TEXAS FORENSIC SCIENCE COMMISSION

Justice Through Science

FINAL REPORT ON SELF-DISCLOSURE BY THE TEXAS DEPARTMENT OF PUBLIC SAFETY (AUSTIN) REGARDING TESTIMONY OF D. JODY KOEHLER (FORENSIC BIOLOGY/DNA)

AUGUST 16, 2019

FORENSIC SCIENCE COMMISSION STATEMENT ON INVESTIGATIVE REPORT RE: DPS SELF-DISCLOSURE IN *STATE V. CRINER*

On Saturday, August 3, 2019, the Texas Forensic Science Commission received the *External Review Investigative Panel Report: DPS Self-Disclosure in State v. Criner*. A copy of the report is attached to this statement. This report was the result of an investigation requested by the Commission and performed by an external review panel consisting of Dawn Boswell, Assistant Criminal District Attorney and Chief of the Conviction Integrity Unit for the Tarrant County Criminal District Attorney's Office, Christina Capt, Technical Leader of the Forensic Casework Division at the University of Health Science Center-Center for Human Identification, and Michael Coble, Ph.D., Associate Director of the University of Health Science Center-Center for Human Identification.

The report focused on testimony provided by D. Jody Koehler, a former DNA manager for the Texas Department of Public Safety (DPS) crime laboratory, in the capital murder trial of Meechaiel Criner for the death of Haruka Weiser. Ms. Koehler was hired as a senior scientific advisor to the Commission on November 1, 2017. Ordinarily, the Commission would have conducted the investigation in this case. Due to Ms. Koehler's role as a staff member of the Commission at the time DPS submitted the self-disclosure, the Commission sought assistance from the external review panel referenced above.

The report concluded that "Ms. Koehler provided inaccurate testimony as to the results and conclusions of the DNA analysis in *Criner*. This erroneous testimony impacted the criminal case by substantially affecting the integrity of the results and conclusions presented." The panel determined that while Ms. Koehler's conduct with respect to her testimony in *Criner* "did not rise to the level of professional misconduct, her conduct did constitute professional negligence."

The panel further determined that Ms. Koehler violated the *Texas Code of Professional Responsibility for Forensic Analysts and Crime Laboratory Management*, and the ANSI National Accrediting Board's *Guiding Principles of Professional Responsibility for Forensic Service Providers and Forensic Personnel*.

Ms. Koehler resigned her employment with the Commission August 5, 2019. On August 16, 2019, the Commission voted unanimously to accept the findings of the investigative panel as set forth in the report.

One of the Commission's principal roles is to investigate allegations of professional negligence and professional misconduct in accredited crime laboratories. The Commission holds Texas laboratories and their analysts to high standards, and is committed to holding its staff to the same high standards.

Ms. Koehler did not perform any forensic testing while at the Commission. Her testimony in the *Criner* case was with respect to DNA analysis she performed while employed by DPS.

During her tenure as a staff advisor to the Commission, Ms. Koehler assisted with vetting complaints and laboratory self-disclosures and provided technical information to the Commission's general counsel and members. However, all final decisions with respect to investigations are made by the Commission.

Media inquiries should be directed to megan.lavoie@txcourts.gov. Inquiries regarding Ms. Koehler's tenure at DPS should be directed to media@dps.texas.gov.

External Review Investigative Panel Report: DPS Self-Disclosure *State v. Criner*

Question 1:

The Texas Forensic Science Commission ("Commission") asked the panel to determine whether it believes Ms. Koehler committed either "professional misconduct" or "professional negligence" in her capacity as a testifying forensic expert in *State v. Criner*.

Question 2:

The Commission asked the panel to determine whether Ms. Koehler's conduct with respect to the *Criner* case and during her tenure as a DPS employee, or with the Texas Forensic Science Commission, met the expectations of the *Texas Code of Professional Responsibility* and *ANAB's Guiding Principles of Professional Responsibility*.

Panel Conclusions[1]

Ms. Koehler provided inaccurate testimony as to the results and conclusions of the DNA analysis in *Criner*. This erroneous testimony impacted the criminal case by substantially affecting the integrity of the results and conclusions presented.

While Ms. Koehler's conduct did not rise to the level of professional misconduct, her conduct did constitute professional negligence.

Her conduct violated the *Texas Code of Professional Responsibility for Forensic Analysts and Crime Laboratory Management* requiring that an analyst "present accurate and complete data in reports, oral and written presentations and testimony based on good scientific practices and valid methods." 37 Tex. Admin. Code § 651.219, section 12 (Effective May 16, 2018).

Finally, Ms. Koehler's conduct also violated *ANAB's Guiding Principles of Professional Responsibility for Forensic Service Providers and Forensic Personnel* requiring that an analyst is "aware of their limitations and only render conclusions that are within their area of expertise and about matters which they have given

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[1] In the interests of clarity, the panel combines its answers to both Questions 1 and 2.

formal consideration" and "present accurate and complete data in reports, testimony, publications and oral presentations." *GD 3150, Guiding Principles of Professional Responsibility for Forensic Service Providers and Forensic Personnel*, sections 2, 14 (Effective: 2018/11/20) (emphasis added).

Applicable Standards for Scope of Review

As requested by the Commission in its *Scope of Review*, the panel analyzed Ms. Koehler's actions or omissions under "Texas Admin. Code, Title 37, Part 15, Chapters 651.219 and 651.302, and ANAB's Guiding Principles of Professional Responsibility for Forensic Service Providers and Forensic Personnel[2]" and heeded the Commission's instructions that "at the time of forensic analysis" is defined to include the analyst's actions from the beginning of DNA processing through oral or written communication of results to the criminal justice system. To assess professional misconduct or negligence the panel had to determine:

> Did Ms. Koehler, through a material act or omission, deliberately fail to follow the standard of practice generally accepted at the time of the forensic analysis that an ordinary forensic professional or entity would have exercised, and did the deliberate act or omission substantially affect the integrity of the results of a forensic analysis? An act or omission was deemed deliberate if Ms. Koehler was aware of and consciously disregarded an accepted standard of practice required for a forensic analysis.

> Did Ms. Koehler through a material act or omission, negligently fail to follow the standard of practice generally accepted at the time of the forensic analysis that an ordinary forensic professional or entity would have exercised, and did the negligent act or omission substantially affect the integrity of the results of a forensic analysis? An act or omission was deemed negligent if the actor should have been but was not aware of an accepted standard of practice required for a forensic analysis.

See 37 Tex. Admin. Code § 651.301, sections 7, 8 (Effective date: January 30, 2018).

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[2] http://www.pbso.org/qualtrax/QTDocuments/1130.PDF

The panel contemplated the common definition of "deliberately" — consciously and intentionally; on purpose. The panel further interpreted the "consciously disregards" language of the statute as having the same meaning proscribed by "deliberately."

The panel understood that the phrase "would substantially affect the integrity of the results of a forensic analysis" does not necessarily require that a criminal case be impacted or a report be issued to a customer in error but includes acts or omissions that would call the integrity of the forensic analysis, the individual forensic examiner, or the laboratory as a whole into question. This is true regardless of the outcome on the underlying criminal case. 37 Tex. Admin. Code § 651.301, section 10 (Effective date: January 30, 2018).

In the *Criner* case, the trial court excluded the at-issue evidence, "items 0807AA and 0807AB", "under Daubert and its progeny" not because of its conclusions concerning challenges to STRmix™ theory, but because the "technique or theory in question was not properly applied." (3 R.R. 4-5).[3] The trial court also excluded Y-STR evidence "pursuant to Rule 403." (3 R.R. 4-5). In this case, there was a direct nexus between the testimony of the analyst and the exclusion of the evidence.

While the pertinent testimony occurred after Ms. Koehler's employment with the Texas Department of Public Safety Crime Laboratory ("DPS"), it related to analyses performed during that tenure. Consequently, the panel reviewed the appropriate DPS standards of practice and standard operating protocols ("SOP") applicable at the time these analyses were performed. *See* Appendix 1. DPS protocol includes standards directing analysts to "testify in a manner which is clear, straightforward, and objective" and "limit conclusions to reliable, accurate, and

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[3] For purposes of this report the transcript of the June 18th hearing is "1 R.R.", June 19th hearing is referenced as "2 R.R." and the June 20th hearing is "3 R.R."

factual results that logically follow from the underlying data and analytical results." *Texas DPS Laboratory Operations Guide, Court Testimony Monitoring LOG-03-02, Version 06*.

DPS protocol also states that analysts are responsible for "accurately representing qualifications, evidence, opinions, conclusions, and testimony" and should carry out "the duties of the profession with integrity and attention to accuracy in an unbiased manner…" *Texas DPS Standard Operating Procedures, Report Writing Guidelines DNA-08-03, Version 18a*.

Of course, the panel also considered the standard of practice an "ordinary forensic professional or entity would have exercised" in providing accurate testimony.

Panel's Statements Regarding Evaluation Process

Assessing professional negligence is necessarily difficult because it is a contextual-driven analysis that is dependent on the weight accorded various factors. For this reason, the panel has endeavored to explicitly set forth the numerous factors that were meticulously considered ("*Relevant Considerations Supporting Panel's Evaluation and Conclusions*") and identified the facts and evidence used in deliberations ("*Facts and Evidence Considered*"). Hopefully, the Commission will find this approach helpful in pinpointing any areas where it may concur or dissent with the panel's rationales and conclusions.

Facts and Evidence Considered

The panel reviewed and considered the requested documents listed in Appendix 1 of this report.

As this Commission has recited in its own reports, the panel would also like to express that the information it gathered has **not** been subjected to the standards for admission of evidence in a courtroom. Documents obtained have not been subjected to any independent validation. The panel assumed the documentation

received was accurate and unaltered. The information requested by the panel was based upon its understanding of the facts as presented in the self-disclosure, and the panel relied upon all parties and witnesses to provide any supplemental information which they believed would assist in the panel's investigative review. Because the Commission has no authority to subpoena documents, the panel relied upon the parties' willingness to cooperate with the investigation.

The panel considered information provided by witnesses, listed in Appendix 2, through oral interviews or written statement.

During on-site and telephone interviews, no individual testified under oath, the information was not limited by either the Texas or Federal Rules of Evidence, nor were interviewees subjected to formal cross-examination under the supervision of a judge.

Evidence Regarding Inaccurate Testimony

The crux of the negligence finding, and code and guideline violations, lies within the inaccurate testimony Ms. Koehler gave in relation to two specific evidentiary items.

Sample 08-07-AA

The analyst incorrectly stated that the Defendant, Meechaiel Criner, was excluded as a contributor to 08-07-AA. The relevant testimony portions are:

> Q. (BY MS. DAVIS) So in fact your notes at the bottom say, suspect is excluded.
>
> A. Correct.
>
> Q. Okay. So on 807AA, Defendant's No. 8, which is from the right thigh swab of Ms. Weiser, it's a mixture but you are excluding Mr. Criner from being part of that mixture?
>
> A. That's correct.

