PHYSICAL EVIDENCE EXAMINATION

1.1 PURPOSE

1.1.1: To examine physical evidence for the presence of blood, semen, saliva, touch/wearer DNA, trace material and/or other body fluids.

1.1.2: To collect and preserve samples for further analysis.

1.2 RESPONSIBILITY

Personnel qualified to perform Forensic Biology duties.

1.3 SAFETY

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

1.4 DEFINITIONS

A. LIMS: Laboratory Information Management System

B. PPE: Personal Protective Equipment

C. QRW(s): Quality Record Worksheet(s) (Appendix 1)

1.5 PROCEDURE

Physical evidence 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.

1.5.1 Cleaning Utensils and Laboratory Area

A. Clean utensils and bench top supplies during use as needed and between each case and case submission. 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_2O may be used between the disinfecting solution and ethanol.

B. Containers used to clean/soak utensils in disinfecting solution, dH_2O and ethanol, are replaced weekly. The disinfecting solution, dH_2O and ethanol are replaced daily or more often, as necessary.

C. Clean camera and other electronic equipment during use as needed and between each case 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 case or more often, as necessary, to ensure aseptic conditions.

1.5.2 Personal Protective Equipment

A. Examiners must wear lab coats, masks, gloves, disposable sleeves and hair nets while examining evidence.

B. When conducting microscope work for Sperm Hy-Liter the examiner must wear a lab coat and gloves.

C. Examiners will wear protective eyewear when it is indicated to do so.

1.5.3 Case Assignments and Evidence Retrieval

A. Case Assignments

1. Generally, examiners will be notified of case assignments by a Forensic Biology Lead, Case Management, an Assistant Director or through the LIMS computer system according to GL-4 (LIMS).
2. When necessary, an examiner may self-assign casework. However, a Unit Lead and/or Assistant Director should be notified.

B. Evidence Retrieval

Examiners will retrieve evidence from a secure storage location, Evidence Receiving or other examiners through a secure transfer within the LIMS computer system according to GL-4 (LIMS).

1.5.4 Evidence Examination

All examinations are conducted macroscopically. Other types of examinations (i.e. microscopic or stereoscopic) will be recorded (along with the microscope(s)/stereoscope(s) used) on the appropriate QRW(s) and specified in reports. See FB SOP-05 (Case Records and Reports).

Depending on the evidence type and amount of time necessary for examination, it is part of the normal process for some items being examined in Forensic Biology to remain on an examiner's workbench during the day. Therefore, it is not necessary for permission to be granted each time as long as the evidence is maintained according to GL-13 (General Evidence Handling).

Sterile swabs will be used for the collection of samples and any testing that requires swabbing of the evidence (see section 1.5.4.E).

For information related to the examination of Sexual Assault Evidence Collection Kits, see FB SOP-02 (Sexual Assault Evidence Collection Kit Examination).

A. Document the label information on the submission packaging and the label information, if present, on the physical evidence. This may include written and/or photographic documentation. Record on the appropriate QRW(s). For evidence submitted as swabs, include the location (in quotes) that the swabs were collected from, if available.

B. Mark the package and evidence with the examiner's initials when possible. If there is a Latent Print request, the evidence may not be initialed until after the Latent Print examination has been completed.

C. When possible, leave the submitting agency seal intact when opening the package.

D. Record information on the appropriate QRW(s) using blue ink. When necessary, other colors of ink may be used.

1. Recorded information (i.e. documentation) should include but is not limited to:
   a. evidence description
   b. examination and test results
   c. description/disposition of sample(s) collected/sub-itemized and preserved for future testing
   d. evidence disposition
   e. examiner's initials on each page

2. All documentation will be dated. If completed on the same day, the date on each page of the worksheet is sufficient. If additional examination and/or testing is conducted on a subsequent day, then it will be dated and initialed on the worksheet accordingly.

   In general, pages with photographs are not dated since the QRW in use will have a reference to the attached images.

3. Attach sketches, photocopies and/or photographs to the worksheet(s) as necessary.

a. It should be noted that additional photographs may be taken but not be printed. These photographs will be made available for Discovery Requests.

b. Record on the worksheet when photographs taken are not included in the case jacket.

4. Notes recorded on photographs of evidence should include:
   a. Screening test results for blood and semen (may include evidence swabs collected by the Submitting Agency).

   b. 'NT' (not tested), as necessary, when additional biological-type stains are observed but not tested.

   c. Location(s) on evidence from which samples are collected or removed for direct testing/extraction.

