Texas Forensic Science Commission

Justice Through Science

FINAL REPORT ON TFSC LABORATORY SELF-DISCLOSURE NO. 22.39: BODE TECHNOLOGY (FORENSIC BIOLOGY/DNA)

April 14, 2023

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I. COMMISSION BACKGROUND

A. History and Mission of the Texas Forensic Science Commission

The Texas Forensic Science Commission ("Commission") was created during the 79th Legislative Session in 2005 with the passage of HB-1068. The Act amended the Code of Criminal Procedure to add Article 38.01, which describes the composition and authority of the Commission.[1] During subsequent legislative sessions, the Texas Legislature further amended the Code of Criminal Procedure to clarify and expand the Commission's jurisdictional responsibilities and authority.[2]

The Commission has nine members appointed by the Governor of Texas.[3] Seven of the nine commissioners are scientists or medical doctors and two are attorneys (one prosecutor nominated by the Texas District and County Attorney's Association and one criminal defense attorney nominated by the Texas Criminal Defense Lawyer's Association).[4] The Commission's Presiding Officer is Jeffrey Barnard, MD. Dr. Barnard is the Chief Medical Examiner of Dallas County and Director of the Southwestern Institute of Forensic Sciences in Dallas.

B. Commission Jurisdiction

1. Investigations of Professional Negligence and Professional Misconduct Resulting from Laboratory Self-Disclosures

Texas law requires the Commission to "investigate in a timely manner, any allegation of professional negligence or professional misconduct that would substantially affect the integrity of:

(A) the results of a forensic analysis conducted by a crime laboratory;

(B) an examination or test that is conducted by a crime laboratory and that is a forensic examination or test not subject to accreditation; or

[1] TEX. CODE CRIM. PROC. art. 38.01.
[2] *See e.g.*, Acts 2013, 83rd Leg. ch. 782 (S.B. 1238) §§ 1-4 (2013); Acts 2015, 84th Leg. ch. 1276 (S.B. 1287) §§ 1-7 (2015); TEX. CODE CRIM. PROC. art 38.01 § 4-a(b).
[3] TEX. CODE CRIM. PROC. art. 38.01 § 3.
[4] *Id.*

> (C) testimony related to an analysis, examination, or test described by paragraph (A) or (B)."[5]

The term "forensic analysis" is defined as a medical, chemical, toxicological, ballistic, or other examination or test performed on physical evidence, including DNA evidence, for the purpose of determining the connection of the evidence to a criminal action.[6]

Crime laboratories must report professional negligence or professional misconduct to the Commission.[7] The statute does not define the terms "professional negligence" and "professional misconduct." The Commission defined those terms in its administrative rules.[8]

> "Professional misconduct" means the forensic analyst or crime laboratory, through a material act or omission, deliberately failed to follow the standard of practice that an ordinary forensic analyst or crime laboratory would have followed, and the deliberate act or omission would substantially affect the integrity of the results of a forensic analysis. An act or omission was deliberate if the forensic analyst or crime laboratory was aware of and consciously disregarded an accepted standard of practice required for a forensic analysis.
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2. Accreditation Jurisdiction

The Commission is charged with accrediting crime laboratories and other entities that conduct forensic analyses of physical evidence.[9] The term "crime laboratory" includes a public or

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[5] TEX. CODE CRIM. PROC. art. 38.01 § 4(a)(3).
[6] TEX. CODE CRIM. PROC. art. 38.35(a)(4).
[7] *Id.* at § 4(a)(1)-(2) (2019). (*Pursuant to the Forensic Analyst Licensing Program Code of Professional Responsibility, members of crime lab management shall make timely and full disclosure to the Texas Forensic Science Commission of any non-conformance that may rise to the level of professional negligence or professional misconduct.*) *See*, 37 Tex. Admin. Code § 651.219(c)(5) (2018).
[8] 37 Tex. Admin. Code § 651.302 (7) and (8) (2020).
[9] TEX. CODE CRIM. PROC. art. 38.01 § 4-d(b).

private laboratory or other entity that conducts a forensic analysis subject to article 38.35 of the Code of Criminal Procedure.[10]

3. Licensing Jurisdiction

Under Texas law, a person may not act or offer to act as a forensic analyst unless the person holds a forensic analyst license issued by the Commission.[11] While accreditation is granted to entities that perform forensic analysis, licensing is a credential obtained by individuals who practice forensic analysis. The licensing requirement took effect on January 1, 2019.

The law defines the term "forensic analyst" as "a person who on behalf of a crime laboratory [accredited by the Commission] technically reviews or performs a forensic analysis or draws conclusions from or interprets a forensic analysis for a court or crime laboratory."[12]

Pursuant to its licensing authority, the Commission may take disciplinary action against a license holder or applicant for a license on a determination by the Commission that a license holder or applicant for a license committed professional misconduct or violated Texas Code of Criminal Procedure Article 38.01 or an administrative rule or other order by the Commission.[13] Disciplinary proceedings and the process for appealing a disciplinary action by the Commission are governed by the Judicial Branch Certification Commission.[14]

4. Jurisdiction Applicable to the Disclosure

The forensic discipline discussed in this final investigative report, Forensic Biology/DNA analysis, is subject to the accreditation and licensing authority of the Commission. The disclosing crime laboratory, Bode Technology ("Bode"), is accredited by the Commission and the ANSI

[10] *Id.* at art. 38.35(a)(1).
[11] *Id.* at art. 38.01 § 4-a(b); 37 Tex. Admin. Code § 651.201(c) (2018).
[12] *Id.* at art. 38.01 § 4-a(a)(2).
[13] *Id.* at art. 38.01 § 4-c; 37 Tex. Admin Code § 651.216(b) (2019).
[14] TEX. CODE CRIM. PROC. art. 38.01 § 4-c(e); 37 Tex. Admin. Code § 651.216(d) (2019).

National Accreditation Board ("ANAB") under International Organization for Standardization ("ISO") standard 17025: 2017 and is subject to the Commission's authority.[15] The analyst involved in this disclosure was a senior forensic DNA analyst licensee ("DNA Analyst") from December 31, 2018, until her license expired on December 10, 2022. She resigned her employment from Bode on August 2, 2022.

5. Investigative Process

The Commission's administrative rules set forth the process by which it determines whether to accept a self-disclosure for investigation as well as the process used to conduct the investigation.[16] The Commission's rules also describe the process for appealing final investigative reports by the Commission and, separately, disciplinary actions by the Commission against a license holder or applicant.[17]

C. Limitations of this Report

The Commission's authority contains important limitations. For example, no finding by the Commission constitutes a comment upon the guilt or innocence of any individual.[18] The Commission's written reports are not admissible in civil or criminal actions.[19] The Commission does not have the authority to subpoena documents or testimony; information received during any investigation is dependent on the willingness of affected parties to submit relevant documents and respond to questions posed. Information gathered in this report was not subject to standards for the admission of evidence in a courtroom. For example, no individual testified under oath, was limited

[15] *See*, https://www.txcourts.gov/fsc/accreditation/for a list of accredited laboratories.
[16] 37 Tex. Admin. Code § 651.304-307 (2019).
[17] 37 Tex. Admin. Code § 651.309 (2019); *Id.* at § 651.216 (2019).
[18] TEX. CODE CRIM. PROC. art. 38.01 § 4(g).
[19] *Id*. at § 11.

by either the Texas or Federal Rules of Evidence (*e.g.*, against the admission of hearsay) or was subject to cross-examination under a judge's supervision.

II. BACKGROUND AND SUMMARY OF DISCLOSURE

A. Disclosure and Investigative Decision by the Commission

This report concerns an August 16, 2022 self-disclosure by Bode describing conduct by a former senior DNA Analyst. (*See*, **Exhibit A**, Disclosure). In July of 2022, laboratory management became aware that a draft forensic report containing both serology and DNA results included the signature of a forensic biologist who did not personally sign the report or authorize another person to apply her signature to the report. The forensic biologist was responsible for the serology portion of the analytical work and related reporting, while the DNA Analyst was responsible for the DNA portion of the analytical work and related reporting. The Commission accepted the disclosure for investigation and formed an investigative panel at its October 7, 2022 quarterly meeting. The Investigative Panel consisted of Michael Coble, Ph.D, Sarah Kerrigan, Ph.D, and Brazos County Elected District Attorney Jarvis Parsons.

B. Summary of the Disclosure

The disclosure alleges that in July 2022, the DNA Analyst submitted a draft forensic report for internal technical review. The report contained both the signature of the DNA Analyst sponsoring the DNA results as well as the signature of a forensic biologist sponsoring the serology results. After submission, the technical reviewer noted two items missing from the file: the forensic biologist's self-review signature on the case work review form and a "second read" worksheet for sperm search.[20] The technical reviewer notified the DNA analyst and the forensic

[20] Bode Standard Operating Procedures require all slides found to be negative or inconclusive be re-evaluated by a second analyst. Second reads should be performed independently of the first read. *See*, **Exhibit B**, BTF00234 - Microscopic Examination for Spermatozoa, item 5.8 and 5.8.1 (effective 3/25/2022).

biologist of necessary corrections. The forensic biologist had not yet written the report or signed the report because she was specifically waiting on the second read for sperm search to be completed. As a result, she was surprised with the technical reviewer's observations. The forensic biologist notified her supervisor on July 29, 2022, and all work on the case was suspended.