(2 R.R. at 67:15-22).

…

> Q. But we do know that it's not Mr. Criner?
>
> A. Correct.

(2 R.R. at 68:23-24).

…

> Q. … If we're looking at the electropherograms from 807AA, the one where you excluded Mr. Criner?
>
> A. Yes.

(2 R.R. at 80:16-25; 1 R.R. at 81:1-3).

…

> Q. So if you look at 807AA as compared to 807AB, Defendant's 8 versus Defendant's 9, would it surprise you if on Defendant's 8 where he was excluded, there are actually more of his alleles showing up?
>
> A. It actually doesn't surprise me because it's not a numbers matching game. We're not just looking at the alleles that are present in the profile and then just saying, oh, well, he's here and his allele is here and here and here.

(2 R.R. at 80:16-25; 2 R.R. at 81:1-3).

…

> Q. Okay. But nevertheless, on AA, Defense No. 8, you excluded Meechaiel Criner from that mixture?
>
> A. On AA, that is correct.

(2 R.R. at 85:19-21).

…

 Q. Okay. And that's the one that Mr. Criner was excluded?

 A. That's correct.

 Q. Okay. So on 807AA, which is Defendant's Exhibit No. 8, we know it's a mixture of two people. So your interpretation was it is a mixture of Ms. Weiser and anybody else but not Mr. Criner?

 A. Yeah, it's consistent with the victim and an unknown individual is how I – how I would report that.

 Q. And you wrote down defendant is excluded?

 A. Yes, suspect is excluded.

 Q. Suspect is excluded.

 A. That's correct.

(2 R.R. at 145:12-24).

*Ten times Ms. Koehler was questioned about the 08-07-AA conclusions. On each occasion Ms. Koehler not only testified to a result that was not in agreement with her report -- she testified to an **incorrect** result. She **never** testified to the correct conclusion.*

The Identifiler Plus results for 08-07-AA, a portion of a swab from decedent's right thigh, indicated a lower-level mixture with at least two contributors. If the victim is assumed to be a known contributor to this mixture, a foreign contributor profile can be deduced. The Defendant, Meechaiel Criner cannot be excluded as the foreign contributor from 08-07-AA. The STRmix™ report, in which 08-07-AA was evaluated as a two-person mixture and conditioned on the victim's known profile, yielded a likelihood ratio of 566 which falls within the inconclusive range per DPS

SOP. *Texas DPS Standard Operating Procedures, STRmix^TM Autosomal STR Interpretation Guidelines, DNA-08-08 Versions 00 and 01a*.

Accordingly, *Supplemental DNA Laboratory Report – May 20, 2016* stated the following result for 08-07-AA:

> The DNA profile from this item is interpreted as a mixture of two individuals with the victim as an assumed contributor. Based on the likelihood ratio result, it is inconclusive whether Meechaiel Criner is a contributor to this profile.

However, the conclusion "suspect is excluded," is hand-written on the electropherogram for 08-07-AA. Perhaps some explanation for this lies in what appears to be an issue with the manual deconvolution performed by the analyst on this sample. The manual deconvolution of the possible foreign contributor genotypes from 08-07-AA are incorrect at the D8S1179 locus. At D8S1179, alleles 12, 13, and 14 were detected in the mixture. The victim has a genotype of 12, 14. The obligate foreign contributor allele at this locus is 13. The correct possible genotypes of the foreign contributor should have been documented as "13+" (where the "+" could represent other alleles in combination with the 13). The analyst documented the obligate foreign contributor allele as 12 and possible genotypes as "12+" at D8S1179. The Defendant's genotype at this locus is 13, 16. The incorrect documentation of the foreign contributor genotype at D8S1179 may have been a contributing factor to Ms. Koehler's incorrect notation of exclusion documented on the 08-07-AA electropherogram.

DPS' root cause analysis proposed a potential explanation for this error. The panel believes there is particular support for the DPS transcription error "theory" that Ms. Koehler inadvertently wrote the wrong conclusion on the electropherogram -- rather than that she violated professional and ethical standards by reporting an inconclusive conclusion for a comparison that she disagreed with, and then failed to disclose that disagreement to the relevant parties.

The inaccurate documentation of exclusion on the electropherogram may have been the cause of Ms. Koehler's inaccurate testimony regarding 08-07-AA. She may have testified to the (alleged) result documented on the electropherogram rather than the result provided in her report. If Ms. Koehler was aware of the disagreement between her testimony and her written report, it is unclear as to why she did not inform the relevant parties and offer some explanation for the deviation from the reported result. Ms. Koehler provided extensive testimony regarding a similar discrepancy between the conclusions on the electropherogram and report for 08-07-AB, however, she never uttered a single word on the record about the similar discrepancy in 08-07-AA.

In her written response to the panel, Ms. Koehler wholly failed to address this discrepancy or provide a reason for her inaccurate testimony regarding 08-07-AA beyond repeatedly saying "I misspoke." *May 14, 2019, Written Response by Ms. Koehler* ("*2019 Response*"). While "I misspoke" might be appropriate if this was an isolated instance during testimony and the bulk of her testimony supported the true conclusion, repeating or agreeing with an unsupported conclusion 10 times and offering an explanation of "I misspoke" is simply unacceptable. The panel also wondered whether Ms. Koehler ever followed up with the attorneys to inform them that she repeatedly and consistently "misspoke" about the conclusion for 08-07-AA and to ensure that they were aware that the report was actually correct.

In her interview with DPS on August 16, 2018, Ms. Koehler could not recall why the electropherogram and report disagreed for 08-07-AA but indicated that the associated STRmix™ report was missing from her copy of the case record. She asserted she was therefore unable to use this missing STRmix™ report to determine the possible cause of the discrepancy or resolve which conclusion, excluded or inconclusive, was accurate. *DPS Interview, DPS Appendix C,* pages 4-5 *("DPS Interview")*. In that same interview, she seems to imply that she had both the report

and the electropherogram on the stand but that she did not have "a good way" to explain why the conclusion had changed from "excluded to inconclusive" and that she did not know which conclusion was correct on the stand. *Id.*

During an interview with the panel, Ms. Koehler was questioned about the rationale for the offered explanation of "I misspoke" and was shown the discrepant electropherogram and report statement for 08-07-AA. She initially seemed unaware of this issue and uncomprehending of the concern. She ultimately and emphatically agreed that her explanation in her written response was not sufficient to address the error. Although she did not seem certain, Ms. Koehler suggested that she may have testified from the conclusion on the electropherogram rather than the report. Ms. Koehler stated that she typically testifies directly from her report and would preface her testimony with "reading from my report" when stating conclusions. Ms. Koehler indicated that she should have testified from the conclusions on the report during her *Criner* testimony and was mistaken not to do so. Interestingly, the transcripts reflect that Ms. Koehler did, in fact, preface her testimony with "reading directly from my report" when conveying the results for 08-07-AB and the Y-STR analyses, but not when testifying to the results for 08-07-AA. (1 R.R. at 132, 135).

Ms. Koehler explained that the incorrect conclusion on the electropherogram was possibly due to an erroneous STRmix™ analysis with the stutter filters on. She suggested that she initially analyzed the sample in STRmix™ with the stutter filters on (i.e. stutter products were removed from the input file)[4] and wrote "suspect is excluded" after obtaining "a likelihood ratio of zero." She offered that she had

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[4] The analysis software GeneMapper® ID-X is capable of analyzing data with or without marker specific stutter filters. STRmix™ will model stutter artifacts as being possible stutter, possible allelic, or perhaps both during its analysis and therefore requires any labeled stutters be included in the input file. Typically, a laboratory will first analyze the mixture with the stutter filters turned on to remove these artifacts, and then turn the stutter filter off to include stutter in the input file for STRmix™ analysis.

neglected to change her hand-written notation after correctly re-analyzing the sample with the stutter filters off. While admitting that she should have caught this error on her electropherogram, Ms. Koehler also pointed out that her technical reviewer should have caught it too. The panel could not locate any support within the case records for Ms. Koehler's theory regarding the origin of the mistaken notation of "suspect is excluded" on 08-07-AA. The sample is a low signal level mixture that is expected to yield the exact same allelic data whether analyzed in GeneMapper® ID-X with the stutter filters on or off.

It should also be noted that the prosecutors in the *Criner* case were aware that Ms. Koehler's testimony regarding 08-07-AA was inaccurate. 2 R.R. at 162-163. Ms. Winkeler pointed out in-chambers that, contrary to Ms. Koehler's testimony, the report reflected that the comparison was inconclusive. Ms. Winkeler explained during her interview with the panel that she had recognized this on her own because she had reviewed the reports and knew the evidence in her case, but she just never got to resolve the issue through further courtroom examination. She also told the panel that she sought out confirmation of her understanding of the evidence immediately following the hearing by asking Dr. Budowle to review and verify the report and electropherograms.

Sample 08-07-AB

The issue of whether Ms. Koehler followed DPS protocols came up during questioning about whether a manual comparison of the 08-07-AB data was done to determine if the STRmix™ results were intuitively supported. Ms. Koehler indicated that she did not understand this requirement as specified in DPS SOP DNA-08-08 STRmix™ Autosomal STR Interpretation Guidelines, yet, she also initially confirmed that she followed this SOP. *Texas DPS Standard Operating Procedures, STRmix™ Autosomal STR Interpretation Guidelines, DNA-08-08 Version 00*. Later, Ms. Koehler testified that she performed a manual comparison of the data prior to

STRmix™ but did not recall performing a manual comparison of the data after STRmix™. This caused confusion about whether Ms. Koehler followed the required DPS procedure prior to reporting results for 08-07-AB. The following is the relevant testimony regarding this sample:

> Q. So how would we know that a manual comparison was done after the STRmix results were obtained? How would we know that happened if it's not written down somewhere?
>
> A. Well, I guess I'm even kind of confused as to what -- I mean, I'm assuming that the manual comparison means -- I didn't write this SOP. I'm assuming that what the manual comparison means is that you visually checked that what was imported into STRmix is what was on -- what was in that table or what was in the – on the electropherogram. And so once you verified that that's there -- if it wasn't correct, you wouldn't move forward with your -- you wouldn't move forward with your interpretation because it wouldn't have been correct. So I don't know how -- yeah, I don't know -- I guess I don't -- I don't exactly know what that -- what that means in the SOP since I didn't write it and I wasn't involved in that process.
>
> Q. Okay. This is an SOP that was effective through 2016.
>
> A. Yeah, it was -- right, it was, and I read it and I -- and I followed it.

(2 R.R. at 108:5-25, 2 R.R. at 109:1).

