



**AUDIT OF COMPLIANCE WITH STANDARDS
GOVERNING COMBINED DNA INDEX SYSTEM
ACTIVITIES AT THE BALTIMORE COUNTY POLICE
DEPARTMENT CRIME LABORATORY
BALTIMORE COUNTY, MARYLAND**

U.S. Department of Justice
Office of the Inspector General
Audit Division

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EXECUTIVE SUMMARY

The Department of Justice Office of the Inspector General (OIG), Audit Division, has completed an audit of compliance with standards governing Combined DNA Index System (CODIS) activities at the Baltimore County Police Department Crime Laboratory (Laboratory).

Background

The Federal Bureau of Investigation's (FBI) CODIS program combines forensic science and computer technology to provide an investigative tool to federal, state, and local crime laboratories in the United States, as well as those from select international law enforcement agencies. The CODIS program allows these crime laboratories to compare and match DNA profiles electronically to assist law enforcement in solving crimes and identifying missing or unidentified persons.¹ The FBI's CODIS Unit manages CODIS, as well as develops, supports, and provides the program to crime laboratories to foster the exchange and comparison of forensic DNA evidence.

The FBI implemented CODIS as a distributed database with hierarchical levels that enables federal, state, and local crime laboratories to compare DNA profiles electronically. The hierarchy consists of three distinct levels that flow upward from the local level to the state level and then, if allowable, the national level. The National DNA Index System (NDIS), the highest level in the hierarchy, is managed by the FBI as the nation's DNA database containing DNA profiles uploaded by law enforcement agencies across the United States. NDIS enables the laboratories participating in the CODIS program to electronically compare DNA profiles on a national level. The State DNA Index System (SDIS) is used at the state level to serve as a state's DNA database containing DNA profiles from local laboratories and

¹ DNA, or deoxyribonucleic acid, is genetic material found in almost all living cells that contains encoded information necessary for building and maintaining life. Approximately 99.9 percent of human DNA is the same for all people. The differences found in the remaining 0.1 percent allow scientists to develop a unique set of DNA identification characteristics (a DNA profile) for an individual by analyzing a specimen containing DNA.

state offenders. The Local DNA Index System (LDIS) is used by local laboratories.

OIG Audit Objectives

Our audit generally covered the period from November 2008 through December 2010. The objectives of our audit were to determine if: (1) the Baltimore County Police Department Crime Laboratory was in compliance with the NDIS participation requirements; (2) the Laboratory was in compliance with the Quality Assurance Standards (QAS) issued by the FBI; and (3) the Laboratory's forensic DNA profiles in CODIS databases were complete, accurate, and allowable for inclusion in NDIS.

Our review determined the following.

- The Laboratory was in compliance with NDIS participation requirements we reviewed, including: physical and electronic security of CODIS; up-to-date training for Laboratory personnel; maintenance of training and qualification records; and timeliness of NDIS matches.
- The Laboratory was in compliance with Quality Assurance Standards (QAS) we reviewed, including: the most recent internal and external QAS reviews; physical security of the Laboratory; retention of evidence; and analysis performed by an outsourced contractor.
- We reviewed 100 of 538 forensic profiles the Laboratory had uploaded to NDIS as of November 15, 2010. Of the 100 forensic profiles sampled, we found that 98 of the sampled forensic profiles were complete, accurate, and allowable for inclusion in NDIS. We had concerns based on case file information that two profiles in our sample may not have met the NDIS allowability guidelines. The Laboratory agreed that one of the profiles was unallowable because of its tenuous link to a putative perpetrator, and was uncomfortable with the inclusion of another; both were subsequently removed from NDIS.

The results of our audit are discussed in detail in the Findings section of the report. Our audit objectives, scope, and methodology are detailed in Appendix I of the report and the audit criteria are detailed in Appendix II. We discussed the results of our audit with Laboratory officials and have included their comments in the report as applicable.

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INTRODUCTION

The Department of Justice Office of the Inspector General, Audit Division, has completed an audit of compliance with standards governing Combined DNA Index System (CODIS) activities at the Baltimore County Police Department Crime Laboratory (Laboratory).

Background

The Federal Bureau of Investigation's (FBI) CODIS provides an investigative tool to federal, state, and local crime laboratories in the United States using forensic science and computer technology. The CODIS program allows these laboratories to compare and match DNA profiles electronically, thereby assisting law enforcement in solving crimes and identifying missing or unidentified persons.¹ The FBI's CODIS Unit manages CODIS and is responsible for its use in fostering the exchange and comparison of forensic DNA evidence.

OIG Audit Objectives

Our audit generally covered the period from November 2008 through December 2010. The objectives of our audit were to determine if: (1) the Baltimore County Police Department Crime Laboratory was in compliance with the National DNA Index System (NDIS) participation requirements; (2) the Laboratory was in compliance with the Quality Assurance Standards (QAS) issued by the FBI; and (3) the Laboratory's forensic DNA profiles in CODIS databases were complete, accurate, and allowable for inclusion in NDIS. Appendix I contains a detailed description of our audit objectives, scope, and methodology; and Appendix II contains the criteria used to conduct the audit.

