IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF MARYLAND

UNITED STATES	:	
	:	
	:	
v.	:	**Case No. PWG-17-242**
	:	
JOVON MEDLEY	:	
	:	
Defendant	:	

MOTION *IN LIMINE* TO EXCLUDE FIREARM INDENTIFICATION EVIDENCE, OR IN THE ALTERNATIVE, TO LIMIT SUCH TESTIMONY

Jovon Medley, the Defendant, by and through his attorneys, James Wyda, Federal Public Defender for the District of Maryland, Michael S. Oppenheimer and Christian Bryan Lassiter, Assistant Federal Public Defenders, hereby moves to exclude the Government's proposed expert testimony and firearm identification evidence, or in the alternative, to limit the scope of the expert's opinion to accurately reflect the discipline. The proposed expert testimony is inadmissible under Federal Rule of Evidence 702 because the proposed opinion is based on an unvalidated and unreliable methodology. *See Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 597 (1993); *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999); *see also* Fed. R. Evid. 702. Equally important, the examiners in this case failed to reliably apply the methodology and the Government has not provided the bases and reasons for the examiners opinions. *See Id.*; *see also* Fed R. Crim. P. 16.

INTRODUCTION

The debate over whether firearms examiners can link fired ammunition components to a particular firearm has reached its zenith. Three recent reports issued in 2008, 2009, and 2016, two

by the research arm of the National Academy of Sciences,[1] and one by the President's Council of Advisors on Science and Technology, have rejected the claim that firearms identification is valid and reliable science. The most recent report, issued in 2016 following a review of more than 2,000 articles and presentations by members of the forensic community, states unequivocally: firearms identification "falls short of the scientific criteria for foundational validity." President's Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Validity of Feature-Comparison Methods*, at 11 (Sept. 20, 2016) [hereafter PCAST Report].

These three reports made several findings central to whether this Court should admit firearms identification testimony. The findings are:

- "The validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been demonstrated." National Research Council, Committee to Assess the Feasibility, Accuracy, and Technical Capability of a National Ballistics Database, *Ballistics Imaging* (2008) at 3 [hereafter Ballistics Imaging Report]. *See* **Exhibit A**, Ballistic Imaging Report excerpts.

- The theory of firearms examination is "not a scientific theory," but rather a "claim that examiners applying a subjective approach can accurately individualize the origin of a toolmark." PCAST Report at 60. *See* **Exhibit B**, PCAST excerpts.

- The method is subjective, with examiners using their personal judgment to select which features to compare; and the reasoning employed to reach a conclusion is circular—a match can be declared when there is "sufficient agreement" and when there is "sufficient agreement" is based on the personal judgment of each examiner. *Id*. at 47, 60, 104, and 113.

[1] The National Research Council (NRC) is a component of the National Academy of Sciences, which was created by congressional charter in 1863 to "investigate, examine, experiment, and report upon any subject of science." Act to Incorporate the National Academy of Sciences, sec. 3, 12 Stat. 806 (1863). http://www.nasonline.org/about-nas/leadership/governing-documents/act-of=incorporation.html (last visited March 19, 2018). The NRC was established in 1916 "to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government." National Research Council, Committee to Assess the Feasibility, Accuracy, and Technical Capability of a National Ballistics Database, Ballistic Imaging iii (2008).

- Because the method is "subjective," foundational validity and reliability "can *only* be established through multiple independent black-box studies"[2] and "at present there is only a single study that was appropriately designed." *Id*. at 106, 111 (emphasis in the original); *See* **Exhibit C,** *An Addendum to the PCAST Report on Forensic Science in Criminal Courts*, (Jan. 6, 2017) at 7 [hereafter PCAST Addendum].

- As a result, "firearms analysis currently falls short of the criteria for foundational validity." PCAST Report at 111; *see also* **Exhibit D**, National Research Council, *Committee on Identifying the Needs of the Forensic Science Community, Strengthening Forensic Science in the United States: A Path Forward*, (2009) at 154 [hereafter NRC Forensics Report].

In sum, three interdisciplinary reports authored by three separate committees of nationally recognized scientists and professionals found that: the "fundamental assumptions" underlying firearms examination have not been demonstrated; the theory is "not a scientific theory"; the method is "subjective"; and there is "insufficient empirical evidence" establishing validity and estimating reliability.

