

SUPERIOR COURT OF THE DISTRICT OF COLUMBIA
Criminal Division – Felony Branch

UNITED STATES	:	2016 CF1 17282
	:	
v.	:	Hon. Craig Iscoe
	:	
MASTER THOMAS	:	

**GOVERNMENT’S MOTION *IN LIMINE* REGARDING
FIREARM AND TOOLMARK TESTIMONY**

There are two motions pending before the Court regarding the admissibility of firearm and toolmark testimony in this case: (1) The Government’s Notice of Intent to Introduce Relevant Evidence of Firearm Possession, filed January 5, 2018; and (2) Defendant’s Motion to Preclude the Government from Admitting Ballistics Evidence and Expert testimony that the Same Firearm Was Used in Two Unrelated Shootings, filed January 28, 2018. At a hearing on August 29, 2019, and in a scheduling order issued on August 30, 2019, the Court sought clarification regarding the scope and limitations on the proposed firearm and toolmark testimony, particularly in light of the Court of Appeals decisions in Gardner v. United States, 140 A.3d 1172, 184 n.19 (D.C. 2016) and Williams v. United States, 210 A.3d 734 (D.C. 2019) (Williams II). With Defendant’s agreement, the government requested additional time to brief the Court on these issues in light of the recent ruling by Judge Edelman in United States v. Marquette Tibbs, 2016 CF1 19431, where the Court, *inter alia*, reduced the firearms examiner’s testimony to a statement that an evidentiary casing “could not be excluded” as having been fired from a particular firearm. This Supplemental

Memorandum is intended to address those issues.¹

It is important to note up front that the record in Williams II was deficient insofar as it did not have the benefit of sworn statements from leaders in the scientific community, including the DNA community, that PCAST is scientifically flawed and has been disproven by subsequent research. Moreover, according to leaders within the scientific community, Judge Edelman's holding is riddled with factual inaccuracies, ignores the vast majority of existing validation, and contravenes the Court of Appeals holding in Gardner where the Court held that it is permissible for **“toolmark experts to offer an opinion that a bullet or shell casing was fired by a particular firearm,”** but noting that they are not permitted to do so “with absolute or 100% certainty.” Gardner v. United States, 140 A.3d 1172, 184 n.19 (D.C. 2016) (emphasis added). In other words, Judge Edelman did not arrive at his conclusions by performing a meaningful evaluation of the existing validation data; rather, he used PCAST as a basis to ignore the existing scientific data. Scientific leaders and the hundreds of accredited laboratories throughout the United States and the world reject this myopic approach.

Notably, the vast majority of federal and local judges around the country, including Judge Bartnoff and Judge Lee, have rejected these types of limitations. Judge Edelman's ruling that firearms and toolmark analysis fails to satisfy Daubert is an outlier decision and not in line with judges across the country who have decided this issue, many after extensive evidentiary hearings. *Most perplexing, rather than rely upon anyone with firearms and toolmark training, casework experience, research in the field, peer-review publication in the field, or membership on the Organization of Scientific Area Committees (OSAC), Judge Edelman relied upon the testimony of*

¹ The government's pleadings in Tibbs and the hearing transcripts are being filed in a separate Notice of Filing and will be referred to in this pleading for the sake of efficiency.

psychologists with no credentials whatsoever to evaluate the relevant Daubert factors. Finally, the PCAST report, primarily relied upon by Judge Edelman, and discussed in *dictum* in Williams II, is outdated, flawed, belied by scientific empirical data, and has been rejected by the scientific community at large.

I. The Government Is Not Offering “Unqualified” Testimony From the Firearms Examiner

Here, Firearms Examiners will not be offering “unqualified” testimony, but expert opinion based on training and experience and the degree of agreement of individual characteristics observed under the comparison microscope between the fired cartridge casings. **For example, Mr. Coleman will state that items three through five consist of three .40 caliber Smith & Wesson cartridge cases. Based on the level of agreement in individual characteristics observed under the comparison microscope of firing pin aperture shear marks and firing pin impressions, he concluded that the fired cartridge cases were fired from the same gun.** He will **not** use unqualified terms such as “match.” He will **not** state his expert opinion with any level of statistical certainty, much less 100% or absolute certainty. He will **not** render his opinion “to the exclusion of all other firearms” or use the phrase “to a reasonable degree of scientific certainty.”

This testimony is consistent with the manner in which firearms examiners from accredited laboratories throughout the country convey their conclusions to juries. The Tibbs Opposition pleading, pp. 16-20, discusses how a firearms examiner can appropriately convey an association between a casing and a particular firearm, or another evidentiary casing, without overstating a conclusion. In fact, the Tibbs Opposition fully incorporates the FBI Approved Standards for Scientific Testimony and Report Language for the Firearms/Toolmarks Discipline (ASSTR). The ASSTR permits examiners to offer an opinion that casings originated from the same firearm “when

the comparison of the microscopic marks are in sufficient agreement to conclude they originated or were created from the same individual source.” ASSTR 4.1. However, the ASSTR prohibits an examiner from concluding that casings were fired from the same firearm “to absolute certainty or to the exclusion of all other tools in the world” or to “assign a numerical degree of certainty.” ASSTR 5.1 / 5.2. The language of the ASSTR is consistent with the Department of Justice Uniform Language for Testimony and Reports for the Forensic Firearms/Toolmarks Discipline – Pattern Matching Examination (DOJ ULTR) (Attachment 1). The DOJ ULTR permits firearms examiners to conclude that casings were fired from the same firearm where “the quality and quantity of corresponding individual characteristics is such that the examiner would not expect to find that same combination of individual characteristics repeated in another source and has found insufficient disagreement of individual characteristics to conclude they originated from different sources.” *Id.* Section III. Like the FBI ASSTR, the DOJ ULTR precludes examiners from associating a casing to a firearm “to the exclusion of all other sources,” from asserting a “numerical degree of probability” without appropriate data, or use of the expression “reasonable degree of scientific certainty.” *Id.* Section IV.

In sum, the firearm examiners will adhere to FBI and DOJ standards by associating the casings as fired from the same firearm based on the level of agreement in individual characteristics (*e.g.*, firing pin aperture shear marks and firing pin impressions) observed under the comparison microscope. Equally important, the firearms examiners will NOT offer an unqualified opinion by stating a conclusion with absolute (100%) certainty, to the exclusion of all other firearms, or with a professed zero error rate). They will also refrain from using the phrase “to a reasonable degree of scientific certainty.”

II. Williams II is Limited to a Harmless Error Ruling and Does Not Alter Gardner

The holding in Williams II is clear that it need not resolve the meaning of footnote 19 in Gardner v. United States, 140 A.3d 1172, 1185-85 n.19 (D.C. 2016), where the Court of Appeals clarified that the holding is “limited in that **it allows toolmark experts to offer an opinion that a bullet or shell casing was fired by a particular firearm**, but it does not permit them to do so with absolute or 100% certainty” (emphasis added). Williams II, 210 A.3d at 741-72 (“We ultimately concluded that we need not resolve the ambiguity of Gardner’s footnote 19 in this case ...”). Williams II is equally clear that it was not questioning “the admissibility of firearms and toolmark examiner testimony generally.” Id. at 742. Rather, the holding of plain, but harmless, error in Williams II is limited to the facts of that case – where the examiner stated the conclusion (1) unequivocally (“these three bullets were identified as being fired out of Exhibit No. 58” ... “It was fired from the pistol” ... “Item Number 58 fired these three bullets”), (2) with absolute certainty (without “any doubt in [his] mind”) and (3) to the exclusion of all other firearms (“it doesn’t matter how many firearms Hi[-]Point made. Those markings are unique to that gun and that gun only”). Id. at 738. Given the Court’s prior holdings in Gardner and Jones v. United States, 27 A.3d 1130 (D.C. 2011), it is unremarkable that this type of “unqualified” opinion would be deemed plain error. However, Judge Nebeker’s concurrence makes clear Williams II “**is not a case in which to resolve the knotty question of to what degree of certainty, or not, an expert’s opinion is admissible as to a particular fact,**” but rather is “**confined to a harmless error judgement.**” Williams II, 210 A.3d at 746-47 (Nebeker concurring). As we discuss, the dictum about PCAST was without the benefit of the record here that shows PCAST is outdated, flawed,

belied by empirical data, and rejected by the scientific community at large.² Not surprisingly, virtually all courts to address the issue have held that PCAST does not preclude admissibility under Daubert. The dictum relating to the 2009 NAS Report is inconsistent with courts throughout the country that have concluded it had no impact on admissibility under Daubert and also inconsistent with the Court of Appeals observations about the NAS Report as it relates to firearms analysis as well as other areas of forensics.

Williams II characterized the examiner's testimony as an "unequivocal opinion." Williams II, 210 A.3d at 738. Gardner used similar verbiage in characterizing the examiner's opinion as "unqualified" and shed light on what qualifies as an "unqualified" opinion. Appellant in Gardner argued "the difference between whether the silver gun was definitely the murder weapon or whether it was simply believed by the ballistics expert to be the murder weapon" may have affected the jury's deliberations. 140 A.3d at 1183. To this point, in Gardner, the firearms examiner stated an "unqualified" or "unequivocal" opinion on direct examination ("Government exhibit 2 was fired in Government exhibit 71 – firearm, and Government exhibit 18, which is the copper jacketed bullet was fired from the barrel of Government's Exhibit 71"), cross-examination ("It was fired from the pistol") and redirect examination ("It was identified as having been fired from Government Exhibit 71"). Gardner, 140 A.3d at 1182.

Noting the government conceded this testimony to be improper, the Court further shed light on what was meant by "unqualified": "This is the second time we have noted in a published opinion the government's position that its ballistics expert should not give an unqualified opinion (**that is, one with 'absolute certainty'**), based on pattern matching, that a fatal shot was fired from a

² It is also worth pointing out that in Williams II and Motorola Judge Easterly wrote concurring opinions about PCAST, which is a red flag that others on the Court do not share her views.

particular gun.” *Id.* at 1184 (emphasis added). The Court then held: “that in this jurisdiction a firearms and toolmark expert may not give an unqualified opinion, or testify with absolute or 100% certainty, that based on ballistics pattern comparison matching a fatal shot was fired from one firearm, to the exclusion of all other firearms.” *Id.* Importantly, footnote 19 – *allowing “toolmark experts to offer an opinion that a bullet or shell casing was fired by a particular firearm”* – immediately followed the Court’s admonition against eliciting “unqualified” testimony. Thus, the only way to square footnote 19 with *Gardner*’s overarching discussion of “unqualified” opinions, is that firearms examiners can opine that a bullet or casing was fired from a particular firearm -- so long as the examiner avoids statements of certainty.

