Idaho State Police

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To: **National Institute of Standards and Technology Scientific Foundations Review**
From: Matthew Gamette, ISP Forensic Services Laboratory System Director
Subject: **NISTIR-8351 Draft Report Second Public Comment Period**
Date: November 19, 2021

Idaho State Police Forensic Services (ISPFS) is an accredited DNA laboratory system with a forensic biology/DNA section that is an NDIS participating laboratory. ISPFS relies on robust and critically reviewed validation studies to support our mixture interpretation protocols and procedures. ISPFS was one of the first laboratory systems in the country to implement probabilistic genotyping software into laboratory methods. As a part of that validation process, ISPFS was a participant in a peer reviewed multi-laboratory publication in the journal "Forensic Science International Genetics." This article highlights the analysis of 2825 mixtures from 31 laboratories.

Your second solicitation, "to receive additional comments, new data, or information" found at https://content.govdelivery.com/accounts/USNIST/bulletins/2f8b05e, Second Public Comment Period for NISTIR-8351-DRAFT Report: Oct. 22 to Nov. 19, 2021, specifically requests new data. ISPFS has performed several validation/performance verifications of our DNA methods, including the use of the probabilistic genotyping software STRmix™. We have initial validation data when we put STR testing online, validation data when we upgraded to STRmix™, and data from last year when we moved to Applied Biosystems® 3500 instrumentation and redid our mixture interpretation data as part of the validation. While federal and state Genetic Information Nondiscrimination Act (GINA) laws prohibit us from openly sharing this data on our website, we have attached the executive summary of our latest validation to show the extent of work and the quality of the reports we generate from validation work. ISPFS is committed to putting all validation studies on our website, and has started that process with new validations. While we cannot share the raw genetic information and data on our website, we would be happy to share that data with NIST under a cooperative agreement where the provisions of GINA are addressed.

Our validations have been reviewed by many experts, both inside and outside the forensic science community. We would welcome the opportunity to have NIST review our data and provide us with constructive feedback. We have full confidence that our data will show the robust nature of our validation studies and the great effort we take to ensure that the protocols and software are scientifically robust and reliable. We post all of our scientific methods on our public website and welcome NIST or any other entity to review our standard operating procedures at any time. Attached to this email we have included a recent example of a recent validation summary of the STRmix™ software to demonstrate the robust nature of the validations performed by our laboratory.

We join with Dr. Ray Wickenheiser in the following concerns shared with NIST:

1. The data sample utilized by NIST in generating this report is too restrictive and does not accurately reflect validation data used by forensic laboratories. NIST is only reviewing data that is publicly available. Most forensic laboratory validation data is not made public, as it contains staff, friends and family profiles, and individuals providing the samples who did not provide informed consent to permit their DNA profiles to be released into the public domain. Forensic laboratories operate in a secure environment where data must be safeguarded, which runs contrary to NIST's determination that only data published or posted publicly qualify for their foundation review.

NIST did not make a request to public laboratories to review their data. Much validation data is currently available for defense witnesses, laboratory auditors and assessors review at forensic laboratory premises and has been independently reviewed by these entities. Requiring data to be publicly available as a prerequisite to determining it is valid is an unprecedented requirement by NIST, which is not in place for many other scientific endeavors. Therefore, we feel NIST's requirement that only data that is in the public domain will be used to determine the scientific foundation for DNA mixture interpretation is too restrictive.

Recommendation: NIST visit forensic laboratories and forensic DNA mixture interpretation vendors and review validation data on site. As an alternative, they could make requests to review such data with appropriate confidentiality measures in place. Idaho State Police would welcome discussions with NIST about reviewing our validation studies and data with the appropriate provisions to comply with federal and state law.

2. NIST incorrectly contends that forensic laboratory data has not been independently reviewed. There are 60 publications including DNA mixture studies noted in the NIST report, including one with 1315 samples run by 31 different forensic laboratories. All forensic lab DNA validation studies are reviewed by independent external auditors within their 2-year external audit FBI Quality Assurance Standards requirements, and also by independent auditors from the national accrediting board 4-year audit cycle to meet ISO 17025:2017 standard requirements. Additionally, some states have statutorily created bodies responsible for oversight of forensic laboratory accreditation and approval of such laboratories use of new scientific methodologies and technologies. Many of these bodies have panels of forensic experts who have independently reviewed data and approved probabilistic genotyping of DNA mixtures as fit for purpose.

Recommendation: NIST include individuals with appropriate practical forensic experience to assist with independent review of validation studies and data and co-authorship of the report. Idaho State Police participated in the publication referenced above and would welcome discussions with NIST about reviewing our validation studies and data with the appropriate provisions to comply with federal and state law.

3. The draft report recommends an impracticable standard for validation studies to meet. NIST defines a novel concept of "factor space" including 26 factors impacting DNA mixtures, stating that the publicly available data did not cover this factor space. If every factor were comprehensively covered in a single mixture's "factor space," each of these 26 variables would need to be changed while holding the rest constant to determine the impact of a single variable on the mixture's behavior. Assuming 10 increments for each of the 26 variables, this would require 403 septillion factor comparisons (10 x 26 factorial). This huge number of samples is not practical nor feasible. The factor space model is therefore not appropriate for demonstrating that DNA mixture interpretation as practiced by forensic laboratories is fit for purpose.

Recommendation: NIST abandon the concept of factor space and develop a more practical measure of what is required to demonstrate fit for purpose and apply that measure to the review of on-site data with additional experts with forensic experience. NIST should then revisit their preliminary report, make the recommended changes herein and include forensic expertise in authorship of the next corrected version.

Finally, ISPFS would like to express concern in regard to key takeaway #4.7 in the draft report. Lines 769 through 773 suggest that applicable validation performance results would be helpful to include in the case file and report. As previously stated, including aspects of validation results in individual case files would be a violation of federal and state privacy laws. That aside, validations are already available to the appropriate legal entities and case agents through the discovery process. Additionally, ISPFS is making great effort to make as much validation information available on our website as possible and allowable per federal and state law. The addition of this information in the case file would simply add length and confusion for the average customer.