¹ DNA, or deoxyribonucleic acid, is genetic material found in almost all living cells that contains encoded information necessary for building and maintaining life. Approximately 99.9 percent of human DNA is the same for all people. The differences found in the remaining 0.1 percent allow scientists to develop a unique set of DNA identification characteristics (a DNA profile) for an individual by analyzing a specimen containing DNA.

Legal Foundation for CODIS

The FBI's CODIS program began as a pilot project in 1990. The DNA Identification Act of 1994 (Act) authorized the FBI to establish a national index of DNA profiles for law enforcement purposes. The Act, along with subsequent amendments, has been codified in a federal statute (Statute) providing the legal authority to establish and maintain NDIS.²

Allowable DNA Profiles

The Statute authorizes NDIS to contain the DNA identification records of persons convicted of crimes, persons who have been charged in an indictment or information with a crime, and other persons whose DNA samples are collected under applicable legal authorities. Samples voluntarily submitted solely for elimination purposes are not authorized for inclusion in NDIS. The Statute also authorizes NDIS to include analysis of DNA samples recovered from crime scenes or from unidentified human remains, as well as those voluntarily contributed from relatives of missing persons.

Allowable Disclosure of DNA Profiles

The Statute requires that NDIS only include DNA information that is based on analyses performed by or on behalf of a criminal justice agency – or the U.S. Department of Defense – in accordance with QAS issued by the FBI. The DNA information in the index is authorized to be disclosed only: (1) to criminal justice agencies for law enforcement identification purposes; (2) in judicial proceedings, if otherwise admissible pursuant to applicable statutes or rules; (3) for criminal defense purposes, to a defendant who shall have access to samples and analyses performed in connection with the case in which the defendant is charged; or (4) if personally identifiable information (PII) is removed for a population statistics database, for identification research and protocol development purposes, or for quality control purposes.

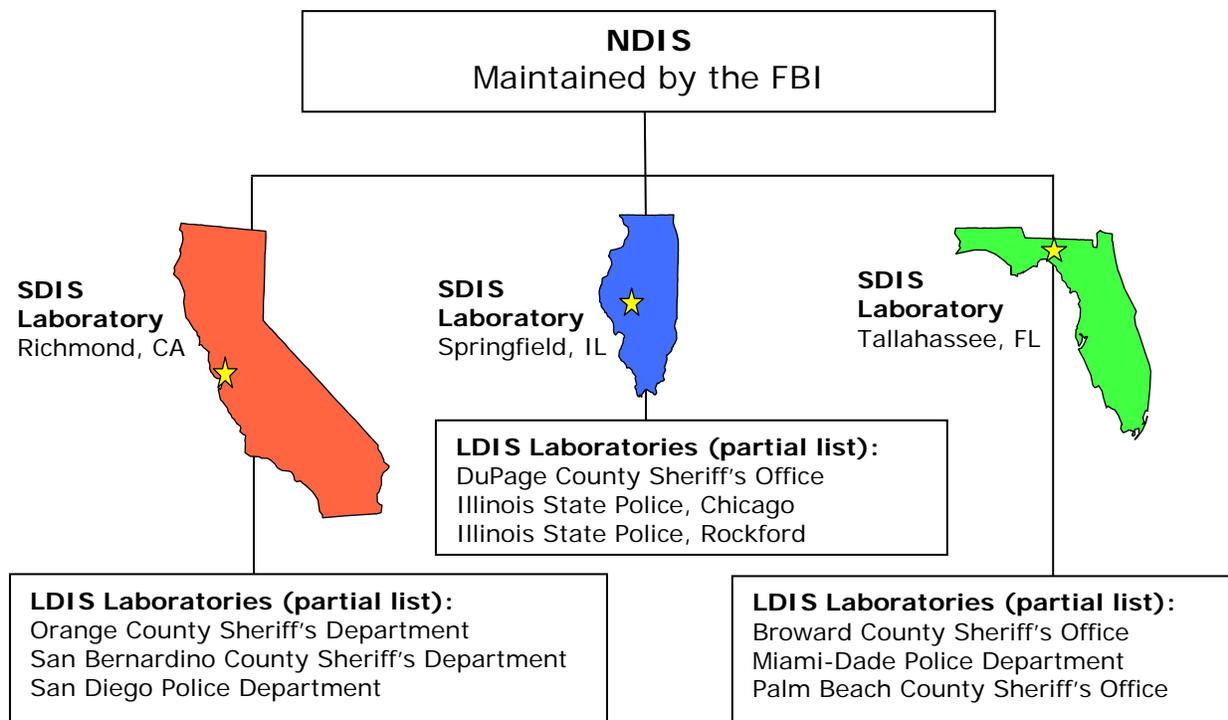
CODIS Structure

The FBI implemented CODIS as a distributed database with hierarchical levels that enables federal, state, and local crime laboratories to compare DNA profiles electronically. CODIS consists of a hierarchy of three distinct levels: (1) NDIS, is managed by the FBI as the nation's DNA database containing DNA profiles uploaded by participating states, (2) the State DNA Index System (SDIS) is used at the state level to serve as a state's DNA database containing DNA profiles from local laboratories within

