

Procedure for Casework Report Writing

1.0 Purpose – The purpose of this document is to provide casework report writing guidelines for autosomal DNA results when using the Identifiler® Plus amplification kit.

2.0 Scope – This document applies to casework analysts and trainees in the Forensic Biology Section who are qualified to use the Identifiler® Plus amplification kit.

3.0 Definitions

- **Combined Probability of Exclusion (CPE):** The probability that a randomly chosen, unrelated person from a given population would be excluded as a potential contributor to the observed DNA mixture.
- **Combined Probability of Inclusion (CPI):** The probability that a randomly chosen, unrelated person from a given population would be included as a potential contributor to the observed DNA mixture.
- **Intimate Sample:** A biological sample from an evidence item that is obtained directly from an individual's body; it is not unexpected to detect that individual's allele(s) in the DNA typing results.
- **Random Match Probability (RMP):** The chance that a randomly selected unrelated individual from a population will have an identical STR profile to that obtained from a forensic sample.
- **Reference Standard/Sample:** Biological material for which the identity of the donor is established and used for comparison purposes; also referred to as a known standard. These include victim, suspect, elimination and/or witness standards.

4.0 Equipment, Materials and Reagents – N/A

5.0 Procedure

5.1 Introduction - General reporting guidelines are provided throughout this procedure, and *most* reporting scenarios will fall within the provisions of this procedure. However, unique case circumstances may warrant the use of reporting language beyond those provided herein.

Wording used in reports may be modified with documented approval from the DNA Technical Leader. Approval shall be documented in writing. Forensic Scientists shall provide the DNA Technical Leader with the requested wording. The DNA Technical Leader shall then reply in writing with an approval or denial of the request. This correspondence shall be placed in the FA Case Record Object Repository.

The results statements shall reflect only work that is performed. Portions of the statements listed in the reporting guidelines may be omitted if not reflective of testing actually performed.

All inclusionary statements when compared to a reference sample shall be accompanied by the appropriate statistic (i.e., RMP or CPI/CPE). An exception to this requirement is when an

assumed contributor is present in an intimate item (i.e., victim on a vaginal swab) or there is a written request from the investigating agency or the District Attorney's office.

Forensic Scientists shall refer to and print a copy of the U.S. Census Bureau World Population Clock (<http://www.census.gov/main/www/popclock.html>) only when RMP is calculated on a partial profile(s).

5.2 General Principles

- 5.2.1** If a profile is determined to be partial (whether a single source, mixture, predominant profile, evidentiary or reference), the word partial shall be used to qualify the result. NOTE: comparisons between partial reference profiles and evidentiary profiles can be made only for the loci at which results exist in the partial reference profile.
- 5.2.2** If a differential extraction is performed, non-sperm and sperm fractions shall be used to qualify the results and both fractions shall be reported.
- 5.2.3** If a single source or single predominant profile (unknown) profile is obtained and a Y is present at Amelogenin, such profiles shall be qualified as male in the report.
- 5.2.4** If a Y is present at Amelogenin in a mixture and no inclusionary statement to a male reference standard has been made, the overall mixture shall be qualified as having a male contributor: *This mixture contains at least one male contributor.*
- 5.2.5** If multiple unknown profiles are present within a case, they may be qualified numerically. For example: first unknown (male), second unknown (male), etc.
- 5.2.6** For cases where evidence was analyzed prior to January 3, 2013 and a request is made to make additional comparisons, the following statement shall be added to the report: "On January 3, 2013, the North Carolina State Crime Laboratory implemented new technologies for the analysis of DNA evidence in the Forensic Biology Section. Due to these changes in technology, comparisons to evidence analyzed after this date can be made only for those DNA profiles generated from the items listed below. For further information, please do not hesitate to contact the Forensic Scientist or the Forensic Scientist Manager of the Forensic Biology Section at 919-662-4500."

