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RE: State of Arizona Superior Court Case Hogue, et. al. vs. Mark Goudeau, et. al. CV2010-092705, CV2010-099221, CV2012-095372, CV2012-095373, CV2012-095374 (Consolidated). Report of Forensic Biology Practices of the Phoenix Police Department Laboratory Services Bureau in Connection with Phoenix Police Department Case DR Number 200551799055.

Dear Attorney Victor,

In connection with the above case and to aid in the formation of opinions contained herein, I reviewed records and documents provided to me by the Law Firm of Marc J. Victor, P.C.. The records that I reviewed consisted of 1) Phoenix Police Department Laboratory Services Bureau (PPD LSB) forensic biology screening case file records pertaining to preliminary screening tests conducted on a "sex crime evidence kit" and other evidence in this case, 2) PPD LSB DNA case file records pertaining to DNA testing of samples in this case including but not limited to the following: circumoral swab(s), right breast swab(s), and external labia swab as well as exemplar samples including those from Alejandra Lara and Lorena Lara, 3) PPD police reports, 4) Arizona Department of Public Safety (AZ DPS) case file records pertaining to DNA testing of samples in this case including but not limited to the following: circumoral swabs, right breast swab(s), left breast swabs, external labia swab, and vulva swabs, exemplar samples including those from Mark Goudeau, and DNA database search records, 5) AZ DPS DNA testing protocols and Quality Manual, 6) transcripts and excerpts of testimony of witnesses Allison Sedowski, Jennifer Palmer, and/or Lauren Heath proffered at an evidentiary hearings and trial in the respective criminal case of Arizona v. Mark Goudeau, and 7) various legal writings such as complaints and motions pertaining to the presently pending civil case referenced above.

Portions of the aforementioned records were illegible and/or obliterated. If I receive legible copies of these records as well as additional records and documents, more

information may be gleaned and further opinions may be rendered.

The following publications were also reviewed: 1) Butler, J.M. (2005) Forensic DNA Typing, Biology, Technology, and Genetics of STR Markers, 2nd Edition, Burlington, MA: Elsevier Academic Press. 2) Butler, J.M. (2011) Advanced Topics in Forensic DNA Typing: Methodology, Waltham, MA: Academic Press, 3) Applied Biosystems (2001), AmpFISTR™ Identifiler PCR Amplification Kit Users Guide, Rev. J, Foster City California: Applied Biosystems by Life Technologies, 4) St. Clair, J. (2003), Crime Laboratory Management, San Diego, CA: Academic Press, 5) SWGDAM (1995, 2004, 2010) Scientific Working Group on DNA Analysis Methods Guidelines, Washington, DC: Federal Bureau of Investigation and 6) ASCLD/LAB (2005, 2008, 2010) American Society of Crime Laboratory Director's / Laboratory Accreditation Board Manual, Garner, NC: ASCLD/LAB.

Within this report, the acronym PPD LSB is intended to represent the City of Phoenix defendants in this case, including Allison Sedowski and Roger Schneider.

The following are some observations and opinions relative to the records and documents reviewed.

Background:

Records indicate that on September 20, 2005 the Phoenix Police Department began the investigation of a reported sexual assault on two sisters, victims Alejandra Lara and Lorena Lara. Police interviews were conducted with both Alejandra Lara and Lorena Lara on September 20, 2005. According to the victims' accounts of the assault, the sisters were walking down the street and were attacked by a stranger at gunpoint. Lorena, being six months pregnant, was forced to undress and lay down on the dirt, was witness to the rape of her sister, and was forced to spit on the perpetrator's hands. Alejandra was raped by the perpetrator multiple ways and multiple times, and his hands and mouth contacted her body in many areas including her breasts and her genitals. After he raped her, the perpetrator wiped Alejandra's body with her sister's saliva and dirt. The armed, unknown assailant fled the scene and was at-large.

Evidence was collected by a Sexual Assault Nurse Examiner (SANE) from the body of Alejandra Lara on September 21, 2005 and the evidence was contained within a so-called "sex crime evidence kit". The SANE completed forms with information about the hospital examination and the assault. On September 22, 2005, the "sex crime evidence kit" was in the custody of the Phoenix Police Department. Other items of evidence including clothing were also recovered in connection with this case.

The Phoenix Police Department has within its organization a Laboratory Services Bureau to which investigators request forensic analysis of evidence. In this case, the Phoenix Police Department requested that the Laboratory Services Bureau conduct forensic biology testing, which generally includes 1) screening items for biological materials and 2) DNA analysis. Forensic biology testing ensued at the Laboratory Services Bureau. Beginning on August 24, 2006, items from this case were submitted to the Arizona Department of Public Safety forensic laboratory for additional DNA analysis.