² 42 U.S.C.A. § 14132 (2006).

the state and state offenders, and (3) the Local DNA Index System (LDIS), used by local laboratories. DNA profiles originate at the local level and then flow upward to the state and, if allowable, national level. For example, the local laboratory in the Palm Beach County, Florida, Sheriff's Office sends its profiles to the state laboratory in Tallahassee, which then uploads the profiles to NDIS. Each state participating in CODIS has one designated SDIS laboratory. The SDIS laboratory maintains its own database and is responsible for overseeing NDIS issues for all CODIS-participating laboratories within the state. The graphic below illustrates how the system hierarchy works.

Example of System Hierarchy within CODIS



National DNA Index System

NDIS, the highest level in the CODIS hierarchy, enables laboratories participating in the CODIS program to electronically compare DNA profiles on a national level. NDIS does not contain names or other PII about the profiles. Therefore, matches are resolved through a system of laboratory-to-laboratory contacts. Within NDIS are eight searchable indices discussed in the following paragraphs:

- Convicted Offender Index contains profiles generated from persons convicted of qualifying offenses.³
- Arrestee Index is comprised of profiles developed from persons who have been arrested, indicted, or charged in an information with a crime.
- Legal Index consists of profiles that are produced from DNA samples collected from persons under other applicable legal authorities.⁴
- Detainee Index consists of DNA records from non-United States (U.S.) persons detained under the authority of the U.S. and required by law to provide a DNA sample.
- Forensic Index profiles originate from, and are associated with, evidence found at crime scenes.
- Missing Person Index contains known DNA profiles of missing persons and deduced missing persons.
- Unidentified Human (Remains) Index holds profiles from unidentified living individuals and the remains of unidentified deceased individuals.⁵
- Relatives of Missing Person Index is comprised of DNA profiles generated from the biological relatives of individuals reported missing.

³ The phrase “qualifying offenses” refers to local, state, or federal crimes that require a person to provide a DNA sample in accordance with applicable laws.

⁴ An example of a Legal Index profile is one from a person found not guilty by reason of insanity who is required by the relevant state law to provide a DNA sample.

⁵ An example of an Unidentified Human (Remains) Index profile from a living person is a profile from a child or other individual, who cannot or refuses to identify themselves.

Although CODIS is comprised of multiple indices or databases, the two main functions of the system are to: (1) generate investigative leads that may help in solving crimes and (2) identify missing and unidentified persons.

The Forensic Index generates investigative leads in CODIS that may help solve crimes. Investigative leads may be generated through matches between the Forensic Index and other indices in the system, including the Convicted Offender, Arrestee, and Legal Indices. These matches may provide investigators with the identity of suspected perpetrators. CODIS also links crime scenes through matches between Forensic Index profiles, potentially identifying serial offenders.

In addition to generating investigative leads, CODIS furthers the objectives of the FBI's National Missing Person DNA Database program through its ability to identify missing and unidentified individuals. Those persons may be identified through matches between indices in CODIS, such as through matches between the profiles in the Missing Person Index and the Unidentified Human (Remains) Index. Identifications may also be generated through matches between the Missing Persons Index and the Relatives of Missing Persons Index. The profiles within the Missing Person and Unidentified Human (Remains) Indices may be vetted against the Forensic, Convicted Offender, Arrestee, and Legal Indices to provide investigators with leads in solving missing and unidentified person cases.

State and Local DNA Index Systems

The FBI provides CODIS software free of charge to any state or local law enforcement laboratory performing DNA analysis. Laboratories are able to use the CODIS software to upload profiles to NDIS. However, before a laboratory is allowed to participate at the national level and upload DNA profiles to NDIS, a Memorandum of Understanding (MOU) must be signed between the FBI and the applicable state's SDIS laboratory. The MOU defines the responsibilities of each party, includes a sublicense for the use of CODIS software, and delineates the standards laboratories must meet in order to utilize NDIS. Although officials from LDIS laboratories do not sign an MOU, LDIS laboratories that upload DNA profiles to an SDIS laboratory are required to adhere to the MOU signed by the SDIS laboratory.

States are authorized to upload DNA profiles to NDIS based on local, state, and federal laws, as well as NDIS regulations. However, states or localities may maintain NDIS-restricted profiles in SDIS or LDIS. For instance, a local law may allow for the collection and maintenance of a victim profile at LDIS but NDIS regulations do not authorize the upload of that profile to the national level.

