submitted with the evidence and will list the types of lab services requested. A signature on the form indicates agreement to the confidentiality, simplified reporting, and selection of methods information available in the customer agreement linked on the Form 49. Leave shaded areas of the form blank for Laboratory use.

A single Forensic Services Request Form may be used to make multiple requests for service in any of the disciplines available through the FSD. Request forms are available through our website.

- <https://www.oregon.gov/osp/programs/forensics/Pages/Law-Enforcement-Resources.aspx>
- The most up-to-date Form 49 should be used and can accessed here: https://www.oregon.gov/osp/Docs/Form_49-General.pdf
- Form 49 instructions can also be found here: https://www.oregon.gov/osp/Docs/Form_49-Instructions.pdf

Specialized laboratory request forms should be used for the following types of analysis:

- Sexual Assault Form: https://www.oregon.gov/osp/Docs/Form_49-Sexual_Assault.pdf
- DRE Form: https://www.oregon.gov/osp/Docs/Form_49-DRE.pdf
- High Throughput Property Crime (HTPC) Form: https://www.oregon.gov/osp/Docs/Form_49-HTPC-DNA.pdf

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**FORENSIC FIELD GUIDE
6.0 FIELD INVESTIGATIONS (CRIME SCENES)**

6.0 FIELD INVESTIGATIONS (CRIME SCENES)

Field Investigations (crime scenes) involve the analysis of physical locations or objects suspected to be involved in a crime. Analysis may include recognition, documentation, collection, and preservation of evidence and/or performing scientific analysis, interpretation, and reconstruction.

OSP FSD is available to assist with field investigations at the request of any law enforcement agency, District Attorney’s Office or the State Medical Examiner’s Office. A request can be made during normal business hours (8:00 a.m. to 5:00 p.m., Monday-Friday excluding holidays) by calling your local laboratory (see laboratory contact information). Be aware the responding lab may be different based on variances in service areas for field investigations or availability of laboratory resources.

During non-business hours and holidays, call OSP Dispatch and request an OSP FSD crime scene response team. Dispatch will notify the OSP FSD on-call supervisor.

Northern Command Center: 503-375-3555 or 800-442-0776

Southern Command Center: 541-664-4600 or 800-442-2068

FIELD INVESTIGATION RESPONSE COVERAGE

Field Investigation (i.e., crime scene) response regions differ from the coverage map above. The service area counties for crime scene response only are as follows:

Bend Forensic Laboratory: 541-388-6150

Crook, Deschutes, Harney, Jefferson, Klamath, Lake, Wheeler

Central Point Forensic Laboratory: 541-776-6118

Curry, Jackson, Josephine

Pendleton Forensic Laboratory: 541-276-1816

Baker, Gilliam, Grant, Malheur, Morrow, Sherman, Umatilla, Union, Wallowa

Portland Metro Forensic Laboratory: 971-673-8230

Benton, Clackamas, Clatsop, Columbia, Hood River, Lincoln, Marion, Multnomah, Polk, Tillamook, Wasco, Washington, Yamhill

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6.0 FIELD INVESTIGATIONS (CRIME SCENES)

Laboratory management will assess each request based upon the crime type, the complexity of the forensic services needed, available resources within the laboratory and the investigating agency, and the anticipated response time. FSD field investigation response is generally limited to death investigations, missing persons, skeletal remains/buried body recovery, and officer-involved shootings although crime scene assistance may be provided for other person crimes and/or cases in which public safety may be a concern (e.g., assault, sexual assault, hit and run, kidnapping). In most circumstances, the FSD response team will NOT respond to burglaries, unauthorized use of a motor vehicle, theft, or other property crimes. If special circumstances exist that require the skills of trained forensic personnel, scene assistance may be provided for additional types of crime scenes.

If a search warrant is deemed necessary, it should be complete and ready to be executed by the time the OSP FSD crime scene team responds to the scene. This helps ensure that our team members do not waste valuable time waiting at the scene. The warrant should be available for the team to review upon arrival.

Ensure that the scene is secure and safe for the crime scene team. Scenes are complicated and can take anywhere from several hours to days to process. **It is the responsibility of the investigating agency to provide scene security for the duration of the crime scene processing.**

Accident Reconstructionist typically have specialized equipment to diagram the scene. Consider securing response from a reconstructionist in addition to the FSD response team, if necessary.

If you anticipate you will need an OSP FSD crime scene team, call the forensic laboratory, or dispatch and provide advance notice when possible. This helps with coordinating a timely response.

It is strongly recommended that agencies submitting scene evidence contact the primary Field Investigator that responded to the scene for evidence triage **prior to submitting any evidence.** Evidence associated with a scene to which Forensic Services Division Field Investigators responded will be submitted to the agency's regional laboratory even if the response team was dispatched from another region.

Information to be provided by agency prior to laboratory response:

- Name and contact information of requesting official
- Name and contact information for on-scene lead investigator (if different from above)
- Status of search warrant

Reminders while waiting for team response:

- Limit personnel inside the scene
- Do not move items
- Once an analyst has been assigned, they will reach out to discuss scene specifics and estimated response time

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6.0 FIELD INVESTIGATIONS (CRIME SCENES)

Field Investigation Services Offered

- Evidence identification, documentation, preservation, and collection for autopsy, scene, and vehicle processes
 - Biological material (i.e., blood, DNA, semen, saliva, vaginal secretions)
 - Firearms evidence
 - Impression/Toolmark enhancement, casting, and lifting (e.g., tool, shoe or tire impressions)
 - Latent print processing
 - Major case prints
 - Trace evidence (e.g., hair, fiber, glass, paint, physical fit)
- Photography
 - Documentary
 - Exam Quality
 - Specialized and Full-Spectrum Photography (e.g., IR)
- Chemical testing for blood
 - Visible
 - Non-visible
- Use of an Alternate Light Source to search for biological evidence (i.e., bodily fluids)
- Buried body excavation and scattered remains recovery
- Metal Detection
- Trajectory determinations
- Bloodstain Pattern Analysis (at scene or in-lab)
 - Pattern classification
 - Event reconstruction
- Crime Scene Reconstruction

The scene response team can provide the following:

- Media card(s) with images from scene prior to analyst departure
- Assistance with packaging and sealing evidence collected
- Analytical report addressing observations and examinations at the scene, test results, and any conclusions and/or opinions drawn by the analyst
- Expert testimony covering all aspects of scene documentation, analysis, and report

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6.0 FIELD INVESTIGATIONS (CRIME SCENES)

For Vehicle Examinations conducted by non-FSD personnel, the following guidelines are provided:

Note the following information about the vehicle:

- Year
- Make
- Model
- License plate
- VIN
- Color
- Areas and Descriptions of Damage

Based on the case circumstances, consider the items in the following (not all-inclusive) list. It may help to divide the vehicle passenger compartment into quadrants and search each quadrant from ceiling to floor.

- Examine the exterior of the vehicle. Look for transfer evidence relevant to the case (e.g., paint from a hit-and-run vehicle, clothing impressions on the plastic of a front bumper, hair or fibers caught on the broken edge of windshield glass).
- Document tire information for all tires including manufacturer, type, and size. If the tires need to be compared to tire track evidence the forensic laboratory should be contacted to assist in collecting an exemplar from each tire.
- Note the position of seat(s), tilt wheel, accelerator and brake pedals, and rearview mirror.
- Examine the interior of the vehicle and the trunk for potential evidence, including any fiber-plastic fusion which may help determine where persons were located at the time of a crash.
- Examine the engine compartment and undercarriage of the vehicle for potential evidence.
- Take known standards from the upholstery, carpet, or other vehicle for possible later comparisons. Refer to the Trace section of this guide for instructions.
- If paint or glass damage is apparent, take known standards from the broken glass and areas of damaged paint. Each broken window/mirror and each damaged vehicle body panel requires a separate standard. Refer to the Trace section of this guide for instructions.

Guide to Capturing Quality Scene Photos

Sequencing of images

- Capture images in a progression which allows for recreation of scene at a later date
- Overall, Mid-range, and Close-up

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**FORENSIC FIELD GUIDE
6.0 FIELD INVESTIGATIONS (CRIME SCENES)**

- Overall images establish scene context and location of evidence
- Mid-range images show the item in its immediate surrounding and relative position to other types of evidence
- Close-up images detail the specific item of evidence and can be used for identification
 - Capture image as close to 90-degrees as possible
 - Use a scale (e.g., ruler, L-scale)
 - Fill the frame (i.e., viewing window) with evidence, scale, and/or placard designation

File Formats

- Lossless format (preferred)
 - RAW (preferred)
 - TIFF
 - Lossy format
 - JPEG-- Ensure camera is set to capture the highest resolution JPEG possible

Examples of images to capture

- 360° perimeter view of the overall scene
- Scene location established by landmarks (e.g., street signs, address numbers, adjacent areas)
- Apparent and/or potential access routes to/from the scene
- Entrances and exits to the structure
- Interior overall views with an overlapping series for each room (including ceilings, doorways, hallways, etc.)
- Mid-range and close-up views of individual items of potential evidence
- Continuity should be maintained between mid-range and close-up views
- Overall views that include evidence markers in relation to each other

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FORENSIC FIELD GUIDE

7.0 BIOLOGY PROCESSING/BIOLOGICAL EVIDENCE

7.0 BIOLOGY PROCESSING / BIOLOGICAL EVIDENCE

List of Services

- Case Consultation
- Blood Testing
- Saliva Testing
- Semen Testing
- Sampling for DNA analysis
- SAFE Kit Testing

Body Fluid Analysis

DNA analysis can be highly successful when the sample in question originates from a body fluid (blood, semen, and/or saliva), although other types of evidence (wearer DNA and aggressive handling) are also appropriate for Biology Processing/DNA analysis. Items suspected to contain body fluids should be submitted to the laboratory for examination.

Prior to evidence submission, you may call or email your local laboratory to have a case consultation. Taking the time to triage a case before the items are submitted to the laboratory, especially if you have many items, will help you to get results in a more timely manner. Submission of DNA evidence follows a "Five at First" DNA referral model, in which only five evidence samples will be forwarded to DNA at any one time (not including standards).

Baseline Measures for Contamination Prevention

When handling any item that will be submitted for Biology/DNA testing, appropriate measures to prevent contamination should be employed. The following is a list of best practices to avoid contamination:

1. Wear gloves and a mask while collecting biological samples.
2. Change gloves frequently or anytime your gloves are contaminated with biological material.
3. Avoid touching the tips of cotton swabs with your fingers or to other unintended surfaces.
4. Avoid talking over swabs or other evidence, blowing on swabs to make samples dry faster, etc.
5. Consider purchasing individually wrapped sterile swabs (e.g., Bode swabs).
6. Do not touch the water dropper bottle tip to any surface or evidence.
7. Clean tools (such as scissors or tweezers) that you might use to collect evidence with a dilute bleach solution or product containing bleach. Alcohol should be used to rinse residual bleach from those items that will come in direct contact with the evidence. Do not use commercial disinfectant products (such as Clorox wipes) for the purposes of decontamination unless they contain bleach or are designed specifically for laboratory surface decontamination.
8. Do not lick envelope seals; moisten with water.
9. Package items separately (individual paper bags or envelopes).

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7.0 BIOLOGY PROCESSING/BIOLOGICAL EVIDENCE

Biohazard Materials

Any evidence items with potential biohazard material (e.g., urine, blood, feces, saliva) should be clearly and boldly labeled with a “biohazard” label affixed to the outside of the container.

Physical Evidence – Best Practice

Physical evidence submitted to the lab should be used to:

- Establish a crime has been committed
- Link a crime and victim
- Link a crime and perpetrator

Wet items should be air dried, packaged, tape sealed, initialed, labeled and stored at room temperature. Examples of wet/damp items and items with wet stains are:

- Clothing
- Swabs
- Tampons, pads, condoms, diapers
- Bedding

If the evidence is wet when packaging:

- Keep cold by refrigeration or freezing and secure until it can be dried in a secure law enforcement location.
- It may be placed in plastic **temporarily**, but never package a wet item in an airtight container for long-term storage because there is a potential for loss of DNA due to degradation.
- Dry evidence as soon as possible.

Biology Processing Request- Blood, Semen, Saliva

Use Standard Form 49 and select “Biology Processing”

Blood

Blood evidence may be present at the scene of any crime. Bloodstains may appear red, red-brown, tan, gray, or yellowish. Bloodstains may be undetectable to the unaided eye depending upon evidence and stain characteristics. In addition to DNA, blood contains cells and proteins that allow the laboratory to perform the following examinations:

- Presumptive blood testing
- Testing to indicate human or non-human origin

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If it is reasonable to transport the entire stained object, the **entire item** may be collected and submitted to the laboratory. Be careful to seal all openings of a package since dried blood may flake off of an object. If the stained object is not being transported, collect the blood by one of the following methods:

- Swabbing
- Cutting

Swabbing

This collection method may be desirable when the dried bloodstain is on an object that is not easily transported and is non-porous (not absorbent).

- Moisten a sterile cotton swab using 1-2 drops of distilled water or tap water.
- Gently swab the stain with the moistened swab tip until the swab thoroughly absorbs the blood. Continue collecting the stain until it is either completely collected or a sufficient number of swabs (up to 4) have been saturated. **Attempt to concentrate the stain on as few swabs as possible.**
- Allow the swabs to thoroughly air dry.
- Place the dried swabs in a paper container (e.g., paper envelope or bag). Swabs collected from the same stain should be packaged together and facing the same direction.
- Properly label and seal the container.
- When the location of the bloodstain may also have high levels of background/wearer DNA, (such as the collar of a shirt) or the amount of blood present is very small, it may be appropriate to select an unstained area adjacent to the suspected bloodstain to collect (known as a substrate control). Repeat steps 1 through 5 on the unstained area. Package the substrate control separately.

Cutting

This collection method may be desirable when the dried bloodstain is on an object such as the upholstery of a car seat or carpeting. Use a clean, sharp knife or scissors to cut the stained area, leaving unstained margins surrounding the stain. Package into a paper container (e.g., paper envelope or bag) and properly label and seal the container.

It is recommended that you consult with the District Attorney's Office before destroying property.

Collecting Liquid or Moist Blood – Large Quantity

1. Saturate up to 4 sterile cotton swabs with the blood.
2. Blood will coagulate so it is important to collect a good mix of clotted cells and serum.
3. Allow the swabs to thoroughly air dry.
4. Place the dried swabs in a paper container (e.g., paper envelope or bag). Swabs collected from the same stain should be packaged together and facing the same direction.
5. Properly label and seal the container.