Because the hallmark of legal admissibility is scientific validity and reliability, this Court should exclude the proposed firearms identification testimony until firearms examiners produce appropriate independent empirical evidence that (1) firearms have unique or individual characteristics, (2) firearms consistently imprint those characteristics on bullets and shell casings, and (3) examiners can identify and evaluate those marks using a reliable and repeatable method, with a known and acceptable error rate.

Law enforcement and laboratory accrediting bodies have created standards to which examiners must adhere. Chief among these standards are the requirement of contemporaneous documentation. This requirement serves two core functions: First, documentation helps to protect

[2] "Black-box" studies are studies "with many examiners making a series of independent comparison decisions between a questioned sample and one or more known samples that may or may not contain the source." PCAST Report at 110 Because these studies best replicate case work they are the "*only*" studies appropriate for assessing scientific validity and estimating reliability. *Id*. at 106. (emphasis in the original).

against bias—the examiner deviating from his initial analysis in order to identify similarities with a comparison. Second, documentation seeks to ensure that an examiner's work and ultimately subjective conclusions that two items "match" can be reproduced and verified by a third party.

The Government's experts Scott C. McVeigh, Edward L. Gesser, and Steven W. Chase, have failed to meet these requirements and ignored the standards that govern the discipline. Mr. McVeigh has proposed to testify that "cartridge cases and bullets were, *in fact*, fired from the…Rock Island Armory firearm" attributed to Mr. Medley. *See* **Exhibit E,** Government's Expert Disclosure, at 2 (Jan. 22, 2018 (emphasis supplied). Mr. McVeigh provided neither contemporaneous documentation of his adherence to any methodology, nor any other documentation of the similarities or differences he purports exist between the items he compared. *See* **Exhibit F ¶¶** B11-12, Affidavit of John Nixon (Mar. 21, 2018) [hereafter Nixon Affidavit]. These failures not only violate the accreditation and licensing standards governing Mr. McVeigh's laboratory but also deprives the defense of any way to test whether he reliably applied any methodology in this case.

Exclusion is the appropriate remedy in this case, as cross-examination cannot cure the prejudice from the admission of evidence derived from a method that has not been proven valid and that lacks estimates of its reliability. The significance of expert testimony at trial cannot be overstated. Scientific expert testimony carries with it the "aura of special reliability and trustworthiness," creating a grave risk that jurors will receive it without a critical eye. *United States v. Dowling*, 753 F.2d 1224, 1236 (3d Cir. 1985); *see also United States v. Haines*, 803 F.3d 713, 730 (5th Cir. 2015) (recognizing the significance of expert testimony to juries). Cross-examination cannot solve this problem. The Government has not provided any information with which to question its expert regarding his adherence to a methodology or the validity of his

subjective conclusion that the Rock Island Armory firearm "in fact" fired the recovered ammunition components. The failure to state the bases and reasons renders the examiners opinion inadmissible under Rule 702 and violates Rule 16. If the testimony is admitted, the jury will be left to take the Government's expert at his word: because he says so, it is true.

At a minimum, the Court should instruct that Mr. McVeigh cannot testify that he "identified" the Rock Island firearm as the source of the ammunition. This sort of testimony is scientifically indefensible in light of the well-documented limitations of firearm identification. Mr. McVeigh should only be permitted to testify to the similarities and differences he observed when comparing two items without any statements of certainty. His conclusions, if any, should be limited to including or excluding the Rock Island Firearm as a potential source of the recovered ammunition. Finally, Mr. McVeigh should be prepared to testify to the error rates from the only appropriately designed validation study. Absent these limitations—even with the benefit of cross-examination—Mr. Medley will be unfairly prejudiced by misleading testimony that will unquestionably garner significant weight from the jury.

ARGUMENT

I. RULE 702 AND *DAUBERT* REQUIRE RIGOROUS EVALUATION AND REEVALUATION OF THE RELIABILITY OF PARTICULAR METHODOLOGIES AND HOW THEY ARE APPLIED.

Firearm identification evidence is inadmissible unless it is based on a method that is both "scientifically valid" and that "properly can be applied to the facts in issue" in a particular case. *See Daubert,* 509 U.S. at 589; *accord Kumho Tire*, 526 U.S. at 141 (same analysis applies to matters of a technical, rather than a scientific expertise). Federal Rule of Evidence 702, which

codified the Supreme Court's holding in *Daubert* and its progeny, governs the admission of expert testimony of a technical or scientific nature. The rule requires the proponent to show:

(1) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;

(2) the testimony is based on sufficient facts or data;

(3) the testimony is the product of reliable principles and methods; and

(4) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702; *see also Daubert*, 509 U.S. at 592 n.10 (proponent bears the burden); *see also Cooper v. Smith & Nephew, Inc.*, 259 F.3d 194, 199 (4th Cir. 2001)(same). Thus, *Daubert* requires, as codified in the rules of evidence, *both* that an expert's testimony be the "product of reliable principles and methods," *and* that the expert "reliably *applied*" the principles and methods to the facts of the case. *Daubert*, 509 U.S. at 597. "Nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert." *Kumho Tire*, 526 U.S. at 158 (citing *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997).

