



AUDIT OF THE FEDERAL BUREAU OF INVESTIGATION'S CONVICTED OFFENDER, ARRESTEE, AND DETAINEE DNA BACKLOG

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Introduction

DNA analysis can be used to implicate or eliminate a suspect in an investigation, solve cases previously considered unsolvable, link evidence from different crime scenes, and aid in the identification of victims. Forensic DNA can be obtained from crime scenes or from evidentiary items such as envelopes, clothing, and drinking glasses, and then compared to samples collected from known persons to identify the perpetrator of a crime. A single forensic case can contain multiple pieces of evidence, each of which may yield several samples. For example, in a sexual assault case, DNA evidence left behind by a perpetrator may be collected from the victim's body, clothing, and the physical location where the assault occurred.

In addition to forensic DNA evidence collected from crime scenes or evidentiary items, federal laws require DNA samples to be collected from persons who have been convicted of a federal crime (convicted offenders), persons who have been arrested under federal authority (arrestees), and persons who have been detained and who are not United States citizens (detainees).¹ The profiles generated from analyzing these DNA samples are compared to forensic DNA samples collected during investigations to help match DNA profiles from unsolved cases or cases without a suspect, thereby providing key investigative leads to law enforcement agencies.²

¹ Legislation that defines the scope of DNA collection includes the 2001 *USA PATRIOT Act*, which added qualifying offenses to the collection of DNA samples from convicted offenders; the Justice for All Act of 2004, which expanded the offenses for convicted offenders to include any federal offense; and the DNA Fingerprint Act of 2005, which directed that the Attorney General may collect DNA samples from individuals who are arrested or from non-United States persons who are detained under the authority of the United States.

² The process of generating a DNA profile begins with a sample of an individual's DNA. The DNA sample goes through many different stages of processing and analysis that produce a DNA profile. The DNA profile, which serves as a person's unique identifier, is then compared against other samples to determine whether there is a genetic match.

From January 2004 through December 2009, the Federal Bureau of Investigation Laboratory (FBI Laboratory) uploaded approximately 123,000 convicted offender, arrestee, and detainee DNA profiles into the Combined DNA Index System (CODIS) – the national repository of DNA samples collected by local, state, and federal law enforcement agencies. In December 2009, FBI Laboratory reported that it had a backlog of over 312,000 convicted offender, arrestee, and detainee DNA samples waiting to be processed. However, by September 2010, the FBI Laboratory reported that it had eliminated the backlog, and from January 2010 through May 2011, the FBI Laboratory reported it had uploaded almost 500,000 DNA profiles to CODIS.

OIG Audit Approach

The U.S. Department of Justice (DOJ) Office of the Inspector General (OIG) conducted this audit to review the FBI Laboratory's efforts to reduce and eliminate its backlog of convicted offender, arrestee, and detainee DNA samples, and to determine the total amount of the backlog, if any. For the purposes of this report, we defined "backlog" as DNA samples that the FBI Laboratory had accepted but had not yet uploaded into CODIS. We reviewed statistics on convicted offender, arrestee, and detainee DNA samples from January 2004 through May 2011 in order to determine whether the FBI had a backlog.

To assess the FBI Laboratory's efforts to reduce the backlog, we interviewed officials responsible for administering the convicted offender, arrestee, and detainee DNA program; toured the FBI Laboratory in Quantico, Virginia; reviewed backlog reduction plans; and examined personnel and automation costs. Appendix I contains a more detailed description of our audit objectives, scope, and methodology.

Results in Brief

Our review determined that as of September 2010, the FBI Laboratory's Federal DNA Database Unit had effectively eliminated its backlog of convicted offender, arrestee, and detainee DNA samples. We determined that the FBI reduced this backlog from over 312,000 samples in December 2009 to a workload of approximately 14,000 samples in May 2011. As part of the unit's backlog reduction efforts, from January 2010 through May 2011, the unit uploaded almost 500,000 profiles into CODIS. The FBI currently has the capacity to analyze 60,000 profiles per month, and as of September 2010, the unit was able to begin processing accepted DNA

samples within 30 days of receipt.³ Our audit revealed that the FBI achieved these results by implementing a backlog reduction strategy, hiring additional personnel and contractors, using high throughput robotics, implementing Expert System software for a semi-automated review of DNA profiles after completion of analysis, and reconfiguring laboratory space for more efficient processing.⁴ The FBI has achieved a significant accomplishment in reducing the convicted offender, arrestee, and detainee DNA backlog to a manageable monthly workload.

The FBI implemented two plans to address the convicted offender, arrestee, and detainee backlog, which gave the FBI tangible goals and milestones to reduce its backlog. Additionally, the convicted offender, arrestee, and detainee program was originally staffed by 5 personnel in 2001. Currently, the Federal DNA Database Unit has 33 personnel on-board and 11 contractors to support the program. The FBI also implemented high throughput robotics which allowed each robotic to process up to 850 DNA samples in 2.5 hours and Expert System software to review profiles before being uploaded to CODIS. Finally, the FBI Laboratory provided additional space for the new personnel and robotics to help maximize efficiency.

While the FBI was successful in reducing its backlog, we identified some concerns with reporting backlog statistics, estimating future workload, and storage space for DNA samples. Analyzing DNA samples has several stages through which each sample must sequentially pass. We found that from April 2005 through May 2011 the FBI Laboratory reported to management its backlog of convicted offender, arrestee, and detainee samples by only reporting the stage with the most backlogged samples, rather than capturing all samples being processed across all stages. For example, in December 2007, the FBI reported 152,457 samples in its backlog, but this number only captured the DNA samples available for DNA analysis and did not include the samples ready for examiner review. Our review of records showed that in December 2007 the Federal DNA Database Unit's total backlog of convicted offender, arrestee, and detainee DNA samples was actually 211,352.

³ Accepted samples include all of the samples received during the month minus those with administrative issues, such as duplicate samples or samples missing information. Accepted samples are eligible for upload to CODIS once processed.

⁴ High throughput robotics refers to the automated equipment that the Federal DNA Database Unit uses to analyze DNA samples. An Expert System is software or a set of software programs that serves as a semi-automated review system that assists qualified examiners in the review process by alerting them to samples that require a more thorough manual review.

Further, we noted that the Federal DNA Database Unit changed which backlogged stage it reported in monthly status reports several times from April 2005 through September 2010, and as of May 2011, the Federal DNA Database Unit did not have a documented method for capturing its total workload. We are concerned that the Federal DNA Database Unit does not have documented policies, procedures, and reporting methods to ensure backlog and workload levels are accurately identified and reported to management. The lack of written policies and procedures can cause inconsistent calculations and affect the ability to compare statistics over a period of time. Accurate and consistent reporting is important because it gives decision-makers the ability to identify and address problems. Therefore, we recommend that the FBI develop and implement policies and procedures to document the methodology used to report its workload statistics and backlog calculations.

The DNA Fingerprint Act of 2005 states that DNA samples may be collected from non-U.S. citizens detained by the United States.⁵ Prior to the enactment of the law, the FBI estimated that it would need to process up to 1 million DNA samples per year, primarily from detainees. However, the FBI is not receiving the estimated volume of detainee DNA samples and does not have clear criteria from the Department of Homeland Security (DHS) regarding which DNA samples the DHS submits to the FBI Laboratory. We recommend that the FBI coordinate with the DHS to determine the criteria used to collect and submit detainee DNA samples. We also recommend that the FBI, if appropriate, revise estimates for monthly sample receipt so that the FBI Laboratory can plan for any influx of detainee DNA samples.

While the FBI has provided additional space for personnel and robotics, the storage space for DNA samples is still a concern. The FBI maintains its processed DNA samples indefinitely because of required retesting to confirm a CODIS match. As of May 2011 the FBI Laboratory had over 712,000 DNA samples that required storage, and it anticipates having 1 million samples by the end of the calendar year. Currently, the samples are stored in a room in boxes stacked to the ceiling. The Federal DNA Database Unit is in the process of procuring high density storage units and is considering long-term storage, including off-site options; however, these two initiatives are still in the planning stages. Offsite storage would add complexity to the storage and retrieval protocols, and may increase risk regarding the maintenance of

⁵ 42 U.S.C. § 13701 note (2006). DNA Sample Collection, Analysis and Indexing in 28 C.F.R. § 28.12 (2008) does not require the Department of Homeland Security to obtain DNA samples from aliens lawfully admitted, or in the process of being admitted to the United States, aliens held in connection with maritime interdiction; or other aliens that the DHS, in consultation with the Attorney General, determines that collection of DNA samples is not feasible.

samples. With DNA samples arriving daily and storage space presently limited, it is critical that the FBI finalize a long-term solution for DNA sample storage.

In our report, we make three recommendations to assist the FBI in more accurately identifying, reporting, projecting, and storing its convicted offender, arrestee, and detainee DNA sample workload. The following sections of our report contain detailed information on the full results of our audit.

Background

The FBI Laboratory conducts analyses of forensic DNA evidence and of convicted offender, arrestee, and detainee DNA samples. Historically, the FBI Laboratory has had backlogs both in its forensic casework and its convicted offender, arrestee, and detainee samples.⁶

Processing offender, arrestee, and detainee DNA samples in a timely manner is valuable to law enforcement because CODIS software matches DNA profiles from unsolved cases or cases without a suspect to offender profiles. DNA matches provide key investigative leads to investigators and help to reduce victimization, particularly by serial offenders.

The FBI Laboratory's backlog in analyzing and uploading convicted offender DNA samples was mainly the result of federal legislation that expanded the scope of DNA sample collection from violent convicted federal offenders to include anyone who commits a federal offense as well as non-U.S. citizens who are detained in the United States.

Specifically, the DNA Analysis Backlog Elimination Act of 2000 authorized officials from the Federal Bureau of Prisons and United States Probation Offices to collect DNA samples from persons convicted of violent federal offenses and to furnish the samples to the Director of the FBI.⁷ As a result, in 2001, the FBI created the Federal Convicted Offender Program to generate DNA profiles from samples taken from persons convicted of violent

⁶ In *Review of the Federal Bureau of Investigation Laboratory's Forensic DNA Case Backlog*, Report 10-39 (August 2010), the OIG reported that the forensic DNA casework backlog was growing. The demand on the FBI Laboratory to conduct forensic DNA casework testing increased substantially, and the FBI Laboratory struggled to increase its capacity to meet this growing demand. According to the FBI, the nuclear DNA casework backlog will be eliminated by the end of the 2011 calendar year.

⁷ 42 U.S.C. § 14135a (2000).

federal offenses and to enter the profiles into the CODIS.⁸ From 2001 through 2003, this program had five FBI personnel assigned to process the DNA samples and input the DNA profiles into CODIS. From the program's inception in 2001 through the end of 2004, the FBI Laboratory received an annual average of nearly 8,000 DNA samples.