The utility of CODIS relies upon the completeness, accuracy, and quantity of profiles that laboratories upload to the system. Incomplete CODIS profiles are those for which the required number of core loci were not tested or do not contain all of the DNA information that resulted from a DNA analysis and may not be searched at NDIS.⁶ The probability of a false match among DNA profiles is reduced as the completeness of a profile increases. Inaccurate profiles, which contain incorrect DNA information or an incorrect specimen number, may generate false positive leads, false negative comparisons, or lead to the misidentification of a sample. CODIS becomes more useful as the quantity of DNA profiles in the system increases because the potential for additional leads rises. However, laws and regulations exclude certain types of profiles from being uploaded to CODIS to prevent violations to an individual's privacy and foster the public's confidence in CODIS. Therefore, it is the responsibility of the Laboratory to ensure that it is adhering to the NDIS participation requirements and the profiles uploaded to CODIS are complete, accurate, and allowable for inclusion in NDIS.

Laboratory Information

The Baltimore County Police Department Crime Laboratory (Laboratory) is a Local DNA Indexing System (LDIS) laboratory located in Towson, Maryland. The Laboratory, which analyzes forensic samples, has been a part of the CODIS program since December 2001, and currently serves over 780,000 residents living in Baltimore County. It last received accreditation in December 2009 through the American Society of Crime Laboratory Directors/Laboratory Accreditation Board, and is due for renewal in 2014. In addition, since 2003, the Laboratory has outsourced work to Bode Technology through a contract run by Maryland State Police.

⁶ A "locus" is a specific location on a chromosome. The plural form of locus is loci.

FINDINGS

I. Compliance with NDIS Participation Requirements

The Baltimore County Police Department Crime Laboratory was in compliance with NDIS participation requirements we reviewed, including: physical and electronic security of CODIS; up-to-date training for Laboratory personnel; maintenance of training and qualification records; and timeliness of NDIS matches.

The NDIS participation requirements, which consist of the MOU and the NDIS Procedure Manual, establish the responsibilities and obligations of laboratories that participate in the CODIS program at the national level. The MOU describes the CODIS-related responsibilities of both the Laboratory and the FBI. The NDIS Procedure Manual is comprised of the NDIS operational procedures and provides detailed instructions for laboratories to follow when performing certain procedures pertinent to NDIS. The NDIS participation requirements we reviewed are listed in Appendix II of this report.

Results of the OIG Audit

We found that the Laboratory complied with the NDIS participation requirements we reviewed. Specifically, security measures were adequate, Laboratory personnel were up to date with training requirements and required documentation, and the NDIS procedures manual was readily available and accessible to all CODIS users. These results are described in more detail below.

- NDIS requires that CODIS be physically and electronically safeguarded from unauthorized use and accessible to limited approved personnel. We conducted a walk through tour of the Biology Unit of the laboratory, which is separately key-coded and can only be accessed by personnel in the Biology Unit. The CODIS workstation is within the biology Unit, and each CODIS user has a unique password. Furthermore, the CODIS server is stored in a server room on a separate floor of the building. Following both the walk through tour and the interviews of Laboratory management and personnel, we found the security measures, both physical and electronic, safeguarding the CODIS work area to be adequate.

- All Laboratory personnel were able to verify the location of the hard copy of the NDIS Procedures Manual, in addition to being able to access the Criminal Justice Information System Wide Area Network.
- We contacted the FBI to verify that all Laboratory CODIS users were up-to-date with training. All four CODIS users have completed NDIS training for 2010, and matched the list provided by the Laboratory.
- We verified that all Laboratory CODIS users submitted FBI required documentation for access to CODIS.
- We reviewed the Laboratory procedures in its Quality Assurance Manual (QAM) for maintaining personnel training and qualification records, and found that records are maintained on-site for a minimum of 5 years and off-site for a minimum of 10 years. In discussions with the Laboratory, the Laboratory manager told us that the personnel records are kept indefinitely.
- We selected and analyzed a sample of NDIS matches and found that the Laboratory requested confirmation of matches, confirmed matches, and reported matches to investigators in a timely manner.

Conclusion

We found the Laboratory to be in compliance with the NDIS participation requirements. Therefore, we made no recommendations concerning our review of the NDIS participation requirements.

II. Compliance with Quality Assurance Standards

We determined the Laboratory to be in compliance with Quality Assurance Standards (QAS) we reviewed, including: the most recent internal and external QAS reviews; physical security of the Laboratory; retention of evidence; and analysis performed by an outsourced contractor.

During our audit, we considered the Forensic Quality Assurance Standards (QAS) issued by the FBI.⁷ These standards describe the quality assurance requirements that the Laboratory must follow to ensure the quality and integrity of the data it produces. We also assessed the two most recent QAS reviews that the Laboratory underwent.⁸ The QAS we reviewed are listed in Appendix II.

Results of the OIG Audit

We found that the Laboratory complied with the Forensic QAS tested. These results are described in more detail below.