5. Notes that are not necessary to record on photographs but should be recorded elsewhere on the worksheet include:

   a. 'NFT' (No further testing)

   b. Swabbings of areas collected by the analyst for touch/wearer DNA are generally not photographed. If a screening test for blood is conducted on these swabbings it is not necessary to record the result on the photograph of evidence depicting the location of the collection.

6. If needed, more information can be found in the metadata of the digital image of each photograph.

E. The lot #s of all reagents (including sterile swabs) used during examination are recorded on the appropriate QRW(s) and/or the General Reagent Sheet (FB QR-09) located in Appendix 1.

1. Additions made subsequent to the date on the General Reagent Sheet (FBQR-09) will be dated and initialed.

2. An electronic reference will be maintained for tracking these reagents.

F. If the submission contains more than one (1) piece of evidence, sequential item numbers shall be designated for each item, as necessary according to GL-4 (LIMS).

G. Evidence that is received wet should be removed from the package and air dried (in a hood whenever possible). Once dry, the evidence may be examined or re-packaged and sealed until future examination.

H. When examining evidence with a controlled substance request and a potential controlled substance is known to be present in a quantity greater than a residue:

1. A second examiner must witness the package being opened, verify the contents and date and initial the appropriate QRW(s).

2. The contents must again be verified by a second examiner when it is re-packaged and sealed. The second examiner must initial the seal and again date and initial the appropriate QRW(s).

3. If a potential controlled substance of any quantity is unexpectedly observed during the examination of any evidence, at any time, the Controlled Substance Unit must be notified immediately.

I. If there is a Gun Shot Residue (GSR) request, the Chemistry Unit will be notified prior to the FB examination and examination efforts will be coordinated.

1. It will be the responsibility of the Chemistry Unit to collect the appropriate samples. Such sample collection will be conducted by appropriately-trained analysts, according to the needs of the Chemistry Unit, and according to relevant procedures within that unit.

2. The sample collection of evidence by the Chemistry Unit (or other unit, as appropriate) may occur during the same time as Forensic Biology examination. If the evidence is being simultaneously examined in the FB Unit:

   a. The examiner from the Chemistry Unit will temporarily transfer the evidence into their custody in LIMS while in the presence of the FB examiner.

   b. The chemistry analyst will collect and sub-itemize the sample(s) and then transfer the evidence back into the custody of the FB examiner.

J. For biological screening of hair-like fibers (when necessary) please refer to FB SOP-19 (Trace Evidence Collection/Hair-like Fiber Examination). See section 2.5.6 for additional information.

K. Sample selection is conducted considering the substrate and the type/amount of sample present. Sample selection details will be included on the appropriate QRW(s). These details will not be included with the results stated in the report.

L. Samples for touch/wearer DNA analysis may be collected based on the submitting agency requests, case information and type of evidence, according to FB SOP-03 (Guidelines for Collecting and Forwarding Samples for DNA Analysis).

Document the number of swabs used to collect each sample on the appropriate QRW(s).

M. Use an alternate light source to locate stains, if necessary, and mark the location on the evidence. Record the alternate light source used on the appropriate QRW(s).

N. Perform serological tests according to the applicable FB SOP-08 through FB SOP-18 (Forensic Biology Serological Tests) and flow charts in section 1.7 below.

1. Multiple swabs collected from the same area and submitted as one item will be considered one sample. Items submitted for blood/body fluid testing will be tested accordingly (i.e. a portion of each swab will be combined and tested as one sample).

   a. If all swabs in an item appear reddish-brown stained, it is only necessary to test a portion of one (1) swab per item.

   b. See FB SOP-02 (Sexual Assault Evidence Collection Kit Examination) and FB SOP-03 (Guidelines for Collecting and Forwarding Samples for DNA Analysis) for additional information.

2. For cases requested to be expedited when body fluid testing is warranted, 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.

O. Collect blood and/or body fluid samples from the evidence based on the submitting agency requests, case information, type of evidence/stain(s) and number, size and quantity of stain(s), according to FB SOP-03 (Guidelines for Collecting and Forwarding Samples for DNA Analysis).

Document the following on the appropriate QRW(s):

1. If a swabbing was collected:
   a. Document the number of swabs used to collect each sample.
   b. Document the number of swabs retained and/or forwarded for DNA analysis.

2. If a cutting was collected, it is not necessary to specify on the QRW. See step S below for additional information.

P. Mark the evidence, sketches, photocopies and/or photographs with the location where the samples were collected.

1. When necessary, indicate the size of the stain/sample collected and forwarded to DNA on the appropriate QRW(s) and/or the sketches, photocopies, or photographs.