On August 2, 2022, after a discussion with management, Bode informed the DNA Analyst that she would be placed on administrative leave while the incident was investigated. The DNA Analyst resigned her employment shortly thereafter, and her forensic analyst license was placed on "inactive" status pending the investigation.

III. COMMISSION INVESTIGATION

The laboratory conducted an internal investigation regarding the application of the forensic biologist's signature to the draft report and issued a corrective action report on December 12, 2022. Commission staff reviewed relevant documents and conducted interviews with laboratory management and with the DNA Analyst.

A. Background: Description of Laboratory Workflow

Bode management described the typical workflow at the time for cases involving a joint report co-authored by a DNA analyst and a forensic biologist as follows:

1. Evidence was received by the evidence management technologists, who barcoded and accessioned the evidence into an internal LIMS.

2. Cases were signed out to a technologist for sampling for DNA, or to a forensic biologist for serology testing. Note: Serology is most often performed before DNA analysis, however, sometimes it happens simultaneously or afterwards.

3. Once data were generated, subsequent data analysis and report-writing were conducted by the DNA analyst and the forensic biologist.

4. The draft report was initiated by either the forensic biologist or the DNA analyst. Reports were drafted in MS Word.

5. The DNA analyst and forensic biologist coordinated directly with each other to complete their relevant sections of the report.

6. Once the draft report was completed by both individuals, most analysts and biologists would convert the MS Word report to a PDF file and independently sign the PDF. During its internal review, Bode found that some added their signature to the MS Word version before converting the report to PDF.

7. The DNA analyst and forensic biologist independently completed their self-review form of the case after signing the report. They would each sign for self-review on the review form. The case would then be posted by either the DNA analyst or forensic biologist to a SharePoint Excel tracker to indicate it was ready to be technically and administratively reviewed. While either individual could post, it was typically done by the DNA analyst. The individual would add their date and initials to the tracker when it was posted.

8. A technical reviewer would take responsibility in the tracker to perform the review and document when the review was completed. There were separate checkboxes on the tracker for serology and DNA technical review, respectively.

9. Upon completion of all reviews, the lead analyst for the client project was responsible for delivering the report and applicable data to the client.

Notably, although cases were tracked through an internal LIMS during testing, report-writing itself was not included in the Bode LIMS at the time of this incident. The report-writing process occurred outside of the LIMS in MS Word and was tracked through project tracking files. This meant that detailed audit trails were not available for the report-writing process as they would be with items created in the LIMS.

B. Laboratory Investigation

On December 12, 2022, Bode issued a corrective action report describing the nonconformance as the unauthorized application of a forensic biologist's signature to a joint biology screening and DNA report without the knowledge or consent of the forensic biologist.

On August 1, 2022, the forensic biologist was interviewed by her supervisor. She confirmed she did not author the report in question. On August 2, 2022, DNA Analyst was interviewed by the Laboratory Director, the Technical Leader, the Director of Casework, and her

immediate supervisor. The DNA Analyst confirmed that the forensic biologist may not have authored the report before the DNA Analyst submitted the report and casefile for technical review. The DNA Analyst explained that she used a previous report including the forensic biologist's signature as a template for the report in question to save time to meet the client's deadline. The DNA Analyst further explained that she followed this same process of having a template with two signatures on it previously, but that she always coordinated with the forensic biologist. Their practice was to change the color of the font of the template from red to black after confirming the results. In this case, the DNA Analyst did not have a record of the forensic biologist seeing the report before it went into technical review. The DNA Analyst stated she was unaware of any other time the report made it to technical review without the forensic biologist updating their section.

On August 3rd and 4th, 2022, the Casework Director conducted additional interviews with several DNA analysts and forensic biologists to determine whether the use of a prior report as a template with signatures already included or signing for another individual, was common practice among analysts and biologists.

During the course of the investigation, laboratory management asked all analysts and biologists to review and sign an attestation affirming that no one had knowledge of any other examples of "improper use of a signature" aside from the case that is the subject of this report.[21] The form was provided to all current employees with an opportunity to note any exceptions. Eighty (80) attestations, representing all current employees, were signed and affirmed by the employees.[22]

[21] *See*, **Exhibit C**, Attestation of Analysts

[22] The term "improper use of a signature" is used here because it is the language utilized by the laboratory in its corrective action report. The actual attestation requested the attestant to confirm they had never affixed or signed another employee's signature to a case report "*without that employee's express consent or authorization*."

C. Analysts Interviews by Management

During the investigation, Bode management conducted interviews with several forensic biologists and DNA analysts to determine whether the use of a prior report as a template with other signatures included or signing for another individual was common practice. The interviews revealed inconsistencies among the analysts in the practice of co-authoring and signing joint reports. For example, one other DNA analyst referred to the practice of "ghostwriting" the serology portion of the report on behalf of the forensic biologist and submitting it for their review and adoption.[23] Another DNA analyst would utilize the merge function in MS Word to add the forensic biologist's signature to the draft joint report and submit it to the biologist for review and approval. Other practices involved the use of dates and initials used to correct information in the draft report.

D. Commission Interview with Management

Commission staff interviewed the Laboratory Director and Casework Director on March 22, 2023. Management explained that the vast majority of their cases do not involve serology testing, so only a small percentage of cases would be co-authored by a second person. Co-authoring of reports was done by a small group because they work on a project that requires serology all or part of the time. Management learned from the interviews conducted during their investigation that there was variation between and among analysts and forensic biologists when they co-authored reports, but generally they all employed a mechanism for ensuring the biologist completed the work, agreed with what was written in the report, either signed the report or expressly authorized their signature. Management also learned that in certain situations an analyst

[23] Bode has a template for serology results that consists of various categories of biological screening and potential results. The author eliminates those categories and results that do not apply and edits the case and item number. The result is a set of forensic biology conclusions that reflect the results of the biology screening.

gave permission for another analyst to add their signature. Management agreed this was a violation of their documentation Standard Operating Procedure ("SOP") and that it was a practice that evolved over time to expedite report-writing.

In all other cases, the analysts who had engaged in this practice affirmatively obtained the authorization to make a correction or add a signature on behalf of another. In this case, they could not find any evidence that the DNA analyst had coordinated with the forensic biologist in the writing or signing of the report. Management was unable to determine why the coordination that typically existed for co-authored reports did not happen in the instant case.

E. Commission Interview with DNA Analyst

Commission staff interviewed the DNA Analyst on March 27, 2023. She was an analyst for 17 years and worked for Cellmark before working for Bode. She worked remotely, as many Bode analysts do, and would VPN into the Bode network. The DNA Analyst communicated with others at Bode via email, instant messaging, and screensharing in Teams. Her supervisor provided direction on casework requirements for each month. If serology was involved, the DNA Analyst often coordinated the process of ensuring technical reviewers were available for both the DNA and serology sections of the report and getting the cases ready for submission to technical review. Her deadline for producing the assigned reports was generally at the end of the month.

The case that is the subject of this report was submitted to technical review at the end of the month. This case was part of a batch of cases, and the DNA Analyst described a flurry of activity to ensure the case reports were issued by the end-of-month deadline whenever possible. She also noted that the events described here occurred on a Friday after close of business, while she was also caring for two small children.

The DNA Analyst stated her intention was to enter the PDF of her DNA results into the technical review process because the DNA analysis component of the review takes the most time. She was aware that the serology portion of the report still needed a second read for sperm search. She recalls wanting to forward the case for review expecting that, during the next 2-4 hours while the DNA review was occurring, the forensic biologist could do what she needed to do for the serology component of the report. The forensic biologist let the supervisor know the case needed a second read for sperm search and advised she was bringing a laptop home to finish the work.

The DNA Analyst completed the serology portion of the draft report by copying and pasting into the MS Word document information from another report, making the necessary changes to include the appropriate case number and item number. The method she previously employed to co-author the reports was to change the font of the serology portion of the report from black to red and delete the serology analyst's signature from the draft so it would be apparent to everyone (the forensic biologist and the technical reviewer) that additional work still needed to be completed by the forensic biologist. She had successfully utilized this practice in the past. However, in this case, whether due to distraction, rushing, or simple human error, she failed to change the font color from black to red or to delete the forensic biologist's signature from the draft submitted for technical review. As a result, the report appeared as though both the DNA sections and the serology sections were complete and ready for technical review when in fact only the DNA section was ready.

The DNA Analyst explained the actions described in this report resulted from a series of unfortunate mistakes or errors on her part that stem from the challenges of co-authoring a report, the challenges writing and editing reports in MS Word, and the end-of-the-month pressure she felt to get the reports out. She states she had no reason to purposefully add the forensic biologist's

signature without authorization. We note that the forensic biologist informed management during their investigation that she believed the DNA Analyst was only trying to be helpful. According to the DNA Analyst, "doing this job with integrity is of the utmost importance to me."

F. Casework Review and Notice to Affected Parties

The laboratory reviewed prior casework by the DNA Analyst that was co-authored with another analyst or forensic biologist during her employment with Bode. The laboratory identified 201 cases that the DNA Analyst co-authored. All 201 cases underwent a new technical review by reviewers authorized to review the various technologies involved in the cases. Additionally, if the co-author of the report was still employed at Bode, they were assigned to conduct a new self-review of their cases to confirm their own results and conclusions. This new self-review was conducted in 61 of the 201 cases.

