

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 equipment between each item or sample examined or handled with the appropriate disinfecting solution described in FB SOP-21 (General Chemical and Reagent QC), followed by ethanol. dH₂O may be used between the disinfecting solution and ethanol.
- B. Containers on the bench top with disinfecting solution, dH₂O and ethanol, used to clean/soak utensils, should be replaced weekly. The disinfecting solution, dH₂O and ethanol are replaced daily or as often as necessary. Disposable scalpels used and discarded after each single use do not have to be cleaned/soaked.

- C. Clean camera and other electronic equipment before each item or sample is examined or handled. Use the appropriate disinfecting solution described in FB SOP-21 and avoid the use of ethanol.
- D. Clean bench top between each kit examined (more often as needed) with the appropriate disinfecting solution described in FB SOP-21.
- E. Replace examination paper between each kit examined.

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 evidence on a regular basis from the Evidence Receiving Unit 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 unless otherwise recorded (microscopical, stereoscopical examination) 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 # and initials on each envelope/package.
- F. Item(s) that are received wet should be removed from the package and air dried. 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 'No Suspect' rush cases, 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. If necessary, examine additional physical evidence (i.e. underpants, tampon or sanitary pad) included in the SAECK according to FB SOP-01 (Physical Evidence Examination).

- 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 section 2.6 (paragraph J) below 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 unless otherwise recorded 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 yellow 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). Place examiner's initials in the appropriate location on page 1 of the worksheet.
 - 2. Label the used envelopes/bags with the Lab ID#, item #/and 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.
- E. Known Blood Sample
 - 1. Retain a known bloodstain according to FB SOP-07 (Whole Blood Sample Preservation).
 - 2. 'CT 100' Kit (manufactured prior to January, 2011)
 - a. If a Toxicology request has been made, notify Case Management to obtain the necessary consent form prior to Toxicology testing.
 - i. Retain a bloodstain from the red top tube.
 - ii. Refrigerate the purple top tube until notified by Case Management it can be transferred to the Toxicology Unit.
 - b. If a known blood sample is not included in the kit, retain the inner envelope of the known saliva sample. Label this envelope with the Lab ID#, item #/letter and examiner's initials.

3. Revised 'CT 100' Kit (manufactured January, 2011 or later)
 - a. No red top tube blood sample is included in the revised kit. If a Toxicology request has been made, notify Case Management to obtain the necessary consent form prior to Toxicology testing.
 - i. Retain a bloodstain from the purple top tube.
 - ii. Refrigerate the purple top tube until notified by Case Management it can be transferred to the Toxicology Unit.
 - b. No saliva sample is included in the revised kit. Request a known buccal sample from the victim if a known blood sample is not included in the kit.

F. Sperm Search

Note: It is at the discretion of the examiner whether a hospital prepared smear will be examined or not, prior to analysis of the corresponding swab.

1. Label the smear holder with the Lab ID#, item #/letter and examiner's initials.
2. 'CT 100' Kit (manufactured prior to January, 2011)
Label the two (2) smear slides on the frosted edge in pencil with the Lab ID#, item #/letter and examiner's initials.
3. Revised 'CT 100' Kit (manufactured January, 2011 or later)
Label the one (1) smear slide on the frosted edge in pencil with the Lab ID#, item #/letter and examiner's initials.
4. Collect any hair-like fibers noted on the smears in a paper fold and label with the Lab ID#, item #/letter and examiner's initials. Place the paper fold back into the corresponding swabs/smear envelope and return to the kit.
Note: Only if it is necessary for the Forensic Biology Unit to retain trace material will it be sub-itemized using the letter 'S' designation with the corresponding sample number (ex. #1B-S1).
5. Conduct a preliminary, unstained search at 200X of 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. Note red blood cells if present on the worksheets.

6. 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)
 7. Record coordinates (if needed to relocate the sperm), scope # and examiner's initials.
 8. 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). Conduct a full search of each smear. Note: If spermatozoa are identified prior to a full search being completed it is not necessary to continue searching.
 9. Record the results (including rating if positive) and the method of staining on the worksheet.
- G. Positive Smears
1. If spermatozoa are identified on the smears, the corresponding swabs are not tested but retained or prepared for DNA testing.
 2. Note appearance and quantity of swabs on worksheets.
 3. Collect any hair-like fibers noted on the swabs/smears in a paper fold and label with the Lab ID#, item #/letter and examiner's initials. Place the paper fold back into the corresponding swabs/smear envelope and return to the kit.
Note: Only if it is necessary for the Forensic Biology Unit to retain trace material will it be sub-itemized using the letter 'S' designation with the corresponding sample number (ex. #1C-S1).
 4. Prepare the corresponding swabs to be forwarded to the DNA Unit for processing or retain according to steps 10 and 11 under section I (Negative Smears) below.
- H. Negative Smears
1. If no spermatozoa are identified, prior to testing, collect any hair-like fibers noted on the corresponding swabs in a paper fold and label with the Lab ID#, item #/letter and examiner's initials. Place the paper fold back into the corresponding swabs/smear envelope and return to the kit.