   Stain(s) or sample(s) may be photographed with a well-placed scale to indicate the size collected and/or forwarded to DNA.

2. If there is a Latent Print request, the evidence may not be marked until after the Latent Print examination has been completed. It is not necessary to mark the evidence for collected touch or wearer sample locations.

Q. Designate/sub-itemize the samples collected on the appropriate QRW(s) according to GL-4 (LIMS).

R. When examination of each evidentiary item is complete, examiners will account for all samples collected from each item prior to returning the item to its packaging and prior to discarding the bench paper used during examination. Document that the samples have been accounted for on the appropriate QRW(s).

S. Once accounted for, these samples will immediately be placed into a secure location at the proper temperature and sub-itemized in LIMS according to GL-4 (LIMS) and GL 13 (General Evidence Handling).

1. For evidence submitted as swabs, include the location (in quotes) from which the swabs were collected.

2. Note in LIMS whether the collected sample is a swab(s), i.e. submitted as such, a swabbing or cutting.
   a. "Swab" or "Swabbing" will be indicated in the sub-item description.
   b. "Cutting" will be recorded under LIMS notes.
   c. It is not necessary to record the number of swabs or size of the cutting in LIMS.

3. Samples remaining in the custody of the examiner (i.e. during testing or for temporary storage in the examiner's evidence locker) do not require immediate transfer in LIMS.

4. Samples placed into other temporary storage for a period extending beyond their normal workday (i.e. overnight or longer) must be transferred in LIMS immediately following sub-itemization according to GL 13 (General Evidence Handling).

5. See verification step U below for samples transferred to their final storage location(s).

T. The evidence will be placed back into the original packaging. If the original packaging is not suitable for re-packaging, do not discard. Place with evidence in new packaging. The packaging (original or new) will be sealed and the seal initialed before transferring to designated storage location or returning to the Evidence Receiving Unit.

U. All samples collected and retained and/or forwarded to DNA (or other unit as necessary) will be verified for correct labeling and contents (i.e. swab vs cutting) by a second analyst (however titled) prior to being transferred to their final storage location.

1. The previously created sub-item(s) will be transferred in LIMS to the appropriate storage location(s). The LIMS transfer sheet(s) will be printed.

2. The second analyst will review the samples collected/retained/forwarded and verify that the labeling and contents (i.e. swab vs cutting) agrees with the LIMS information.

   a. If in agreement, the second analyst will initial and date the LIMS transfer sheet.

   b. If the second analyst discovers a discrepancy, the appropriate corrections will be performed by the examiner.

   c. The Unit lead will be informed, the root cause will be determined and corrected. Further appropriate action may be taken by the Unit Lead.

3. The initialed and dated transfer sheet(s) (or copy) will be retained in the appropriate case jacket(s).

4. Trace material being retained will be verified according to section 19.7 (Verification and Retention of Trace samples) in FB SOP-19 (Trace Evidence Collection/Hair-like Fiber Examination).

5. Once verified, the samples will be physically transferred to the designated, secure and temperature appropriate storage locations corresponding to the transfer in LIMS.

V. Semen extracts will be retained and preserved for future testing as follows:

1. Remove the extracted substrate (i.e. cutting/portions of swabs) from the basket and return to the extract tube. Discard the basket.

2. Seal the tube(s) with parafilm and place in a small plastic bag. This bag may be heat sealed and the seal initialed.

3. Extracts retained will be uniquely identified with the Lab ID # and designated sub-item # utilizing LIMS for secure tracking.

   Extracts from collected stains should be created off of the stain, not the item.

4. If no extract remains, the extracted substrate (i.e. cuttings/portions of swabs) will be discarded without sub-itemization.

5. The disposition of retained extracts will be reported out. See FB SOP-05 (Case Records and Reports).

W. Forward the appropriate samples to the DNA Unit according to FB SOP-03 (Guidelines for Collecting and Forwarding Samples for DNA Analysis). Create the appropriate DNA request(s) using the LIMS computer system according to GL-4 (LIMS).

X. A secure and password protected LIMS computer system is used in accordance with GL-5 (Ethics) for the secure tracking of all evidence and samples.

Y. The transfer of samples from laboratory cases which were opened prior to 1998 and not in the LIMS system will be recorded on the Evidence Transfer Sheet (FBQR-11) located in Appendix 1 when necessary.

