STATE OF NEW HAMPSHIRE
DEPARTMENT OF SAFETY
DIVISION OF STATE POLICE
FORENSIC LABORATORY

PERFORMANCE AUDIT
SEPTEMBER 2011

To The Fiscal Committee Of The General Court:

We conducted an audit of the New Hampshire Department of Safety, Division of State Police, Forensic Laboratory (Lab) to address the recommendation made to you by the joint Legislative Performance Audit and Oversight Committee. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require 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 the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The purpose of the audit was to determine if the Lab was operating efficiently and effectively. The audit period is State fiscal years 2009 and 2010.

This report is the result of our evaluation of the information noted above and is intended solely for the information of the Department of Safety, Division of State Police, the Lab, and the Fiscal Committee of the General Court. This restriction is not intended to limit the distribution of this report, which upon acceptance by the Fiscal Committee is a matter of public record.

Office Of Legislative Budget Assistant

September 2011

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ABBREVIATIONS

ASCLD/LAB	American Society Of Crime Laboratory Directors / Laboratory Accreditation Board
CBA	Collective Bargaining Agreement Between The State Of New Hampshire And The State Employees' Association
CODIS	Combined Deoxyribonucleic Acid (DNA) Index System
COOP	Continuity Of Operations Plan
DEA	Drug Enforcement Administration
DEU	Digital Evidence Unit
DFI	Digital Forensic Investigator
DHHS	Department Of Health And Human Services
DNA	Deoxyribonucleic Acid
DoIT	Department Of Information Technology
DOC	Department Of Corrections
DOJ	Department Of Justice
DOS	Department Of Safety
DRP	Disaster Recovery Plan
DRU	Drug Analysis Unit
DSSP	Department of Safety, State Police
FBI	Federal Bureau Of Investigation
FTE	Full Time Equivalent
GAO	Government Accountability Office
ICAC	Internet Crimes Against Children
ID	Identification
ISO	International Organization For Standardization / International Electrotechnical Commission
IT	Information Technology

Lab	State Police Forensic Laboratory
LBA	Office Of Legislative Budget Assistant
LIMS	Laboratory Information Management System
LPAOC	Legislative Performance Audit And Oversight Committee
NIJ	National Institute For Justice
NRC	National Research Council
PIN	Personal Identification Number
PSU	Professional Standards Unit
QA	Quality Assurance
QC	Quality Control
RSA	Revised Statute Annotated
SAN	Storage Area Network
SFY	State Fiscal Year
SJD	Supplemental Job Description
SOP	Standard Operating Procedure
State Police	Division Of State Police
TRA	Training
TSS	Technical Support Specialist

SUMMARY

Purpose And Scope Of Audit

This audit was performed at the direction of the Fiscal Committee of the General Court consistent with the recommendation of the joint Legislative Performance Audit and Oversight Committee. It was conducted in accordance with generally accepted government auditing standards applicable to performance audits. The purpose was to assess the efficiency and effectiveness of the Division of State Police (State Police), Forensic Laboratory (Lab). The audit period was State fiscal years 2009 and 2010. Our audit did not include a review of the science or scientific methodologies employed by the Lab.

Background

The Lab began operations shortly after the creation of the State Police in 1937, but was not codified in statute until 2004. The Lab is the main provider of forensic laboratory services in New Hampshire and supports the investigatory, analytical, and enforcement functions of State public safety laws.

Results In Brief

Our performance audit found the Lab generally served its customers well and the quality of its services was viewed favorably by respondents to our survey. The Lab operated in a culture focused on continuous quality improvement. However, we found management controls could be improved in several areas, including increased use of performance and outcome measures to enhance the Lab's analysis of its productivity and goal achievement.

Quality was a major focus of the Lab. Even though the Lab has been accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) since 2004, it recognized the need to upgrade its standards to those of the more rigorous International Organization for Standardization/International Electrotechnical Commission (ISO). It intends to implement those standards in 2014. However, many of the management control issues we found could have been identified by broader internal management reviews of Lab operations.

Our report presents 29 observations and recommendations where the Lab could improve its efficiency and effectiveness. Two observations and recommendations may require legislative action.

Laboratory Operations

While the Lab generally met its customers' needs, we identified several opportunities to improve the effectiveness and efficiency of its operations, including performance measures. During the audit period, the Lab did not: collect all necessary data to effectively measure analyst productivity, use data to effectively assign analyst time, or effectively manage backlogs. The Lab inconsistently followed its documented case prioritization policy, while informal case

prioritizations were neither formalized nor reviewed for case impact. Also, the Lab's case and evidence acceptance policies could have more effectively dealt with growing backlogs, affecting its ability to best meet customer needs. The Lab needs to improve its backlog data. Total backlog as of June 30, 2010 was 3,025, down from 3,050 at the beginning of the audit period. However, the backlog trend increased. Submitted and completed requests trended down and completed requests fell below submitted requests toward the end of the audit period. The Digital Evidence Unit had poor workflow and a large backlog during the audit period. The cost-effectiveness of the Lab's process for testing urine samples for illicit drugs submitted by the Department of Corrections should have been improved. By using commercially available multi-drug testing cups, the Lab could have re-tasked resources and personnel to other areas of the Lab.

Lab Evidence Technicians had fewer duties and responsibilities, higher education and experience requirements, and were paid above the average wage for evidence technicians we examined in other jurisdictions. The Lab could have accomplished this function for less cost. The Blood Toxicology Unit's evidence documentation process needed improvement and had inflated case counts and reporting.

Quality Assurance

Quality is an essential characteristic of forensic laboratory operations. Accreditation standards are one form of quality control, but should not be solely relied upon for management control. The Lab should be more systematic in applying, following, and documenting its policy on nonconforming work and deviations. The Lab did not report measures of uncertainty, clarifying the levels of accuracy and precision associated with reported results. The Lab's technical and administrative review process should be improved to allow the highest level of quality controls possible.

Facilities And Security

We found the Criminalistics Group area was improperly designed and work space was inadequate, which limited its ability to operate, and process and safeguard evidence, as efficiently and effectively as possible. We found improvements could be made in storage for and control over drugs, narcotics, currency, and other valuables; as well as to electrical resources and ventilation. We also found the Lab could improve controls over physical access to Criminalistics Group analytical areas, after-hours access to the Lab, and physical keys. Further, the Lab could also improve its process for periodic physical counts of evidence.

Human Resource Management

Effective human resource management is essential for achieving program goals. We found controls over timekeeping and overtime should have been improved and personnel resources could have been more effectively utilized. The Lab did not track overtime by discipline or job classification and assigned time-consuming administrative tasks to analysts, employed one analyst as an expert witness who testified infrequently, and allowed relatively high-paid analysts to escort visitors through the Lab. We also found one Lab employee was overpaid $5,844 in overtime from May 2008 to March 2011. The Lab could not evaluate if analysts were utilizing

their regular or overtime hours efficiently and effectively. Additionally, the Lab has no formal process for determining ongoing educational needs or assessing training quality. We found policy allowed analysts to record a successful pass on a proficiency test despite discrepant results when not attributable to analyst error. Two Units had supervisory personnel who did not have documented competency in the respective discipline and a third Unit did not have a senior criminalist or technical supervisor during the audit period. Finally, we found the Lab did not periodically monitor staff for influences impacting personnel competence, impartiality, or integrity.

Forty-one of 47 Lab positions were classified under the X416 plus 20 percent law enforcement wage schedule which was not cost effective. When first proposed, this job classification was justified by Lab management, in part, based on after-hour recalls of Lab personnel, which happened infrequently, and to attract and retain quality staff; but, historically there was minimal turn-over of Lab staff. Personnel transfers to the Lab from other State laboratories were not cost-neutral, increasing base wage costs by $184,273 during calendar years 2009 and 2010. The Lab used analysts to perform an estimated 6,200 hours of non-analytical, information technology (IT)-related tasks during the audit period. Lab personnel who reported performing non-analytical, IT-related tasks also accrued 3,321 hours of overtime, while the Lab had an average monthly case backlog of 2,792 cases.

Controls over staff competency, training, and proficiency could have been improved. We found some personnel files did not include all background investigation paperwork. Management controls should be implemented to ensure segregation of duties in the Trace and Digital Evidence Units. Lab policies and procedures for handling employee non-compliance with rules, policy, procedures, and regulations and disciplinary-related complaints were ambiguous, appeared to conflict with State Police policies and procedures, and relied on a bifurcated reporting system. Further, the Lab should be more systematic in its treatment of known non-conformities, instances of non-compliance, and complaints.