Reliability is thus the touchstone of admissibility under *Daubert*. *Daubert*, 509 U.S. at 589. Indeed, because of the power of expert testimony to sway a jury, "it is crucial that the district court conduct a careful analysis into the reliability of the expert's proposed opinion." *United States v. Fultz*, 591 Fed. Appx. 226, 227 (4th Cir. 2015). To guide this inquiry, *Daubert* and its progeny established five factors for assessing the reliability of an expert's proffered opinions:

(1) whether the particular scientific theory "can be (and has been) tested";

(2) whether the theory "has been subjected to peer review and publication";

(3) the "known or potential rate of error";

(4) the "existence and maintenance of standards controlling the technique's operation"; and

(5) whether the technique has achieved "general acceptance" in the relevant scientific or expert community.

United States v. Hassan, 742 F.3d 104, 130 (4th Cir. 2014); *see also Daubert*, 509 U.S. at 593–94. The list is not exhaustive: the Court retains broad latitude to use other factors to measure reliability. *Kumho Tire.*, 526 U.S. at 152.

The reliability of a particular methodology requires constant reevaluation by each court asked to admit expert testimony in a particular case. *Daubert* explained that "scientific conclusions are subject to perpetual revision." *Daubert*, at 597. In practice, this means that "[w]hen scientific methodologies once considered sacrosanct are modified or discredited, the judicial system must accommodate the changed scientific landscape." *See* **Exhibit G**, Hon. Harry T. Edwards, *The National Academy of Sciences Report on Forensic Sciences: What it Means for the Bench and Bar*, 51 JURIMETRICS J. 1 (Summer 2010). For this reason, "past acceptance does not render expert testimony admissible"; rather, "expert testimony long assumed reliable before Rule 702 must nonetheless be subject to the careful examination that *Daubert* and *Kumho Tire* require." *See United States v. Willock*, 696 F. Supp.2d 536 (D. Md. 2010).

II. THE THEORY OF FIREARMS IDENTIFICATION

To conduct firearms identification, examiners look at toolmarks on spent ammunition. Bullets pick up markings from gun barrels. The barrels are rifled, to improve accuracy, with spiral grooves cut into the barrel's interior to impart spin on the bullet. Cartridge casings, which do not travel down the barrel, may pick up markings from other parts of the weapon, such as the firing pin or breechface. To conduct their analysis in an individual case, the examiner test-fires the suspected firearm and visually compares the pattern of marks on the test-fired ammunition with that on the ammunition recovered from the scene, using a comparison microscope. If the examiner does not have a suspect weapon, he or she compares the marks on spent bullets or casings to

determine if they were fired from the same weapon. *See* Foundational Overview of Firearm/Toolmark Identification tab available at afte.org/resources/swggun-ark (last accessed March 19, 2018).

Firearms examiners first examine bullets and/or casings for class characteristics. "Class characteristics" are distinctive features shared by many items of the same or similar type—such as the width of a groove cut into the barrel of a firearm, or the shape of a firing pin—and are determined before manufacturing. *See* NRC Forensics Report at 152. Class characteristics are used to narrow the pool of suspect firearms to one or more makes and models. If the class characteristics between test-fired and evidence ammunition, or between sets of ammunition, are the same, the examiner next evaluates "accidental" marks left on bullets and/or casings by features of a weapon that are accidentally imparted during manufacture. One group of accidental marks, "subclass characteristics," are defined as features left on multiple items fabricated by the same tool: imperfections on the tool's cutting surface are imparted on a series of weapons. Examiners may confuse subclass characteristics with individual characteristics, discussed below, in cases where there are limited microscopic marks of value.[3] Subclass characteristics are only "present on a group of guns within a certain make or model, such as those manufactured at a particular time and place." *United States v. Monteiro*, 407 F. Supp. 2d 351, 360 (D. Mass. 2006).

