

**SEXUAL ASSAULT EVIDENCE COLLECTION KIT EXAMINATION****2.1 PURPOSE**

2.1.1: To examine Sexual Assault Evidence Collection Kits for the presence of semen, blood and saliva and trace material when warranted.

2.1.2: To collect and preserve samples for further analysis.

**2.2 RESPONSIBILITY**

Forensic Science Examiners from the Division of Scientific Services who have been trained in the discipline of Sexual Assault Evidence Collection Kit handling and examination according to FB SOP-26 (Training Manual and Checklist), GL-4 (LIMS/JusticeTrax) and GL-13 (General Evidence Handling).

**2.3 SAFETY**

Use appropriate measures for the proper handling of biohazardous materials and chemicals according to GL-2 (Safety Manual).

**2.4 DEFINITIONS**

- A. SAECK: Sexual Assault Evidence Collection Kit
- B. LIMS: Laboratory Information Management System
- C. PPE: Personal Protective Equipment

**2.5 PROCEDURE**

Sexual Assault Evidence Collection Kits will be examined and serological tests will be performed based on the examiner's knowledge, training and experience according to the submitting agency requests, case information and the condition of the evidence.

**2.5.1: Cleaning Utensils and Laboratory Areas**

- A. Clean utensils and bench top supplies during use as needed and between each kit. The appropriate disinfecting solution is described in FB SOP-21 (General Chemical and Reagent QC) and is followed by ethanol to ensure aseptic conditions. dH<sub>2</sub>O may be used between the disinfecting solution and ethanol.
- B. Containers used to clean/soak utensils in disinfecting solution, dH<sub>2</sub>O and ethanol, are replaced weekly. The disinfecting solution, dH<sub>2</sub>O and ethanol are replaced daily or more often, as necessary.
- C. Clean camera and other electronic equipment during use as needed and between each kit to ensure aseptic conditions. The appropriate disinfecting solution is described in FB SOP-21. Avoid the use of ethanol.

- D. Clean bench top using the appropriate disinfecting solution described in FB SOP-21 and replace examination paper between each kit or more often, as necessary, to ensure aseptic conditions.

**2.5.2: Personal Protective Equipment**

- A. Examiner's must wear lab coats, masks, gloves, disposable sleeves and hair nets while handling evidence.
- B. When conducting microscope work for Sperm Hy-Liter the examiner must wear a lab coat and gloves.
- C. Examiner's will wear protective eyewear when it is indicated to do so.

**2.5.3: Evidence Retrieval**

- A. Examiners will be notified of case assignments by a Forensic Biology Lead, Case Management or the LIMS computer system according to GL-4 (LIMS/Justice Trax).
- B. Examiners will retrieve kits from a secure storage location or from other examiners through a secure transfer with the LIMS computer system according to GL-4 (LIMS/Justice Trax).
- C. Label the kit with the Lab ID #, submission # and examiner's initials.

**2.5.4: Evidence Examination**

All examinations are conducted macroscopically. Other types of examinations (i.e. microscopical or stereoscopical) will be recorded, along with the microscope(s) used, on the SAECK Quality Record Worksheet (FBQR-05) located in Appendix 1. For additional information, refer to section 2.6 (Work Instructions and Flow Chart for SAECK Examination) below.

- A. Document the package and evidence it contains according to the SAECK Quality Record Worksheet (FBQR-05).
- B. Use blue ink to record information, including the intended evidence disposition, on the SAECK Worksheet. When necessary, different colors of ink may be used. Date all documentation and test results.

- C. All reagents that are used during examination are recorded on the SAECK Worksheet and the General Reagent Sheet (FBQR-09). An electronic reference will be maintained for tracking these reagents.
- D. Attach photocopies of the medical report form and label information. Attach additional Quality Record worksheets and photographs/sketches as necessary.
1. Notes may be recorded on the photographs.
  2. If needed, more information can be found in the metadata of the digital image of each photograph.
- E. Inventory and label the items in the kit according to the SAECK Worksheet. Include Lab ID #, item #/letter and initials on each envelope/package.
- F. Item(s) that are received wet should be removed from the package and air dried in hood whenever possible. Once dry, the item may be examined or re-packaged until future examination.
- G. Preserve a sample of the known blood for further analysis according to FB SOP-07 (Whole Blood Sample Preservation).
- H. Perform serological tests according to the applicable FB SOP-08 through FB SOP-18 (Forensic Biology Serological Tests) and flow charts located in FB SOP-01 and section 2.6 (Work Instructions and Flow Chart for SAECK Examination) below, based on the submitting agency requests, case information, type of evidence/samples(s) and number, size and quantity of sample(s).