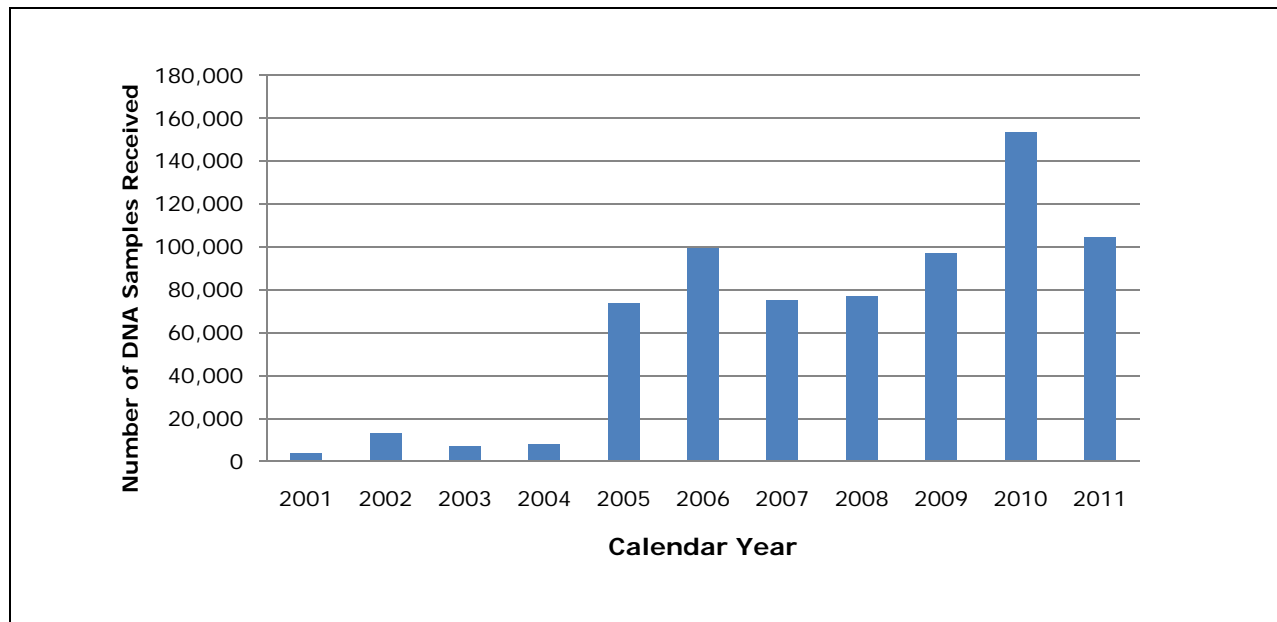
In addition, the Justice for All Act of 2004, signed into law in October 2004, amended the DNA Analysis Backlog Elimination Act of 2000 to include DNA collected in all federal felony offenses for submission to CODIS.⁹ As a result of this legislation, the FBI Laboratory received more than 73,000 DNA samples in 2005. Additional federal legislation further expanded the scope of DNA collection. The DNA Fingerprint Act of 2005 and the Adam Walsh Child Safety and Protection Act of 2006 authorized the Attorney General to collect DNA samples from individuals who are facing charges, have been arrested or convicted under federal authority, or are non-U.S. persons detained under the authority of the United States.¹⁰ Between 2005 and 2010, the FBI Laboratory received a yearly average of approximately 96,000 DNA samples. In 2010 alone, the FBI Laboratory received over 153,000 DNA samples of convicted offenders, arrestees, and detainees. Through the first 5 months of 2011, the FBI received over 100,000 samples. Exhibit 1 demonstrates the dramatic increase in convicted offender, arrestee, and detainee DNA samples that the FBI received beginning in 2005.

⁸ CODIS is a database of local, state, and national DNA profiles from convicted offenders, unsolved crime scene evidence, and missing persons. Every state has a statutory provision establishing a DNA database that allows for the collection of DNA profiles from offenders convicted of particular crimes. CODIS software enables local, state, and national law enforcement crime laboratories to compare DNA profiles electronically, thereby linking crimes to each other and identifying suspects by matching DNA profiles from crime scenes with profiles from convicted offenders. The FBI uploads DNA samples from convicted offenders, arrestees, and detainees directly into the National DNA Index System, which is the national database in CODIS. As of May 2011, there were over 10 million convicted offender, arrestee, detainee, and forensic profiles in the National DNA Index System.

⁹ 42 U.S.C. § 13701 note (2004).

¹⁰ 42 U.S.C. § 13701 note (2006) and 42 U.S.C. § 16901 (2006). There may be some circumstances in which agencies collect fingerprints but the collection of DNA samples would not be warranted or feasible. For example, in relation to non-arrestees, the Department of Homeland Security will not be required to collect DNA samples from aliens who are fingerprinted while in the process of seeking lawful admission to the United States or from aliens from whom DNA sample collection is otherwise not feasible because of operational exigencies or resource limitations. If any agency believes that such circumstances exist within its sphere of operations, the agency should bring these circumstances to the attention of the Department of Justice, and exceptions to the DNA sample collection requirement may be allowed with the approval of the Attorney General.

Exhibit 1: Annual Total of Convicted Offender, Arrestee, and Detainee DNA Samples the FBI Received from July 2001 – May 2011



Source: OIG analysis of statistics from Sample Tracking and Control System (STaCS)

Note: The statistics from 2001 only include July through December. Additionally, 2011 statistics only include January through May.

At the FBI Laboratory, the Federal DNA Database Unit analyzes the convicted offender, arrestee, and detainee DNA samples it receives.¹¹ According to the FBI, the Federal DNA Database Unit defines a backlog as samples accepted but not entered into CODIS. With the increasing number of DNA sample submissions resulting from legislation, the Federal DNA Database Unit accumulated a substantial backlog. In December 2009, the FBI Laboratory reported over 312,000 convicted offender, arrestee, and detainee DNA samples in need of analysis, review, and entry into CODIS. However, in September 2010, the FBI announced that it had cleared its backlog and was able to begin processing accepted DNA samples within 30 days of receipt. FBI officials also stated that after it eliminated its backlog, monthly submissions that were accepted and in-process constituted the unit’s monthly workload and were not considered backlogged.

¹¹ Prior to July 2009, DNA Unit I conducted forensic DNA casework analysis and the convicted offender, arrestee, and detainee DNA analysis, known as the Federal Convicted Offender Program. As a result of a laboratory-wide reorganization, two units were formed - the Nuclear DNA Unit, which conducts analyses of forensic DNA cases, and the Federal DNA Database Unit, formerly the Federal Convicted Offender Program, which conducts analysis of convicted offender, arrestee, and detainee DNA samples.

The FBI received enhancements in FY 2008 for \$12.6 million and in FY 2009 for \$16.2 million for DNA analysis. Additionally, the Federal DNA Database Unit was authorized to have a funded staffing level of 37 positions for analyzing convicted offender, arrestee, and detainee DNA samples – a seven-fold increase from the original staff of 5. These enhancements allowed the FBI Laboratory to purchase high throughput robotics and reagents and to hire additional personnel necessary to analyze the large volume of convicted offender, arrestee, and detainee DNA samples that the FBI Laboratory received.¹²

Overview of the FBI’s Federal DNA Database Unit

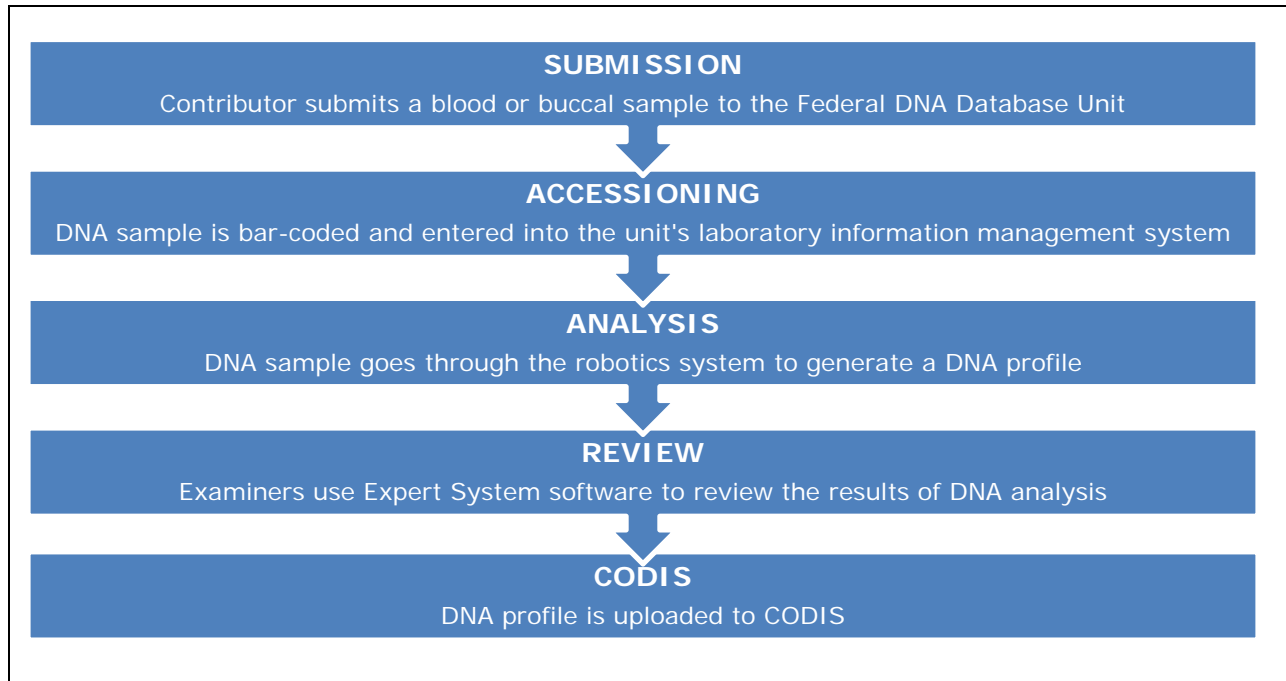
The Federal DNA Database Unit, a part of the Biometrics Analysis Section of the FBI Laboratory, tests DNA samples from convicted federal offenders, arrestees, and non-U.S. citizen detainees for entry into CODIS.¹³ Contributors submit DNA samples to the FBI Laboratory primarily in two forms. Generally, the DNA of convicted offenders is collected using blood cards, whereas the DNA of arrestees and detainees is collected using buccal (cheek) swabs.¹⁴ As depicted in Exhibit 2, these DNA samples are accessioned, analyzed, reviewed, and uploaded into CODIS entirely through the Federal DNA Database Unit and are processed on a first-in, first-out basis. A more detailed overview of the DNA sample process is described in Appendix II.

¹² A reagent is a substance used to bring about a chemical reaction during the processing of DNA samples.

¹³ The FBI Laboratory is accredited through the American Society of Crime Laboratory Directors Laboratory Accreditation Board (ASCLD/LAB), satisfying the ASCLD/LAB-*International* requirements. The Federal DNA Database Unit’s last Quality Assurance Audit was performed in December 2010 by auditors from the Bureau of Alcohol, Tobacco, Firearms and Explosives National Laboratory Center and the United States Army Criminal Investigation Laboratory.