"Individual" characteristics are the other type of accidental marks sometimes found on guns.[4] Like subclass characteristics, firearms examiners believe that individual characteristics result from imperfections on tool cutting surfaces during the firearm manufacturing process, as

[3] http://projects.nfstc.org/firearms/module11/fir_m11_t04_01.htm (last visited March 19, 2018).

[4] Marks left on ammunition by imperfections in the barrel versus deliberate rifling are called "striae."

well as through wear and tear of the firearm.[5] Unlike subclass characteristics, firearms examiners presume that the imperfections that result in individual characteristics are imparted upon, and thus unique to, a particular gun. *See* NRC Forensics Report at 150-151; PCAST Report at 104.

Because of these individual characteristics, firearm examiners assume that each firearm has a unique set of patterns or marks on bullets or casings that are not shared by any other firearm. *See Williams v. United States*, 130 A.3d 343, 352 (D.C. 2016) (Easterly, J., concurring). While class characteristics are well-defined, firearms examiners lack standards for distinguishing between subclass characteristics, which are shared by firearms, and "individual" characteristics, which are not. *See* Nixon Affidavit ¶¶ A11-15. Instead, the examiner relies on his or her training and experience.[6]

If the examiner finds "sufficient agreement" between the individual characteristics seen in the two sets of ammunition, he or she declares a "match" and concludes that the ammunition recovered from the crime scene was fired from the suspected firearm. No standard or protocol, however, dictates how many characteristics the examiner must find in agreement to declare a match. Instead, firearms examiners utilize a subjective pattern-matching methodology that allows each examiner to set his or her own criteria based on training and experience. *See* **Exhibit I**, AFTE Theory of Identification; *see United States v. Taylor*, 663 F.Supp.2d 1170, 1177 (D. N.M. 2009); *see also* PCAST Report at 104 (Examiners find "sufficient agreement" when they are "convinced that the items are extremely unlikely to have a different origin.")(citing AFTE Criteria).

[5] The assumption that wear and tear creates unique marks on all bullets and shell casings shot by a particular gun is puzzling as this would require "wear and tear" to remain constant over the life/use of a gun. This is contrary to the idea of "wear and tear."

[6] Firearms examiners themselves concede that subclass marks "may be misinterpreted, especially in cases with very limited microscopic marks of value, or in instances in which no firearm is submitted." *See* **Exhibit H**, National Forensic Science Technology Center/AFTE Firearm examiner training module, Physical Characteristics, *available at* http://projects.nfstc.org/firearms/module11/fir_m11_t04_01.htm.

III. THIS COURT SHOULD EXCLUDE THE FIREARMS IDENTIFICATION TESTIMONY BECAUSE THE GOVERNMENT CANNOT DEMONSTRATE IT IS BASED ON A VALID AND RELIABLE METHODOLOGY

The field of firearms identification lacks the scientific validity that is the predicate for evidentiary admissibility. Indeed, the conclusions of the NRC and PCAST Reports are uniform: there is no scientific theory or technique that is generally accepted by the relevant scientific community, and there is no evidence that examiners regularly reach accurate conclusions. *See Daubert*, 509 U.S. at 593-95.

Each report found no empirical research proving the "theory of identification." Instead, this "theory" is nothing more than a series of unproven assumptions embraced by firearms examiners. First, the field assumes that every firearm has unique characteristics resulting from both the manufacturing process and wear and tear, which consistently produce unique marks on bullets and shell casings. It also assumes that examiners, based on experience and judgment, can identify and distinguish these "unique" accidental marks from subclass marks[7], which are also accidentally left during the manufacturing process but are not unique. Finally, the field assumes that examiners can accurately determine when two sets of "unique" marks are in "sufficient agreement" to declare a "match." There is no standard for what constitutes "sufficient agreement," nor is there empirical data supporting any particular threshold number of marks that must align. Rather, each examiner refers to his personal recollection of the amount of agreement he has

[7] The OSAC (Organization of Scientific Area Committees) was unable to find a single study "that assesses the overall firearm discipline's ability to correctly/consistently categorize evidence by class characteristics, identify subclass marks, and eliminate items using individual characteristics." PCAST Report at fn 160. *See* **Exhibit J**, OSAC Research Needs Assessment Form. The OSAC was established by the National Institute of Standards and Technology (NIST) to develop standards and guidelines to improve the quality and consistency in the forensic science community.

observed in close non-matches encountered throughout his career; in other words, "sufficient agreement" is wholly subjective.