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7.0 BIOLOGY PROCESSING/BIOLOGICAL EVIDENCE

Collecting Liquid or Moist Blood – Small Quantity

1. Use swabs to collect the blood, concentrating the blood onto each swab. Attempt to concentrate staining on as few swabs as possible.
2. Allow the swabs to thoroughly air dry.
3. Place the dried swabs in a paper container (e.g., paper envelope or bag). Swabs collected from the same stain should be packaged together and facing the same direction.
4. Properly label and seal the container.

Biology Processing Request – Saliva (Double Swab Technique)

Saliva stains are not typically evident from a visual examination. However, certain types of evidence frequently contain traces of saliva (e.g., cigarette butts, drinking containers, adhesive surfaces of envelopes, chewing gum, bite marks, masks, air bags, etc.).

If the stained object is transportable, the item may be collected and submitted to the laboratory. If it is not transportable, such as bite marks on a body, collect the saliva stain using the double swab technique:

1. Moisten a sterile cotton swab with 1-2 drops of distilled or tap water.
2. Thoroughly swab, with pressure, the suspected saliva stain.
3. While surface is still wet, thoroughly re-swab, with pressure, the same area with a dry sterile swab to collect any remaining moisture.
4. Label the swabs as “wet” and “dry”.
5. Allow the swabs to thoroughly air dry.
6. Place the dried swabs in a paper container (e.g., paper envelope or bag). Swabs collected from the same area should be packaged together and facing the same direction.
7. Properly label and seal the container.

Biology Processing Request – Semen

When the perpetrator of a sexual offense is a male, semen stains may be found on the victim as well as on clothing, bedding, rags, upholstery and other objects. Semen stains may appear white, off-white, yellow, tan or colorless and may have a crusted appearance. Semen stains may be undetectable to the unaided eye depending upon evidence and stain characteristics.

Consider collecting the suspect’s underwear, pants, or other clothing items, as the victim’s DNA could also be transferred to the suspect or the suspect’s clothing.

Collecting Semen Evidence

1. Collect all suspected stained material (e.g., bedding, underwear or other clothing).
2. Each item of evidence should be packaged separately and carefully to prevent loss of any trace evidence (e.g., hairs) that may be present.

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NOTE: Evidence with damp stains should be air dried. Consider marking the location of a damp stain by circling it with permanent marker, as it may not be visible once it has dried.

While air drying, clean paper should be spread under the item to catch any debris, which may be dislodged during the drying process. Clean paper should be placed between items hanging next to each other to prevent cross-contamination. Package each item separately in paper bags or envelopes, along with any paper used.

If the semen stain is on an object that cannot be easily submitted to the laboratory, contact your local laboratory for collection instructions.

Biology Processing Request – Submission to the Lab

Evidence is triaged using a “Five at First” DNA Referral Model. All evidence (with the exception of HTPC evidence and criminal paternity cases that include products of conception evidence) is examined in the Biology Processing section of the laboratory before being forwarded to DNA. In most circumstances, no more than 5 samples are sent to DNA in any round of DNA testing.

Note: Five samples do not necessarily equal five items and does not include standards.

Please call your local laboratory to work with a Biology Processing analyst to triage evidence if you have many items.

Evidence submission should include the following:

- Completed Form 49 with all fields completed
- An officer’s report

Biology Processing – Adult and Child Sexual Assault Forensic Evidence (SAFE-A and SAFE-C) Kits

Biological evidence associated with the body of a potential sexual assault victim needs special attention. The victim needs to be transported to a medical facility for a sexual assault examination. This should be done as soon as possible to preserve what remains of the biological evidence and to document any physical trauma. Consider having photographs taken of any physical trauma and collecting blood and/or urine for toxicology testing as well. Attending medical personnel should collect the evidence by using the appropriate Sexual Assault Forensic Evidence (SAFE) Kit provided by the OSP FSD.

In general, if more than 120 hours has elapsed from the time of the sexual assault to the time of the medical examination, the chances of finding semen evidence in the body of a living victim are greatly diminished, although it may still be possible to detect male DNA. However, it may be prudent to collect a SAFE Kit if you have any doubts or concerns about the timeline. This time range does not apply to deceased victims; it is recommended that you collect a SAFE Kit from deceased victims regardless of the elapsed time.

Bathing, showering, and douching by the victim does not necessarily eliminate the possibility of finding semen, saliva, or trace evidence on the body. A SAFE Kit should still be collected under these circumstances.

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Undergarments, worn by the victim during and/or immediately after the assault, are also good sources for collecting biological and trace evidence. Package each clothing item separately.

Biology Processing– Sexual Assault Evidence

With the exception of rush cases (i.e., cases with a trial date or a public safety concern) or cases previously tested by Sorenson Forensics, the initial submission of sexual assault evidence should be limited to SAFE kits (if collected) and relevant DNA standards (victim, suspect, and consensual partner). Submit SAFE Kit, Penile Swabbing Forensic Evidence (PSFE) Kit, or Child SAFE Kits and oral swab standards from the victim (usually contained within a SAFE kit), suspect, and any consensual sexual partners (if consensual sex occurred within 120 hours prior to assault) to the laboratory before submitting anything else.

Note: DO NOT OPEN SAFE KITS TO VERIFY CONTENTS

Additional items that are packaged separately may be rejected.

The Sexual Assault Form 49 is preferred for all sexual assault evidence submissions. In addition, all SAFE kits submitted to the laboratory must be registered by the law enforcement agency in SAMS Track: <https://sams.osp.oregon.gov>. If an agency or user doesn't have the ability to enter a kit into SAMS, please send an email to samstrack@osp.oregon.gov to request access.

If the investigative questions have not yet been answered by testing of the SAFE kit, the next items preferred for submission will differ depending on individual case circumstance. Contact your laboratory to assist with evidence triage. Additional item submissions often include:

- Clothing (particularly underwear)
- Condoms, tampons, sanitary pads, etc.
- Bedding

Biology Processing– Penile Swabbing Forensic Evidence (PSFE) Kits

Consideration should also be given to collecting penile swabs (swabbing the external portion of the penis), especially if a suspect is identified and has not bathed. It is possible to detect the victim's DNA on the suspect. The purpose of the PSFE kit is to collect DNA that may have been transferred to the male subject as a result of sexual contact. In the absence of a PSFE kit provided by the Forensic Services Division, evidence may be collected using sterile cotton swabs and envelopes.

How to collect swabs using a PSFE kit:

Step 1: Collect four oral swabs.

Swab the inside of the mouth with four sterile cotton swabs.

Air-dry the swabs and place in the provided envelope.

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Step 2: Collect two penis shaft swabs.

Using the double swab technique (previously described for the collection of Saliva), collect two swabs from the entire penis shaft, avoiding the penile orifice.

Air-dry the swabs and place in the provided envelope.

Step 3: Collect two scrotum swabs.

Using the double swab technique, collect two swabs from the entire scrotum.

Air-dry the swabs and place in the provided envelope.

Step 4: Collect two pubic hair swabs.

Using the double swab technique, collect two swabs from the entire pubic hair area.

Air-dry the swabs and place in the provided envelope.

Step 5: Collect head hair standards.

Collect 24 pulled and shed hairs from various areas of the head.

Place the hairs in a clean envelope.

Step 6: Collect pubic hair standards.

Collect 24 pulled and shed hairs from various areas of the pubic region.

Place the hairs in the provided envelope.

Step 7: Collect any additional evidence.

Rectal/anal area, bite mark, hickey, fingers, or other sites of possible evidence transfer.

Use four swabs to collect evidence from internal body sites (e.g., rectum).

Use two swabs via the double swab technique to collect evidence from external body sites (e.g., bite mark, hickey, fingers)

Air-dry the swabs and place in "Other Swabs" envelope. Label the envelope with the area of collection and the purpose of collection (e.g., "bite mark on neck for saliva")

Step 8: Collect the subject's underwear.

If the subject was not wearing underwear at the time of sexual contact or afterward, collect the subject's pants.

Package clothing in a paper bag separate from the PSFE kit, using a separate bag for each garment if possible. Seal each bag with evidence tape and initial across the seal.

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8.0 DNA ANALYSIS

8.0 DNA ANALYSIS

DNA analysis is a multi-step process that tests for the presence of total human and/or male-specific DNA and results in a DNA profile that is comprised of genetic information obtained from the human DNA present in the sample. When an interpretable DNA profile is developed, it can be compared to relevant standards and/or searched in the COmbined DNA Index System (CODIS) database. The DNA unit also manages and administers the State’s CODIS database. DNA analysis can be conducted on both person crimes and property crimes.

Since blood, semen, and saliva originate as liquids, they can quickly coat or penetrate surfaces on which they are deposited and may be difficult to remove once dried. Because no two humans are genetically the same (except for identical twins), these body fluids are unique to the person from which they originate. Performing DNA analysis on these fluids or stains can result in a DNA profile which can then be compared to DNA profiles obtained from reference standards or from other items of evidence.

The nature of DNA analysis lends itself to a computerized identification system; thus, DNA profiles from qualifying items of evidence can be compared to CODIS, a database that maintains qualifying DNA profiles from convicted offenders, items of evidence, unidentified human remains, and missing persons. In Oregon, this information is maintained at the state level. Searches of the database also occur at a national level.

The type of DNA analysis currently performed at the Oregon State Police Forensic Laboratories can yield much information.

DNA analysis <u>can</u>:	DNA analysis <u>cannot</u>:
Provide an association between an item of evidence and an individual (or individuals) and give a statistical estimate in support of the association.	Determine the age or race of the person who deposited DNA on an item
Exclude a person from being the donor of an evidentiary DNA profile	Determine how old a sample is
Determine the sex of an individual who deposited DNA on an item	Determine how a sample was deposited (see “Field Investigations - Bloodstain Pattern Analysis”)
Determine that biological material is from a human	Differentiate between consensual and non-consensual sexual contact

DNA analysis is useful not only on samples originating from body fluids such as semen, blood, or saliva, but also on samples that contain skin cells from a wearer or handler.

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Wearer DNA evidence results from contact with an individual's skin. Items considered for wearer DNA analysis should be submitted to your local laboratory for examination. Wearer DNA evidence can also be extended to items routinely handled by an individual but not necessarily worn, such as backpacks and duffel bags.

Evidence submitted for wearer DNA analysis (and possibly trace evidence examination) include, but are not limited to, shirts, coats, pants, baseball caps, stocking hats, masks, disposable/non-fabric gloves (may also be suitable for latent prints), fabric gloves, and shoes.

Aggressive handling DNA evidence results from contact that is **limited but not casual**, which includes items such as ligatures or victim's clothing where the suspect groped or grabbed violently, **or contact that is casual but not limited**, which includes items such as the steering wheel of a stolen vehicle. Items considered for aggressive handling should be submitted to the laboratory for examination.

Evidence submitted for aggressive handling (and possibly trace evidence examination) include ligatures, clothing items, guns, knives, tools used with force, porous objects, non-porous objects, swabs from skin-to-skin contact, etc.

Touch DNA evidence is the category of evidence originating from an item that has had **both limited and casual contact** with an individual. This category primarily includes objects touched by an individual's hand for a short period of time, such as door handles, drawer handles, light switches, countertops, etc. If there is some ambiguity with respect to whether the item falls under the touch or aggressive handling category, the DNA Unit should be contacted for more guidance.

Touch evidence will only be analyzed with prior approval from a DNA Unit Manager or designee at the Portland Metro Laboratory. The case should meet all of the following criteria:

- The case is a rape, attempted rape, homicide, or attempted homicide.
- All other forensic avenues to identify a suspect or link a known suspect to the crime have been exhausted.
- A DNA result, possibly in conjunction with the CODIS database, is necessary to identify a suspect or link a known suspect to the crime. Evidence items will not be processed to determine, establish, or corroborate path of travel or location.
- There should be a reasonable expectation that the suspect handled the item.
- Every reasonable effort has been made to collect elimination standards from individuals who have routine or recent contact with these items.

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Collecting Aggressive Handling or Touch DNA Evidence

Whether touch evidence or aggressive handling evidence, an abundance of caution should be used when swabbing or packaging an item for submission. Touch and aggressive handling evidence should be collected prior to the use of any latent print processing techniques on the item. This technique is intended for non-porous items.

1. Moisten a sterile cotton swab with 1-2 drops of distilled or tap water.
2. Gently swab the area suspected of having been touched or handled.
3. Follow with a dry swab to collect any remaining moisture.
4. Label the swabs as “wet” and “dry.”
5. Allow the swab to thoroughly air dry.
6. Place the dried swabs in a paper container (e.g., paper envelope or bag). Swabs collected from the same area should be packaged together and facing the same direction

DNA standards should be obtained from all listed individuals in a case who may have contributed DNA to evidentiary items if those items will be referred for DNA analysis. This includes victim and suspect standards, and, in sexual assault cases, standards from any recent (within 5 days) consensual sexual partner(s). Elimination standards are especially critical when an item of evidence is collected from a person who can reasonably be assumed to have left their own DNA behind on an item (for example, standards from the regular driver(s) of a vehicle when submitting swabs from the steering wheel of a stolen vehicle). These standards are compared to the DNA profiles obtained from the evidence.

DNA profiles from convicted offenders will not be used in lieu of DNA standards for direct comparison to evidence profiles.

Standards are required for:

- Samples collected directly from someone’s person (including intimate samples, non-intimate samples such as clothing, or items recovered directly from someone’s pockets).
- Samples expected to have high levels of background DNA from regular use by a particular person or persons (e.g., steering wheel swabs, owned items such as backpacks or personal weapons).
- Samples that are not CODIS eligible (e.g., Felon In Possession gun swabs). In these scenarios, suspect standards are necessary in addition to any pertinent victim or elimination standards.

If the required standards are **not** received, the agency is contacted and provided a 14-day window to submit the required standards. If the required standards are not received within 14 days, the evidence will be returned to the agency. The evidence can be resubmitted at such time as the required standards are collected and submitted to the laboratory.

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If a SAFE kit is submitted without a victim DNA standard (this standard is generally included inside the kit), the SAFE kit will **not** be returned to the agency; instead, the SAFE kit will still be examined as per ORS 181A.324.