5.3 Single Source Profiles

- 5.3.1** Matches and Non-matches: A DNA profile was obtained from _____ (Item__) that **MATCHES** the DNA profile obtained from _____ (Item__) and **DOES NOT MATCH** the DNA profile(s) obtained from _____ (Item(s)___).
- 5.3.2** An assumed contributor (i.e., victim or elimination reference standard profile) matches an intimate item: *The DNA profile obtained from the _____ (Item__) is no different from*

*that of the victim/subject (Item___) and **DOES NOT MATCH** the DNA profile obtained from _____ (Item___).*

- 5.3.3** Matches and Consistent With: if all four population groups exceed the world's population (refer to the PopClock) at the time the statistics are generated, the word **MATCHES** shall be used. If one or more population groups are less than the world population at the time the statistics are generated, the phrase **IS CONSISTENT WITH** shall be used.

Note: If the phrase **IS CONSISTENT WITH** is used, add the following statement: *(The term is consistent with means that the result of the population data statistics did not exceed the world's population; therefore, the term match was not used).*

5.4 Mixtures

Note: if the number of contributors can be determined, a statement indicating such shall be added to the result statement(s): "...is **CONSISTENT WITH A MIXTURE** of at least (#) contributors." If a determination of the number of contributors cannot be made, see **5.5**.

5.4.1 Mixtures with a Single Predominant Profile

5.4.1.1 Match to Known Reference Sample(s): *The DNA profile obtained from _____ (Item___) is **CONSISTENT WITH A MIXTURE** of (# of contributors). The predominant profile **MATCHES** the DNA profile obtained from _____ (Item___).*

5.4.1.2 Non-match to Known Reference Sample(s) (i.e., unknown profile): *The DNA profile obtained from _____ (Item___) is **CONSISTENT WITH A MIXTURE** of (# of contributors). The predominant DNA profile **DOES NOT MATCH** the DNA profile(s) obtained from _____ (Item(s) __) and is from an unknown individual.*

5.4.1.3 Contribution to Overall Mixture (for 2 or 3 contributor mixtures):

5.4.1.3.1 Cannot exclude from the mixture: *The DNA profile(s) obtained from _____ (Item(s)___) cannot be excluded as a contributor/as contributors to the mixture.*

5.4.1.3.2 Excluded from the mixture (including the predominant profile): *The DNA profile(s) obtained from _____ (Item_) is/are excluded as a contributor/as contributors to the mixture.*

5.4.1.4 Contribution to Overall Mixture (for mixtures of more than 3 contributors):
see Section **5.5**.

5.4.2 Mixtures with Multiple Major Profile:

5.4.2.1 Primary statement: *The DNA profile obtained from ____ (Item__) is CONSISTENT WITH A MIXTURE of (two or three) contributors/of at least four contributors which contains a multiple major profile.*

5.4.2.2 Cannot exclude from the multiple major profile: *The DNA profile(s) obtained from ____ (Item_) cannot be excluded as a contributor/as contributors to the multiple major profile of this mixture.*

5.4.2.3 Excluded from the multiple major profile but not excluded from the minor component: *The DNA profile from ____ (Item__) is excluded as a contributor to the multiple major profile of the mixture. However, the DNA profile from ____ (Item __) cannot be excluded as a contributor to the minor component of the mixture.*

5.4.2.4 Excluded from the overall mixture: *The DNA profile(s) from ____ (Item __) is/are excluded as a contributor/contributors to the mixture.*

5.4.3 Mixtures with No Predominance (Indistinguishable Mixture):

5.4.3.1 Primary statement: *The DNA profile obtained from ____ (Item__) is CONSISTENT WITH A MIXTURE of (# of contributors).*

5.4.3.2 Cannot exclude from mixture: *The DNA profile(s) obtained from ____ (Item__) cannot be excluded as a contributor to/as contributors to the mixture.*

5.4.3.3 Excluded from the mixture: *The DNA profile(s) obtained from ____ (Item__) is/are excluded as a contributor to/are excluded as contributors to the mixture.*

