



## [Changes to Protocols for DNA Interpretation](#)

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Recently, the State Crime Lab has undergone several rounds of changes and updates to their protocols and standard operating procedures (SOPs) for the analysis and interpretation of DNA evidence. Attorneys should be aware of these changes and that only cases worked on or after the effective date will be subject to the new policies. Previously-worked cases will not be reevaluated by the Lab to determine whether the new policies would have resulted in any change(s) to the conclusions drawn. Three changes are worth noting in the most recent update ([Procedure for Casework DNA Interpretation, Effective Date: 03/08/2013](#)).

First, the Lab has changed their Analytical Threshold (also known as the detection threshold) from 75 RFUs to 50 RFUs. This threshold is similar to a cutoff value and is determined empirically by the lab through internal validation studies. In general, any allelic peaks in a DNA profile (as seen on an electropherogram) that pass that threshold are considered to be true alleles or artifacts and not background noise. Under previous protocols, peaks below 75 RFUs were considered to be below detection but were sometimes evaluated for the potential exclusion of individuals. By lowering the detection limit to 50 RFUs, the lab can interpret more information from low quality samples and/or mixtures where minor contributor(s) is/are present.

Second, in accordance with national guidelines that have been in place since 2010, the Lab has implemented another threshold known as the Stochastic Threshold. In essence, this threshold defines another cutoff value that is higher than the Analytical Threshold and provides the analyst with a zone of uncertainty in the DNA analysis data. This threshold (currently set at 200 RFUs) is also determined by the Lab through internal validations. Allelic peaks that pass the detection threshold but fall below the stochastic threshold (above 50 RFUs and below 200 RFUs) are said to be in Stochastic Effect, which is another term that refers to the technically-induced random loss of allelic data from a given DNA profile (also known as allelic dropout). Stochastic Effect is often caused by low DNA quantity and/or quality in a given sample. For rendering interpretation from mixture profiles in particular, the Lab will no longer include allelic peaks that are in stochastic effect in their statistical calculations. (See [Procedure for Statistical Calculations, Effective Date: 08/08/2013](#))

Third, the Lab has implemented a new empirically-derived value for what is known as allelic imbalance, a term that defines whether DNA alleles at a given marker/locus are representative of one or more individuals. This value is calculated by dividing the RFU value of the lower peak by the RFU value of the higher peak and expressing the number as a percent. After using a value of 50% for the past 5 years, the

Lab has now implemented a new value of 65%. Alleles that are 65% (or higher) of RFU value from each other are said to be balanced (indicative of a single contributor). If that percentage is lower than 65%, then there is an indication of allelic imbalance which plays a significant role in the interpretation of mixture profiles.

It is worth noting that the Lab has implemented a flow chart to be utilized by the analysts for DNA profile comparisons and interpretations (See [Procedure for Casework DNA Interpretation, Effective Date: 03/08/2013](#), p. 10) and that the new SOPs reflect the Lab's adoption of newer-generation kits for forensic DNA testing. The three major changes described above can have a significant impact on the interpretation of DNA evidence and the overall conclusions reached by the Lab analyst in the course of analyzing evidence samples in general, and mixture/partial profiles in particular. Cases analyzed on or after March 8, 2013, will follow the new procedures. Cases analyzed previously will follow the older procedures and new conclusions will not be rendered on cases analyzed under the old procedures. Defense counsel are encouraged to do further research or seek the assistance of a DNA expert to evaluate whether those changes (and other modifications to the SOPs) have a bearing on their cases.