Evidence Handling and Processing

Table of Contents

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1 INTRODUCTION

This procedure describes the requirements for the handling of evidence and the procedures for the processing of physical evidence for trace evidence.

2 SCOPE

This procedure applies to all personnel who perform examinations in the disciplines of Hairs and Fibers, Geology, and Anthropology within the Trace Evidence Unit (TEU) for criminal and collected exploitable material (CEM) cases.

3 EQUIPMENT

- Stereobinocular microscope
- Permount mounting medium
- Xylene substitute, Xyless, or Xylene
- Glass microscope slides
- Glass microscope coverslips
- Un-du or equivalent
- Cavicide or equivalent cleaning solution
- Alternate Light Source
- Adjustable rack
- Single-use vacuum filters
- Vacuum
- General Laboratory Supplies
- Personal protective equipment, as appropriate
- Pinking Shears

4 SAMPLING

4.1 Representative Sampling

A representative sample is a selection of hairs and/or fibers that attempts to capture the varying characteristics of the total hairs and/or fibers collected from an item of evidence.

For a known fiber sample selection, the representative sample will attempt to represent the range of colors and apparent fiber types comprising the item.

A known hair representative sample will attempt to represent the different characteristics (e.g., length, color, texture, and thickness) comprising the sample.

5 PROCEDURE – EVIDENCE INVENTORY IN TEU

A. After a case is assigned and the evidence has been delivered to the unit, the evidence container(s) and/or packaging will be opened, and the contents inventoried.

1. If any of the evidence container(s) and/or packaging is damaged or in an unsealed condition, it will be recorded in the case notes.
2. A decision to proceed with evidence processing will be dependent on the circumstances of the case and the nature of the packaging.

B. If there is notification from the contributor or EMU that there are areas of potential moisture on the packaging, and the evidence is received in TEU, the packaging will be opened and assessed.
    1. The condition of the evidence will be recorded in the appropriate communication log within two business days and, if necessary, wet evidence and/or packaging will be placed in an appropriate area to dry (e.g. drying cabinet).
    2. Once evidence and/or packaging has dried, the evidence will be repackaged.
C. Items received will be compared to the itemized listing on the Chain-of-Custody or Exam Plan.
D. If anything is missing or if items are present that are not listed as being delivered, it will be brought to the attention of an examiner and the appropriate Evidence Management personnel.
E. The description of the items received should be consistent with any information received in the Request for Examination.
    1. Any discrepancies found will be brought to the attention of appropriate Evidence Management personnel.
F. The type, nature, and condition of the proximal packaging of the submitted item(s) will be recorded in the case notes. If the packaging is not sealed but examinations will still be conducted, the lack of seal will be noted, and the packaging sealed upon completion of the TEU examination.
G. Multiple examination requests on submitted items of evidence require that testing be conducted in proper sequence to optimize results and to minimize loss, cross-transfer, contamination, and degradation.
    1. If examination of evidence by another discipline precludes/prevents the ability to conduct trace evidence examination(s), the appropriate Evidence Management personnel will be notified.
H. During the review of case information for new case records, any linked cases with a trace evidence case record will be documented in the case record (CR) communication log by the assigned Forensic Examiner (FE).

6 PROCEDURE – EVIDENCE PROCESSING

Evidence Processing in this document refers to the collection of trace debris from submitted items of evidence within the Geology and Hairs and Fibers disciplines.

Examiners may provide specific processing instructions for a case. For CEM cases, typically only unexposed areas of the CEM are processed for hairs and/or fibers. This includes the adhesive side of tape adhering to the device or other tape, the inside of the item if unopened, and from within hardened glue. If additional areas of CEM cases will be processed, it will be documented in the case record communication log.

6.1 Processing Plan

A. For cases containing more than one item of evidence that will require scraping within a processing room(s), a processing plan clarifying how the items can be grouped for processing based on location, individuals etc. will be created.
    1. The processing plan will include specific descriptors for the collection location (e.g., names, and/or specific scene details) when appropriate. This processing plan will be reviewed by a qualified TEU examiner or analyst prior to processing.
    2. The processing plan and review will be documented in the case file.
B. Items from different individuals or scenes to be scraped will be processed in a different processing room or in the same processing room on non-consecutive days.