Note: Only if it is necessary for the Forensic Biology Unit to retain trace material will it be sub-itemized using the letter 'S' designation with the corresponding sample number (ex. #1C-S1).

2. Note appearance of swabs on worksheet.
3. Extract the corresponding swabs (vaginal, oral and anal) according to FB SOP-13 (Extraction of Samples) and/or test for amylase according to FB SOP-16 (Test for Amylase) as the case warrants. 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.
Extract half of a swab if there are only two (2) swabs available.
4. If the assault was vaginal or anal, extract the genital swabs according to FB SOP-13 (Extraction of Samples) and/or test for amylase according to FB SOP-16 (Test for Amylase) as the case warrants. 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.
Extract half of a swab if there are only two (2) swabs available.
5. Extract the dried secretion swabs according to FB SOP-13 (Extraction of Samples) and/or test for amylase according to FB SOP-16 (Test for Amylase) as the sample type and case warrants. 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.
Extract half of a swab if there are only two (2) swabs available.
6. Make a smear of the extract pellet, stain and search according to FB SOP-14 (Identification of Spermatozoa).
Note: If the corresponding hospital prepared smear was examined, this step may be skipped for the vaginal, oral and/or anal swabs at the examiner's discretion.
7. If no spermatozoa are identified, 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 breast milk is suspected, the ABACard p30 test should not be conducted but the sample may still be forwarded for DNA analysis at the discretion of the Forensic Biology Lead or Deputy Director.

8. Forward the appropriate samples to the DNA Unit for processing according to FB SOP-03.
 - 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 Ziploc 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.
 9. 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. Place the tubes or paper folds in a plastic Ziploc bag with the Lab ID# and examiner's initials.
 10. 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 Ziplocbag. This bag may be heat sealed and the seal initialed.
 11. Place the extract tubes/bag into an additional plastic Ziplock bag together with the other samples. Heat seal the additional bag and initial the seal. Store in the designated location of freezer storage.
 12. For 'CT 100' kits manufactured prior to January, 2011, search the second smear of each orifice (according to section F above) if case warrants.
- I. If there is no indication of contact to an orifice, then retain these samples without testing. Note 'NT' (not tested) on the SAECK Worksheet.

J. Trace/Hair-like fibers

1. Unless necessary, the Pubic Hair Combing, Debris Collection, Examination Sheet, and Known Head and Pubic Hair samples will not be examined.
2. If necessary, these items may be examined as follows and according to FB SOP-19 (Trace Evidence Collection/Hair-like Fiber Examination):
 - a. Examine pubic hair combings macroscopically for trace material. Record the contents on the worksheet. If hair-like fibers are present, retain in the inner paper fold or separate paper fold as needed. Label the inner paper fold or separate paper fold with the Lab ID#, item #/letter and examiner's initials. If the inner paper fold is retained, seal with tape and initial seal. If a separate paper fold is retained place in an appropriately labeled coin envelope.
 - b. Known head hair and known pubic hair samples are retained in the inner envelopes. Label the inner envelopes with the Lab ID#, item #/letter and examiner's initials. If necessary, seal the inner envelopes.
 - c. Examine the debris collection envelope macroscopically or microscopically under a stereoscope at a magnification of approximately 8-35X and retain any trace/debris in a paper fold. Label the paper fold with the Lab ID#, item #/letter and examiner's initials. Place into a coin envelope and label with the Lab ID#, item #/letter and examiner's initials.
 - d. If trace/hair envelopes, inner paper folds or coin envelopes are retained by the Forensic Biology Unit, store 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.
 - e. Hair-like fibers may be examined according to FB SOP-19 (Trace Evidence Collection/Hair-like Fiber Examination).

K. Fingernail Scrapings/Clippings

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

1. 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:

- a. Examine the contents for blood and tissue-like material.
 - i. This may be done macroscopically or microscopically under a stereoscope at a magnification of approximately 8-35X.
 - ii. If warranted, test for blood according to FB SOP-08 (Screening Tests for Blood).
 - b. Record the presence of fingernail fragments, wooden sticks and/or debris/trace.
 - c. Record the presence of blood-like stains and/or tissue-like material and test results.
 - d. Swab the entire contents of the fingernail scrapings/clippings with 1-2 swabs and forward for DNA analysis. Include the wooden stick ends, clippings, debris and interior paper fold.
 - e. If hair-like fibers are observed remove until the contents have been swabbed and then place back into the inner paper fold(s). Place the inner paper fold(s) back into the fingernail scraping/clipping envelope and return to the kit.
 - f. 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 Ziploc bag with other retained samples and store in freezer storage.
2. If the Fingernail scrapings/clippings are not examined, they will not be retained by the Forensic Biology Unit but will remain in the kit.
- L. For any items not examined, note 'NEATT' (not examined at this time) on the SAECK worksheet.
- M. Other: Underpants, tampon, pad etc.
1. Examine underpants or other evidence according to FB SOP-01 (Physical Evidence Examination).
 2. If an item of evidence is wet, dry under the hood prior to examination.
- N. Attach the photocopies to the worksheet in the following order:
1. Any appropriate worksheets for additional items examined
 2. Copy of medical report form
 3. Copy of front cover of kit
 4. Copies of any additional labels/seals

O. LIMS

1. Create the items that were retained (ex. #1A-S1) according to GL-4 (LIMS/Justice Trax) and section 2.5.5.
2. Transfer the created items to the appropriate LIMS storage locations.
3. 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.