For rush cases as requested, samples may be forwarded for DNA analysis prior to serological testing. FB will simultaneously conduct serological testing on a remaining portion of the sample for the presence of body fluids.

- I. Other physical evidence (i.e. underpants, tampon or sanitary pad) submitted in the SAECK may be examined according to FB SOP-01 (Physical Evidence Examination) and section 2.6.6.

- J. Collect samples from items that semen, blood and/or saliva have been identified or there is information of digital contact. Collect touch/wearer samples on additional items submitted in the SAECK as necessary.
- K. Sample selection is conducted considering the substrate and the type/amount of sample present. Sample selection details will be included on the appropriate Quality Record Worksheet (FBQR-05). These details will not be included with the results stated in the report.
- L. For biological screening of hair-like fibers (when necessary) please refer to FB SOP-19 (Trace Evidence Collection/Hair-like Fiber Examination). See sections 2.6.2 and 2.6.4 for additional information.
- M. Designate the samples collected according to the SAECK Worksheet and if necessary using the letter 'S' for the Forensic Biology Unit with the corresponding sample number (see examples listed under section 2.5.5).
- N. Place envelope(s)/package(s) back in the kit, re-seal and initial the seals. Store kit in a designated storage area.
- O. Create samples collected from the items in the LIMS computer system according to GL-4 (LIMS/Justice Trax) using the designated sub-items.
- P. Forward the appropriate samples to the DNA Unit according to section 2.6 (Work Instructions and Flow Chart for SAECK Examination) below and FB SOP-03 (Guidelines for Collecting and Forwarding Samples for DNA Analysis).
- Q. Store samples in designated, secure and temperature appropriate areas or transfer to other Units of the Laboratory using the LIMS computer system according to GL-4 (LIMS/Justice Trax). Print the LIMS transfer sheets as needed. Record transfers to other Units on the Request for Examination Sheet (FBQR-10).
- R. If forwarding sample(s) to DNA, create the appropriate DNA request(s) using the LIMS computer system according to GL-4 (LIMS/Justice Trax).

- S. A secure and password protected LIMS computer system is used in accordance with GL-5 (Ethics).
- T. The transfer of samples from laboratory cases which were opened prior to 1998 (which are not in LIMS) will be recorded on the Evidence Transfer Sheet (FBQR-11).

**2.5.5: Examples of kit evidence/sample itemization in LIMS**

- A. Kit samples are itemized according to the SAECK Worksheet and may be retained as itemized, for example:
  - 1. #1A (known blood sample)
  - 2. #1B (vaginal smear)
  - 3. #1C (vaginal swabs), retained as itemized
  - 4. #1L (known pubic hair sample), retained as itemized
  - 5. #1N-L (fingernail clippings-left hand), retained as itemized
  - 6. #1R (underpants)
- B. Samples retained from the kit items are sequentially itemized, for example:
  - 1. #1A-S1 for a stain made from the known blood sample
  - 2. #1C-S1 for trace removed from the vaginal swabs
  - 3. #1N-L-S1 for a swabbing of the contents of the fingernail clippings-left hand
  - 4. #1R-S1 for a cutting from the crotch area of the underpants
  - 5. #1R-S2 for trace removed from the underpants
- C. Any portion of a sample being forwarded for DNA analysis while the remaining portion is being retained in Forensic Biology should be itemized as #1S1\* and #1S1, for example:
  - 1. #1C\* for the portion of vaginal swabs being forwarded for DNA analysis  
#1C for the remaining vaginal swabs retained in Forensic Biology
  - 2. #1R-S1\* for the portion of a cutting from the crotch area being forwarded for DNA analysis
  - 3. #1R-S1 for the remaining cutting from the crotch area retained in Forensic Biology

## 2.6 WORK INSTRUCTIONS and FLOW CHART FOR SAECK EXAMINATION

All examinations are conducted macroscopically. Other types of examinations (i.e. microscopical or stereoscopic) will be recorded, along with the microscope(s) used, on the SAECK Quality Record Worksheet (FBQR-05) located in Appendix 1.

