
Plan for Estimating the Uncertainty of Measurement

- 1.0 Purpose** – To describe the plan for estimating the uncertainty for measurements applicable to the Firearm and Tool Mark Section.
- 2.0 Scope** – This procedure will apply to cases in which a barrel and/or overall firearm length measurement is reported in the Laboratory Report.
- 3.0 Definitions**
- **Measurand** – The unknown quantity subject to measurement.
 - **Uncertainty of measurement** – A parameter associated with the result of a measurement that characterizes the distribution of values that may reasonably be attributed to that being measured. Sources contributing to the uncertainty include, but are not necessarily limited to, the reference standards and reference materials used, methods and equipment used, environmental conditions, properties and condition of the item being tested or calibrated, and the operator.
- 4.0 Equipment, Materials, and Reagents** – N/A
- 5.0 Procedure**
- 5.1** The Firearm and Tool Mark Section shall calculate uncertainty of measurement for barrel and overall firearm length measurements.
- 5.1.1** The measurand shall be specified for each method.
- 5.1.2** The measurement method shall be specified.
- 5.1.3** An uncertainty budget shall be constructed to document and identify all potential sources of uncertainty.
- 5.1.4** The appropriate measurement data shall be gathered. Sources of measurement data may include method validation, QC data, proficiency tests, replicant testing data, calibration certificates and scientific literature.
- 5.1.5** The uncertainty of measurement for the method shall be estimated in accordance with an appropriate formula.
- 5.1.6** The estimated uncertainty of measurement for the method shall be documented and the results and supporting data shall be readily available in the Laboratory.
- 5.1.7** The estimated uncertainty of measurement shall be maintained or recalculated as the need arises (i.e., when a significant change occurs in the uncertainty budget).
- 5.2** Factors known to the Firearm and Tool Mark Section analysts, based on training and experience, to have no impact on the uncertainty of measurement to any significant degree may be eliminated.
- 5.2.1** The Firearm and Tool Mark Section Forensic Scientist Manager shall ensure that all pertinent uncertainty measurements are taken into account while using appropriate analysis methods. Sources that may contribute to uncertainty include, but are not limited

to, the following: the traceability of reference standards and materials, analysis methods, instrumentation, environmental factors, the condition of testing items, and the Forensic Scientists.

5.3 Reporting methods of uncertainty of measurement shall be included in the pertinent technical procedures.

5.4 Implementation of the plan shall begin in 2012.

6.0 **Limitations** – N/A

7.0 **Safety** – N/A

8.0 **References** – N/A

9.0 **Records**

- Uncertainty Budgets

10.0 **Attachments** – N/A

Revision History		
Effective Date	Version Number	Reason
09/17/2012	1	Original Document