For living individuals, oral swabs (also referred to as buccal swabs) are recommended for routine use as a DNA standard. Oral swabs are generally collected by rubbing the inside of the individual's mouth with four sterile cotton swabs. The swabs are air-dried and placed in the provided envelope. Blood standards are also acceptable and are preferred as a DNA standard for deceased individuals that are not severely decomposed or have not recently received a blood transfusion. For recently transfused decedents, an oral swab standard is an appropriate DNA standard.

It is not recommended to swab the bleeding wounds of a living individual for submission as a DNA standard in lieu of collecting oral swabs. Depending on the activity that led to the wounds, this type of sample could yield a mixture of DNA from more than one individual, no longer qualifying the sample for use as a DNA standard.

Collection of DNA Standards- Blood

1. Collect at least one vial of blood into a lavender top tube, which contains the preservative EDTA. If the blood is being collected from a decedent,
2. Up to four swabs of blood may be collected instead of a vial of blood.
3. Label the vial with the individual's name and date collected, and then seal it in a box or padded envelope to prevent breakage.
4. Label the outer packaging with the individual's name, date, and "Blood Standard."

NOTE: Never store liquid blood tubes in the freezer. Refrigerate them instead.

Y-STR testing is a specialized form of DNA testing, which involves the analysis of only the Y-chromosome (male chromosome), not all of the human DNA in the sample. It is useful in DNA mixtures where there is an abundance of female DNA relative to the amount of male DNA in a sample. Suspect standards are required for comparison, as Y-STR profiles are not entered into CODIS. Because the Y-chromosome is passed from father to son, men in the same paternal lineage (fathers, sons, brothers, uncles, etc., all having a common male ancestor) will generally have the same Y-STR profile. For this reason, traditional autosomal STR DNA analysis is generally preferred over Y-STR analysis.

Criminal Paternity testing services can be provided by the DNA Section of the Oregon State Police (OSP) Portland Metro Forensic Laboratory. Please note, we do not perform testing for civil paternity matters.

Criminal Paternity Test Kits are available from all OSP forensic laboratories. This kit includes instructions and the materials required to collect the samples. For live births, oral swabs will be collected from the mother, child, and alleged father.

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For products of conception (abortion or miscarriage), it is the responsibility of the health care provider to separate fetal tissue from maternal tissue. Fetal tissue must be submitted in the provided sample tube. If the fetal tissue has not been appropriately separated prior to submission, OSP will not accept the case. Therefore, it is important that the provider have the kit and instructions at the time of the procedure.

Kits should be submitted directly to the Portland Laboratory. Please ensure the form included in the kit is completed and submitted along with the Form 49. Missing information will result in a delay in analysis.

Secondary Standards may be used when a person of interest is unable to be located (e.g., missing person, fled area) or a standard cannot be obtained (e.g., lack of probable cause for a warrant). Suitable secondary standards include cigarette butts, drinking containers, or personal care items (e.g., toothbrush, razor, etc.) known to have been used only by the person in question. Note that if a mixture of DNA from more than one individual is returned from a secondary standard, it is no longer suitable for use as a secondary standard. In addition, if a secondary standard is determined to match an evidence profile, a known standard will need to be submitted to confirm this match.

Evidentiary items may still be referred for DNA analysis even if **no suspect standards** are available, as the DNA profiles from the evidence may be suitable for entry into CODIS. It is important to note that in the event of a probative association to a profile in CODIS, a known standard (e.g., oral swabs) will be required for confirmation and calculation of statistics to support the weight of the match.

High Throughput Property Crimes (HTPC) Program

This program was successfully piloted in several locations throughout Oregon and has now been expanded to all law enforcement agencies in the state. Much of the success of the pilot program was the result of very specific requirements for evidence submission. For this program to be effectively expanded to all agencies in the state, the program was modified to increase efficiency, reduce redundancy, and ultimately provide agencies with meaningful DNA results in a timely manner.

Law enforcement agencies that wish to participate in the High Throughput Property Crime program will need to complete an online information form that can be found here:

<https://app.smartsheet.com/b/form/090cfbdda6d34b70bfd0988c497a0f10>

Private Laboratory Analysis

The OSP FSD is unable to offer DNA analysis of certain types of evidence (e.g., urine, bones, and drug paraphernalia associated with possession of a controlled substance (PCS)), certain case types (Unidentified Human Remains and Missing Persons), and cases in which there is no victim. The laboratory does not perform mitochondrial DNA analysis.

Information regarding private laboratories available to conduct forensic DNA analysis can be found via an internet search. Please note that if evidence analysis by a private laboratory is performed without prior consultation with the OSP DNA unit, it may be impossible to search any profiles resulting from the private laboratory's analysis in CODIS.

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FORENSIC FIELD GUIDE

9.0 MISSING PERSONS AND UNIDENTIFIED REMAINS

9.0 MISSING PERSONS AND UNIDENTIFIED REMAINS

The OSP FSD no longer provides services related to Unidentified Remains (except for Latent Print Analysis) or Missing Persons.

Missing Persons

For resources and information about CODIS-participating laboratories performing DNA analysis for MP Investigations, please contact the Oregon State Medical Examiner’s Office Human Identification Program/Dr. Nici Vance. For more information on the CODIS database: <http://www.fbi.gov/about-us/lab/biometric-analysis/codis>

If a Missing Person case remains active and unresolved after 30 days have elapsed, a DNA sample directly associated with the missing person should be obtained. DNA Analysis on the majority of missing person cases will be performed by a designated CODIS-participating laboratory. Instruction regarding the requirements and the necessary forms can be found on the OSP website under the “Missing Persons” tab and then “DNA collection” under the “Clearinghouse Functions” menu.

Unidentified Remains

Refer to ORS Chapter 146 - Investigations of Deaths, Injuries and Missing Persons. All unidentified human remains will be submitted to and analyzed by the Oregon State Medical Examiner’s (OSME) Office. The OSP Forensic Laboratories will not accept human remains except for human hands for identification purposes.

“Unidentified human remains” do not include human remains that are part of an archaeological site or suspect of being Native American. Archaeological remains are covered under ORS chapters 97 and 390 and ORS 358.905 to 358.961.

Human Identification Program Contact information:

Oregon State Medical Examiner’s Office
ATTN: Dr. Nici Vance
13309 SE 84th Avenue, Suite 100
Clackamas, Oregon 97015

Nici.vance@osp.oregon.gov

971-673-8200 (General OSME phone)

503-932-8130 (“The Bone Phone”)

971-673-8202 (Desk Phone)

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FORENSIC FIELD GUIDE
10.0 LATENT PRINT EVIDENCE

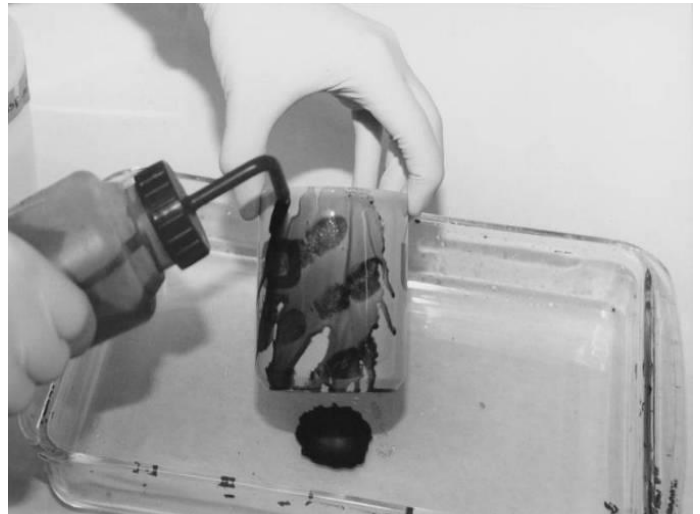
10.0 LATENT PRINT EVIDENCE

Friction ridge detail, also referred to as latent prints, is a widely recognized means of identification. Most crime scene evidence has the potential to reveal comparable latent print impressions; therefore, one should handle all evidentiary items with caution (i.e., with gloves and minimal contact).

Latent print processing is the physical and chemical processing of evidentiary items to develop and preserve friction ridge detail. The chemical composition of latent print residue is such that chemical techniques can be used to visualize latent prints on both porous and non-porous substrates. Friction ridge detail developed on evidentiary items is subsequently compared to a person or persons of interest. The Western Identification Network (WIN) Automated Biometric Identification System (ABIS) and the FBI's Next Generation Identification (NGI) databases are composed of known fingerprint standards and can be utilized to search latent prints of unknown origin.

The services the Laboratory provides include the following:

- Examination and processing of evidence for latent prints.
- Determination of whether latent prints are of comparison quality.
- Comparison of these latent prints to standards provided to attempt to identify a source.
- Search for a possible source by utilizing the Automated Biometric Identification System (ABIS) and/or the FBI's Next Generation Identification (NGI) database.
- Assist with complex deceased printing upon the request of the agency and/or State Medical Examiner



Collection, Packaging, and Submission of Latent Print Evidence

In most circumstances, smaller items of evidence should be collected and submitted to the lab in their entirety for full sequential processing. In these circumstances, no processing (photographs with scales, dusting, etc.) should be conducted by the agency unless absolutely necessary. Latent print evidence should be packaged in a way to minimize the movement of the object without being too restrictive to cause wiping/rubbing (this may destroy latent prints present on the object). Latent print evidence should never be in direct contact with "packing peanuts." Paper items may be placed in a single envelope package for submission

If items have been processed *prior* to submission to the laboratory, information regarding what type of processing was performed should be documented and submitted with the evidence. Chemical processing of evidentiary items should only be done in a laboratory setting.

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10.0 LATENT PRINT EVIDENCE**

Exposure of evidence items to water or dampness should be avoided. However, this exposure does not necessarily destroy all latent prints. It is important that any wet or damp object be air-dried before being packed for shipment.

Guide to Collection and Packaging of Latent Print Evidence	
ACCEPTABLE	NOT ACCEPTABLE
<p>DO use gloves to pick up items of evidence being careful not to wipe possible latent prints off the surface.</p> <p>DO minimize handling of evidence.</p> <p>DO fasten down large articles to a rigid surface to prevent shifting and contact with other items.</p> <p>DO put latent lift cards in envelopes and mark and seal.</p> <p>DO take complete and legible inked fingerprint and palm print standards of all subjects without SID numbers and/or FBI UCN numbers who may have handled the evidence.</p> <p>DO include full name, date of birth, and SID numbers for all involved persons on the Form 49.</p> <p>DO place evidentiary papers and documents in manila envelopes, seal and submit to the laboratory</p>	<p>DON'T apply powder to obviously greasy, wet, or bloody surfaces, or to prints left in dust or soft putty. Please photograph these latent prints or submit the items to the laboratory for processing.</p> <p>DON'T wrap nonporous items in cotton or cloth as they may damage or destroy latent prints.</p> <p>DON'T use "packing peanuts" directly in contact with the evidence.</p> <p>DON'T directly cover evidence to be examined for latent prints with evidence tape.</p>

Digital Imaging

Visible latent prints can also be preserved via digital imaging. All digital images **must** be captured in a lossless format (e.g., TIFF or RAW), contain a visible measuring device and have a resolution of at least 1000 pixels per inch (ppi) whenever possible. An overall photograph (in addition to the close-up image of the impression) should be taken of the item (or scene) such that the latent print can be re-located on the item (or within the scene). Image files should be physically submitted to the laboratory (as evidence) via disk or thumb drive.

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Latent Print Lifts

Larger objects that cannot be easily transported or packaged may be processed in the field. Processing may be performed by powdering the surface with an appropriately colored fingerprint powder and lifting any visible latent prints using clear lift tape. The tape is then adhered to a lift card. Whenever possible, an image of the latent should be acquired prior to lifting. Multiple prints in close proximity should be collected on the same lift, if possible. In some instances, one may need to perform multiple lifts of the same print to obtain the best quality lift. If multiple lifts of the same print are performed, the lifts should be clearly labeled as such. The location, orientation and any other pertinent information (e.g., multiple lifts of the same impression) should be recorded clearly on the back of the lift card. If it is unlikely that the latent print can be lifted due to the surface (e.g., a highly textured surface), then attempt to collect and package the evidence for submission to the laboratory

Submission of Inked Prints for Comparison Purposes

The investigator should take inked prints from all persons known to have handled the evidence (elimination prints) to permit comparison with any latent prints located on the submitted evidence. If the individual already has prints on file, their **full name, date of birth, and SID number or FBI/UCN number** must be listed on the Form 49.

Often latent prints found at the scene of a crime involve areas of the palms, second and third joints of the fingers, and the finger sides and tips. To aid in comparisons, the analyst may request that the investigator take clear and complete inked standards (major case prints) of all ridges on the hands of suspects or persons known to have legitimately handled the evidence. Palm prints should always include recordings of the lower finger joints, as well as the outer edge of the palm (writer's palm). Inked standards should be submitted with the evidence.

Automated Biometric Identification System (ABIS)

After comparisons are conducted with any known suspect's prints, victim prints or submitted inked standards, the remaining unidentified latent prints may be evaluated for ABIS quality and may be searched against the Western Identification Network (WIN) ABIS and/or the FBI's Next Generation Identification (NGI) database. Latent prints that remain unidentified after a search in ABIS may be registered in the Unidentified Latent Database (ULD) for future searches against new standards as they are added to the database. The agency will be notified via a report if a registered print in the ULD is later identified. In the event the submitting agency should identify any latent prints or the case has been resolved, the agency should notify the laboratory so these latent prints can be purged from the ULD.

Identifying the Deceased

Refer to "Unidentified Remains" section in this manual.

Routine identifications for the purpose of clearing a Computerized Criminal History (CCH) record are made through the Criminal Justice Information Services (CJIS) in Salem. Please call 503-378-3070 for more information.

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**FORENSIC FIELD GUIDE
11.0 IMPRESSIONS EVIDENCE**

11.0 IMPRESSIONS EVIDENCE

Shoe, tire, and fabric impressions are routinely present at crime scenes. Examination of these impressions may provide the investigator with valuable leads such as the type, make/model, and approximate size of the footwear or tire. If properly documented and collected, almost every impression left by a shoe or tire has value for forensic comparison to a suspected source. Even when suspect footwear is not available, images of impressions from scenes may be submitted to the laboratory for search in the Solemate® database for make/model determination and comparison to impressions from other scenes. The make/model of tire responsible for a tire impression may also be possible.

Impressions made by other objects (e.g., weapons) may also be encountered and may be collected/documentated using the methods described below.

If impression evidence can be collected without damage, it should be photographed, packaged, and submitted to the laboratory for examination under controlled conditions.