The new self-reviews confirmed the results and conclusions indicating they agreed with the report as issued. Of these cases, eight (8) were missing certain documentation and were further evaluated. Three (3) of these cases were identified as "possibly" having an unauthorized signature and follow-up investigations were conducted and tracked under a separate non-conformance report number. Although these cases were identified as "possibly" having an unauthorized signature, there was insufficient information to determine whether the signatures were actually unauthorized, or the files were simply missing a self-review signature inadvertently. The scientific results in those cases were confirmed as supported by data and related information in the case folder.[24]

The technical reviews of the 201 cases did not identify any additional reports in which an unauthorized signature may have been applied.

[24] Neither the case that is the subject of this disclosure, nor the other three cases identified by Bode as having documentation issues suggesting possible unauthorized signatures, involved Texas criminal cases.

All clients of Cellmark and Bode for which the DNA Analyst performed laboratory testing or performed technical review were notified of the event described in this report, including a list of the cases the DNA Analyst worked on.

IV. COMMISSION FINDINGS, OBSERVATIONS, AND RECOMMENDATIONS

A. Challenges of Remote Joint Report-Writing Electronically Led to SOP "Drift"

Bode is a large organization that has a diverse range of clients with different casework and technology needs. Like many large laboratories, Bode divides labor to increase efficiency. Different people are involved in different aspects of the analytical work, from serology through interpretation. Some analysts, including the DNA Analyst involved in this disclosure, perform their work from home without ever being present in the laboratory. DNA analysts and forensic biologists had devised different approaches for the process of co-authoring reports when the casework required both serology and DNA analysis. Bode's rationale for including both serology and DNA analysis in their reports is that this made it easier for the client to understand because all of the testing results were in one place. The downside of the process is that a co-authored report—especially one authored outside the LIMS in a program like MS Word—requires greater coordination and communication between the individuals involved. The greater the coordination required, the higher the likelihood that various human factors may impact results.

The different practices employed by analysts in the process of co-authoring reports were not always strictly aligned with Bode's SOP. For instance, the application of the signature of another person violates Section 5.11.1.3 of the Bode SOP related to "Laboratory Documentation, Completion and Storage."[25] The SOP language did not allow for signatures to be applied "with

[25] *See*, **Exhibit D**, Bode Standard Operating Procedure BT00070 – Laboratory Documentation, Completion, and Storage item 5.11.1.3, which provided that "Electronic initials and signatures are considered secure, and therefore shall only be added by the author of the initials or signature." (Effective March 24, 2021).

permission." Additionally, the drafting of the serology portion of a joint report by the DNA analyst, subject to the review and approval of the forensic biologist, was a practice not unique to the DNA Analyst in this case. These practices for drafting, reviewing, and signing reports jointly among the analysts were aimed to increase efficiency. However, in this particular case, human error led to the submission for technical review of a report containing serology results that were: (1) incomplete; (2) not authored by the forensic biologist; and (3) not signed by the forensic biologist. Fortunately, Bode's technical review process caught the discrepancy before the report was issued to the customer.

B. Evaluation of Professional Negligence or Misconduct

When the Commission accepts a complaint involving an accredited discipline like DNA analysis, Texas law requires that the investigative report describe whether professional negligence or misconduct occurred in the case under review.[30] Neither "professional negligence" nor "professional misconduct" is defined by statute. The Commission has defined both terms in its administrative rules.

Professional Misconduct means:

> The forensic analyst or crime laboratory, through a material act or omission, deliberately failed to follow a standard of practice that an ordinary forensic analyst or crime laboratory would have followed, and the deliberate act or omission would substantially affect the integrity of the results of a forensic analysis. An act or omission was deliberate if the forensic analyst or crime laboratory was aware of and consciously disregarded an accepted standard of practice.[31]

Professional Negligence means:

> The forensic analyst or crime laboratory, through a material act or omission, negligently failed to follow the standard of practice that an ordinary forensic analyst or crime laboratory would have followed, and the negligent act or omission would substantially affect the integrity of the results of a forensic analysis. An act or omission was negligent if the forensic analyst or crime laboratory

> should have been but was not aware of an accepted standard of practice.[32]

There is no evidence to support a finding of professional misconduct in this case. Neither the Commission's interviews nor the information provided from Bode's internal assessment reflect a perception on anyone's part that the DNA Analyst knowingly created or signed a report for analytical work she did not perform with the intent of releasing the report to the client. Her intent was always that the appropriate serology work be completed and signed off on before the report was issued. However, had the report not caught in technical review, the result would have been that Bode issued a report for which analysis was not complete and for which the purported author had no role in actually creating or signing the document. The Commission commends Bode for flagging the nonconformance as potentially serious and conducting an internal investigation given the potential downstream repercussions.

Assessing professional negligence is difficult because it is a context-driven analysis that depends on the weight afforded to various factors. The Commission recognizes the criminal justice system is not well-served by punitive oversight that discourages analysts from admitting mistakes for fear of adverse consequences. A professional negligence assessment necessarily requires the Commission to determine whether there was an "accepted standard of practice" that the analyst should have followed but did not. In forensic laboratories, the main resource guiding analytical activities is the laboratory's standard operating procedure. In other cases where the Commission has assessed negligence, the Commission has emphasized that good science does not exist without mistakes, and crime laboratories are made up of imperfect humans. During the Commission's interview of the DNA Analyst, she readily admitted that she made a mistake. She did not turn the font color from black to red in MS Word, and she left the copy-pasted signature from a prior serology report in place. These omissions failed to flag the technical reviewer that the serology

portion of the report was still in progress. They were the result of rushing after business hours, which distracted attempting to care for two small children. Fortunately, they were caught in technical review.

The Commission observes the laboratory SOP language regarding signatures was not strictly followed by DNA analysts and forensic biologists in cases where a co-authored serology and DNA report were required. This SOP drift resulted in inconsistent approaches applied by various analysts for co-authoring joint reports. Various human factors contributed to the error by the DNA Analyst. They include: (1) different practices for co-authoring reports that diverged from the strict language of the SOP; (2) rushing to meet an end of the month deadline; (3) the risk of mistake inherent in using a word processing program like MS Word for reports; and (4) the distractions inherent in working after hours while also caring for children. Given these factors, the Commission declines to issue a professional negligence finding against the DNA Analyst.

C. Corrective Actions Taken by the Laboratory

The laboratory took five corrective actions related to the non-conformance described here.

First, they immediately assigned the case in question to a different DNA Analyst to report. The sperm search "second read" was completed and the forensic biologist authored her section of the report. The case was reviewed and uploaded to the client on August 29, 2022. It should be noted that the second sperm search revealed spermatozoa on a sample that was not identified by the original forensic biologist. Therefore, there was one substantive change to the report that was originally submitted by the DNA Analyst in error.

Second, the laboratory immediately notified staff of the event and issued a memo reaffirming Bode's SOP on electronic signatures and issued guidance on immediate actions to be taken by staff to ensure the security of their electronic signature.[26]

Third, the laboratory set up a separate non-conformance report for the tracking of any corrections required to the 201 cases reviewed and will issue amended reports if necessary.

Fourth, the laboratory revised its procedures and policies as a result of the internal review. Employee interviews indicated inconsistencies in the process for building case files, particularly when reports were co-authored by more than one person. The most notable revision removed the option to co-author reports *at all*. If multiple technologies are utilized in the analysis (e.g., STR, YSTR, Mito, serology) they may only be issued in the same report if they are being issued by a single reporting analyst. Otherwise, each analyst is required to author and issue their own report.

Finally, the laboratory established a working group to review the current use of Adobe and explore whether security of signatures and initials could be improved throughout the process. The laboratory revised their laboratory documentation SOP to provide that users should apply date/initials and signatures using the dynamic stamp feature in Adobe so that the addition is traceable in the electronic audit log.

D. Commission Recommendations

The Commission encourages Bode to continue implementation of the items described above. The Commission notes that the National Institute of Standards and Technology (NIST), in collaboration with the National Institute of Justice (NIJ), is in the process of developing the Human Factors in Forensic DNA Interpretation Report, which will be published as the third installment in the Human Factors in Forensic Sciences Expert Working Group Series. The report is expected to

[26] *See*, **Exhibit E:** Memo dated August 4, 2022.

discuss many different human factors in forensic DNA analysis, including various aspects of laboratory workflow. The EWG report's observations and recommendations should provide Bode and other laboratories (public and private) with ideas for how to reduce the potential adverse impact of human factors in forensic DNA analysis, and the Commission encourages all laboratories to read the report when it is published.

EXHIBIT A

1. PERSON COMPLETING THIS FORM

Name: Erin Sweeney
Laboratory: Bode Technology
Address: 10430 Furnace Road Suite 107
City: Lorton
State: VA Zip Code: 22079
Home Phone: 860-888-7422
Work Phone: 703-646-9763
Email Address *(if any)*: erin.sweeney@bodetech.com

2. SUBJECT OF DISCLOSURE

List the full name, address of the laboratory, facility or individual that is the subject of this disclosure:

Individual/Laboratory: Mollie Megahee/Bode Technology
Address: 10430 Furnace Road Suite 107
City: Lorton
State: VA Zip Code: 22079
Year Laboratory Accreditation Obtained: 2002
Name of National Accrediting Agency: ANAB
Date of Examination, Analysis, or Report: 7/29/22
Type of Forensic Analysis: Forensic Biology/DNA
Laboratory Case Number *(if known)*:

Is the forensic analysis associated with any law enforcement investigation, prosecution or criminal litigation?
Yes ☒ No ☐

* If you answered "Yes" above, provide the following information *(if possible)*:

* Name of Defendant:

* Case Number/Cause Number:
(if unknown, leave blank)

* Nature of Case:
(e.g burglary, murder, etc.)