Other Management Controls

The Lab relied heavily on IT to accomplish core functions. We found instances where Lab personnel were used to support IT instead of conducting analytical work. IT was not audited or reviewed to identify and improve control weaknesses, and general controls did not ensure IT systems functioned as intended. Controls over the physical and logical access to the computer containing the Lab's electronic keycard system, which controlled physical access to its facilities, should be improved. The Lab lacked disaster recovery and continuity of operations plans, which are essential in an emergency. Lab-related administrative rules were needed in some areas, contained inaccurate references, and were not formally adopted in other areas. We also found concerns with Lab organizational independence, legacy statutory responsibilities, lack of comprehensive policies, agreements with other laboratories, and reliance on federal grants to fund equipment purchases with little contingency planning if federal grant funding became unavailable.

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RECOMMENDATION SUMMARY

Observation Number	Page	Legislative Action Required	Recommendation	Agency Response
1	22	No	Develop productivity performance measures for the Division of State Police (State Police) Forensic Laboratory (Lab). Establish performance goals, develop a program to monitor goal achievement, and update performance expectations when necessary.	Concur
2	24	No	Formalize, document, and communicate case prioritization, case acceptance, and evidence analysis policies. Review, document, and communicate case prioritization, case acceptance, and evidence analysis policies.	Concur
3	28	No	Define and improve reporting of backlog and turn-around times. Make necessary changes to minimize monthly backlogs. Develop, implement, and monitor a plan to minimize standing backlog.	Concur In Part
4	36	No	Review the efficiency and effectiveness of the Digital Evidence Unit.	Concur In Part
5	40	No	Consider utilizing instant drug tests and verifying only positive test results in the Lab.	Concur
6	42	No	Consider reclassifying or re-grading positions reflecting tasks performed, and utilizing current Evidence Control Unit personnel in an analytical capacity.	Concur In Part
7	44	No	Improve the efficiency of the Blood Toxicology Unit by fully utilizing available software.	Concur In Part
8	48	No	Develop and implement external oversight and review procedures of Lab management and operations. Develop Lab-wide strategic and annual performance goals. Develop an audit plan and expand the scope of internal audits and reviews. Increase follow-up on audits and reviews. Improve remediation and close-out from findings. Develop a project plan to migrate Lab operations to more rigorous accreditation standards.	Concur In Part

Observation Number	Page	Legislative Action Required	Recommendation	Agency Response
9	52	No	Improve document controls, improve standard operating procedure (SOP) language and processes, and migrate to best practice standards for all current SOPs.	Concur
10	55	No	Identify and document all non-conforming work and ensure quality assurance review. Develop a tool ensuring objective and systematic assessments of deviations and non-conforming work. Report all corrective actions and deviations in case files. Consider corrective actions in performance evaluations.	Concur In Part
11	60	No	Consider including measures of uncertainty in reports and courtroom testimony, where applicable.	Concur In Part
12	62	No	Document completion of all elements of technical and administrative reviews in each case file. Technically review a representative sample of cases in each discipline. Ensure reviewers demonstrate competency and duties are appropriately segregated. Establish outsourcing requirements for technical reviews in disciplines and sub-disciplines with too few analysts to preserve controls.	Concur In Part
13	69	No	Review for appropriateness: the *Chain of Custody Change Report*; evidence intake and handling practices; and storage procedures. Ensure the laboratory information management system (LIMS) is secure. Conduct physical cycle counts of evidence.	Concur In Part
14	73	No	Review the Criminalistics Group area ensuring adequate: physical separation between Units, ventilation, electrical resources, and workspace. Conduct a needs assessment.	Concur In Part
15	78	No	Secure internal access points to analytical areas of the Criminalistics Lab and Toxicology Group intake counter. Develop a better method to monitor after-hour Lab and evidence storage area access.	Concur In Part

Observation Number	Page	Legislative Action Required	Recommendation	Agency Response
16	81	No	Comply with Lab policies restricting Lab access. Establish a more secure system for oversight and storage of keys, allowing levels of restricted access.	Concur
17	83	No	Improve controls over evidence storage by: locking storage area doors within secure Lab areas during business hours; installing a tracking system; segregating high-profile items from general evidence; providing individual, temporary, secure storage; and reviewing access logs.	Concur In Part
18	88	Yes	Consider reclassifying personnel pay schedules and the Director position. Record and monitor after-hours recalls.	Do Not Concur
19	92	No	Implement a timekeeping tool capturing work performed by Lab personnel and differentiating between administrative and analytic tasks. Require supervisory pre-approval, review, and tracking of all overtime. Consider assigning administrative personnel to administrative functions currently performed by managers or analysts. Evaluate the expert witness duties and position. Implement controls to prevent overpayments.	Concur In Part
20	97	No	Evaluate current personnel responsibilities related to non-analytical, IT-related tasks; consider reassigning routine non-analytical, IT-related tasks; and consider seeking a DoIT employee dedicated solely to supporting highly technical Lab IT functions.	Concur In Part
21	100	No	Adhere to fiscal notes regarding future position reclassifications and reconsider proposals to reclassify personnel transferred from the Pari-Mutuel Lab.	Do Not Concur

Observation Number	Page	Legislative Action Required	Recommendation	Agency Response
22	102	No	Ensure training requirements across all disciplines, and document training and competency assessments. Institute and document training requirements for new equipment and methods. Develop individual training plans. Utilize blind proficiency testing in appropriate circumstances. Develop and document objective standards for determining when discrepant proficiency test results can be considered a successful pass.	Concur In Part
23	108	No	Ensure background investigations are complete and ongoing staff monitoring is performed.	Concur In Part
24	110	No	Increase supervision and ensure adequate segregation of duties in the Trace Unit. Institute mitigating controls when adequate segregation of duties is not practical.	Concur In Part
25	112	No	Determine whether Lab and State Police complaints investigation policies should be aligned and if State Police *Professional Standards of Conduct*, Chapters 26-E and 1-AA apply to the Lab. Review the Lab's complaint and non-conformance policy.	Concur
26	116	No	Perform a comprehensive review of information technology (IT) controls with the Department of Information Technology (DoIT) or competent third party. Develop, document, and implement IT policies and procedures. Implement intrusion response plans, policies, and procedures, including a reporting system. Review existing logging and audit trail capabilities and institutionalize system monitoring. Develop a strategic IT plan. Maintain a complete inventory of IT assets and system topologies. Consider implementing one LIMS Lab-wide. Review and limit employee hours spent on non-analytical IT-related tasks. Consider requesting additional DoIT assistance.	Concur

Observation Number	Page	Legislative Action Required	Recommendation	Agency Response
27	118	No	Ensure better physical security over the computer containing Lab access system software. Require password changes periodically, monitor attempts to access the system, and follow-up on all unauthorized attempts. Document all changes to access levels.	Concur In Part
28	120	No	Test, validate, revise, and implement disaster recovery and continuity of operations plans.	Concur In Part
29	122	Yes	Establish administrative rules detailing Lab structure, policies and procedures, fee schedules, required forms, and right-to-know requests. Seek Legislative authority to charge for film processing. Update Administrative Rule Saf-C 6300.	Concur In Part

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OVERVIEW

In January 2010, the Fiscal Committee of the General Court approved the joint Legislative Performance Audit and Oversight Committee's (LPAOC) recommendation for a performance audit of the Department of Safety (DOS), Division of State Police (State Police), Forensic Laboratory (Lab). The purpose of the audit was to determine whether the Lab operated efficiently and effectively. The LPAOC approved the audit scope at its January 2010 meeting.

SCOPE, OBJECTIVES, AND METHODOLOGIES

Scope And Objectives

Our audit sought to answer the following question: **How efficient and effective was the Lab during the audit period, State fiscal years (SFY) 2009 and 2010?** To address this question, we focused on the Lab's organizational structure, operations, allocation of resources, and policies and procedures, including how the Lab established priorities. Our audit did not include a review of the science or scientific methodologies employed by the Lab.

Our January 2010 scope statement included reviewing service delivery and the funding structure in the Lab and similar laboratories in other states, as well as the application of supporting technology. Our review of the application of supporting technology was not detailed and our review of service delivery and funding did not include how similar laboratories in other states delivered forensic services. We did not re-analyze Lab analytical conclusions, nor did we substitute auditor judgment for the judgment of Lab management and staff in the technical results of their work. We assessed whether the systems supporting the Lab's work were consistently applied, efficient, and effective, concentrating on areas where the Lab could continue to make improvements. Most Lab customers we surveyed concluded the Lab's work was well-respected and generally met their needs, although the response rate of our survey was inadequate to permit drawing conclusions about the total population of Lab customers.