¹⁴ A blood card is sample that is taken by pricking the finger and applying a few drops of blood to a card for DNA analysis. A buccal swab sample is taken by brushing a swab against the inside of a person’s cheek to obtain cells for DNA analysis.

Exhibit 2: Process of a DNA Sample through the Federal DNA Database Unit



Source: The FBI's Federal DNA Database Unit

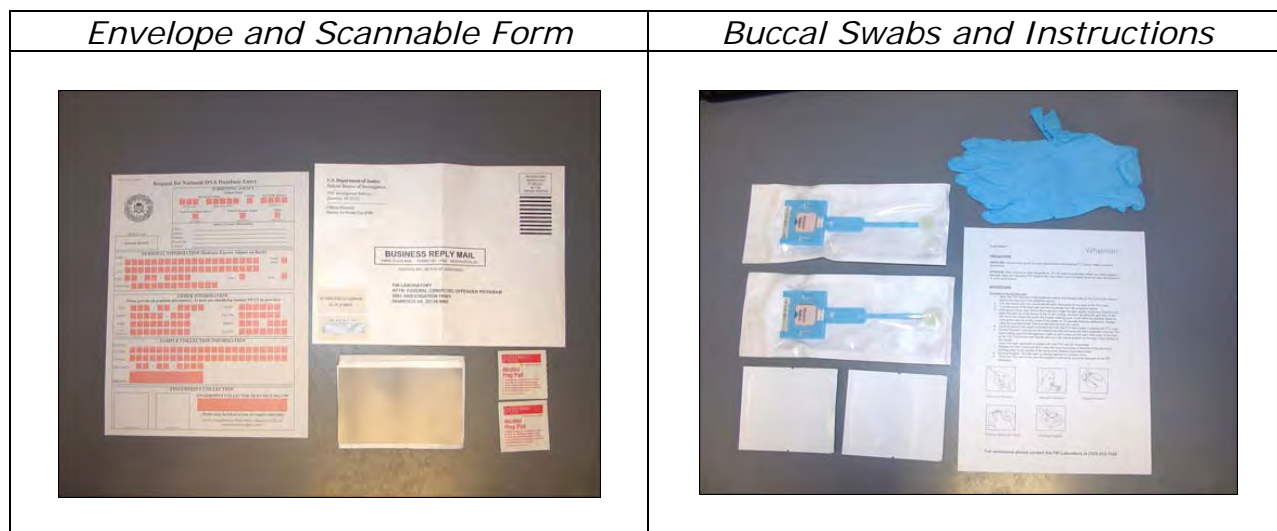
Note: If a DNA sample does not produce a profile that meets CODIS or laboratory standards when it is analyzed, it must go through the analysis process again.

Until 2006, the FBI mainly received vials of liquid blood for testing, and it manually extracted the blood onto DNA cards and entered the convicted offender personal information that accompanies a DNA sample into the laboratory information management system. FBI Laboratory personnel performed manual, and labor intensive, DNA analysis on convicted offender, arrestee, and detainee samples. Although automation existed to process the DNA samples and arrive at a profile, the robotics were able to process far fewer samples than the high through put robotics are now able to process. Further, examiners had to manually review each DNA profile before it was uploaded to CODIS. Between January 2004 and December 2009, the Federal DNA Database Unit was only able to upload to CODIS an average of approximately 1,700 samples per month.

Over time, the FBI Laboratory worked to streamline its DNA analysis processes. The FBI started its improvements with the accessioning process, which is the process of bar-coding a DNA sample and entering the offender, arrestee, or detainee information into the unit's laboratory information management system. The FBI Laboratory developed collection kits that allow submitting agencies to send in blood or buccal samples on a small card

rather than in liquid form, and the kits contain a scannable form that captures information necessary for DNA processing, such as name of the offender, arrestee, or detainee; date of birth; social security number; and submitting agency. Currently, the convicted offender, arrestee, and detainee samples are bar-coded and tracked through every stage of the DNA process using the Sample Tracking and Control System (STaCS), the Federal DNA Database Unit's laboratory information management system.¹⁵ Also, the FBI Laboratory implemented high-speed scanners to scan the forms that accompany the DNA collection kits, thereby speeding the accessioning process and also eliminating data entry errors. Biologists and contractors must still verify that all of the information scanned was complete and accurate. Shown in Exhibit 3 is the Federal DNA Database Unit's collection kit with scannable forms and buccal swabs.

Exhibit 3: FBI DNA Collection Kit



Source: The FBI

In addition to improving the accessioning process, the FBI also automated the analyses of convicted offender, arrestee, and detainee DNA samples. FBI Laboratory personnel now use high-throughput robotics, such as an automated punch instrument that prepares the DNA sample and other

¹⁵ STaCS is the Federal DNA Database Unit's internal laboratory information management system. All of the sections of the FBI Laboratory do not use this information management system. These issues are discussed in the U.S. Department of Justice Office of the Inspector General report entitled *Review of the Federal Bureau of Investigation Laboratory's Forensic DNA Case Backlog*, Report 10-39, August 2010, 15.

instruments to extract and amplify the DNA sample.¹⁶ The DNA samples are grouped in batches of 850 samples and are moved through the various stages of DNA analysis to create DNA profiles. A DNA profile is reviewed twice before it is uploaded into CODIS - a qualified examiner using Expert System software (a laboratory analysis quality assurance system) conducts a primary review, and a second examiner conducts a secondary review of the profile. Using this process, the Federal DNA Database Unit uploaded over 18,000 DNA profiles to CODIS in May 2011.¹⁷

After convicted offender, arrestee, and detainee profiles are uploaded into CODIS, the results can be matched with other DNA profiles to help solve crimes.¹⁸ According to FBI officials, since September 2009 additional personnel, high throughput robotics, and Expert System software have enabled the Federal DNA Database Unit to process 60,000 DNA samples per month.

Measuring the Backlog

According to the FBI, the Federal DNA Database Unit defines a backlog as samples accepted but not entered into CODIS.¹⁹ In December 2009, the FBI reported over 312,000 convicted offender, arrestee, and detainee DNA

¹⁶ Extraction is the process of separating DNA from a biological sample (such as blood or saliva) so the DNA can be analyzed. Amplification is the process of replicating large amounts of DNA from just a few original strands by "copying" the DNA.

¹⁷ The FBI Laboratory also conducts DNA testing on forensic cases. Forensic DNA testing is more complex, time consuming, and it does not lend itself to the same level of automation that can be used for testing convicted offender, arrestee, and detainee samples.

¹⁸ According to National Institute of Justice Special Report - *Making Sense of DNA Backlogs, 2010 – Myth vs. Reality*, from February 2011, DNA analysts generally use CODIS to search DNA profiles obtained from crime scene evidence against DNA profiles from other crime scenes and from convicted offenders and arrestees. CODIS generates leads for investigators when a match is obtained. For example, if the DNA profile from a crime scene matches a sample taken from another crime scene, the cases may be linked in what is called a forensic "hit." Hits give investigating officers valuable information that helps them focus their investigation appropriately.

¹⁹ Samples categorized in STaCS as "pending" are not accepted because of administrative issues such as: missing information, duplicative samples, and rejected samples. STaCS tracks the pending samples, requests for new samples, and notification letters sent to contributors informing them of the pending status. As of May 2011, there were approximately 14,000 samples in this pending category, and these samples are not eligible for upload to CODIS until a contributor provides additional information or a new sample. While we recognize these samples are part of the Federal DNA Database Unit's overall workload, we did not count these samples because in their present state the samples are not eligible for analysis.

samples in need of analysis, review, and entry into CODIS. However, the FBI reported that it cleared its backlog in September 2010 and is processing accepted DNA samples within 30 days of receipt. FBI officials also stated that after it eliminated its backlog, monthly submissions that were accepted and in-process constituted the unit's monthly workload and were not considered backlogged. We discuss how the FBI achieved these results later in the report.

The Federal DNA Database Unit tracks the DNA samples of convicted offenders, arrestees, and detainees in STaCS, the unit's laboratory information management system. STaCS records the date each sample is received, the date a sample moves from one robotic to another robotic, and whether the sample needs to go through the DNA process again (referred to as rework sample). STaCS generates statistics on whether the DNA sample was a blood card or buccal swab; whether it was an offender, arrestee, or detainee sample uploaded to CODIS; and where in the DNA analysis process each DNA sample is located. The FBI Laboratory has captured statistics on its workflows and DNA samples from the program's inception in 2001. However, the Federal DNA Database Unit does not have written policies or procedures for calculating its backlog or workload statistics.

The Federal DNA Database Unit identifies its workflow in terms of operational processes. For example, samples awaiting accessioning are considered one process, samples awaiting DNA analysis are another process, and DNA profiles awaiting examiner review for entry into CODIS are a third process. The Federal DNA Database Unit used this operational process approach to report statistics on the unit's workload and the backlog. For example, in December 2007, the FBI reported 152,457 samples in its backlog, but this number only captured the DNA samples available for DNA analysis and did not include the samples ready for examiner review. Our review of records showed that in December 2007 the Federal DNA Database Unit's total backlog of convicted offender, arrestee, and detainee DNA samples was 211,352.

From April 2005 through May 2011, the Federal DNA Database Unit reported its backlog using monthly status reports. Initially, the status reports were sent to the Federal DNA Database Unit's Section Chief and were intended to show the number of DNA samples the unit received each month. These status updates also reported a backlog which focused on the process that, at the time, had the most samples. As the backlog grew and gained public visibility, the Laboratory Director and FBI Director also received the

status updates containing the operational process statistics.²⁰ While the numbers reported in the status updates were accurate, the statistics did not present a complete picture of the backlog until August 2008.

In December 2009, FBI Laboratory personnel identified a defect in the STaCS software used to generate the monthly statistics. The defect resulted in samples that needed to be re-analyzed, and the samples in-process at the end of the month were not included in the calculation of the total backlog. To ensure the Federal DNA Database Unit reported a comprehensive backlog total, the unit calculated a baseline for backlogged samples by summing monthly statistical information from STaCS, as shown in Exhibit 4.

Exhibit 4: The FBI’s Method for Calculating Baseline Backlog in December 2009

Sample Process	Number of Samples
Total samples available for analysis	36,071
Samples awaiting examiner review	265,250
Samples in process	11,058
Total Backlog as of December 31, 2009	312,379

Source: The Federal DNA Database Unit’s Monthly Statistics from STaCS in December 2009

After determining the baseline backlog number, the January 2010 backlog calculation was computed as depicted in Exhibit 5.