6.2 Processing Evidence

A. Prior to processing, the processing area and any tools used will be cleaned using a cleaner (e.g., Cavicide) and a lint free wipe, at a minimum.
    1. This will occur between cases and between items within a case, as appropriate.
B. Lab coats and gloves will be changed between the processing of items from different individuals or scenes, as warranted.
    1. Gloves will be changed when leaving and returning to the cleaned processing room.
    2. Other PPE will be changed or augmented as necessary.
C. TEU CEM casework: Gloves, at a minimum, will be changed between cases or between items within a case, if deemed appropriate based on the items submitted. Other PPE will be changed as necessary.
D. Facemasks will be worn during the processing of items/cases that have potential for DNA analysis.
E. Case notes will record the date and location of evidence processing.
F. All evidence will be processed over clean paper that is placed on the surface beneath the item.
    1. A clean sheet of paper will be used for the processing of each item of physical evidence unless case circumstances indicate otherwise.
        i. Items received in the same packaging may be processed on the same piece of paper.
G. Accessory lighting, special lighting techniques, and magnification may be used as needed.
H. The item of evidence will be described (e.g., type, color, device construction) and carefully evaluated to determine its condition including damage, stains, etc., where appropriate.
    1. Descriptions may also include any indications of previous exploitation/examination.
I. Evidence may be photographed. Photographs will be included in the case notes, as appropriate.

J. Debris will be collected by scraping, and other processing methods, to include specialized geology processing techniques.
K. Debris removed from the inside of items or within pockets of submitted clothing may be separated from outside debris as warranted by the circumstances of the case.
L. Debris removed from an item may be either collected in a suitable container (e.g., pillbox) or directly mounted on a glass microscope slide following the procedures outlined below.
    1. The container will be appropriately marked with the Laboratory number, item number and initials of the processor.
    2. Pillboxes generated from evidence from different locations (e.g., individual, scene) will be placed in separate packaging.
M. When the item of evidence has been processed, it will be returned to its original container and sealed.
    1. If the original container is replaced or damaged, a new one will be furnished, indicated in case notes and the original packaging will be retained within new packaging, when practicable.
N. After all items have been processed, they will be properly stored.

6.3 Processing Methods

6.3.1 Scraping

A. The approved processing plan will be followed for items collected from different individuals or scenes. The processing room used will be documented in the case notes.
    1. Items submitted from different individuals or scenes may be processed in the same room, depending on the circumstances of the case. This reason will be documented in the case file by the assigned examiner.
B. Items of evidence that are scraped will be either hung on an adjustable rack above a table or manually handled, depending on the size of the item.
C. The adjustable rack will be adjusted to allow the item to hang just above the surface of the table.
D. The item will be gently scraped to remove debris that is adhering to the surface of the item. This debris will be transferred to a pillbox or other suitable container.

6.3.2 Other Processing Methods

A. Smaller items such as knives, sticks, gloves, etc. may be processed at a workstation using a magnifying lamp or stereobinocular microscope.
    1. For items processed at a workstation, the area will be thoroughly cleaned between individual and scene items.
B. Visible debris may be picked off the item and preserved in a separate pillbox, paperfold, or mounted on a glass microscope slide.

C. Debris may be recovered by vacuuming the object and collecting the debris on a vacuum filter.
D. Debris may be recovered by tape-lifting from the surface of an item.
E. When processing items for hairs and/or fibers within a rated fume hood, recovered debris will be covered or placed on an adhesive pad while further processing continues to prevent loss.
F. If appropriate, a known sample of fabric will be removed and placed in a paperfold. The area where the sample was taken will be marked and initialed. For cases where taking a discreet known is appropriate; the item might not be physically marked, however, the location from where the known was taken will be documented in the case notes
    1. The paperfold will be marked with the Laboratory number, item number, initials of the processor and if appropriate, labeled with the two letter country code or Field Office (FO) the evidence originated from
G. Fabric and cordage will be described regarding condition and color. General construction will be described in CEM cases.
    1. A known sample of fabric and cordage can be removed and placed in a paperfold.
    2. The paperfold will be marked with the laboratory number, Item number, initials of the processor, and if appropriate, country or field office code.
H. If there are multiple types of fabric and cordage in an Item, the slides and paperfolds may be labeled with additional identifying information.
I. Information regarding color and construction of fabric and cordage will be input into the TEU-HSV fabric/cordage database, if appropriate.

6.3.3 Envelope/Letter Processing

A. When envelopes/letters containing stamps or labels are received in the TEU, an attempt will be made to remove the stamps or labels using a suitable solvent such as un-du®.
B. If the stamp or label cannot be removed using a suitable solvent, no further attempt will be made to remove the stamp or label.
C. If the stamp or label can be removed using a suitable solvent, the underside will be examined for the presence of trace evidence.
D. If trace evidence is identified, it will be collected as described previously.
E. Each stamp or label that is removed will be subdivided and placed on suitable plastic sheeting.