…

> Q. Okay. And so do you believe that this likelihood ratio that was obtained is intuitively supported?
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> A. So looking at the way -- like looking at the genotype report that was created by STRmix, it's Defense Exhibit 11, it says that Contributor 2 is about two percent of the profile whereas Contributor 1 is about 98 percent. So that is a much lower ratio than what was calculated manually, because manually I calculated that to be about a 1 to 23 ratio, so I don't feel like the results are completely – looking at it now, I don't feel like the results are completely concordant between the two.

(2 R.R. at 169: 19-25; 2 R.R. at 170:1-6).

Despite the confusion regarding whether this step had been undertaken at the time of analysis and reporting, when Ms. Koehler was given the opportunity to provide an opinion on whether the STRmix™ results were intuitively supported by the underlying data she testified that she did not "feel" that the STRmix™ results and the underlying data were "completely concordant" based upon the STRmix™ assessment of 98% for contributor 1 and 2% for contributor 2 and her manual assessment that indicated a mixture ratio for the major to minor contributor of 23:1. By contrast, the panel concluded that the proportions estimated by STRmix™ *are consistent* with the manual mixture ratio calculations. At face value, the 2% minor contributor STRmix™ estimation is comparable to the 1:23 or 4% estimation calculated by Ms. Koehler. A 2% and a 4% mixture proportion are not substantially different enough to be considered non-concordant. Additionally, Ms. Koehler based her calculations on only two of the four loci where a minor contributor allele was detected, made a mathematical error in calculating the mixture proportion at D8S1179 (the correct value is 1:35.5, not "1:23.3"), and calculated ratios assuming heterozygosity for the detected minor allele. If all four loci exhibiting a minor contributor allele are used to calculate an average ratio and if both homozygosity and heterozygosity of the detected minor alleles are considered, the minor contributor mixture proportion is 2-4% which is concordant with this limited aspect of the STRmix™ evaluation.

*In other words – the manual mixture ratio calculations do support the STRmix™ assessment, and her testimony to the contrary was **wholly inaccurate**.*

It is fair to point out that later, when given an opportunity to provide a written response to the panel, Ms. Koehler did identify that she had since recognized this error and her inaccurate testimony regarding the mixture ratio. *2019 Response,* pages 3-4. She also advanced that the excessive length of her

testimony and resulting physical, mental, and emotional exhaustion caused her to be unable to perform the calculations on the stand. Ms. Koehler further recognized and related in her response that "adequate preparation and fully recognizing the extent of the challenge posed may have rectified this situation." *2019 Response,* page 3.

Additionally, Ms. Koehler's testimony attempts to explain a post- STRmix™ manual comparison did not address the critical aspects of manual verification. Her testimony suggested a process limited to a verification of the input profile used for the STRmix™ analysis and to a comparison of the mixture proportions calculated by STRmix™ to those calculated by the analyst. Although certainly important, a manual confirmation of STRmix™ results is not simply verifying that the correct input file was utilized. Confirming the mixture proportions only scratches the surface of an evaluation of the consistency of the STRmix™ output with the underlying data. Essentially, Ms. Koehler was unable to accurately explain how a manual verification of STRmix™ results is conducted and was unable to articulate that analysts must evaluate the STRmix™ outputs to confirm the results are valid and consistent with expectations given the underlying data. Fundamentally, this critical process evaluates concordance or agreement between the DNA expert and the STRmix™ analysis.

Beyond the basic comparison of mixture proportions, Ms. Koehler should have been able to explain how the STRmix™ deconvolution results are compared to the underlying data. The possible minor contributor (or foreign contributor) genotypes defined by STRmix™ for 08-07-AB can be evaluated for consistency with the analyst's assessment of the associated data. The likelihood ratio calculations per marker can then be evaluated within the context of this deconvolution.

For 08-07-AB the appropriate criteria for evaluation include but are not limited to:

- Does the analyst agree with the obligate minor alleles defined by STRmix™?
- Did STRmix™ consider allele drop-out potential where appropriate?
- Are the genotype weights (probabilities) assigned by STRmix™ consistent with the underlying data?
- Are the likelihood ratio results per marker consistent with the underlying data and STRmix™ deconvolution?

The STRmix™ diagnostics and run information can also be evaluated to confirm that STRmix™ was able to perform a proper deconvolution given the input file and the defined number of contributors.

STRmix™ should only be used as a tool to assist the analyst with probabilistic deconvolution of mixture data and calculating likelihood ratios, not as a "black box" that generates an answer the analyst is not capable of understanding, evaluating, or communicating to the trier of fact. In fact, DPS protocol specifically states: "After obtaining the STRmix™ results, a manual comparison of the known profiles and the evidence must be done to ensure the likelihood ratio is intuitively supported." *Texas DPS Standard Operating Procedures, STRmix™ Autosomal STR Interpretation Guidelines, DNA-08-08 Version 00.* Another applicable version of the DPS protocol which varies slightly states: "After obtaining the STRmix results, a manual comparison must be done to ensure the likelihood ratio is intuitively supported." *Texas DPS Standard Operating Procedures, STRmix™ Autosomal STR Interpretation Guidelines, DNA-08-08 Version 01a.*

Moreover, in a December 2017 presentation titled "PROBABILISTIC GENOTYPING: A LABORATORY APPROACH," Ms. Koehler, as the Senior Scientific Advisor of the Texas Forensic Science Commission, presented the following slide that underscores the primary importance of the analyst's verification of the STRmix™ output. That slide reflected:

THE MOST IMPORTANT THING

- Probabilistic genotyping is a **tool** to assist the DNA analyst in the interpretation of forensic DNA typing results.
- Probabilistic genotyping **is not** intended to replace the human evaluation of the forensic DNA typing results or the human review of the output prior to reporting.

- **IT IS NOT A BLACK BOX AND SHOULD NOT BE USED AS SUCH!!!!**

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Despite this, Ms. Koehler specifically reasoned during her testimony that she changed from her initial manual conclusion of "inconclusive" to an "included" result because STRmix™ told her to. (2 R.R. at 139-140).

It is also noteworthy that during her testimony Ms. Koehler deflected responsibility for understanding and being able to explain the manual verification process required by DPS's STRmix™ SOP. (2 R.R. at 109:9-22). Not authoring an SOP does not exempt an analyst or a supervisor from understanding the meaning of an SOP that they are required to follow or direct others to follow. Ms. Koehler also continued to assert this lack of understanding during her interview with the panel by indicating that DPS's STRmix™ SOP could benefit from additional

clarifications and that only the DPS DNA Advisory Board truly knows the meaning of an SOP or the reason behind any requirement within the SOP.[5]

The STRmix™ diagnostics and run information can also be evaluated to confirm that STRmix™ was able to perform a proper deconvolution given the input file and the defined number of contributors. The panel reviewed the STRmix™ output for 08-07-AB and determined that both the mixture deconvolution and the calculated likelihood ratio are consistent with the underlying data given the defined number of contributors and conditioning upon the victim's known profile. The STRmix™ deconvolution of the minor contributor from 08-07-AB correctly identified four obligate minor alleles within the DNA mixture (*See* D8S1179, TH01, D16S539, and TPOX). STRmix™ considered the possibility of single allele drop-out (Q) at each of the markers where a single obligate minor allele was identified and considered complete genotype drop-out (Q, Q) at all other markers where no obligate minor allele was identified. This is consistent with expectations based upon the low signal level of the minor contributor data detected. For most markers, the genotype weights defined by STRmix™ were primarily on the low end and spread rather evenly across the possible genotypes for a given marker. At a few markers, especially those with a defined obligate allele, higher weights were assigned by STRmix™ for a select genotype or genotypes. The peak height data associated with this mixture is supportive of the assigned weights. As expected, higher marker likelihood ratios were calculated for those loci with detected obligate minor alleles and/or higher weighted genotypes that were consistent with the suspect.

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[5] Ms. Koehler did note that she had been on that board from time to time and was herself able to explain why certain SOPs had been put in place because of that fact.

*Perhaps most crucial is that the STRmix[TM] results for 08-07-AB were **consistent with the underlying data** and the conclusions reported for 08-07-AB are **correct and not in question**. Thus, this was **an inaccurate** testimony issue by the testifying analyst **rather** than a question regarding the reliability of the STRmix[TM] analysis.*

Like DPS, the panel noticed many other inaccuracies and errors in testimony; however, the panel only discusses the substantial errors which contributed to its determination of negligence or violations of conduct codes. Ms. Koehler also agreed with most, if not all, of those other inaccuracies or errors in testimony in her *2019 Response* and there is no need to recite those again here.

Relevant Considerations Supporting Panel's Evaluation and Conclusions

The panel believes DPS conducted a detailed, thorough, and appropriate root cause analysis, therefore, the panel's report only addresses the considerations which contributed to the panel's conclusion of negligence, rather than revisiting all of DPS' identified root causes. Additional recommendations and any divergence from DPS' conclusions are listed in the answer to Questions 3, 4 and 5.

It is unclear exactly why Ms. Koehler was unable to testify accurately regarding STRmix[TM] theory and application. One can surmise that Ms. Koehler understood the DPS protocol requirements pertaining to STRmix[TM] analyses and reporting and was competent to perform such analyses based upon her training, her successful completion of competency measures, and her communication of that training in presentations.

It is also not unreasonable to conclude that Ms. Koehler either forgot, and/or was not presented with sufficient opportunities to maintain, her knowledge and expertise after her departure from DPS and was simply no longer qualified to offer expert testimony regarding her STRmix[TM] analyses in *Criner* by the time of the hearing. Perhaps the analyst herself was not fully aware of her lack of knowledge until she was confronted with that reality during the hearing.

Or, perhaps, none of these speculations are correct.

Regardless, it is never appropriate to just guess. And Ms. Koehler should not have offered speculative testimony.

The panel identified three over-arching issues which impacted its ultimate conclusion of Ms. Koehler's negligence by giving inaccurate testimony:

1. An apparent lack of understanding of STRmix™ concepts and DPS protocols at the time of testimony;
2. Testifying that she failed to follow SOP; and
3. Inadequate preparation.

The panel discusses each of these issues in depth.

1. Apparent Lack of Understanding of STRmix™ Concepts and DPS Protocols at the Time of Testimony

Testimony demonstrated that, at least by the time of the hearing, the analyst no longer understood portions of the original DNA analyses she performed. The panel's conclusion here was consistent with the observations that witnesses (present during Ms. Koehler's testimony) conveyed during interviews. It was also the consensus of those witnesses that the panel interviewed that Ms. Koehler appeared to no longer have a command of the necessary expertise in STRmix™ analysis.

Her inability to demonstrate through testimony the requisite knowledge and proper application of DPS protocol, regarding the STRmix™ DNA analyses performed in *Criner*, ultimately led to the exclusion of the evidence.

While discussed in more detail later, the panel pauses here to note that a lack of preparation and review prior to trial certainly appear to have exacerbated her lack of knowledge -- *if not directly caused it*.

It is also fair to note that in several instances Ms. Koehler does say that certain aspects of STRmix™ analysis and probabilistic genotyping are outside of her expertise during testimony.