This approach is consistent with recent post-NAS, post-PCAST holdings by federal judges:

While no federal court (at least to the Court’s knowledge) has found the AFTE method to be unreliable under *Daubert*, several have placed limitations on the manner in which the expert is allowed to testify. The general consensus is that firearm examiners should not testify that their conclusions are infallible or not subject to any rate of error, nor should they arbitrarily give a statistical probability for the accuracy of their conclusions. Several courts have also prohibited a firearm examiner from asserting that a particular bullet or shell casing could only have been discharged from a particular gun to the exclusion of all other guns in the world. These restrictions are in accord with guidelines issued by the Department of Justice for its own federal firearm examiners which went into effect in January 2019. But it is also important to note that the courts that imposed limitations on firearm and toolmark expert testimony were the exception rather than the rule. Many courts have continued to allow unfettered testimony from firearm examiners who have utilized the AFTE method.

United States v. Romero-Lobato, 2019 WL 2150938 *3 (Dist. Ct. Nev. May 16, 2019) (citations omitted, emphasis added); *United States v. Johnson*, 2019 WL 1130358 **21-22 (Dist. S.D.N.Y. March 11, 2019 (“In the vast majority of cases in which courts have limited the opinions a firearms examiner may offer, the limitation has addressed whether the firearms examiner can state his or

her opinion to a specific degree of scientific certainty.... Often these limitations are imposed because of judicial or defense counsel concern that the firearms examiner intends to offer an opinion with absolute or 100% certainty.”³

Judge Bartnoff, *based on an initial pleading identical to the one PDS filed in Tibbs*, ruled consistently with federal judges around the country in rejecting the type of limitations proposed by the defense here:

The defense is asking the Court for additional limitations on the firearms expert’s testimony. The defense proposes that the expert only be permitted to describe the similarities he finds between the various pieces of ballistics evidence and to state (apparently without using the terms “match” or identification”) that he “cannot exclude” the possibility that certain bullets or casings were ejected from the same firearm. The defense also proposes that the expert be required to state any opinion in terms of the error rate found in a single non-peer reviewed study that is cited in the PCAST report. Those limitations far exceed the recent rulings of the Court of Appeals with regard to the appropriate scope of expert opinion testimony regarding toolmark identifications, the Court does not find those limitations to be warranted under Daubert. The Court therefore will not adopt them.

The Court will permit the government’s expert to testify in accordance with the ASSTR and consistent with the Court of Appeals decision in Gardner. The expert may state an opinion that bullets and/or casings were fired from the same firearm and explain the bases for that opinion, but he may not give an unqualified opinion or testify with absolute or 100 percent certainty that the bullet or casing is identified to one firearm, to the exclusion of all other firearms. He also may not state an opinion in terms of “scientific certainty.” Based on the government’s response to the defendant’s motion and the representations of government counsel at the hearing on the motion, it is the Court’s understanding that the government’s expert will be stating an opinion that complies fully with the principles articulated by the Court of Appeals.

³ Judge Edelman’s opinion repeatedly cites to Judge Rakoff, but Johnson illustrates that his colleagues in the Southern District of New York who have more recently examined this issue have not been persuaded by Judge Rakoff’s conclusions that (like Judge Edelman) represent an outlier view.

See U.S. v. Valdez, Case No. 2016 CF1 002267 ORDER at 5 Judge Judith Bartnoff (D.C. Super. Ct., Jan. 30, 2018) (Tibbs Opposition, Ex. VIII). As we demonstrate below, the evidence in the Tibbs hearing, as well as additional sworn statements and validation studies cited herein, only reaffirms that judges throughout the country have correctly determined that firearms and toolmark analysis satisfies Rule 702 and Daubert.

III. Judge Edelman’s Findings are at Odds with the Vast Majority of Local and Federal Courts that have Evaluated Firearms and Toolmark Identification under Rule 702 and Daubert and Belied by the Recent Scientific Studies that Establish Reliability and Illustrate Why The Scientific Community has Rejected PCAST

Importantly, as noted in United States v. Romero-Lobato, 2019 WL 2150938 *3, virtually every local and federal judge addressing admissibility of firearms and toolmark analysis under Rule 702 have found that it satisfies reliability under the Daubert standard. Thus, Judge Edelman’s ruling is an outlier. Courts have even questioned whether PCAST carries any weight, given the lack of subject matter expertise of the committee members. See e.g., United States v. Romero-Lobato, 2019 WL 2150938 *7 (“It is unclear if the PCAST Report would even constitute criticism from the ‘relevant community’ because the committee behind the report did not include any members of the forensic ballistic community”). As we demonstrate below, contrary to Judge Edelman’s ruling, studies issued since PCAST reaffirm that firearms and toolmark identification satisfies Rule 702. Moreover, judges here and throughout the country have correctly concluded that PCAST and the 2008 and 2009 NAS Reports do nothing to undermine reliability under Rule 702 and Daubert.⁴

⁴ The handful of outlier decisions around the country that deviate from a reliability finding under Rule 702 have not done any meaningful evaluation of the empirical data supporting firearms and toolmark identification but rather wholeheartedly embrace the conclusions of the three policy reports relied on by PDS in Tibbs, but rejected by leaders in the scientific community at large. See e.g., United States v. Davis, 2019 U.S. Dist. LEXIS 155037 (W.D. Va. Sept. 11, 2019).

As with other judges around the country, Judge Bartnoff concluded that these policy reports did not alter the scientific or legal landscape:

In its submission in this case, the government has provided additional information to the Court about research that has been done since publication of the 2008 and 2009 reports, including three-dimensional imaging studies, which provides further support for the validity and reliability of the identification of firearms by toolmark matching. The Court recognizes that the PCAST Report also questioned the use of toolmarks in identifying firearms, but the Court does not find that criticism persuasive, for the reasons set forth in the government's extensive filings, including the Declaration and Supplemental Declaration of Todd J. Weller. The PCAST Report did not address firearms identification evidence in any detail, but it appears to have ignored a substantial number of peer reviewed studies that confirm the basic validity and reliability of firearms identification by analysis and matching of toolmarks. The defense request for expert testimony of firearms and toolmarks to be excluded therefore will be denied.

Id. at 3; see also United States v. Johnson, 2019 WL 1130358 *13 ("All of these courts admitted expert testimony concerning toolmark identification, rejecting arguments that the 2008-2016 scientific reports had rendered such evidence inadmissible).

This is consistent with the fact that leaders throughout the scientific community have soundly rejected the findings of PCAST. Accredited laboratories throughout the United States, and around the world, continue to maintain firearms units where firearms examiners routinely issue reports identifying bullets or casings to a particular firearm. Moreover, leading forensic geneticists around the world have thoroughly rejected the two primary findings of PCAST as it relates to DNA analysis, namely PCAST's findings that complex mixture analysis using probabilistic genotyping (e.g., STRmix) or the Combined Probability of Inclusion (CPI) methodology do not enjoy foundational validity. Rejection of PCAST's findings regarding the validation of probabilistic genotyping such as STRmix – used by DFS, ATF, Signature Science, and Bode Labs here in the District of Columbia – is embodied in a peer-reviewed publication by technical leaders from

dozens of laboratories throughout the world demonstrating that STRmix had, in fact, been properly validated. See Jo-Anne Bright et. al. *International Validation of STRmix – A multi laboratory response to PCAST*, *Genetics* 34 (2018) 11-22 (Attachment 2). The primary criticism from PhD geneticists from around the world was that PCAST simply failed to consider “a wealth of unpublished validation material residing in laboratories that had validated (or were in the process of validating) probabilistic genotyping software.” Id. at 23. With respect to PCAST’s rejection of the CPI methodology, five of the leading geneticists from around the world, including Dr. John Buckleton (one of three original developers of STRmix), Dr. Fred Bieber (Harvard), and Bruce Budowle (the most published forensic geneticist) found that the issues related to CPI were with the application of the methodology, not the methodology itself. See Bieber et. al., *Evaluation of forensic DNA mixture evidence: protocol for evaluation, interpretation, and statistical calculations using the combined probability of inclusion*, *BMC Genetics* 2016) 17:125 (Attachment 3).⁵ The fact that PCAST got it wrong with respect to DNA – the gold standard of forensics – is also exemplified by the fact that accredited laboratories throughout the world continue to use these methodologies to interpret complex mixtures, and the reports are routinely admitted into evidence throughout the country, as well as in this Court and in D.C. federal district court. As discussed in detail below, Judge Edelman’s conclusion that PCAST somehow speaks for the greater scientific community when it clearly got it wrong with respect to DNA is baffling.

It is important to note that there was absolutely no record regarding firearms and toolmark identification, or PCAST for that matter, before the Court of Appeals when it considered firearms and toolmark analysis in Jones, Gardner and Williams. In each of those cases, the case did not

⁵ Drs. Bieber and Budowle were the very experts who uncovered the issues with CPI at the D.C. DFS in 2014.

benefit from the government's extensive pleadings. With the benefit of a full record, it should be apparent to the Court of Appeals, as it has been to virtually every federal judge throughout the country, that the scientific community at large has soundly rejected PCAST's findings regarding both firearms and DNA.