P. Reports

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

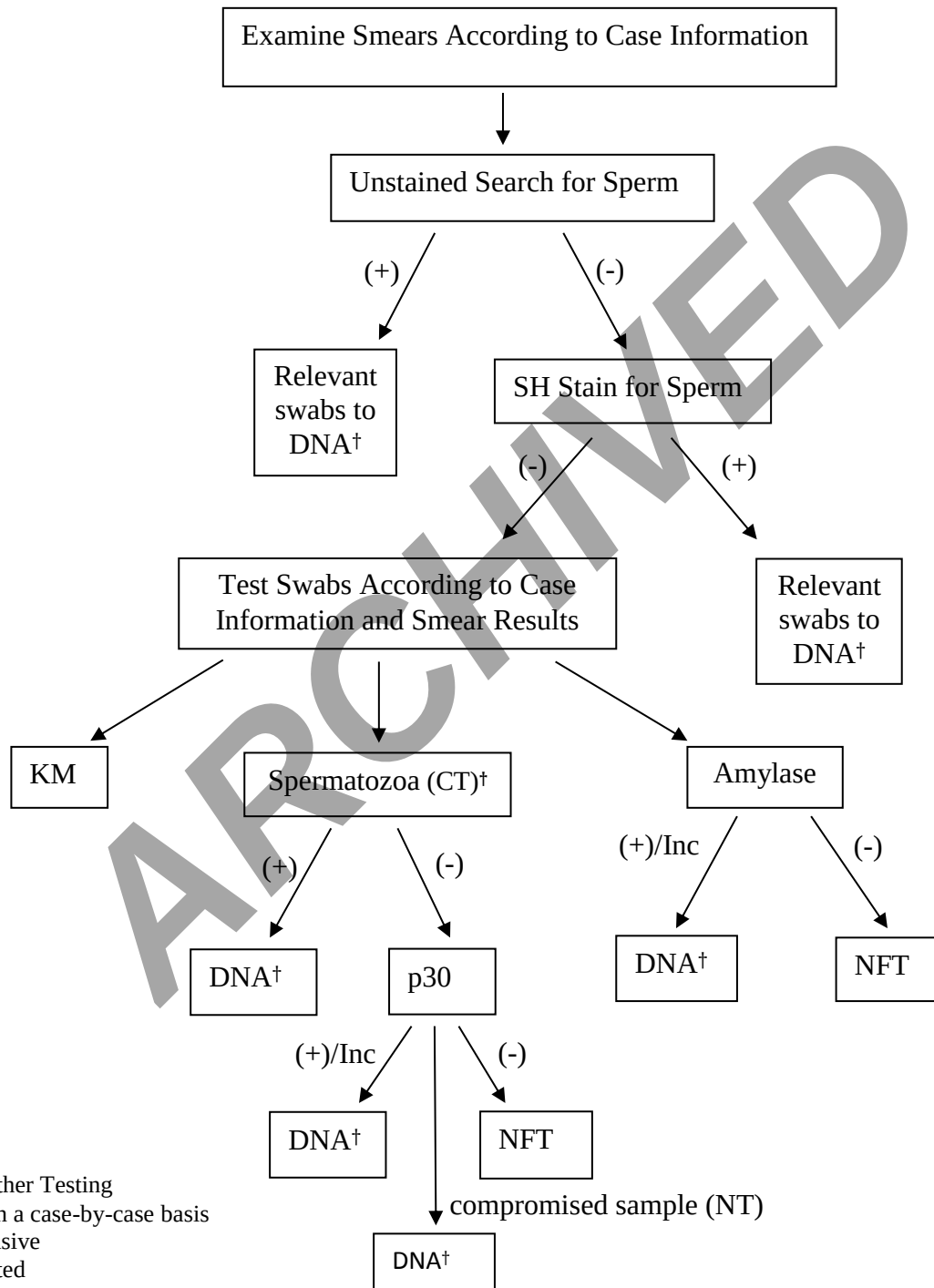
Q. Sexual Assault Evidence Collection Kits submitted to the DSS will be handled according to Public Act No. 15-207 (An Act Concerning Evidence in Sexual Assault Cases) and the procedure above.

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.

R. Flow Chart (General Pathways of SAECK Testing), see below.

R. Flow Chart (General Pathways of SAECK Testing)



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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