Exhibit 5: The FBI’s Method for Calculating Backlog in January 2010

Sample Process	Number of Samples
Number of backlogged samples from December 2009	312,379
Number of samples received in January 2010	9,177
Number of profiles uploaded into CODIS in January 2010	(15,055)
Total Backlog as of January 2010	306,501

Source: The Federal DNA Database Unit’s Monthly Statistics from STaCS in January 2010

The FBI Laboratory used the calculation outlined above until August 2010 when it revised the methodology to remove from the reported backlog the “pending” samples that were duplicates, rejects, or missing information. The FBI Laboratory removed the pending samples from the backlog

²⁰ The convicted offender, arrestee, and detainee DNA backlog numbers were reported to the FBI Director from July 2010 until the backlog number reached zero.

calculation since those samples would not be uploaded into CODIS until missing information was provided or another DNA sample had been received.

We attempted to use the FBI's methodology to verify the backlog of convicted offender, arrestee, and detainee DNA samples from December 2009 through September 2010. The FBI reported zero backlogged samples in September 2010, but, we were not able to reconcile to the same numbers using their method. We noted a small difference of 933 DNA samples considered in process due to a "wobble" in the STaCS data – which is a result of DNA samples shifting from one process to the next.

In order to examine the total backlog of convicted offender, arrestee, and detainee samples over time, we developed a methodology using the Federal DNA Database Unit's statistics from STaCS. We calculated the workload by adding all of the DNA samples that were available for accessioning, analysis, and review.²¹ We applied this method from January 2004 through May 2011. Our method for calculating the FBI Laboratory's workload is presented in Exhibit 6.

²¹ As discussed above, prior to developing DNA collection kits, the FBI Laboratory received DNA samples in the form of liquid blood. FBI personnel had to spot the blood onto cards and archive the DNA sample. This is the process known as archiving, and it is part of the accessioning process. The FBI still periodically receives liquid blood samples, which are still bar-coded and entered into STaCS. We also included approximately 40,000 DNA samples from February 2004 through March 2006 that were outsourced because the FBI had to review the DNA profiles before they were uploaded to CODIS. The outsourcing program was not continued because the FBI Laboratory was building the capacity to process all of the convicted offender, arrestee, and detainee DNA samples in-house.

**Exhibit 6: OIG Calculation of the Federal DNA Database Unit's
Workload in January 2010**

Process	Function	Number of Samples
Accessioning		
Samples Available for Check-in	DNA samples awaiting bar-coding and entering into STaCS	108
Samples Available for Archiving	DNA samples (liquid blood) available for spotting onto blood cards	14
Analysis		
Samples Available for Processing	DNA samples available for processing through robotics, but have not yet started the analysis process	24,580
Samples in Process	DNA samples that are currently being processed by a high-throughput robotic	5,185
Review		
Samples Waiting for Examiner Review	DNA samples that have a profile which is waiting to be reviewed and uploaded to CODIS	279,321
Total Backlog of Accepted DNA Profiles for January 2010		309,208

Source: OIG analysis of the Federal DNA Database Monthly Statistics from STaCS

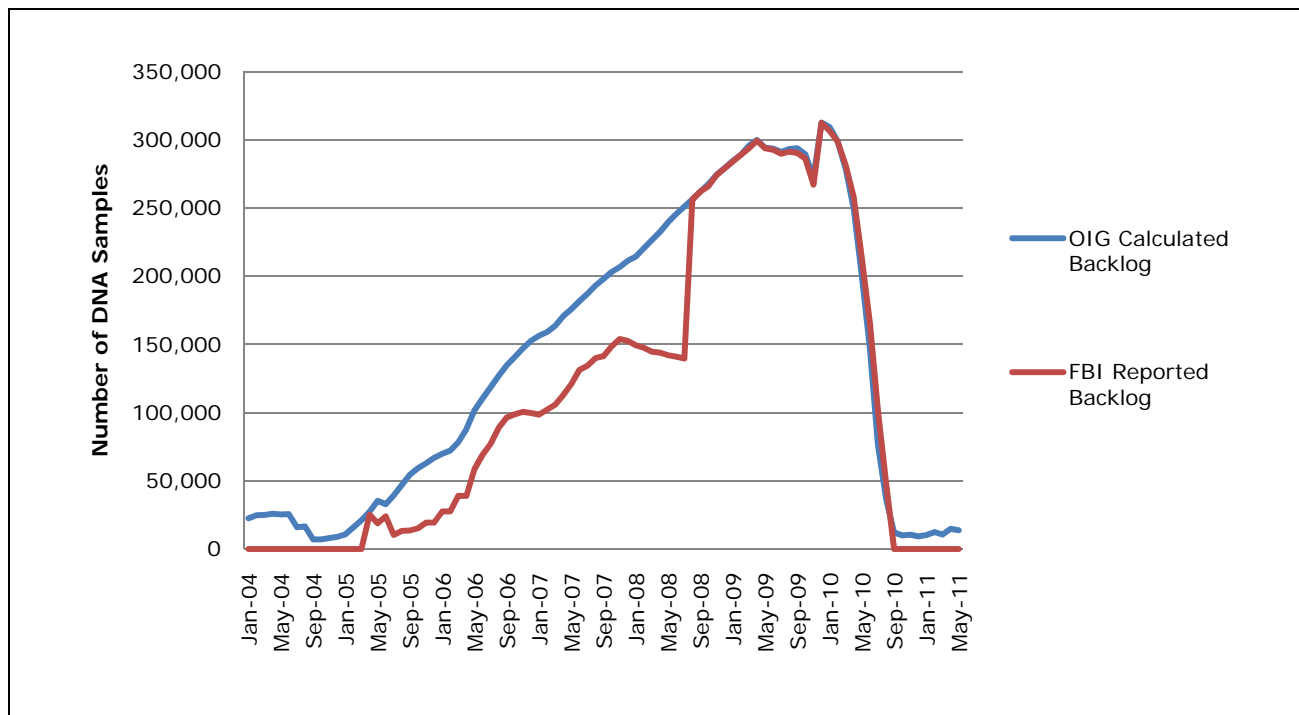
Our calculation of the Federal DNA Database Unit's January 2010 workload is similar to the unit's methodology for calculating its backlog as of May 2011. However, our calculation includes an additional 2,707 DNA samples in process in January 2010. As stated previously, prior to September 2010, the FBI's calculations included all samples that it received even though some samples were eventually rejected, whereas our method included samples that were accepted and in process but not yet uploaded to CODIS.

We used our methodology to examine the Federal DNA Database Unit's backlog over time. As shown in Exhibit 7, we compared our calculation of the backlog to the FBI's reported backlog in the Federal DNA Database Unit's monthly status updates.²² Both calculations show the unit's unprocessed

²² The FBI Laboratory objects to our comparison. It indicated that the number we used for the FBI's reported backlog was incorrect. From the status updates, we used the number identified as "backlog;" however, the FBI Laboratory stated that the purpose of the status reports was intended to reflect the number of samples received during that month – not the total backlog. In the status updates, the FBI listed the limitations of the "backlog" number, which consequentially, meant the Federal DNA Database Unit was not reporting on its full workload. We consider our comparison appropriate because it gives a complete picture of the FBI's reported workload and incorporates the backlog number reported on the status updates.

workload growing steadily from January 2004 through December 2009, and after December 2009, the FBI Laboratory's workload decreased significantly and rapidly through the end of May 2011.

Exhibit 7: Comparison of OIG Calculated Backlog with the FBI's Reported Backlog from January 2004 – May 2011²³



Source: OIG calculation of DNA samples in process reported in STaCS and the FBI reported backlog totals from the Federal Convicted Offender Program status updates

While the FBI reported it had zero backlogged samples from September 2010 through May 2011, the Federal DNA Database Unit still had DNA samples that were being analyzed and reviewed. We reviewed STaCS statistics from May 2011 to determine how many convicted offender, arrestee, and detainee DNA samples were unprocessed at the FBI Laboratory.

As of May 30, 2011, there were 13,704 accepted DNA samples that were in process at the Federal DNA Database Unit. This means that there were 13,704 samples available for accessioning, analysis, review, or already in process. May 2011 statistics are presented in Exhibit 8. Because the FBI has a current capacity to analyze 60,000 DNA samples per month, it has the

²³ The FBI did not begin to report a “backlog” number until April 2005 in its status updates of the Federal Convicted Offender Program.

capability to adequately manage its monthly workload of nearly 14,000 DNA samples.²⁴

Exhibit 8: OIG Calculation of the Federal DNA Database Unit's Workload in May 2011

Process	Function	Number of Samples
Accessioning		
Samples Available for Check-in	DNA samples awaiting bar-coding and entering into STaCS	6,518
Samples Available for Archiving	DNA samples (liquid blood) available for spotting onto blood cards	18
Analysis		
Samples Available for Processing	DNA samples available for processing through robotics, but have not yet started the analysis process	4,270
Samples in Process	DNA samples that are currently being processed by a high-throughput robotic	2,104
Review		
Samples Waiting for Examiner Review	DNA samples that have a profile which is waiting to be reviewed and uploaded to CODIS	794
Total Workload for May 2011		13,704

Source: OIG analysis of the Federal DNA Database Unit's Monthly Statistics from STaCS in May 2011

The FBI has achieved a significant accomplishment in reducing the convicted offender, arrestee, and detainee DNA backlog to a manageable monthly workload. However, we are concerned that the Federal DNA Database Unit does not have defined policies and procedures for calculating and reporting its DNA backlog or workload, and this lack of policies and procedures could potentially affect the accuracy of its reporting in the future. Accurate and consistent reporting is important because it gives decision makers the ability to identify problems in comparison with past reports and to address those problems. Using various methods to calculate the workload may result in under-reporting and over-reporting problems. Further, the "wobble" in the statistics needs to be addressed to make certain the reported information is verifiable and accurate. We understand that the process in the Federal DNA Database Unit is constantly undergoing changes that reveal new methods to calculate statistics. Therefore, we recommend

²⁴ According to the FBI, the Federal DNA Database Unit's processing capability is currently 60,000 specimens per month as of May 2011, with the planned validation and implementation of a 90,000 specimens per month processing capability. The increased capacity is planned to coincide with an increased submission rate within the next 12 to 24 months.

the FBI develop and implement policies and procedures that document the methodology used to report its workload statistics and backlog calculations.

Defining Detainees for Inclusion in CODIS

Since May 2010, the FBI has received an average of almost 16,000 convicted offender, arrestee, and detainee samples per month. According to the FBI, these samples are primarily sent from the Bureau of Prisons, Court Services and Offender Supervision Agency, and Probation Officers. Additionally, the DHS has contributed detainee DNA samples.²⁵

The DNA Fingerprint Act of 2005 required that DNA samples be collected from non-U.S. citizens detained by the United States.²⁶ In order to determine the number of anticipated DNA samples, FBI Laboratory personnel visited two DHS sites to estimate the number of samples the Federal DNA Database Unit would need to process. Based on these visits, the FBI estimated that it would need to process up to 1 million DNA samples per year, primarily from detainees. However, the FBI is not currently receiving this volume of detainee DNA samples.