Genotype Probability Distribution Table

      Ms. Koehler was unable to explain the genotype probability distribution table associated with the STRmix™ report which provided the results for the STRmix™ deconvolution of the analyzed mixture.

> Q. … Let's look at the genotype probability distribution table for 807AB, which is now -- which was Defendant's 11. It's a genotype probability distribution table. So for D8, you're saying that 11 is stutter?
>
> A. Well, according to GeneMapper® ID-X, yes, 11 would have been filtered out as stutter. And I see that it is showing up on the genotype probability distribution table and so I can't answer a question about that because that is outside of my expertise.

(2 R.R. at 125:22-25; 2 R.R. at 126:1-7).

…

> A. And honestly, I think Mr. Baumgartner would be a better person to answer questions about that probability genotype table and what -- what that means.
>
> Q. Okay. Have you come to find out that Mr. Baumgartner actually did some work on this case?
>
> A. I don't -- I mean, just -- I mean, just printing –
>
> Q. Okay.
>
> A. -- this, that was the only thing -- I'm just saying that since he performed the validation and he's been working with STRmix now much longer than I have, I believe he would be a better person to answer the question about what these weights signify as well as the different genotype combinations. That's just a suggestion to make it -- make it make more sense.

(2 R.R. at 135:5-19).

The mixture deconvolution results are the primary output and an essential diagnostic of STRmix™. Analysts must be able to evaluate these tables to determine if the possible genotypes and associated weights generated by STRmix™ are consistent with the underlying data.

Stutter Modeling

Ms. Koehler was unable to fully explain how STRmix™ models stutter and, in certain scenarios, considers a peak in stutter position as either stutter, allelic, or possibly allelic or stutter with some degree of probability for each scenario.

> Q. … Let's look at the genotype probability distribution table for 807AB, which is now -- which was Defendant's 11. It's a genotype probability distribution table. So for D8, you're saying that 11 is stutter?
>
> A. Well, according to GeneMapper ID-X, yes, 11 would have been filtered out as stutter. And I see that it is showing up on the genotype probability distribution table and so I can't answer a question about that because it is outside of my expertise.

(2 R.R. at 125:22-25; 2 R.R. at 126:1-7).

…

> Q. And if STRmix recognizes stutter, it's not going to show up in the genotype probability distribution. If we assume that Mr. Baumgartner is correct in that –
>
> A. Uh-huh.
>
> Q. -- then 11 is not stutter because it's showing up in this table?
>
> A. Oh, I -- yes, if Mr. Baumgartner is correct, I would -- I would agree with that.
>
> Q. Okay. So STRmix is saying there's a real allele at 12, at 14, at 13, at 16, and at 11; is that correct?
>
> A. Well, according to the genotype probability distribution table and if Mr. Baumgartner is correct, then yes, that is correct, that's what it says.

Q. Okay. So that would indicate that maybe this should have been run again as a three-person mixture if we're getting all of these alleles -- STRmix is recognizing all of them as real alleles?

A. Well, see, I guess -- I mean, I guess that -- that's one of the reasons why I do the interpretations with the stutter filters on –

Q. Uh-huh.

A. -- because I feel like that adds a level of complexity to that. I really don't know how the genotype probability distribution table -- like I don't recall from our training how that was created and if in fact it does take out all of the stutter peaks, but looking at this electropherogram, this is what I made my interpretations on, and so based upon this, I would say that it was a two-person mixture. Based upon this with the stutter filters off and if we are going to assume that all of these are real alleles because they're showing up, then yeah, I could see how it could be at least a three-person mixture.

(2 R.R. at 126:17-25; 2 R.R. at 127:1-25; 2 R.R. at 128:1).

…

 Q. Okay. So what we were talking about is that if Mr. Baumgartner is correct and STRmix is going to recognize stutter and whatever stutter it recognizes will then not show up in the genotype probability distribution table, which is Defense No. 11, can you tell me if the peaks that you think are stutter on Defense No. 10 are showing up on Defense No. 11?

A. They are showing up on that table.

Q. All right. So according to Mr. Baumgartner's testimony, the peaks that you think are stutter, which are I believe 11 and –

A. 13.

Q. -- 13 are being recognized by STRmix as true alleles in the genotype probability distribution table, Defense No. 11?

A. They are on the genotype probability distribution table, that's correct.

Q. Okay. And they're giving us ratios for if it's a 13, 16; is that correct?

A. Right, the weight of that is .74.

Q. Right. And so -- but that number 13 allele on Defense No. 10 is something that you don't believe is really there. You think it's a stutter.

A. Well, it was filtered out –

Q. Okay.

A. -- by GeneMapper ID-X.

Q. Okay.

A. And honestly, I think Mr. Baumgartner would be a better person to answer questions about that probability genotype table and what -- what that means.

Q. Okay. Have you come to find out that Mr. Baumgartner actually did some work on this case?

A. I don't -- I mean, just -- I mean, just printing –

Q. Okay.

A. -- this, that was the only thing -- I'm just saying that since he performed the validation and he's been working with STRmix now much longer than I have, I believe he would be a better person to answer the question about what these weights signify as well as the different genotype combinations. That's just a suggestion to make it -- make it make more sense.

Q. But if -- if he's correct in his testimony that if it shows up in the genotype probability distribution, then it really is an allele, then we show five alleles at D8?

A. That's correct.

Q. And that by itself is a clue that we could have a three-person mixture?

A. That's a definite possibility, yes.

(2 R.R. at 134:3-25; 2 R.R. at 135:1-25; 2 R.R. at 136:1-2).

Perhaps unintentionally, the defense misrepresented, or at the very least overstated, Mr. Baumgartner's testimony concerning stutter and the probability distribution table. Nevertheless, Ms. Koehler, as an analyst performing STRmix™ and a purported subject matter expert in STRmix™, should have been able to answer this question and more fully explain how STRmix™ can model a peak in stutter position as both a possible allele and as possible stutter.

Within the 08-07-AB mixture, STRmix™ did not assign a 100% weight or probability to the 11 being a stutter artifact or 100% probability to the 11 being an allele. When the 11 is listed within a possible minor contributor genotype on the probability distribution table, STRmix™ is modeling the 11 as a possible allele. However, other possible minor contributor genotypes listed in this table do not include the 11, in which case STRmix™ is modeling the 11 as stutter. The obligate allele for the minor contributor at D8S1179 is a 16. Due to the low signal level of the 16, the sister allele to the 16 may be present within the data detected or may have dropped out and, therefore, not detectable above the analytical threshold. If the sister allele to the 16 is present, it may be homozygous for the 16 allele, masked by a major allele 12 or 14, or overlap with a stutter peak, 11 or 13, to the major contributor alleles. The STRmix™ deconvolution considered all of these possible genotype combinations with the obligate allele 16, including allele drop-out.

The concerns regarding stutter could have been resolved if Ms. Koehler had been able to clearly convey that when STRmix™ deconvolutes this sample as a two-person mixture conditioned on the victim known, only three alleles, 12, 14 and 16 are considered true alleles with 100% weight or probability. The other two peaks, 11 and 13, in stutter position to the major contributor alleles are individually considered as a possible sister allele to the 16, but are also considered as possible stutter. In each potential set of genotypes considered for contributors 1 and 2,

STRmix™ considers no more than 4 alleles total to explain the data under the hypothesis of a two-person mixture.

Additionally, Ms. Koehler was not able to compare and contrast the GeneMapper® ID-X filtering of stutter and the STRmix™ probabilistic modelling of stutter. The 11 and 13 were filtered by GeneMapper® ID-X because these peaks were detected below the marker specific stutter ratio setting within the software. STRmix™ can apply an allele specific and probabilistic approach to stutter modeling rather than a single binary, allele versus stutter, threshold. The STRmix™ evaluation considered the 13 to be elevated as compared to the expected level of stutter for allele 14 and therefore, weighted the 13, 16 genotype with a much higher probability than the other possible genotypes for the minor contributor.

Ms. Koehler's inability to fully comprehend and explain probabilistic stutter modeling caused her to incorrectly admit that 08-07-AB could be a three-person mixture based upon stutter position peaks that STRmix™ considered as possible stutter or allelic. The minor contributor data observed for 08-07-AB is minimal and very low level. Where the probability of allele drop-out or missing data is very high, it is difficult to estimate the number of minor contributors to a DNA mixture. The observed results only provide evidence of a single minor contributor, but this is still an assumption – an assumption entered into the software by the user that is then used by STRmix™ to deconvolute the mixture. Yes, while it may not be the best explanation of the observed results, the mixture could be a three-person mixture with one major and two minor contributors, but not because of the stutter position peaks observed at D8S1179.

2. Testifying that She Failed to Follow SOP

While the panel does not conclude that the analyst failed to follow protocols, the panel does agree, and considered that the analyst *testified* that she failed to apply DPS' SOP in reaching results in this case.

Q. Okay. So after STRmix was run, did you ever sit down and look at Defense No. 9 and Defense No. 10 and do a manual interpretation to see if the STRmix result made intuitive sense?

A. I never looked at Defense Exhibit No. 10 because that was something that Mr. Baumgartner created. I -- I would say no. I mean, the mixture -- I mean, the mixture ratio, I mean, it kind of made sense because it's a really, really low mixture, but I didn't go back and -- I mean, I looked at it, but did I see if it made intuitive sense or document that it made intuitive sense, no.

(2 R.R. at 139:18-25; 2 R.R at 140:1-4).

...

Q. So we are now looking again at this standard operating procedure of the DPS manual that was discussed earlier, and we're looking at a part where it says, after obtaining the STRmix results, a manual comparison of the known profiles and the evidence must be done to ensure the likelihood ratio is intuitively supported.

A. That's correct.

Q. Okay. And so when you testify that – and correct me if I'm using any language inarticulately, but if you testified that your manual deconvolution showed inconclusive?

A. Right, just based upon the lack of data kind of above the analytical threshold for the minor contributor.

Q. And that that changed after obtaining the STRmix results –

A. Uh-huh.

Q. -- can you explain how that means that it is intuitively supported?

A. Well, and I think that was part of – I think -- when I -- when I -- I think we talked about this in the pretrial. When I initially looked at this profile, I saw the low amount of data that was in the minor contributor, and kind of looking at it, I was like there was no way that this could be anything other than inconclusive because I thought there was too little data and then when

I ran it through STRmix -- I even remember talking to some folks and being like wow, I got this -- I got this result. And it was my -- I guess my interpretation that because this was the result that I obtained, that this is what I was to report out. And honestly, reading that, it sounds like -- because what I did is a manual interpretation prior to running it through STRmix because I wanted to make sure that the manual deconvolution was done and so that was the normal practice for me, was to do a manual mixture deconvolution prior to running anything through STRmix. And I also asked my analysts to do the same thing. Reading that, it now looks like I should have gone back again and done additional work to do yet another – yet another comparison. Does that answer your question? And I think I -- I answered the -- Ms. Davis's question when she asked me if I went back and I did that, I said no, I did not.