Requests for Analysis:

1. The PPD has a report system (hereafter called PACE) whereby individuals make report entries in connection with cases. The cases appear to be uniquely identified by DR Number and items within the case are tracked by invoice number. The DR Number for this sexual assault case is 200551799055. Invoice number 3384388 corresponds to the so-called "sex crime evidence kit" collected from victim Alejandra Lara.
2. In connection with this case and within the PACE, there is a request for lab analysis on September 22, 2005 to "examine the 'sex kit' for biological evidence". The type of request was listed as "Forensic Biology (Sero/DNA)". A similar request was entered in PACE on September 30, 2005 for underwear in connection with this case.
3. In addition, within the case records there is a form entitled "Priority Request Laboratory Services Bureau". This form appears to be a special form for the laboratory that investigators complete to request analysis of high priority cases. Investigators filled out a Priority Request form for this case in September 2005. The form indicates that the case is a "High Priority", that it is "Ongoing", and checkboxes "Serology" and "DNA" are marked. In the "Special Instructions" section of the form it states "Please process the victim's sex kit and underwear (sic) for the presence of any biological or trace evidence and then DNA profile the results from Invoice 3384388 Item 1 and 3385766 Item 7 against CODIS". This form clearly indicates that the investigators identified this case as high priority and requested that DNA analysis be performed on the evidence for the purpose of searching the DNA database, CODIS, to identify the perpetrator of this sexual assault.
4. There are PACE entries on September 20, 2005, September 29, 2005, and October 2, 2005 describing the victims' accounts of the assault.
5. Exemplar buccal samples were collected from Lorena Lara on December 9, 2005 and submitted to the PPD LBS for analysis under this DR Number, Invoice 3410110. An accompanying request for analysis was entered into PACE on December 10, 2005.
6. Phoenix Police Department collected an exemplar from an individual for elimination purposes and made a PACE entry requesting lab analysis on that item on December 13, 2005. The request stated in part "Please compare the DNA profile from the controlled buccal swabs collected... *to any biological evidence found in the entire sexual assault kit and clothing...*" (emphasis added).
7. On February 13, 2006, a PACE entry was made with a request for analysis of additional clothing items and towels in connection with this case. The Laboratory Services Bureau was requested to screen the items for possible biological evidence and if found, to develop a DNA profile.
8. A second Priority Request Laboratory Services Bureau form submitted to the PPD LSB by the investigators and dated February 13, 2006 indicates that this case is "High Priority" and is being investigated as part of a serial investigation.
9. Emails contained in the records indicate that a conversation took place between the Laboratory Services Bureau and investigators about the case on February 15, 2006 and the emails show that on February 16, 2006 the Laboratory Services Bureau was again notified in writing about "The magnitude of all the possible related cases and the number of victims, until any biological material can be found which a DNA profile can be developed, I think we are going to need to process everything."

Biological Screening Notes, Records, and Communications:

10. The biological screening tests performed by the PPD LSB on items from the so-called "sex crime evidence kit" were well documented in notes of the forensic scientist (also referred to herein as "the screener"). The notes describe the biological screening tests that the PPD LSB conducted on the following items on October 9, 2005: circumoral swabs, right breast swabs, left breast swabs, "ext lab maj" swabs, and vulva swabs. The records indicate that although the request was made for underwear (sic) to be examined, they were not examined along with the "sex crime evidence kit" as requested.
 - a. Based upon the records, the PPD LSB used a rating system to score the amount of biological cellular material observed on a microscope slide prepared from approximately 5% of each swab tested from the "sex crime evidence kit".
 - b. The notes also contain descriptions of visual observations of the evidence, such as the amount of staining on the swabs and the presence of apparent dirt.
 - c. Notes are kept as part of a laboratory case file. They are not routinely viewed by investigators.
11. The PPD LSB communicated a summary of the test results via laboratory reports. The PPD LSB issued and maintained official laboratory report(s) of examinations and also had access to PACE where they transcribed summary information about the test results to PACE. For this case, the official laboratory report for the biological screening of the "sex crime evidence kit" was issued on October 30, 2005 and the PACE entry for the Summary of Laboratory Examination Results was made on December 7, 2005, over one month after the official report was issued and nearly two months after the screening tests were done.
 - a. According to entries in PACE, the investigator does not routinely receive the official laboratory report and must contact the PPD LSB for it; the investigator routinely receives information about the laboratory results from PACE only.
 - b. The PPD LSB had delays spanning months between the issue dates of official reports and entries into PACE as well as delays between the time of evidence examinations and the issuance of reports. Such delays in communicating results to investigators prevents the timely use of the information in the investigation of the crime. With these delays, the PPD LSB exhibited unreasonable care in the conveyance of information to investigators in this case.
12. The official laboratory report and the PACE report for the "sex crime evidence kit" omit pertinent information and misleadingly suggest that all mentioned items will be subjected to DNA analysis.
 - a. Neither the official laboratory report nor the PACE laboratory report contains visual observations about the evidence or details of tests. The reports contain the conclusions of the forensic scientist who performed the tests, and it is up to the forensic scientist and his/her reviewer to ensure that results of tests are reported.
 - b. The official report of the "sex crime evidence kit" in this case was issued on October 30, 2005. The Results and Conclusions section of the official report states, in part, that "nucleated cellular material was detected on...circumoral swabs...right breast swabs...left breast swabs...'ext lab maj' swabs, and