²⁵ Currently, the Federal DNA Database Unit tracks contributing agencies for convicted offender samples, but does not track which agencies submit arrestee and detainee DNA samples. The unit has submitted a modification to the STaCS contractor to add tracking contributors to STaCS and anticipates receiving the requested modification later in 2011.

²⁶ 42 U.S.C. § 13701 note (2006).

The DNA Sample Collection, Analysis, and Indexing regulation codified at 28 C.F.R. § 28.12 (2008) outlines the DNA-sample collection requirements for the DHS in relation to non-arrestees.²⁷ It states that the Secretary of Homeland Security, in consultation with the Attorney General, may determine that the collection of DNA samples is not feasible because of operational exigencies or resource limitations.

We contacted the FBI to determine how the DHS defines “detainee”; however, the FBI said apart from the DNA Fingerprint Act of 2005 which legally establishes the collection of arrestee and detainee DNA, it did not know the criteria the DHS uses to determine when to collect detainee DNA. The Federal DNA Database Unit said that it was under the impression that the DOJ and the DHS had communicated an agreement regarding detainee DNA collection. We contacted the Office of the Deputy Attorney General, and an official there said the office was not aware of policies regarding detainee DNA collection between the DOJ and the DHS. We also contacted the DHS Policy Office to discuss DHS criteria regarding DNA collection from detainees; however, as of July 19, 2011, we did not receive a response to our inquiry.

Congress has directed that DNA from non-U.S. citizens detained under the authority of the United States should be collected. However, the FBI is not currently receiving the estimated volume of detainee DNA samples and does not have clear criteria regarding which detainee DNA samples the DHS submits to the FBI Laboratory. We recommend that the FBI coordinate with the DHS to determine the criteria used to collect and submit detainee DNA samples, and if appropriate, revise estimates for monthly sample receipt so that the FBI Laboratory can plan for any influx of detainee DNA samples.

Efforts to Reduce the Backlog

Our review found that the FBI Laboratory has used various strategies to address the convicted offender, arrestee, and detainee DNA backlog, including creating a backlog reduction strategy, hiring additional personnel, utilizing high throughput robotics and Expert System software, and reconfiguring laboratory space.

Backlog Reduction Strategy

In July 2007, the FBI’s Office of Integrity and Compliance (OIC) identified CODIS, which includes the convicted offender, arrestee, and detainee DNA backlog, as a risk to the FBI because of its potential

²⁷ 28 C.F.R. § 28.12 (2008).

noncompliance with the DNA Fingerprint Act of 2005 and the Adam Walsh Child Protection Act of 2006.

The FBI OIC's risk assessment report estimated that to fulfill the federal legislation noted above, the FBI would need \$25.2 million in funding, 36 funded positions, and additional operational and administrative space.²⁸ The estimated non-personnel costs are broken down in Exhibit 9.

Exhibit 9: Estimated Backlog Elimination Costs

Identified Need	Projected Costs		
	DNA Fingerprint Act of 2005	Adam Walsh Child Protection and Safety Act of 2006	Total
Supplies	\$18,100,000	\$3,150,000	\$21,250,000
Equipment	1,220,000	800,000	2,020,000
Services/ Maintenance	1,680,000	250,000	1,930,000
Total	\$21,000,000	\$4,200,000	\$25,200,000

Source: The Office of Integrity and Compliance's Compliance Risk Analysis and Recommendation Report from September 17, 2007

In 2007, the FBI created a mitigation plan to reduce the convicted offender, arrestee, and detainee DNA backlog. In January 2008, the FBI's Deputy Director approved this plan, which included steps to address each of the backlogged processes in accessioning, analysis, and review. The FBI's Science and Technology Branch Executive Management Committee tracked on a quarterly basis the progress toward accomplishing the plan's goals. According to the FBI, the mitigation plan was completed on April 13, 2011. The FBI OIC and the Inspection Division said now that the mitigation plan has been completed, it plans to develop an audit program to determine whether the FBI remains at risk of noncompliance with the DNA Fingerprint Act of 2005 and the Adam Walsh Child Protection Act of 2006.

In addition, in February 2008, the Federal DNA Database Unit, in conjunction with the FBI OIC, developed a Backlog Elimination Project Plan. The goal of this project was to eliminate the DNA backlog within 24 months, and the objectives were to: (1) hire and train FBI employees and contractors to process the incoming samples and to eliminate the accessioning backlog; (2) acquire the necessary equipment, services, and supplies to process the samples; and (3) modify the available work areas to accommodate personnel and equipment.

²⁸ 42 U.S.C. § 13701 note (2006) and 42 U.S.C. § 16901 note (2006).

In June 2009, the FBI requested a team of independent experts to review the Backlog Elimination Project Plan and to provide feedback for areas of improvement.²⁹ According to the report, the backlog reduction plan was "appropriate and timely, but very ambitious." The report described concerns about long-term space and storage facilities, personnel, and management's span of control. The FBI implemented several of the report's recommendations, including keeping a three-month supply of reagents on hand and providing more workspace.

Both the OIC mitigation plan and the Backlog Elimination Project Plan gave the FBI tangible goals and timelines to measure achievement in eliminating the convicted offender, arrestee, and detainee DNA backlog. After implementing the Backlog Elimination Project Plan, the Federal DNA Database Unit eliminated the backlog in 33 months, effectively meeting its goal.

Personnel

As part of the DNA Backlog Elimination Act of 2000, the FBI established the Federal Convicted Offender Program that was funded to handle approximately 5,000 samples per year. In 2001, this program had only 5 personnel assigned to it, and it received approximately 3,800 samples. After the enactment of the Justice for All Act of 2004, the number of samples the program received grew to about 96,000 per year between 2005 through 2010. However, staffing levels did not substantially increase until 2006. According to the FBI, prior to 2006, it shifted personnel from casework DNA analysis to convicted offender DNA analysis in order to reduce the convicted offender, arrestee, and detainee backlog. However, because the two programs were comingled in one unit until July 2009, the total impact of shifting personnel between the two functions is difficult to assess, and records of shifting personnel are not available.³⁰

²⁹ The independent assessment team consisted of four state and international law enforcement and forensic science subject matter experts.

³⁰ We cannot quantify the number or timing of the personnel shift because the unit did not have time reports that identified the specific tasks the personnel worked on and no formal transfer notifications were made because the personnel were within the same unit.

In FY 2008, the FBI Laboratory received a funding enhancement to the program's baseline operations; however, the FBI Laboratory did not receive an increased funded staffing level even though it had requested one. However, in FY 2009 the FBI Laboratory received an enhancement of 26 positions for DNA analysis. This enhancement brought the Federal DNA Database Unit's funded staffing level to 37. Currently, the Federal DNA Database Unit has 33 personnel on-board and 11 contractors assisting with accessioning and laboratory information management system support, as shown in Exhibit 10.

Exhibit 10: Estimates of Contractors and Personnel On-board from 2004 – May 2011

Calendar Year	Contractors	Support Personnel	Biologists/ Technical Specialists	Examiners	Total
2004	-	-	1	5	6
2005	-	-	3	5	8
2006	-	-	5	5	10
2007	5	-	7	5	17
2008	7	5	7	4	23
2009	13	5	15	7	40
2010	6	5	18	12	41
2011	11	6	17	10	44

Source: The Federal DNA Database Unit

According to the FBI Laboratory Director, both the increase in personnel and the implementation of high throughput robotics reduced the backlog of convicted offender, arrestee, and detainee samples. However, the FBI Laboratory Director believed the true bottleneck to DNA processing was related to personnel concerns. On average, it takes between 18 and 24 months to train a DNA scientist for their work at the FBI Laboratory. The FBI Laboratory Director said he believed that the lag time to train personnel, combined with the lack of automation, contributed to the convicted offender, arrestee, and detainee DNA backlog.

Once the FBI OIC deemed CODIS a risk and the FBI developed a mitigation plan, one of the first things the FBI did was to hire contractors to assist with accessioning DNA samples in fall 2007. Not only did the contractors augment the Federal DNA Database Unit's staff, they also freed

scientists to perform DNA sample analysis and review. According to the FBI, by April 2008 it no longer had a backlog in the accessioning process.³¹

According to the FBI, in order to operate each robotics "line," it needs three scientists.³² Each robotics line can generate 30,000 DNA profiles per month. In order for the Federal DNA Database Unit to be able to process 90,000 samples per month, the unit requires 9 scientists to run 3 lines. Additionally, the unit needs examiners to operate the Expert System software, conduct reviews of DNA profiles, validate technology, and upload the profiles to CODIS.

In addition to hiring and training personnel, the FBI used alternative work schedules and weekend schedules to ensure the most productive use of personnel time and equipment. According to the FBI, hiring additional personnel and training them was crucial to reducing the backlog of convicted offender, arrestee, and detainee DNA samples.

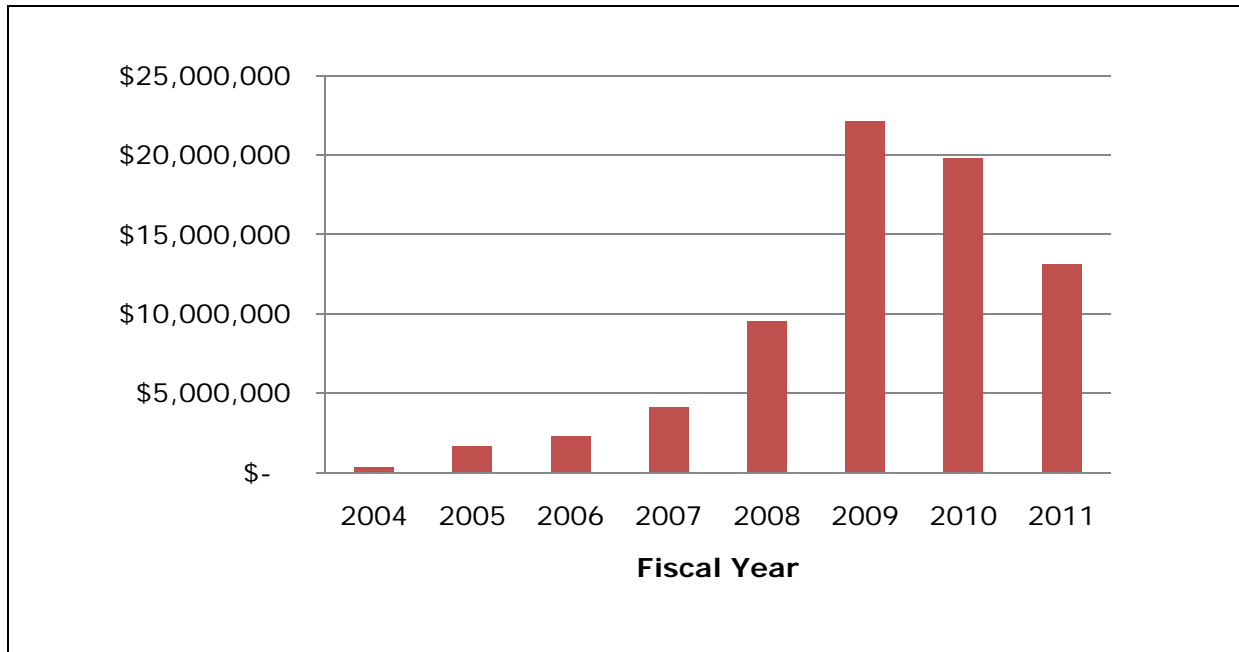
Robotics

From FY 2004 through May 2011, the FBI spent approximately \$73 million on equipment, Expert Systems software, equipment maintenance contracts, DNA collection kits, and reagents necessary to complete DNA testing. According to the FBI, these robotics, maintenance contracts, and supplies are necessary for the FBI Laboratory to maintain its capacity to analyze 60,000 DNA samples per month. The cost of automation from FY 2004 through May 2011 is presented in Exhibit 11.