6.3.3.1 Adhesive Tape Processing

A. The procedures for processing adhesive tape will be followed when processing other adhesive items, including labels or other similar items.
B. If appropriate, the exposed areas of the evidence item, including tape, will be processed using one of the methods covered above in Processing Evidence.
C. Prior to the removal of the tape, the evidence may require examination by another unit within the Laboratory.

1. If the other unit is already on the examination plan for that item, the affected unit will be contacted.
    i. This contact is to determine how far the trace evidence processing can proceed without interfering with the examinations of the affected unit.
2. If the affected unit is not on the examination plan, the examiner or analyst will contact the appropriate individual/unit to determine if this examination is necessary and requested.
3. If evidence needs to go to another unit for examination prior to completion of the trace evidence processing, the outer packaging of the item will be temporarily marked to indicate that the item needs to be returned to TEU for tape removal and the processing of the unexposed areas of the tape (this is not required for CEM cases).

D. When the tape is removed, the unexposed areas will be examined for the presence of visible debris. Any debris found will be directly picked off the tape and mounted on a glass microscope slide or preserved in a separate pillbox or paperfold.
E. Once processing is complete, the tape will be subdivided and placed on suitable plastic sheeting.
    1. If the tape needs to be cut, due to length or for other reasons, the plastic sheeting will be marked where it was cut (this is not required for CEM cases).
        i. When practicable, pinking shears will be used to further identify laboratory cuts.
    2. An indication that the tape was cut will be added to the processing notes for the item. A notation will also be made in the case communication log (this is not required for CEM cases).
F. The plastic sheeting will be appropriately marked with the Laboratory number, Item number, initials of the processor, and, if appropriate, a description of where the tape was located (e.g., tape from battery).
    1. Different types of tape may be included in a single sub-divided item.
    2. For cases where it has been indicated in the case file the tape may be processed for DNA, plastic sheeting that has been UV treated will be utilized. The plastic sheeting will be marked to identify ends possibly suitable for potential DNA analysis, to include the outermost and innermost pieces and, if appropriate, a description of where the tape was located (*e.g.*, tape from battery). This will be added to the processing notes by indicating that the plastic sheeting was annotated for DNA.

6.3.4 <u>Specialized Geology Processing</u>

A. Soil or debris that appears layered will be collected in a manner to preserve the layer structure.
    1. Layered soil can be either picked off an item and placed in a separate pillbox or a cutting of the item containing the soil can be collected and placed in a separate pillbox.

B. Items containing multiple apparent colors of soil or debris could indicate multiple deposition events and will be collected in a manner to preserve all potentially different sources.
    1. Different apparent colors should be collected in separate pillboxes if possible and the location of the collection area noted.
C. When processing shoes for glass, after scraping the items, the soles of the shoes will be examined for the presence of embedded glass.
    1. The soles will be assessed for cuts or tears.
    2. Insert a metal probe into the cut or tear. If any solid objects are embedded in the cut or tear, gently pry the object out and place it in a separate container.
    3. Use a flashlight at an oblique angle to observe any minute glass fragments that may still be clinging to the object and collect as appropriate.

7 PROCEDURE – DEBRIS SCREENING AND SLIDE PREPARATION

A. Screening of the recovered debris may be facilitated by the use of magnifiers and/or stereobinocular microscopes.
B. Additional information can be found in the appropriate technical procedures.

7.1 Slide Preparation (Hairs and Fibers)

A. Debris may be mounted on a clean glass microscope slide using a suitable mounting medium (e.g., Permount).
    1. Placing a thin film of solvent (e.g., Xylene substitute) on the surface of the slide will allow debris to adhere temporarily until the mounting medium is applied.
    2. Using clean forceps, debris will be placed on the slide and arranged so it can be completely covered by the glass coverslip.
    3. Excess solvent will be blotted off to avoid solvent run-off when the mounting medium is applied and to help arrange debris on the glass microscope slide.
B. Each slide will contain the Laboratory number, the item number, and the initials of the individual preparing the slide.
    1. If the slide contains only a representative sample of hairs or fibers, the letters “R/S” will be included.
    2. Slides may additionally be labeled with the two letter country code or Field Office (FO) from which the evidence originated.
C. Forceps will be cleaned between different items/pillboxes.