- A. Transfer the kit into your name in LIMS according to GL-4 (LIMS/Justice Trax).
- B. Obtain a SAECK worksheet (FBQR-05) to record results of examination and analysis.
- C. Make a copy of the medical form, the front cover of the kit and any additional labels/seals as needed. Label these photocopies with the Lab ID# and examiner's initials in the upper right corner.
- D. Inventory
  - 1. Inventory the contents of the kit and cross out any items that were not collected on the worksheet. Place the unused envelopes and bags back in the kit (unlabeled).
  - 2. Label the used envelopes/bags with the Lab ID#, item #/appropriate letter (according to the worksheet) and examiner's initials.
  - 3. Record any written information from the envelopes, such as sample origin or reason sample not collected, on the worksheet.

### 2.6.1 Known blood sample

- A. Retain a known bloodstain according to FB SOP-07 (Whole Blood Sample Preservation).
- B. If a Toxicology request has been made, notify Case Management to obtain the necessary consent form prior to Toxicology testing.
  - 1. Retain a bloodstain from the purple top tube.
  - 2. Refrigerate the purple top tube until notified by Case Management it can be transferred to the Toxicology Unit.
- C. If a red top tube is also present and a Toxicology request has been made, notify Case Management to obtain the necessary consent form prior to Toxicology testing.
  - 1. Retain a bloodstain from the red top tube.
  - 2. Refrigerate the purple top tube until notified by Case Management it can be transferred to the Toxicology Unit.

- D. If a known blood sample is not included in the kit:
1. The oral swabs may be used as a known for DNA analysis according to section 2.6.3.E.4.h below.
  2. If a saliva sample is present, it may be used as a known for DNA analysis. Retain the inner envelope of the known saliva sample. Label this envelope with the Lab ID#, item #/letter and examiner's initials.
  3. A known sample (i.e. blood or buccal) from the victim may be requested for DNA analysis.

### **2.6.2 Hair-like fibers noted during examination**

Collect any hair-like fibers noted during examination of the kit (i.e. smears, swabs, fingernail scrapings/clippings, other physical evidence), before proceeding, in a paper fold and label with the Lab ID#, item #/letter and examiner's initials. Sub-itemize and place in a similarly labeled coin envelope and retain according to section 2.6.4.B.3 below.

### **2.6.3 Smears and swabs**

- A. Label the smear holder with the Lab ID#, item #/letter and examiner's initials.
1. Hospital prepared smears may or may not be examined prior to the analysis of the corresponding swab based on the case information.
  2. Retain smear(s) according to step 5c under section E below.
- B. Label the smear(s) on the frosted edge of the slide in pencil with the Lab ID#, item #/letter and examiner's initials.
- If two (2) smear(s) per orifice are present, the second smear may be examined if the case warrants.
- C. Conduct a preliminary, unstained search at 200X of the smear(s) appropriate for the case scenario (vaginal, oral and/or anal), placing the slide on a microscope stage with the frosted edge to the left.
1. Record the microscope(s) used and note red blood cells, if present, on the worksheet.

2. If positive (the identification of intact spermatozoa, i.e. the head, neck and tail or the identification of non-intact spermatozoa, i.e. only the head portion), record the results of the sperm search on the worksheet according to the following rating:
    - 4+ - numerous sperm in every field
    - 3+ - a few sperm in every field
    - 2+ - sperm not in every field but easy to locate
    - 1+ - a few sperm (coordinates are needed to relocate)
    - 1 sperm - head portion or intact (coordinates are needed to relocate)
  3. Record coordinates (if needed to relocate the sperm).
  4. If no spermatozoa are located after a quick preliminary search, stain a smear from each appropriate orifice according to FB SOP-14 (Identification of Spermatozoa).
- D. If spermatozoa are identified on the stained smears, proceed with the corresponding swabs and other relevant swabs as the case/sample warrants.
1. Label the swab packets with the Lab ID#, item #/letter and examiner's initials. Note the appearance and quantity of swabs on the worksheet.
  2. It is not necessary to test the corresponding swabs for semen. Conduct other serological testing as warranted according to FB SOP-08 (Screening Tests for Blood) and FB SOP-16 (Test for Amylase).
  3. Prepare the corresponding swabs to be forwarded to the DNA Unit for processing according to FB SOP-03 (Guidelines for Collecting and Forwarding Samples for DNA Analysis) or retain according to step 5c under section E below.
- E. If no spermatozoa are identified on the stained smears, examine the corresponding swabs and other relevant swabs as the case/sample warrants.
1. Label the swab packets with the Lab ID#, item #/letter and examiner's initials. Note appearance and quantity of swabs on the worksheet.
    - a. If warranted, the swabs may be tested for blood according to FB SOP-08 (Screening Tests for Blood) and/or for amylase according to FB SOP-16 (Test for Amylase), prior to extraction for semen.