Q. Okay. And so I guess do you feel as if you followed the standard operating procedure?

A. I mean, reading that, I – I – I would say no, but quite honestly I don't -- I mean, I guess -- I mean, I guess I feel like doing the mixture deconvolution prior to, that I was meeting that, but I didn't go back after obtaining it, so I did it prior to.

Q. Okay. And so do you believe that this likelihood ratio that was obtained is intuitively supported?

A. So looking at the way -- like looking at the genotype report that was created by STRmix, it's Defense Exhibit 11, it says that Contributor 2 is about two percent of the profile whereas Contributor 1 is about 98 percent. So that is a much lower ratio than what was calculated manually, because manually I calculated that to be about a 1 to 23 ratio, so I don't feel like the results are completely – looking at it now, I don't feel like the results are completely concordant between the two.

(2 R.R. at 167:17-25; 2 R.R. at 168:1-25; 2 R.R. at 169:1-25; 2 R.R. at 170:1-6).

Ms. Koehler was questioned about a notation on the electropherogram for 08-07-AB that originally read "suspect is inconclusive" that had been amended to "suspect is included." She explained that "suspect is inconclusive" was the result of her manual comparison of the Defendant's known profile to the data from 08-07-

AB and that this conclusion was changed to "suspect is included" after the sample was analyzed in STRmix™.

Ms. Koehler testified that since all foreign contributor alleles were below the stochastic threshold, she deemed the manual comparison inconclusive. (2 R.R. at 138). This determination is appropriate if the laboratory's binary system does not allow comparisons to data with allele drop-out potential or requires a determination of inconclusive where no loci are suitable for statistical support (i.e. CPI – combined probability of inclusion). It is the panel's opinion, that it is perfectly acceptable for an analyst to testify that, due to inherent limitations of a binary approach, the results of a manual analysis and/or comparison may be inconclusive and differ from a conclusive result obtained through a probabilistic genotyping analysis and comparison of the same data. The panel would caution against sliding into "black box" territory in this regard. The analyst must be able to understand and explain the limitations of a prior binary approach in contrast to the more sophisticated and complex probabilistic approach. Although it is an acceptable practice under certain scenarios to determine a comparison as inconclusive (insufficient data to conclusively determine inclusion or exclusion) the availability of this option may vary depending on the laboratory system. DPS indicated that under prior laboratory manual mixture analysis protocols, the determination of inconclusive or "not suitable for comparison" has been an option for an entire profile or certain aspects of an individual profile but has never been an approved conclusion for a comparison. During her post-hearing interview with DPS, Ms. Koehler initially reasserted her testimony that the amended "suspect is inconclusive" notation on the electropherogram for 08-07-AB was the conclusion of her manual comparison. As the interview progressed, she indicated that the determination of "inconclusive" applied to the minor contributor data from 08-07-AB and she was unable to remember why "suspect is inconclusive" was originally

documented on the electropherogram. In her written response to the panel, Ms. Koehler agreed with DPS that the notation of "suspect is inconclusive" was a direct result of the initial STRmix™ analysis for 08-07-AB–using data that was analyzed with the stutter filters on. That initial erroneous STRmix™ analysis yielded a likelihood ratio in the inconclusive range -- prompting the notation of "suspect is inconclusive." This error was identified during the technical review process, and a second STRmix™ analysis was conducted using data that was analyzed without stutter filters.   The second STRmix™ analysis resulted in the determination of "included," and the results of the comparison were amended accordingly on the 08-07-AB electropherogram.

The panel agrees that the case file and audit log documentation; the timeline of the STRmix™ analyses, electropherogram notations, amendments, and technical review; and the interviews of witnesses support this conclusion.

Ms. Koehler admitted in testimony that she did not follow laboratory SOP and perform a manual comparison of the STRmix™ results to the underlying data. This admission, if true, casts doubt on the proper application of the STRmix™ analyses and the validity of the reported results. Again, when given the opportunity during testimony to evaluate if the likelihood ratio or the STRmix™ results were intuitively supported by the underlying data, she stated that the STRmix™ results and her prior manual assessment of the underlying data were not "completely concordant." As previously mentioned, it is simply not appropriate for an analyst to report conclusions based upon probabilistic genotyping if he or she disagrees with the analysis and interpretation.

Ms. Koehler's testimony reflected that she either reported an inclusion for an evidentiary item without doing the required post- STRmix™ manual comparison in violation of SOP, or she did the comparison, determined that it was insupportable, but then reported it anyway in violation of SOP. Again, the panel doesn't believe

she reported a result she disagreed with, and Ms. Koehler has since confirmed the panel's and DPS' conclusion in her written response:

> "After spending time thinking about this, being reminded by DPS that 'inconclusive' only applies to questioned profiles and their suitability for comparisons, not comparisons themselves, I agree that the word 'inconclusive was due to running profiles with the stutter filter on through STRmix, instead of running profiles with the stutter filter off through STRmix. This did not fully hit home until I was in the process of writing this response."

2019 Response, page 2.

While the panel commends this admission, it is troubled by the fact that Ms. Koehler did not review her own work sufficiently to comprehend this error prior to her interview with DPS or at any point before May 2019 — even after her testimony resulted in the exclusion of evidence and other myriad of issues. The panel is concerned with whether Ms. Koehler really appreciated the seriousness of this issue if she did not, until only very recently, endeavor to appropriately review her work and testimony to determine what *actually* happened.

During her interview with DPS, Ms. Koehler was questioned as to whether she truly believed that she did not follow SOP by not performing a manual comparison and evaluation of intuitive support for the 08-07-AB STRmix™ results. She responded that she *did follow SOP*, but "in the moment" and "after seven hours of testimony," she had lost confidence and was simply doubting that she followed the SOP since there was no documentation in her case record that supported this assessment had been performed.[6] In her written response to the panel, Ms. Koehler confirmed that she testified in *Criner* that she did not follow SOP, but stopped short of answering whether she currently believes she followed the required SOP for the

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[6] It is important to note that DPS informed Ms. Koehler that documentation of the manual assessment is not required and that, if an analyst did not agree with the STRmix™ results, he or she would not report them.

analysis in question. Ms. Koehler's written response further states that at no time during her DPS tenure has she *intentionally* not followed an SOP:

> I testified that I did not follow the standard operating procedure. I can say that at no time during my tenure at DPS did I intentionally not follow the standard operating procedures that were in place.

2019 Response, page 3.

Regardless of what happened, the DPS system and the panel agree that the STRmix™ results for 08-07-AB are valid and supported by the underlying data. Additionally, and perhaps most importantly -- because her name is on the issued report -- Ms. Koehler has stated in her DPS interview and written response that she believes the STRmix™ analysis and results reported for 08-07-AB are supported by her manual analysis.

Moreover, even in her written response, she still did not appreciate, or she minimized, the errors that she made during testimony regarding sample 08-07-AA. While the analyst can certainly disagree with the STRmix™ report, the analyst violates policy and, frankly, professional ethics if she reports results that are not intuitively supported by the underlying data. Additionally, as previously noted, the incorrect conclusion on the 08-07-AA electropherogram documented as "excluded" when the suspect is clearly not excluded, appeared to the panel to be either an error due to incorrect manual deconvolution or an incorrect notation. In fact, some of the notations on that electropherogram appear to support that "suspect is excluded" was likely added in error and haste on the "5/20/2016" date and after the technical review required additional documentation.

3. Inadequate Preparation

A lack of preparation and review prior to trial certainly appears to have exacerbated or caused this entire situation. The panel considered all the evidence illustrating the level of Ms. Koehler's preparations prior to and during the hearing.

Interviewed witnesses who observed the testimony also reflected that Ms. Koehler appeared ill-prepared in some regards. The panel also notes that at least one witness recalled that Ms. Koehler had appeared well-prepared in previously-observed testimonies and had a good reputation.

The attorney witnesses that the panel interviewed, while less critical of Ms. Koehler's testimony in this hearing than the forensic analyst witnesses, still agreed that she seemed ill-prepared at times and at some point, during cross-examination, it appeared as if she just did not know how to answer.

Importantly, <u>none</u> of the witnesses indicated a belief that the errors were malicious or intentional. And <u>none</u> of the witnesses expressed the belief that Ms. Koehler intentionally violated Brady or disclosure obligations.

Regarding inadequate preparation the panel considered and concluded the following:

<u>*Ms. Koehler did not obtain, organize, or sufficiently review the complete case file prior to testifying*</u>

In her interview with DPS, Ms. Koehler asserted that she did not think she would be required to testify to STRmix™. She said she did not study for the "STRmix part," that the DA told her Chase was going to do that part, and that she thought that the DA "was bringing in everything through Chase." *DPS Interview,* page 1. She said she was told by the DA to focus on the Y-STR part. *Id.*

In her written response, Ms. Koehler did clarify, "I erroneously thought that my testimony would not be focused on the technical aspects of STRmix, but only the STRmix results obtained/reported and answering any technical questions about Y-STR testing. Based upon this belief, I did not prepare for this testimony as I normally would when testifying to a new technology."

In response to questioning by the panel, Ms. Winkeler stated that she believed Ms. Koehler would be testifying to her Y-STR and STR results, as well as to why

those results were valid. Ms. Winkeler volunteered that Ms. Koehler had indicated that she would not be the best person to discuss validation or get in to (as Ms. Winkeler characterized them) the "nitty-gritty" aspects of STRmix™.

Ms. Koehler also said she thought she had a copy of the case file on her computer, but those records were from a different case. On June 12th, 2018, she realized the DA had emailed and offered a copy of the file, so she requested the copy from the DA.[7] *DPS Interview,* page 1. She said she had assumed the DA had given her a full copy of the case record but that some items were missing – like the "STRmix reports." *Id.* Ms. Koehler told DPS in that interview that she did not think she was provided the same CD that DPS had provided the prosecutor. According to DPS records provided to the panel, the copy of the file given to the defense and the prosecutor on April 5, 2017, included "DNA files from JTrax," A similarly named file that the panel received did include the STRmix™ reports for the AA and AB samples. *See* Appendix 1.

Ms. Koehler told DPS that she spent approximately 2 to 2 ½ hours reviewing the Y-STR information and maybe 2 hours to get the case record in shape. *DPS Interview,* page 2. Ms. Koehler also said that she did not testify as she normally would have when testifying to a new technology. *See 2019 Response; DPS Interview.*

Even after her interview, the panel was not clear if Ms. Koehler had or had not reviewed the laboratory DNA reports (or other items) prior to her testimony due to her ambiguous responses.