- ...vulva swabs" and that "further characterization may be possible using nuclear DNA analysis". Accompanying pages of the official report (e.g., Evidence Custody Report) detail chain of custody information for the swabs, indicating that all of aforementioned swabs and portions of swabs were placed in Laboratory Frozen Storage on October 9, 2005. There was no statement describing staining or dirt on the swabs, and no statement that only some of the swabs had been selected for DNA analysis.
- c. The PACE entry for the summary of laboratory examination results for these tests, entered on December 7, 2005 also states, in part, that "nucleated cellular material was detected on... circumoral swabs...right breast swabs...left breast swabs...'ext lab maj' swabs, and ...vulva swabs" and that "further characterization may be possible using nuclear DNA analysis.". No chain of custody information is included in this PACE entry, and thus there was no way to know which samples had been placed in Laboratory Frozen Storage. There was no description of staining or dirt on the swabs, and no statement that only some of the swabs had been selected for DNA analysis.
 - d. The statements in both the official report and the PACE report are misleading and would lead a reasonable person who has requested DNA analysis on evidence in this case to assume that all of the samples that had nuclear cellular material detected on them and were listed together in the report would be subjected to DNA analysis. By issuing separate, different, and incomplete reports, by not reporting crucial visual observations about the evidence, and by not communicating which samples were selected to be DNA tested, the PPD LSB impeded a timely, effective investigation of this case. This is a failure to report and convey forensic case information to investigators with reasonable care.
13. The investigative information and victim accounts of the assaults were available prior to the examination of the evidence and provided sufficient background information to aid the PPD LSB forensic scientists in their search for probative evidence, such as a DNA profile from the perpetrator. Information from the SANE nurse who collected evidence for the "sex crime evidence collection kit" as well as PACE entries were available prior to the biological screening of the evidence in this case.
- a. It is important for a forensic biology screener to have background information about an alleged incident to help guide them in their search for probative biological evidence. For example, if a victim describes that a perpetrator bit, licked, sucked or kissed her breasts then the forensic scientist should know to search for foreign DNA on the swabs collected from the victim's breasts. If case information indicates that the perpetrator had oral contact with the victim's genitals, then the forensic scientist should know to search for foreign DNA on swabs collected from the genital area.
 - b. It was the job of the PPD LSB screener to recognize probative forensic evidence in this "sex crime evidence kit". To fail to recognize this or to consciously ignore or omit pertinent testing of obviously probative items is negligent.
14. As a result of follow-up requests by investigators in February 2006, the PPD LSB conducted biological screening examinations on clothing items and a towel. One item also examined at this time was the pair of underwear originally requested to be examined in September 2005. It was not screened for biological evidence by the

PPD LSB until February 2006 and a sample of the crotch of the underwear was selected for DNA analysis at that time.

- a. The PPD LSB conducted biological screening tests on these items in February 2006 but the official report was not issued until April 22, 2006, two months after the testing was done. The PPD LSB entered the PACE entries with the screening results of these items on June 6, 2006, four months after the testing was done and two months after the official report. It is shocking that, for a serial investigation with high priority, there was a four month delay in reporting results of screening tests to investigators. This pattern of delays in reporting and conveying forensic case information to investigators shows unreasonable care by the PPD LSB in their handling of this case.

Screening of Swabs and Selection for DNA Analysis:

15. Of the five items on which the PPD LSB detected probative nucleated cellular material from the "sex crime evidence kit", the PPD LSB selected only three of the items to be forwarded to the PPD LSB DNA Unit for DNA analysis. The PPD LSB selected the equivalent of one swab from each of the following items for DNA analysis at PPD LSB: the circumoral swab(s), the right breast swab(s), and the labia swab(s). PPD LSB consciously omitted the left breast swabs and the vulva swabs for DNA analysis at the PPD LSB, without valid reasons for omitting them. These omissions are failures by the PPD LSB to use reasonable care in the examination of evidence in this case.
16. PPD LSB's decision to initially forward some items but not others for DNA analysis at the PPD LSB may have been prompted by organizational policy. Labs with such a policy typically test in the first round items thought to be highly probative, and subsequent rounds of testing follow, if necessary, until the perpetrator's DNA profile is detected or there is no more evidence to test. Such a laboratory practice requires that results of initial rounds of testing be assessed to determine the need for future rounds of testing based upon initial results. The PPD LSB neglected to select a highly probative item - specifically the left breast swabs - in the first round and neglected to follow-up and activate without delay what would have proven to be a probative second round of DNA testing on additional items from the "sex crime evidence kit". They committed these omissions despite a standing request from the investigators to test the entire "sex crime evidence kit", despite the investigators having submitted two Priority Requests to the PPD LSB for this case, and despite that further testing was warranted since the first round of testing failed to develop a usable STR DNA profile from the perpetrator. The PPD LSB failed to use reasonable care in this case when they did not follow-up without delay after the first round of DNA testing and complete further DNA tests on the evidence as soon as possible. There is no valid reason for neglecting to test the left breast swabs and the vulva swabs, and the PPD LSB failed to use reasonable care in this case by never testing these items.
17. PPD LSB's decision to altogether omit the DNA testing of the left breast swabs is unconscionable. The right breast swabs and left breast swabs are separate items, collected and packaged separately, each having the potential for bearing probative evidence. The available investigative information as well as visual examination and test results of the swabs indicate that the left breast swabs were highly probative,