- We verified that QAS reviews of the Laboratory were conducted. The Laboratory had an external QAS review performed in October 2009 and an internal QAS review in November 2010. This is in accordance with QAS Standard 15, which directs laboratories to have a review performed every year, but once every 2 years must undergo an external review.
- We analyzed both the above mentioned QAS reviews, and found that neither made any findings.
- We contacted the external QAS reviewer from the 2009 QAS review and received a signed auditor independence statement for the period in question.

⁷ Forensic Quality Assurance Standards refer to the Quality Assurance Standards for Forensic DNA Testing Laboratories, effective July 1, 2009.

⁸ The QAS require that laboratories undergo annual audits. Every other year, the QAS requires that the audit be performed by an external agency that performs DNA identification analysis and is independent of the laboratory being reviewed. These audits are not required by the QAS to be performed in accordance with the *Government Auditing Standards* (GAS) and are not performed by the Department of Justice Office of the Inspector General. Therefore, we will refer to the QAS audits as reviews (either an internal laboratory review or an external laboratory review, as applicable) to avoid confusion with our audits that are conducted in accordance with GAS.

- We toured the Laboratory and found that access to the facility is limited to the public, with police personnel posted at the entrance. Additionally, the Laboratory is housed on its own floor in which access is limited to only designated personnel. All doors in the building require key card access, and all visitors require an escort.
- We reviewed the policies and procedures regarding evidence security and during our tour of the Laboratory, we were given a walkthrough of the evidence control process. We found the security of evidence and chain of custody to be acceptable. Furthermore, the Laboratory has adequate procedures in place to ensure accurate entry into LDIS.
- We reviewed the policies and procedures the Laboratory implements regarding the separation of known and unknown DNA samples in accordance with the QAS standards. According to the Laboratory's Quality Assurance Manual (QAM), as well as its personnel, the processing of known and unknown samples are to be separated by space or time. The samples are completed at different times, which we find to meet the standards outlined in the QAS.
- We discussed the policies and procedures regarding retention of DNA samples after analysis with Laboratory personnel and reviewed Laboratory protocols, which we found to be in compliance with the QAS. The Laboratory retains DNA evidence when possible, and full consumption of a sample requires permission from the State's Attorney's Office. Furthermore, evidence is kept long term in the Laboratory's Evidence Maintenance Unit.
- We found that the Laboratory has outsourced work to Bode Technology Group (Bode) through a contract with the Maryland State Police. We received accreditation and audit documentation for Bode for relevant years. The Laboratory provided contracts for Bode; we reviewed the contracts and did not note any requirements that were not met.

- We talked with Laboratory personnel who told us that 100 percent of Bode work has documentation in the case files indicating a technical review was performed. Furthermore, the Laboratory has contractors sign statements of compliance with QAS every year, and documents proficiency testing for all Bode analysts who analyze cases. During our review of Laboratory profiles, which included contracted cases, we found technical review documentation for all files.
- We reviewed the site visit documentation for Bode for the last 2 years. The Laboratory provided documentation for the 2010 site visit it conducted, and a 2008 site visit conducted by the Maryland State Police. The Laboratory explained it was exempt from the 2009 site visit requirement because its contract was in place prior to the July 2009 QAS document. They supplemented the 2008 documentation with a review of the 2009 Bode QAS review. Our review found the site visits contained no issues, and the QAS review to have three issues, which were addressed and closed.

Conclusion

We found the Laboratory to be in compliance with Quality Assurance Standards (QAS) we reviewed, including: the most recent internal and external QAS reviews; physical security of the Laboratory; retention of evidence; and oversight of analysis performed by an outsourced contractor. Therefore, we made no recommendations concerning the Laboratory's adherence to QAS.

III. Suitability of Forensic DNA Profiles in CODIS Databases

We reviewed 100 forensic profiles uploaded to NDIS by the Baltimore County Police Department Crime Laboratory and determined 98 profiles were complete, accurate, and allowable for inclusion in NDIS. We had concerns about the allowability of two profiles uploaded into NDIS. The Laboratory agreed that one of the profiles was unallowable in accordance with NDIS guidelines because it did not have an adequate link to the putative perpetrator, and was uncomfortable with the inclusion of another; both profiles were subsequently removed from NDIS.

We reviewed a sample of the Laboratory's Forensic DNA profiles to determine whether each profile was complete, accurate, and allowable for inclusion in NDIS.⁹ To test the completeness and accuracy of each profile, we established standards that require a profile include all the loci for which the analyst obtained results, and that the values at each locus match those identified during analysis.¹⁰ Our standards are described in more detail in Appendix II of this report.