Moreover, Judge Edelman's reliance on the 2008 and 2009 NAS reports is equally baffling. Judge Edelman's conclusion that the 2008 NAS Report "directly addressed the sufficiency of the published studies purporting to show a low error rate in the field of firearm and toolmark identification," ignores the sworn statement by Dr. John E. Rolph, the Chair of the 2008 NAS Report, refuting this very finding:

The statement in the Report that the "validity of the fundamental assumptions of uniqueness and reproducibility of firearm-related toolmarks has not been fully demonstrated" (Report at 3-22) was not made in the context of assessing the admissibility of firearms-related evidence. Indeed, the Report states clearly that "*this study is neither a verdict on the uniqueness of firearm-related toolmarks generally nor an assessment of the validity of firearms identification as a discipline. Our charge is to focus on 'the uniqueness of ballistic images'—that is, on the uniqueness and reproducibility of the markings (toolmarks) left on cartridge cases and bullets as they are recorded or measured by various technologies*" Report at 1-5 (emphasis in the original)....

The Committee's cautionary statement [about not casting conclusions in terms of absolute certainty, to the exclusion of all other firearms, or implying a zero error rate] is not a commentary on the admissibility of firearm-related toolmark evidence. In the Committee's view, "statements on toolmark matches (including legal testimony) should be supported by the work that was done in the laboratory, by the notes and documentation made by examiners, and by proficiency testing or established error rates for individual examiners in the field and in that particular laboratory." Report at 3-23 to 3-24.

Sworn Statement of Dr. John E. Rolph (Attachment 4) at Paras. 6 & 10 (quoting portions of the 2008 NAS Report. Courts have relied upon Dr. Rolph in placing the 2008 NAS Report in proper

context. See United States v. Casey, 928 F. Supp.2d 397, 400 (D.P.R. 2013) (Dr. Rolph's statements greatly undermine the portions of the 2008 NAS report upon which defendant ... relies]."); State v. Langlois, 2 N.E.3d 936, 945 (Ohio Ct. App. 2013) ("the 2008 NRC report addressed the issue of establishing a nationwide database for the computer imaging of bullets. The report's primary focus was not firearms identification, comparative ballistics, or tool mark analysis."); Taylor, 663 F. Supp.2d at 1175-76, 1179-80 (holding firearms evidence admissible after considering, *inter alia*, the 2008 Ballistic Imaging Report); Otero, 849 F.Supp.2d at 430, 438 (same).

In addition, Judge Edelman's reliance on the 2009 NAS Report is also out of line with decisions throughout the country, none of which found the 2009 NAS Report to impact admissibility under Daubert. United States v. Ashburn, 88 F.Supp.3d 239, 274 (E.D.N.Y. 2015) (holding that firearms and toolmark identification is a proper subject of expert testimony under Rule 702 and Daubert after considering the 2009 NAS Report); State v. Romero, 341 P.3d 498, 498 (Ariz. App. Div. 2 2014) (same); United States v. Casey, 928 F. Supp.2d 397, 400 (Dist. P.R. 2013) (ballistics evidence admissible under Rule 702 and Daubert); State v. Langlois, 2 N.E.3d 936, 950 (Ohio Ct. App. 2013) (firearms and toolmark identification satisfies the test for reliability under Rule 702); United States v. Otero, 849 F. Supp.2d 425, 438 (D.N.J. 2012) (essential foundations for the admission of expert testimony under Rule 702 established by the government); United States v. Willock, 696 F. Supp.2d 536, 568 (D. Md. 2010); Taylor, 663 F. Supp.2d at 1180 ("The evidence before the Court indicates that when a bullet is fired from a gun, the gun will impart to the bullet a set of markings that is, at least to some degree unique to that gun. The evidence further indicates that an experienced firearms examiner can make observations of those markings, using a method that has been peer-reviewed, that allow him, in some cases, to form an opinion that

a particular bullet was or was not fired from a particular gun. The court therefore concludes that the firearms identification testimony is admissible under Rule 702 and Daubert.”); State v. Lee, 2017 WL 1494012, *10 (4th Cir., Apr. 26, 2017) (“[E]ven after publication of the NAS Report, courts have addressed, in detail, the reliability of [firearms and toolmark identification] testimony and ruled it admissible, although to varying degrees of specificity.”); Spears v. Ryan, 2016 WL 6699681, *5 (D. Ariz., Nov. 15, 2016) (“[T]he NAS Report would have had no effect on the admissibility of the toolmarks evidence in this case.”); Napier v. Commonwealth, 2014 WL 3973113, *9 (Ky. Ct. App., Aug. 15, 2014) (It was not the purpose of the 2009 NAS Report to opine on the long-established admissibility of toolmark and firearms testimony in criminal prosecutions and there was no error in taking judicial notice of scientific reliability of ballistic analysis under Daubert); United States v. Sebborn, 2012 WL 5989813, at * 8 (E.D.N.Y 2012) (no need for a Daubert hearing before admitting ballistics evidence); United States v. Cerna, 2010 WL 3448528, at *5 (N.D. Cal. Sept. 1, 2010) (the NAS report “does not necessitate exclusion of expert [ballistics] testimony.”).

It is equally surprising that Judge Edelman would rely upon 2009 NAS Report given that in the firearms and toolmark analysis context the D.C. Court of Appeals concluded in Jones that, “[a]lthough [the 2009 NAS Report] is not properly before us, even after considering it, we are still unpersuaded that *pattern matching* is no longer generally accepted.” Jones, 27 A.3d at 1137 n. 7 (emphasis added). Soon after, in Thomas v. United States, the Court of Appeals commented:

In challenging the general acceptance of firearms and toolmark identification, [appellant] relies primarily on [the 2009 NAS Report] – a broad-based report, commissioned by Congress, examining a variety of forensic disciplines, not just firearms and toolmark identification. [Appellant] relies on language in the report, which challenges the lack of statistics, “lack of sufficient studies,” and “lack of a precisely defined process” as evidence that firearms and toolmark identification[s] are no longer generally accepted or, in

fact, not “science” at all. [Appellant], however, confuses a single scientific report, which reaches no definitive conclusion and which includes no independent examination of the challenged methodology, with general discord in the scientific community. We therefore reject [appellant’s] reliance on the [2009] NAS Report.

Memorandum Opinion and Judgment ** 3-4.⁶

We note, other than the issuance of the harmless error decision in Williams II, the only difference in the evidence presented to the Court in Valdez and Tibbs was sworn statements and testimony from four individuals. The defense presented two purported experts, **both psychologists**, who: (1) are not trained firearms and toolmark examiners; (2) have not conducted peer-review publications in the field of firearms and toolmark examination; (3) have not designed or conducted any studies in the field of firearms and toolmark examination; and (4) have made no meaningful contributions to the field. As such, their statements and testimony do nothing to change the Rule 702 analysis.

The government presented statements and testimony from Todd Weller (Chair of the

⁶ The Court of Appeals also had occasion to consider the NAS report in the latent fingerprint context in Gee v. United States, 54 A.3d 1249 (D.C. 2012). Gee upheld the trial court’s decision to preclude the defendant from impeaching the government’s fingerprint analyst with the NAS report because the report was not a learned treatise. 54 A.3d at 1268. The Court explained, “On the issue that was before the trial court—whether the relevant scientific community accepts such statements in the [r]eport as authoritative—there is post-[r]eport commentary that appears to be consistent with government counsel’s proffer that the answer to that question is ‘no.’” *Id.* at 1266 n.24 (collecting sources). For example, the report was “compiled by a committee of forensic scientists, statisticians, judges, and lawyers but no fingerprint examiners.” *Id.* at 1266 n.24 (internal citation omitted). Thus, the Court held that it was not an abuse of discretion to decline to take judicial notice of the NAS report as a learned treatise. *Id.* at 1266. In reviewing the admissibility of handwriting analysis under the Frye standard, the D.C. Court of Appeals cited Jones for the proposition that “pattern matching is not new, and courts in this jurisdiction have long been admitting firearms identifications based on this method.” Pettus, 37 A.3d at 217. The Court also addressed appellant’s assertion that the 2009 NAS Report “taken as a whole amounts to a critique, and repudiation, of the supposed science underlying all forensic analysis based on pattern-matching, except DNA.” *Id.* at 226. The Court of Appeals concluded: “In our view, however, it exaggerates the measured conclusions and recommendations of the [2009 NAS] Report to read them as a rejection of the scientific basis for all pattern-matching analysis, including handwriting identification.” *Id.* at 227. As in Jones, the Court of Appeals concluded that the 2009 NAS Report did not undermine the scientific consensus supporting identifications. *Id.* at 228 and n. 31.

firearms and toolmark subcommittee for the OSAC, and Dr. Nicholas Petraco (an applied mathematician with a Ph.D. in theoretical Chemistry). Both Mr. Weller and Dr. Petraco have made significant contributions to the field and reaffirm that ongoing research and validation supports the admissibility of firearms and toolmark identification. Given the extensive testing, peer-review, low levels of error, and general acceptance throughout the world, virtually every court to address the admissibility of firearms evidence under this standard has ruled in favor of admitting firearms evidence. State v. Romero, 341 P.3d 493, 498 (Ariz. App. Div. 2 2014) (“Several federal district courts have held that firearms identification testimony is sufficiently reliable under Daubert and Federal Rule 702”); United States v. Hicks, 389 F.3d 514, 526 (5th Cir. 2004) (noting that defendant was unable to point the court to a single case in any circuit showing that the methodology was unreliable); United States v. Santiago, 199 F. Supp.2d 101, 111 (S.D.N.Y. 2002) (“The Court has not found a single case ... that would suggest that the entire field of ballistics identification is unreliable.”). Changing from Frye to Daubert has had no impact on the admissibility of firearms and toolmark identification evidence. See id. (After abandoning Frye, the court found “that the methodology governing firearms identification is sufficiently reliable, under Daubert and ... Rule 702, to permit a qualified expert to provide in-court technical testimony.”). Many federal courts have held extensive hearings before admitting firearms and toolmark identification evidence. See e.g., United States v. Montiero, 407 F. Supp.2d 351, 355 (D.Mass. 2006) (six-day hearing); United States v. Diaz, 2007 WL 485967, * 1 (N.D. Cal. Feb. 12, 2007) (four-day hearing); United States v. Taylor, 663 F. Supp.2d 1170, 1171 (D.N.M. 2009) (two-day hearing); United States v. Otero, 849 F. Supp.2d 425, 429 (D.N.J. 2012) (three-day hearing).