- b. Extract the corresponding swabs (vaginal, oral and anal) according to FB SOP-13 (Extraction of Samples).
    - i. Extract one (1) swab if there are four (4) swabs available unless there is information of digital contact/penetration, then extract only half of a swab.
    - ii. Extract half of a swab if there are only two (2) swabs available.
  - c. If the assault was vaginal or anal, extract the genital swabs according to FB SOP-13 (Extraction of Samples).
    - i. Extract one (1) swab if there are four (4) swabs available unless there is information of digital contact/penetration, then extract only half of a swab.
    - ii. Extract half of a swab if there are only two (2) swabs available.
  - d. Test the dried secretion swabs for acid phosphatase according to FB SOP-12 (Screening Test for Semen) and extract as necessary according to FB SOP-13 (Extraction of Samples).
    - i. Extract one (1) swab if there are four (4) swabs available unless there is information of digital contact, then extract only half of a swab.
    - ii. Extract half of a swab if there are only two (2) swabs available.
2. Prepare a smear from each swab extract when necessary. Stain and search each extract smear according to FB SOP-14 (Identification of Spermatozoa). Christmas Tree stain is typically used for extract smears.

Note: It is not necessary to prepare extract smears from the vaginal, oral and/or anal swabs if the corresponding hospital prepared smear was examined and no spermatozoa were identified.

3. If an extract smear was not prepared or if no spermatozoa were identified on the extract smear, test the extract for the presence of semen according to FB SOP-15 (Rapid Immunoassay Test for Semen).

Note: If sample is heavily stained with fecal-type material or if the presence of breast milk is suspected, do not conduct the ABACard® p30 test. The sample may still be forwarded for DNA analysis at the discretion of the Forensic Biology Lead or Deputy Director.

4. Forward the appropriate samples to the DNA Unit for processing according to FB SOP-03 (Guidelines for Collecting and Forwarding Samples for DNA Analysis).
  - a. Prepare swabs being forwarded to DNA by removing the swab tip(s) from the sticks and placing in a centrifuge tube.
  - b. If digital contact/penetration is reported, when appropriate, forward all remaining swabs available up to four (4).
  - c. Do not place more than three (3) swabs in one (1) tube, separate into two (2) tubes if necessary. Note this in LIMS/on the LIMS sheet.
  - d. Label the tube(s) with the Lab ID#, item #/letter and examiner's initials.
  - e. Place the tubes in a plastic bag with the Lab ID#, heat seal and initial the seal.
  - f. Store in the designated location of freezer storage.
  - g. The number of swabs being forwarded for DNA and any swabs remaining should be indicated on the SAECK Worksheet and in LIMS.
  - h. An oral swab may be forwarded as a known for DNA analysis, if it has been determined to be negative for semen or based on case information.
5. Retaining items/samples
  - a. Retain any remaining swabs by placing the tip(s) with ~ ½" of the stick in a centrifuge tube or paper fold or by removing the swab tips from the stick. Label the tube or paper fold with the Lab ID#, item #/letter and examiner's initials.
  - b. Retain the extracts by removing the extracted swab from the basket, placing it into the extract tube and sealing the tube with parafilm. Place the extract tubes in a small plastic bag. This bag may be heat sealed and the seal initialed.
  - c. Place smears and swabs, remaining swabs, extract tubes/bag and other items/samples into a plastic bag. Heat seal the bag and initial the seal. Store in the designated location of freezer storage.
  - d. If there is no indication of contact to an orifice, then retain the relevant swabs without testing. Note 'NT' (not tested) on the SAECK Worksheet.