She expressed to both DPS and to the panel that it was challenging to compile the record out of an electronic format and that she had to re-organize it after her first day of testimony. *Id.* When the panel interviewed her, she explained that her normal practice in preparing to testify was to get the case record in order and flag

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[7] She also expressed this to the panel and the June 12th date was identified from emails Ms. Koehler had in her possession.

specific portions. *Id.* However, she indicated that it was not her practice to review many, or most, things in the file. When the panel sought clarification on what type of review or preparation she thought was appropriate and necessary for analysts to do prior to testifying, Ms. Koehler's elaborations on this topic mainly focused on certain aspects of validation review if she were testifying to a new technology and did not offer anything concrete in terms of reviewing the actual case results. She did, however, insist that reviewing lab reports, electropherograms, and STRmix™ runs and comparing them or doing any sort of deeper dive into the case file as preparation would be akin to another "technical review." Ms. Koehler stated that she would not normally perform a "second technical review" of the case file, nor would she expect this level of review from other analysts prior to testimony. When specifically asked if she would read the DNA reports, review electropherograms, and review STRmix™ reports prior to testifying, she insisted to the panel that she did not think a review of the electropherograms and STRmix™ reports was necessary unless she was testifying to another case analyst's work.

The panel likewise considered that the analyst participated in multiple pre-trial discussions prior to the hearing. [8]

DPS' root cause analysis reflected that the Travis County District Attorney's Office informed DPS that Ms. Koehler never expressed any disagreement with her conclusions in the report or STRmix™ during those pre-trial meetings. Ms. Winkeler confirmed that Ms. Koehler never expressed any concern about, or disagreement with, the reports or results. Ms. Koehler had conveyed to Ms. Winkeler that she thought the likelihood ratio was on the lower end and that the DNA results were not strong.

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[8] Ms. Winkeler recalled 3 or 4 pre-trial meetings with Ms. Koehler (but did not have notes to consult for confirmation of this fact during her interview). Ms. Koehler re-called 2 pre-trial meetings in her interview with the panel (but did not have access to all her emails or notes to confirm her memory).

It seems that if Ms. Koehler had reviewed the file, even right before her testimony, and had really disagreed with the conclusions she reported, or even suspected that she disagreed due to the disparate documentation within the case file, she could have, and should have, informed someone before testifying.

The panel also considered the following testimony excerpts as supporting the lack of a thorough review of the file or preparation for trial:

> Q. And did you I guess ultimately analyze the data related to all the information that y'all were able to gather from those pieces of evidence?
>
> A. Yes, I believe I issued all of the reports except for one. If I – if I've compiled this appropriately – I apologize I was compiling this from a CD and I realized that I may not have all of the pages. So I believe all but one report, which was a forensic biology report, was issued by myself, by me.

(1 R.R. at 129:15-24).

…
> Q. -- do you know what the quant was on that?
>
> A. If I'm remembering correctly, because I looked at this this morning and I'm trying to find the paperwork to verify that it's actually correct. If I'm remembering correctly, that sample was actually undetermined for quantification value. Let me verify that if I have that in here.

(2 R.R. at 35:8 – 14).

…
> Q. …this is what generated a STRmix report, Defendant's No. 6; is that correct?
>
> A. 0804A -- I don't have that STRmix report. There may be one but I didn't have that in the materials provided to me, but I do see that I did report it out.

(2 R.R. at 53:9-14).

…

    Q. Okay. And did you have any notes as to how many swabs came to you from the victim's right thigh?

    A. I don't have that information with me at this time. I believe it was two, but I can't be certain of that.

(2 R.R. at 62:6-10).

…

    Q. … And just to be clear, when these swabs come to you, do they come like in one envelope with several -- with the two swabs in there together or would they be packaged separately?

    A. Those would all be in the notes that I do not have – that I do not have with me, how they were all packaged.

(2 R.R. at 69:1-7).

…

    Q. And do you recall I guess the condition of the evidence that you received?

    A. I would have to rely solely on the reports that I have. And I don't know even if I have them in order right now. Just to refer to how the items were packaged, I don't have anything in my notes to indicate that there was anything inappropriate about how the items were packaged or how they were sealed."

(2 R.R. at 130:5-12).

…

    Q. So who technically reviewed 807AB STRmix results?

    A. I don't have that in front of me because that's in the case record that I – that's in the part of the case record that I didn't print.

(2 R.R. at 109:10-14).

Ms. Koehler has admitted that she did not appropriately prepare; however, the panel is concerned that she does not appear to recognize what constitutes an appropriate level of preparation. Her recitation of appropriate preparation was in stark contrast to every other analyst or expert interviewed who each expressed a more rigorous preparation routine.

The panel believes this Commission should consider that she has voiced an acceptance of responsibility and admitted making mistakes, but it is also clear -- in part from some of those same admissions -- that Ms. Koehler simply did not adequately prepare.

Ms. Koehler said she "mistakenly believed the prosecutor had provided her with the full case record." The panel takes her at her word but still observes that a thorough review of the materials provided should have put her on notice that it was not complete prior to the hearing. The panel also understands that electronic formats can complicate file reviews. [9] However, if there was any difficulty encountered because of the electronic format, Ms. Koehler should have exerted more effort to ascertain what she did or did not have and request specific documents that she believed to be missing directly from DPS.

Ms. Koehler expressed to the panel that her strained relationship with DPS may have made her reticent to reach out to communicate in this case. The panel agrees this was a contributing factor based on that admission, but further recognizes that this scenario is something that can frequently happen in a laboratory system -- or any field -- and that it is always up to the individual ethics of any person to make sure that he or she fulfills a duty to the work and his or her role in the system, rather than a past employer. The panel appreciates Ms. Koehler's candid insight on this fact.

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[9] The panel also was provided information in an electronic format.

Poor documentation made her case review more complicated

The panel agrees with DPS that poor documentation also created confusion during the testimony. Details about this contributing factor are included in the panel's answer to the Commissions' Questions 3, 4, and 5 below.

The panel is acutely aware that issues with documentation and organization of the case record were pointed out to Ms. Koehler almost a year before her testimony and it was suggested at that time that she might want to supplement or clarify the file. A notion by Mr. Baumgartner in the "Main Case Record," made on July 24, 2017, and his interview, supports this contention. Specifically, the case note reflects "Spoke to Jody Koehler about the need for an amended report and some additional documentation that the case file may benefit from." *DPS Case File, Main Case Record, AUS-1604-06703, [File Name AUS-1604-06703 MCR 2017-0824.pdf], page 13 of 17).* Mr. Baumgartner did indicate in his interview with the panel that Ms. Koehler seemed appreciative of his observations and was not dismissive of these recommendations.

The lack of clear documentation, especially the recording of conclusions or reasons for changing a conclusion, exacerbated the problems that resulted here and contributed to the analyst' inability to quickly disseminate the information contained in the case during the hearing – especially since she had failed to adequately prepare beforehand. Ms. Koehler tells the panel in her written statement that this being a "rush" case contributed to the errors for both herself and the technical reviewer. *2019 Response,* page 1. She reasoned that this caused her to not adequately document in a way that would permit her to recall why she made particular notes. The panel recognizes that "rush" work can cause issues such as this but does not find that this "mitigating" factor negates a negligence finding.

It is important to point out that there is no standardized documentation process across labs -- or even within labs from analyst to analyst -- and it may be

unclear what truly satisfies "the documentation requirement" standard of practice in forensic work. While DPS -- like other labs -- have SOPs regarding required documentation, the level and extent of documentation that is necessary can be hard to quantify from situation to situation. It can also be so time-consuming that it is prohibitive for a lab to employ. Again, while the panel recognizes documentation was a problem here, it only considered that fact as contributing to the inaccurate testimony. Inadequate documentation was also not determined to be as a stand-alone negligence issue because of the difficulty in defining what is an acceptable level of documentation.

As Ms. Koehler noted, it is also extremely difficult for those in leadership roles to juggle the many obligations and duties placed on them in the laboratory system. The panel is cognizant of this fact as well and concurs with that assessment. Additionally, the panel recognizes that monetary restrictions and resource limitations can impact the ability of analysts to adequately perform work. Ms. Koehler stated that she did not have necessary software which contributed to her difficulty in documenting the file. The panel can appreciate this fact without excusing the obligation on the analyst to fulfill her duties even in the face of limited resources.

Testimony errors appear related to an inadequate review

Perhaps the most compelling evidence that Ms. Koehler neglected to adequately review the file is found in her testimony. She testified to a conclusion that was not in agreement with her issued report (08-07-AA), and she testified to reporting a conclusion that was not supported by the underlying data (08-07-AB). If she had reviewed the file, seen and understood the results, yet neglected to inform the prosecution and defense of the clearly exculpatory fact that she reported conclusions that she believed to be incorrect or unsupportable, the panel would have had no choice but to find that Ms. Koehler committed professional misconduct.

After a thorough and complete review, like DPS theorized, the panel concludes that the case file and other evidence supports that the analyst simply did not adequately review or comprehend the case records and, as a result, testified incorrectly regarding reported conclusions.

The panel expects that, if Ms. Koehler had reported conclusions that she thought were not supported by the underlying data, there would have been some notation or documentation indicating disagreement with the STRmix™ analyses and/or some recollection or notation by the technical reviewer or analyst on the resolution of this disagreement prior to reporting. Such action would also be unsupportable per DPS' SOP. It is preposterous to conclude that a veteran analyst of Ms. Koehler's experience would be willing to report results with which she did not agree. It also strains credulity to believe that no person involved in the process would have recalled or noted such an extraordinary event or conflict. In fact, according to DPS' *Root Cause Analysis*, both the technical reviewer and technical leader indicated that Ms. Koehler only expressed surprise with the likelihood ratio and never expressed any disagreement with the results or report.

It is difficult to believe that Ms. Koehler would not have relayed that information to the prosecutor for disclosure. Regrettably, Ms. Koehler's inattention to detail, lack of appropriate and thorough documentation, lack of preparation, and perhaps, loss of knowledge, appeared, instead, to have caused her to mistakenly conclude during her testimony that she had reported an unsupported result. Such an admission is far more damning than what appears to have *actually* happened. There were not, in fact, inaccurate conclusions presented in the reports issued for 08-07-AA and 08-07-AB. The panel concurs with DPS that the facts and evidence point instead to an error in the case file notes (08-07-AA) and an error in the evaluation of the case file notes "on the fly" by the analyst (08-07-AB).

This was all complicated by the fact that Ms. Koehler was no longer performing the STRmix™ work she was called to testify about, was not part of the DPS laboratory system, and had not been involved in forensic casework for approximately ten months prior to her testimony. It is possible that she was so far removed from the scientific practice of DNA analysis to have been able to maintain proficiency in the field. However, she did not simply retire from forensic work. On the contrary, Ms. Koehler was actively involved in upholding standards for the forensic community in her current role and as an ANAB assessor. As such, she was surely aware of her professional obligations regarding accuracy of reports and testimony.