* The county where case was investigated, prosecuted or filed: Outside of Texas

* The Court:

* The Outcome of Case:

* Names of attorneys in case on both sides *(if known)*:

3. WITNESSES

Provide the following about any person with factual knowledge or expertise regarding the facts of the disclosure. Attach separate sheet(s), if necessary.

First Witness *(if any)*:
Name: Carley Chwal
Address: 10430 Furnace Road Suite 107 Lorton VA 22079
Daytime Phone: 267-614-2953
Evening Phone: 267-614-2953
Fax:
Email Address: carley.chwal@bodetech.com

Second Witness *(if any)*:
Name: Teresa Vreeland
Address: 10430 Furnace Road Suite 107 Lorton VA 22079
Daytime Phone: 703-646-9757
Evening Phone: 703-646-9757
Fax:
Email Address: teresa.vreeland@bodetech.com

Third Witness *(if any)*:
Name: Kristin Sasinouski
Address: 10430 Furnace Road Suite 107 Lorton VA 22079
Daytime Phone: 703-646-9807
Evening Phone: 703-646-9807
Fax:
Email Address: kristin.sasinouski@bodetech.com

4. DESCRIPTION OF DISCLOSURE

Please write a brief statement of the event(s), acts or omissions that are the subject of the disclosure. See Page 6 of this form for guidance on what information should be disclosed to the Commission.

On July 29, 2022, Senior DNA Analyst, Mollie Megahee, submitted a draft forensic report containing both serology and DNA results for internal technical review. The forensic case report, in the form of a pdf file, included the signature of both Ms. Megahee, taking ownership of the DNA results, and a Forensic Biologist, taking ownership of the serology results. A report including both DNA and serology results, signed by the respective analysts, is common practice. The Bode Technical Reviewer of the case noted that the self-review signature for the Forensic Biologist was not on the case file review form and that the second read worksheet for sperm search, as required by Bode's standard operating procedures, was not present in the case file. The Technical Reviewer notified both Ms. Megahee and the Forensic Biologist of the necessary corrections. The Forensic Biologist was surprised to receive the corrections as she had not written or signed the report because she was still waiting on someone to perform a second read on the slide. She notified her Supervisor, who is also the Supervisor of Ms. Megahee, in the evening on July 29, 2022. All work on the case was halted.

On August 2, 2022 Ms. Megahee's Supervisor, Casework Director, Technical Leader and Laboratory Director interviewed Ms. Megahee to understand how the report was submitted to technical review without all necessary steps being completed and to ask whether the Forensic Biologist had authorized her portion of the report. Ms. Megahee explained that she had used a previous report that included the Forensic Biologist's signature as a report template in an effort to save the Forensic Biologist time and admitted that it was possible the Forensic Biologist had not seen the report prior to submitting the case for technical review. She explained she was trying to expedite the process to meet a due date.

Bode's Laboratory Director informed Ms. Megahee that she would be placed on administrative leave to further investigate the incident. Upon notification of the administrative leave, Ms. Megahee verbally resigned from her position and shortly afterwards submitted written resignation. August 2, 2022 was Ms. Megahee's last day of employment.

5. DESCRIPTION OF CORRECTIVE ACTION TAKEN

Please describe any corrective actions or corrective action plans the laboratory has developed to address the issues discussed in this disclosure. Please attach copies of the actions taken and/or future corrective plan to this disclosure form.

Please let the Commission know if any other agencies (e.g., Texas Rangers, local district attorney, Inspector General's Office, etc.) are also conducting an investigation of the matter in question. If possible, provide a contact name and phone number for the individual responsible for any other investigation(s).

Immediately upon discovery of the issue on the evening of July 29, 2022, the Supervisor halted work on the case. The Supervisor interviewed the Forensic Biologist on August 1, 2022 to confirm that she had not authored the report. Ms. Megahee was placed on administrative leave on August 2, 2022 to further investigate the incident. Upon notice of the administrative leave, Ms. Megahee resigned. Her final day of employment was August 2, 2022. A corrective action investigation has been initiated and cause analysis will be performed. Interviews with other Forensic Biologists and DNA Analysts are ongoing. At this time it appears to be an isolated incident.

As an immediate corrective action, Bode's Laboratory Director issued a memo to all staff on August 4, 2022 regarding the security and use of electronic signatures. Bode will be making additional changes and policy updates related to electronic case files and signatures. Over the next month Bode will identify all cases worked by Ms. Megahee during her employment with both Cellmark Forensics as well as Bode Technology and will notify all accrediting bodies and clients as applicable. A subset of cases, particularly those with joint serology/DNA reports, will be re-reviewed. Bode's Information Technology Director is actively engaged with third parties to determine best practices for Bode to implement further security of staff's electronic initials and signatures.

6. EXHIBITS AND ATTACHMENT(S)

Whenever possible, disclosures should be accompanied by readable copies **(NO ORIGINALS)** of any laboratory reports, relevant witness testimony, affidavits of experts about the forensic analysis, or other documents related to your disclosure. Please list and attach any documents that might assist the Commission in evaluating the disclosure. Documents provided will **NOT** be returned. List of attachments:

7. YOUR SIGNATURE AND VERIFICATION

By signing below, I certify that the statements made by me in this disclosure are true. I also certify that any documents or exhibits attached are true and correct copies, to the best of my knowledge.

Signature:

Date Signed: 2022-08-16

EXHIBIT B

BTF00234 - Microscopic Examination for Spermatozoa

Effective Date: 3/25/2022 11:35:03 AM
Revision Number: 20

1.0 PRINCIPLE:

This protocol details the microscopic examination of slides for the observation of spermatozoa and nucleated epithelial cells. It may be used to confirm the presence of semen if spermatozoa are present. Nuclear Fast Red will stain nuclear material (cell nuclei and sperm heads) and appear red or red-purple. Picroindigocarmine will stain cytoplasm (including epithelial membranes and sperm tails) blue or green, with the combination of stains creating a “Christmas tree stain”. Sperm heads are usually well differentiated via morphology, intensity of staining and visualization of the acrosomal cap which stains significantly less densely than the distal region of the head. This test is confirmatory for spermatozoa. Additional testing is required for confirmation of seminal fluid to determine the presence of semen.

2.0 REAGENTS, SUPPLIES, AND EQUIPMENT:

Scissors/forceps/disposable wooden sticks
Shaker
Vortex
Centrifuge filter baskets (optional)
TE^{-4} Buffer (10mM Tris-HCl, pH 7.5, 0.1mM EDTA)
Sterile water
OPTIONAL: Differential Extraction Buffer #1
OPTIONAL: ATL Tissue Lysis Buffer
OPTIONAL: Proteinase K (20mg/ml)
Microcentrifuge
Microcentrifuge tubes
Microscope slides and coverslips
Hydrophobic Pen
Incubator at 56°C
Spray Cyte fixative
Xylene substitute
Microscope with 200x, 400x and 1000x magnification capabilities
Oil for objective immersion at 1000x magnification
Lens paper

The following reagents are needed for the Christmas Tree Staining Procedure:

Nuclear Fast Red [e.g. SERI Christmas Tree Stain A]
Nuclear Fast Red dye- powder form (optional, for in-house stain preparation)
Aluminum sulfate (optional, for in-house stain preparation)
Picroindigocarmine [e.g. SERI Christmas Tree Stain B]
Indigocarmine dye- powder form (optional, for in-house stain preparation)
Picric acid solution (optional, for in-house stain preparation)
100% Ethanol

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3.0 QUALITY ASSURANCE / SAFETY:

3.1 All work surfaces, utensils, and instruments used must be cleaned as necessary with 10% bleach. A 70% reagent alcohol or sterile water rinse must follow for all metal items. Alternatively, if using razor blades, a new blade can be used for each cutting.

3.2 A minimum of one reagent blank must be carried through the sample preparation procedure.

3.3 If picric acid is used, it is a severe irritant and potentially explosive. For this reason, a saturated solution should be purchased rather than dry product.

3.4 Prepared slides or slides spotted during differential extraction should be scanned slowly and systematically. For 1.2 cm diameter spotting area, a sperm negative or 1+ slide with minimal cellular debris/epithelial cells should take 15 to 20 minutes to scan in entirety; the time should increase with an increase in cellular debris/epithelial cells present on the slide. No more than four sperm negative or 1+ slides should be examined per hour.

3.5 Smears included in sexual assault kits should take less than 1 hour to search ~ 30% of the stained area. Smears examined in their entirety may take up to four hours to scan. Smears containing multiple layers of cells may be unsuitable for microscopic analysis. Consult a supervisor or technical leader if assistance is needed in making this determination.

3.6 Smears may be submitted with previous staining applied; if apparent red-green Christmas Tree stain is observed, the smears may be examined. Breaks from microscopic examination should be taken each hour.

