A. Purpose:

1. To examine recovered shot pellets and wadding in order to determine the shot size and gauge of the firearm from which these items were fired. This determination can be made by comparing the fired ammunition components, like shot pellets and wadding, with the ammunition components loaded in unfired submitted shotshells. Determination of the shot size or gauge of the firearm may also be determined by comparing the fired ammunition components to submitted discharged shotshells.

B. Responsibility:

1. It is the examiner's responsibility to examine recovered shot pellets and wadding in order to determine the shot size and gauge of the firearm from which these items were fired.

C. Safety:

1. The use of personal protective devices is at the discretion of the examiner.

D. Procedure:

1. The examiner may use one, or all, of the techniques detailed below to determine shot size.
    a. Visual/Microscopic Comparison
        i. Determine the total number of pellets received.
        ii. Determine the composition of the pellets.
        iii. Determine the number of pellets suitable for comparison purposes. Make note if pellet sizes all appear to be similar in size. If several different sizes are present, determine each specific size.
        iv. Compare laboratory standards of known shot sizes, side by side with the evidence pellets, until a known shot size is determined. A stereo microscope may aid in this determination. This can be done one size at a time or several sizes at a time. However, if more than one size is used at a time, care should be taken not to mix up the shot.
        v. Record the results of the findings on the appropriate worksheet.

b. Directly compare the weight of the evidence pellets to the weight of the lab's known standards. Use the same number of pellets until a similar known weight is obtained.

   i. Record the total number of pellets received.

   ii. Determine the composition of the pellets.

   iii. Determine the number of pellets suitable for weighing. Make note if pellet sizes all appear similar. If several sizes present, determine each specific size.

   iv. Weigh the pellets in grams or grains.

   v. Divide weight of pellets by total number weighed.

   vi. Consult known pellet weights in Table 1 of Appendix G of the AFTE Glossary (3rd Edition) and determine shot size, which corresponds to evidence shot.

c. Measure Pellet Size

   i. Determine the total number of pellets received.

   ii. Determine the composition of the pellets.

   iii. Determine the number of pellets suitable for comparison purposes. Make note if pellet sizes all appear to be similar in size. If several different sizes are present, determine each specific size.

   iv. Choose the best specimen, measure the diameter using a caliper and record the measurement in hundredths or thousandths of an inch.

   v. Consult known pellet sizes in Table 1 of Appendix G of the AFTE Glossary (3rd Edition). Use the chart to determine the shot size with the same diameter as the submitted evidence.

2. Determine gauge size by examining shot wadding.

   a. Directly compare the evidence to known laboratory standards of similar manufacture and composition. Do this by comparing the base of evidence to the bases of the standards until a similar size is found.

   b. Determine gauge size by measuring the base diameter of the wad and comparing it to the base diameter of known gauge measurements.

   c. Measurements may be obtained by utilizing a caliper, micrometer, or the macroscope digital imaging measurement tool.

   d. Manufacturer's data can be determined by locating information stamped into the wad or by comparing the wad to known laboratory standards.

e. Macroscopic examination may reveal striations suitable for identification of the wad back to the shotgun that fired it.

f. If evidence shotshells are submitted, it may be necessary to disassemble one of them, to determine the gauge size or the manufacturer.

g. Record all information on the appropriate worksheet.

E. References:

1. AFTE glossary
2. AFTE procedures
3. Leica® Application Suite software V3.5.0

F. Appropriate Appendices:

1. Appendix 1 -- Worksheets