Assumptions and observations do not constitute a valid scientific theory tested through independent empirical research. To the contrary, a "valid theory" is a "comprehensive explanation of some aspect of nature that is supported by a vast body of evidence." PCAST Report at 60; NRC Forensics Report at 154-55 (reaching the same conclusion); Ballistics Imaging Report at 1, 3 ("[T]he validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks ha[s] not yet been demonstrated.").

The NRC and PCAST Reports also uniformly and emphatically conclude that the field of firearms identification has not proved it has a reliable or valid scientific technique for reaching conclusions about individualization, and is therefore not generally accepted in the scientific community. *See Daubert*, 509 U.S. at 593-95 (courts must consider "the extent to which the underlying scientific theory and technique are accepted as valid by the relevant scientific community.") As all three reports recognized, to be an accepted scientific method, the field must conduct empirical testing to prove that examiners can reliably and repeatedly reach accurate conclusions. The field lacks any repeatable and consistent procedures for examiners to follow when identifying features within evidence samples, comparing those samples, and then measuring the significances of similarities and differences. Rather, the field allows each examiner to draw his own subjective conclusions about what qualifies as "sufficient agreement" between test-fired samples and found ammunition. *See* PCAST Report at 111-12; *see also* NRC Forensics Report p. 155 (concluding that the field of toolmarks relies on the "subjective findings of examiners rather than on the rigorous quantification and analysis of the sources of variability."); *id*. at 153-54 ("the

decision of the toolmark examiner [to declare a match] remains a subjective decision based on unarticulated standards and no statistical foundation for estimation of error rates.").

As these reports also make clear, the field lacks sufficient peer review. *Daubert*, 509 U.S. at 593-95 (requiring courts to evaluate whether peer-reviewed studies exist demonstrating the field's validity). Only one study, the Ames study, has replicated case-work situations to test the reliability of firearms examiners' case work. PCAST Report at 108-110. This does not prove scientific validity. *Id*. at 111.

To that end, the field lacks a known error rate, as only one appropriately designed study – the Ames study – has attempted to measure it. *Id*.; *Daubert*, 509 U.S. at 593-95 (emphasizing the importance of a known error rate in assessing a field's reliability). That study suggests that the field has grossly underestimated its rate of false-positives. *Id*. at 11, 111. Without a known error rate, "an examiner's statement that two samples are similar – or even indistinguishable – is scientifically meaningless: it has no probative value, and considerable potential for prejudicial impact." *Id*. at 6.

Here, the firearms examiners unabashedly rely on their training and experience to reach indefensible claims of individualization and certainty.[8] *See* Government Disclosures at 2. However, the collective experience of examiners in the field and in courts, no matter how extensive, is not a scientific basis to demonstrate validity and reliability. Claims to the contrary have been soundly rejected by the scientific community. "Nothing – not training, personal

[8] The proposed testimony contravenes a 2016 memorandum from the Attorney General directing Department forensic labs to cease using the expressions "reasonable scientific certainty" or "reasonable [forensic discipline] certainty" in their reports or testimony and directing Department prosecutors to abstain from use of these expressions. *See* **Exhibit K**, DEPT. OF JUSTICE, Memorandum of Attorney General Loretta Lynch (Sept. 6, 2016)

experience nor professional practices – can substitute for adequate empirical demonstration of accuracy." PCAST Report at 46.

Defense counsel have made requests to ascertain the scientific foundations and principles upon which the Government's examiners will rely. *See* **Exhibit L**, Firearm & Toolmark Discovery Requests I and III (requesting validation studies conducted and/or relied on in connection with firearm analysis in this case). However, the firearms examiners in this case refuse to specify the validation studies that would support their claims and proposed testimony. *See* **Exhibit M** at 2, Discovery Production Letter, dated February 28, 2018. The defense submits that the NRC and PCAST Reports critiques of the firearms identification disciple shine a spotlight on this silence and obfuscation. The entirely subjective methodology employed here lacks sufficient empirical evidence to establish validity and reliability. The firearms identification evidence is not evidence that a jury can rely on. This Court should exclude it.

IV. THE COURT SHOULD EXCLUDE THE EXPERT TESTIMONY BECAUSE THERE IS NO WAY TO DISCERN WHETHER THE METHODOLOGY HAS BEEN RELIABLY APPLIED

Even if the Court finds that the general methodology underlying the Government's expert testimony is sufficiently reliable, it must query "whether those principles and methods have been properly applied to the facts of the case." *See* Fed. R. Evid. 702 advisory committee's note; Rule 702(a)(3).

