

Alaska Scientific Crime Detection Laboratory
Forensic Biology Administrative Manual

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Section 1 Definitions:

- **Error:** an action or event that leads to an inaccurate result, conclusion or opinion released by the laboratory. Errors will be addressed and documented in a Quality Review Form (QRF), which may lead to corrective action if deemed appropriate through the review process.
- **Questioned (or Q) sample:** evidence collected from an alleged crime scene, for which the source(s) of any DNA present on the evidence may be unknown.
- **Known (or K) sample:** a reference sample collected directly from an identified individual, typically collected as a buccal swab or drawn blood.
- **Reported:** alleles whose peak heights are equal to or above the stochastic threshold and are generally reproducible when re-amplified. Such alleles are routinely used in making comparisons between known and questioned sample genetic profiles under the interpretation guidelines stated in this manual.
- **Observed:** data (peaks) below the stochastic threshold and/or alleles whose peak heights are greater than the analytical threshold, but that are not reproducible in replicate amplifications of the same DNA extract. Such alleles are not routinely included in the STR results table. Observed alleles may be considered for use when reporting the presence of multiple sources of DNA in a sample and/or when reporting the presence of male DNA. On occasion, depending on the quality of the data and the nature of the sample, such alleles may be used to generate a composite profile, with the documented approval of the DNA Technical Manager.
- **Work product:** a material that is generated as a function of analysis, which may include extracts, spermatozoa search slides/extract slides, and amplified products. Extracts become evidence if the original sample is consumed.

Section 2 Retention Policies

2.1 Sample Control

- 2.1.1 If the results of a microscopic slide examination are included in a report, the slide will be packaged with the original evidence and retained.
- 2.1.2 Provided that a sufficient quantity of the original item of evidence remains for possible retesting, work products are discarded after the relevant report has been issued.
- 2.1.3 If an entire item of evidence (e.g. penile swabs, fingernail scrapings, contact DNA swabs, etc.) is used for DNA extraction owing to potentially limited amounts of biological material, then at least half of the DNA extracted from that item will be retained as an item of evidence.
- 2.1.4 In situations where the entire item of evidence has been used for DNA extraction and when quantitation results suggest that the entire volume of the DNA extract will be required for PCR amplification in order to attempt to obtain interpretable data, the laboratory shall require written permission from the Department of Law to consume the entire extract. However, in unknown suspect cases, the entire sample maybe consumed in analysis without prior Department of Law notification and/or approval.
- 2.1.5 Database samples are considered as reference material and not treated as evidence.

2.2 Electronic data

- 2.2.1 Electronic data from quantitation is not retained.
- 2.2.2 All raw data files generated in the course of electrophoretic analysis shall be retained and archived on the lab network.
- 2.2.3 Because discipline manuals contains sufficient information to recreate the GeneMapper ID-X project from the raw data files, GeneMapper ID-X project files are not retained long term and may be deleted after the technical and administrative reviews of a batch are completed.

Section 3 Contamination Policy

- 3.1 Contamination is the unintentional introduction of exogenous DNA into a DNA sample or PCR reaction.
- 3.1.1 Contamination may be introduced via reagents, in which case all samples containing that reagent are potentially affected. In such cases, the source of the contaminating DNA may or may not be attributable to an identified source.
- 3.1.2 Contamination may be introduced by an inadvertent action during evidence handling or processing (e.g. sample collection, pipetting, physical contact with sample, etc.). The number of potentially affected samples is incident specific. In such cases, the source of the contaminating DNA is more likely to be identifiable, either as an analyst directly or indirectly handling the evidence, or as another source of DNA handled concurrently during batch processing.
- 3.1.3 Contamination may be introduced by consumables and/or sample-handling equipment. The scope of contamination in such incidents may be confined to a single sample or may affect multiple samples, depending on the contaminating event. In such events, the source of the contaminating DNA may not be possible to identify.
- 3.2 Decontamination/Prevention: Precautions used to minimize incidence of contamination are described in relevant sections of the FBCP manuals.
- 3.3 Detecting contamination: When contamination is detected, the analyst will initiate a Quality Review Form (QRF) as described in the Laboratory QAM. In addition to root cause analysis and possible corrective actions, the quality review process will include input from the DNA technical manager regarding the impact of the contamination on data interpretation and possible future course of action. QRF documentation will be included in case files of all impacted cases.
- 3.3.1 Contamination via reagents: Potential contamination introduced via reagents is detected through the use of reagent blanks and negative amplification controls. The use and interpretation of these controls are discussed in the relevant sections of the FBCP manuals.
- 3.3.2 Contamination via evidence or sample handling: The process of data analysis of positive controls and casework samples includes examination of low-level alleles. Low-level amounts of DNA are of particular concern when they cannot be accounted for by the case scenario or type of evidence. When sufficient information is available to make comparisons, as described in the data interpretation section, comparisons should be made among samples analyzed concurrently.