Z. Reports will be generated according to FB SOP-05 (Case Records and Reports).

AA. The Chemical/Reagent Log Sheets and Equipment Log Sheets are located in Appendix 2. The Forensic Biology Inventory, Consumable Product Inventory and Equipment Inventory are located in Appendix 3.

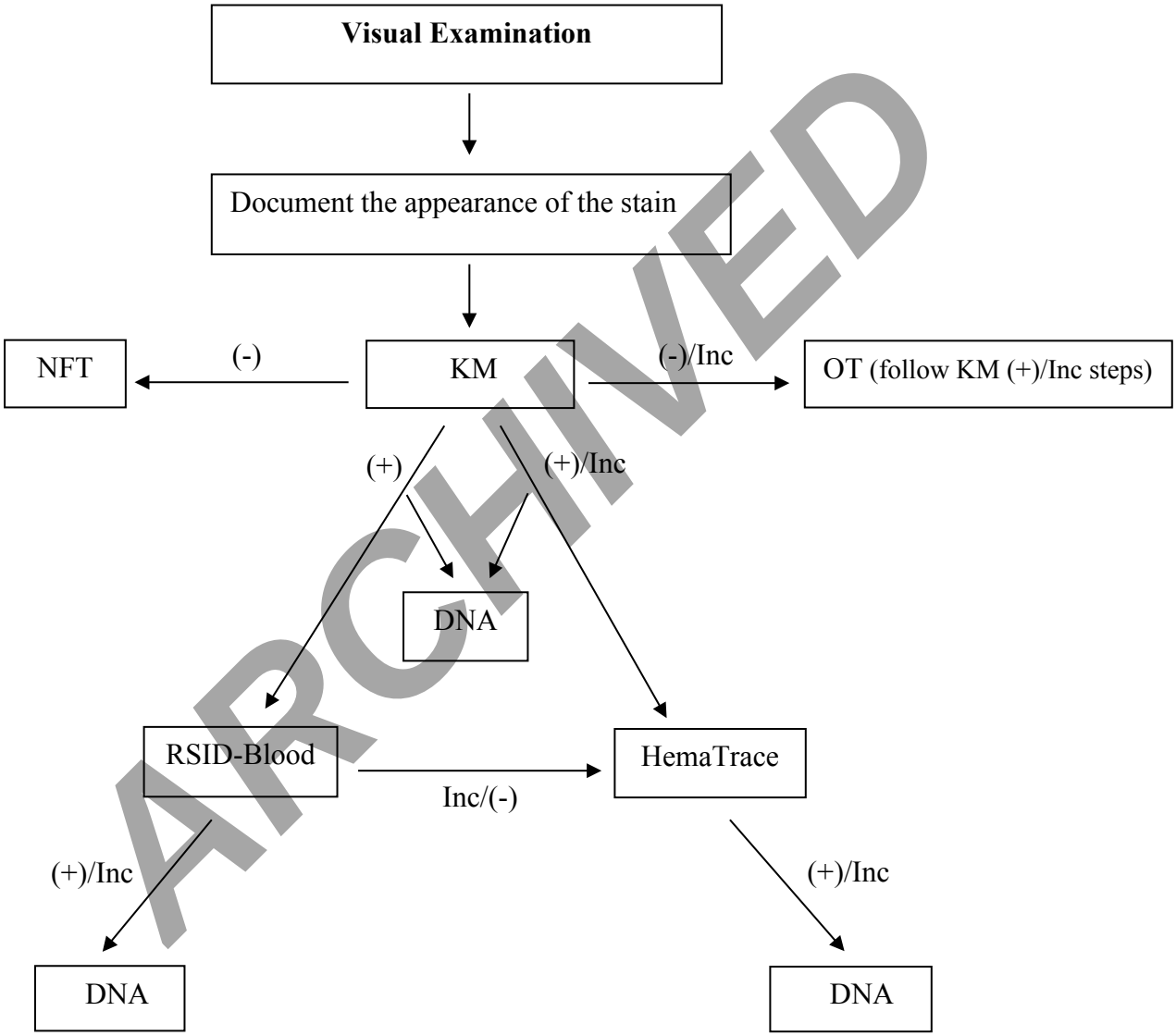
1.6 REFERENCES

A. GL-2 (Safety Manual)
B. GL-4 (LIMS)
C. GL-5 (Ethics)
D. GL-13 (General Evidence Handling)
E. FLIN SOP-07 (SEM sample collection on clothing for GSR analysis)

NOTE: As revisions have been made regarding the order and sequence of the current SOP's, please refer to archived SOP's for all previously used versions.