³¹ Additionally, to assist with administrative functions in the unit, the FBI hired management and program analysts.

³² A "line" consists of three robotics that are necessary to generate DNA profiles.

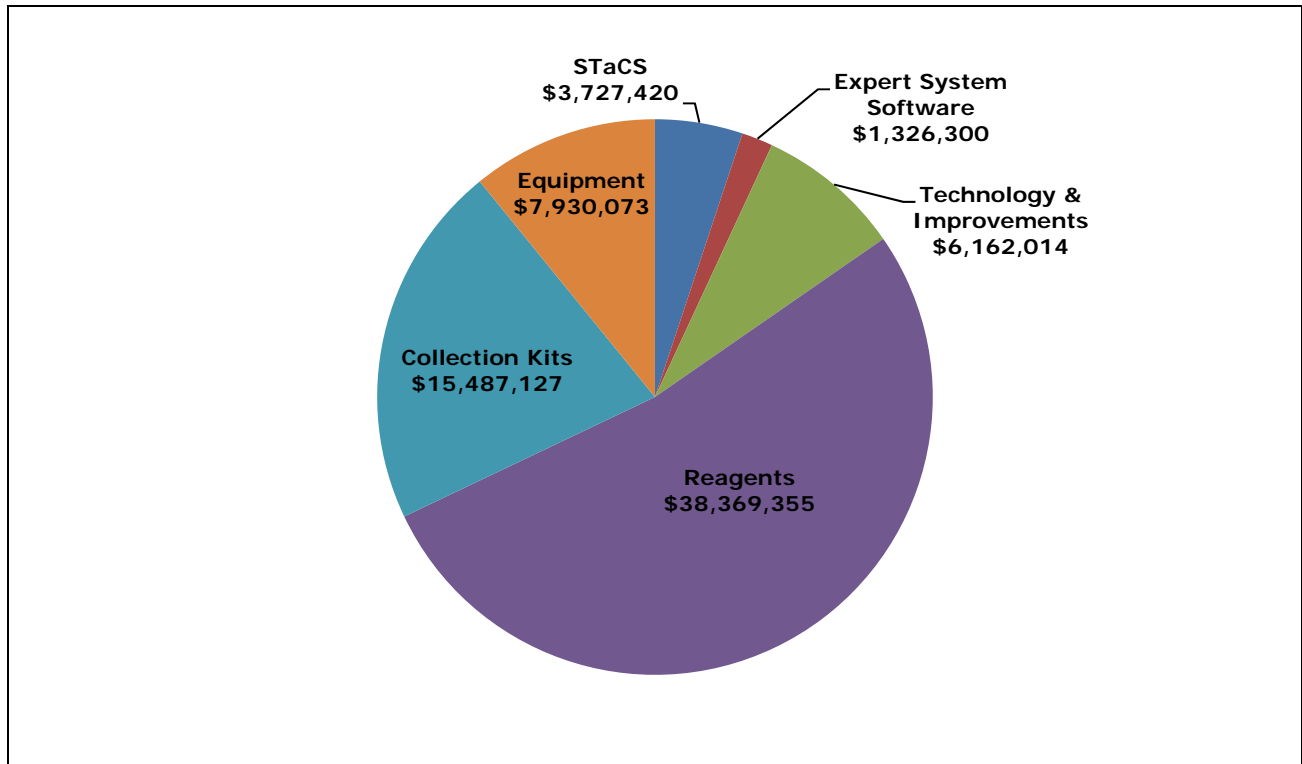
Exhibit 11: Total Automation-Related Expenditures FY 2004 through May 2011



Source: The Federal DNA Database Unit

According to the FBI, from FY 2004 to May 2011 the Federal DNA Database Unit spent approximately \$38 million on reagents necessary for operating the robotics. Additionally, the FBI spent over \$15 million on DNA collection kits, which it provides free of charge to requesting agencies that collect DNA from convicted offenders, arrestees, and detainees. As shown in Exhibit 12, these two expenses comprised approximately 74 percent of the Federal DNA Database Unit's expenditures from FY 2004 to May 2011. The remaining 26 percent was expended on equipment (robotics, high throughput scanners, genetic analyzers), Expert System software, STaCS, and improving technologies, such as radio frequency identification tags.

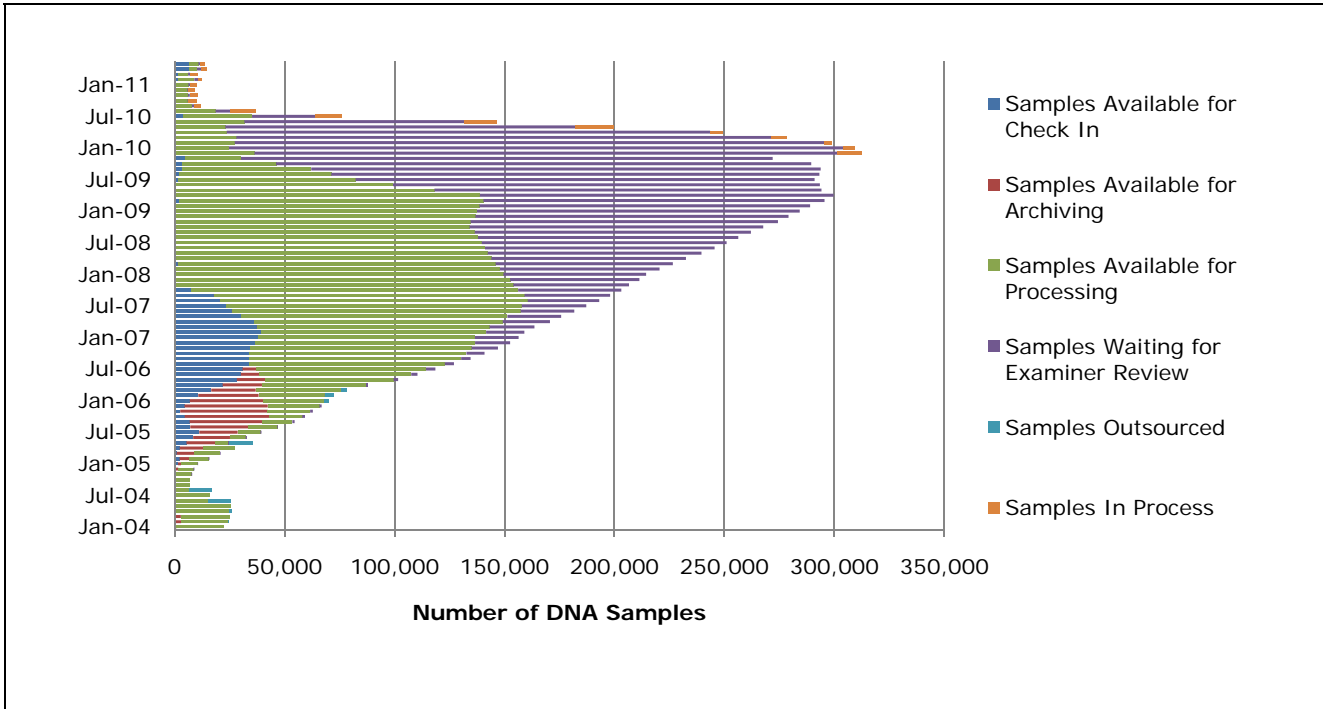
**Exhibit 12: Categorical Breakout of Cost of Automation from
FY 2004 through May 2011**



Source: The Federal DNA Database Unit

As seen in Exhibit 13 below, since January 2004, the process that was experiencing the greatest number of backlogged samples varied over time. As new equipment or processes were implemented, the backlog shifted to the next process. For example, from March 2005 through October 2008, the Federal DNA Database Unit identified the greatest backlog in samples available for processing. However, after high throughput robotics were installed to process a large volume of DNA samples at one time, the backlog shifted to DNA profiles waiting for data review and CODIS upload.

Exhibit 13: DNA Samples Not Uploaded to CODIS by Process from January 2004 – May 2011



Source: OIG analysis of DNA processes captured in STaCS




Note: Outsourced samples are DNA samples that were sent to an outside laboratory for DNA analysis. The FBI Laboratory reviewed the profile before it was uploaded to CODIS. In process samples refer to samples that were in the DNA analysis process.

To improve accessioning time, the FBI Laboratory developed collection kits for blood cards and buccal swabs. Until 2006, the FBI primarily received blood in liquid vials, which biologists had to prepare for DNA analysis by hand. Although the FBI periodically receives liquid blood samples, it primarily receives the DNA collection kits containing dried blood or buccal submissions. These kits are opened, bar coded, and sent for analysis at a much faster rate. Additionally, the Federal DNA Database Unit uses bar coding to track DNA samples, and it acquired high speed scanners to input offender, arrestee, and detainee information into STaCS. Prior to the scanners, the contractors manually entered the data into STaCS.

To address the DNA analysis backlog, the Federal DNA Database Unit purchased and implemented high throughput robotics - equipment necessary to generate data with minimal manual operation - that processes DNA samples in batches of 850 samples at one time. Prior to acquiring the high throughput robotics, the Federal DNA Database Unit analyzed fewer DNA samples because biologists manually placed DNA samples onto the robotics. The robotics were not equipped to handle large quantities of DNA samples.

Currently, the robotics at the Federal DNA Database Unit punch blood or buccal cards in 30 seconds, and the samples are deposited onto plates containing 85 samples. The robotics analyze these plates in groups of 10, allowing 850 DNA samples to be analyzed by the robotics at one time. Each robotic takes approximately 2.5 hours to complete this processing. Pictured in Exhibit 14 are the instruments used to analyze DNA: the semi-automated sample preparation (“punch”) robotic, the sample processing robotic, and the high-throughput genetic analyzers.

Exhibit 14: High-Throughput Robotics Used By the Federal DNA Database Unit

<i>Punch Robotic</i>	<i>Sample Processing</i>	<i>Genetic Analyzer</i>
		

Source: FBI Laboratory

To improve the review process, the FBI acquired Expert System software to review high volumes of DNA samples. Prior to the use of Expert System software, examiners performed a review of each DNA profile and a second examiner conducted a secondary review. The Federal DNA Database Unit was only able to review and upload to CODIS a few hundred DNA samples in a month. When it began using Expert System software, the FBI Laboratory saw a four-fold reduction in review time as compared to manual review. One examiner using Expert System software can conduct the primary review of 85 DNA samples in 25 minutes. The examiner conducting a secondary review is able to analyze the same 85 DNA samples in 10 minutes.