Methodologies

To gain a general understanding of the Lab's role, responsibilities, organization, and operations, we:

- examined the structure and funding mechanism for other laboratories within the State;
- reviewed timeliness of service delivery and performance, staffing, and workload data;
- examined industry practice by reviewing materials from academia, federal and state government, and professional organizations focused on similar laboratory services;
- compared Lab practices and controls to applicable standards;
- conducted physical inspections and observations of Lab operations;
- reviewed staff qualifications;
- surveyed Lab customers and analyzed results;
- reviewed State laws, the State Police website, administrative rules, policies, procedures, professional standards of conduct, annual reports, personnel documents,

organizational charts, supplemental job descriptions, class specifications, and vision and mission statements;
- interviewed DOS, State Police, and Lab management, and other Lab personnel; and
- reviewed the Collective Bargaining Agreement and related Appendices.

To gain a general understanding of other states' crime laboratories, we:

- conducted an Internet search of other states' crime laboratories to review organization and funding structure; and
- reviewed audits, evaluations, and studies of other jurisdictions' crime laboratories.

To examine the Lab's allocation of resources, we reviewed:

- the Lab's facilities, assessing allocation of physical resource needs;
- personnel compensation and assignment, assessing personnel and funding allocation;
- case processing data, assessing the productivity of the Lab;
- grants and funding sources, assessing use of funds; and
- the Lab's equipment inventory, assessing adequacy of the Lab's equipment.

To identify strengths, weaknesses, and risks in the Lab, we:

- reviewed and analyzed the Lab's source of funds and expenditures, including federal grants and employee compensation;
- reviewed the Lab's security controls and compared them to industry practice;
- reviewed Lab request submission, completion, and backlog data for accuracy;
- emailed a survey to 153 of 249 Lab customers, receiving 73 responses (48 percent), the results of which could not be extrapolated to the population due to the inadequate response rate;
- reviewed curricula vitae, supplemental job descriptions, class specifications, and internal documents;
- obtained an inventory of information technology (IT) hardware and software, reviewed IT policies and procedures, and reviewed management controls over the Lab's keycard access system;
- interviewed Lab management and appropriate personnel;
- issued a questionnaire to all Lab personnel assessing the time dedicated to non-analytical, IT-related tasks;
- reviewed all personnel files reviewing personnel qualifications;
- reviewed all deviation reports and corresponding case files;
- reviewed all corrective action reports and a non-representative sample of corresponding case files;
- reviewed all personnel background investigation files;
- reviewed industry-related literature, industry consensus practice, accreditation standards and other industry practice literature; and
- reviewed management control best practices.

BACKGROUND

The Lab began operations shortly after the creation of the State Police in 1937, but was not codified in statute until 2004 when the toxicology component of the Department of Health and Human Services, Public Health Laboratory and the urine testing laboratory of the Department of Corrections (DOC) were incorporated into the Lab. In 2008, three personnel were transferred to the Lab from the former Pari-Mutuel Commission's laboratory when it was disestablished and the Commission's testing function outsourced.

The Lab is the main provider of forensic laboratory services in New Hampshire. RSA 106-B:2-a states "The commissioner of the department of safety may establish, equip, and operate a forensic science laboratory with such expert assistants and such facilities as are necessary to support the investigatory, analytical, and enforcement functions of the state criminal, motor vehicle, hazardous waste, and other public safety laws." The Lab receives and analyzes evidence from city and town law enforcement agencies, State agencies including the State Police, county sheriff departments, city and town fire departments, and, on occasion, federal law enforcement agencies conducting criminal investigations in the State. In State fiscal years (SFY) 2009 and 2010, the Lab served at least 249 different customers, based on unaudited data provided by the Lab. The Lab provided services in 11 disciplines including: controlled drugs, digital evidence, deoxyribonucleic acid (DNA), firearms and toolmarks, identification, serology, trace, imaging, blood toxicology, urine toxicology, and breath alcohol. The Lab also provided evidence control, court testimony, imaging for courtroom testimony, crime scene investigation for major crimes, and training for law enforcement on evidence collection and preservation. Additionally, the Lab provided urine testing for probationers and parolees for the DOC and for State employees when required for employment; tested beverage alcohol content; trained and certified operators of evidentiary breath alcohol testing devices; supported cold case investigations; and maintained dental records for missing persons, matching them against unidentified decedents.

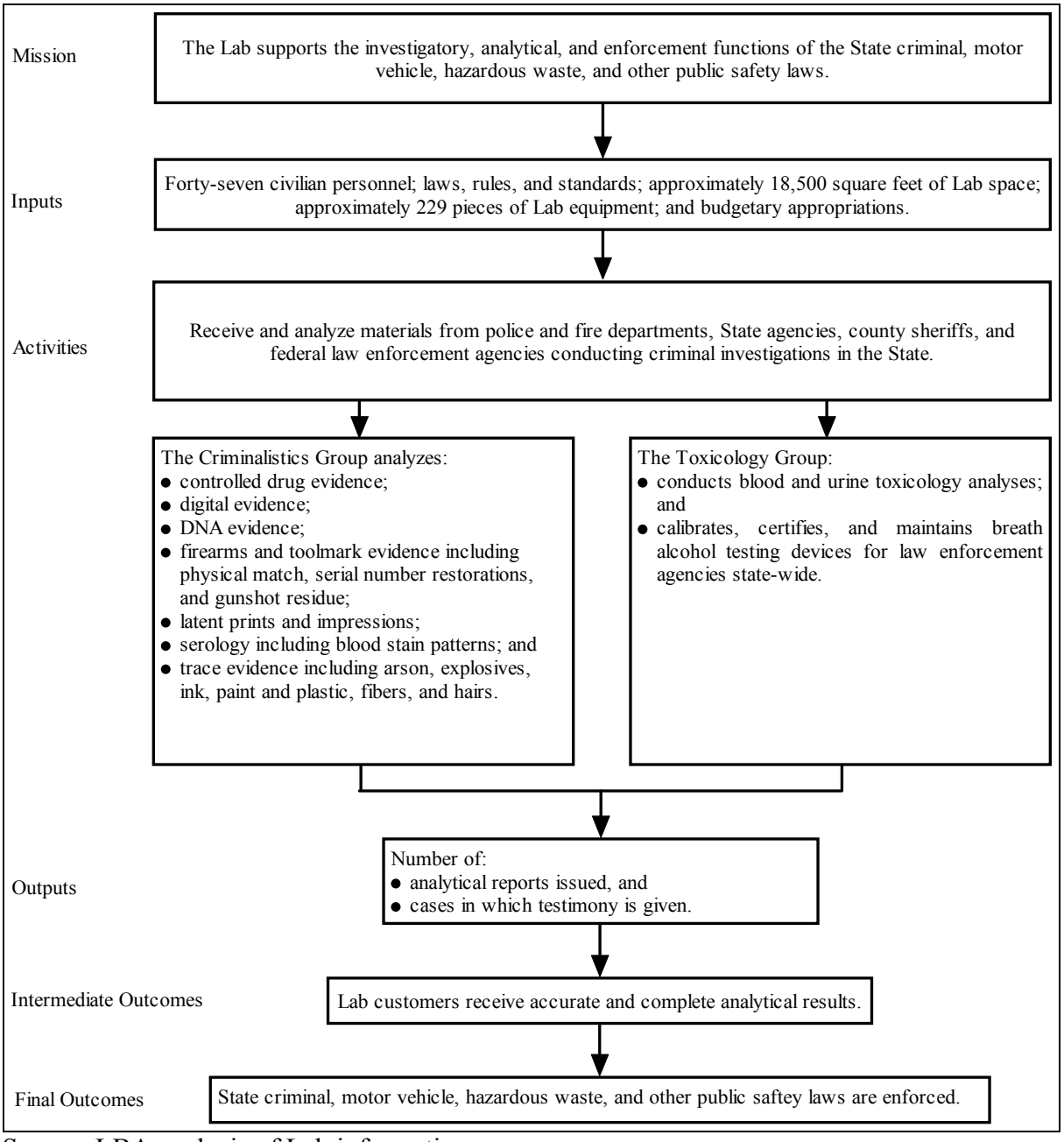
The logic model in Figure 1 graphically depicts the causal relationship between mission, inputs, activities, outputs, and outcomes for major program goals. The logic model starts with the Lab mission, identifies inputs, and then divides into major Lab activities which describe what the Lab does to produce outputs. Outcomes are what statute intends the Lab to achieve through its activities. Outcomes should be linked back to the mission.