even more so than the right breast swabs. The left breast swabs had more staining than the right breast swabs (50%+50% versus 10%+20%, respectively), they had an overall comparable or larger amount of biological cells than the right breast swabs considering the totality of staining on the respective swabs, and the presence of dirt was consistent with accounts of the sexual assault indicating that this item was highly probative. These points, along with the knowledge from the victims' accounts that the perpetrator had transferred saliva to the victim, all indicated that probative DNA would likely be present on the left breast swabs. The value of the left breast swabs was ultimately demonstrated by future DNA results on the left breast swabs - conducted over 9 months after this initial screening examination - whereby the perpetrator's DNA profile was identified on the left breast swabs. The PPD LSB forensic scientists had a duty to recognize the potential for the perpetrator's DNA on this sample during their biological screening examination, to actively pursue and act upon the DNA analysis of the left breast swabs, and to put that item in the queue for DNA analysis in a timely manner. To have not done this shows a reckless disregard for diligence in the examination of evidence in this case. Such reckless disregard is even more grievous considering the totality of circumstances involving a serial rapist and the high degree of probability that substantial harm will result if the perpetrator is not apprehended.

18. The PPD LSB also omitted DNA testing on the vulva swabs. While the vulva swabs and "ext labia maj" swabs (i.e., external labia swabs) presumably originate from body regions in close proximity to one another, they are separate items and each has the potential for bearing probative evidence. The PPD LSB initially forwarded one of the "ext labia maj" swabs for DNA analysis at the PPD LSB but never put the vulva swabs in the queue for DNA analysis at the PPD LSB despite that the biological screening tests and case information suggested they were probative and despite that initial DNA results on the labia swab indicated that additional testing was warranted (see PPD LSB DNA section). PPD LSB failed to use reasonable care in the examination of this "sex crime evidence kit" when they omitted DNA testing of the vulva swabs at PPD LSB.
 - a. The case information describes the victim, Alejandra Lara's account of the perpetrator "...sucking on my vagina lips". This action would surely transfer saliva and thus DNA from the perpetrator to the victim's labia and vulva areas. It was the responsibility of the screener to recognize this potential transfer of DNA by the perpetrator. By omitting the vulva swabs for DNA analysis at the PPD LSB, whether in the first round of testing or in future rounds of testing at PPD LSB, critical evidence that could have identified the perpetrator sooner was recklessly ignored.
19. The PPD LSB forensic scientist was erratic, inconsistent, and reckless in her decisions about which items to put in the queue for DNA analysis when opting to not forward all potentially probative items.
 - a. The PPD LSB stated that they selected items with the highest biological cell rating for DNA analysis and that the left breast swabs were not selected for DNA analysis at PPD LSB because they had a lower cell rating than the right breast swabs. Their decisions are in contradiction of this approach. For example, the PPD LSB decided to forward an external labia swab for DNA analysis while omitting the vulva swabs. According to the case records, the vulva swabs contained a higher nuclear cell rating than the labia swabs yet

the vulva swabs were not forwarded for DNA analysis at PPD LSB.

- b. Additionally, the left breast swab had an indication of "dirt?" being present, and according to PPD LSB that was a factor in the PPD LSB's decision to not test the left breast swabs. The labia swabs and vulva swabs also indicated "possible dirt?", yet the labia swab was still forwarded for DNA analysis. The presence of dirt on a sample does not prevent an attempt at DNA analysis nor does it absolve a laboratory of their duty to test a probative sample. In fact, many forensic samples encountered routinely are less than pristine and contain environmental contaminants such as dirt. Probative samples are subjected to forensic DNA analysis even with dirt present. Forensic DNA techniques can overcome such environmental contaminants and still yield usable DNA results. Although the presence of dirt and bacteria can degrade DNA, the longer the DNA sample is exposed to the degrading factor the more the DNA could be degraded. The fact that dirt was observed on the swabs should have prompted the testing of the dirty samples to occur sooner rather than later.

These recklessly inconsistent decisions and the PPD LSB reviewer's endorsement of them suggests an indifference to duty to select highly probative and biologically suitable items for DNA analysis that would certainly identify the perpetrator of this crime.

20. The PPD LSB further demonstrated a disregard for reasonable care in their examination of evidence in this case by never requesting authorization to consume swabs in the "sex crime evidence kit". Despite that the consumption of the swabs was warranted based upon the case information about the perpetrator depositing his saliva on the victim's body where these swabs were collected, the PPD LSB consciously neglected to inform the investigating authorities and request consumption of the samples.