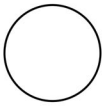
4.0 PROCEDURE: SAMPLE PREPARATION

4.1 Slides may be prepared by spotting 5 µl of the sperm fraction during differential DNA extraction (see differential extraction procedures for details), or by extracting the substrate directly. Spotting during differential DNA extraction will conserve sample and limit the amount of epithelial cells and debris present, but will also eliminate the possibility of visualizing intact sperm cells. For samples spotted during differential DNA extraction, proceed to section 4.4 for staining procedures.

4.2 Place a small cutting (approximately $^1/_4$ of a swab, or less if multiple swabs are being combined into one sample; or approximately 0.5 cm^2 of a cloth or paper substrate) from the item into a clean, labeled microcentrifuge tube.

NOTE: Indicate either how much of the item is cut or how much of the item remains, e.g., "¼ swab consumed" OR "¾ swab remains."

4.3 Prepare the appropriate number of microscope slides by drawing a 1.2 cm diameter circle on the slide using a hydrophobic pen or use a slide with a pre-made well (12 mm or 13 mm).



1.2 cm diameter circle

4.4 Use one of the following methods to prepare an extract of the sample:

4.4.1 Extracting directly on the slide (sample will be consumed with sperm search):

4.4.1.1 Place the cutting on a microscope slide.

4.4.1.2 Add 1-2 drops sterile, distilled water, allowing the sample to soak for approximately 1 minute.

4.4.1.3 Masticate the sample thoroughly using clean forceps or disposable wooden sticks.

4.4.1.4 Remove and discard the cutting.

4.4.2 Extracting in a tube (the cutting/extract may be processed further):

4.4.2.1 Add 300 µl of Abacus Diagnostics supplied p30 buffer to the tube. Vortex thoroughly and place on shaker for a minimum of 30 minutes at room temperature. Vortex periodically to remove biological material from the substrate.

NOTE (1): If the supernatant may be needed for p30 testing, the samples should be incubated at 4°C with more frequent vortexing, rather than at room temperature on a shaker.

NOTE (2): If TE^{-4} buffer or sterile water is used, the samples must be incubated for a minimum of 2 hours at room temperature on a shaker or at 4°C with more frequent vortexing if the supernatant is needed for p30 testing.

4.4.2.2 Transfer the cutting to a centrifuge filter basket. Place the insert back in the original tube or in a new receiver tube. If using a new tube, transfer the entire sample. Spin for 2 minutes at 5,000 x g (6860 rpm). The cutting can be reintroduced before DNA extraction to ensure that all material has been removed from the substrate.

4.4.2.3 Transfer 200 µl of the supernatant, along with the filter basket and cutting, to a new labeled tube. Be careful not to disturb the pellet on the bottom of the original tube. The supernatant can be tested for acid phosphatase and/or p30 testing; the cutting can be introduced before DNA extraction.

4.4.2.4 Spin the remaining 100 µl for 1 minute at maximum speed.

4.4.2.5 Using a smaller volume pipettor and/or gel loading tips, transfer the remaining 100µl of supernatant to the previously labeled tube without disturbing the pellet.

4.4.2.6 OPTIONAL: To remove epithelial cells from the sample; perform the following steps to the cell pellet.

NOTE: Spermatozoa tails (if present) will be degraded/removed if these optional steps are followed.

4.4.2.6.1 Add 500µl DEB #1 or ATL (preferred) and 5 µl 20 mg/ml Proteinase K to the cell pellet. Incubate samples at 56ºC for 1 hour. Vortex and spin for 10 minutes at maximum speed.

4.4.2.6.2 Without disturbing the pellet, remove and discard approximately 400µl of the supernatant.

4.4.2.6.3 Spin the remaining 100 µl for 1 minute at maximum speed.

4.4.2.6.4 Using gel loading tips, remove and discard the remaining 100 µl of supernatant without disturbing the pellet.

4.4.2.7 Add 25 µl of TE^{-4} buffer Re-suspend the cell pellet by pipetting up and down. Spot the entire contents of the tube on a prepared microscope slide, spreading the sample to fill the circle.

4.5 Christmas Tree Staining Procedure

4.5.1 Fix cells to the microscope slide by drying in a 56°C oven for a minimum of 30 minutes or until dry. This incubation should be no longer than approximately 1 hour. Apply a spray fixative and allow to dry for 5-7 minutes.

NOTE: To prepare stain prior to application, follow steps 4.5.2 through 4.5.7. To stain slides with commercially prepared stains, follow steps 4.5.4 through 4.5.7.

4.5.2 Dissolve 5 g aluminum sulfate in 100 ml of boiling water. Add 0.1 g nuclear fast red dye. Allow solution to cool and filter (Stain A).

4.5.3 Dissolve 1 g of indigocarmine dye in 300 ml of saturated picric acid solution (Stain B).

4.5.4 Stain with Nuclear Fast Red (Seri Christmas Tree Stain A or prepared stain A) for at least 15 minutes.

4.5.5 Gently wash with water, avoiding direct contact with the stained area.

4.5.6 Stain with Picroindigocarmine (Seri Christmas Tree Stain B or prepared stain B) for 10 seconds.

4.5.7 Gently rinse with 100% ethanol, avoiding direct contact with the stained area, and air dry.

5.0 PROCEDURE: Microscopic Examination *(general guidelines for prepared slides and smears)*

5.1 Smears may be microscopically screened for apparent cellular material and/or previous staining prior to a complete microscopic examination to evaluate any identified cellular material. Preliminary microscopic screening notes will be documented in the case inventory.

5.2 Köhler Illumination shall be performed at the start of slide/smear examination each day and should be rechecked occasionally throughout the day.

5.2.1 Place a Köhler Illumination reference slide on the specimen stage. If a Köhler Illumination slide is not available, any slide with cellular material that is easily focused is suitable.

5.2.2 Using 100x magnification, adjust the course focus knob followed by the fine focus knob until the cellular material is clearly defined and in focus.

5.2.3 Change to 200x magnification and re-check the focus to ensure the cellular material is still clearly defined. Adjust the focus as necessary.

5.2.4 Close the field diaphragm until it is almost closed. The field diaphragm will appear dark/black and the cellular material will still be visible through the diaphragm opening, located near the center of the field of view. The edges of the diaphragm may appear blurred and out of focus at this point.

5.2.5 Using the substage condenser height adjustment knob, raise or lower the substage condenser until the edges of the field diaphragm are clearly defined.

5.2.6 If necessary, centralize the substage condenser. If the substage condenser is not centralized, the diaphragm opening will not be in the center of the field of view. To centralize the substage condenser, adjust the centering screws until the diaphragm opening is in the middle of the field of view.

5.2.7 Centralizing the substage condenser is rarely required since it does not need re-centering unless the centering screws are manipulated, or force is applied to the condenser. Therefore, do not manipulate the centering screws unless the condenser is clearly out of center.

5.2.8 Open the field diaphragm until the diaphragm edges are barely out of the field of view.

5.2.9 The light intensity and condenser diaphragm should be adjusted as necessary to provide optimal contrast. These adjustments may vary between slides depending on the amount of cellular material and intensity of staining.

5.3 Place one drop of xylene substitute onto the slide and add a coverslip (if xylene substitute is unavailable, water may be used for KPIC stained slides only).

5.3.1 When using oil immersion on 1000x, place one drop of oil onto the slide without a coverslip. Be sure to thoroughly clean the 100x objective with lens paper after each use.

5.4 Systematically scan the slide using 200x magnification. The presence of sperm should be confirmed at 400x magnification or 1000x magnification may be used to differentiate between sperm heads and similarly shaped cells.

5.4.1 To confirm a possible sperm cell as a sperm cell, examine using 1000x under oil immersion.

5.5 Use the microscope stage coordinate system to record the coordinates of sperm cells requiring second analyst verification. The coordinates of possible sperm heads should be documented on the sperm search worksheet in LIMS so they can be confirmed using 1000x under oil immersion.

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5.6 Record results using the following grading guidelines:

GRADE	SPERM CELL OBSERVATION	EPITHELIAL CELL OBSERVATION
4+	More than one sperm cell observed in every examined field	Abundant and layered epithelial cells in every examined field
3+	Sperm cells observed without difficulty in at least 60% of examined fields	A single layer of epithelial cells in a nearly complete cell lawn
2+	Sperm cells observed in 20% to 50% of examined fields	Epithelial cells observed in at least 50% of examined fields in an open cell lawn
1+	Sperm cells observed in less than 10% of all fields (record total number of sperm cells observed on slide if less than 10, including possible sperm heads)	Epithelial cells observed in less than 50% of examined fields
INC	Only possible sperm heads observed on slide, or slide is inappropriate for viewing	N/A
-	No sperm cells observed on slide	No epithelial cells observed on slide

5.7 A minimum of 10 fields should be observed for sperm positive (4+, 3+ or 2+) slides in order to approximate the number of sperm cells present. Sperm negative slides or slides with a minimal number of sperm cells (1+) should be searched in entirety.

5.8 All slides found to be negative or inconclusive (due to only possible sperm heads observed or excessive debris) will be re-evaluated by a second analyst, unless a documented exception is made by a supervisor or technical leader.

5.8.1 Second reads should be performed independently of the first read and documented in a separate results sheet kept in the shipment or case folder.

5.8.2 The first read analyst is responsible for adding only the sample name to the second read results page and placing it in the appropriate folder.

5.8.3 Once both reads have been performed, it is the reporting analyst's responsibility to compare the results and print both reads for the case file.

5.8.4 Once the results sheets have been through review, all changes to the forms must be made on the original sheet and not electronically.