Organization And Personnel

The Lab is organized into Criminalistics and Toxicology Groups. As of September 2010, 47 of 52 Lab positions were filled. The five vacancies included an Assistant Laboratory Director position and four Criminalist positions. The Criminalistics and Toxicology Groups were further divided into discipline-specific Units as detailed in Figure 2. In January 2009, open positions were frozen but in August 2009, federal American Recovery and Reinvestment Act grants totaling $244,000 were awarded to the Lab, funding one analytical position for 2.5 years. Approximately $450,000 in other federal grants were awarded for federal fiscal year 2010 for overtime, training, and equipment.

Figure 1

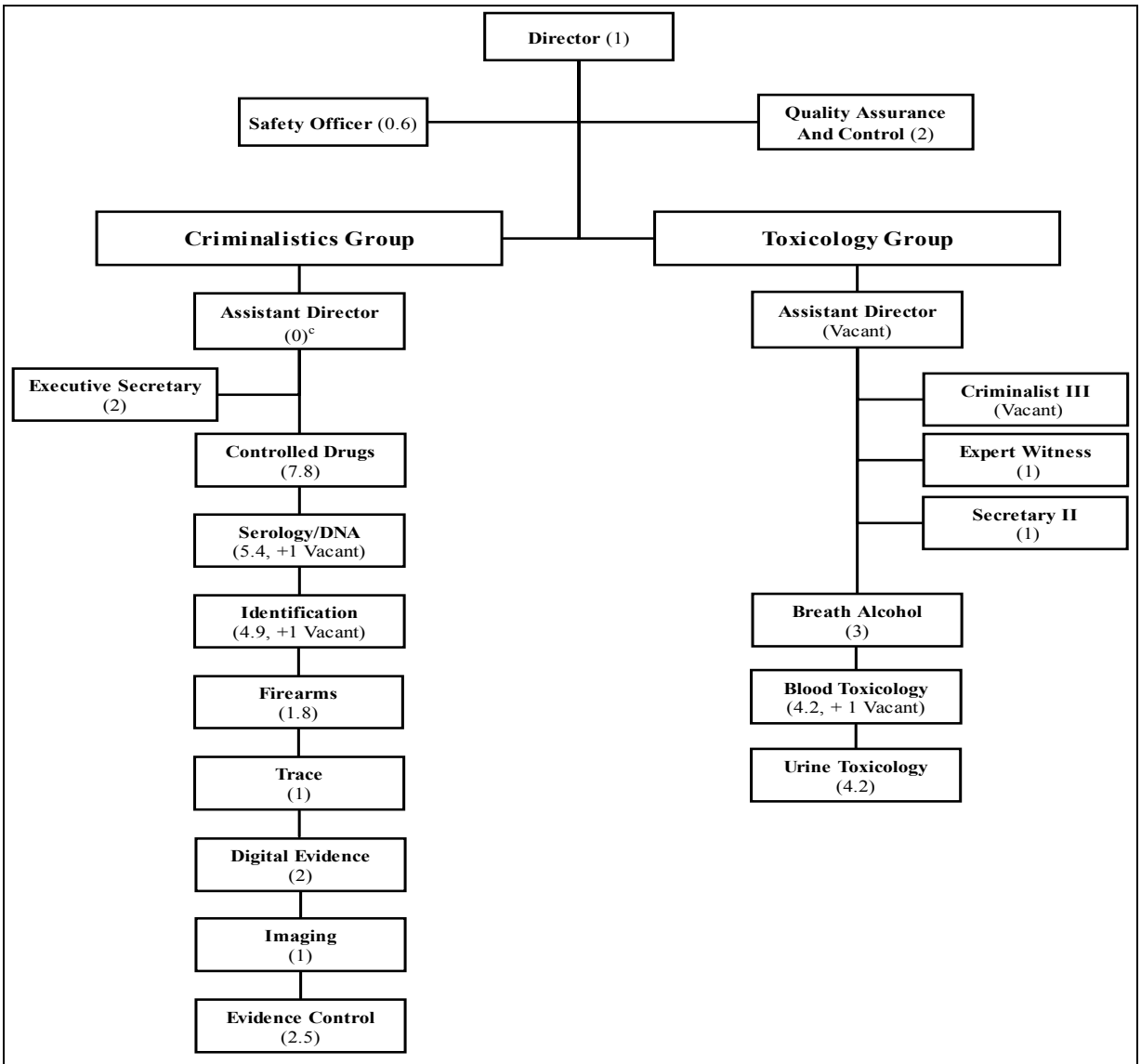
Lab Logic Model



Source: LBA analysis of Lab information.

Figure 2

Lab Structure, February 2011[a, b]



Notes:

[a] Full Time Equivalent (FTE) positions total less than 47 due to four part-time employees.
[b] Numbers in parentheses denote FTE positons.
[c] The Criminalistics Assistant Director position was filled but there were no FTE hours assigned.

Source: LBA analysis of unaudited Lab information.

Sources Of Funds And Expenditures

As detailed in Table 1, SFY 2009 Lab funding neared $4.3 million. General Funds accounted for nearly $1.1 million, federal funds accounted for under $500,000, and transfers from Highway Funds accounted for over $2.6 million. SFY 2010 Lab funding totaled nearly $4.8 million. The Lab received $1.3 million in General Funds, over $2.8 million in Highway Funds, and nearly $600,000 in federal funds. Most Lab services were provided at no cost to the requesting agency and an estimated 75 percent of all services were provided to municipalities.

Table 1

Lab Sources Of Funds And Expenditures,
SFYs 2009 And 2010

Sources Of Funds	SFY 2009	SFY 2010
Federal Funds [a]	$ 424,409	$ 590,615
Highway Funds	2,651,534	2,863,874
Revolving Funds	62,338	53,756
General Funds	1,108,481	1,290,279
Total Sources Of Funds	$ 4,246,762	$ 4,798,524
Expenditures	**SFY 2009**	**SFY 2010**
Personal Services – Permanent	$ 2,319,214	$ 2,506,903
Personal Services – Temporary	57,082	94,579
Benefits	972,491	1,159,361
Overtime	168,615	108,277
Current Expense	397,396	365,840
Equipment	85,437	351,817
Other Expenditures [b]	246,529	211,748
Total Expenditures	$ 4,246,764	$ 4,798,525

Notes:

[a] Federal Funds include federal grants to the Department of Justice subsequently transferred to the DOS.

[b] Other Expenditures include rents and leases, maintenance, organizational dues, indirect costs, audit fund set-aside costs, consultants, training, travel, and contracts.

Source: LBA analysis of unaudited Lab financial data.

Lab Equipment And IT Systems

The Lab was highly dependent on analytical equipment and IT systems for daily operations. The Lab relied on the Department of Information Technology, private contractors, the federal government, and Lab employees to support IT systems. Major IT systems included two distinct laboratory information management systems (LIMS) supported by different vendors, a digital image evidence management system, a forensic storage and review system, and a video testimony system. The Criminalistics Group and Blood Toxicology Unit relied on a LIMS to

track evidence, request analyses, and internally document chain of custody. The Urine Toxicology Unit used a different LIMS to track analyses and the Breath Alcohol Unit used a combination of electronic databases and spreadsheets. The Criminalistics Group LIMS and stand-alone analytical instruments used to conduct core functions were supported by Lab staff with vendor assistance. Additionally, in 2008, the Lab purchased video equipment to facilitate analysts' video testimony. Video testimony allowed analysts to testify remotely instead of traveling to courts throughout the State, saving travel time and increasing analytical time; however, video testimony was reportedly only used once. The video testimony system was managed by Lab personnel. Systems supported primarily by the federal government, or a commercial contractor through the federal government, included the Integrated Automated Fingerprint Identification System, Integrated Ballistics Information Systems, and Combined Deoxyribonucleic Acid (DNA) Index System (CODIS).