The FBI's NDIS operational procedures establish the DNA data acceptance standards by which laboratories must abide. The FBI also developed a flowchart as guidance for the laboratories for determining what is allowable in the forensic index at NDIS. Laboratories are prohibited from uploading forensic profiles to NDIS that clearly match the DNA profile of the victim or another known person that is not a suspect. A profile at NDIS that matches a suspect may be allowable if the contributor is unknown at the time of collection; however, NDIS guidelines prohibit profiles that match a suspect if the suspect's DNA could reasonably have been expected to be on an item at the crime scene or part of the crime scene independent of the crime. For instance, a profile from an item seized from the suspect's person, such as a shirt, or that was in the possession of the suspect when collected is generally not a forensic unknown and would not be allowable for upload to NDIS. The NDIS procedures we reviewed are listed in Appendix II of this report.

⁹ When a laboratory's universe of DNA profiles in NDIS exceeds 1,500, our sample is taken from SDIS rather than directly from NDIS. See Appendix I for further description of the sample selection.

¹⁰ A "locus" is a specific location on a chromosome. The plural form of locus is loci.

Results of the OIG Audit

We selected a sample of 100 profiles out of the 538 forensic profiles the Laboratory had uploaded to NDIS as of November 15, 2010. Of the 100 forensic profiles sampled, we had concerns about the allowability for two profiles based on NDIS guidelines. The remaining profiles sampled were complete, accurate, and allowable for inclusion in NDIS. The specific exceptions are explained in more detail below.

OIG Sample Number CA-22

Sample CA-22 was taken from a baseball cap found at the exterior entrance to an apartment building in which a homicide occurred. We followed up with the Laboratory regarding the location of the cap as compared to the victim. We were provided a statement from the detective on the case, who stated that the cap was found outside the apartment building doors, and not the specific doors to the apartment where the crime was committed. Considering the location of the hat in relation to the crime scene, we did not consider it to be attributable to the putative perpetrator in accordance with NDIS guidelines and found the profile to be unallowable for upload into NDIS. The Laboratory agreed with the finding and removed the profile.

OIG Sample Number CA-75

Sample CA-75 was taken from a gun allegedly used in a robbery and attempted murder. The gun was found in a laundry basket located in the basement of the victim's apartment building. The basket was found in a community laundry room after detectives provided a warrant and searched the premises. At the time of the recovery, the suspect was adjacent to the laundry basket containing the gun. We noted that the suspect's proximity to the gun when it was recovered may have indicated that it was in his possession, thereby indicating it may be reasonable to assume that the suspect's DNA might be on the weapon. We requested additional information on the profile and Laboratory personnel noted that the case file did not clearly distinguish whether the laundry basket the gun was found in was communal property (possibly containing DNA from persons unrelated to the crime), or the property of the suspect (whose DNA could reasonably be present). The Laboratory stated it was uncomfortable with the profile's inclusion in NDIS and subsequently removed it.

Conclusion

We reviewed 100 forensic profiles the Laboratory had uploaded to NDIS and found two that, based on the facts of the case, had questionable allowability in accordance with NDIS guidelines. The Laboratory removed both profiles. The remaining profiles were accurate, complete, and allowable. As such, we made no recommendations concerning our review of Forensic DNA profiles.

OBJECTIVES, SCOPE, AND METHODOLOGY

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Our audit generally covered the period from November 2008 through December 2010. The objectives of the audit were to determine if the: (1) Laboratory was in compliance with the NDIS participation requirements; (2) Laboratory was in compliance with the Quality Assurance Standards (QAS) issued by the FBI; and (3) Laboratory's forensic DNA profiles in CODIS databases were complete, accurate, and allowable for inclusion in NDIS. To accomplish the objectives of the audit, we:

- Examined internal and external Laboratory QAS review reports and supporting documentation for corrective action taken, if any, to determine: (a) if the Laboratory complied with the QAS, (b) whether repeat findings were identified, and (c) whether recommendations were adequately resolved.¹¹

In accordance with the QAS, the internal and external laboratory review procedures are to address, at a minimum, a laboratory's quality assurance program, organization and management, personnel qualifications, facilities, evidence control, validation of methods and procedures, analytical procedures, calibration and maintenance of instruments and equipment, proficiency testing of analysts, corrective action for discrepancies and errors, review of case files, reports, safety, and previous audits. The QAS require that internal and external reviews be performed by personnel who have successfully completed the FBI's training course for conducting such reviews.

¹¹ The QAS require that laboratories undergo annual audits. Every other year, the QAS requires that the audit be performed by an external agency that performs DNA identification analysis and is independent of the laboratory being reviewed. These audits are not required by the QAS to be performed in accordance with the *Government Auditing Standards* (GAS) and are not performed by the Department of Justice Office of the Inspector General. Therefore, we refer to the QAS audits as reviews (either internal or external laboratory reviews, as applicable) to avoid confusion with our audits that are conducted in accordance with GAS.