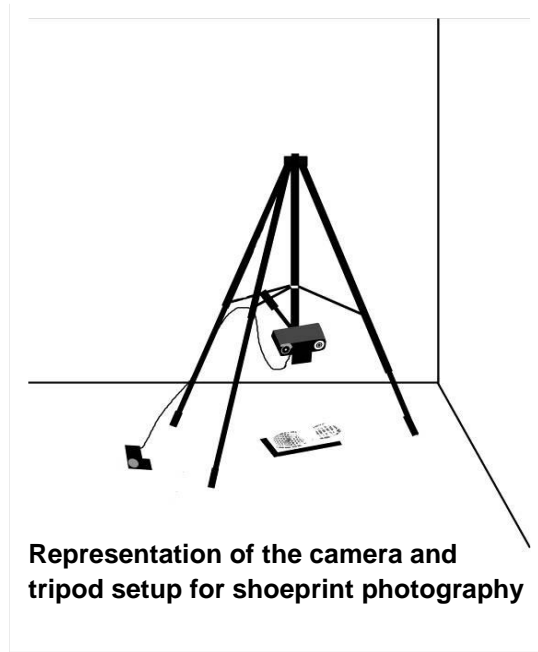
- Always include a scale when taking photographs of impressions to be used for examination. The scale should be a two-dimensional ruler and should be placed on the same plane as the impression.
- Impressions in soil, sand, snow, or impressions which cannot be sent to the laboratory should be photographed and collected via casting or lifting.

Photographing Impression Evidence

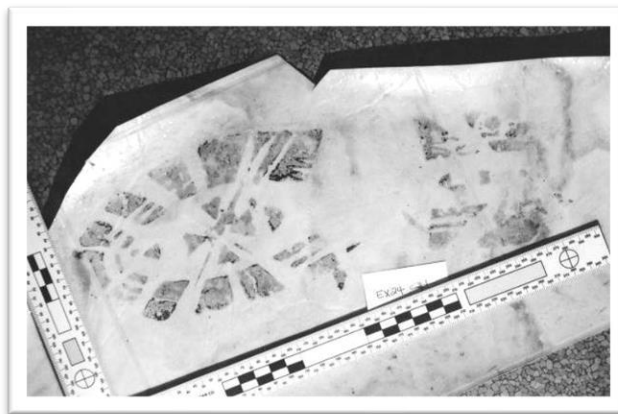
- Photographs of the evidence should always be taken *before* any attempt to collect it.
- Photograph the general scene that contains the impression evidence.
- Impression evidence should be photographed in an uncompressed format (e.g., TIFF or RAW).
- Place the camera on a tripod with the camera directly over and perpendicular to the impression. If the impression is on an angled surface adjust the camera to tilt it to a plane parallel to the impression. It is important to avoid taking the photos at an angle to the impression. This can result in the inability to accurately enlarge the images as needed for comparison.
- Adjust the camera height so the impression and scale fill the frame.
- Use overlapping exposures to record large impressions.
- Use side lighting at various angles and from various directions to illuminate tread design more clearly. This may require shading the camera setup from high, bright sunlight with a makeshift tent and access to a detachable flash unit.

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Photograph of a shoeprint impression. Notice the shoeprint fills the frame, a scale is present, and the camera is directly over the shoeprint, not at an angle.



Three-Dimensional Impressions

Three-dimensional impressions are those that have a significant depth, in addition to the length and width of the impression. Commonly, they may be found in soil, sand, snow or other materials and the detail within the impression may vary according to the substrate. Casting is an effective method of collecting these types of impressions. Impressions should always be photographed prior to casting.

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Photographs, however, are not considered a substitute for a cast. If a lengthy tire track is encountered, an attempt should be made to cast a section at least three feet in length. Do not clean out debris that is part of the impression or was present when the impression was made.

Casting Methods

Note: The methods described below are not applicable to casting of impressions in snow. Specialized techniques are required for casting of snow impressions. Should the need arise to cast impressions in snow, please contact the laboratory for assistance or advice regarding the casting of snow impressions.

Dental stone or die stone should be used to cast three-dimensional footwear and tire tread impressions. Plaster of Paris is no longer recommended as an acceptable casting material. Dental stone can be obtained from local dental supply houses or in pre-made ready to use kits at minimal cost.

If using bulk dental stone, two (2) pounds of dental stone may be placed into an 8 x12 inch Ziploc plastic bag; this amount will cast an average sized shoe impression. In preparation for use at crime scenes, numerous two-pound bags can be prepared and stored.

When using a commercially prepared kit, follow manufacturer instructions for mixing.

The following is the procedure for making a cast from a self-made (bulk) dental stone kit:

- Retrieve a two-pound bag, add about 10 ounces of water, and thoroughly mix in the closed bag. The mixture should have the consistency of thin pancake batter. If needed, add more water or dental stone to create the correct consistency.
- Metal forms may be placed around the impression to contain the casting mixture. These are less critical with the advent of dental stone and other forensic casting materials¹.
- Open the bag and, with the bag at ground level, carefully pour the mixture into or next to the impressions, allowing it to gently flow into it. Fill the impression completely so that the mixture overflows out of the impression.
- When the cast is firm but still soft, scratch identifying marks on the exposed surface or write identifying marks with a permanent marker when the cast is dry.
- Allow the cast to dry for a minimum of twenty minutes in warm weather, longer in cold, wet conditions.
- Carefully lift the cast. **Do not try to clean the cast;** cleaning will occur in the laboratory.
- Package the cast in a large brown paper bag or cardboard box (not plastic) and allow to dry for an additional 48 hours.

¹ This was more critical when plaster of Paris was used as the casting material. The form was required because the cast had to be about 2 inches thick to be reinforced properly. This is no longer a concern with dental stone and other modern forensic casting materials.

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Two-Dimensional Impressions/Prints

A two-dimensional impression is one where there is no significant depth to the impression. A thin deposit of dust, mud, blood, or other material from a shoe or tire onto a hard surface may create these impressions.

- Floors, glass, desktops, doors, paper items, etc. can retain a dust or residue impression at a scene. Some impressions may be clearly visible while others may be partially or totally latent.
- Latent dust shoeprints can often be located by turning out all lights and shining a flashlight across the surface of interest at a low angle. For example, to search for latent shoeprints on a vinyl floor, place the flashlight on the floor (or near it) and allow the long beam of light to shine across the floor.
- Photograph the impressions before collecting.
- Attempt to enhance or lift the impression **only** if the entire item cannot be retrieved from the scene and submitted to the laboratory.
- Dry dust and residue impressions may be lifted with an electrostatic lifting device, gelatin lift, or adhesive lift. Contact the laboratory for purchasing information.
- Impressions made by wet or damp footwear can sometimes be enhanced by carefully dusting with fingerprint powder. A small portion of the impression should be dusted first to test the success of the powdering technique. The impression is then photographed and can be lifted with a contrasting gelatin or adhesive-lifting material. Contact the laboratory for information on where to purchase lifts.

Collection and Packaging

- Whenever possible, collect the impressed item and submit it to the laboratory.
- Protect the impressed item so that the impression does not rub off.
- Package in a cardboard box or paper bag. Carefully securing the item to the bottom of a thin cardboard box is a good way to protect flat impressed items.
- Submit the photographs of the impression to the laboratory. These should be properly packaged as evidence and submitted along with any casts or lifts.

Exemplars and Standards

Footwear Exemplars

There may be several people who have legitimately walked into a crime scene. These include first responders, medical personnel, members of the field investigation team, funeral home or Medical Examiner’s Office personnel, individuals from the District Attorney’s Office, etc. These people may leave shoeprints at the scene, and it can become difficult to distinguish evidentiary shoeprints from those that are artifacts of the scene processing.

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Exemplars may be collected from people entering the scene in a number of ways. A good time to do this is have the person keeping the scene log require everybody entering the scene to give a shoeprint exemplar before proceeding into it. This may be accomplished by:

- Taking a photograph of the shoe sole.
- Greasing the soles with a thin film of petroleum jelly and having the individual step onto a clean piece of paper. Dust the grease print with fingerprint powder for visualization.
- Using a commercially available kit consisting of an ink pad with non-visible ink and foot-sized pieces of paper for collection.

Footwear Standards

If a comparison is to be performed, footwear should be submitted to the laboratory as standards from all individuals thought to have left evidence impressions.

Tire Exemplars and Standard

Tire exemplars should be made with the tire still in place on the vehicle. If it is not possible to transport the vehicle or to collect the tire, please contact your local laboratory for recommendations on how to proceed.

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12.0 DRUG CHEMISTRY

12.0 DRUG CHEMISTRY

Services

The following are the five categories of analysis related to controlled substances (the labs that provide each service are notated in parentheses):

- **Anonymous Analysis (ALL labs)**
- **Controlled Substances (ALL labs)**
- **Cannabis Determination (PDX, SPR)**
- **Methamphetamine Quantitation (PDX)**
- **Chemical Synthesis/Extraction Laboratory Analysis (Clandestine Lab) (PDX, CP)**

Anonymous Analysis

Testing of substances submitted by parents/guardians through the Anonymous Analysis program. These submissions are confidential, results are reported verbally to the customer, and the evidence is destroyed after analysis. The [Anonymous Analysis Brochure](#) provides further information.

Controlled Substances Analysis

Testing of physical evidence to determine whether a controlled substance is present. The results are qualitative (i.e., no purity testing). All laboratories perform this type of analysis. In cases with **multiple suspects**, an indication should be made regarding which evidence is associated with each suspect. If an item is specifically related to a **probable cause** issue, it should be designated as such on the Form 49.

See below for further guidelines on submitting evidence for this type of analysis.

OSP FSD video training about packaging of drug evidence available here:

<https://www.oregon.gov/osp/programs/forensics/Pages/Law-Enforcement-Resources.aspx>

Powders, Bindles, Tar-like Substances:

Plastic bags are strongly recommended for all drug submissions. Prior to submission,

- Every attempt should be made to secure evidence to prevent spillage or mixing; close zip lock bags and package loose or leaking substance in individual bags
- Care should be taken when collecting more than one exhibit in the same package to prevent cross contamination (i.e., the transfer of drug residue or material from one item to another)
- Drug evidence should be separated from non-evidentiary or extraneous items (e.g., purses, drug kits)

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Tablets/Capsules:

- Tablets must be submitted in packaging such as a plastic bag that allows the laboratory staff to visualize the quantity and the imprints. Agencies should be encouraged to package pills, capsules, and/or tablets of differing design or imprint separately.
- For pills, capsules, and tablets, **no more than two of each similar imprint or design** should be submitted to the laboratory for confirmation of the contents. If weight enhancements apply, the submitting agency may submit additional pills to reach an enhancement level if preapproved. Please call your local lab to receive submission approval.
- The number and description (e.g., color, shape, imprint) of pills, capsules and/or tablets should be listed on the Form 49. The number of evidentiary packages should be indicated in the evidence description field of the Form 49 (e.g., 6 plastic bags containing white crystalline substance).

Suspected Fentanyl:

The following conditions must be met for evidence suspected to contain fentanyl or a fentanyl derivative:

Suspected Fentanyl submissions must be *double bagged* in clear plastic so that the contents are visible.

- The evidence packaging and Form 49 will indicate the suspected presence of a fentanyl-class compound to alert anyone handling the item.
- For suspected fentanyl-class compounds in pills, capsules, and tablets, the agency will follow regular laboratory submission guidelines of two pills of similar design. See exception below.
- If safety concerns prevent the removal of two tablets for submission, the agency may submit additional tablets if it is determined the condition of the substance would present an elevated risk to personnel safety (i.e., pills disintegrating into a fine powder) during repackaging. Preapproval of this submission by your local laboratory is strongly recommended to avoid rejection of the evidence.



Sharps, Biohazards:

- A Biohazard is any item potentially contaminated by a body fluid such as blood, saliva, urine, or feces. Items removed from a body orifice, as well as syringe contents, should be labeled with a "BIOHAZARD" label and the Form 49 should indicate the location where the item originated as well as any identification of known concerns.
- Syringes must be packaged individually in a sharps container, or other puncture proof container.
- Broken glass, razors, knives, etc. must be packaged as to protect personnel during handling.



*Both ends should be secured via glue or evidence tape.

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- Biohazards should be packaged to prevent exposure and clearly marked (e.g., “taken from mouth”, “suspect positive for hepatitis C”).
- Please do not label typical drug submissions as “biohazard” unless there truly is cause for concern.

Field Test Kits:

- It is not recommended to use field test kits on a residue amount of drug or when quantities are limited. Skip the field test and submit the evidence directly to the laboratory for analysis.
- When using field test kits, remember that a positive result only indicates the possible presence of a drug. Visible color changes can occur with non-drug substances (false positives).
- Field test kits should be discarded after use. DO NOT submit them to the laboratory. Many of these kits contain concentrated acids that can leak, creating a chemical hazard and can potentially destroy evidence or packaging.

Other:

- Suspected **LSD** should be packaged in dark packaging to prevent light exposure. Gloves should be worn when handling, as LSD can be absorbed through skin contact
- **Biological material** (e.g., plants, food, liquids, etc.) should be clearly marked to ensure proper storage after submission. Live plant material (e.g., marijuana, mushrooms, peyote, opium poppies, etc.) and other damp/wet evidence should be dried prior to submission and packaged in paper bags. When packaged in airtight containers, such as plastic bags, evidence decays rapidly and can inhibit or possibly eliminate the chance for detecting a controlled substance.
- Potentially spiked liquids should be submitted in a timely manner in leak-proof containers.
- If **Latent Print** analysis is required, it must be indicated on the Form 49, separating the drug evidence from the packaging is recommended

Cannabis Determination:

Testing of suspected cannabis plant material to determine whether the level of Delta-9-THC is above or below the legal limit. Plant material with THC content above the established threshold are identified as marijuana. This type of analysis is performed at the Portland and Springfield Laboratories. Full THC quantitation is not currently available from OSP FSD.

Submissions of plant material should be between 5g and 200g.

- Dry plant material may be submitted in plastic
- Wet plant material should be dried prior to submission or submitted in paper bags

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Methamphetamine Quantitation:

Quantitative (purity) testing of methamphetamine. This type of analysis is only performed at the Portland Metro Laboratory and is performed for federal prosecution only. Samples requiring purity testing must be accompanied by a request from an AUSA who has agreed to prosecute federally. It is strongly recommended to call the laboratory prior to submission.

Avoid submitting more weight than necessary for prosecution.