Quality Assurance And Control

International Organization for Standardization/International Electrotechnical Commission (ISO), *General Requirements for the Competence of Testing and Calibration Laboratories (General Requirements)*, concludes management must be committed "to the development and implementation of the management system and to continually improving its effectiveness." The Lab's quality assurance system uses a total quality management approach with continuous process improvement. The purpose of the Lab's *Quality Assurance Program Manual* was, in part, to seek "continuous improvement in all facets of laboratory operations." The Lab's quality system and policy statement establish the Lab's commitment to "the highest quality service available," requiring "all personnel…take an active role in establishing, implementing, and maintaining the quality assurance program."

The Lab adhered to and was accredited under the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) Legacy standards. Initial accreditation includes a formal application and an inspection by the accrediting body documenting compliance with all accreditation standards. This inspection includes a review of case files and policies and procedures and interviews of personnel. During the initial application process, the entity seeking accreditation has up to 12 months from the date of inspection to correct any shortcomings. To renew accreditation, the entity seeking accreditation must submit the required application documents six months prior to expiration and present the ASCLD/LAB with annual self-evaluations. The ASCLD/LAB conducts accreditation reviews every five years which mirror the initial accreditation process and encompass a review of cases selected by laboratory supervisors. Any issues of non-compliance must be corrected within 180 days to remain accredited. The DNA Unit within the Criminalistics Group received external quality assurance audits biennially to assess compliance with quality assurance standards for DNA laboratories issued by the Federal Bureau of Investigation (FBI) Director.

The Lab had two non-accredited Units: Imaging and Breath Alcohol. Accredited Units in the Criminalistics Group maintained accreditation since 2004, while accredited Units in the Toxicology Group maintained accreditation since 2006. Accredited Units were reaccredited in 2009. In 2009, the Lab paid $13,600 for the ASCLD/LAB inspection fee and $5,390 for annual accreditation in calendar year 2010. The Lab reported working towards a 2014 accreditation

under the more rigorous international standard using ISO 17025 criteria.

The Lab's internal quality assurance and quality control system included:

- two Quality Assurance Managers;
- policies and procedures covering safety, training, and analytical procedures;
- a quality manual;
- training programs;
- a competency program;
- a proficiency testing program;
- document control processes;
- evidence handling procedures;
- validation processes for new equipment and methods;
- calibration and quality control verification processes;
- technical and administrative reviews;
- testimony monitoring;
- deviation management;
- monitoring non-conformities and implementing corrective and preventative actions;
- customer feedback surveys; and
- internal audit and quality system review processes.

Prioritization And Backlog

Lab policies required cases be analyzed in the order received, with some exceptions. Its policies allowed the Lab to prioritize criminal cases involving juveniles, while criminal and toxicology analyses needed for court or grand jury purposes may have been prioritized at the request of the submitting agency. The Lab also informally prioritized crimes against people over crimes against property. In practice, cases with court dates were the highest priority.

Definitions of "backlog" vary among sources. The U.S. Department of Justice, on its DNA Initiative website, defines backlog as a case not completed within 30 days of receipt. However, according to the Assistant Lab Director, a backlogged case was any case awaiting analysis. According to the Lab Director, case backlog may not have been an adequate measure of Lab effectiveness. The quantification of the work within each analytical request not yet completed more accurately reflects effectiveness and backlog. Not all cases required the same amount of effort. One case may have consisted of one item for analysis, while another case may have consisted of 25 or more items. The Lab started tracking discrete analysis time at the sub-case, or request level in 2010, which may have allowed for improved backlog measures. Monthly, the Lab tallied the number of requests received, processed, and backlogged in each discipline.

Unaudited Lab data indicated 33,994 requests were received and 34,007 were completed in SFY 2009 and 31,078 requests were received and 30,827 requests were completed in SFY 2010. Monthly requests received and processed decreased over time in SFYs 2009 and 2010, while monthly backlog increased during the same period. Unaudited Lab data identified 3,346 open

cases, with 341 (10 percent) cases over one year old and 840 (25 percent) more than six months old as of February 2011.

According to the Lab Director, New Hampshire's population increase led to increased crime and increased demand for Lab services. Backlog was also reportedly due to the 2009 ASCLD/LAB reaccreditation process, which consumed staff time and effort that could have been dedicated to completing casework; renovations which required protracted shutdown of Lab operations; and the Lab's role adhering to a recent State law mandating convicted felons provide DNA samples to the State for the national database, which made 9,000 to 10,000 convicted felons subject to sampling.

Attempting to reduce backlog, the Lab Director implemented changes to Lab procedures, including alternative work schedules and limited analysis within cases. The Lab also applied for federal grants allowing for overtime funding to enter DNA samples into CODIS.

Significant Achievements

Performance auditing by its nature is a critical process, designed to identify weaknesses in past and exisiting practices and procedures. Noteworthy management achievements related to the scope of the audit are included here to provide appropriate balance to the report. Significant achievements are considered practices, programs, or procedures performing above and beyond normal expectations. Lab management provided the following examples they and we consider noteworthy achievements.

Implementation Of A Remote Viewing System For Digital Evidence

The Lab has been processing digital evidence since 2000. One important step in analyzing digital evidence is to create a forensic duplicate of the data from the evidence computer or digital device. Originally this was done by purchasing hard drives to store a copy of the data. This presented several problems. First, computers have increased their storage capability tremendously, and larger hard drives needed to be purchased for data storage. Second, there was no backup associated with saving the data on a single removable hard drive. Third, submitting agencies needed to come to the Lab to review the computer data saved on this duplicate drive to identify the images or data they were interested in.

In 2006, the Lab acquired a 22 terabyte storage area network (SAN) for storing case data. Not only did the SAN provide backup and archiving capabilities so the data for each case was protected from loss or a drive failure, it was configured to allow remote viewing over the State Police secure wide area network. Investigators were given a password and Internet protocol address to connect over the wide area network in order to review their case. Any evidence found was then copied to a DVD or printed at the Lab for evidentiary purposes. To date, the Lab has signed memoranda of understanding with 40 law enforcement agencies. This saved police departments travel time and allowed them to review the data at a convenient time and place.

Creation Of The Evidence Control Unit In The Criminalistics Group

The Evidence Control Unit was created to address interruptions Criminalistics Group analysts experienced when called to log evidence in or out of the Lab for their respective disciplines. This forced Criminalists to start and stop their analytical processes, which should be avoided. The main responsibility of the three individuals assigned to the Evidence Control Unit was to receive and return evidence for the Criminalistics Group and enter case information into the LIMS. This has relieved the burden on the analysts in the Criminalistics Group of transferring evidence.

Increased Effectiveness Due To Implementation Of Drug Confirmations In The Urine Toxicology Unit

In the past, the Urine Toxicology Unit performed only screening tests for the presence of drugs in urine. One screening test was performed, and if a sample tested positive for any drugs, a second screening test utilizing the same technology was performed. The major drawback of screening tests is they can only test for a class of drugs, not a specific type of drug. For example, someone on probation may have a prescription for Oxycodone, but be abusing heroin. The screening test would show a positive result for opiates, which could be explained by the Oxycodone prescription. There would be no independent evidence of the heroin abuse. Neither of the two screening tests served to confirm the presence of a particular drug. Ideally, a positive screening test should be followed up by a more specific confirmatory test. With a commitment to more robust and accurate toxicology tests, the Urine Toxicology Unit validated and incorporated routine confirmatory drug tests, so the presence of a particular drug, rather than just a class of drugs, can be confirmed when necessary. During calendar year 2010, the Toxicology Group confirmed the presence of specific drugs for 1,500 cases, providing stronger evidence in court to show an individual may be in violation of the conditions of their probation or parole.

LABORATORY OPERATIONS

As the main provider of forensic laboratory services in New Hampshire, the Division of State Police (State Police) Forensic Laboratory (Lab) received and analyzed evidence in 11 disciplines from at least 249 different customers during the audit period. The Government Accountability Office (GAO) suggests in its *Internal Control Management and Evaluation Tool (Internal Control)*, to assess the efficiency and effectiveness of operations, management must review data, analyze trends, and measure results against established goals. Performance evaluation and feedback is necessary to help employees understand the connection between their performance and the organization's success. Accurate data are an integral part of management decision making. Information should be based on accurate data which has been tested, reconciled, and validated.

Timely and accurate evidence processing underpins successful investigations, identification of suspects, and prosecution of criminal defendants. Efficient and effective Lab operations, allowing for quick and accurate processing times, can help provide justice in a particular case, and protect the public from further criminal activity which may occur if cases remain unsolved. Eliminating redundancies, improving efficiency, and reducing backlog are needed to reduce long-term costs, provide faster turnaround to law enforcement agencies, and better protect the public.