5.5 Un-interpretable Profiles

5.5.1 The following statement shall be used when the overall DNA profile is insufficient for comparison purposes. This statement shall also be used when results are only obtained at Amelogenin: *No interpretable DNA profile was obtained from ____ (Item__). This DNA profile is not of sufficient quantity and/or quality for comparison purposes.*

5.5.2 The following statement shall be used for minor components of a mixture: *No interpretable DNA profile was obtained from the minor component of the mixture from ____ (Item__). This DNA profile is not of sufficient quantity and/or quality for comparison purposes.*

5.6 No conclusion (for individual contribution)

5.6.1 In an overall mixture: *No conclusion can be rendered as to the contribution of the DNA profile(s) from ____ (Item __) to the mixture due to insufficient quality and/or quantity.*

5.6.2 To the minor component of a mixture: *No conclusion can be rendered as to the contribution of the DNA profile(s) from _____ (Item __) to the minor component of the mixture due to insufficient quality and/or quantity.*

5.7 Limited DNA Profile

5.7.1 Primary statement: *Examination of _____ (Item __) revealed the presence of _#_ alleles and is of insufficient quality and/or quantity for inclusionary purposes.*

Note: Amelogenin results shall not be considered when determining the total number of alleles present.

5.7.2 Exclusions: *The DNA profile(s) obtained from _____ (Item __) is/are excluded from this profile.*

5.7.3 No conclusion: *No conclusion can be rendered as to the contribution of the DNA profile(s) from _____ (Item __) to this profile.*

5.8 No DNA Profile – When no alleles are detected above the analytical threshold: *No DNA profile was obtained from _____ (Item __).*

5.9 Additional Alleles – When additional alleles are present in an interpretable mixture that cannot be attributed to any of the known reference standards provided: *Additional DNA was present which cannot be accounted for by the standard(s) submitted.*

5.10 Presence of Male DNA Based Upon Quantitation Results

5.10.1 If the male Quantitation results indicate the presence of male DNA in a sample but the resulting STR profile is negative (either no profile is obtained or there is no indication of a male contributor), the Forensic Scientist shall report the following: *Based upon quantitation results, male DNA was detected on _____ (Item __); however, no male DNA profile was observed. It is recommended that this sample be outsourced for YSTR testing.*

Note: this statement only applies to evidence tested in sexual assault cases.

5.11 CODIS Hit Notifications

5.11.1 Offender/Arrestee Hits: *Upon a routine search of the (FBI's National DNA Index System (NDIS)/ North Carolina state DNA database (SDIS)), a (high/moderate) stringency match occurred between the (mixture/partial) DNA profile obtained from _____ (Item __) and the DNA profile contained within the (name of state/Federal) DNA Database identified as belonging to Offender/Arrestee Name (Database Number). The identity of this donor was conveyed to _____ of the _____ on _____ by _____. Analysis in this case is not considered complete until a DNA standard has been obtained from this individual and submitted for comparison purposes. If you need*

further information regarding this CODIS hit or need assistance in applying for or serving a search warrant in order to obtain a DNA standard in this case, please do not hesitate to contact the Forensic Scientist or the State CODIS Administrator at 919-662-4500.

5.11.2 Forensic Hits: *Upon a routine search of the (FBI's National DNA Index System (NDIS)/ North Carolina state DNA database (SDIS)), a (high/moderate) stringency match occurred between the (mixture/partial) DNA profile obtained from _____(Item____) and the casework DNA profile contained within the (name of state/Federal) DNA Database with specimen ID#_____. This information was conveyed to _____ of the _____ on _____ by_____. If you need any further information regarding this CODIS hit, please do not hesitate to contact the Forensic Scientist or the State CODIS Administrator at 919-662-4500.*

Note: if the Forensic Scientist is informed that a DNA standard will not be submitted by the investigating agency, the follow statement shall be added: *Per ____ further prosecution in this case will not be pursued.*

5.12 Comparisons Across Multiple Submissions – Unless necessary for clarification, repeated comparisons between items of evidence and reference standards already established in prior case records/submissions is not required. Once an individual's contribution or exclusion has been determined and reported, it need not be reiterated in subsequent case records/reports.