Chemical Synthesis/Extraction Laboratory Analysis (Clandestine Labs):

Analysis of substances, both controlled and non-controlled, that may be used to extract or manufacture controlled substances. Theoretical drug yield determination may also be possible. Examples of typical requests include Methamphetamine and MDMA production labs, or DMT extraction labs. This type of analysis is only performed at the Portland Metro and Central Point Laboratories. Please contact your local laboratory if you suspect a lab of this type.

The recognition, collection, packaging, and documentation of evidence associated with clandestine labs is specialized knowledge that is typically the subject of separate agency training programs. Extreme care and caution should be exercised whenever investigating or processing a clandestine drug lab site. Before attempting to process such a scene, contact law enforcement personnel who have the appropriate training. Questions may also be directed to laboratory analysts who perform Clandestine Laboratory analysis.

- Use glass sample jars with Teflon-lined lids
- Pack jars into plastic buckets filled with adsorbent material (i.e., clay-based kitty litter)
- Include an officer report (including lists and/or photographs of chemicals and lab equipment/glassware found at the scene)
- Agencies will be required to pick up the evidence in person at the completion of analysis. Due to the nature of the samples, they are not allowed to be shipped via a common carrier.

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13.0 TOXICOLOGY

13.0 TOXICOLOGY

Toxicology is the analysis of biological fluids for volatiles, controlled substances, common pharmaceuticals, and poisons. During investigations when it is suspected that an individual may have been under the influence of ethanol and/or drugs, efforts should be made to obtain blood and/or urine for toxicological analysis.

The following toxicology services are offered by the FSD:

- Analysis of postmortem toxicology cases for the State Medical Examiner’s Office
- Analysis of antemortem blood specimens for the presence of drugs
- Analysis of antemortem blood specimens for volatile determinations, including ethanol, isopropanol, methanol, and 1,1-difluoroethane
- Analysis of antemortem urine specimens for the presence of drugs

Depending on the sample type, the analysis may be quantitative or qualitative. Quantitative analysis is only performed on blood specimens and determines how much of a drug or ethanol is present in a specimen. Qualitative analysis simply determines whether a drug or volatile is detected in a biological specimen or not. Qualitative analysis may be performed on any sample type.

Type of Sample

Volatiles (including ethanol, acetone, methanol, isopropanol, and the inhalant, 1,1-difluoroethane)

In cases where it is necessary to determine the concentration of ethanol, **blood** is the specimen of choice. Urine may be tested for the *presence* of ethanol; however, it is not a legally recognized testing medium for blood ethanol determinations and therefore a percentage of ethanol will not be reported. The laboratory is also able to determine the ethanol concentration of unknown liquid samples and the presence of other volatiles.

Drugs

In cases where the use of controlled substances or other drugs is suspected, **urine or blood may be collected for testing.** For drug-facilitated crimes, such as drug-facilitated sexual assault, blood should be collected for volatiles analysis and urine collected for drug testing.

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Collection, Packaging, and Storage of Urine and Blood

Blood

Ideally, two gray-stoppered 10 milliliter tubes with both preservative (Sodium Fluoride) and anticoagulant (Potassium Oxalate) will be collected **at the same time**. If two 10 milliliter tubes is not feasible, **collect at least 4 milliliters of blood** for volatiles analysis.



These tubes do not contain an anticoagulant, but are also acceptable:

- Red-top
- Gold/yellow-top containing serum or plasma
- Green-top containing serum or plasma
- Blue-top containing serum or plasma
- Gray-stoppered Sodium Fluoride (NaF) preservative only

Each blood tube should be labeled with the following:

- The subject's name (not just initials)
- The date of collection
- The time of collection

If two or more blood tubes are collected consecutively during the same blood draw, they should be labeled with the same time. The Forensic Services Division does not recommend the collection of **multiple** sequential blood draws.

Urine

Urine specimens should be collected in the plastic screw-top container provided in the kit. Be sure the lid is secured, and **the container is labeled** with the following information:

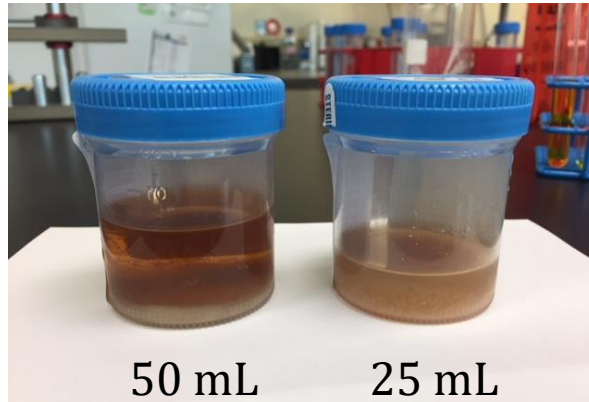
- The subject's name (not just initials)
- The date of collection
- The time of collection

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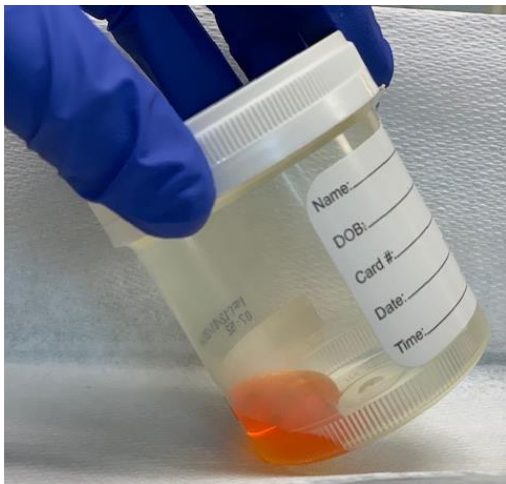
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It is recommended to submit at least **30 mL of urine** for a complete toxicological analysis. Below are examples of 50- and 25-mL specimens.



Examples of **insufficient** urine specimen volume:



If there is a reason to suspect tampering of the urine specimen, obtain another sample from the subject, and send both samples to the laboratory.

If a Drug Recognition Evaluation (DRE) has been completed, please include a copy of the DRE face sheet when submitting the evidence to the Laboratory.

If drug use is known or if the suspect has offered statements regarding drug use, it is recommended to include that on the Forensic Services Request (Form 49). **GHB is not detected in our routine analysis.** If GHB use is suspected, note it on the Form 49.

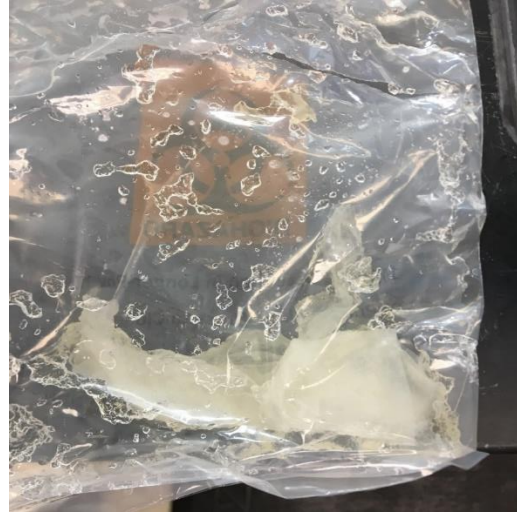
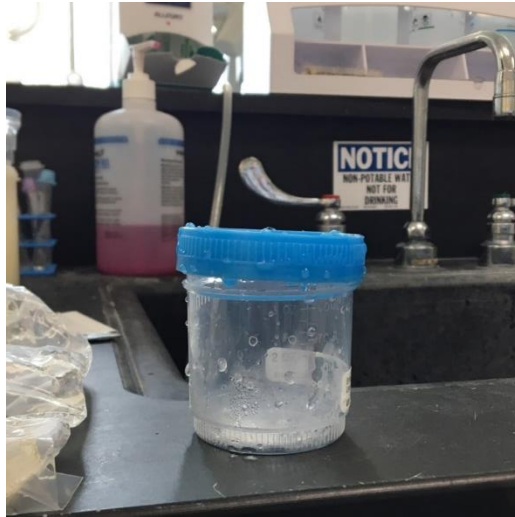
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Secure the urine cup in the plastic bag provided. Specimens that leak completely into the biohazard bag will not be analyzed. Be sure to secure the specimen lid. **Aligned threads are more important than being super tight.**



General Guidance on blood and urine collection, packaging, and storage:



Blood and Urine Specimen Kits for packaging and securing the blood tube are provided by the Oregon State Police. To order kits go to the following link:

<https://www.oregon.gov/osp/programs/forensics/Pages/evidence.aspx>

Do not submit toxicological evidence in the same packaging as SAFE kits.

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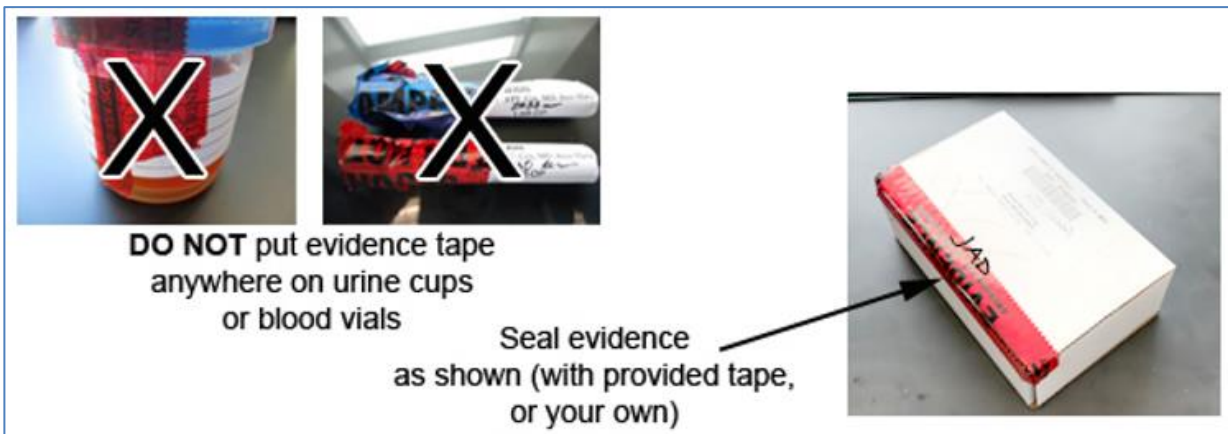
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It is very important that the specimen cup and/or blood tube(s) is labeled with the individual's name, date, and time of the blood draw. If two or more blood tubes are collected consecutively during the same blood draw, they should be labeled with the same time.



Do not place evidence tape or other seals over the stopper of the vial or specimen cup, as the tape can obstruct the information on the vial label and can interfere with resealing of the tube. Instead, **the kit should be securely sealed with evidence tape and initialed.**

Do not include extraneous kit items such as used needles, tourniquets, etc. when submitting a blood volatiles specimen. These are not considered evidence and can be hazardous to laboratory personnel.



Care must be taken to maintain proper chain of custody. Blood and urine should be submitted to the laboratory as soon as reasonably possible and should be refrigerated. Blood evidence returned to the submitting agency should be stored under refrigeration.

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14.0 BREATH ALCOHOL PROGRAM (IMPLIED CONSENT UNIT)

14.0 BREATH ALCOHOL PROGRAM (IMPLIED CONSENT UNIT)

The Implied Consent Unit services Oregon's Breath Alcohol Program. The unit approves breath alcohol instruments, calibrates and certifies the instruments, provides instrumentation, training and certification for the users and offers expert testimony.

Questions regarding the Breath Alcohol Program should be referred to Mike Jackson, Portland Metro Lab Blood Volatiles and Implied Consent Supervisor at Michael.jackson@osp.oregon.gov.

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Firearms Evidence

Firearm examinations compare marks or impressions which result when two objects make contact with each other. These resulting impressions are characteristic of the “tool”, which is usually the harder of the two objects. When a bullet, which is composed of relatively soft metals, travels through the harder barrel of a firearm, the barrel leaves markings on the bullet. These markings are unique and can often be associated with a specific firearm. Fired cartridge cases can also be identified to a firearm in a similar manner. Questions concerning firearms evidence should be directed to your local forensic laboratory.

Integrated Ballistics Identification System (IBIS)

IBIS is a system that captures and compares images of known test-fires and unknown fired cartridge cases. These images are searched against a database. When similarities are observed, the submitting agency is notified.

OSP FSD no longer provides IBIS services. Examination of suitable evidence can be requested through Salem Police Department. For information, contact NIBIN.ADMIN@cityofsalem.net

Firearms eligible for IBIS entry generally include the following:

- Centerfire and rimfire semiautomatic pistols
- 7.62x39mm, 5.56x45mm/223 REM, and 22 LR caliber semiautomatic rifles

When an agency requires a physical confirmation of an IBIS notification in order to obtain a search warrant, or for court testimony, the agency must submit the evidence to the Forensic Lab for comparisons by the Firearms Unit.

Please note that agencies requiring forensic analysis on firearms beyond IBIS entry (e.g., firearms comparison, latent print analysis, DNA analysis) should consult with their local laboratory PRIOR to submission to the Salem Police Department, in order to help facilitate proper preservation of any associated evidentiary items.

Firearms Analysis

Services provided by the OSP FSD Firearms Unit include:

- Determining functionality/operability of a firearm in the manner in which it was designed by the manufacture, or whether any modifications have been made. Note: This analysis is not required for Felon in Possession charges in Oregon.
- Determination of manufacturer and type of ammunition.
- Test fires of firearms to obtain known specimens for comparison with evidence ammunition, such as bullets, cartridge cases, and shotshell casings.

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- Intercomparison between fired bullets, cartridge cases, or shotshell casings to determine if they were fired from the same firearm.
- Determining the presence/functionality of a sound suppressor. Testing can determine whether a muzzle attachment can be classified as a suppressor based on observable physical features and sound reduction capability.
- Generating a list (for investigative use, not all-inclusive) of possible source firearm(s) based on the class characteristics found on fired bullets and/or cartridge cases. Class characteristics include features such as weight, caliber, bullet design, general rifling characteristics, gauge, manufacturer, and presence/type/extent of mechanism marks.
- Generating a list (for investigative use, not all-inclusive) of possible source firearm(s) from individual or unassembled firearm parts/components, based on the physical characteristics of the part and the FSD Reference Firearm Collection and other reference material. Similar lists may be generated for unfired ammunition, cartridges/shotshells.
- Examinations of shot pellets, buckshot, or slugs to determine the size of the shot, the gauge of the slug, and/or the manufacturer. Examination of shotshell wadding components can determine the gauge and the manufacturer.
- Estimation of distance from muzzle to target based upon gunshot residues and/or shot pellet patterns on evidence such as clothing items, furniture, bedding, and wallboard.
- Examinations and conclusions regarding the identification of gunpowder.
- In certain circumstances, accidental discharge or silencer testing.