**2.6.4. Trace items and known hair samples**

- A. Unless necessary, the Pubic Hair Combing, Debris Collection, Examination Paper, and Known Head and Pubic Hair samples will not be examined.
1. If not examined, retain these items as described in section B.3 below.
  2. The examination sheet should first be placed into a separate envelope, labeled with the Lab ID#, item #/letter and examiner's initials, sealed and the seal initialed.
- B. If necessary, these items may be examined as follows and according to FB SOP-19 (Trace Evidence Collection/Hair-like Fiber Examination):
1. Examine pubic hair combings macroscopically for trace material.
    - a. Record the contents on the worksheet.
    - b. Retain hair-like fibers in the inner paper fold or in a separate paper fold as needed.
    - c. Label the inner paper fold or separate paper fold with the Lab ID#, item #/letter and examiner's initials.
    - d. If the inner paper fold is retained, seal with tape and initial the seal. If retained in a separate paper fold, place in a similarly labeled coin envelope.
  2. Examine the debris collection envelope and examination paper each separately macroscopically or stereoscopically.
    - a. Retain any hair-like fibers from each item in a separate paper fold.
    - b. Label each paper fold with the Lab ID#, item #/letter and examiner's initials.
    - c. Place each into a separate coin envelope and label with the Lab ID#, item #/letter and examiner's initials.
    - d. If applicable, record the microscope(s) used on the worksheet.
  3. Store all trace related items/samples (including but not limited to unexamined items and collected hair-like fibers) in a sealed and initialed manila envelope. The manila envelope is labeled in the upper right corner with the Lab ID#, incident town and examiner's initials. Store the envelope at room temperature in Trace Storage-retained trace.
  4. Hair-like fibers may be further examined according to FB SOP-19 (Trace Evidence Collection/Hair-like Fiber Examination).

**2.6.5. Fingernail Scrapings/Clippings**

For additional information, refer to FB SOP-03 (Guidelines for Collecting and Forwarding Samples for DNA Analysis).

- A. If the SAECK is negative for body fluids and there is information that the victim scratched the suspect or there was a struggle then examine as follows:
1. Examine the contents for blood, tissue-like material and/or debris/trace.
    - a. This may be done macroscopically or stereoscopically.
    - b. If warranted, test for blood according to FB SOP-08 (Screening Tests for Blood).
    - c. If applicable, record the microscope(s) used on the worksheet.
  2. Record the presence of fingernail fragments, wooden sticks and/or debris/trace. If hair-like fibers are noted, see section 2.6.2.
  3. Record the presence of blood-like stains and/or tissue-like material and test results.
  4. Swab the entire contents of the fingernail scrapings/clippings with 1-2 swabs and forward for DNA analysis according to FB SOP-03 (Guidelines for Collecting and Forwarding Samples for DNA Analysis). Include the wooden stick ends, clippings, debris and interior paper fold.
  5. If there is left over biological material after swabbing the contents of the inner paper fold(s) then label the paper fold with the Lab ID#, item #/letter, seal with tape and initial. Place the paper folds in a plastic bag with other retained samples and store in freezer storage.
- B. Fingernail scrapings/clippings not examined are retained with other retained items/samples in freezer storage.

**2.6.6. Other evidence (i.e. underpants, tampon, pad etc.):**

- A. The necessity of examining other items submitted in the SAECK will be evaluated on a case-by-case basis. Examination will be conducted according to FB SOP-01 (Physical Evidence Examination).
- B. When not examined, retain as follows:
1. Clothing such as underpants should be retained with other retained trace related items/samples in Trace Storage-retained trace.
  2. Tampons or sanitary pads should be retained with other retained items/samples in freezer storage.

- C. The necessity to retain the examined evidence will be assessed on a case-by-case basis.
- D. When hair-like fibers are noted, see section 2.6.2.

**2.6.7. 'NEATT'**

For any items not examined, note 'NEATT' (not examined at this time) on the SAECK worksheet.

**2.6.8. Attach the photocopies to the worksheet in the following order:**

- A. Any appropriate worksheets for additional items examined
- B. Copy of medical report form
- C. Copy of front cover of kit
- D. Copies of any additional labels/seals

**2.6.9. LIMS**

- A. Create the items that were retained (ex. #1A-S1) according to GL-4 (LIMS/Justice Trax) and section 2.5.5.
- B. Transfer the created items to the appropriate LIMS storage locations.
- C. Store the kit at room temperature in a locked evidence storage area until the report is ready and the evidence is returned to the Evidence Receiving Unit.