The admissibility of an examiner's opinion as to the existence of an identification is a subjective determination predicated on the examiner's experience, and it is "essential that the examiner provide a sufficient explanation for the basis of the opinion." *See Willock*, 696 F. Supp.2d at 561. As noted by the Advisory Committee Note to Fed. R. Evid. 702:

> If the witness is relying solely or primarily on experience, then the witness must explain how that experience leads to the conclusion reached, why that experience is a sufficient basis for the opinion, and how that experience is reliably applied to the facts. The trial court's gatekeeping function requires more than simply "taking the expert's word for it."

In *Willock*, this Court emphasized that when applying a subjective methodology like firearm identification, evidence is relevant, reliable, and helpful only if the examiner followed and documented his or her application of the accepted methodology. *See Willock*, 696 F. Supp.2d at 572 (discussing the importance of adherence to standards in firearms toolmark identification).

To this end, courts have required an expert presenting subjective identification testimony to properly document his analysis such that his conclusions and application of the methodology in question can be verified and reproduced. "The twin requirements of adequate documentation and peer review of the primary examiner's results are said to 'ensure the reliability of the expert's results and the testability of the opinion.'" *Willock*, F. Supp.2d at 561 (citation omitted); *In de Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 745 (3d Cir. 1994) (explaining that "any step that renders the analysis unreliable . . . renders the expert's testimony inadmissible. This is true whether the step completely changes a reliable methodology or merely misapplies that methodology"). Thus, in the context of expert testimony regarding subjective firearm identification, courts have explained that "[r]eproducibility is an essential component of scientific reliability." *United States v. Green*, 405 F. Supp. 2d 104, 108 (D. Mass. 2005); *see also Monteiro* 407 F. Supp. at 368.

For these reasons, courts have excluded subjective firearm expert testimony where the examiner failed to document their analysis in a way that was reproducible and verifiable. *Monteiro*, 407 F. Supp. at 374 ("Until the basis for the identification is described in such a way that the procedure performed…is reproducible and verifiable, it is inadmissible under Rule 702"); *Green*, 405 F. Supp.2d at 120 (absence of notes and photographs by firearms examiner "makes it

difficult, if not impossible," for another expert to reproduce what examiner did); *Commonwealth v. Pytou Heang*, 458 Mass. 827, 847 (2011) ("[B]efore trial, the examiner must adequately document the findings or observations that support the examiner's ultimate opinion, and this documentary evidence, whether in the form of measurements, notes, sketches, or photographs, shall be provided in discovery, so that defense counsel will have an adequate and informed basis to cross-examine the forensic ballistics expert at trial."). In *Monteiro*, the government sought to admit evidence regarding firearm identification. The court found that subjective firearm methodology required, as a "prevailing and established standard of reliability" that examiners "document identification by notes, sketches, or photographs." *Id.* at 373. But the *Monteiro* examiner failed to do so. His notes "contain[ed] no description of what led [the examiner] to his conclusions. *Id.* For that reason, the court excluded the identification, explaining that: "Until the basis for the identification is described in such a way that the procedure performed by [the examiner] is reproducible and verifiable, it is inadmissible under Rule 702." *Id.* at 374.

By excluding any basis for their assertions, the Government's examiners failed to conform to either recognized standards of quality laboratory practice or the Forensic Science Division's own Standards of Policies and Practices. *See* Nixon Affidavit ¶¶ B6-12. The documentation, or lack thereof, "does not divulge the data upon which the conclusions were drawn." *Id*. ¶ B11. While the examiners have turned over photographs they do not document or note anywhere which individual characteristics were relied on to reach their conclusions. *Id*. Similarly, there is no information regarding the candidate exhibits returned from the two NIBIN searches conducted in this case. *Id*. ¶ B3. The defense is only provided conclusions that there was a "hit" in one search and "no hit" in the other. *Id*. That the Government's examiners purport to have followed a process does not provide the needed "facts or data" or demonstrate that they "reliably applied the principles

and methods to the facts of the case." *See* Fed. R. Evid. 702. The missing "facts and data" are necessary to connect the examiners' process to their conclusions.[9] The examination conducted in this case is not reproducible or verifiable, and thus must be excluded under Rule 702.