Performance measures comparing actual to expected performance help management understand the efficiency and effectiveness of operations. Performance measures strengthen management controls by identifying, measuring, and assessing core activities. Prioritizing cases and case acceptance policies to minimize backlogs are common forensic laboratory practice. Formal written plans for minimizing case backlogs, including timetables and monthly progress monitoring, should be developed. These plans should incorporate performance expectation levels.

We identified several opportunities to improve effectiveness and efficiency of Lab operations. The Lab should improve its performance measures. It did not collect all necessary data to effectively measure analyst productivity, use data to effectively assign analyst time, or effectively manage backlogs. Lab efforts to measure relative effectiveness of staff or Units were not evident. Backlogged requests and older cases affected the Lab's ability to best meet customers' needs. Informal case prioritization practices were neither formalized nor reviewed for case impact. Further, three Units relied on inefficient work processes. The Lab might have been able to re-task resources and personnel to other areas of the Lab had these processes been optimized. This included one Unit in the Toxicology Group which used the same case management method as it did before it was merged into the Lab from the Department of Health and Human Services, Public Health Laboratory in 2004. The same method to screen urine samples was also carried-over and remained in place.

Observation No. 1

Improve Performance Measures To Increase Efficiency And Effectiveness

During the audit period, the Lab did not collect all necessary data to measure analyst productivity, or use data to effectively assign analyst time.

Analyst Productivity

During the audit period, while the Lab collected workload data, the effectiveness of analyst productivity measures should have been improved, and the Lab should have assessed analyst productivity when making case assignment decisions. Thirty-eight analysts, three of which were part-time, conducted analyses in 11 different disciplines. At least 14 of 38 Lab analysts (37 percent) completed work in more than one discipline, and analysts were permitted to choose which case they worked next. Unaudited Lab data demonstrated productivity by analyst varied significantly within disciplines. If the Lab implemented individual and Unit performance goals, analyst productivity could have been measured, enhancing accountability.

The Drug Analysis Unit had nine analysts assigned who reportedly spent between 40 and 100 percent of their time on drug analysis. Similarly, the Identification Unit had seven analysts assigned, with analysts devoting between ten and 100 percent of their time to the Unit. Analysts' productivity varied significantly. For example, two analysts in the Identification Unit accounted for ten percent of the completed work, but accounted for 49 percent of the time spent in the Identification Unit. In the Firearms Unit, one analyst accounted for 76 percent of the completed work compared to 24 percent by the other analyst. However, each analyst had 90 percent of their time assigned to the Unit. A Lab manager noted total completed requests was "an unfair basis for measuring productivity of one analyst against another" due to other responsibilities and variety and complexity of cases; however, when considered over time, these data can be used to assess analyst productivity and improve decision-making regarding analyst assignment. Lab management did not require Lab personnel account for how their regular or overtime hours were spent, such as time spent on analyses; additional, non-analytic duties; or administrative tasks. Lab management did not track employee production and progress, or account for time spent on analytical and non-analytical tasks, with its generic timekeeping tool. Based on assignment, case completion, and backlogs, the Lab could not demonstrate the effectiveness of analysts' assignments.

Unit Performance Measures

The GAO in *Internal Control* suggests control activities should include performance measures comparing actual and expected performance. Performance measures allow management to understand the efficiency and effectiveness of operations, while identifying and meeting performance goals. Performance measures strengthen management controls by identifying, measuring, and assessing core activities. The Lab did not use performance measures which could identify trends, shortcomings, and successes.

Performance indicators can identify spikes and trends. We identified trends by analyzing unaudited Lab data to assess analyst and Unit productivity, and backlog. By not conducting similar analyses, the Lab could have missed opportunities to improve efficiency and effectiveness. For example, the Lab may have considered reassigning analysts during months when case submissions increased at a rate inconsistent with the trend, creating long-term backlog.

Performance measures, including analyst productivity, backlog, case turn-around times, non-conformities, aspects of quality control, and other relevant data could be used to improve the efficiency and effectiveness of the Lab.

Recommendations:

We recommend Lab management improve performance measures by:

- **developing productivity performance measures for analysts, Units, and the Lab;**
- **establishing performance goals; and**
- **developing a program to monitor goal achievement and update performance expectations when necessary.**

Auditee Response:

We concur.

Our overall goal is to provide the highest quality service available to all members of the law enforcement community. We have implemented a rigorous quality assurance program designed to help ensure the work coming out of the Laboratory is reliable and accurate. Analysts currently set goals as part of their annual self-evaluation and these goals are reviewed with supervisors during the formal performance evaluation which takes place each year. The annual performance evaluation also rates an employee's quantity of work as one of the standard performance measures, which provides the supervisor an opportunity to give feedback to an employee on their productivity, or explore how productivity may be enhanced.

Action item: Lab management will formalize its annual and long term performance goals for each unit and the Lab, and communicate them to staff members.

Regarding productivity, many Lab analysts have multiple duties such that their time is not devoted 100% to a single discipline. In the instance of an analyst in the Identification Unit only devoting 10% of their time to the Unit, the Senior Criminalist in that Unit is also responsible for supervising the Identification Unit, the Firearms Unit, and the Evidence Control personnel. He does analytical work in the Firearms Unit (accounting for the 24% figure cited in the report) as well as performing technical and administrative reviews for Identification and Firearms. He is also the LIMS Administrator. The observation also mentioned drug analysts spending 40-100% of their time on drug analysis. Three of the drug analysts also perform Trace Evidence analysis, and so their time is split between the two units. Other analysts have additional responsibilities outside the Drug Unit as well. In a Lab with a limited number of personnel to accomplish

numerous services it is not unusual for analysts to divide their time among several duties and units, such that they are not spending 100% of their time performing analytical work in a particular area.

Each month, the Laboratory Director obtains a report from the LIMS system which documents each analyst's and unit's case output. The request numbers are collated into a monthly report, which is routed throughout the Laboratory staff and to the State Police Director. However, the numbers of requests completed per analyst is not a good measure of an analyst's productivity, as all requests are not the same. For example, a single homicide case could have up to 20 separate requests for analysis, each comprised of numerous items of evidence for examination. One analyst working on that homicide case in serology could spend numerous days just on that one case, whereas another analyst could work several burglary cases in a single day. Comparing these analysts' productivity would provide misleading information, as the time necessary for these analyses cannot be considered comparable.

Our primary focus is on quality of work and we continue to look for review criteria that will ensure that quality and quantity are not mutually exclusive. In the past we have chosen not to set individual performance goals measured in case output for the following reasons. A primary concern has been that it may lead to cutting corners to meet them, which the Lab will not tolerate. Time spent by an analyst doing a quality job is time well spent. We expect analysts to use their time wisely, and we review case output on a monthly basis as well as reviewing quantity of work during the performance appraisal.

Action item: While being cautious not to establish performance goals for analysts based in significant part on case output, we will communicate with other forensic laboratories to determine what methods they are using to evaluate performance, and adopt a better way if one can be discovered that does not compromise accuracy and reliability. We will institute a LEAN process within the Lab to develop performance measures for analysts, units, and the Lab to increase efficiency and effectiveness within the next six months.

Observation No. 2

Improve Case Prioritization, Case Acceptance, And Evidence Analysis Policies

The Lab should have consistently followed its documented case prioritization policy. Also, the Lab's case and evidence acceptance policies could have more effectively dealt with growing backlogs.

Case Prioritization

Prioritizing cases is a common and necessary practice. However, the Lab's documented prioritization policy was not always followed.

Other forensic laboratories' case prioritization policies included prioritizing crimes against people or cases with pending court dates. One laboratory prioritized cases when service demand

exceeded the laboratory's ability to meet customer needs. Lab standard operating procedure (SOP) Quality Assurance (*QA) 120, Criminalistics Group Evidence Control, Section 5.1,* stated criminal cases should "generally" be worked in the order received by the Lab. The policy allowed exceptions for pending court or grand jury dates and juvenile cases. SOP required an administrative note in the case file documenting case prioritization. Lab SOP *QA 250, Toxicology Group Evidence Control, Section 4.1,* provided similar prioritizations for the Toxicology Group. The Lab Director stated prioritized cases were juvenile cases, pending court dates, crimes against people, and then property crimes, although a property crime with a court date would have been prioritized over a crime against a person without a court date. Also, rape cases with known victims but without a court date would have been prioritized, as this was seen as a threat to public safety. There was no policy detailing prioritization practices, so it was unclear to what extent such cases were prioritized.