OSP FSD does not perform routine screening for the presence of gunshot residue particles or muzzle-to-target distance determination on skin.

For Trajectory analysis refer to the Crime Scene section in this manual.

Collection, Packaging, and Submission of Firearms Evidence

The primary concerns when packaging firearms are safety and the preservation of the evidence including blood/DNA, trace evidence, and latent prints that may be present. The firearm must be handled minimally to avoid loss or destruction of evidence.

- Never insert anything into the barrel of a firearm. This could alter the microscopic features of the barrel.
- All firearms must be submitted in unloaded condition, made safe (e.g., action secured open with a zip-tie), and secured in a sealed box. The box must be marked to indicate that the firearm has been made safe.
 - Note 1: If the submitted firearms packaging is not marked as rendered safe or unloaded, and the condition of the firearm cannot be visually confirmed to be safe, the evidence must be

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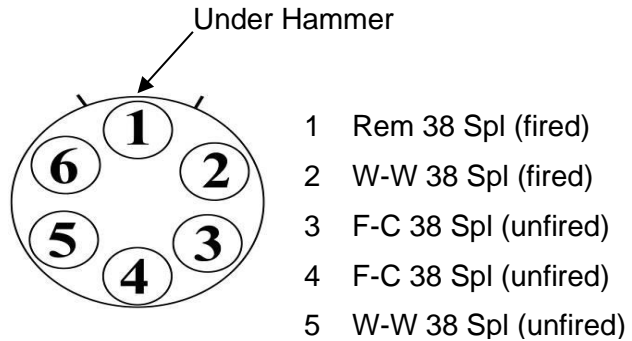
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opened and examined. Submitting agency personnel or a qualified laboratory staff member must break the seal and visually confirm that the weapon is in a safe condition.

- Note 2: If unable to render the firearm safe, hand-deliver the firearm to the laboratory and inform lab personnel immediately of the firearm’s condition.
- Do not remove cartridges from magazines when latent print examination will be requested; however, do remove the magazine. Ensure that magazines and any recovered ammunition are all submitted with the firearm. The submission of unfired ammunition used with the firearm is essential to give accurate results in muzzle-to-target proximity test. When latent print examination is not needed, remove the cartridges from the magazine to obtain a count for the Form 49.
- When submitting loose cartridges, cartridge cases, bullets, fired bullets, waddings, shotshells, etc., the number of each type needs to be included on the Form 49. Refer to Appendix B for photos and firearms terminology.
- Do not directly mark on firearms, bullets, cartridges, cartridge cases, shotshells, or other firearms-related evidence. Instead, mark the packaging with a description of the evidence, the case number, and the evidence number. (Note exception below)
- Exception: Mark the position of the cylinder on both sides of the top strap before opening the cylinder of a revolver and make note of the position of fired and unfired cartridges in the cylinder. This is so the position of the cylinder, as recovered, can be determined after the cylinder is opened.

Example of how to note the positions of cartridges and cartridge cases in the cylinder of a revolver.



- Any evidence with possible blood or body fluids should first be air-dried, then packaged in paper bags, envelopes, or cardboard boxes labeled as a biohazard.
- For firearms recovered from bodies of water, submit the firearm in a watertight container that will keep it submerged in the water it was recovered from. **Do not** dry the firearm out prior to submitting to the lab.
- Clothing with blood must be air dried and marked “Biohazard”. Mark the packaging, not the clothing, with a description of the evidence, the case number, and the evidence number.

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16.0 TOOL MARK EXAMINATION

16.0 TOOLMARK EXAMINATION

Toolmark evidence is worked within the Firearms Unit.

Tools may have unique microscopic features from both the manufacturing process and acquired from wear during use. Toolmarks are the impressions or marks produced when a tool comes into contact with an object; the tool is generally the harder of the two objects. Physical contact between a tool and a surface may produce marks not only characteristic of the type of tool used, but marks that may be uniquely associated with an individual tool.

In the absence of a suspect tool, tool mark impressions can be examined in an attempt to determine the type of tool(s) that may have produced them and whether the toolmark is of value for further comparison. Examples of tools that may be encountered include hammers, screwdrivers, pry bars, knives, bolt cutters, pliers, tin snips, pipe wrenches, axes, and hatchets.

Do not attempt to determine if a found tool fits in the toolmark. This may alter or obliterate the toolmark and trace evidence may be lost or contaminated. Be aware that paint may also transfer between tools and surfaces and may be suitable for a paint comparison.

Collection and Packaging of Toolmark Evidence

The recovered tool should be carefully packaged to prevent the prying blade or cutting edges from having contact with any other objects that may cause an alteration of the tool. Strapping tools inside boxes is recommended.

If possible, submit the entire item with the toolmark impression. If this is not possible due to the size of the object, contact your local laboratory for casting instructions. Alternatively, photograph the toolmark, and carefully cut out the area with the tool mark, being cautious to avoid distorting the impression.

Mark the cast or cut object with appropriate information indicating its orientation such as up/down, inside/outside, and left/right directions. Package the object containing the toolmark in such a manner as to prevent alteration or damage during shipment and storage.

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17.0 SERIAL NUMBER RESTORATION

17.0 SERIAL NUMBER RESTORATION

Serial Number Restoration is conducted within the Firearms Unit. Firearms, bicycles, motorcycles, chainsaws, boats, and cameras are all evidence items on which serial numbers have been restored.

The obliteration of serial numbers and manufacturer's marks is often done to prevent tracing ownership of articles. Depending on the type of metal surface, specialized techniques and/or chemical methods are used to restore and visualize all or part of an obliterated number.

Package the evidence in a manner that will protect the area where the serial number has been obliterated. Contact the laboratory prior to delivering large items.

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18.0 TRACE EVIDENCE

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Trace evidence is physical evidence such as glass, paint, fibers, or hair that may transfer between one person or surface to another during the course of an event. Trace evidence also includes chemical analysis of evidence such as: ignitable fluids found at an arson scene, poisons or toxins, pepper sprays or other volatile compounds. The trace discipline may also be able to provide investigative lists of source vehicle makes and models that could have left paint chips or vehicle parts at a scene. In addition, the trace unit conducts physical fit analysis that can show that two broken pieces were originally part of one item.

Plastic fusion marks might be present on an individual's clothing as a result of a high-energy impact with a plastic component of a vehicle interior. Because a variety of different plastics may be present on the interior of the same vehicle, it may be possible to establish the position of the individual within the vehicle by comparing the plastic fusion mark to standards from the vehicle interior. Remember that a high-energy impact can cause a plastic component in a vehicle interior to have fibers or a fabric impression from the clothing, as well.

Each type of trace evidence has specific collection and packaging needs. These are outlined in detail in the following sections. Very large items such as vehicle bumpers or windshields, bicycles, safes or cash registers may be impractical to entirely contain within normal packaging. If necessary, create custom package from a roll of paper "sleeve" or sheets of butcher paper. As a last resort, paper can be used to cover the area(s) of interest on the large object, taking care to cover a sufficient area that tape does not interfere with the surfaces to be examined.

For all types of Trace requests, an incident report that describes the evidence items being submitted and gives their context at the scene, is required.

A Trace Collection Kit may be helpful in responding to scenes presenting trace evidence. An example of the contents of such a kit can be found "Trace Collection Forms" at <https://www.oregon.gov/osp/programs/forensics/Pages/Law-Enforcement-Resources.aspx#Training>

OSP-FSD recommends this mobile phone app for further Trace Evidence assistance: <https://forensiccoe.org/trace-evidence-collection-mobile-app/>

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18.1 ARSON AND FIRE DEBRIS

Arson analysis to test for the presence of ignitable liquids may be helpful in an arson investigation. The recognition and interpretation of scene phenomena that may indicate an arson took place are often the subject of specialized agency training programs.

Ignitable liquids readily evaporate and are lost; therefore, arson evidence should be collected and packaged in an airtight container as soon as possible to prevent loss and possible contamination.

An arson investigator should be contacted with specific questions regarding the type of scene being worked, what evidence collection is appropriate, and how to package/preserve evidence for submission to the laboratory. Arson analysis is conducted in the Portland Metro Forensic Lab only: (971) 673-8230.

Collection of Evidence

The following are examples of evidence suitable for testing for the presence of ignitable liquids. Note that for each type of fire debris for testing, a comparison sample-- a sample of uncontaminated carpeting and/or padding, drywall, wood, etc.-- should be collected and packaged separately. In addition, control samples – new, unused gauze, bags, swabs, etc. – are needed when these materials are used to collect or package evidence from the scene of a fire.

- Charred debris and related material from the origin where the accelerant was placed
- Igniting devices (fuses, rags, candles, etc.) including mechanical and electrical devices
- Samples of upholstery, drywall, plaster, wood, or other material that may have been penetrated by flammable liquids
- Samples of soil that may have been penetrated by flammable liquids (these samples should be frozen to prevent degradation that can hamper analysis)
- Suspect clothing worn at time of crime, including shoes. Nylon fire debris bags are the preferred packaging for clothing items. Paper bags should be avoided as they allow potential evidence to evaporate.
- Liquids containing possible accelerants (for comparison to unknown samples) and containers that may have been used to transport them
- Material used as a wick (shirt, sock, towel, etc.) from an incendiary device. This material may be analyzed for DNA comparisons.

In addition to samples for ignitable fluids analysis, be aware of Trace evidence possibly left by the arsonist such as hairs, broken glass, tool marks, shoe impressions, clothing fibers, matches, etc. These may be suitable for other types of Trace analysis or comparison.

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Packaging of Evidence

- Use airtight containers. Flammable liquids readily evaporate and thus arson evidence should be collected and packaged in an airtight container to prevent loss by evaporation and possible contamination between samples. Unused, clean metal paint cans are preferred. Lined or unlined cans work equally well, but the lined cans will not corrode over time. Heat sealed bags specifically manufactured for flammable evidence collection may also be used. When these bags are used, submit an unused bag as a control. Contact the laboratory for information on where to purchase these packaging supplies.
- *Moisture is not a problem; do not dry arson evidence, as this may cause volatile liquids to be lost.*
- Do not use paper bags (volatile vapors can escape or enter through paper)
- Do not put gloves used by the investigator while collecting evidence into the container with the evidence. Throw them away.
- Gauze pads can be used to soak up or collect residual liquid. Unlike biological materials such as blood, arson evidence should not be collected with Bode or other types of swabs, as they are not large enough to absorb an adequate sample for testing. Seal each collected item separately and securely.
- Mark all containers with appropriate identifiers.
- Document locations from which evidence samples were collected by notes, sketches, and/or photograph.

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18.2 PHYSICAL FIT

Physical fits are made when the contours of broken pieces are sufficiently unique and fit together so that it may be concluded that both pieces were originally one object. Broken pieces left at a scene may be suitable for a physical match request when a suspect is found, or a suspect vehicle is developed.

A physical fit is the strongest level of association between two objects in the Trace Evidence disciplines. The use of microscopes and specialized lighting conditions allows an examiner in the laboratory to photograph the details of the edge contour that may not be obvious to the naked eye.

If a physical match is unable to be made between evidence items, it may be possible to compare the overall construction and composition of the pieces to determine if they are similar or dissimilar. This analysis of class characteristics would fall under a Trace Miscellaneous exam.

Evidence Types

Any piece of a rigid or pliable object has the potential to make a physical fit to another object. Examples of rigid objects include paint chips, broken glass, car parts (e.g., taillight, paint chips, bumpers, and side mirrors), and weapons. Examples of pliable objects include paper, tape, fabric, garbage bags, matches from matchbooks, etc.



Collection and Packaging

Take photographs of objects before packaging to assist the physical fit examiner with the analysis. Care must be taken to avoid damaging or altering the edges of the evidence during collection and packaging.

Attempt to collect as many broken pieces that appear related as possible. These can be packaged together if found in the same vicinity (e.g., broken lamp base, pieces of vehicle light assembly, several sheets of torn notebook paper in a garbage can). Items collected from different areas or locations should

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be packaged separately. Housings, such as that from a headlamp or taillight, can be removed from a vehicle and submitted in its entirety to the lab.

Caution: General handling and other laboratory examinations (e.g., processing for latent prints) can alter the edges used in physical fit analysis. Communication with lab personnel regarding a possible physical fit should be done before other work is performed.

Online OSP training in Physical Fits and Make/Model/Year searching is available here: Webinar #3: Physical Fits & Make/Model/Year searches April 22, 2021 (75 minutes) <https://youtu.be/tiZcmLfOvQ>

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18.3 GLASS EVIDENCE

Glass is one of the more important types of physical evidence that is commonly overlooked. Glass is frequently encountered in burglaries and hit and run cases, and glass fragments may be found adhering to garments, hair, embedded in shoe soles, or may be transferred to other property belonging to the victims and suspects. Tiny glass particles may not be visible to the naked eye. The lab can typically conduct full comparisons of fragments as small as 0.5mm in size, about half the thickness of a credit card.

Glass evidence cannot be individualized to a single source, however, there are some instances where two fragments can be physically fit together, and a common origin can be conclusively established.

Glass examinations may demonstrate the following:

- The presence and number of glass particles recovered from clothing or other surfaces.
- Whether or not fragments of recovered evidence glass are indistinguishable from glass from a known source of broken glass
- The type of glass found (e.g., tempered window glass, container glass, smartphone screen)
- The direction of force (from inside or outside) used to break a window
- The order of shots fired into a window or windshield

Consider that large glass pieces may have latent fingerprints present and the broken edges of glass may have other trace evidence present such as blood, hair, traces of bullets, or snagged fibers.

Online OSP training on Trace Glass is available here: Webinar #1: Trace Glass, April 8, 2021 (90 minutes) https://youtu.be/wiM_Fir_JPE

Collection and Packaging of Glass Standards

A comparison of evidence glass to a possible source requires the submission of glass standards for comparison. A separate glass standard should be submitted for each broken glass item at the scene.

For each glass standard, submit at least ten fragments of broken glass from that item; 20-50 fragments are preferred. These fragments should represent the entire broken area of the item (taken from different areas of the broken item, if possible) since physical properties may vary even within a single glass object.