Addressed through the Daubert factors, we demonstrate how the testimony of these

witnesses, as well as the scientific studies discussed at the truncated Tibbs hearing⁷, reaffirm the admissibility of firearms and toolmark identification testimony offered here and throughout the country under Rule 702 and illustrate how Judge Edelman's ruling is erroneous.

1. Testability

Judge Edelman concluded that firearms and toolmark identification had undergone testing and therefore satisfied the first prong of Daubert. However, it is important to point out that Judge Edelman's evaluation of validation in the field of firearms and toolmark identification generally suffers from a number of basic factual misunderstandings that have broad implications. Primarily, Judge Edelman perceived the firearms and toolmark community as an insular field that is researched primarily by practitioners and evaluated primarily through peer-review in the AFTE Journal. Mr. Weller points out that both of these conclusions are factually incorrect. For example, Judge Edelman concludes that there are only two validation studies that appear in Journals other than the AFTE Journal. In Mr. Weller's updated affidavit (Attachment 5), he cites to forty-seven scientific studies involving firearms and toolmark analysis that were published elsewhere, including the following ten scientific journals: 1) Forensic Science International, 2) Journal of Forensic Sciences, 3) Science and Justice, 4) National Institute of Standards and Technology, 5) Surface Topography, 6) Measurement Science and Technology, 7) Scanning, 8) Three Dimensional Imaging, Processing and Applications, 9) The Annals of Applied Statistics, and 10) Journal of Physics. Weller Affidavit Attachment A. These studies alone were authored by sixty-seven scientists, most of whom hold PhDs in a wide range of the applied sciences, including

⁷ The hearing Tibbs was truncated and rushed. Both government witnesses were not available in person on the week of May 13th, 2019, and government counsel was scheduled to leave town at the end of the week. The Court denied the government's request to do the hearing earlier or later than May 13 and had the government witnesses provide truncated testimony *by video* in which they adopted their affidavits and addressed some points by the defendant's witnesses in their affidavits.

statistics, engineering, quantum chemistry, mathematics, physics, computer science, and physical chemistry to mention a few. Id. at 41-44. Many of these scientists, such as Max Morris, the Chair of Statistics at Iowa State University, specialize in experimental design – which completely undermines Judge Edelman’s acceptance of Dr. Scuirich’s argument that persons conducting research in this area do not understand experimental design. Scientific studies authored by scientists and academics from a variety of applied scientific disciplines and published in a variety of scientific journals demonstrates that the field of firearms and toolmark identification has embraced the call for more research and has welcomed outside scientists into the field. Accordingly, Judge Edelman’s conclusion that the field comprises of practitioners who primarily publish research in the AFTE Journal is simply inaccurate.

The vast majority of these studies were published after the 2009 NAS Report and fourteen of these studies were published after the PCAST report, demonstrating the outdated nature of these policy reports. Much of this research focused on the use of 3D imaging and sophisticated algorithms in the field of firearms and toolmark analysis. This area of research has been the focus of applied scientists and academics, but ignored by Judge Edelman presumably because he did not understand its application to the current state of validation. As discussed by Mr. Weller, recent developments in the area of 3D imaging have further illustrated the ability of a trained firearms examiner to accurately identify a casing to a particular firearm and have relevance when weighing several Daubert factors, including testability, error rates, and peer-review. The point missed by Judge Edelman is that 3D imaging is not just a promising new area of scientific research (that demonstrates a commitment by the field to move towards more objective, scientific method), but also a tool that further illustrates how accurate and precise firearms examiners are in identifying a casing to a particular firearm.

For example, a recently published study by government witness Todd Weller and other scientists illustrates how the use of 3D imaging is not limited to machine learning but has direct application to implementation of the AFTE theory of identification by humans. See Pierre Duez, et. al., Development and Validation of a Virtual Examination Tool for Firearm Forensics, *J Forensic Sci*, July 2018, Vol. 63, No. 4 (Attachment 6) (referred to throughout the Tibbs hearing as the “heat map study”). In the heat map study, trained firearms examiners used virtual microscopic tools, i.e., 3D images rather than a comparison microscope, to correctly identify casings to a particular firearm. Id. at 1069. Although not used in this particular case, using 3D images to perform firearms and toolmark identification is no different from using scanned latent and known prints to conduct ACE-V analysis in the latent fingerprint field – a practice commonly used by D.C. DFS and routinely admitted into evidence in this Court. In other words, the method utilized is the same; examiners are merely comparing 3D images rather than markings under a comparison microscope. This type of post-PCAST research is further evidence of testability.

More importantly, this study – “the largest study on the feasibility of virtual microscopy for firearm forensics conducted to date,” id. at 1080, undermines many of the arguments put forth by the defense and many of the findings made by Judge Edelman. As a preliminary matter, the involvement of two Ph.D. scientists, Drs. Marcus Brubaker and Ryan Lilien, further refute the argument that applied scientists are not involved in the validation of firearms and toolmark identification. The study further illustrates the low rate of errors made by trained firearm examiners in identifying casings to a particular firearm. Forty-six trained examiners “correctly reported 100% of the identifications (known matches) while reporting no false positives.” Id. at 1069. There were no “inconclusive” conclusions where ground truth was an identification

(meaning sensitivity was 100%). Weller Affidavit at 16.⁸

PCAST, defendant's witnesses in Tibbs, and Judge Edelman were all critical of any study that was not a "black box" or "open set" design; in fact, this was the rationale for ignoring most of the validation in the field. However, one of the two tests administered in the heat map study met PCAST's criteria for black box design because the "test-set has questioned samples, and a known sample to be compared" and there were "questioned samples that match and do not match the known". Weller Affidavit at 16 n. 84. It is unclear what Judge Edelman's rationale was for ignoring the black box portion of the study. We note too that both parts of the study survived double blind peer-review in the *Journal of Forensic Sciences* (JFS), demonstrating that the scientific community rejects the notion that only black box design is worthy of consideration.

The heat map study also consisted of a "white box" study that provided researchers insight into the exact markings that all of the firearm examiners independently relied upon to correctly identify casings to particular firearms. As Mr. Weller discusses, the following heat map exhibit illustrates how "examiners from different laboratories (15), each working independently, are mostly using the same amount and same location of microscopic marks when concluding identification." Weller Affidavit at 16; Tibbs 5/13/19 TR at 110-12. The red zone represents breach face marks.

⁸ We note, Judge Edelman was fixated on all inconclusive determinations, even where ground truth was an exclusion; however, would a jury ever be interested in knowing the rate at which an examiner reaches an inconclusive conclusion where a suspect is excluded – especially where, as here, an examiner has rendered a positive identification?



Thus, not only did the study reaffirm that trained examiners could accurately identify casings to a specific firearm, but it demonstrated how alternative forms of study design are valuable to the advancement of the field, a point lost on PCAST and Judge Edelman. This one study is a microcosm of how current scientific research belies the approach taken by PCAST. Importantly, this study and the above image were presented at the Tibbs hearing. It is unclear why Judge Edelman ignored this study, or the entire field of 3D research for that matter.

Another critical point is that researchers such as Mr. Weller have shown objective data to support the idea that consecutively manufactured firearms produce markings with distinguishable individual characteristics. Weller Affidavit at 5 citing Weller T, Zheng A, Thompson R, Tulleners F “*Confocal Microscopy Analysis of Breech Face Marks on Fired Cartridge Cases from 10 Consecutively Manufactured Pistol Slides*” J. Forensic Science, July 2012 57(4) pp. 912-917. In this study, despite the presence of subclass toolmarks, there was no overlap of data between the matching (720 comparisons) and non-matching (7290 comparisons) test fires. Id. Like the more recent heat-map study, this study survived peer-review in the Journal of Forensic Science. The authors concluded:

The data strongly support the hypothesis that for the type of manufacturing processes studied, marks left by the breech face can be used both to distinguish between firearms and to associate fired evidence to a particular firearm. We would like to highlight that we did not observe a high cross-correlation value for nonmatching comparisons. At this time, supported by the

selected weapon and ammunition, the research provides objective scientific support that even with the high degree of topographical similarity between consecutively manufactured surfaces, one can still correctly separate the surfaces based on their random surface features.

Id. at 5 (emphasis by Weller). Equally important, “there is no published research from the 3D studies that supports the opposite: namely that non-matching toolmarks are likely to have a high degree of correspondence and therefore likely to be mistaken as having originated from the same source.” Id. at 6.

Additionally, no other scientific discipline subscribes to PCAST’s approach of discarding all research data that does not meet the black box design. As Dr. Petraco pointed out at the Tibbs hearing, such an approach would require scientists to ignore Einstein’s theory of relativity! Tibbs 5/13/10 TR at 19. The implications of such an approach in physics, according to Dr. Petraco, is that humans would do without things such as space travel, satellites, cellular telephones, etc. Id. There is no requirement under Rule 702 or Daubert that test design must comport with PCAST. In fact, every other court to address this issue and the scientific community at large have rejected such an approach. Examination of the work done by the firearms examiners in this case illustrate why such an approach is misguided. The examinations did not involve a black box, pairwise study scenario advocated by PCAST, but rather involved the comparison casings collected from the crime scene. Of course, this gave them the advantage of being able to observe how markings repeated across the casings. The work done in this case supports the point made by Todd Weller at the hearing that one study design cannot capture the host of scenarios confronted by examiners in casework and illustrates the absurdity of disregarding any validation that does not equate to a black box design.

Like the members of PCAST, the defense witnesses in Tibbs had no experience whatsoever

in study design, research or casework. Instead, the defense proffered two psychologists, one of whom was a lawyer. It is somewhat alarming that the Court would largely disregard nearly a century of validation research based on the opinions of psychologists, a field recently rocked by the revelation reported in the prestigious journal *Science* that over half of psychology studies fail the reproducibility test. See *Estimating the Reproducibility of Psychological*, *Science*, 28 August 2015 – Vol 349 Issue 6251 (Attachment 7). In an article published in *Nature* (another prestigious scientific journal), the author commented as follows about the study published in *Science*: “Don’t trust everything you read in the psychology literature, in fact, two thirds of it should probably be distrusted.” See *Nature News* at 1 (Attachment 8). This commentary was not surprising considering that “According to the replicators’ qualitative assessments ... only 39 of the 100 replication attempts were successful.” Id. The logic of dismissing years of scientific validation based on the testimony of psychologists with no training or experience in the field of firearms or toolmarks is flawed.