5.13 Associations to Employees/Vendors/Batched Cases

5.13.1 Forensic Scientists shall follow the reporting guidelines already provided in this document and modify the positive association (i.e., match, consistent with, cannot be excluded) based upon the categories below.

5.13.2 Forensic Scientists shall report non-matches/exclusions to known reference samples in the case. (Refer to **5.3** and **5.4.**)

5.13.2.1 DNA Forensic Scientist who worked the case: *...State Crime Laboratory Forensic Scientist (name) who performed the DNA analysis on this item of evidence...*

5.13.2.2 Forensic Scientist or Field Agent previously involved with the item: *...State Crime Laboratory Forensic Scientist/Agent _____. This scientist/agent performed the (type of testing: serology, latent print examination, etc.) on this item prior to DNA analysis...*

5.13.2.3 State Crime Laboratory Employee, Vendor or Visitor not involved with the item: *...State Crime Laboratory (employee, vendor, visitor) _____. This individual has been present in a Laboratory area within the Forensic Biology Section on at least one occasion...*

5.13.2.4 Sample in a batched case: ...*State Laboratory item number _____*
which was analyzed along with items of evidence in this case...

5.13.3 Note: 5.13.1 and 5.13.2 does not preclude Forensic Scientists from reporting comparisons made to DNA results that qualify as limited DNA profiles (see 5.7).

5.14 Statistics

Note: Qualifiers such as partial, predominant, partially predominant, non-sperm fraction or sperm fraction shall be used as appropriate in the statistical statements. Refer to the Forensic Biology Section Procedure for Statistical Interpretations. If no statistical data is generated, the following statement shall be used: *No population frequency data were generated for the contribution of _____ (Item) to this Item.*

5.14.1 Random Match Probability

5.14.1.1 When Random Match Probability statistics have been generated for a profile in which all databases utilized are above 1 trillion, the following statement shall be used: *The probability of randomly selecting an unrelated individual with a DNA profile that matches the DNA profile obtained from the ____ is 1 in greater than 1 trillion (which is more than the world's population) in the N.C. Caucasian, Black, Hispanic, and Lumbee Indian populations.*

5.14.1.2 When Random Match Probability statistics have been generated for a profile in which one or more of the databases utilized is below 1 trillion, the following statement shall be used: *The probability of randomly selecting an unrelated individual with a DNA profile that matches/is consistent with the DNA profile obtained from the ____ is approximately 1 in _____ in the N.C. Caucasian population, 1 in _____ in the N.C. Black population, 1 in _____ in the N.C. Hispanic population and 1 in _____ in the N.C. Lumbee Indian population.*

5.14.2 Combined Probability of Inclusion

5.14.2.1 If a known reference sample cannot be excluded from a mixture, the following statement shall be used: *The chance of randomly selecting an unrelated individual who would be expected to be included for the DNA mixture obtained from _____ (Item __) is approximately:*

N.C. Caucasian: 1 in ____

N.C. Black: 1 in ____

N.C. Hispanic: 1 in ____

N. C. Lumbee Indian: 1 in ____.

5.14.2.2 Note: If CPI/CPE is performed on a multiple major profile, the statement in 5.15.2.1 shall be modified as: ... *expected to be included for the mixed major profile obtained from....*

6.0 Limitations – N/A

7.0 Safety – N/A

8.0 References

Forensic Biology Section Procedure for Casework DNA Interpretation

Forensic Biology Section Procedure for Statistical Interpretations

Forensic Biology Section Procedure for CODIS

9.0 Records – N/A

10.0 Attachments – N/A

Revision History		
Effective Date	Version Number	Reason
01/03/2013	1	Original Document
02/01/2013	2	Added 5.2.6 to add statement to report for cases with evidence worked prior to 01/03/2013
03/08/2013	3	Definitions – clarified CPE and CPI; 5.2.4 – clarified when statement is added to report; 5.4 - Note – reworded statement to read # contributors; 5.4.1.2 – changed “predominant profile” to “predominant DNA profile”