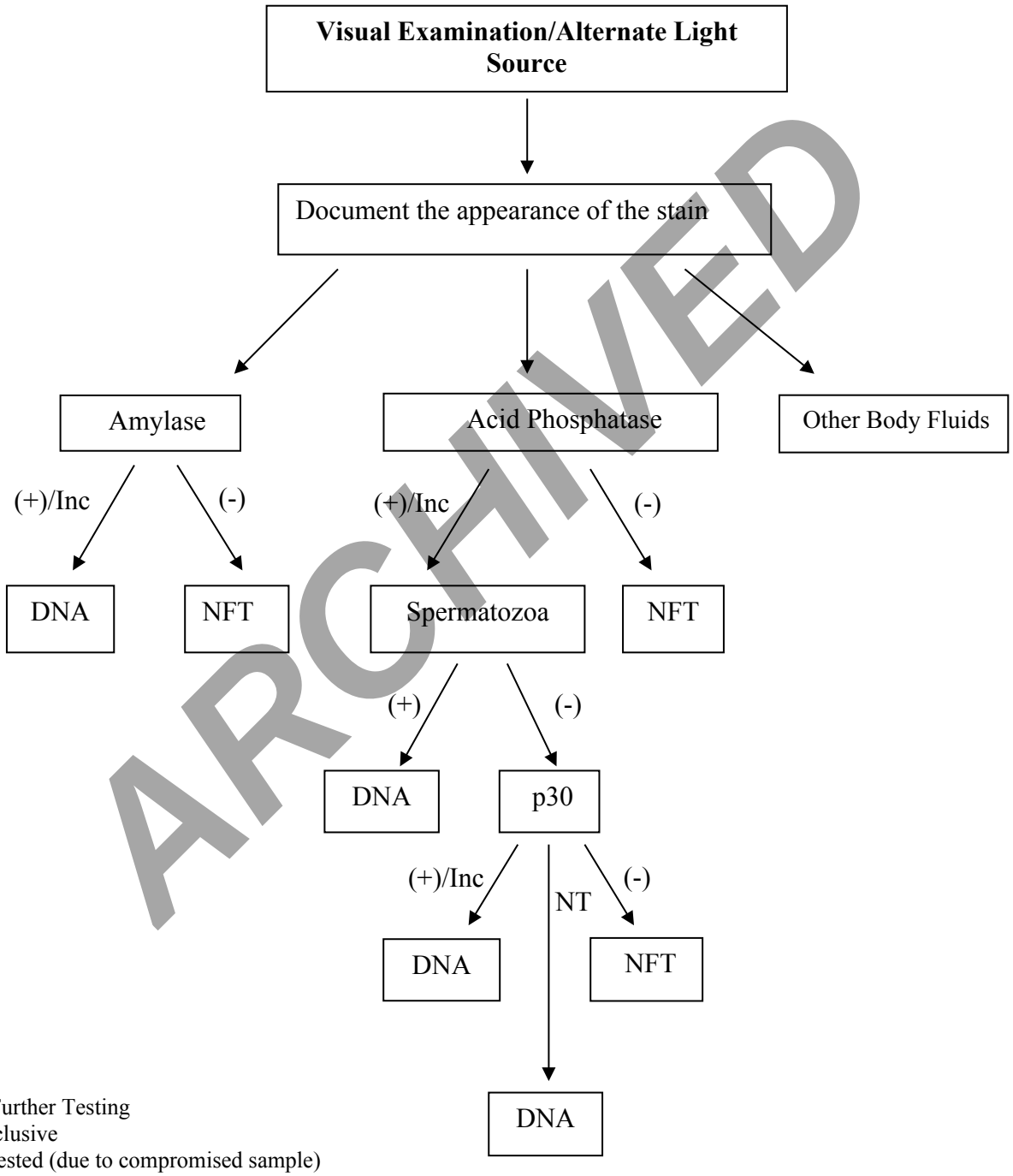
1.7 FLOW CHARTS (General Pathways of Serological Testing)

1.7.1 Bloodstain Analysis (steps during analysis may be evaluated on a case-by-case basis)



NFT = No Further Testing
Inc=Inconclusive
KM=Kastle Meyer
OT=o-Tolidine

1.7.2 Body Fluid Stain Analysis (steps during analysis may be evaluated on a case-by-case basis)



NFT=No Further Testing
Inc=Inconclusive
NT=Not Tested (due to compromised sample)