2. Error Rates

Research in the field of firearms and toolmark identification asks the question of whether trained firearms examiners can identify a casing or bullet to a particular firearm with a high degree of accuracy. The question posed by these studies is not whether a casing can be “excluded from having been fired from a particular firearm.” While error rates are complicated to calculate for myriad reasons,⁹ all who are involved in study design, research, or casework, and courts generally, with the exception of Judge Edelman and a few other outliers, have concluded that the validation research to date establishes a low error rate. See e.g., *United States v. Romero-Lobato*, 2019 WL

⁹ Judge Edelman concludes that error rates cannot be calculated for most studies; however, Judge Edelman is confusing false positive error rates with overall error rates. *Weller Affidavit* at 7, 9-10.

2150938 *5 (“[T]he studies cited by [the firearms examiner] in his testimony and by other **federal courts examining the issue universally report a low error rate for the AFTE method.**”) (emphasis added).

A critical flaw in PCAST’s evaluation of the field of firearms and toolmark identification, and by extension the ruling by Judge Edelman, is a perceived difference in the false positive error rates, as well as “inconclusive” decisions, between “open” (pairwise, black box) studies and “closed” studies:

Specifically, the closed-set studies have inconclusive and false-positives rate that are dramatically lower (by more than 100-fold) than those for the partly open design (Miami-Dade study) or fully open, black-box designs (Ames Laboratory) studies described below.

PCAST at 109; Tibbs Memorandum Op. at 36-37. This perceived difference in study design is critical because it is the rationale PCAST and Judge Edelman used to ignore volumes of validation establishing an extremely low rate of false positive identifications, an approach rejected by virtually all other courts to address the issue. See e.g., Romero-Lobato, 2019 WL 2150938 * 5 (“While the Court is cognizant of the PCAST Report’s repeated criticisms regarding the lack of true black box tests, the Court declines to adopt such a strict requirement for which studies are proper and which are not. Daubert does not mandate such a prerequisite for a technique to satisfy its error rate element.”).¹⁰

¹⁰ Mr. Weller meticulously details how PCAST incorrectly calculated the error rates when comparing open and closed set studies. Weller Affidavit at 33-37.

“PCAST is not comparing apples-to-apples because the “set-to-set/closed” and “set-to-set/partly open” error rates in Table 2 are not false positive error rates.” The justification for the “striking difference” between the “closed-set” studies and “open-set” studies espoused by PCAST is not

A recently published black box study involving fired casings illustrates that PCAST is outdated and simply wrong that such a design leads to an increase in either the “rate of false positive identifications” or “inconclusive” conclusions. See Keisler et. al., Isolated Pairs Research Study, *AFTE Journal – Volume 50 Number 1 – Winter 2018* (Attachment 9) & Addendum in the form of a Letter to the Editor, *AFTE Journal – Volume 50 – Number 3 – Summer 2018* (Attachment 10). Of a possible 1512 true positive identifications, firearms examiners successfully identified 1508 casings to the correct firearm. **There were zero false identifications.** Keisler at 56 & Addendum at 131.

Equally important, there were only four inconclusive determinations where ground truth indicated a positive identification. Addendum at 131. Again, the data in Keisler disproves the idea that inconclusive determinations spike in the pairwise, black box context. The low number of inconclusive determinations reflected in the “sensitivity” – i.e., the percentage of times examiners correctly identify a casing to a firearm where ground truth is an identification – which was 99.7%. Keisler at 56 & Addendum at 131. This data belies Judge Edelman’s concerns that examiners could simply avoid hard comparisons by deciding inconclusive all of the time. It also overlooks that “[e]rror rate studies can account for inconclusives by calculating the specificity and sensitivity.” Weller Affidavit at 21. As pointed out by Mr. Weller, the presence of inconclusive conclusions would certainly be a concern if sensitivity was extremely low, but the Keisler study refutes this concern. In fact, the data from this and other studies confirms that “[w]hen examiners are faced with true same-source samples, the overwhelming amount of the time they will conclude

supported. This report fell flat when received by the forensic community and has been widely rejected as serious critique by forensic practitioners.

Id. at 37.

identification, and also do so at very low error rates.” Id. at 21-22.

Judge Edelman’s ruling also overlooks the basic fact that the primary issue presented is whether the identification rendered by the firearms examiner is, in fact, correct. To answer that question, the Court should inquire how often examiners err when making a positive identification. Otero, 849 F. Supp.2d at 433 (“Indeed, for the purposes of utilizing toolmark identification in legal proceedings, the critical validation analysis has to be the extent to which false positives occur.”). The Keisler study demonstrated zero false positive identifications with casings using the black box design advocated by PCAST. In fact, the Keisler study shows that when ground truth is a positive identification of a casing to a particular firearm, examiners are inclined to make an identification, and to make it correctly. When considering all of the validation to date, Dr. Petraco, the only applied scientist to testify at the Tibbs hearing, who has a decade of research experience in the field of firearms and toolmark identification, testified that validation suggests a low error rate, e.g. below 1%. Tibbs 5/13/19 TR at 19.

New studies continue to reveal the flawed logic employed by PCAST and Judge Edelman. Mr. Weller and Dr. Ryan Lillian, an MD with a PhD in computer science, just recently presented the results of yet another black box study involving fired casings at a conference. 9/5/19 Weller Affidavit at 16. Like the heat map study, this study involved firearms examiners using new 3D imaging to identify casings to a particular firearm. The study included trained examiners from the United States and Canada and Mr. Weller will be submitting it for publication in the Journal of Forensic Science. Overall, 76 examiners correctly identified 453 casings to a particular firearm. Id. Only three false positives identifications were reported from 693 true different-source samples, resulting in a false positive error rate of 0.433%. Id. Moreover, sensitivity was 92.2%, id., once again reaffirming examiners tend to make a call, and make it correctly, when confronted with a

possible identification involving a casing, and refuting Judge Edelman's concern that examiners may be avoiding difficult decisions by simply concluding "inconclusive." Id.

PCAST dismissed studies involving consecutively manufactured firearms – considered worst-case scenario design by practitioners and researchers in the field, Weller Affidavit at 34 – because it equated it to completing a puzzle. Not surprisingly, PCAST does not cite a single trained firearms examiner who subscribes to this theory. Although the import of these worst-case-scenario validation studies were lost on PCAST, courts have appreciated the significance of the studies on reliability under Rule 702. Otero, 849 F. Supp.2d at 432 (“Some of these ‘validation studies’ seek to validate the theory that one can individualize tools, even when comparing marks made by tools of the greatest possible similarity, such as those involved in the consecutive manufacture of various firearms of the same make.”). Ironically, the study with the highest reported false positive error rate (1.6%) involved this type of “closed” study design. Weller Affidavit at 12 citing Maryland B, et al. *Validation of Obturation Marks in Consecutively Reamed Chambers* AFTE Journal Vol. 44(2) Spring 2012, pp. 167-9. More to the point, each type of design, whether black box or closed-set contains studies with “some false identifications and others with zero false identifications.” Weller Affidavit at 12.

The flaw in focusing only on “open” black box studies is more obvious here, where the examiners’ work was not analogous to a pairwise study, but rather involved the comparison of multiple casings without the benefit of a known firearm. In one study researchers attempted to mimic the very scenario encounter by the examiners here by providing examiners with casings and bullets but no known firearm. See Smith et al., A Validation Study of Bullet and Cartridge Case Comparisons Using Samples Representative of Actual Casework, *J. Forensic Sci.* 2016 (Attachment 11). “The false-positive error rate recorded for the evaluation of cartridge cases in

this study was .144%.” Id. at 5. As in the Keisler study, overall sensitivity for casings was high at 95.5%, id., again reaffirming that, trained examiners will typically make a call with a high degree of accuracy. Once again, the fact that this study survived the double-blind peer-review process (which Judge Edelman deemed “meaningful”) demonstrates that the scientific community values research that falls outside PCAST’s black box universe.

Aside from ignoring most of the 400 plus firearms studies submitted for review, PCAST inflated the false positive error rates in the handful of studies addressed by removing “inconclusive” determinations from the calculations. This approach ignored the fact that the AFTE Guidelines, the FBI ASSTR, and now the DOJ guidelines, all make clear that “inconclusive” is an appropriate response if an examiner is not seeing sufficient agreement to make an identification or an exclusion. However, even under this approach, the false positive rate was only elevated to 1.5% (Ames black box Laboratory Study) and 2% (Miami-Dade study). PCAST at 111 Table 2. As noted by United States District Court Judge Paul G. Gardephe of the Southern District of New York, even accepting these rates – which are significantly higher than the false positive error rates calculated by the authors in these studies and in the studies ignored by PCAST – the error rate calculated under PCAST’s method still satisfies this Daubert factor. Johnson, 2019 WL 1130358 * 19 (“Finally, even accepting the PCAST Report’s assertion that the error rate could be as high as 1 in 46, or close to 2.2%, such an error rate is not impermissibly high.”). Of course, the vast universe of validation ignored by PCAST, as well as post-PCAST pairwise research such as the Keisler study (with a false positive error rate of zero) indicate that the error rate for the field is considerably lower. Weller Affidavit at 8 – 17 (discussing numerous recent validation studies, all revealing low false positive error rates). Ironically, the review of recent validation studies by Mr.

Weller is more comprehensive than the nine PCAST chose to review, five of which it committed basic math errors (for a PCAST error rate of 56%!). *Id.* at 34 & n. 163.

It is important to pause here and emphasize that defendant's primary expert in *Tibbs* went considerably further than PCAST in inflating the false positive error rate by hypothesizing that "inconclusive" decisions should be included in calculating the false positive error rate. Only by characterizing an inconclusive decision as a "false positive" is one able to inflate the false positive error rate in a select few studies to 20 or 30%. Importantly, this theory is the conception of a psychologist, not by a statistician with training or knowledge of firearms and toolmark identification. The attached affidavits by Dr. Max Morris, Chair of the Statistics Department at Iowa State University *who specializes in experimental design*, reveals the flaw in such an approach:

Using such a combined count as the numerator in an "error" proportion runs counter to any reasonable definition of "error."...