5.9 When less than three sperm heads are observed, the coordinates of the heads shall be recorded on the sperm search worksheet in LIMS. A second analyst is required to locate and verify the sperm heads using the coordinates previously recorded by the first analyst. The verification analyst must record their initials and date of the verification on the sperm search worksheet. A note must also be made to the worksheet to clarify that the verification analyst only examined the specific coordinates of the sperm heads.

5.10 A slide may also be reported as inconclusive if the analyst determines it is unsuitable for viewing or if only possible sperm heads are observed. Examples of slides being unsuitable for viewing include the presence of heavy debris/cellular lawns or insufficient staining.

NOTE (1): If a slide is deemed inconclusive due to insufficient staining, the analyst will consult with the technical leader to troubleshoot and analyst may attempt re-staining of the slide.

NOTE (2): If the slide contains heavy debris/cellular lawn and there is sufficient sample remaining, the analyst must attempt to make a new slide and/or perform p30 testing to confirm the presence of sperm cells and/or seminal fluid on an inconclusive sample.

5.11 Only cells containing a stained nucleus should be included in the epithelial cell observation. In addition to sperm cell and epithelial cell observation, the extent of overall cellular debris should be noted.

6.0 PROCEDURE: Microscopic Examination of Smears

6.1 Smears included in sexual assault kits may contain multiple layers of cells that may be unsuitable for microscopic analysis. Consult a supervisor or technical leader if assistance is needed in making this determination.

6.2 In general, smears should be examined per the following method (a more exhaustive search may be required for cases involving- juvenile, mentally challenged, or elderly victims, and where the presence of even low numbers of sperm may be deemed probative):

6.2.1 Smear searching is considered to be a “representative sampling” of the entire evidence item (similar to taking a cutting from a swab for DNA analysis).

6.2.2 Approximately 30% of the smear’s stained area should be examined to serve as a “representative sampling.”

6.2.3 The first read analyst shall start by scanning the most heavily stained area on the smear (usually around the center of the slide) in a horizontal fashion (left to right or length-wise).

6.2.4 If a smear is negative or inconclusive (due to only possible sperm heads observed), a second read must be performed by another analyst. The second read will then search the most heavily stained area (usually around the center of the slide) in a vertical fashion (up and down).

6.2.5 When less than three sperm heads are observed, the coordinates of the heads shall be recorded on the sperm search worksheet in LIMS. A second analyst is required to locate and verify the sperm heads using the coordinates previously recorded by the first analyst. The verification analyst must record their initials and date of the verification on the sperm search worksheet. A note must also be made to the worksheet to clarify that the verification analyst only examined the specific coordinates of the sperm heads.

7.0 REFERENCES

7.1 Baechtel FS. The Identification and Individualization of Semen Stains. Forensic Science Handbook Volume II, Saferstein ed, 1988; 347-369.

7.2 Gaensslen RE. Identification of Semen and Vaginal Secretions. Sourcebook in Forensic Serology, Immunology, and Biochemistry, 1983; 149-155.

7.3 Olympus America, Inc. Transmitted Light- Köhler Illumination. [Online] (2010) Available: http://www.olympusmicro.com/primer/anatomy/transkohler.html.

7.4 Serological Research Institute. A Gram Modified Christmas Tree Stain Methods Manual, 2002.

EXHIBIT C

Attachment A

EMPLOYEE ATTESTATION REGARDING CASE REPORT SIGNATURES

_____ (Print Attestant Name) "Attestant" understands that Bode Technology is conducting an internal review relating to the use of signatures on forensic case reports and that Attestant is making the following attestation to assist Bode in that review. Attestant understands that they are not to sign this Attestation if the following statements are not true and correct.

Attestant declares under penalty of perjury the following statements are true and correct:

- Attestant has never affixed or signed another employee's signature to a case report without that employee's express consent or authorization.
- Attestant has never submitted a case report for technical review containing the signature of an employee that was not authorized, signed, or affixed by that employee to the best of their knowledge.
- With the exception of the case reports listed below, Attestant is unaware of any case report delivered to a client containing the signature of an employee that was not authorized, signed, or affixed by that employee.
- Attestant has reviewed and is familiar with Bode Technology's BT00070 – Laboratory Documentation, Completion, and Storage standard operating procedure.

_____

Sign Attestant Name

_____

Date

EXHIBIT D

BT00070 - Laboratory Documentation, Completion, and Storage

Effective Date: 3/24/2021 9:21:54 AM
Revision Number: 22

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BODE TECHNOLOGY

BT00070 - Laboratory Documentation, Completion, and Storage

Effective Date: 3/24/2021 9:21:54 AM
Revision Number: 22

1.0 PRINCIPLE

Laboratory activities conducted at Bode Technology (Bode) must be documented and maintained in a case file, tray record, and/or data package. Upon completion of a case and/or databasing sample, sufficient documentation must be present in the case file and/or tray record to support the reported conclusions such that any qualified individual could evaluate and interpret the data. This procedure designed as a guide to assist in generating and completing laboratory documentation. Laboratory activities may be organized in separate file folders or in binders depending on the requirements of each project. Binder systems may have separate binders for controls, core forms, and case data or a combination of binders and file folders. Preference is to document in electronic case files unless client specifications require otherwise.

2.0 SUPPLIES

- Colored folder (project dependent)
- Binder (project dependent)
- Dividers (project dependent)
- Hole-puncher (two and three hole)
- Black/Blue Pen
- Electronic or hard copy worksheets
- Laboratory Information Management System (LIMS) – Casework LIMS and BodeLIMS
- Qualtrax
- Scanner
- PDF software
- Computer

3.0 CASE FILE or DATAPACKAGE CONTENTS, as applicable

If created, all items below must be included in the case file.

3.1 Technical Records include the following:

- 3.1.1 Issued Case Reports
- 3.1.2 Allele Table
- 3.1.3 Analytical data (EPGs)
- 3.1.4 Statistical calculation worksheets
- 3.1.5 Case Notes

3.2 Examination Documentation are also technical records and include the following:

- 3.2.1 Evidence Inventory
- 3.2.2 Interpretation documentation including edits, mixture interpretation worksheets, DNAView reports, and STRmix deconvolution reports
- 3.2.3 Laboratory worksheets
- 3.2.4 Photographs, when applicable (or reference to photograph location, if maintained electronically)

3.3 Administrative Documentation:

- 3.3.1 Case Review Form

3.3.2 Agency Case Information (e.g. manifest, case submission form, acceptance of data from NDIS lab, if not part of project guidelines)

3.3.3 All correspondence from the agencies/lawyers/courts

3.3.4 Chain of Custody

3.3.5 Index

4.0 PROCEDURE - STAFF AND PARALLEL PROCESSING SEARCH

Profiles generated and reported must be searched against the Bode staff database, samples processed in parallel shipments, and unsourced contamination profiles previously detected as a quality assurance measure. The completion of the search will be documented on the case review form and/or data package checklist.

4.1 For all nuclear DNA testing: Automated STR and Y-STR search:

4.1.1 Profiles generated in Casework LIMS and BodeLIMS can be automatically searched against the database. Refer to BT00456 – *BodeMATCH - STR and Y-STR Profile Comparison*.

4.1.2 Manual mitochondrial DNA (mtDNA) search:

4.1.2.1 A summary of differences is in the excel file "Bode Staff DB" under the tab "Bode Staff mtDNA Profiles."

4.1.2.2 The summary of mitochondrial differences must be compared against staff who have access to the mtDNA laboratory or any person who assisted with processing of the case(s).

5.0 PROCEDURE – GENERAL

The following items are required of laboratory and proficiency test documentation:

5.1 Examination records will be documented from receipt of items through reporting, as applicable.

5.1.1 Casework uses a combination of casework LIMS, BodeLIMS, Qualtrax workflows, and approved excel documents for records of casework processing.

5.1.2 Databasing uses a combination of BodeLIMS, Qualtrax workflows, and approved excel documents for records of databasing sample processing.

5.2 Sample and/or tray lists may be generated electronically prior to processing, and worksheets may be populated with reagent lot numbers and sample processing information electronically in the laboratory.

5.3 When handwritten documentation or correction is necessary, use only blue or black ink. Do not use pencil or permanent marker.

5.4 Documentation shall indicate who performed each laboratory procedure and the date(s) the procedure was performed.

5.5 Record reagent lot numbers as they are used and verify that they have been properly QC-tested and have not expired prior to use.

5.6 Record instrument numbers as they are used and verify that they have been properly serviced prior to use. Do not use shorthand for instrument naming/recording (e.g., Use CE-L007 versus 7502).

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5.7 Abbreviations may be used throughout the examination documentation so long as the abbreviations are defined. Abbreviation keys may be in SOPs or in the examination documentation. A list of common abbreviations can be found in Appendix A.

NOTE: In addition, Bode uses known scientific abbreviations for units of measure and volume that will not be documented in the abbreviation list.

5.8 When an error is identified on any examination documentation it shall be corrected as follows. These steps shall be taken for both hard copy documentation and electronic files.

NOTE: Examination documentation notes generated from LIMS shall not be edited using Excel. It may be appropriate to remove data prior to printing for the case file in some instances (for example, printing edits applicable to certain cases only, or printing only inventory notes taken after original notes were reviewed), but the contents of the documentation shall not be altered.

5.8.1 Any administrative errors identified during review will be given to the responsible analyst or technician for correction.