For window glass standards, collect the glass that is still adhering to the window frame whenever possible. Collecting glass standards from the ground increases the likelihood of introducing contaminant glass into the standard. A second comparison standard may be collected from the ground and submitted separately.

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Some structural glass may be double paned, meaning that two different panes of glass are present. A standard should be collected from multiple areas on *each* glass pane. Package the standards from each pane separately, if possible, and mark the packaging to indicate the interior and exterior panes.

Vehicle windshields are double-paned with a polymer sheet between them. To collect a windshield standard, cut out a square (2"x2") of the double-thickness windshield from the center area of the windshield. Mark the interior (IN) and exterior (EX) sides with a permanent marker. Repeat by cutting out and marking a second square near the driver's or passenger's side edge of the windshield. Both squares can go into the same evidence packaging.

Submit glass evidence in packaging that reduces the chance for further breakage and prevents sharp edges from cutting through the packaging. Sharps tubes may be used.



Collection and Packaging of Recovered Glass Evidence

- Package recovered glass pieces from different locations into different containers, clearly marking the outside packaging as to the location and description of the evidence.
- Depending on the size, small glass pieces can be packaged in envelopes, bags, paperfolds, or on Post-It notes. For very small glass particles, place the particle onto the adhesive of a Post-It note

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and use a pen to circle around it. Fold the note in half, covering the glass particles, and then put the labeled folded Post-It note in a paper envelope. See Appendix A for paperfold instructions.

- Tape over any holes in the packaging through which small glass particles could be lost.
- Glass pieces that are slightly bigger can be packaged in envelopes or bags, and then secured in a padded envelope to protect from further breakage or injury to those handling the evidence.
- Collect and submit *all* glass pieces if you believe numerous glass pieces were from the same object (e.g., a window, a bottle, vehicle headlights, etc.) and request the laboratory to attempt a physical fit.
- Label large glass pieces with orienting marks (e.g., up/down, inside/outside) when applicable.
- Collect and package a large glass piece in a rigid container such as a cardboard box. Protect the broken or fractured edges of the glass from any additional damage or breakage.



Clothing Items and Hair Combing

An individual who breaks a window with force or who is in contact with or nearby a breaking glass object may have very small particles of glass on their clothing and hair. Walking over broken glass often embeds glass in the soles of the shoes; this glass may later drop off inside vehicles or residences.

Collect clothing items, taking care not to shake or handle the clothing more than necessary. Doing so may dislodge these small glass particles. If the clothing is not stained with biological material (e.g., blood), package in a paper bag carefully sealing all possible openings. If the clothing is stained with biological material, allow the clothing to air-dry on a clean, dry surface and package in a paper bag. If this is not possible, collect *and submit to the lab ASAP*.

To collect glass particles from hair, have the person stand or lean over a large clean sheet of examination or butcher paper. Using a new comb, comb the hair to dislodge any particles so that they will fall onto the paper. Fold the paper to enclose any debris from the hair and tape closed. Package inside a larger envelope or bag for submission to the laboratory.

Vacuum Sweepings / Large Objects

In some cases, it is useful to screen large objects such as carpets, car mats/vehicle flooring, or backpacks for glass particles. The entire object may be submitted, or a vacuum sweeping may be made of these objects and the vacuum filter submitted to the laboratory. Adhesive lifts are not recommended for collection of glass evidence from these surfaces, as the lifts too quickly become saturated and lose the ability to pick up any glass present.

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18.4 PAINT EVIDENCE

Paints are applied to surfaces such as vehicles, structures, safes, and appliances. Spray paints and nail polishes are also types of paints suitable for trace analysis. Many crimes, such as burglaries, hit and run vehicle incidents, and others involve forceful activities that can result in the transfer of paint from the original source to another place, person, or object. Paint transfer may also occur if wet paint is applied in the commission of a crime. Depending on the case scenario, some polymer analysis may be performed under a paint request.

If painted objects come into contact with each other, paint may be transferred in both directions. This often occurs in vehicle collisions or when a painted tool such as a prybar is used to force open a painted object like a safe, filing cabinet or window/door frame. Paint evidence may be transferred from one object to another from contact or loose paint chips may be collected at the crime scene for later comparison with a suspected source. Paint chips may also fracture in such a way that a conclusive physical fit can be made between the loose chips and the object they came from.

Paints contain a multitude of components, many of which may be detected in very small samples such as those encountered as evidence. Analysis and comparison of paint samples can be useful even when they are extremely small in size.

Paint examinations can determine:

- Whether evidence paint sample(s) are indistinguishable from a paint standard
- The type of paint (vehicle, architectural, etc.)
- Lists of makes and models of possible source vehicles by using the Paint Data Query (PDQ) database. This analysis requires layers of original factory paint to be present in the evidence paint sample. This may be encountered as paint chip left at the scene of an impact or as smeared paint layers on objects or clothing.
- If a physical fit exists between paint coatings on broken pieces of an object that was at one time joined

Online OSP training on Trace Paint is available here: Webinar #2: Trace Paint, April 15, 2021 (90 minutes) <https://youtu.be/z2vPptyLTuM>

Collecting and Packaging Paint Evidence

Paint comparison standards from a known object are required when the laboratory is required to perform a paint comparison. Paint comparisons are performed on a variety of paint types including vehicle paints, architectural paints, spray paints, cosmetic lacquers, etc.

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A painted item such as a car or door frame may have layers of different kinds and colors of paint. Because of this, it is important to obtain paint standards that adequately represent all the paint types present on a potential source. To do this, the paint should be scraped in such a way that it includes all the layers of paint present. In addition, if multiple body panels of a vehicle show damage, a paint standard should be collected from each; car body panels often have different paint on different body panels (such as a hood versus a bumper), even if it appears to be the same color to the eye.



If paint transfer is loosely adhering to a surface, place a loose paper cover or Post-it note over the area to protect it during packaging and transport. Do not place tape directly onto an area of paint transfer. Tape adhesive can contaminate paint evidence; never collect or package paint evidence onto tape or other adhesive—except Post-it-type notes.

Collection Procedures:

Small Items (Easily Transported)

- If an item that is a potential source or recipient of paint transfer is small enough to be easily packaged and transported, then it should be submitted in its entirety (e.g., tools, keys, knives, spray paint cans). Paint chips should be folded inside a paperfold or a Post-it-type note and then into a larger envelope for submission. See the Glass section for more packaging instructions and Appendix A for paperfold instructions.

Large Items (Not Easily Transported)

- If the potential paint source or paint transfer is on a large object or one not easily transported, such as a vehicle part or a door from a residence, use the following method for sample collection:
 1. Locate the area of damage. If paint transfer from one object to another is suspected, collect both the area of suspected paint transfer and a nearby area of a paint standard that shows no paint transfer. Collect a standard from an area as close to the point of damage as possible; on vehicles, they should be from the same body part (i.e., hood, right front quarter panel, driver's door).
 2. When contact between two painted surfaces is suspected, the possibility of cross-transfers must be considered. Collect both objects or collect areas showing paint transfer and standards from both surfaces.
 3. Use a clean razor blade, scalpel, or sharp knife to gently pry, carve, or chip the paint from the surface down to the foundation or substrate.
 4. Always clean collection tools or use disposable blades between each use to avoid cross-contamination of one sample with another.

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5. Collect a total of about a nickel-sized amount of paint from each damaged area, when possible.
6. Place each paint sample into a paper fold or small paper envelope. Securely seal all possible openings in the packaging, including seams and corners if necessary.
7. Securely seal and label the package(s) with a description of where the sample came from.
8. Continue to collect paint from each damaged area in the same manner, even if the object appears uniformly painted. Also collect any samples that are visually different. Package and label each area separately.
9. Paperwork should clearly document the locations of collection of any paint evidence to be submitted to the laboratory.

Cautions:

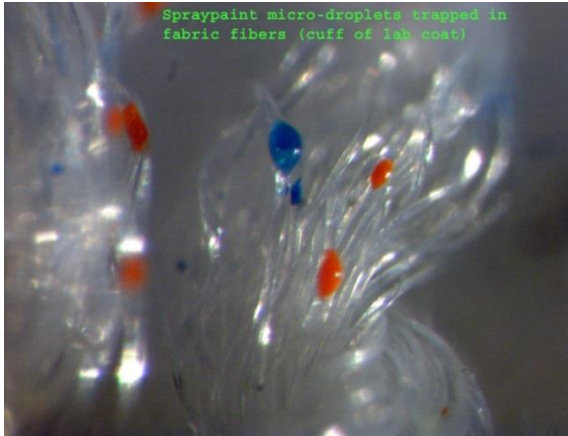
- Do not package paint standards in the same envelope as recovered paint evidence. This could allow cross contamination to occur.
- Do not collect paint evidence on tape. The adhesive from the tape may interfere with instrumental analysis of the paint. Post-it-type adhesive notes are acceptable.
- Substantial variations in thickness and layer sequences over short distances can exist across a painted surface. This is particularly true in architectural paint and for vehicle paint where curves, corners, and edges are often impact points and may have been subjected to previous damage, sanding, or over-painting. Known paint samples should be collected from these areas, when recognized.
- Do not use plastic bags (including evidence bags) or boxes that have small holes in them. Such bags are manufactured to allow excess air out; however, they are not appropriate for trace evidence collection as small particles may be lost. At a minimum, tape over the holes, or include a second, inner layer of packaging.
- Be aware that when a vehicle's clear topcoat of paint is abraded, it may appear white to the naked eye.
- When observing road debris, be on the lookout for paint chips and plastic parts that may form a physical match with a damaged vehicle. Collect these items now for later comparison to a suspect vehicle.

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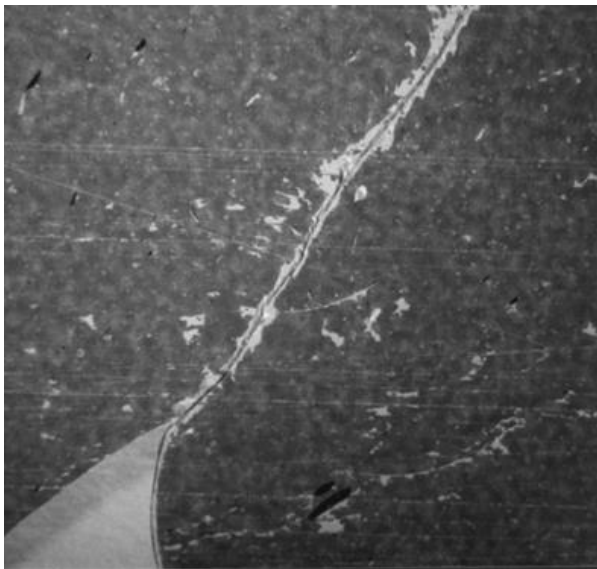
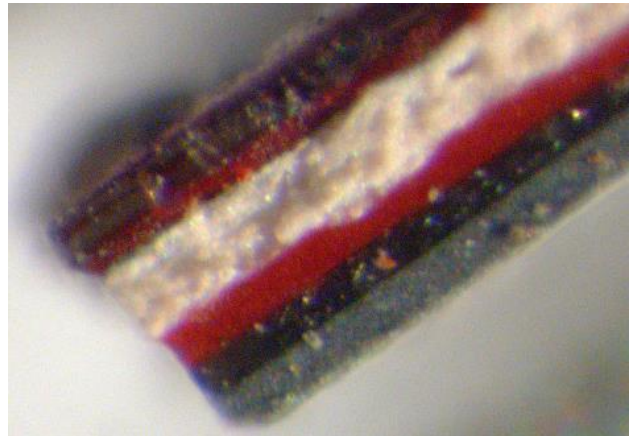
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Micro-droplets of spray-paint on fibers of a sleeve cuff



Layers of original and aftermarket paint from a red vehicle



A physical fit of two paint chips. Paint chip "A" was recovered from the scene of a hit-and-run; paint chip "B" was collected from the damaged area of a suspect vehicle. Note the microscopic scratches in the paint extending across the break.

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18.0 TRACE EVIDENCE

18.5 MISCELLANEOUS TRACE EVIDENCE (INCLUDING POISONS AND INHALANTS)

A number of forensic examinations do not fall neatly into one of the other laboratory categories. These are assigned to Trace Miscellaneous. Common miscellaneous request examples include analysis of food for suspected poisons and of cosmetics and household products for harmful tampering.

Case details should be submitted with the evidence in order that the analysis can proceed efficiently. It is extremely helpful to the examiner to receive a complete police report that details the suspected poison or adulterant and any symptoms of the person(s) exposed. If the type of chemical is unknown, the examiner will perform general screening tests that will include, as appropriate, controlled substances, heavy metals, volatiles, and some pesticides/organics. It is not possible to screen evidence for every possible poisonous substance.

In addition to the item in question, the lab may request the submission of a control sample. For instance, were you to suspect that a beverage had been contaminated with antifreeze, you would submit the beverage in question, plus an untainted sample of the same beverage. If a sample of the contaminant is available, it should also be submitted.

Miscellaneous Trace examination also includes the general chemical identification of unknown solids, inhalants, liquids and gases, chemical irritants such as pepper sprays, measurement of physical, chemical, or elemental properties, and the comparison of contents to product labeling. Again, case details should be submitted with the evidence in order that the analysis can proceed efficiently.

Miscellaneous Trace also encompasses the comparison of two materials that is outside the other trace protocols. Materials such as plastic bags or gloves, tapes, and other plastic items can be compared to one another to see if they share class characteristics or are different from one another.

If an incident involving a vehicle leaves behind broken vehicle parts, those parts may be useful for a physical fit attempt, a make/model/year search based on the painted surface or may have imprinted codes that can narrow down the type of source vehicle. Product sourcing based on manufacturer's codes or other features fall under Miscellaneous Trace.

Plastic fusion (melting and adhering) marks might be present on an individual's clothing as a result of a high-energy impact with a plastic component of a vehicle interior. Because a variety of different plastics may be present on the interior of the same vehicle, it may be possible to establish the position of the individual within the vehicle by comparing the plastic fusion mark to standards from the vehicle interior. A high-energy impact can cause a plastic component in a vehicle interior to have fibers or a fabric impression from the clothing, as well.

Online OSP training on Trace Miscellaneous is available here: Webinar #4: Trace Miscellaneous April 29, 2021 (75 minutes) <https://youtu.be/WBoKCCq6Ttc>

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18.6 FIBER EVIDENCE

Textile fibers can be exchanged between individuals, between individuals and objects and between objects. When fibers are associated with a possible source, such as fabric from the victim, suspect or scene, it can help corroborate case information and/or provide a potential link between items, persons, and/or places.