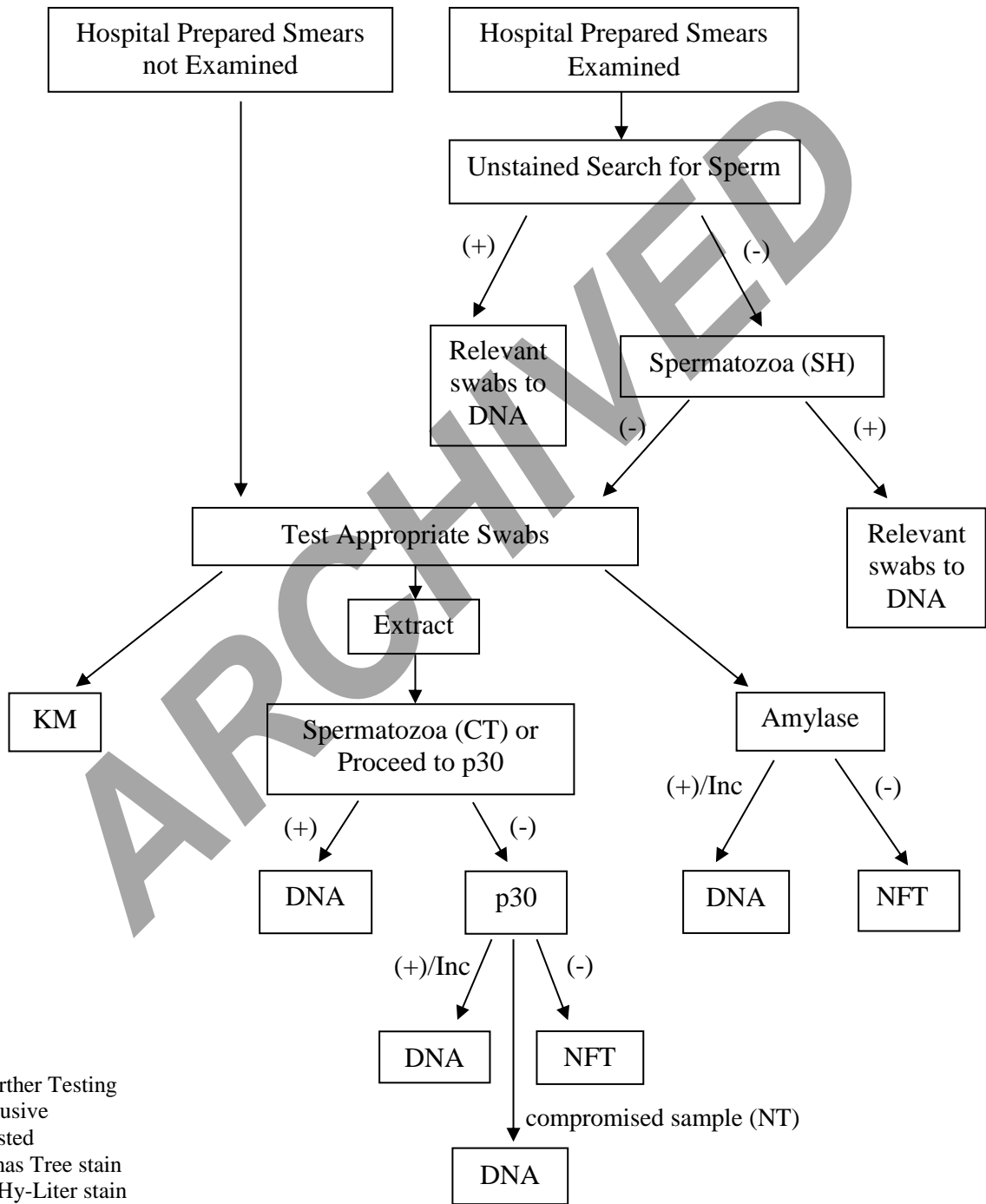
**2.6.10. Reports**

- A. Write a report to the submitting agency summarizing the results of the examination according to FB SOP-05 (Case Records and Reports).
- B. Positive kits:  
Request known samples from the victim and suspect if not submitted.
- C. Negative kits:  
More evidence may need to be examined if the kit is negative. The submitting agency may be contacted to see what other evidence may be relevant/significant and is available for testing.

**2.6.11. Public Act No. 15-207**

- A. Sexual Assault Evidence Collection Kits submitted to the DSS will be handled according to Public Act No. 15-207 (An Act Concerning Evidence in Sexual Assault Cases) and the procedure above.
- B. The following statement will be used to report out the disposition of SAECK's and other evidence related to sexual assault cases:  
*Submission [ ] will be retained at the Laboratory per Public Act No. 15-207.*

**2.6.12. Flow Chart: General Pathways of SAECK Testing (steps during analysis are evaluated on a case-by-case basis and according to case information)**



## **2.7 REFERENCES**

- A. GL-2 (Safety Manual)
- B. GL-4 (LIMS/Justice Trax)
- C. GL-5 (Ethics)
- D. GL-13 (General Evidence Handling)
- E. Public Act No. 15-207(An Act Concerning Evidence in Sexual Assault Cases)

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