5.8.2 Cross out the error with a single line (strike-through) and add initials and date to one side of the strike-through. If the changes are extensive, the entire page may be marked with a strike-through and initials and date added to the side or be marked as a draft document, and a new copy of the page may be added to the file on top of this draft page.

5.8.3 Corrections to printed workflows in either hard copy form or electronic form may be corrected following 5.7.2 but should also be corrected in Qualtrax following steps in 5.7.5.

5.8.4 If the analyst or technician is unavailable (e.g. long term leave, no longer an employee) to correct the administrative error, another analyst or technician may correct the error so long as the alternate is documented with the correction (e.g. initial ABC for XYZ).

5.8.5 Corrections to Workflows

5.8.5.1 Workflows that have been submitted:

5.8.5.1.1 Alert the Qualtrax Administrator or designee of the correction needed with the following information:

5.8.5.1.1.1 Applicable workflow ID number

5.8.5.1.1.2 Identify what information needs to be corrected

5.8.5.1.1.3 Provide the corrected information

5.8.5.1.1.4 The Qualtrax Administrator or designee will make the correction to the workflow and identify in the comments what the correction is (to include specific field, original information, and the new information) who made the correction, and when the correction was made.

Example: Plate Name corrected from 101920HG to 113020HG, per email request. HG 6.10.2020

5.8.5.2 Workflows that are not yet submitted:

5.8.5.2.1 If the user has not submitted the workflow but have saved it to return to at a later time, they may make the correction to the workflow and identify in the comments what the correction is (to include specific field, original information, and the new information), who made the correction, and when the correction was made.

Example: Plate Name corrected from 61020HG-EF to 061020HG-SF. HG 6.10.2020

5.8.6 Technical and administrative corrections to issued reports are to be made in the form of an amended report. If corrections only are needed, the report will be titled "Amended Forensic Case Report". Additional submissions that supplement issued reports will be made in the form a supplemental report. All other instructions for amended and supplemental report must be followed. See BTF00220 – *Forensic Report Writing*.

5.9 If an addition is made to documentation (e.g. note in margin, interlineation), include handwritten initials and the date.

5.9.1 Additions to workflows should follow 5.7.2 and provide the information to be added. The individual making the addition should identify in the comments what information was added, who made the addition, and when the addition was made.

5.10 Case and data package notes should be included to provide further technical clarification or to document anything outside of normal procedure that may have occurred during the processing of the case/data package.

NOTE: Corrections such as tube and/or sample numbering should be made directly on the affected laboratory worksheet(s) and do not require notes. Deviations from procedures as authorized by the technical leader or designee, or from project guidelines authorized by the supervisor/manager/director will be recorded on the associated worksheet and/or in a case note, as applicable.

5.11 Electronic documentation may be created using PDF software prior to technical review, or a copy of the final case file may be scanned to the appropriate network location for secure transmittal to the client after technical/administrative review.

5.11.1 When creating an electronic case file, personnel shall not use the features of the software to obliterate any original administrative or examination documentation. Once technical and administrative review is finalized; no further revisions shall be made to the electronic documentation. The file should be saved as read only.

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5.11.1.1 Personnel may use features of the software to cross out text and add comments to make corrections to administrative or examination documentation. The individual making corrections must date and initial these edits. Personnel may use features of the software to add electronic initials and signatures. Technical documentation (with the exception of issued case reports) may be reprinted with changes reflected or removed during the review process so long as the basis for the change is reflected in the examination or administrative documentation.

5.11.1.2 Corrected pages within the casefile may be issued after reporting without issuing an amended report, so long as the additional page has been reviewed. Corrected pages may not be issued for a report. See BT00067- *Review of Analyst Case Files and Reports.*

5.11.1.3 Electronic initials and signatures are considered secure, and therefore shall only be added by the author of the initials or signature.

5.12 Completed hard copy documentation will be scanned and maintained electronically indefinitely at Bode. See Appendix B for scanning instructions.

5.12.1 Default Dots per Inch setting should be set to 300 to maintain the visual quality of the documentation.

5.12.2 Follow the steps below for preparing an electronic copy as a permanent record in place of the hard copy:

5.12.2.1 Documentation shall be maintained in the respective network location recording that the document(s) were scanned and verified, and the date of destruction shall be recorded. Verify the following:

5.12.2.1.1 The total number of pages in the hard copy against the total number of pages in the electronic copy. Discrepancies shall be resolved.

5.12.2.1.2 The quality of the scanned copy shall be assessed verifying at minimum that pages are legible and in the correct orientation.

5.12.2.1.3 If pages are not legible, rescan as needed.

5.12.2.1.4 Verify the document is read-only.

5.12.2.2 Following generation of an electronically scanned copy, hard copy chain of custody documentation will be returned to the client. All other hard copy documentation shall be destroyed after a minimum of 24 hours from the scan and verification. This is to ensure the network backs up the new files. Hard copy documentation is not maintained by Bode. All hard copy pages shall be placed in a secure shred bin.

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6.0 PROCEDURE – CASE FILES/PROFICIENCY TESTS

6.1 Upon case file/proficiency test completion (after the review process), number according to the following guidelines. Manual numbering may be utilized if the physical documentation is provided to the client otherwise, proceed to Electronic Numbering, after scanning.

6.1.1 While examination documentation should be single-sided, some submitted administrative documentation may be double-sided. In the case of double-sided documentation, both sides of the page should have separate numbering.

Manual Numbering, prior to scanning:

6.1.2 Beginning with the left-hand side of the file, or the first page if case files are separated by dividers within a binder or electronic, number the pages from the top to the bottom beginning with "1" and ending with the last page of data/results.

6.1.3 Continuing with the right-hand side of the file, if applicable, number the pages from the top to the bottom starting with the next number (i.e. if the last page number on the left-hand side is 100, then the first number on the right-hand side is 101). Proceed to step 6.1.10.

Electronic Numbering, after scanning:

6.1.4 Open select document.

6.1.5 Select Edit in the tool bar, then select “Edit Text & Images”.

6.1.6 Click on ‘Header & Footer’, then Add.

6.1.7 Click on ‘Page Number and Date Format’, then select Page Number Format to ‘Page 1 of n’, click OK.

6.1.8 Click in the ‘Right Footer Text’ to place the cursor, then click ‘Insert Page Number’, click OK.

NOTE: Left Footer Text or Center Footer Text may be used for the page number.

6.1.9 Review all pages in the file to ensure proper placing of the page number. Adjust the page number as applicable to ensure no information is obstructed. This may be done by clicking on the page number and moving the page number to a clear are in the lower right corner.

6.1.10 Save the document.

6.1.11 The total number of pages will be indicated within the file. This should be indicated at a minimum on the first page. (e.g. X of Y)

NOTE: Page numbering of case files may vary according to client case file organization requirements. See project guidelines.

6.2 All pages of case file documentation must include a unique identifier such as a batch case number (shipment) or individual case file number, date and the identity of the personnel responsible for each laboratory activity, and for analyzing data and results.

If the identity of the personnel responsible for the analysis or interpretation is not listed, the responsible personnel shall date and initial each applicable page. EPGs printed from GMID or Sequencer only need the identity or date and initials of one analyst.

6.3 After transmitting files to client, verify the document in the archived network storage is read-only.

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7.0 PROCEDURE: DATABASING

7.1 Samples processed by the databasing group are primarily tracked through BodeLIMS.

7.1.1 Samples are electronically added to tray(s) with a unique ID assigned by BodeLIMS. Trays are then released to workflows that include process flows of DNA processing *methods based on client approved and sample appropriate methods.*

NOTE: Trays have pre-defined tray layouts that are managed in BodeLIMS by a trained and authorized user with administrator permissions.

7.1.2 Once a sample is assigned to a tray, samples are tracked by specific tray IDs on laboratory and analysis worksheets.

7.1.3 The following items should be included in each set of tray worksheets, as applicable:

- Reprocessing Sample History Reports
- Sampling worksheet
- Sampling Tray List Report
- Extraction worksheet
- Quantification and Normalization worksheets
- Amplification worksheet
- Cherry Picking Tray List Report
- Cherry Picking Former Well Report
- Cherry Picking worksheet
- CE Set-Up worksheet
- CE Injection worksheet
- Read Verification worksheets, including any samples rejected for further analysis.
- Final Technical Review worksheet, including any samples rejected for further analysis.
- Databanking Technical and Administrative Review Form

NOTE: The items listed in section 7.1.3 may vary according to client and/or processing requirements.

7.1.3.1 After final technical review and administrative review have been performed, each folder is to be saved in the appropriate client network location for inclusion in the data package. The total number of pages is determined by the number of pages listed in the page navigation toolbar.

7.2 For reporting to the client, samples are grouped into data packages; primarily separated by tray ID.

7.2.1 The contents of each data package vary according to client specifications, but may include any of the following:

- Tray worksheets, as described above in 7.1.3
- Scanned Chain of Custody
- Data tables showing the profiles obtained
- Raw data from the CE Instrument

- GeneMapper ID or GeneMapper ID-X data files
- Invoice Tally and/or Invoice
- Sample History Report
- Unusual Profiles Report & Screenshots, as applicable
- Data package Contents & Notes

7.2.2 Data packages are delivered to the client with the data either burned to CD or electronically transferred using a secure FTP or sharefile site.