- a. The PPD LSB chose to forward only one half of the total sample from the right breast swabs for DNA analysis at PPD LSB, rather than gaining authorization from the investigating authorities to consume the entire sample, which would have been appropriate given the case information.
- b. Since the PPD LSB altogether omitted DNA testing of the left breast swabs at PPD LSB, the forensic scientist did not request authorization for consumption of them either - even after DNA analysis of the right breast swab(s) at the PPD LSB was unsuccessful in identifying the perpetrator.
- c. At a minimum, once the first round of testing was complete the PPD LSB should have requested authorization for the consumption of the remaining swabs to enable the recovery of more DNA from the samples to attempt to identify the perpetrator, but they did not. Their lack of follow-up and DNA testing on probative samples remaining in the "sex crime evidence kit" shows unreasonable care in the PPD LSB's examination of the evidence in this case.
- d. Tellingly, in other cases referenced in the case records and analyzed around the same time as this case, the PPD LSB forensic scientist forwarded both right and left breast swab samples for DNA analysis simultaneously and she immediately sought consumption authorization for them. The need for consumption authorization was clearly stated in the PACE report for one case, and email records demonstrate communication between the PPD FSB and investigators to acquire such authorization for another case. This is

completely different than what the PPD LSB did in the present case. If this approach had been applied for this case, the perpetrator's DNA profile would have been identified as early as December 1, 2005. (It is noted that consumption authorization was ultimately obtained for the swabs in this case. Authorization was prompted by AZ DPS not PPD LSB and was granted apparently without hesitation, suggesting that if the PPD LSB had asked then they would have been granted authorization to consume the samples. They never asked.)

PPD LSB's decision to not seek consumption authorization on the swabs in this "sex crime evidence kit" was a failure of their duties as a crime laboratory to use reasonable diligence in their examination of evidence and to advise investigators. The public entrusted the PPD LSB with the analysis of evidence, and the PPD LSB's failure to apply all necessary means to test the swabs in this case was reckless.

PPD DPS DNA Testing:

21. The PPD LSB conducted DNA analysis on the items selected by the screener: the circumoral swab(s), the right breast swab(s), and an external labia swab. An exemplar sample was also tested from the victim from whom the "sex crime evidence kit" was collected, Alejandra Lara. The DNA testing of these items started on November 22, 2005 and a report was issued on January 3, 2006. The PPD LSB had gleaned STR DNA typing data for this round of DNA testing as of December 1, 2005.
 - a. An exemplar sample from Lorena Lara was collected on December 9, 2005, DNA testing began January 19, 2006, and an official report was issued by the PPD LSB on March 20, 2006. The PACE entry was done soon thereafter, on March 29, 2006. The PPD LSB had gleaned STR DNA typing data for Lorena Lara's exemplar sample and another elimination exemplar sample as of February 10, 2006.
 - i. The PPD LSB DNA analyst who performed the DNA analysis of the swabs from the "sex crime evidence kit" and the aforementioned exemplars went on leave from the PPD LSB shortly after the March 2006 report was issued.
 - b. In September 2005, additional testing had been requested on underwear in this case and the PPD LSB had not done it initially, so the PPD LSB conducted DNA testing on a sample from the crotch of a pair of underwear from Alejandra Lara. This DNA testing was initiated on February 24, 2006 by the same PPD LSB screener who had omitted the left breast swabs from earlier testing. The DNA testing process started on February 28, 2006 and PPD LSB issued an official report for this item on March 24, 2006. Unlike the screener, the PPD LSB DNA analyst made a timely PACE entry with these results on April 3, 2006.
22. PPD LSB's testing of the right breast swab(s) did not yield a DNA profile foreign to the victim that was suitable for CODIS entry. The results indicated a mixture of DNA from two females, including victim Alejandra Lara. The DNA report does not indicate the presence of any male DNA. A review of the data reveals that there may be an indication of male DNA, though at a very low level. This finding is confirmed by the fact that AZ DPS obtained a male-specific, Y-STR result on the remaining portions of

the right breast swabs 9 months later.

- a. In testimony at the evidentiary hearing for the criminal case against the later identified perpetrator, Mark Goudeau, the PPD LSB DNA analyst admits that "she could have done more work (with this sample) but did not think it was worth pursuing".
 - i. At this stage, half of the total right breast swabs sample remained untested. More work should have been done on this sample and it would have been worth it. Consumption authorization should have been sought, DNA from the remaining other half of the sample should have been extracted and combined with remaining DNA extract from the first half of the sample, and STR DNA testing should have been attempted again. Even if the right breast swabs themselves had been consumed, DNA extract from them would have remained for further DNA testing, if necessary.
- b. The PPD LSB DNA analyst also explained that the right breast swabs and left breast swabs are different, separate samples and that an analyst could not predict the results of one based upon the results of the other.

The PPD LSB's failure to follow-up with further analysis of the right breast swab constituted unreasonable care in their examination of this sample.