A fiber that is transferred and detected is also dependent on the nature and duration of the contact between the suspect and the victim and/or scene or object and the persistence of the fibers after they have been transferred.

Research has shown that with few exceptions, the largest quantity of fibers on an object is from the last object to be in contact with it. Therefore, it is advantageous to consider collecting fiber evidence prior to processing for other types of evidence. Caution should be used to prevent cross contamination of evidence collected for fiber examinations, particularly when crime scene personnel will also be responsible for collecting suspect or victim clothing items or for the processing of related scenes or vehicles. Caution should also be used to not add fibers from your own environment and clothing to the evidence (e.g., fleece coat, wool sweater).

Fiber examinations involve a comparison of samples from known and questioned sources to determine whether they are consistent with having originated from the same source (e.g., carpet from a suspect's car compared with fibers removed from the victim's clothing). Laboratory analysts examine various physical, chemical, and microscopic properties of fibers when performing a comparison between evidence fibers and a potential source. Common conclusions include statements regarding the similarity or dissimilarity of the evidence fiber(s) to the possible source or standard. This comparison involves the recognition and evaluation of class characteristics, which associate materials to a group, but never to a single source due to the mass production of textiles in society.

Determining whether a textile has been cut, torn, or otherwise damaged may be a probative question for a piece of evidence. It may be possible to distinguish the type of damage depending on the object used, the textile type, and other factors.

Fiber Examinations

The following may be determined from fiber examinations:

- The type of fiber (e.g., natural or synthetic, animal fiber, glass fiber, etc.)
- The possible end uses for the fiber (e.g., carpet fiber, clothing fiber, etc.)
- The degree of similarity between evidence fiber(s) and a fiber source
- Whether a textile has been cut, torn, or otherwise damaged and if a particular object could have been used to create the defect

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Collection of Fiber Evidence

Fiber evidence can be collected in a number of ways, as described in the table below.

Fiber Collection Methods			
Method	Description	Packaging	When to Use
Particle Pick method	Using tweezers or gloved fingers, carefully retrieve the fiber taking care not to pinch, crush, or stretch it.	Place the fiber into a paper fold, in a folded Post-It note, or paper envelope. (See photos under Paint section.)	For fibers you can see.
Adhesive lifts*	Use an adhesive sheet, fingerprint tape, cellophane tape, or other clear adhesive substrate and pat over the item. Take care not to miss any areas or allow the tape to become "overloaded." Post-It notes may also be used for small areas.	Stick adhesive tapes onto a clear, colorless plastic sheet (transparency film). Place into a paper envelope or bag. Fold Post-It notes in half and place into a paper envelope.	For fibers you cannot see, or to be sure you have not missed any. Useful on car seats, feet/shoes of dumped bodies, surfaces of clothing, and other medium to large surfaces.
Vacuum sweepings	Use a portable vacuum cleaner equipped with special traps holding a piece of filter paper. <i>Lightly</i> vacuum the surface of interest. The goal is to collect fiber evidence that is on the surface of the object, not to clean it. Take care not to overload to ensure the filter paper doesn't lift allowing material to pass into the vacuum.	Carefully remove the filter trap, cover with the lid or cap, and package in a paper or plastic bag.	For fibers you cannot see, or to be sure you have not missed any. Good on car seats, sections of carpeting, and other large surfaces.

* Gridded template for adhesive lifts can be found under "Trace Collection Forms" at <https://www.oregon.gov/osp/programs/forensics/Pages/Law-Enforcement-Resources.aspx#Training>

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18.0 TRACE EVIDENCE

Cautions:

- Care should be taken to store adhesive lifting materials in such a way that they will not become contaminated prior to use
- Use of tools, such as forceps and tweezers, may cause damage to the trace evidence.
- Clean any collection tools thoroughly between samples to prevent cross-contamination.
- Avoid serrated tools as they may be more difficult to clean thoroughly.

Collection of Fiber Standards

A fiber standard (or a possible source) is required when the laboratory is requested to perform a fiber comparison. If the possible source can be packaged and transported to the laboratory with ease, submit the entire object (e.g., clothing items, throw rugs, etc.).

If the fiber source is believed to be from a large object or one not easily transported, such as car upholstery or carpeting from a dwelling or vehicle, cut representative samples from various areas. Be sure to collect samples from areas that are visually different (e.g., different colored areas, faded areas due to sunlight, worn sections, etc.). Samples should be about 1x1 inch unless you see variations in the item that would warrant a larger sample cutting.

Package the garment, object, or sample cuttings in paper envelopes or bags and clearly label with a description of from where the standard came.

Do not package standards with evidence fibers, nor allow them to be near or in contact with each other. This could allow cross contamination to occur.

Adhesive lifts are **NOT** acceptable for collection of standards.

Fabric Damage

If it is necessary to determine if textile defects are the result of a cut or puncture by a specific item, the item suspected of creating the defect (e.g., knife, scissors, screwdriver) should also be submitted.

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18.0 TRACE EVIDENCE

18.7 HAIR EVIDENCE

Hair evidence can be obtained from the victim, the suspect, a crime scene, or from other evidence such as clothing. Hair is valuable evidence, particularly in cases where the perpetrator is a stranger to the victim or an environment. Note that except in specific circumstances (victim refusal, person is bald, incident occurred more than 6 months prior, clear documentation that fewer than five hairs are present), it is expected that head and/ or pubic hair standards from individuals involved are collected and submitted along with the hair evidence in question. Contact the Trace Supervisor for other considerations.

Hair Examinations

The following may be determined with hair examinations:

- Determination of human or non-human origin
- Limited determination of animal species
- Determination of human body origin (e.g., head hair, pubic hair, etc.)
- Whether there are indications that a human hair was forcibly removed
- Alterations exhibited in a human head hair (e.g., bleached, dyed, etc.)
- Whether the root of a hair appears appropriate to attempt nuclear DNA analysis

Head and pubic standards can be used to determine a target when screening evidence consisting of numerous hairs (e.g., vacuum sweeping, tape lift). However, the Forensic Services Division does not perform morphological hair comparisons.

DNA Analysis of Human Hairs

The hair examiner will evaluate the hair for nuclear or mitochondrial DNA. Suitability for nuclear DNA testing of hairs is based on the growth phase of the hair and/or presence of tissue at the root. Most hairs encountered in casework are not suitable for nuclear DNA testing. Mitochondrial DNA analysis of hairs can be performed on the root or the shaft portion of the hair. The Forensic Services Division does not perform mitochondrial DNA analysis, but we can assist with the transfer of evidence to another laboratory (i.e., the FBI or a private laboratory).

The amount of DNA in a hair is very small and therefore contamination may occur if precautions are not taken. Do not touch hair evidence with your bare hands or contaminated gloves.

Collection of Hair Evidence

Hair evidence can be collected in a number of ways. The table below lists the various methods and when they are appropriate.

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Hair Collection Methods			
Method	Description	Packaging	When to Use
Particle Pick method	Using your gloved fingers or tweezers, carefully retrieve the hair taking care not to pinch, crush, or stretch it.	Place hair into a paper fold, in a folded Post-It note, or paper envelope.	For hairs you can see.
Vacuum sweepings	Use a portable vacuum cleaner equipped with special traps holding a piece of filter paper. <i>Lightly</i> vacuum the surface of interest. The goal is to collect trace evidence that is on the surface of the object, not to clean the object. Take care not to overload to ensure the filter paper doesn't lift allowing material to pass into the vacuum.	Carefully remove filter trap, cover with the lid or cap, and package in a paper or plastic bag.	For hairs you <u>cannot</u> see, or to be sure you have not missed any. Useful on car seats, sections of carpeting, and other large surfaces.
Adhesive lifts*	Use an adhesive sheet, fingerprint tape, cellophane tape, or other clear adhesive substrate and pat over the item. Take care not to miss any areas or allow the tape to become "overloaded." Post-It notes may also be used for small areas.	Stick adhesive tapes onto a clear, colorless plastic sheet (e.g., transparency film). Place into a paper envelope or bag.	For hairs you cannot see, or to be sure you have not missed any. Useful on car seats, surfaces of clothing, and other medium to large surfaces.
Scraping	Use a clean spatula or long, flat tool to scrape the surfaces of an object onto a large, clean piece of paper. For this to work well, the object should be hanging or held up vertically over the paper, scraping downwards.	Carefully shake any trace evidence on the paper to the center and fold the paper. Seal the paper fold and place into a paper envelope or bag.	For hairs you cannot see. Works well on clothing or other pliable objects.

* Gridded template for adhesive lifts can be found under "Trace Collection Forms" at <https://www.oregon.gov/osp/programs/forensics/Pages/Law-Enforcement-Resources.aspx#Training>

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18.0 TRACE EVIDENCE

Cautions:

- Care should be taken to store adhesive lifting materials in such a way that they will not become contaminated prior to use.
- Use of tools, such as forceps and tweezers, may cause damage to the trace evidence.
- Clean any collection tools thoroughly between samples to prevent cross-contamination.
- Avoid serrated tools as they may be more difficult to clean thoroughly.

Collection of Hair Standards

Because of the variation in characteristics among different hairs from the same body region of one person, it is important to obtain a sufficient number of hairs in order to adequately represent the ranges of all characteristics (e.g., color, length, etc.) present. If the ranges of characteristics are large, it becomes necessary to obtain a large number of hairs.

Hairs should be collected from the head and pubic area, if appropriate. Hairs from different regions have different characteristics. A head hair standard cannot be used for comparison to pubic hair evidence.

Collect hair standards in the following manner:

- Obtain standards from all persons who might reasonably be considered a source of an unknown hair (e.g., suspect, victim, and other individuals common to an environment).
- Obtain standards as soon as possible after the crime occurred. Hair naturally changes in its characteristics over time because it is constantly growing. The standards should reflect the individual's hair as close to the date of the crime as possible.
- It is recommended that a known head hair sample consists of at least 24 hairs collected from 5 different areas of the scalp (center, front, back, and both sides). These hairs should be obtained by both pulling and combing. The recommended procedure for obtaining combed hairs is to use a clean, unused comb and repeatedly comb the hair over a large sheet of clean paper.
- If appropriate to the case, a pubic hair standard should consist of at least 24 hairs obtained by both pulling and combing from different areas of the pubic region
- Gather all the hairs collected from a single body region and place into a paper fold or paper envelope
- Seal and label the envelope with the individual's name, date, and the body region it was collected from.
- Do not package paper folds enclosing different individual's hair in the same envelope, or package hair standards with hair evidence. This could allow cross-contamination to occur.

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Secondary Standards

A secondary standard is not obtained from an individual directly, but from an object or location where the individual is believed or known to have deposited hair (e.g., a hairbrush). Necessity should be the only reason to obtain secondary hair standards vs. pulled/combed hair standards (e.g., missing person, person buried/cremated before collection could occur).

Secondary hair standards may be acceptable if it can be demonstrated or documented that the hair collected from the object/location is unlikely to include hair(s) from other individuals. The acceptance of a secondary standard for comparisons will be evaluated by the hair examiner on a case-by-case basis.

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19.0 COMPUTER EVIDENCE

19.0 COMPUTER EVIDENCE

The Forensic Services Division does not examine this type of evidence. The Federal Bureau of Investigation (FBI) accepts this type of evidence at its regional laboratory in Portland, Oregon. Please refer to the FBI's Northwest Regional Computer Forensics Laboratory website: <http://www.nwrcfl.org/>.

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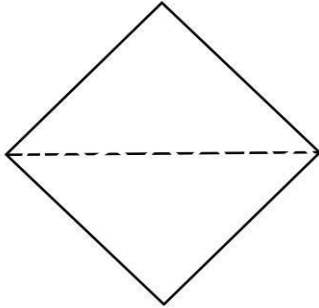
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APPENDIX A: HOW TO MAKE A PAPERFOLD

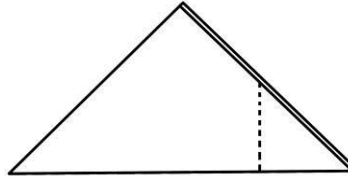
APPENDIX A: HOW TO MAKE A PAPERFOLD

Also available under "Trace Collection Forms" at

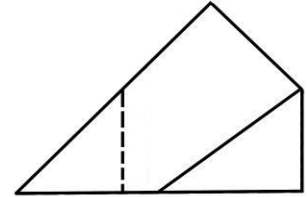
<https://www.oregon.gov/osp/programs/forensics/Pages/Law-Enforcement-Resources.aspx#Training>



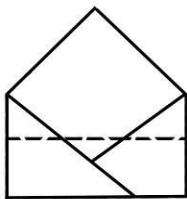
1. Fold a square piece of paper into a triangle. If using a rectangular piece of paper, make the same fold as above and then cut off the excess.



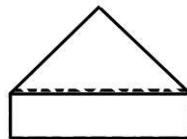
2. Take one corner at the folded edge and bring the corner just past the center point, keeping the two folded edges together.



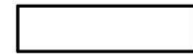
3. Take the second corner at the folded edge and bring the corner just past the center point on the opposite side, keeping the two folded edges together.



4. Bring all folded edges up together to the point where the top of the paper starts to angle.



5. Take the top center point and tuck into the opening created by the folded edges.



6. Crease the fold and enclose this paperfold in another layer of packaging such as an envelope or plastic bag for submission.

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APPENDIX B: FIREARMS AND TERMINOLOGY

APPENDIX B: FIREARMS AND TERMINOLOGY



Shotshell



Cartridge



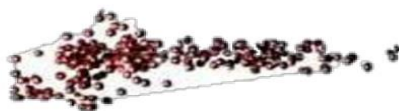
Wad



Cartridge Case



Wad



Shot



Bullet

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APPENDIX C: FORENSIC FIELD GUIDE HISTORY

APPENDIX C: FORENSIC FIELD GUIDE HISTORY

Revision #	Summary	Date Effective
Original	Manual Created and Adopted Physical Evidence Manual	May 2002
1	Revision	February 2004
2	Revision	January 2006
3	Revision	October 20, 2006
4	Revision	December 11, 2006
5	Revision	October 26, 2007
6	Revision	January 31, 2008
7	Revision	December 13, 2011
8	Revision	June 3, 2014
9	Revision	September 10, 2015
10	Revision	September 17, 2018
11	Revision - renamed from Physical Evidence Manual to Forensic Field Guide	January 1, 2023
12	Revision	October 1, 2024

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