A. Purpose:

To describe the steps to perform an examination of evidence using a comparison microscope. These procedures apply to both the examination of fired ammunition components and to tool marks.

B. Responsibility:

Forensic Science Examiners assigned to the Firearms Unit.

C. Safety:

Evidence items for comparison should be decontaminated prior to using a comparison microscope.

D. Procedure:

The procedure steps below do not have to be performed in the order listed; however, all steps should be considered and/or addressed:

1. Ensure that the objectives are set for equal magnification for both stages of the comparison microscope.
2. Adjust the illumination as needed. Oblique lighting is usually preferred.
3. Adopt a consistent procedure for comparing knowns to unknowns, e.g. tests on the left stage and evidence on the right stage, or vice versa.
4. If a firearm or a tool are included as evidence, consider comparing test-to-test to ensure reproducibility of microscopic characteristics.
5. Evaluate the possibility of subclass characteristics on tests or on the evidence.
6. Compare the unknown evidence to either another piece of unknown evidence or to a known standard.
7. The entire unknown should be considered.
8. If a conclusion cannot initially be reached, the analyst should consider the following factors:
    i. The angle of lights
    ii. The type of lights
    iii. The need for additional tests
    iv. The position of the test and/or evidence on the microscope

v. The possibility of needing to clean the firearm

vi. The possibility that the firearm or tool itself has changed

9. Comparisons of evidence will be adequately documented to support the conclusions reached. This can be in the form of photographs, written notes, or a combination of both.
10. If an examination results in either an identification or an elimination based on individual characteristics, a second examiner must verify the findings. Refer to the steps outlined in CW-I-5 Verifications.

E. References:

1. GL 2 Safety Manual
2. CW-I-10 Range of Conclusions
3. CW-I-5 Verifications