23. The PPD LSB's DNA analysis of the "ext labia maj" sample was cursory at best, and the PPD LSB failed to report and pursue obvious data that could have been used to identify the perpetrator of this crime. It is remarkable and unconscionable that, given the initial results of the labia swab, the PPD LSB did not act without delay to conduct further tests on this item and the vulva swabs to identify the perpetrator of this crime.
 - a. PPD LSB results of DNA analysis on the "ext labia maj" swab reveal a mixture of DNA from at least three people, with the two main contributors being female and the minor contributor being male. Both Alejandra Lara and Lorena Lara are included as being major contributors to the DNA results, and this is consistent with case information about the sex crime incident. The DNA data also reveals a low level "Y" result at the gender-identifying locus called amelogenin, indicative of a minor contributor being male. From a forensic standpoint, this male DNA is obviously highly probative and is likely to have originated from the perpetrator (barring consensual partners). Since the case information describes how the perpetrator had sucked on Alejandra Lara's genital lips, determining the male DNA profile on this sample is paramount and would lead to the identification of the perpetrator.
 - b. Forensic STR DNA analysis generally consists of four analytical steps, followed by data interpretation. The process consists of: 1) isolation of DNA from a sample resulting in a so-called "DNA extract" that can be subjected to many different types of DNA analysis including STRs, 2) quantification of DNA in the sample to determine the amount of DNA present, 3) amplification of the sample using the polymerase chain reaction (PCR) to target areas of DNA such as short tandem repeats (STRs), 4) separation of the DNA fragments targeted and amplified in Step 4, commonly using capillary electrophoresis. Forensic laboratories have protocols or guidelines for analyses, and also enable deviations from guidelines if warranted. The PPD LSB should have done more in each of these steps as well as in the interpretation of the DNA data that existed for the "ext labia maj" swab, and

the fact that they did not do more shows unreasonable care in their analysis of this sample.

- c. In December 2005, the PPD LSB obtained results indicating a minor male contributor. At this point the PPD LSB should have done the following without delay in order to identify the STR DNA profile of the male contributor:
 - i. Further assessed the analytical DNA data from the "ext labia maj" swabs. Aside from the data used to report results, there was additional STR DNA data that was available to the PPD LSB DNA analyst at that time and could have been used to help identify the minor male DNA profile in the "ext labia maj" sample. The STR data used for the report was gathered at a capillary electrophoresis instrument setting of "2 seconds" but data was available at a setting of "5 seconds", which would have introduced a larger quantity of amplified DNA into the instrument and aided in the interpretation of the male DNA results in this sample. Additionally, the PPD LSB could have run the same sample at an instrument setting of "9 seconds" to introduce even more amplified DNA into the instrument, which would have further aided the assessment of the male DNA in the sample. All of these aforementioned instrument settings appear to be acceptable at the PPD LSB laboratory, based upon the records. Assessment of such data requires caution but is common practice in forensic laboratories. The PPD LSB failed to use reasonable care in their analysis of this sample when used only some of the data available to them and did not even attempt other analytical strategies available to them to evaluate DNA data from this sample.
 - ii. Conducted further tests on already isolated DNA from the "ext labia maj" swab. The PPD LBS isolated DNA from a single swab from the "ext labia maj". Ultimately, this isolated DNA (i.e., DNA extract) is within a liquid solution. The PPD LSB did not consume the entirety of this liquid, the DNA extract, for its DNA test. Additional DNA extract remained and further tests should have been done on it. For example, once the first STR DNA test revealed the proportions of contributors to the DNA sample and that there was male DNA present, a larger volume of liquid (i.e., larger quantities of DNA) should have been amplified with PCR to attempt to obtain a more complete STR profile of the male DNA profile in the sample. The PPD LSB failed to use reasonable care when they did not attempt any progression of strategies to further evaluate the male DNA in this sample.
 - iii. Conducted further DNA tests on the remaining external genital swabs in this case. One "ext labia maj" swab and two vulva swabs remained available for testing and these should have been acted upon without delay once the initial STR DNA results of the "ext labia maj" swabs were known by PPD LSB. Consumption authorization should have been obtained. There was a clear indication that the perpetrator's DNA was present on the external genital swabs, and it was inexcusable and negligent to not even attempt any DNA testing on the vulva swabs at PPD LSB.
 - iv. Contacted other laboratories to determine their capabilities for testing

samples with minor male contributors. If attempts to obtain usable results at the PPD LSB failed due to their lack of testing capability, the PPD LSB had a duty to seek and recommend other alternatives for testing without delay. DNA extract remained (and would also have remained if the vulva swabs and left breast swabs were tested at the PPD LSB), and the DNA extracts should have been sent forthwith to a different laboratory with better testing capabilities, as soon as it was known that there was a low level male contributor in the sample that the PPD LSB was consciously not pursuing internally. It is not uncommon for forensic laboratories to possess different testing capabilities, but individual laboratories have a duty to act responsibly on evidence samples, to achieve accepted levels of testing capability or proactively refer testing to appropriate laboratories, and to communicate this to its clients. To do anything less shows reckless indifference towards the evidence the public has entrusted to them.