As permitted by GAS 7.42 (2007 revision), we generally relied on the results of the Laboratory's external laboratory review to determine if the Laboratory complied with the QAS.¹² In order to rely on the work of non-auditors, GAS requires that we perform procedures to obtain sufficient evidence that the work can be relied upon. Therefore, we: (1) obtained evidence concerning the qualifications and independence of the individuals who conducted the review and (2) determined that the scope, quality, and timing of the audit work performed was adequate for reliance in the context of the current audit objectives by reviewing the evaluation procedure guide and resultant findings to understand the methods and significant assumptions used by the individuals conducting the reviews. Based on this work, we determined that we could rely on the results of the Laboratory's external laboratory review.

- Interviewed Laboratory officials to identify management controls, Laboratory operational policies and procedures, Laboratory certifications or accreditations, and analytical information related to DNA profiles.
- Toured the Laboratory to observe facility security measures as well as the procedures and controls related to the receipt, processing, analyzing, and storage of forensic evidence.
- Reviewed the Laboratory's written policies and procedures related to conducting internal reviews, resolving review findings, expunging DNA profiles from NDIS, and resolving matches among DNA profiles in NDIS.
- Reviewed supporting documentation for 10 of 15 NDIS matches to determine whether they were resolved in a timely manner. The Laboratory provided the universe of NDIS matches as of December 2, 2010. The sample was judgmentally selected to include both case-to-case and case-to-offender matches. This non-statistical sample does not allow projection of the test results to all matches.

Reviewed supporting documentation to determine whether the Laboratory provided adequate vendor oversight. Reviewed the case files for selected forensic DNA profiles to determine if the profiles were developed in accordance with the Forensic QAS and were complete, accurate, and allowable for inclusion in NDIS.

¹² We also considered the results of the Laboratory's internal laboratory review, but could not rely on it because it was not performed by personnel independent of the Laboratory. Further, as noted in Appendix II, we performed audit testing to verify Laboratory compliance with specific Quality Assurance Standards that have a substantial effect on the integrity of the DNA profiles uploaded to NDIS.

Working in conjunction with the contractor used by the FBI to maintain NDIS and the CODIS software, we obtained an electronic file identifying the 538 Short Tandem Repeat forensic profiles the Laboratory had uploaded to NDIS as of November 15, 2010. We limited our review to a sample of 100 profiles. This sample size was determined judgmentally because preliminary audit work determined that risk was not unacceptably high.

- Using the judgmentally-determined sample size, we randomly selected a representative sample of labels associated with specific profiles in our universe to reduce the effect of any patterns in the list of profiles provided to us. However, since the sample size was judgmentally determined, the results obtained from testing this limited sample of profiles may not be projected to the universe of profiles from which the sample was selected.

The objectives of our audit concerned the Laboratory's compliance with required standards and the related internal controls. Accordingly, we did not attach a separate statement on compliance with laws and regulations or a statement on internal controls to this report. See Appendix II for detailed information on our audit criteria.

AUDIT CRITERIA

In conducting our audit, we considered the NDIS participation requirements and the Quality Assurance Standards (QAS). However, we did not test for compliance with elements that were not applicable to the Laboratory. In addition, we established standards to test the completeness and accuracy of DNA profiles as well as the timely notification of DNA profile matches to law enforcement.

NDIS Participation Requirements

The NDIS participation requirements, which consist of the Memorandum of Understanding (MOU) and the NDIS operational procedures, establish the responsibilities and obligations of laboratories that participate in NDIS. The MOU requires that NDIS participants comply with federal legislation and the QAS, as well as NDIS-specific requirements accompanying the MOU in the form of appendices. We focused our audit on specific sections of the following NDIS operational procedures.

- DNA Data Acceptance Standards
- DNA Data Accepted at NDIS
- Quality Assurance Standards (QAS) Reviews
- NDIS DNA Autosearches
- Confirm an Interstate Candidate Match
- General Responsibilities
- Initiate and Maintain a Laboratory's Participation in NDIS
- Security Requirements
- CODIS Users
- CODIS Administrator Responsibilities
- Access to, and Disclosure of, DNA Records and Samples
- Upload of DNA Records
- Expunge a DNA Record
- The FBI Flowchart: A Guide to Determining What is Allowable in the Forensic Index at NDIS¹³

¹³ The FBI Flowchart is guidance issued to NDIS-participating laboratories separate from the MOU and NDIS operational procedures. The flowchart is contained in the 2010 CODIS Administrator's Handbook and has been provided to laboratories in referendums such as CODIS conferences.

Quality Assurance Standards

The FBI issued two sets of Quality Assurance Standards (QAS): QAS for Forensic DNA Testing Laboratories, effective July 1, 2009 (Forensic QAS); and QAS for DNA Databasing Laboratories, effective July 1, 2009 (Offender QAS). (The Forensic QAS and the Offender QAS describe the quality assurance requirements that the Laboratory should follow to ensure the quality and integrity of the data it produces.)