In practice, cases without a pending court date were pushed back to prioritize cases with court dates. The Lab Director estimated up to 90 percent of cases processed in the Drug Analysis Unit had pending court dates and approximately 75 percent of cases in the Identification, Digital Evidence, Trace, and Firearms Units had pending court dates. The turn-around time for cases lacking a pending court date resulted in one Lab customer noting, "[w]e cannot adequately investigate cases when forensic analysis takes upwards of 2 years for cases without a pendng [sic.] court date. For all the things the lab does well, this weakness brings the overall lab services to the level of poor." According to our Lab customer survey, 25 of 71 (35 percent) respondents noted turn-around times had negatively affected their agency's cases, with two of 25 agencies (eight percent) reporting as many as 15 cases affected in the past two years. At least 88 cases were reported as affected by 19 of the 25 agencies responding. Of the 73 surveys returned, there were 50 comments about insufficient turn-around times on 36 separate surveys (49 percent).

Prioritizing cases with court dates over other cases inadequately supported the investigative function. The Director stated the Lab never missed a known court date, but noted the practice may not have been optimal for cases without a court date. One state's crime laboratory audit noted prioritization based on a court date delayed case resolution for those lacking court dates and led to dismissed cases as officers lost contact with witnesses and lost memory of case details. This same audit noted when cases lacking court dates were continually delayed, the long wait led to sample deterioration, false negative results, and storage problems for drug evidence.

Case Acceptance

The Lab accepted any evidence collected in connection with a criminal or medical examiner investigation connected to New Hampshire. Limiting case acceptance by excluding misdemeanors, property crimes under a specified dollar value, or drug cases with minimal quantities such as residue would have improved timely case processing by reducing case submissions. The Lab had substantial backlogs in several disciplines with backlog exceeding 3,000 cases at the end of the audit period. We found it is common forensic laboratory practice to use case acceptance policies to help minimize backlogs.

Case Processing

Under the Lab's informal case processing policies, submitting agencies were asked to make a *need* versus *all* judgment, identifying which pieces of evidence were most relevant or probative and the Lab informed submitting agencies they would, for example, test "five of twenty pieces of evidence." The Lab also introduced practices stopping analysis once one positive match was determined, and testing only evidence most relevant to the charge. Stopping at one positive match or testing only the most probative evidence could fail to identify all suspects. However, the Lab Director stated if the submitting agency has multiple suspects the Lab may have continued analysis. Additionally, if a Sexual Assault Evidence Kit was submitted with an anonymous victim, the case was not analyzed. The Lab held the case for 60 days and if a victim did not step forward to the investigating agency, the evidence was returned to the submitting agency for disposition. The Lab Director acknowledged there could be some value in processing cases with anonymous victims and identifying repeat offenders, but the Lab does not process such cases. We found case analysis criteria are common forensic laboratory practice.

The Lab formalized evidence analysis processes only in the Drug Analysis Unit and for sexual assault cases in the Serology Unit. While evidence analysis policies could have been used to minimize backlogs and streamline workflows, the Lab did not document or fully communicate these decisions to all submitting agencies. There was no systematic process for establishing what would, and what would not be analyzed, or for requiring decisions be based on relevant facts of the case. Further, the Lab had no administrative rules to codify its processes, nor were the processes described in its *Handbook of Forensic Services*. The Lab had a policy to coordinate and communicate with submitting agencies for major cases such as homicides or major felonies with numerous exhibits requiring multiple analyses, but did not provide communication or analysis guidelines for all other cases. The Lab Director stated analysis decisions were handled case-by-case based on "common sense" and each analyst's communication with submitting agencies.

The Lab's practice of prioritizing cases with court dates, pre-selecting what pieces of evidence to analyze, stopping once a positive match was achieved, and excluding analysis on crimes with anonymous victims were not formalized and were not reviewed for case impact.

<u>Recommendations</u>:

We recommend Lab management improve case prioritization, case acceptance, and evidence analysis policies by:

- **formalizing and documenting all case prioritization practices and communicating all prioritization policies and practices to Lab customers, helping ensure full support of all investigatory, analytical, and enforcement functions;**
- **considering the implementation of additional case acceptance criteria to improve efficiency;**
- **formalizing, documenting, and communicating the Lab's evidence analysis, selection, and exclusion policies and practices to Lab customers; and**

- **reviewing, documenting and communicating all case prioritization, case acceptance, and evidence analysis policies.**

Auditee Response:

We concur.

The Laboratory has a policy of prioritizing cases when it is aware of upcoming court dates. We would find it unacceptable if criminal charges were to be dropped solely due to our failure to complete an analysis in time for court.

Action item: We will better document in our own SOPs, as well as better communicate with customers, which cases will receive prioritization, general criteria for a case to be expedited, and how submitting agencies can request that a particular case be rushed if necessary. This information will be included in the next edition of the Lab's Handbook of Forensic Services, which is distributed to all law enforcement agencies in the state. The next edition will be issued during the FY 2012-2013 biennium.

Laboratory management has long considered the possibility of changing case acceptance criteria to improve wait times for analyses. This decision does not come easily, as it would likely involve cutting back on services which are currently being offered based on the degree of offense or putting a cap on the number of items which will be analyzed for each case. Laboratory management cannot unilaterally make these changes without discussions with appropriate DOS and State Police management to determine whether changes to the case acceptance policy should be made.

Action Item: A meeting on the subject of changing case acceptance criteria to improve wait times for analysis will occur within the first six months of SFY 2012.

To maximize laboratory efficiency, the Laboratory has made processing decisions based on the apparent probative value of the evidence. Frequently, the submitting agency is consulted when making processing decisions and is asked to assist with determinations regarding which items of evidence may be the most relevant for a case. However, some processing decisions are made to avoid redundant analyses. For example, if semen is found on samples taken directly from a rape victim's body, there is no added benefit to analyzing bed sheets, pillowcases, or additional outer clothing items merely because they were submitted to the Lab. In this case, and in every case when not all evidence items submitted are analyzed, a statement appears in the report to alert the submitting agency that no additional analyses will be taking place absent further case information. If the submitter would like additional items to be analyzed based on circumstances about the case of which the Lab is not aware, they have the opportunity to contact the Lab and explain what additional items should be analyzed and why.

Action item: While some units have memorialized processing policies in their unit SOPs, it is possible that this information has not been clearly communicated to submitting agencies. The Laboratory will more clearly define its processing scheme in unit SOPs, as well as including this information in the Handbook of Forensic Services.

The laboratory's policy of not analyzing evidence related to sexual assaults that have not yet been reported to police in which the victim remains anonymous is documented in lab policy, as well as in the Acute Care Protocol for Medical/Forensic Evaluation distributed by the NH Office of the Attorney General and posted on the New Hampshire Coalition Against Sexual and Domestic Violence web site. There is very limited value in performing analysis in such instances. The audit report suggests that repeat offenders may be identified if such cases were tested. The only way to identify repeat offenders is to have a tool for the comparison of DNA profiles from multiple cases. This tool is the Combined DNA Index System (CODIS). However, these cases do not qualify under the federal protocols for inclusion in the CODIS system. Since the offense was not reported to law enforcement, it cannot be determined that the submitted samples are in fact evidence from a crime. Further, it would not be known whether any DNA profile developed may be from a consensual partner and therefore is not probative to the alleged offense.

Action item: By including information on the Lab's prioritization of cases, case acceptance policy and evidence processing in the Handbook of Forensic Services, the Lab will achieve the final audit recommendation in this observation. It is expected that the Lab's Handbook of Forensic Services will be edited and a new edition distributed to all law enforcement agencies throughout the state within the FY 2012-2013 biennium.

Observation No. 3

Improve Backlog Controls

The Lab's backlog affected its ability to effectively serve its customers. Backlog data should be improved for use in developing a backlog reduction plan and timetable.

Backlog

The Lab Director reported backlog rates varied. For example, Toxicology, Deoxyribonucleic Acid (DNA), and Serology had limited backlogs with turn-around times ranging from one to two weeks to one to two months, while the Drug Analysis and Digital Evidence Units had turn-around times ranging from several months to years. Lab management reported instituting policies to improve backlog monitoring and reduce backlog. These included: measuring backlog by requests (analysis of all items in need of analysis in one discipline for a single case) instead of cases (one case may include multiple requests); automating backlog tracking; and implementing processes such as ceasing examination once a positive match is made, changing drug sampling policies, and offering alternative work schedules to maximize space available for analysis. The Director stated case backlog inadequately measured effectiveness as each case differed and required a different amount of effort and time. The Lab did not define "backlogged case" in policy and, in practice, any open, incomplete case contributed to backlog.