- v. Effectively communicated with investigators, informing them of the importance of the external genital samples and of options for testing. Given the threat to public safety that this serial perpetrator posed, the PPD LSB had a duty to proactively communicate with investigators to ensure that the information about these samples was effectively explained and understood, so that investigators could adequately apply their skills, information, and resources to help identify the perpetrator. Failure to communicate with investigators about pertinent forensic case information is a breach of trust, and the PPD LSB failed to use reasonable care in communicating information to investigators in this case.
- d. PPD LSB results reported for the "ext labia swab" were incomplete and misleading, resulting in the conscious omission of critical information that investigators could have used to pursue the identity of the perpetrator of this crime. As described in Paragraph 11, the PPD LSB issued official laboratory reports as well as making duplicate - yet incomplete - entries of results into the PACE system. PPD investigators reference the information in PACE and only receive a copy of the official laboratory report via specific request to the Laboratory Services Bureau. In this case, the information in these two reports is different; critical information is omitted from PACE, the one seen by the police investigators.
 - i. The official PPD LSB DNA report dated January 3, 2006 includes a general statement about "...possible allelic activity that does not meet reporting guidelines and therefore is not reported in the data table". This statement indicates that there could be DNA from additional individuals in the sample. Importantly, the PACE Summary of Laboratory Results that the PPD LSB forensic scientist entered does not have any reference to such results. The investigator would not have known that there was additional information available for the "ext labia maj" sample, nor that male DNA was present in the sample, nor that further testing was warranted. This omission is a fatal flaw.
 - ii. Even if the investigator had requested and read the official PPD LSB DNA report, the significance of the results on the "ext labia maj" swab

was not evident. The general statement referenced above makes no mention of any indication of male DNA, which is critical information for an investigator seeking forensic information about the existence of perpetrator's DNA in a sex crime case. In forensic samples and sexual assault samples in particular, all indications of gender at the locus amelogenin should be included in a DNA report. This omission in reporting critical information gleaned during the DNA analysis constitutes a failure by the PPD LSB to use reasonable care in reporting DNA results for this case.

- e. Records also show that DNA results were communicated to investigators for this case, indicating "no probative DNA results on anything - all victim DNA". This is utterly untrue. The labia swab tested at PPD LSB clearly indicated the presence of probative male DNA that was foreign to the Lara sisters. For the PPD LSB to have communicated anything different to investigators is not supported by the DNA data and was reckless.
- f. Following the January 3, 2006 official DNA report, the PPD LSB issued a supplemental DNA report on this case. The report dated March 20, 2006 states with regard to this sample "*Assuming only two sources* (emphasis added), the mixed DNA profile obtained from...external labia swabs is consistent with the combined DNA profiles from ...Lorena Lara and Alejandra Lara". This statement is completely misleading. There was no basis for the assumption made in this statement since the data clearly shows the presence of DNA from at least three individuals, including a male. The report again does not alert investigators that there is male DNA on this sample, information which would lead a reasonable person to conclude that the perpetrator's DNA is there. The omission of this critical information, and the misleading assumptions about the number of DNA contributors to the sample despite scientific evidence otherwise, is inexcusable and beyond reckless.

It was the duty of the PPD LSB forensic scientist to employ all scientific means to determine the DNA profile and to communicate this information to investigators. To do anything less is unfathomable.

CODIS:

24. Based upon the available records and to a reasonable degree of scientific certainty, it is my opinion that if, in late 2005 to early 2006, the PPD LSB had performed additional STR DNA analysis on the swabs from the "sex crime evidence kit" from this case, then the identity of the perpetrator would have been revealed as early as December 1, 2005. If the PPD LSB had performed STR DNA analysis on the left breast swabs then the data supports that they certainly would have obtained a complete or near complete STR DNA profile of the perpetrator. If the PPD LSB had conducted additional analyses of the labia swab then the data supports that they would have obtained at least a partial STR DNA profile of the perpetrator from that testing. If the PPD LSB had conducted further STR DNA analysis on the right breast swabs or tested the vulva swabs then those tests would have revealed additional STR DNA results from the perpetrator. The perpetrator's STR DNA profile obtained from the evidence - whether partial or complete - would have been searched against the statewide DNA database, CODIS, and the identity of the perpetrator would have

been revealed as early as December 1, 2005.