V. THE GOVERNMENT HAS NOT PROVIDED A BASIS FOR ITS EXAMINER'S OPINION

The same defects that render the firearm identification evidence inadmissible under Rule 702 dictate its exclusion under Rule 16(a)(1)(g). The Government's expert disclosure did not adequately lay out the basis for its expert's opinions. Initially, the Government's summary states that the basis for Mr. McVeigh's testimony is set forth in the documents provided. Government's Expert Disclosure at 2. However, none of the paperwork describes the methodology used to reach the examiner conclusions. For instance, the Government clearly states, at least, that the fingerprint examiner's "conclusion is based on the ACE-V…Methodology." The defense is entitled to know the basis for Mr. McVeigh's conclusion; not speculate that he employed the AFTE theory of identification or, perhaps, some other method.

Equally important, as discussed above, by omitting the data used to reach the examiner's conclusion, the Government left out the critical link between any methodology and the conclusion. The process is the steps followed in a methodology. The data gathered during each step, however, is what forms the basis of the expert's opinion. *See, e.g.*, *United States v. Saunders*, 826 F. 3d 363, 369 (7th Cir. 2016) (finding a Rule 16 violation for failure to provide the basis of the examiner's opinion where the Government did not disclose the number of points of similarity for a fingerprint

[9] *See, e.g.*, **Exhibit N** ¶ 9, DEPT. OF JUSTICE, Code of Professional Responsibility for the Practice of Forensic Science (Forensic science providers must meet 15 requirements including "[M]ake and retain contemporaneous, clear, complete, and accurate records of all examinations, tests, measurements, and conclusions, in sufficient detail to allow meaningful review and assessment by an independent professional proficient in the discipline.").

identification). Here, "the bench notes describe only *class characteristics*, which cannot limit the potential pool of firearms any further than a particular make and model of firearm…" Nixon Affidavit ¶ A11 (emphasis in the original). It is that data, striations claimed to be in agreement and disagreement, *see id*. ¶¶ B11-12, that serves as the firearm examiner's "basis" for his ultimate conclusion regarding whether the firearm is "in fact" a match to the recovered ammunition. Similarly, the Government has not produced that data—the candidates list—from the NIBIN searches. As Mr. Nixon describes, once images are uploaded into the system, NIBIN returns candidate items which are then examined by a human. Id. ¶ A21. Without the candidate information NIBIN produced, the defense cannot replicate the examiners searches, or evaluate the accuracy of their work.

The key bases of the firearms examiner's opinion have not been disclosed, and thus the defense has been denied the opportunity to challenge the Government's evidence.

VI. AT A MINIMUM, THE COURT MUST LIMIT THE TESTIMONY OF THE FIREARMS EXAMINER SO THE JURY IS NOT MISLEAD

Should this Court refuse to exclude the examiner's testimony on firearms identification, it should nonetheless limit the examiner's conclusions to describing the similarities he sees between the two sources, without declaring that the spent ammunition was fired from the same gun or that the spent ammunition was fired from a specific gun. This Court should also insist that firearms examiners present the only documented error rate – between 1 in 46 and 1 and 66 – to the jury. *See* PCAST Addendum at 7. Failure to limit this testimony will mislead the jury, violating Federal Rules of Evidence 702 and 403, and Mr. Medley's Due Process rights. The examiner must not be permitted to overstate the significance of his conclusion by making claims that exceed the empirical evidence and the applications of valid statistical principles to that evidence. Instead, the

examiner must "report the overall false-positive rate and sensitivity for the method established in the studies of foundational validity," and should "demonstrate that the foundational [or black-box] studies are relevant to the facts of the case." PCAST Report at 6.

Courts must limit the examiner's testimony if there is a gap between the conclusions supported by existing data and the examiner's conclusions. *Gen. Elec. Co. v. Joiner*, 522 U.S. at 146. Permitting the examiner to state conclusions beyond those supported by the data blindsides the jury into giving the examiner's testimony more significance than is due. For this reason, courts have refused to allow firearms examiners to make conclusions of absolute certainty when declaring a match, as no empirical evidence shows that toolmarks are always unique, or that examiners are generally right. *See, e.g. Willock*, 696 F.Supp.2d at 549 (requiring the expert to state his opinions and conclusions without any characterization to the degree of certainty); *Taylor*, 663 F.Supp.2d at 1180 ("[B]ecause of the limitations on the reliability of firearms identification evidence . . . [the examiner] will not be permitted to testify that his methodology allows him to reach this conclusion as a matter of scientific certainty."); *Glynn*, 578 F.Supp.2d at 574 (emphasizing that examiners tend to make assertions "that their matches are certain beyond all doubt, that the error rate of the methodology is 'zero,' and other such pretensions."); *Monteiro*, 407 F.Supp.2d at 372.