7.3 Expungement Requests: If a sample has been requested to be expunged by a client, an expungement checklist must be completed documenting what data and/or records have been modified.

7.3.1 The expungement checklist and record requesting the sample to be expunged (e.g. email requesting the expungement) must be maintained within the client data package binder.

APPENDIX A: Common abbreviations found in examination documentation

20%	20% filter applied
A	Adenine
-A, MA	Split peak(s), Incomplete Adenylation
AB, ABI	Applied Biosystems
ADMIN	Administrative
ALS	Alternate light source
AMEL	Amelogenin
AMP	Amplification
AP	Acid Phosphatase
APPROX, ~	Approximately
AR, ART	Artifact
AUT	Allele below minimum threshold
BACT	Possible bacterial peak
BP	Basepair
BBP	Bode Bone Prep
C	Cytosine
CE	Capillary electrophoresis
CF	Control Failure
CO	*Databanking only:* Color problem
CR	Control region
cRNA	Carrier RNA
CS	CentriSep DNA Purification
CSF	CSF1PO
CT	Cycle threshold
CYC	Cycle

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D	Deletion
D1	D1S1656
D10	D10S1248
D12	D12S391
D13	D13S317
D16	D16S539
D18	D18S51
D19	D19S433
D21	D21S11
D22	D22S1045
D3	D3S1358
D5	D5S818
D7	D7S820
D8	D8S1179
DE	Sample degraded
DIS	Disregard
DNA	Deoxyribonucleic acid
DTT	Dithiothreitol
DUP	Duplicate
EA	Extra allele
EB, EBL or Elevated BL	Elevated baseline
EDTA	Ethylenediaminetetraacetic acid
EF, N	Epithelial fraction/Non-sperm fraction; in reference to differential extraction fractions
EMS	Evidence management section
EP	Extraction positive/ Employee profile
ES	Excessive stutter

EtOH	Ethanol
EVID, E	Evidence
EXT	Extraction, *databanking only:* Extract
FC	Failed capillary
FNC	Fingernail Clippings
FLS	Formamide Loading Solution
FNS	Fingernail Scrapings
FRIDGE	Refrigerator
FTR	Final Technical Review
G	Guanine
GF	GlobalFiler
GM, GMID, GMID-X	GeneMapper ID, GeneMapper ID-X
GR	Gelman-Rubin
H/h	Head/Heads
H2O	Water
dH2O	Distilled water
diH2O	Deionized water
HV	Hypervariable e.g. HV1, HVII
IA	Imbalanced allele(s)
ILS	Internal Lane Standard, ILS<MIN (as rejection code in BodeLIMS)
ICU	Inhibition/Clean up
IN	Inhibition
INC	Inconclusive
INT	*Databanking only:* Intermediate
IPC	Internal positive control
LH	Left Hand

LLMP	Low level mixed profile
LLP	Low level peak
LNR	Locus not reported
LOR	Loss of resolution
LRG	Large
MAX	Maximum
MC, M'CON	Microcon
MF	MiniFiler
MI	Migration
MIN	Minimum
MP	Mixed profile
mtDNA	Mitochondrial DNA
MV	Microvariant
N	A position that could not be confirmed; in reference to mtDNA sequencing
n-#, n+#, ST	Stutter peak e.g. n-4
NA, N/A	Not applicable
NA	*Databanking only*: No amplification
NEG, -	Negative
NORM	Normalized extract, Normalization
NPF	No primer flash
NR, N/R	Not recorded
NSA	Non-specific artifact
NU	Null allele
nuDNA	Nuclear DNA
OL	Off ladder
OMR	Out of marker range allele

OS	Off-Scale
OT	Other
OTA	Other re-amp
OTC	Other re-cut
OTL	Other re-load
OV	Overloaded/strong
PA	Poor amplification
PCIA	Phenol/Chloroform/Isoamyl Alcohol
PPF/PPF6C	PowerPlex Fusion/PowerPlex Fusion 6C
PCR	Polymerase chain reaction
Pkg	Package
PH	Phenolphthalein
POS, +	Positive
Prep	Preparation
P/N	Part number
Poss	Possible
PREV	Previous
ProK	Proteinase K
PS	Primer set
PSA, P30	Prostate specific antigen
PU	Pull up
PPY23	PowerPlex Y23
QA	Quality Assurance
QC	Quality control
QT	Quantification
RA	Re-amp

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RB	Reagent blank
RC	Re-cut
RCVD	Received
R2	Read 2 Analyst
RE	Re-extract
REF, R	Reference
RFU	Relative fluorescence unit
RFU<MIN	Sample RFU below minimum threshold
RFU>MAX	Sample RFU above maximum threshold
RH	Right Hand
RI	Reinjection
RL	Reload
RNA	Ribonucleic acid
RXN	Reaction
SAK	Sexual Assault Kit
SAECK	Sexual Assault Evidence Collection Kit
SEQ	Sequence
SERO	Serology
SF, S	Sperm fraction
SH	Shoulder
SH	*Databanking only:* Shadow peak(s)
SP	Spike(s)
SR	Self-Review
SS	Sperm search
STD	Standard
STR	Short tandem repeat

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T	Thymine
TBE	Tris Borate EDTA
TC	Thermal cycler
TE	Tris-EDTA
TECH	Technical
TS	Tape seal
VAG/Vag	Vaginal
VC, V'CON	Vivacon
VIC	Victim
VOL	Volume
W	Wattage
W/	With
WIT	Witness
WK	Weak amplification
Y, YF	Yfiler
YSTR, Y-STR	Y-chromosome short tandem repeat

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APPENDIX B: Scanning Instructions

8.0 Follow the steps below for generating an electronic copy using Capture Perfect 3.0:

8.1 Select Scan Batch to File: Scan\Scan Batch to File or click the stacked papers icon

8.1.1 In the pop-up menu, navigate to the desired network location to save the document.

8.1.2 Load the document with writing side up and with the top edge pointing into the scanner and select save.

8.1.3 To finish scanning select Stop Scanning.

8.1.4 Additional paperwork may be scanned into the same document file by feeding the scanner and selecting Continuing Scanning.

8.1.5 To verify or alter the scanner settings:

8.1.5.1 DPI can be altered by selecting Dots per Inch. Default setting should be set to 300.

8.1.5.2 To switch from single-sided to double-sided scanning:

8.1.5.2.1 Select Scanning Side, then Simplex for single-side or Duplex for double-sided.

8.1.5.2.2 Selecting Skip Blank Pages during Duplex mode will allow double-sided and single-sided documents to be scanned at the same time.

8.1.6 To insert a page into an existing document:

8.1.6.1 Select Page, then select Go to Page. Insert the page number where the document should go.

8.1.6.2 Select Page, then select Insert Page from Scanner.

8.1.6.3 Load the new page into the scanner and select Save.

8.1.7 To replace a page in an existing document:

8.1.7.1 Select Page, then select Go to Page. Insert the page number where the document should go.

8.1.7.2 Select Page, then select Replace Page from Scanner.

8.1.7.3 Load the new page into the scanner and select Save.

9.0 Follow the steps below for generating an electronic copy using Kodak Smart Touch

9.1 Confirm the scanner is set to the appropriate setting in the display window. Press the Up or Down scroll buttons to scroll through the predefined functions for scanning. See User's Guide for more details about each setting to ensure you scan the document to the appropriate client specifications as applicable.

9.1.1 Load the document with writing side up and with the top edge pointing into the scanner and press the Play button (>/||).

9.1.2 Once the document scanning is complete, a "Save" window will pop up. Navigate to the appropriate network storage location and save the file with the appropriate name.

EXHIBIT E

Attachment B

Memo

To: All Laboratory Operations Staff
From: Erin Sweeney
CC: Hannah Gillis, Quality Assurance Manager
Subject: Use of electronic signatures and initials
Date: August 4, 2022

The authorizer of a case report or other technical record is the individual whose name appears on the report or record. The individual's signature, which may be an ink signature or electronic equivalent, signifies the individual's authorization of the report or record. If more than one signature is present on a report, it shall be clear who authorizes each section of the report. If more than one signature is present on a review form, it shall be clear who performed each type of review. A signature may only be added to a report, review form, or any other technical record by the owner of that signature. In no circumstances is it permitted to apply a signature or initials on behalf of another individual, even if that individual has given you permission to do so. Additionally, when corrections that are permissible to be made on behalf of others are performed, you must sign your initials to the correction and not the initials of the other individual. For example, initial "ABC for XYZ." Please refer to BT00070 – *Laboratory Documentation, Completion, and Storage* for guidance as to when it is permissible to make a correction on behalf of someone else.

To protect the security of your signature and initials, and the integrity of our technical records, the following guidelines are effective immediately:

- Remove any copies of your signature file and initials file that are stored in locations accessible to other people.
- Store your signature and initials locally on your computer, your OneDrive, and/or imported in your Adobe software.
- Do not share your signature or initials file with anyone. The only exception to this is that the Quality Assurance Manager is required to maintain a copy of everyone's signature and initials for QA purposes. The QA record will be stored in a secure location for QA purposes only.
- Do not ask anyone to add your signature on your behalf.
- Do not add your signature, or anyone else's, to a report that is in draft form. Add your signature as a final step to indicate authorization of all applicable report content.
- Do not include signatures in any report templates.
- Signatures may only be added through Adobe, not in Microsoft Word.

Erin Sweeney
Laboratory Director