7.1.1 Hairs

A. The number of hairs mounted on glass microscope slides may be influenced by the types of hairs in the questioned debris or known sample and the circumstances of the case.
B. A representative sample of hairs of different characteristics (e.g., length, color, texture, and thickness) may be mounted.

C. Case notes will indicate that a representative sample of hairs was mounted and that additional hairs are present on or in the item/pillboxes.
D. If a representative sample of hairs from the questioned item(s) or known sample has been mounted on glass microscope slides, additional targeted searching of the debris may be conducted if warranted.
E. In order to identify hairs for further examination, the screening of the debris can also be directed by a "target" search, i.e., looking for hairs with specific characteristic(s) (e.g., hairs that are similar in appearance to a known hair sample). Case notes will indicate that a target search was conducted and that additional hairs are present on or in the item/pillboxes.

7.1.2 Fibers

7.1.2.1 Recovered debris

A. A representative sample of fibers of different colors, shapes and sizes may be mounted.
    1. The number of glass microscope slides prepared during the initial screening is dependent on the number and types of fibers in the questioned debris and the circumstances of the case.
    2. Case notes will indicate that a representative sample of fibers was mounted and that additional fibers are present in the item/pillbox.
B. In order to identify fibers for further comparison, the screening of the debris can also be directed by a "target" search, i.e., looking for fibers with specific characteristic(s) (e.g., similar to fibers comprising a known fiber sample). Case notes will indicate that a target search was conducted and that additional fibers are present on or in the item/pillboxes.
C. When intact yarns are found in the recovered debris, they will be documented in the processing notes for potential comparison purposes.
    1. Intact yarns may be preserved separately, as appropriate.
    2. At the discretion of the examiner, a known fiber sample may be mounted of the intact yarn.

7.1.2.2 Known Fibers

A. A known fiber sample is a sample of fibers known to be from a particular textile.
B. A representative sample will be selected that attempts to represent the range of colors and fiber types comprising the known textile.
C. Known samples should not be taken from damaged areas because of potential future fabric examinations.
D. Fiber samples from yarn types present in the fabric will be mounted.
E. Warp yarns and fill yarns may be separately mounted.
F. Sewing thread and button thread fiber samples may also be mounted.
G. In addition to the Laboratory number, item number and the initials of the processor, the letters "kn", which indicates a known sample, will be written on the frosted end

of the glass microscope slide. Slides may additionally be labeled with the two letter country code or FO the evidence originated from.

7.2 Geologically-Derived Materials

A. Items are air-dried, if needed.
    1. If samples are wet, place them in a hood with a permeable filter (e.g. a Kimwipe) over the top and allow to air dry.
        i. When checking in a soil collection kit, soil samples will be carefully opened to determine if air drying is necessary.
B. Individual components are removed from the items for identification as necessary.
    1. These individual sub-samples may not be representative of the entire item.
    2. Sub-samples are chosen based on the need to identify a particular component by a specific technique, and by its availability or presence in an item.
    3. Items may be mechanically broken to facilitate sub-sampling.
C. Apparent soil removed from objects, (e.g., shoes), will be kept as coherent as possible.

8 PROCEDURE – SECONDARY EVIDENCE

A. Material derived from an item of evidence is designated as secondary evidence. In TEU examples of secondary evidence include (but are not limited to) the following: glass microscope slides, plastic pillboxes, paperfolds, and vacuum canisters.
B. TEU – QT: The slides generated will be assigned a separate item number from the other secondary evidence. TEU – HSV: Slides and paperfolds generated will be assigned separate item numbers from any other secondary evidence.
C. TEU – QT: All secondary evidence will be accounted for on TRACE-002 TEU FA Secondary Evidence Inventory (SEI) form. TEU – HSV: All secondary evidence will be accounted for on TRACE-000 TEU-HSV FA Secondary Evidence Inventory or TRACE-001 TEU-HSV Legacy Secondary Evidence Inventory (SEI).

9 REVISION HISTORY

Revision	Issue Date	Changes
02	3/15/2024	Updated 6.1 A reference to processing plans, added 6.1.A.1 and 6.2.2.2 D i and ii, added 5E for comm log review
03	11/01/2024	Combined Trace 200 and Trace 205; removed SBAU references. Added 5B on drying cabinets. Clarified language about processing plans in 6.1. Updated tape processing in 6.3.3.1.F.1. Added information on CEM cases. Added 7.1.1E about target search. Added representative sample information in 4.1. Clarified 6.3.2.F for discreet known. Added information on processing instructions in 6.