This Court should therefore preclude the Government from introducing testimony suggesting there is any statistical significance tied to similar toolmarks found on ammunition unless the firearms community presents data showing that certain characteristics are unique. As the three reports discussed throughout demonstrate, there is insufficient empirical evidence suggesting that toolmarks are unique or that examiners can declare a match at the exclusion of all other weapons.[10] Instead, this Court should limit the examiner to pointing to the similarities he

[10] It is not enough to simply bar the examiner from using the phrase, "to the exclusion of all others." "A statement that markings are 'unique' to a particular gun is a statement that that the probability of finding

sees between the ammunition, and any differences identified.[11] As explained *supra*, no researchers have conducted reliable scientific studies analyzing the frequency of toolmark characteristics. The firearm examiner, therefore, has no more idea than the jury as to the significance of similarities or differences between toolmarks left on ammunition.

Alternatively, this Court should limit the examiner to testifying only that "this gun cannot be eliminated as the source of the bullet/cartridge." This is the ruling made recently by the circuit judge in *State of Missouri v. Scott Goodwin-Bey*, No. 1531-CR00555-01 (Dec. 16, 2016). After hearing testimony from both prosecution and defense firearms experts, the trial judge expressed serious concern over the lack of a scientific basis supporting firearms comparison testimony. "As it stands today," the Court noted, "independent scientists have uniformly concluded that firearm and toolmark analysis has not been scientifically validated. Only current and former law enforcement personnel – who have proverbial skin the game – believe otherwise." *Id*. at *4-5.[12]

Finally, this Court must require the examiners to accurately report an error rate. To date, the only available error rate comes from the Ames study. The expert should therefore have to tell the jury that the field has an error rate between 1 in 46 and 1 in 66 and that there is no data on this

another gun that can create identical bullet markings is zero. If purportedly unique patterns on bullets are declared to match, that declaration likewise negates the possibility that more than one gun could have fired bullets—it is a statement of unqualified certainty that the bullets were fired from a specific gun to the exclusion of all others." *See, e.g., Williams*, 130 A.3d at 352.

[11] "[T]he subjective nature of the process, lack of quantitative standards, and limited scope of foundational testing do not demonstrate the scientific principles necessary to establish the origin of the marks with any specific amount of certainty." *United States v. St. Gerard*, APO AE 09107, at 4 (U.S. Army Tr. Judiciary, 5th Judicial Cir. June 7, 2010).

[12] The Court emphasized that toolmark evidence is "all subjective," that there existed no "large scientific studies to determine an error rate," and that the "peer community is almost exclusively law enforcement." "Toolmark identification is a very valuable tool," the Court stated, but "that is where it should stay, in the area of law enforcement, not in the courts." *Id*. at 7.

examiner's ability.[13] "Claims of higher accuracy are not justified at present." PCAST at 12. Without this qualifying information, there is a grave risk that the jury will overvalue the expert's testimony.

CONCLUSION

For the reasons set forth in this motion, Mr. Medley respectfully requests that this Court exclude the proposed testimony of the firearms examiner, or in the alternative limit such testimony as described above. Mr. Medley further requests a hearing on this matter to enable him a meaningful opportunity to demonstrate to the Court the necessity for the relief requested herein.

Respectfully submitted,

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[13] The defense requested information with regard to proficiency testing taken by the examiners in this case. To date, the defense has not received any information other than the dates of the exams and that every person in the firearms section of the PG County Forensic Division passed every proficiency test recorded. It is well-documented that the firearms field lacks the rigorous proficiency testing and controls for minimizing human error and bias that ensure the method is reliably applied. Whereas "[s]cience takes great pains to avoid biases by using strict protocols to minimize their efforts," NRC Forensics at 122, the field of firearms identification has not taken any steps in that regard. *Id*. at 8 n.8 ("Unfortunately . . . there is no good evidence to indicate that the forensic science community has made sufficient effort to address the bias issue."). To the contrary, firearms examiners are often given contextual information about the case and evidence before performing examinations. *Id*. at 123; *see also Taylor*, 663 F. Supp.2d at 1178 (quoting *Green*, 405 F.Supp. 2d at 108. And the field lacks the rigorous proficiency testing showing that specific examiners are capable of conducting accurate evaluations in each case. PCAST Report at 111-12.

CERTIFICATE OF SERVICE

I hereby certify that on March 21, 2018, a copy of the foregoing was served via CM/ECF to parties in this matter.

_____/s/_____
Michael S. Oppenheimer