In the referenced report of Baldwin et al. (of which I am a coauthor), our more straightforward approach was to see "exclusion", "identification" and "inconclusive" as three distinct outcomes that can result from different-source comparisons, and we used $22/2178 = 1.01\%$ as the proportion of all such comparisons resulting [in] a (clearly) erroneous conclusion. As Scurich states in a footnote to his comments, an alternative approach would be to cite $22/1443 = 1/52\%$ as the proportion of erroneous calls among only those comparisons judged to have sufficient probative value to support a conclusion regarding source, a complication we chose not to include in our report, but which might be appropriate under some circumstances if clearly explained where cited. Either of these approaches limits the characterization of "error" to what is clearly an incorrect assessment regarding source. Because an "inconclusive" determination cannot be regarded as a claim that contradicts fact, "error" proportions computed by pooling such counts with factual errors in the numerator (e.g., $22+735$ in the Baldwin common-source samples) are **logically flawed and seriously misleading with respect to any reasonable interpretation of the word "error."**

See Attached 9/5/19 Affidavit of Dr. Max Morris at 1-2 (Attachment 12) (emphasis added in bold; underscore in original).¹¹ Unlike Dr. Scurich, Dr. Morris is a PhD statistician with a specialization in experimental design who has been involved in firearms and toolmark research, including the Baldwin black box study evaluated by PCAST, as well as the Addendum to the Keisler black box study. No researcher or practitioner has ever advocated Dr. Scurich's use of inconclusive conclusions as false positive errors. Dr. Petraco, who teaches statistics to graduate students, testified that Dr. Scurich's approach is so out of touch with reality that if a student presented a thesis with Dr. Scurich's calculations of error rates, not only would he fail the student but he would suggest that the student consider another profession. 5/19/19 Tibbs TR at 30.

At the Tibbs hearing, PDS proffered an article by cognitive neuroscientist Dr. Itiel Dror to support Dr. Scurich's theory. See Dror et al., "*Cannot Decide*": *The Fine Line Between Appropriate Inconclusive Determinations Versus Unjustifiably Deciding Not to Decide*, J. Forensic Sci., January 2019, Vol. 64, No 1 (Attachment 13). However, Dr. Dror himself does not support Dr. Scurich's theory. Dr. Dror makes clear that an "inconclusive" conclusion can never be a "false positive":

Inconclusive decisions therefore can be erroneous, but they are neither false positive nor false negative: they are false inconclusive.

See 9/3/19 Affidavit of Dr. Itiel Dror (Attachment 14) Par. 4.3.2. Dr. Dror emphasizes that there are times when "inconclusive" is the correct decision, i.e., "when the information is not sufficient to make any other decision (even though the unknown and known, either do, or do not, originate from the same source, the information – usually from the unknown – does not contain sufficient information to decide one way or the other)." Id. Par. 4.3.1. The possibility of a correct

¹¹ The affidavit, undated, was received by the U.S. Attorney's Office on September 5, 2019.

inconclusive determination does not change, as Dr. Scurich contends, when there is ground truth in validation:

If the information is not sufficient to justify an identification or an exclusion decision, then inconclusive is the only correct decision **(even though the ground truth is always an identification or an exclusion, nevertheless an inconclusive is the only correct decision in circumstances that information is insufficient to determine the identification or the exclusion).**

Dr. Dror Affidavit Para. 4.3.2 (emphasis added). Moreover, Dr. Dror makes the obvious point that where there is insufficient information to render a positive identification or exclusion, “inconclusive” is a good thing; “Not only is it correct, but it is a good sign of the expert’s meta-cognitive ability to know their limits and decide that they ‘cannot decide.’” Id. Consistent with the continuum of “inconclusive” possible conclusions outlined in the AFTE Glossary, Dr. Dror points out that knowing when there is enough information to make an identification or an exclusion can be difficult because there is a range of possibilities that include “features in agreement, but insufficient to identify,” and -- on the other end of the spectrum -- “features in disagreement, but insufficient to exclude.” Id. Para. 4.3.2. Where the level of agreement falls into this particularly challenging category, Dr. Dror points out that it is best for examiners to exercise caution and conclude “inconclusive”:

In fact, to “decide that something is inconclusive is very reassuring—it demonstrates a certain level of caution. In a case with doubt, it is better to lean toward caution and determine inconclusive, rather than making an incorrect identification or exclusion decision.”

Id. Para. 5.¹² In sum, conflating “inconclusive” decision with a “false identification” is simply

¹² Dr. Dror was on vacation during the Tibbs hearing and did not have time to provide a sworn statement to clarify his position. When undersigned counsel attempted to clarify the record based on direct conversations with Dr. Dror, PDS objected and the Court surprisingly sustained the objection (despite the fact that PDS had proffered Dr. Dror’s article in support of Dr. Scurich’s position).

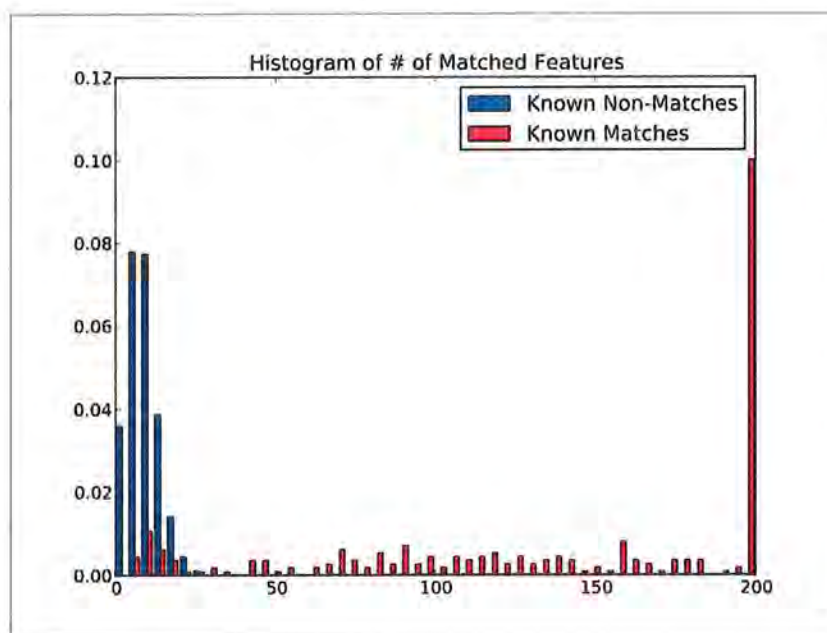
ridiculous.

The affidavits by Drs. Morris and Dror, as well as the testimony by Dr. Petraco, illustrate just how far afield Dr. Scurich is from any rational evaluation of error rate in the firearms and toolmark identification discipline. Although Judge Edelman states that he did not entirely accept Dr. Scurich's theory, he did conclude that the error rate for the firearms discipline was somewhere between a few percent to as high as 30 percent. This analysis is gravely out of touch with reality and vastly higher than the error rate calculations even calculated by PCAST and, more importantly, evaluation of the error rate factor by all other local or federal judges evaluating firearms and toolmarks under Rule 702 and Daubert. It is also counter-intuitive that having firearms examiners be conservative when they are unsure of whether a casing or bullet identifies to a particular firearm is a bad thing. As Dr. Dror points out, conservatism is a good thing. The community wants examiners to be conservative so that when an examiner makes an identification, law enforcement, the Courts and juries can be confident in their conclusion.

Part of why Judge Edelman strayed so far from a reasonable interpretation of the empirical data is explained by his acceptance of Dr. Scurich's theory that under "pristine" conditions of validation, all inconclusive determinations are a type of error and should be calculated in deciding the error rate for the field. This approach completely changes the playing field for firearms examiners whose training instructs that inconclusive is an appropriate response. In fact, under the range of acceptable AFTE conclusions, the "inconclusive" category recognizes three subcategories, *i.e.*, some level of agreement in individual characteristics, lack of any discernable agreement or disagreement in individual characteristics, and some level of disagreement in individual characteristics, see AFTE Glossary 6th Ed. at 93 (Attachment 15) – this is consistent with Dr. Dror's observation that an "inconclusive" decision cannot be lumped into one category

but rather involves a continuum of possibilities. Dror Affidavit Paras. 4 & 5; see also, Heat Map Study at 1075 (parroting the range of conclusions in the AFTE Glossary). It is absurd to change the playing field *after* being trained consistent with AFTE’s range of conclusions *after* examiners have participated in validation studies in which inconclusive is an appropriate response.

The notion that samples used in validation are somehow “pristine” rendering all “inconclusive” decisions errors is refuted by objective, 3D empirical data. In Tibbs, Mr. Weller testified about how the below histogram depicts this phenomenon:



The above illustrates how “some known matches also have a low number of matching features.” Weller Affidavit at 20. This is significant because the samples from this study were all collected under controlled, non-casework environment and would qualify as “pristine.” Id. However, there are “occasional known matching samples that do not have sufficiently similar microscopic marks to be algorithmically separated from the known non-matching samples.” Id. It is for this very reason, that when faced with two samples that do not share a high degree of correspondence, examiners may properly conclude that a comparison is “inconclusive.” Id. It is equally important

to point out that “despite this overlap near the left portion of the graph, at no time do the known non-matches show a high amount of similarity.” Id. This further validates the theory that when firearm examiners observe “a significant amount of microscopic correspondence” it supports a true identification. Id. Like heat map study, this data was presented at the Tibbs hearing – Tibbs 5/13/19 TR at 115-16 – but ignored.