According to the FBI, automation efforts decreased the amount of time it takes to process convicted offender, arrestee, and detainee DNA samples, as illustrated in Exhibit 15.

Exhibit 15: Comparison of Previous Methods of DNA Processing with Current Methods

Category of Comparison	Prior method	One Robotic Line and Expert Software
Samples processed per day	510	1,700
Samples processed per month	8,000	30,000
Number of plates processed per day (1 plate = 85 Samples)	6	20
Sample Review	Manual review, 100 minutes per plate	Examiner assisted with Expert System software, 25 minutes per plate

Source: FBI presentation dated June 2009

According to the FBI, the FBI Laboratory has spent \$6.1 million to develop and improve technology to further streamline the Federal DNA Database Unit’s workflow processes. For example, the FBI is developing radio frequency identification tags to be able to more quickly locate DNA samples for retesting. Also, the FBI is working with other law enforcement agencies to develop an electronic data capture system, which should help improve efficiencies in data collection and limit the number of DNA samples that may be rejected because of administrative issues, such as samples that are missing information. This technology would also enable law enforcement personnel to electronically submit the forms that accompany DNA samples. According to FBI officials, this new technology may minimize errors such as missing names or duplicative samples, and it will reduce the time the FBI Laboratory devotes to administrative functions.

Laboratory Space

Both the FBI OIC mitigation plan and an independent assessment of the Backlog Elimination Project Plan designated space for the Federal DNA Database Unit as one of the top priority areas for the FBI Laboratory. In fall 2008, the FBI commissioned an architectural study to examine the space in the FBI Laboratory and design a laboratory layout to maximize efficiency. According to the architectural firm’s report, physical changes to the Federal DNA Database Unit would cost approximately \$2.7 million.

The Federal DNA Database Unit is spread across three floors at the FBI Laboratory and shares some laboratory space with the Nuclear DNA Unit. The accessioning room and DNA sample storage are located in the basement, with the samples boxed and stacked almost to the ceiling.

Exhibit 16 depicts the storage space at the FBI Laboratory as of August 2011.³³

Exhibit 16: Pictures of the Federal DNA Database Unit Storage Space at the FBI Laboratory as of August 2011



Source: The Federal DNA Database Unit as of August 2011

In April 2011, the Federal DNA Database Unit was able to use other space in the FBI Laboratory to use as the accessioning room and for offices. In late May 2011, the Federal DNA Database Unit moved into this space, and according to the FBI Laboratory, was able to nearly double the number of accessioning workstations from 10 to 18. This move provided the Federal DNA Database Unit with even more space than the architectural firm's study had recommended. The FBI Laboratory has also identified other office space that will be available for the Federal DNA Database Unit within the 2011 calendar year. According to FBI personnel, the Federal DNA Database Unit has \$400,000 appropriated for these moves, and has taken timely steps to identify new space for the Federal DNA Database Unit to further maximize efficiency.

³³ Prior to July 2009, the Washington, D.C. Metropolitan Police Department was located at the FBI Laboratory in Quantico, Virginia. However, to make additional space for the Federal DNA Database Unit's robotics, the FBI Laboratory relocated the Washington, D.C. Metropolitan Police Department to an offsite location.

In addition, because the FBI must maintain DNA samples indefinitely because of the need to re-analyze the sample when there is a CODIS match, the FBI Laboratory is seeking high density storage solutions. As of May 2011, the FBI has over 712,000 DNA samples to store, and it anticipates needing to store a total of 1 million DNA samples by the end of 2011. As contributors continue to submit DNA samples to the FBI for analysis and entry into CODIS, the FBI Laboratory will need to provide storage space for those submissions as well. As of May 2011, the Federal DNA Database Unit expected that the vendor bid process and selection will be made during FY 2011, with delivery and installation of the high density storage units during the first quarter of FY 2012. According to the FBI Laboratory, it is also in the early stages of examining long term storage options at an offsite location. However, an independent review of the Backlog Elimination Project Plan characterized this initiative as a risk, noting that offsite storage would add complexity to storage and retrieval protocols, and increase risk regarding the maintenance of samples.

In sum, the FBI has several plans for DNA storage options but these plans have not yet been implemented. With the continuing increase in the number of DNA samples received and in need of storage, we are concerned that the FBI has not yet implemented a long term solution for storing its DNA samples. Therefore, we recommend that the FBI finalize a long-term plan for DNA sample storage space.

Conclusion

Through backlog reduction plans, hiring additional personnel, implementing high throughput robotics and Expert System software, and creating additional space for the Federal DNA Database Unit, the FBI has significantly improved its efficiency in processing convicted offender, arrestee, and detainee DNA samples. These improvements enabled the FBI to effectively eliminate its convicted offender, arrestee, and detainee DNA samples backlog. The FBI Laboratory now has an average processing rate (from sample receipt to upload to CODIS) of 30 days for accepted DNA samples.

However, we found the FBI can improve the accuracy and consistency of its workload statistics to more comprehensively inform decisions regarding management concerns. In addition, the FBI needs to ensure that it has a clear understanding of DHS policy for collecting DNA samples from detainees, because a significant change in policy could greatly affect the FBI's ability to keep pace with the DNA samples it receives for analysis. Finally, space and storage capacity at the FBI Laboratory is a significant

concern and the FBI must expediently identify a long-term storage solution for its DNA samples.

Recommendations

We recommend that the FBI:

1. Develop and implement policies and procedures that document the methodology used to report its workload statistics and backlog calculations.
2. Coordinate with the DHS to determine the criteria used to collect and submit detainee DNA samples, and if appropriate, revise estimates for monthly sample receipt so the FBI Laboratory can plan for any influx of detainee DNA samples.
3. Finalize a long-term plan for DNA sample storage space.

STATEMENT ON INTERNAL CONTROLS

As required by the *Government Auditing Standards* we tested as appropriate, internal controls significant within the context of our audit objectives. A deficiency in an internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to timely prevent or detect: (1) impairments to the effectiveness and efficiency of operations, (2) misstatements in financial or performance information, or (3) violations of laws and regulations. Our evaluation of the Federal Bureau of Investigation's (FBI) internal controls was *not* made for the purpose of providing assurance on its internal control structure as a whole. FBI management is responsible for the establishment and maintenance of internal controls.

Through our audit testing, we did not identify any deficiencies in the FBI's internal controls that are significant within the context of the audit objectives and based upon the audit work performed that we believe would affect the FBI's ability to effectively and efficiently operate, to correctly state financial and performance information, and to ensure compliance with laws, regulations, and other applicable requirements. Because the Federal DNA Database Unit does not have defined policies and procedures for calculating and reporting its DNA backlog or workload, the backlog statistics were reported inconsistently.

Because we are not expressing an opinion on the FBI's internal control structure as a whole, this statement is intended solely for the information and use of the auditee. This restriction is not intended to limit the distribution of this report, which is a matter of public record.

STATEMENT ON COMPLIANCE WITH LAWS AND REGULATIONS

As required by the *Government Auditing Standards* we tested, as appropriate given our audit scope and objectives, selected transactions, records, procedures, and practices, to obtain reasonable assurance that FBI's management complied with federal laws and regulations for which noncompliance, in our judgment, could have a material effect on the results of our audit. FBI's management is responsible for ensuring compliance with federal laws and regulations applicable to the Department of Justice. In planning our audit, we identified the following laws and regulations that concerned the operations of the auditee and that were significant within the context of the audit objectives:

- DNA Analysis Backlog Elimination Act of 2000;
- USA PATRIOT Act of 2001, Section 503 (Public Law 107-56);
- Justice For All Act of 2004;
- DNA Fingerprint Act of 2005;
- Adam Walsh Child Protection Act of 2006;
- 28 C.F.R. Part 28.12 (December 10, 2008);
- United States Code, Title 42, Chapter 136, Subchapter IX, Part A – DNA Identification.

Our audit included examining, on a test basis, FBI's compliance with the aforementioned laws and regulations that could have a material effect on FBI's operations, through interviewing auditee personnel, analyzing data, assessing internal control procedures, and examining procedural practices.

Nothing came to our attention that caused us to believe that the FBI was not in compliance with the aforementioned laws and regulations.

OBJECTIVES, SCOPE, AND METHODOLOGY

Objectives

We audited the FBI's convicted offender, arrestee, and detainee DNA backlog. The objectives of this audit were to determine the number of convicted offender, arrestee, and detainee DNA samples that remained unprocessed at the FBI Laboratory, and to evaluate the FBI's efforts to reduce and eliminate the convicted offender, arrestee, and detainee DNA backlog.

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.

We reviewed historical performance data, internal and external assessments, and documentation for planned changes to for streamlining the DNA database process. The audit generally covered, but was not limited to, FBI DNA statistics from January 2004 through May 2011.

Audit work was conducted at both FBI headquarters and the FBI Laboratory located in Quantico, Virginia. We interviewed personnel from the Finance Division, and Resource Planning Office, and the Office of Integrity and Compliance at FBI headquarters. We also interviewed Laboratory Division personnel involved with the convicted offender, arrestee, and detainee DNA program.

In order to determine the number of convicted offender, arrestee, and detainee DNA samples that remained unprocessed at the FBI Laboratory, we discussed with laboratory personnel the methodology they used for calculating their workload and attempted to replicate the FBI's method. We relied on computer-generated data from the Sample Tracking and Control System (STaCS), the Federal DNA Database Unit's laboratory information management system. Although we did not assess the information system's control or the reliability of statistics from STaCS, we do not believe our

reliance on this information significantly affects the findings and recommendations offered by this report.

We were not able to replicate the FBI's calculations, so using statistics from STaCS, we developed a methodology for calculating the Federal DNA Database Unit's workload from January 2004 through May 2011. We added the following numbers to calculate the unit's backlog and workload: (1) samples available for check-in; (2) samples available for archiving; (3) samples available for processing; (4) samples in process; (5) samples outsourced; and, (6) samples waiting for data analysis.

We compared our calculation of the Federal DNA Database Unit's workload to the FBI program status updates and FBI "scorecards" from April 2005 through May 2011. We used the number that was reported as "backlog" to determine the FBI's reported backlog number.

Additionally, to understand the Department of Homeland Security's DNA collection policy and how it may impact the FBI Federal DNA Database Unit's workload, we interviewed personnel from the United States Secret Service. We attempted to interview persons from the Department of Homeland Security's Policy Division; however, we did not receive a response to our inquiry.