- a. The STR DNA profile of Mark Goudeau was in the Arizona statewide CODIS database prior to December 2005.
- b. If the PPD LSB had performed additional DNA analyses on the "ext labia maj" swabs in 2005 they would have developed additional results for the male contributor, the perpetrator. The STR testing of the labia swab at PPD LSB revealed an indication of a partial DNA profile from the perpetrator that, if further analyzed, would have revealed additional data. The partial STR DNA results obtained would have been sufficient to be searched against local or statewide DNA databases, CODIS.
- c. If PPD LSB had tested the left breast swabs in 2005 or early 2006, there was sufficient male DNA present for them to obtain results and determine the DNA profile of the male contributor, the perpetrator. These results would surely have been sufficient to be searched against local and statewide DNA databases, CODIS. In fact, results of STR DNA tests on the left breast swabs were sufficient for searching though CODIS when the AZ DPS forensic laboratory conducted the testing and determined the identity of the perpetrator in September 2006.
 - i. AZ DPS tested two swabs from the left breast of Alejandra Lara. Their results revealed a mixture of DNA from at least three individuals, consistent with two females and a male. The females' DNA in the sample was more abundant than the male DNA. Without knowledge of the victims' profiles, AZ DPS identified alleles attributable to the male contributor at eight loci plus the gender identifier (XY alleles), and searched these results against DNA profiles in the CODIS database on September 4, 2006. There was a candidate match to a DNA profile identified as belonging to Mark Goudeau.
 - ii. AZ DPS then compared the results from the left breast swabs to the exemplar profiles of Alejandra Lara and Lorena Lara. The female DNA in the sample was a mixture matching the DNA profiles of Alejandra Lara and Lorena Lara, which is consistent with the case information about the sexual assault. By assuming that there were three individuals in the mixture and that two of them were the victims, AZ DPS was able to ascertain alleles attributable to the male contributor at 12 loci plus the gender identifier. The AZ DPS searched the results from these loci against the DNA profiles in CODIS on September 13, 2006. Again, there was a candidate match to a DNA profile identified as belonging to Mark Goudeau.
 - iii. According to AZ DPS records, they require an evidence sample to have results at a minimum of 6 STR loci in order for a match to be reported from the CODIS DNA database (Note that it is possible to do a search of local and statewide databases on a sample with results at fewer loci than 6). The AZ DPS first searched results at 8 loci and then searched results at 12 of the 13 of the loci on which they tested the left breast swabs, nearly a complete DNA profile. This demonstrates that there was plenty of DNA on the left breast swabs to obtain an STR result for the male contributor on the left breast swabs.
 - iv. According to AZ DPS records and to a reasonable degree of scientific

certainly, the ratio of male DNA present relative to the sisters' DNA on the left breast swabs was sufficient for the PPD LSB to have obtained a usable STR DNA result for the male contributor, which would have identified Mark Goudeau through a search of the statewide DNA database, CODIS. Even though the AZ DPS used a different STR DNA typing kit than the PPD LSB was using at the time, given the ratio of individuals' DNA in the sample, the male contributor's DNA would be identifiable using either kit.

1. Even if the PPD LSB had tested only half of the total left breast sample (i.e., one half of each left breast swab like was done for the right breast swabs), the ratio of DNA from the three people (two sisters and the perpetrator) would have been similar to that obtained when the total sample was used, with sampling variation being a factor. There would have been sufficient male DNA present relative to the female DNA in the sample to expect a usable STR DNA result for the male contributor.
2. If the PPD LBS had obtained consumption authorization and conducted DNA analysis on both of the left breast swabs, they would have obtained comparable results to the AZ DPS. The ratios of DNA obtained on the left breast swabs would be the same whether tested by AZ DPS or PPD LBS. Given this ratio of contributors, a competent forensic laboratory would be able to identify the DNA profile of the minor male contributor with sufficient completeness to enter the DNA profile into CODIS for a statewide search. A CODIS search would have revealed the identity of the perpetrator as Mark Goudeau as early as December 1, 2005.

Conclusions:

25. Based upon the case information communicated by the Phoenix Police Department to the Laboratory Services Bureau in PACE entries, Priority Request forms, SANE forms, and emails, the Laboratory Services Bureau had knowledge of the egregious nature of this attack, the fact that the perpetrator was unknown, armed, and dangerous, and that the perpetrator was suspected of being a serial violent attacker. The PPD LSB knew that since the identity of the perpetrator was unknown, obtaining an STR DNA profile of the perpetrator from evidence collected in connection with this case was of utmost relevance and would lead to the identity of the perpetrator. Omitting, ignoring, misrepresenting, and failing to perform tests on highly probative evidence created an unreasonable risk of harm to future victims of this perpetrator. The PPD had informed the PPD LSB multiple times and through multiple requests and, at least by February 13, 2006 if not earlier, the urgency of the matter and risk to public safety had been communicated by the PPD to the PPD LSB. The PPD LSB was aware that that there was a high probability of substantial harm or death to victims with each day that this perpetrator was not apprehended. The PPD LSB had a duty to act with dogged determination and diligence to determine if the perpetrator's DNA was present on the evidence and if so, to obtain a STR DNA profile from the evidence without delay, and to use that information to identify this

serial perpetrator through a search of the DNA database, CODIS. Because of the PPD LSB's numerous actions, omissions, neglect of due diligence, failure to communicate, misrepresentations, failures to use reasonable care and recklessness described herein, Mark Goudeau was free to harm and murder others after his attack on the Lara sisters.

Sincerely,



Mary Kate McGilvray
Forensic DNA Consultant
Quality Forensic and Investigative Services, LLC