# OSAC RESEARCH NEEDS ASSESSMENT FORM

**Title of research need:** Consistency of Examiner Evaluation of Distance Determination GSR Patterns

**Keyword(s):** Muzzle-to-target distance determination; Gunshot Residue, bracketing, distance determination, range estimation

**Submitting subcommittee(s):** Firearm and Toolmarks **Date Approved:**

*(If SAC review identifies additional subcommittees, add them to the box above.)*

**Background Information:**

1. Description of research need:

This Research Need has two parts:
The first is to evaluate the use of a standard process of creating known distances in performing muzzle to garment distance determinations. This would then be used to study and better characterize the amount of variance observed in gunshot residue patterns when known variables (e.g. target material, ammunition, muzzle to target distance, firearm) are unchanged.
The second need is to evaluate the variance of examiner interpretation and reporting of distance determination with the goal of standardizing bracket ranges for reporting muzzle to target distances.

2. Key bibliographic references relating to this research need:

Nichols, R., Gunshot Proximity Testing: A Comprehensive Primer in the Background, Variables and Examination of Issues Regarding Muzzle-to-Target Distance Determinations; AFTE Journal, 2004, Vol. 36, No 3

Smith, Rebecca, Differences in Smokeless Propellant Grain Morphology: Predictable Effects on Muzzle-to-Target Distance Determination; AFTE Journal, 2015, Vol. 47, No. 3

SWGGUN Guidelines for Gunshot Residue Distance Determinations, AFTE Journal, 2012, Vol. 44, No. 4

Crego, Lynette, Distance Determination Results When Utilizing the Same Make, Model and Barrel Length Firearms, AFTE Journal, 2011, Vol. 43, No. 4

3a. In what ways would the research results improve current laboratory capabilities?

The research could lead to a more consistent process when developing witness panels or known test distances for the entire community when performing distance determinations. Further, if able to achieve a standard reporting range this would provide more consistent reporting across the entire community.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

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| The basis and concepts of distance determination testing are well established. However, there may be variability in the production and interpretation of known distance patterns; therefore, this research may result a more systematic approach. |

3c. In what ways would the research results improve services to the criminal justice system?

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| The criminal justice system would be served by having more consistent analysis and reported distance brackets. |

4. Status assessment (I, II, III, or IV): III

| | **Major** gap in current knowledge | Minor gap in current knowledge |
|---|---|---|
| **No or limited** current research is being conducted | I | III |
| **Existing** current research is being conducted | II | IV |

*This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.*

**Approvals:**

Subcommittee Approval date: 5/4/2018

*(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)*

SAC

1. Does the SAC agree with the research need? Yes [x] No [ ]
2. Does the SAC agree with the status assessment? Yes [x] No [ ]

If no, what is the status assessment of the SAC: [ ]

Approval date: 5/4/2018

*(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)*