That said, one of the biggest issues that the panel wrestled with in its determinations was the rudimentary concept of whether an analyst can ever comply with any standards of practice at even the most basic level when he or she *simply fails to prepare.*

Analyst Role at Hearing

As this appeared to be a rationale offered by Ms. Koehler throughout this process for why she was not prepared, the panel believed it necessary to address this contention. As previously indicated, Ms. Koehler has explained that she believed it was her role to testify regarding the technical aspects of Y-STR analysis, her Y-STR results, and her autosomal STR/ STRmix™ results.

Ms. Koehler's suggestion that another analyst could testify to certain topics better would not act to bar the defense from questioning her in an admissibility hearing on those topics. Nor does her communication of this to the prosecution indicate any acquiescence by the prosecutor to utilize the witness for only the specific purposes she suggested.

Ms. Koehler's written and verbal assertions that she was not prepared to testify regarding technical aspects of STRmix™ analyses does not seem to indicate

an appreciation of the fact that she also *failed to prepare to testify regarding the results she obtained, or even, at the most basic level, her actual reports*. It is not as if she was simply unable to articulate the nuances of STRmix™ theory, it is that she also testified incorrectly regarding the work she performed. The panel is concerned about whether Ms. Koehler truly appreciates that her testimony was unacceptable as to the work she performed and her analyses generally.

Ms. Winkeler expected Ms. Koehler to testify regarding her analyses in the case and the application of the principles making up those analyses. Mr. Baumgartner did not expect to testify to the analyses performed by Ms. Koehler. Since Ms. Koehler had performed the autosomal STR results, was trained on STRmix™, and demonstrated proficiency in STRmix™ theory, there would be no reason for the prosecution or DPS to believe she was incapable of that testimony absent her explicitly communicating that fact.

Ms. Koehler's own understanding of the scope of her testimony may or may not have controlled her preparation or lack of preparation. Ms. Koehler indicated in her most recent statement to this panel that she did believe she might be called upon to testify to her STRmix™ results. Thus, it would not be unreasonable for her to also expect to testify not only to the work she performed but also to the expertise that the parties would naturally assume she possessed because she performed the analysis. Ms. Winkeler's email also specifically indicated the areas that she expected to be challenged by the defense. A prudent analyst should have considered each of these things to be within the expected area of examination.

Even assuming a misunderstanding as to her role prior to the hearing, that misunderstanding should not have continued after the questioning on the first day. The prosecutor clearly told the analyst that the focus of the analyst' testimony would be on the amended report and specifically 08-07-AB, which was an autosomal STRmix™ result. (1 R.R. at 131:22-25; 1 R.R. at 132:1-7). Certainly, it

was also clear by the lunch break on the second day of testimony. Ms. Koehler was specifically asked to testify to the STR/STRmix™ results and application -- although not as to theory questions at this point. She was questioned about the amended report STR results for 08-07-AB as well as Y-STR results for 08-07-AB and Y-STR (results on framed glasses). The analyst had an opportunity -- between June 18th and 19th -- to prepare for additional areas of examination that should have been obvious. That said, the analyst had not yet been cross-examined by the end of the first day and perhaps did not anticipate the level or skill of cross-examination she might receive.

Regardless, at any given point during the hearing, and once she realized the topics of cross or direct examination, Ms. Koehler could have asked to break and review the file. Certainly, once she realized she did not have all the data she needed, it was her obligation to inform the parties and to refrain from offering speculative testimony. Ms. Koehler was not a new, inexperienced analyst but rather a seasoned one with decades of testimony experience. It is not unreasonable to expect that she would be able to communicate her need for additional time to the court.

Ms. Koehler's years of experience as a testifying analyst should have, similarly, informed her that her *application* of the relevant forensic analyses was a component for admission of the evidence in this type of hearing.

A review of Ms. Koehler's training records indicates that she had undergone training in these types of *Daubert/*Rule 705 challenges and that DPS provided training and guidance to its analysts on this very scenario. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993); *Tex. R. Evid.* 705; *See* Appendix 1. Still, the panel recognizes that training is no substitute for real world experience. It also is not lost on the panel that frequently real-life 705 hearings do not involve aggressive and pointed cross-examination as to application or reliability. The panel is also informed by its anecdotal knowledge,

as participants in the criminal justice system, that true challenges are frequently few and far between and it can be difficult for analysts to be fully prepared for such challenges. This issue is compounded by the fact that oftentimes parties will bring in "experts" beyond the daily forensic practitioner to address more intense admissibility challenges -- thereby necessarily decreasing the opportunity for practitioners to experience the most extensive or vigorous challenges.

However, it is also possible that here the reverse may be true. Ms. Koehler indicated that she typically did not review a case file prior to testimony unless there was something specific that she needed to go over because she had so much experience in testifying. This may indicate that her experience testifying caused her to be complacent. Ms. Koehler has indicated that she did not fully appreciate the extensive challenge that she would face. However, many of the issues that plagued her testimony were not rooted in a challenge to the reliability of STRmix™ but were challenges to her application and testing. That is a very different aspect of the hearing and one that an analyst should be prepared to routinely contend with since the analyst is necessarily required to testify to the work performed by that analyst.

Ms. Koehler also indicated that the length of her testimony and the challenges she faced impacted her performance. As the panel has stated herein, it is difficult for analysts to prepare for true challenges when they do not have adequate exposure to such challenges, however, that is why it is imperative to be prepared by having a full command of the work that has been performed, expertise in the area that is being testified to, and diligent preparation and review of the implicated file or analyses. Even an analyst who has faced many extensive and lengthy challenges, and is proficient, will fail if he or she has not sufficiently reviewed the work.

So, while the panel did consider these additional "mitigating" factors raised by Ms. Koehler, the panel must also give substantial weight to the fact that had Ms.

Koehler prepared and reviewed her work and the file thoroughly, at a minimum, she could have informed the parties or the court that she was unable to address the questions and challenges or, perhaps she would have been able to testify adequately.

Additionally, the panel is mindful that Ms. Koehler's knowledge and experience would have prepared her to at least express her disagreement with inaccurate conclusions posited by the lawyers. Ms. Koehler's roles with the Commission, and as an assessor for ANAB, provided her with additional opportunities and exposure to the potential problems that can result when analysts are negligent in analyses, preparing, or testifying.

The panel is also aware that analysts who frequently testify in the system are not immune from the recognition that consequences are dire. Analysts are also aware of the additional importance and seriousness of instances when a relatively new or novel scientific method is being offered. It should not have escaped Ms. Koehler the gravity of the proceeding she was participating in, nor could she be ignorant of the consequences to all parties, the science, and the entire criminal justice. Ms. Koehler did not approach her role with the attention that was required and, which she should have known, was her duty.

For all the reasons discussed above the panel concludes that Ms. Koehler's conduct in providing inaccurate testimony violated her ethical obligations and constituted professional negligence.

Question 3:

The Commission asked the panel to determine whether DPS' self-disclosure adequately identified all root causes contributing to the exclusion of the STRmix™ evidence and related issues.

Question 4:

The Commission also asked the panel to identify if any other additional root causes were present.

Question 5:

The Commission also asked the panel to recommend if any retroactive reexamination of casework is necessary in light of the self-disclosure.

Panel Conclusions[10]

DPS' self-disclosure was thorough and detailed. Many of the root causes[11] implicated in this case have already been addressed by DPS; however, the panel does have an additional observation.

DPS performed a review of the additional STRmix™ casework, six cases total including *Criner*, processed by Ms. Koehler. Four of the six cases, including *Criner*, required amended reports due to associated inaccuracies in the report statements. These inaccuracies involved discrepant report statements in which the victim was specified as an assumed contributor to the DNA mixture, but the likelihood ratio statement presented or the likelihood ratio calculated did not assume the victim as a contributor. In other instances where the reported likelihood ratio statement and calculations were conditioned on the victim, the report indicated that, "based on the likelihood ratio result," both the victim and the suspect are included as possible

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[10] Again, the panel combines these questions as they are interrelated and to avoid repetition.

[11] The panel dissents from DPS' analysis regarding the prosecution's request to test the second swab. It is one thing to ask for scientifically inappropriate testing. It is another to ask, in specific instances, for additional appropriate testing of items seized by law enforcement that have the potential to yield viable evidence and different results.

contributors. A likelihood ratio calculated by assuming the victim is a contributor cannot be used to support an inclusion of the victim to the DNA mixture. These latter instances involved intimate samples where it is reasonable to assume the presence of the victim. Therefore, while technically inaccurate, the impact is not critical. Overall, these issues possibly indicate that Ms. Koehler and the corresponding technical reviewers may have struggled with the precise reporting of STRmix™ results during the time frame in which these cases were processed.

Since DPS has reviewed all STRmix™ casework processed by Ms. Koehler, further reviews are not necessary unless significant new deficiencies in manual data analysis and interpretation on the part of Ms. Koehler are discovered, or there is further concern regarding any of the technical reviewers' understanding of STRmix™ reporting principles. DPS should reflect on whether these issues observed in technical review are isolated incidents associated with the implementation of a new technology and since rectified, or, whether they indicate the need for a more thorough assessment of the DPS' technical review system. This self-assessment should inform whether other retroactive reviews are needed.

Question 6:

The Commission asked the panel if it had any other corrective or preventative actions it recommended for either it, DPS, or Ms. Koehler.

Question 7:

The panel was also requested to further communicate any other observations or recommendations that might be helpful -- including changes to Commission rules, oversight procedures and/or additional training initiatives that might benefit Ms. Koehler, the DPS laboratory system, or the forensic DNA community as a whole.

Panel Recommendations and Observations[12]

The panel wishes to observe that it received a substantial amount of cooperation from all participants. From what the panel could deduce, the legal participants appeared to be diligently trying to understand the scientific issues and were appropriate in preparation and communication with experts. Additionally, and especially, the trial court asked salient and thoughtful questions about the forensic analyses and scientific methods.

Statements Regarding Concerns and Evaluation Process

The panel identified several things during its review and evaluation which it would like to bring to the Commission's attention. Specifically, the panel had the following general observations that it hopes the Commission will keep in mind in this instance and in future assessments:

1. There is an added layer of complexity to a negligence evaluation when courtroom testimony is involved because of the high potential for the evaluation to be impacted by the nature of the adversarial process and skilled cross-examination. The panel would like to impart its general concerns about making negligence determinations based on performance in the courtroom as there are a myriad of factors which generally the analyst may have no real control over.

2. It cannot be understated that absent uniform recognized standards of practice for trial preparation, it is hard to quantify what constitutes "adequate

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[12] Again, the panel combines its discussion of these questions.

preparation" or the impact inadequate preparation may have on other evaluations relating to negligence or misconduct. What is deemed adequate or inadequate is a fluid evaluation that is inevitably viewed in hindsight from the lens of "resulting consequences."