In order to evaluate the FBI's efforts to reduce and eliminate the convicted offender, arrestee, and detainee DNA backlog, we reviewed the Office of Integrity and Compliance CODIS risk analysis and mitigation plan and the Federal DNA Database Unit's Backlog Elimination Project Plan from February 2008. In addition, we reviewed the independent assessment of the Federal DNA Database Unit's February 2008 Backlog Elimination Project Plan. We also examined the unit's most recent Quality Assurance Audit, conducted in December 2010 by auditors from the Bureau of Alcohol, Tobacco, Firearms and Explosives National Laboratory Center and the United States Army Criminal Investigation Laboratory.

Part of the backlog strategy was to increase personnel, pursue automation efforts, and identify additional space. Therefore we reviewed the Federal DNA Database Unit's personnel and contractor history from 2001 through 2011. Since the FBI did not maintain detailed personnel records for the DNA Unit I, which included casework DNA analysis and convicted offender, arrestee, and detainee DNA analysis until July 2009; we could not comment on the shift in personnel between casework and the convicted offender, arrestee, and detainee program to reduce the backlog.

To evaluate the impact of automation on the reduction of the FBI's backlog, we examined the Federal DNA Database Unit's automation costs from FY 2004 through FY 2011, reviewed FBI Laboratory presentations on the increased efficiencies attributed to the automation efforts, and discussed with FBI Laboratory personnel the impact the robotics and other automation efforts had on the FBI Laboratory processes. We also reviewed the Office of Integrity and Compliance Risk Mitigation Plan for implementing automation efforts in the Federal DNA Database Unit.

Additionally, we toured the FBI Laboratory and the Federal DNA Database Unit. We looked at the current space for the Federal DNA Database Unit, future space planned for the unit, reviewed the architectural firm's laboratory space study and schematics plan of the FBI Laboratory, and discussed DNA sample storage with FBI Laboratory personnel.

OVERVIEW OF DNA ANALYSIS PROCESS AT THE FEDERAL DNA DATABASE UNIT

PROCESS	EXPLANATION
Accessioning	Process in which the collection kits containing DNA samples are opened and verified. Included in each kit is a DNA sample, fingerprints, and a form containing biographical information of the individual. This information is entered into STaCS. Each DNA sample receives a unique ID, and STaCS tracks the flow of the sample, work assignments, and captures metrics.
Punching of Samples	High throughput robotics pierce the DNA sample cards like a sewing machine creating a tiny circle or punch. The punch is inserted into a plate of 85 samples each assigned to a well. This plate is bar-coded and moves forward in the process.
Extraction	Robotics are used to dispense chemicals (reagents) that aid in the separation of DNA in the sample. A very thin layer of wax seals the plate so the sample does not evaporate.
Amplification	DNA amplification is the process of replicating large amounts of DNA from just a few original strands using a thermal cycler robotic to "copy" the DNA.
Electrophoresis	Another robot dilutes the sample and applies an electrostatic charge to separate the DNA. This machine detects and measures the DNA fragments in a DNA sample for further analysis.
Data Analysis and Interpretation	Information generated from the electrophoresis process is loaded into Expert System software. This software serves as a semi-automated review system that assists qualified examiners in the review process by alerting them to the samples that require more thorough manual review. A qualified examiner reviews the Expert System software analysis and a second qualified examiner confirms.
Upload into CODIS	Once samples have been reviewed, a qualified examiner creates a computer file and the DNA profile is uploaded to CODIS. A CODIS biologist runs a weekly search of CODIS for potential matches to the other indexes in CODIS.

Source: The FBI Federal DNA Database Unit

APPENDIX III

THE FEDERAL BUREAU OF INVESTIGATION'S RESPONSE TO OFFICE OF INSPECTOR GENERAL'S AUDIT REPORT RECOMMENDATION



U.S. Department of Justice

Federal Bureau of Investigation

Washington, D. C. 20535-0001

September 1, 2011

Cynthia A. Schnedar
Acting Inspector General
Office of the Inspector General
U.S. Department of Justice
Suite 4706
950 Pennsylvania Avenue, N.W.
Washington, D.C. 20530

Dear Ms. Schnedar:

The Federal Bureau of Investigation (FBI) appreciates the opportunity to review and respond to your draft report entitled, "Audit of the Federal Bureau of Investigation's Convicted Offender, Arrestee, and Detainee DNA Backlog" (hereinafter "Report").

We are pleased your Report recognizes the FBI has effectively eliminated its backlog of convicted offender, arrestee, and detainee DNA samples. As noted, the FBI has achieved a "significant accomplishment" in reducing this backlog to a manageable monthly workload. The FBI remains committed to ensuring accepted DNA samples are promptly processed and submitted into the Combined DNA Index System (CODIS).

In conclusion, based upon a review of the Report, the FBI concurs with the three recommendations directed to the FBI. The FBI appreciates the professionalism exhibited by your staff to complete this Report. Enclosed herein are the FBI's responses to the recommendations. Please feel free to contact me at 202-324-2903 should you have any questions or need further information.

Sincerely yours,

Jennifer Smith Love
Acting Assistant Director
Inspection Division

Enclosure

**The Federal Bureau of Investigation's (FBI) Response to the
Office of the Inspector General's Audit of the FBI's
Convicted Offender, Arrestee, and Detainee DNA Backlog**

Recommendation #1: Develop and implement policies and procedures that document the methodology used to report its workload statistics and backlog calculations.

FBI Response to Recommendation #1: Concur - The policies and procedures associated with the workload statistics, such as average turnaround time calculation, currently reported through the unit's laboratory information management system (LIMS), were formally documented through issuance of an Electronic Communication (EC) on June 15, 2011. Modifications to the LIMS for further expanding and customizing the reporting functionality, as defined by formal requirements documents generated by the unit, is proceeding with completion projected in FY2012. Once finalized, the unit will revise the procedures issued in June 2011 to memorialize these new requirements as standardized methodologies for reporting workload statistics and production metrics.

Recommendation #2: Coordinate with the DHS to determine the criteria used to collect and submit detainee DNA samples, and if appropriate, revise estimates for monthly sample receipt so the FBI Laboratory can plan for any influx of detainee DNA samples.

FBI Response to Recommendation #2: Concur - As the Department of Homeland Security (DHS) implements DNA sample collection as mandated by the DNA Fingerprint Act of 2005 and other applicable DNA legislation, the FBI Laboratory will continue to remain in communication with those components of DHS that are likely to submit significant numbers of samples to the FBI Laboratory's Federal DNA Database Unit (FDDU). The majority of such submissions are expected from the U.S. Customs and Border Protection (CBP), with a secondary level from U.S. Immigration and Customs Enforcement (ICE). The most recent projections of the FBI Laboratory indicate that approximately 10-20% of the FDDU workload in fiscal year 2012 will be contributed by CBP or ICE. This estimate has increased from historical CBP and ICE submission rates of less than 5% of the FDDU workload. The FBI Laboratory has scheduled on-site training and operational/deployment meetings with the CBP during October 2011 in Tucson, AZ. It is anticipated that an updated time-line for CBP arrestee/detainee sample collection projections may be available following such on-site planning sessions. In an effort to ensure efficient submissions, the FBI Laboratory will also provide DHS instruction regarding proper DNA sample collection techniques and submission procedures for arrestee and detainee samples. The FBI Laboratory is not in a position to assist DHS with determining the criteria used to collect and submit arrestee and detainee DNA samples as described within Recommendation #2. We understand that legal and policy decisions concerning those criteria as well as DHS's implementation of such legislation are being coordinated by the Department of Justice Office of Legal Policy and the DHS Office of the Secretary.

Recommendation #3: Finalize a long-term plan for DNA sample storage space.

FBI Response to Recommendation #3: Concur - The FBI Laboratory will formalize and continue to implement the plan developed by the unit for the long-term storage of DNA samples.

The plan is composed of a series of sequential phases:

- Acquisition of additional space permitting expansion of FDDU operations within the FBI Laboratory facility. Completed August 2011.
 - Relocation of sample accessioning operations, enabling space for electronic retriever systems (sample storage)
 - Relocation of unit administrative activities, resulting in additional space for further expansion of electronic retriever systems, if needed.
- Procurement and implementation of nine systems electronic retriever storage systems, customized for use within FDDU room dimensions, with a projected combined storage capacity for over 825,000 samples. On-schedule for completion by November 2011.
 - Augments unit's existing storage capacity of 775,000 samples
- Development and execution of an off-site lease for continued DNA sample storage
 - Coordination with the Space Management Unit, FBI HQ initiated August 2011
 - Off site lease will allow for samples to be stored on-site at the FBI Laboratory for at least one year after receipt (assuming most pessimistic sample receipt projections) to facilitate hit confirmations which occur when these samples are uploaded, thus mitigating the risk associated with off-site storage and retrieval

**OFFICE OF THE INSPECTOR GENERAL
ANALYSIS AND SUMMARY OF ACTIONS
NECESSARY TO CLOSE THE REPORT**

The OIG provided a draft of this audit report to the FBI. The FBI's response is incorporated in Appendix III of this final report. The following provides the summary of actions necessary to close the report.

Summary of Actions Necessary to Close the Report

1. **Resolved.** The FBI concurred with our recommendation to develop and implement policies and procedures that document the methodology used to report its workload statistics and backlog calculations. The FBI stated in its response that the policies for the Federal DNA Database Unit's (FDDU) laboratory information management system were formally documented on June 15, 2011. The FBI plans to make additional modifications to its laboratory information management system in FY 2012. After the laboratory information management system's modifications are completed, the FBI will revise the June 15, 2011 procedures as standardized methodologies for reporting workload statistics and production metrics.

This recommendation can be closed when we receive the finalized policies for reporting working and production metrics, and documentation that these policies and procedures have been implemented.

2. **Resolved.** The FBI concurred with our recommendation to coordinate with the Department of Homeland Security (DHS) to determine the criteria used to collect and submit detainee DNA samples, and if appropriate, revise estimates for monthly sample receipt so the FBI Laboratory can plan for any influx of detainee DNA samples. The FBI stated in its response that it plans to remain in communication with the DHS components that are likely to submit DNA samples to the FDDU. The FBI Laboratory estimated that approximately 10 to 20 percent of the FDDU workload in 2012 will be from DHS contributors. Additionally, the FBI Laboratory has scheduled on-site training and operational/deployment meetings with U.S. Customs and Border Patrol

in Tucson, Arizona, for October 2011. The FBI will provide DHS with instructions on the proper DNA sample collection techniques.

This recommendation can be closed when we receive documentation that the FBI is actively coordinating with the DHS, and documentation describing how the FBI plans to handle DNA sample influxes from DHS.

3. **Resolved.** The FBI concurred with our recommendation to finalize a long-term plan for DNA sample storage space. The FBI stated in its response that it intends to formalize and continue to implement the plan for the long-term storage of DNA samples. The FBI listed aspects of the long-term plan, such as acquiring additional space for the expansion of FDDU, procuring and implementing customized electronic retriever storage systems, and developing and executing an off-site lease for continued DNA storage.

This recommendation can be closed when we receive the finalized long-term plan for DNA sample storage and evidence that the FBI has implemented the long-term plan.