For our audit, we generally relied on the reported results of the Laboratory's most recent annual external review to determine if the Laboratory was in compliance with the QAS. Additionally, we performed audit work to verify that the Laboratory was in compliance with the QAS listed below because they have a substantial effect on the integrity of the DNA profiles uploaded to NDIS.

- Facilities (Forensic QAS and Offender QAS 6.1): The laboratory shall have a facility that is designed to ensure the integrity of the analyses and the evidence.
- Evidence Control (Forensic QAS 7.1): The laboratory shall have and follow a documented evidence control system to ensure the integrity of physical evidence. Where possible, the laboratory shall retain or return a portion of the evidence sample or extract.
- Sample Control (Offender QAS 7.1): The laboratory shall have and follow a documented sample inventory control system to ensure the integrity of database and known samples.
- Analytical Procedures (Forensic QAS and Offender QAS 9.5): The laboratory shall monitor the analytical procedures using [appropriate] controls and standards.
- Review (Forensic QAS 12.1): The laboratory shall conduct administrative and technical reviews of all case files and reports to ensure conclusions and supporting data are reasonable and within the constraints of scientific knowledge.

(Offender QAS Standard 12.1): The laboratory shall have and follow written procedures for reviewing DNA records and DNA database information, including the resolution of database matches.

- [Reviews] (Forensic QAS and Offender QAS 15.1 and 15.2): The laboratory shall be audited annually in accordance with [the QAS]. The annual audits shall occur every calendar year and shall be at least 6 months and no more than 18 months apart.

At least once every two years, an external audit shall be conducted by an audit team comprised of qualified auditors from a second agency(ies) and having at least one team member who is or has been previously qualified in the laboratory's current DNA technologies and platform.

- Outsourcing (Forensic QAS and Offender QAS Standard 17.1): A vendor laboratory performing forensic and database DNA analysis shall comply with these Standards and the accreditation requirements of federal law.

Forensic QAS 17.4: An NDIS participating laboratory shall have and follow a procedure to verify the integrity of the DNA data received through the performance of the technical review of DNA data from a vendor laboratory.

Offender QAS Standard 17.4: An NDIS participating laboratory shall have, follow and document appropriate quality assurance procedures to verify the integrity of the data received from the vendor laboratory including, but not limited to, the following: Random reanalysis of database, known or casework reference samples; Inclusion of QC samples; Performance of an on-site visit by an NDIS participating laboratory or multi-laboratory system outsourcing DNA sample(s) to a vendor laboratory or accepting ownership of DNA data from a vendor laboratory.

Office of the Inspector General Standards

We established standards to test the completeness and accuracy of DNA profiles as well as the timely notification of law enforcement when DNA profile matches occur in NDIS. Our standards are listed below.

- Completeness of DNA Profiles: A profile must include each value returned at each locus for which the analyst obtained results. Our rationale for this standard is that the probability of a false match among DNA profiles is reduced as the number of loci included in a profile increases. A false match would require the unnecessary use of laboratory resources to refute the match.

- Accuracy of DNA Profiles: The values at each locus of a profile must match those identified during analysis. Our rationale for this standard is that inaccurate profiles may: (1) preclude DNA profiles from being matched and, therefore, the potential to link convicted offenders to a crime or to link previously unrelated crimes to each other may be lost; or (2) result in a false match that would require the unnecessary use of laboratory resources to refute the match.
- Timely Notification of Law Enforcement When DNA Profile Matches Occur in NDIS: Laboratories should notify law enforcement personnel of NDIS matches within 2 weeks of the match confirmation date, unless there are extenuating circumstances. Our rationale for this standard is that untimely notification of law enforcement personnel may result in the suspected perpetrator committing additional, and possibly more egregious, crimes if the individual is not deceased or already incarcerated for the commission of other crimes.

APPENDIX III

THE FEDERAL BUREAU OF INVESTIGATION RESPONSE TO THE DRAFT REPORT

U.S. Department of Justice

Federal Bureau of Investigation



Washington, D. C. 20535-0001

March 15, 2011

Troy M. Meyer
Regional Audit Manager
Washington Regional Audit Office
Office of the Inspector General
1300 North 17th Street
Suite 3400
Arlington, VA 22209

Dear Mr. Meyer:

Your memorandum to Director Mueller forwarding the draft audit report for the Baltimore County Police Department Crime Laboratory, Towson, Maryland (Laboratory), has been referred to me for response.

Your draft report contained no recommendations relating to the Laboratory's compliance with the FBI's Memorandum of Understanding and *Quality Assurance Standards for DNA Testing Laboratories*. The CODIS Unit reviewed the draft report and since it appears that the Laboratory is in compliance with NDIS participation requirements, the CODIS Unit has no significant comments to provide about the draft report.

Thank you for sharing the draft audit report with us. If you have any questions, please feel free to contact Jennifer Luttmann, Chief of the CODIS Unit, at (703) 632-8315.

Sincerely,

Alice R. Isenberg, Ph.D
Section Chief
Biometrics Analysis Section
FBI Laboratory