3. STRmix^{TM} itself is a new and complex analytical tool and the panel cannot help but question what impact, if any, the internal and external pressures to expedite implementation may have had on both laboratory and analysts alike. The panel cautions strongly against viewing errors in testimony relating to new technology as being misconduct or negligence without a full and complete evaluation of the totality of the circumstances. In particular, the panel does not want its recommendations here to be overemphasized in light of that context.

4. The panel was guided in its evaluation by the Commissions' previous reports from investigative panels (especially its *Final Report on Complaint by the Harris County Criminal* Lawyer's (sic) *Association Against the Harris County Institute of Forensic Sciences and Fessessework Gual, issued February 2, 2018*). It is important for investigative panels to understand the potential effect of interpretations and to be cognizant of setting precedence. It is also, therefore, extremely important to be consistent in those evaluations.

Recommendations and Observations for DPS

1. The panel believes that DPS took this issue very seriously and invested substantial resources in attempting to determine what happened and why. Conversations with current and former DPS personnel lead the panel to conclude that they were circumspect in their evaluations and professional and diligent in their review and root cause analysis.

2. Upon hearing testimony from Ms. Koehler that she failed to follow DPS' SOP, Mr. Baumgartner responded ethically and appropriately. It is critical to realize that lawyers are not intimately familiar with laboratory processes and may not always immediately recognize the significance of certain testimony. When Mr. Baumgartner recognized the disclosure implications of Ms. Koehler's testimony, he immediately informed the prosecutor. This was absolutely the right thing to do and his conduct is deserving of commendation.

3. No quality system can achieve perfection. Analysts will make mistakes. One of the issues in this case might have been avoided if the technical reviewer had caught the documentation error. However, it should be noted that the

technical reviewer met her obligation in the most critical aspect of the review – reporting correct conclusions. Moreover, when asked about the mistake, the reviewer immediately and unequivocally accepted responsibility and took ownership of the error. The panel was impressed with her professional demeanor when pressed about the issue and appreciated the complete lack of defensiveness displayed. It also appeared from interviews with many of the witnesses that technical reviews of Ms. Koehler's cases were frequently difficult for a variety of reasons. Some of these reasons seemed to be of her own making while others were attributable to the competing demands of her position.

4. Based on the panel's review of DPS protocols, the panel recommends that DPS consider clarifying its SOP regarding the required manual comparison of the STRmix™ analysis to the underlying data and perhaps explain exactly how that manual comparison should be performed to determine whether a result is "intuitively supported." Initially, the panel intended to recommend that DPS analysts might benefit from additional guidance on the evaluation of the probability distribution genotypes table. However, after interviews with DPS personnel, the panel believes analysts are receiving this important training. The panel has learned that DPS is conducting gap/knowledge assessments to identify areas were further training and education may be needed. DPS is also utilizing oral boards to evaluate if analysts are appropriately verbalizing likelihood ratios and probabilistic genotyping concepts.

5. When DPS is aware of the potential for a departing analyst to testify it should also consider a thorough review of the case file by the original technical reviewer or another analyst still with the DPS laboratory system. The panel also suggests that DPS determine whether Ms. Koehler may still be called to testify in other cases. DPS should have frank conversations with stakeholders to provide them with all relevant information concerning *Criner*, and other related STRmix™ cases, so that those stakeholders may evaluate the impact and appropriate disclosures, if any. Ms. Koehler should not testify for DPS again without undergoing additional STRmix™, testimony, and DPS protocol training. Even then, it is suggested that DPS assess her fitness prior to that testimony. It may also be necessary for the technical reviewer or another DPS analyst to take ownership of the case results and testimony.

Recommendations and Observations for the Commission

1. It should not go unnoticed that the DPS system and analysts within that system were under incredible pressure to quickly implement STRmix™ and, that this drastic change came on the heels of SOP changes relating to mixture deconvolution and the implementation of a stochastic threshold for some labs. Certainly, all labs in Texas have suffered of late from "SOP Modification and Implementation Fatigue Syndrome (SMIFS)." While the Commission sincerely attempted to provide resources and training to assist with these rapid changes, it is not unexpected that there might be "growing pains" felt by both analysts and laboratory systems. The Commission should recognize that some errors are inevitable and take care not to rush to judgments that do not account for these facts, or the Commissions' and legal systems' complicity in the matter.

2. While it is laudable that DPS' root cause analysis recognized a need for better communication with departing analysts as well as standards relating to providing files for review, those factors are not entirely in the purview of DPS or any laboratory system. Nor, are they completely in the purview of the Commission. The legal system plays its part in this issue. Perhaps, however, the Commission might consider setting forth standards or guidance for licensed analysts and accredited laboratories to follow in the endeavor to correct potential problems that can arise with analyst departures. It might also be important to explain potential implications and limitations to the legal community via training or other communication. A stakeholder primer to assist in identifying the relevant issues to be addressed with analysts or with the laboratory system, in the event a former analyst is no longer able to offer expert testimony might be helpful. Analyst retire, die, change professions, or commit misconduct or negligence. This is a problem that will continue to affect the criminal justice system. The licensing committee addressed some of these concerns -- which the Commission adopted in its rule-making -- but licensing issues are not the only impediments to future testimony. Perhaps the Commission could form a group of stakeholders to assist with this task.

3. The Commission could offer guidance on the issue of what constitutes adequate preparation for testimony and assist in establishing community standards on this topic.

4. It is difficult to propose suggestions to ensure that the Commission's scientific advisor maintains expertise. At a minimum, the Commission should require, offer, or encourage continued educational training in the discipline of expertise. The Commission should also monitor advisor testimony and require advisors to meet with former laboratory employers prior to that testimony.

5. It does appear that Ms. Koehler received adequate training in STRmix™ theory. *See* Appendix 1. Additionally, she performed well in testing on that training. Although her training appears sufficient, perhaps she did not have regular opportunity to put this training into practice. Ms. Koehler and DPS both identified her limited work in STRmix™ cases as a potential root cause. Ms. Koehler also correctly posits that her lack of exposure to casework and DPS protocols after she left DPS' employment likely made it difficult for her to appropriately maintain a skill level to be able to testify to her analyses and the methods used. Specifically, the Commission should provide additional training for Ms. Koehler in STRmix™ and remedial training in preparation for testimony. Even now, Ms. Koehler seems not to appreciate the true level of preparation and case review that is needed prior to testifying.

6. The panel recognizes that trial testimony and *Daubert* hearings are areas where forensic analyst training may be lacking. Perhaps the Commission can facilitate this training or solicit the cooperation of lawyers in this endeavor.

Recommendations and Observations for Ms. Koehler

1. Many observations and recommendations for Ms. Koehler are already set forth above. The panel confirms that Ms. Koehler conveyed her acceptance of responsibility and regrets. The panel would caution Ms. Koehler that many of the problems here, however, were not simply because she failed to prepare for a vigorous admissibility hearing -- especially since the true challenges to the reliability of STRmix™ theory never manifested -- but because she failed to adequately prepare generally. Make no mistake, the evidence was excluded because of issues surrounding application, documentation, preparation, and communication, all of which led the analyst to give inaccurate testimony and confirm incorrect applications and conveyance of STRmix™ results. This was more than just a poor response to a vigorous challenge by the defense in a 705 hearing.

2. It may be appropriate for Ms. Koehler to use her experience here for training and educational purposes. That can only truly be effective if Ms. Koehler has

a complete understanding of the failures that occurred, a sincere appreciation for her role in those failures and, only if she is willing to openly and accurately convey the issues. The panel expresses concern about whether Ms. Koehler can rise above her defensiveness in this instance and truly be self-reflective. Her continued shifting of responsibility and deflecting of blame is troubling.

3. Ms. Koehler must also make diligent and earnest efforts to work with the DPS system as required by her role with the Commission.

4. Ms. Koehler will also have to make extra and concerted efforts to maintain proficiency in her field -- as would any analyst who might be called to testify after leaving a laboratory -- and attend additional trainings as recommended above.

Closing Observations

As one witness the panel interviewed observed: "You don't have forensic science without testimony." The panel believes that it is imperative that Ms. Koehler, and all analysts involved in the criminal justice system, prepare and approach his or her role with the solemnity demanded by the task being performed and recognize the impact that an analyst's work can have on the crucial and life-altering matters being resolved by the criminal justice system.

APPENDIX 1

List of documents provided to the External Review Investigative Panel by the Texas DPS Crime Laboratory or the Texas Forensic Science Commission:

Texas DPS Crime Laboratory Physical Evidence Handbook (Versions 8-11, October 2015 to January 2018)

Texas DPS Crime Laboratory Lab Operations Guide (September 2015 to June 2017)

Texas DPS Crime Laboratory DNA Standard Operating Procedures (August 2015 to October 2017), including associated deviations

Texas DPS Crime Laboratory, Austin Crime Laboratory Local Documents (June 2016)

The State of Texas vs Meechaiel Criner Pretrial Hearing Transcripts, Trial Court Cause No. D-1-DC-18-904027 (June 18-20, 2019)

"Introduction to DNA" PowerPoint presentation by Chase Baumgartner for Criner Daubert hearing

Texas DPS Crime Laboratory Case File and Records for AUS-1604-06703 (Criner)

Additional Texas DPS Crime Laboratory Case Files (Other STRmix^{TM} cases)

Statement of Qualifications for D. Jody Koehler (October 2017)

Disclosure Form for D. Jody Koehler (Revised October 2018)

Testimony Evaluation Forms for D. Jody Koehler (2011-2018)

DNA Training Notebooks and Work Authorizations for D. Jody Koehler (1998-2017)

Texas DPS Crime Laboratory STRmix^{TM} Training Materials including:
      Journal articles
      STRmix^{TM} User and Operation Manuals
      STRmix^{TM} Validations (internal and external)
      PowerPoint presentations
      Review Material
      Practice Sets
      Practical Exam Sets
      Competency Sets
      Task Checklist
      Training Checklist
      Final Written Exam

D. Jody Koehler, C.V.

Presentations given by Ms. Koehler

Texas DPS Disclosure, Root Cause Analysis and Appendices

TFSC Scope Document

D. Jody Koehler – May 2019 Written Response

APPENDIX 2

List of individuals interviewed by the External Review Investigative Panel:

Chase Baumgartner, former analyst, Texas DPS Crime Laboratory, Austin

Dr. Bruce Budowle, Director of the Center for Human Identification, University of North Texas Health Science Center

Heather Dragna, former analyst, Texas DPS Crime Laboratory, Austin

Jody Koehler, Senior Scientific Advisor, Texas Forensic Science Commission

Caitlin Lott, Training Coordinator, Texas DPS Crime Laboratory, Austin

Ariel Payan, The Law Office of Ariel Payan

Megan Rommel, Technical Leader, Texas DPS Crime Laboratory, Austin

Suzanna Ryan, Laboratory Director, Pure Gold Forensics, Inc.

Victoria Winkeler, Assistant District Attorney, Travis County District Attorney's Office