Dr. Morris who – unlike the expert relied upon by PDS in Tibbs – is a statistician with an emphasis in experimental design and experience conducting firearms research explains why Judge Edelman went off the reservation regarding inconclusive decisions:

[I]nconclusive calls are a common and necessary part of firearms examinations, both in controlled studies and in casework. In casework, such calls may be necessary due to material damage that can occur at the crime scene (which, if so severe as to obliterate the firearm-produced marks, may result in an “unsuitable for examination” evaluation rather than an inconclusive call). But even in controlled studies based on material produced in the laboratory, the random variation in tool marks left on bullets or cartridge cases can lead to comparison sets that cannot definitively be classified as exclusions or identifications. The type of firearms and ammunition used in these studies (along with other factors) influences the number of such calls. Characterizing the probative value of the tool marks left on any specific bullet or cartridge case, in the context of the required comparison(s), is a critical part of forensic examination. Classification of a comparison set as inconclusive, while frustrating from a legal perspective, is simply appropriate in some cases. To ignore this fact would be essentially equivalent to requiring an examiner to yield an exclusion or identification judgement when neither is physically justifiable....

To be sure, inconclusive calls are never the most *desirable* result of a forensic examination, just as it is disappointing to receive the result of an expensive medical diagnostic procedure that does not provide the hoped-for information regarding a patient’s condition. But to suggest that inconclusive calls are never the most *appropriate* calls for any specific set of physical evidence, whether in casework or

controlled studies, does not coincide with the process and goals of forensic examination....

On page 41, “While the Court does not accept Dr. Scurich’s inclusion of inconclusives in the false positive error rate, it agrees with his essential premise that such responses should represent an error by the examiner.” While I certainly concur with the first part of this statement, I strongly disagree with the second part, as explained above. In fact, a more honest reporting of these studies is to refuse to combine the two conclusions of lesser desirability (as the Court agrees), but to understand that inconclusive calls are a distinctive and necessary (if frustrating) part of the evaluation process, and that proportions of conclusive errors, conclusive correct evaluations, and inconclusive calls are *all* important characterizations of what can be expected of firearms forensics. The frequency of inconclusive results tells us how often we should expect firearm examinations to be of limited or null probative value. **The relative frequencies of correct and incorrect definitive calls are estimates of the error probabilities we can expect among those examinations of material that are judged by the examiner to support such calls.**

9/17/19 Morris Affidavit (Attachment 16) at 1-2 (emphasis added).

Moreover, the notion that casings used in validation are “pristine” is contrary to the plain language of the validation studies and the view of scientists with knowledge of the discipline. For example, the Keisler study used firearms that “were selected from the Indiana State Police firearms Reference Collection, which is comprised of confiscated firearms or public donations.” Keisler at 56. Similarly, in the Smith Study, “the firearms used for test firing were obtained from crime-related cases and therefore were circulated in the general population and subjected to use, corrosion and abuse similar to that observed in a typical case.” Smith Study at 2. A study by Fadul plainly states:

The possibility exists that the questioned casings and known standards failed to mark clearly. Since every set was not microscopically examined to ensure that the casings were comparable and identifiable, some sets may have contained casings that were not suitable for identification.

Weller Affidavit at 18 (quoting Fadul et al., *An empirical study to improve the scientific foundation*

of forensic firearm and tool mark identification). According to Mr. Weller, there is no reason to believe casings fired from validation studies would mark materially different from casings encountered in casework. Weller Affidavit at 21. The Baldwin Study, evaluated by PCAST, recognized that “the possible reasons are numerous as to why insufficient marks exist” to permit an examiner to conclude that a casing could be excluded or identified from a particular firearm. That same study also noted: “there are a significant number of times that the firearm fails to make clear and reproducible marks (which very well might have happened for a questioned case).” Baldwin et al., A Study of False-Positive and False-Negative Error Rates in Cartridge Case Comparisons at 6 (Attachment 17). In addition, the issues of how to evaluate “inconclusive” determinations are complicated by the fact that some agencies have policies in place that prohibit examiners from excluding a casing as having fired from a particular firearm when the class characteristics are the same. *Id.* Importantly, the defense in Tibbs did not present a single person involved in research or design of firearms and toolmark validation studies, or a person who has participated in one of these studies, who subscribed to the notion that validation samples are “pristine” or that inconclusive responses were inappropriate, much less an error, much less a “false positive error.”

Finally, as previously noted, the question presented here, and the vast majority of court cases, is whether the firearms examiner properly identified all of the casings as being fired from the same firearm. While it is an interesting academic exercise to figure out how to account for “inconclusive” decisions, it bears no relevance to the issue presented here. In fact, Dr. Dror’s attention to this issue is not to undermine the validity of positive identifications when examiners concluded there is sufficient information to render such a conclusion, but rather to address situations where examiners use “inconclusive” in being overly conservative. The fact that some

examiners are overly conservative should give the Court more confidence, not less, in identifications.

In sum, concluding that the approximate error rate is anything but exceedingly low (hovering between 0% and 1% in a huge body of validation) can only be accomplished by discarding hundreds of studies that are not a black box and by inflating the error rates by conflating “inconclusive” decisions with “false positive identifications.” Of the numerous federal and local judges who have addressed this issue under Daubert, many of whom did so after extensive evidentiary hearings, all but a few outliers have concluded that the error rate factor weighs in favor of admissibility.

3. Validation of Firearms and Toolmark Analysis has Undergone Peer-Review

According to Dr. Bruce Budowle, Judge Edelman’s evaluation of this factor is out of step with how the scientific community evaluates peer-review. Dr. Budowle is in a unique position to comment on the peer-review process as the most published forensic DNA scientist in the world who sits on the editorial boards of several scientific journals. Budowle Affidavit (Attachment 18) at 1. The idea that only double-blind peer-review constitutes “meaningful” review is just not something embraced by leaders in the community such as Dr. Budowle:

It is important to realize that submitting a manuscript to a scientific journal for potential publication is only a part of the peer review process and indeed may be considered a limited and initial part of the peer review process. An editor(s) usually selects two (or sometimes three) individuals to review a submission, provide constructive criticism and opine on whether the submission warrants publication. This initial screening is reviewed by a very limited number of individuals. If accepted and published, then the more extensive and typically more critical review process begins. The greater scientific community has the opportunity to read and assess the published work. If individuals disagree with the work, they can write letters to the editor(s) to criticize the science and the authors can respond. This open debate brings transparency and potentially helpful solutions to continue to increase the quality of the science.

Moreover, other scientists can attempt to replicate the work and determine if what is published is valid or supportable. These scientists can publish their own work either criticizing or supporting the original publication findings. Regardless if double blind, single blind or open review, this post- publication more comprehensive peer review process is the most important part of how science gets corrected, if appropriate, and advances. As an example of how the peer review process works, a peer-reviewed publication on cold fusion in the late 1980s raised hope of an abundant energy source. However, other scientists could not replicate the work, and the research was found to be flawed. While the initial peer-review for publication did not detect the flaws of the work, the more extensive peer review process determined the claims about cold fusion were invalid.

All publications, regardless of the peer review method, bring information forward to be assessed by the greater scientific community. It is this assessing, testing, more extensive constructive criticism (or lack thereof after publication), and acceptance of the work in a publication that is dear to science. Scientific criticisms come from additional peer-reviewed publications pointing out the flaws, if there are any. This constructive critical review process moves science forward.

Budowle Affidavit at 2.

One misperception on the part of Judge Edelman is that past Daubert hearings regarding firearms and toolmark identification did not involve renowned experts in the field. Quoting John Murdock, a practitioner, researcher, and leader in the field for nearly 50 years, United States District Court Judge Judith Herrera explained why the AFTE Journal satisfied the peer-review Daubert factor:

The AFTE Journal publishes articles, studies and reports concerning firearm and toolmark evidence, it has a formal process for the submission of articles, including “specific instructions for writing and submitting manuscripts, assignment of manuscripts to other experts within the scientific community for technical review, returning of manuscripts to authors for clarification or re-write or re-write, and a final review by the Editorial Committee. There is also a formal post-publication peer review process, allowing AFTE members and any other interested individuals to comment on previously published articles. Most of the validation studies

discussed in this opinion, which the Government has submitted to demonstrate the testability and viability of AFTE identification theory, were published in the AFTE Journal. In addition, the Journal of Forensic Sciences publishes peer-reviewed articles on toolmarks and firearm identification.

United States v. McCluskey, 2013 WL 12335325 * 6 (Dist. Ct. New Mexico, Feb. 7, 2013). Just on the eve of the Tibbs hearing, a federal judge in the Southern District of New York, citing McClusky, concluded: “Courts addressing this Daubert factor have determined that the AFTE Journal scholarship qualifies as peer-reviewed literature.” Johnson, 2019 WL 1130258 * 16. After the commencement of the Tibbs hearing, but before Judge Edelman issued his oral ruling, yet another federal judge reiterated the same conclusion: “Several published federal decisions have also commented on the AFTE Journal, with all finding that it meets the Daubert peer review element.” Romero-Lobato, 2019 WL 2150938 * 5.

Judge Edelman was critical of the AFTE journal because it does not currently employ double-blind peer review. However, there is no consensus in the scientific community that double-blind peer review is the only meaningful kind; rather, there are three commonly used forms of peer review, one of which is the open peer-review used by the AFTE journal. 9/5/19 Weller Affidavit at 22-23. As noted by Mr. Weller, Wiley Publishers, which publishes 1600-plus academic and scientific journals, outlines the pros and cons of each type of peer-review and notes that the use of open peer review is growing. Id. Moreover, for many prestigious journals, double-blind peer review is a recent phenomenon. For example, the prestigious journal Nature first instituted double-blind peer-review in 2015, *and it is voluntary for the authors, most of whom do not opt for it (from March 2015 to February 2017 only 12% of authors opted for double-blind review)*. Id. at 17-18. Does this mean that every scientific discipline that published in Nature prior to 2015, or studies where authors did not opt for double-blind review, were somehow deficient under the peer-review

Daubert factor? This would require reevaluating whether DNA is a double helix. See Watson, J. D., & Crick, F.H. C. A Structure for deoxyribose nucleic acid. *Nature* 171, 737-738 (1953). Dr. Budowle echoes this sentiment: “each [form of peer-review] has some merit; however, there is no consensus at this time on which approach is superior. Nonetheless, they all serve as part of the peer review process.” Budowle Affidavit at 1.