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- In addition, comparisons to the profiles of analysts who handled evidence may be appropriate in identifying low-level contamination
- 3.3.3 Contamination via consumables and/or sample handling equipment:
As described above, the process of data analysis of positive controls and casework samples includes examination of low-level alleles. When the source of the potential contamination cannot be attributed to a known source (i.e. an analyst or concurrently analyzed sample), and when the pattern of potential contamination is not consistent with a handling error, the analyst must consider the possibility of contamination of either consumables or sample handling equipment.
 - 3.4 Interpreting data: Each incident of contamination must be considered individually with respect to its nature and extent. However, a few general guidelines apply.
 - 3.4.1 Data definitively attributed to contamination which appears in casework samples must be documented as such in the applicable case file(s).
 - 3.4.2 In instances when low-level contamination can be treated as a minor contributor, the major component is suitable for comparison.
 - 3.4.3 If the source of contamination can be identified, it may be possible to use its known profile to deduce a profile that is suitable for comparisons.
 - 3.4.4 If contamination renders a casework sample unsuitable for comparison, this will be stated in the case report.
 - 3.5 Monitoring contamination
 - 3.5.1 It is the responsibility of the individual analyst to initiate the QRF process when specific incidents of contamination are encountered.
 - 3.5.2 It is the responsibility of the DNA Technical Manager to evaluate all QRFs with respect to spotting larger trends and opportunities for discipline-wide improvements.

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Section 4 Forensic Biology Discipline Locker Key Policy

- 4.1 Evidence lockers in the Forensic Biology discipline are self-assigned. An analyst may choose any locker(s) for storing evidence. When lockers are not in use, keys are stored in the locks.
- 4.2 A master set of locker keys is stored in the discipline supervisor's office. These may only be used with permission from the discipline supervisor or designated individual.
- 4.3 If one of the locker keys is lost, the discipline supervisor shall be notified.

Section 5 Forensic Biology Literature Review Policy

- 5.1 Any member of the Forensic Biology discipline may put forward an article of scientific literature for members of the discipline to read, as appropriate to their areas of competency.
- 5.2 A spreadsheet is maintained on the lab network which tracks scientific literature put forward to the Forensic Biology discipline.
- 5.3 Analysts document their readings in the LIMS.
- 5.4 Literature review documentation is monitored annually by the DNA Technical Manager.

Section 6 Extended Absence Policy

When an analyst is away from the laboratory for an extended period of time (three months or longer), he/she will be required to successfully complete an internal competency test before resuming casework analysis. The scope of the competency test and authorization to resume casework are the responsibility of the DNA Technical Manager and/or the discipline supervisor.

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Section 7 Forensic Biology Case Report Close-Out

7.1 Once a forensic biology report has been completed, the following administrative tasks must be completed:

- Bench notes and checklist retained in LIMS in case file
- CODIS Specimen Detail Report retained in LIMS in case file (if applicable)
- DNA Central Log file retained in LIMS in case file (if applicable)
- DNA Central Log file retained in LIMS in annual DNA case file in LIMS (if applicable)
- Evidence discipline contacted to return evidence (if applicable)
- Report sent to submitting agency (and prosecutor if required)
- Release of report documented in LIMS
- Electronic data retained on lab network

7.2 These tasks may be completed by the analyst or an administrative designee.

7.3 It is the responsibility of the analyst to confirm that all of the above tasks have been completed correctly.

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Section 8 Annual Forensic Biology Quality Review

- 8.1 An annual review of the quality system in the Forensic Biology discipline will occur concurrently with the lab wide annual quality system review.
- 8.2 The quality review of the Forensic Biology discipline will be approved by the DNA Technical Manager.
- 8.3 At a minimum, the quality review of the Forensic Biology discipline will include the following:
 - Audit (internal and/or external) of the Forensic Biology discipline
 - Inventory of long-term biological evidence storage
 - Collection of feedback from discipline members regarding improvements to discipline manuals
 - Review and updates to manuals
 - Review of all verifications, validations and performance checks. Follow-up as required.
 - Conduct an overview of all Forensic Biology CARs and QRFs for the preceding year
 - Assessment of discipline-wide adherence to literature review policy
 - "Roadmap" Forensic Biology discipline manuals and documentation against the FBI QAS document.
- 8.4 Documentation of the Forensic Biology quality system annual review will be by memo to the lab QA Manager.

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Section 9 Continuing Education Records

All DNA personnel (except for technicians) annually receive a minimum of 8 cumulative hours of continuing education, in accordance with the FBI QAS requirements.

Continuing education is documented in the analysts training record in LIMS. The record is reviewed and approved by the discipline supervisor and the DNA technical manager. The following information is required in the record:

- Course title
- Documentation of attendance (may include certificates, agenda/syllabus, etc.). Shall include an attendance list for internal training
- Training date(s) number of continuing education hours
- Evaluation of course (content, instruction, relevance, etc.)

Additionally, the following is required for continuing education provided by lab personnel:

- A record of the presentation
- The curriculum vitae of the presenter

Programs based on multimedia or internet delivery require written documentation of approval by the DNA technical manager.

Documentation required specifically for internal and/or multimedia education is retained in the Forensic Biology discipline share.

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Section 10 Contingency Plan for DNA Technical Manager

Pursuant to the FBI QAS, the laboratory must have a documented contingency plan if the technical manager position is vacated. The plan will be as follows:

- If a current staff member is qualified to serve as DNA Technical Manager, that individual will be appointed as an interim technical manager.
 - If the laboratory has more than one qualified individual, the discipline supervisor will coordinate with top management to appoint an interim technical manager. This individual will serve until a permanent replacement is hired.
 - The laboratory may continue to do work and issue reports under this scenario.
- If no current staff members are qualified to serve as the DNA technical manager, the DNA Technical Leader from another laboratory will be hired to serve in an interim capacity until a suitable replacement can be found.
 - The laboratory may not begin new casework until an interim technical manager is in place.

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Appendix A Revision History

Sections of this manual were taken from the current versions of DNAQAM 2012 R1 and 3500 CW 2013 R0. No substantive changes were made to those sections. Other sections are newly created and have no revision history.

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