Moreover, importantly, Judge Edelman’s ruling is riddled with factual errors, including: (1) Judge Edelman concludes that the AFTE Journal does not make itself available to the public; Weller explains that all articles are publicly searchable and AFTE subscriptions have been available to non-members since 1989; (2) Judge Edelman concludes that unlike other scientific journals, the AFTE Journal is not more broadly available and cannot even be obtained in university libraries; Weller explains that the AFTE Journal can be freely searched on WorldCat.org and is available in universities throughout the United States and around the world; and (3) Judge Edelman’s ruling suggests that the AFTE Journal should be free; Weller illustrates how the AFTE subscription fees are comparable to fees charged by other scientific journals. Weller Affidavit at 25-27. This series of factual misunderstandings led Judge Edelman to erroneously conclude that “The AFTE Journal, by generally limiting the review of its publications and making them available only to its members or others who pay, avoids the scrutiny of scientists and academics outside the field of firearms and toolmark analysis.” Tibbs Memorandum at 23.

More importantly, Judge Edelman’s evaluation of peer-review ignores all but two of the peer-reviewed articles listed in Mr. Weller’s affidavit that appear in other scientific journals that are authored by an array of PhD scientists trained in a variety of scientific disciplines. Weller Affidavit Attachment A.

Finally, Judge Edelman’s conclusion that only double-blind peer-review amounts to a

“meaningful” review is belied by studies that were initially published in the AFTE Journal and subsequently published in the Journal of Forensic Science with no alterations to the design study. See Hamby et al. A Worldwide Study of Bullets Fired From 10 Consecutively Rifled 9MM RUGER Pistol Barrels – Analysis of Examiner Error Rate, J Forensic Sci, March 2019, Vol. 64, No. 2 (Attachment 19). The study was an update of a continuing study that has been ongoing for over twenty years. Id. at 551. The study used the consecutive barrel (worst-case scenario) design; although this design was criticized by PCAST, it survived the double-blind peer-review process in JFS after initially being published in the AFTE journal. Id. The first four installments of the ongoing study consisted of two AFTE Journal publications, a dissertation, and a presentation at an AFTE training seminar. Id. at 557. According to PCAST, and under Judge Edelman’s findings, the type of peer-review involved in the first four rounds of this study would be a basis to neglect the data altogether. However, when the fifth installment of the study (which included all prior four installments) had no problem surviving double-blind peer review as it was published in the Journal of Forensic Science. Notably, the study design remained unchanged from the earlier installment published in the AFTE Journal. Id. (referring readers to the earlier studies “for the complete design of the study”).

4. Standards

We do not spend time in this pleading rehashing the government’s position regarding standards because this is the one factor where courts have come to different conclusions. Compare Johnson, 2019 WL1130258 *18 (standards weighs in favor of admissibility) with Romero-Lobato, 2019 WL 2150938 *6 (standards factor weighs against admissibility). However, we note, disagreement between courts on this one factor has not prevented any other courts from finding that firearms and toolmark identification satisfies Daubert.

5. Firearms and Toolmark Identification is Generally Accepted throughout the United States and the World

Judge Edelman's most perplexing finding was that firearms and toolmark identification did not enjoy general acceptance within the scientific community. Firearms and toolmark identification is practiced by accredited laboratories in the United States and throughout the world, including England (Scotland Yard), New Zealand, Canada, South Africa, Australia, Germany, Sweden, Greece, Turkey, China, Mexico, Singapore, Malaysia, Belgium, Netherlands, and Denmark. 9/5/19 Weller Affidavit at 21. In the United States alone, there are 233 laboratories with firearm and toolmark accreditation certificates, all of which routinely identify bullets or casings to a particular firearm. *Id.* The firearms units do not exist in a vacuum, but are rather part of a greater scientific accreditation umbrella; virtually all of these accredited firearms units function within a larger forensic laboratory offering a multitude of accredited scientific units, *e.g.*, chemistry, DNA, latent fingerprint identification, etc. In this jurisdiction alone, D.C. DFS, ATF, and FBI maintain accredited firearms and toolmark units, along with a variety of accredited forensic disciplines that support local and federal investigations. Notably, PhD scientists in various applied scientific disciplines are in charge of many of these laboratories, *e.g.*, Dr. Smith, the Director of DFS is a forensic geneticist. In addition, as discussed *supra*, scientists who design, conduct, and publish validation studies in the area of firearms and toolmark identification accept the AFTE method of identification, as do leading scientific working groups such as the OSAC, which is comprised of a variety of applied scientists. *Id.*

Moreover, PCAST has had no impact on the acceptability of the firearms and toolmark discipline by the community at large. For example, in the District of Columbia, the Scientific Advisory Board to D.C. DFS -- comprised of applied scientists of various backgrounds -- addressed what impact, if any, PCAST should have on the functions of various accredited forensic

units. In addressing PCAST generally, the SAB stated:

[A]ccording to published reviews of this report, the PCAST report presents a flawed paradigm for forensic evaluation, misapplies statistics and the notion of probability, ignores existing data and literature in forensic science, and, as a result, this report is scientifically unsound.

DFS SAB Statement regarding the PCAST Report at 1 (Attachment 20) (citations omitted).

Addressing PCAST's conclusions regarding the foundational validity of firearms and toolmark analysis, the SAB stated:

As the OSAC Firearms and Toolmarks Subcommittee noted in its December 16, 2016 response to PCAST there have been many research studies performed on the foundational validity of firearms and toolmark analysis. They describe how PCAST reviewed several of these studies and discounted their results because they did not fit the PCAST definition of structured black-box studies. The OSAC Firearms and Toolmarks subcommittee continues by stating, "*we disagree with the premise that a structured black-box study is the only useful way to gain insight into both the foundations of firearm and toolmark identification and examiner error rates. Taken collectively, the published studies support the underlying principles of firearm and toolmark examination and the fact that examiner error rates are quite low.*" The discipline of firearms and toolmark analysis is built upon many decades of research that support the foundations of its practice. Research does continue in this scientific are and the results of these studies will continue to add to the foundation and improve the performance over time.

Id. at 4 (italics in the original; citations omitted). Interestingly, the SAB advising the local lab, like the U.S. Attorney's Office, turned to the OSAC, *not PCAST*, for guidance.¹³

In general, the PCAST Report has fared abysmally with leaders throughout the scientific community. It is important to note that the 2009 NAS report referred to DNA as the "gold

¹³ The SAB also recognized the importance of the "increased and accelerated global research in the measurement of firearm and toolmark similarity based primarily on 3D surface measurement topography, mathematically based measurement of surface similarity, and research databases used to statistically assess the chance agreement from a different firearm source" – a point also stressed by the government in Tibbs, but ignored by Judge Edelman in assessing general acceptance within the scientific community.

standard” of forensics. As noted supra, it is noteworthy that leaders throughout the scientific community soundly rejected PCAST recommendations regarding DNA analysis. This point was not contested by either of PDS’s purported experts in Tibbs. In evaluating the overall impact of the report on the scientific community, Dr. Budowle did not mince words: “the PCAST Report 1) is **not** scientifically sound, 2) is **not** based on data, 3) is **not** well-documented, 4) misapplies statistics, 5) is full of inconsistencies, and 6) does **not** provide helpful guidance to obtain valid results in forensic analyses.” Tibbs Opposition, Budowle Statement at 12 (emphasis in original). In fact, Dr. Budowle was of the view that PCAST was so scientifically deficient that it would not have survived the very peer-review it advocated. Id. It is absurd to conclude that a report that got it wrong with respect to the gold standard of forensics could somehow speak for the scientific community at large about any forensic discipline, especially considering that its deficiencies in the area of DNA, according to Dr. Budowle, transcended the report as a whole. Id. Not surprisingly, as discussed in the Tibbs Opposition at pp. 56-57, local and federal judges around the country have concluded that PCAST does not undermine the admissibility of firearms and toolmark identification under Rule 702 or Daubert.¹⁴

¹⁴ Nor did the 2009 NAS Reports anything to affect the general acceptance of this discipline in accredited laboratories here or throughout the world. The Court of Appeals has on more than one occasion observed that the 2009 NAS report did not change the general acceptance of firearms and toolmark identification or other pattern matching disciplines for that matter. Jones, 27 A.3d at 1137 n. 7 (“[a]lthough [the 2009 NAS Report] is not properly before us, even after considering it, we are still unpersuaded that *pattern matching* is no longer generally accepted.”) (emphasis added); Thomas, Memorandum Opinion and Judgment ** 3-4 ([Appellant], however, confuses a single scientific report, which reaches no definitive conclusion and which includes no independent examination of the challenged methodology, with general discord in the scientific community. We therefore reject [appellant’s] reliance on the [2009] NAS Report); Pettus, 37 A.3d at 217, 227-28 and n.31 (rejecting appellant’s assertion that the 2009 NAS Report amounts to a repudiation of all forensic analysis based on pattern-matching, including handwriting analysis; as in Jones, the Court of Appeals concluded that the 2009 NAS Report did not undermine the scientific consensus supporting identifications); Gee, 54 A.3d at 1268 (upholding the trial court’s refusal to recognize the 2009 NAS Report as a learned treatise in the latent fingerprint context).

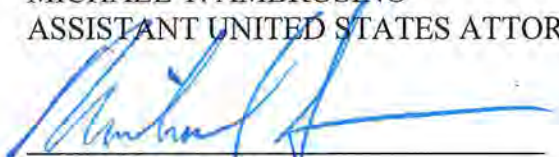
It should be a red flag for the Court that the defense in Tibbs, here, and in almost every case that has litigated this issue over the past 10 years, have not even asked to have the evidence reexamined. Nor are we aware of a single case over the past three decades where an independent firearms expert has reached a different conclusion or where a firearms identification has led to an exoneration. If the rate at which firearms examiners erred when making a positive identification were anything close to what Judge Edelman contends, these types of red flags would be rampant rather than nonexistent.

Thus, Judge Edelman's reliance upon PCAST, as well as the dictum in Williams II regarding PCAST, is misplaced.

Respectively submitted,

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CERTIFICATE OF SERVICE

This is to certify that a copy of the foregoing opposition to defendant's motion to exclude firearms and toolmark testimony was served upon counsel for defendant on this 19th day of September, 2019.



Michael Spence
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