Monthly Lab backlog reports measured open requests by Unit, discipline, and sub-discipline. Backlog data for State fiscal years (SFY) 2009 and 2010 showed a one percent decrease overall; however, five Units' backlogs increased substantially and overall Lab backlog trended up over the audit period as illustrated in Figure 3. Overall backlog as of June 30, 2010 was 3,025, down

from 3,050 at the beginning of the audit period. Figure 3 also illustrates as backlog trended up, submitted and completed requests trended down, with completed requests falling below submitted requests toward the end of the audit period.

The Lab's backlog reduced its ability to effectively serve its customers. Cases were pushed back to address prioritized cases, increasing turn-around times for backlogged cases. According to our survey of Lab customers, 25 of 71 respondents (35 percent) reported turn-around times negatively affected their agency's cases. Of 73 surveys received, 36 agencies (49 percent) included 50 comments about turn-around times needing improvement, particularly with fingerprints. Unaudited Lab data identified 3,346 open cases, one dated back to 2006, four to 2007, and seven to 2008, with 341 (10 percent) cases over one year old and 840 (25 percent) more than six months old as of February 2011.

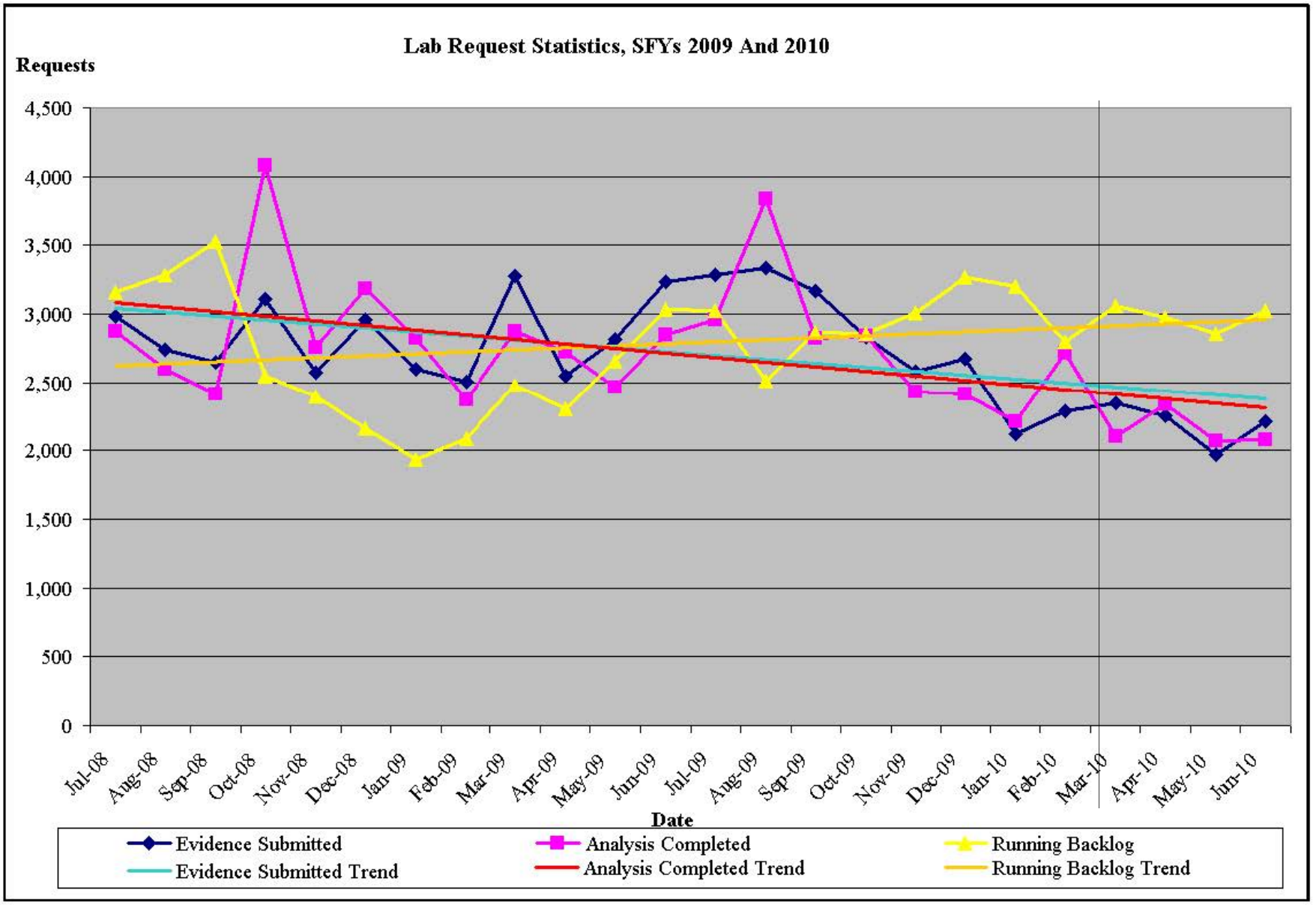
Agencies should develop a formal written plan for reducing or minimizing backlogs of forensic services cases, including timetables and monthly progress monitoring. These plans should incorporate performance expectation levels such as the number of requests completed per analyst per month or completed cases per Unit, discipline, or sub-discipline.

Meeting Monthly Demand

We estimated the amount of time and staff necessary to eliminate monthly and total Lab backlogs, based on the average time to complete an average case. Three Units - Drug Analysis, Identification, and Firearms - would have required additional positions to complete as many cases as submitted and stop increasing monthly backlogs, as the Lab's staff did not keep up with demand during the audit period. The Fingerprints sub-discipline in the Identification Unit required 1.25 full-time equivalent (FTE) positions, the Drug Analysis Unit required 0.50 FTE positions, and Firearms Unit required 0.26 FTE positions.

Table 2 summarizes monthly case submission and completion data, and FTE positions needed to address monthly shortfall. Trending data showed the Firearms Unit's completed cases trended above the level of submitted cases toward the end of the audit period, indicating backlog would eventually be cleared.

Figure 3



Source: LBA analysis of unaudited Lab data.

Table 2

Estimated Full-Time Equivalent Positions Needed To Complete Monthly Demand, Based On SFYs 2009 And 2010 Demand

Unit/Sub-discipline/Function	Average Cases Submitted Per Month	Average Cases Completed Per Month	FTE Assigned To Discipline	Additional FTEs Needed To Complete Cases Submitted Monthly [a]
Not Meeting Monthly Demand				
Drug Analysis	589	553	7.8	0.50
Identification (Fingerprints only)	51	41	4.9	1.25
Firearms	9	8	1.8	0.26
Subtotals	**649**	**602**	**14.5**	**2.01**
Meeting Monthly Demand				
Imaging	3	3	1.0	0.09
Digital Analysis [b]	4	6	2.0	-0.80
CODIS Analysis [c]	33	59	0.8	-0.36
Serology	37	39	2.6	-0.19
Trace	7	8	0.5	-0.04
DNA	27	28	2.0	-0.03
Breath Alcohol Analyzers	69	70	3.0	-0.03
Urine Toxicology	1,634	1,637	4.2	-0.01
Blood Toxicology	236	236	5.2	-0.01
Other (Blood Stain Pattern Analysis, Footwear)	15	15	0.5	0
Subtotals	**2,065**	**2,101**	**21.8**	**-1.38**
Totals	**2,714**	**2,703**	**36.3**	**0.64**

Notes:

[a] Totals may not add due to rounding.

[b] Digital Evidence data over-report completed cases which resulted from two corrective actions in 2009 identifying 37 assigned but incomplete cases dating to 2002. These cases were cancelled but added to the completed case count. This inflated the average cases completed per month and deflated the additional FTE needed to complete cases submitted monthly.

[c] CODIS is the Combined DNA Index System, a national database of DNA samples administered by the Federal Bureau of Investigation. The database contains DNA profiles from convicted offenders, forensic specimens, population samples, and other specimen types.

Source: LBA analysis of unaudited Lab data.

Processing Backlog

Definitions of backlog differ. Functionally, backlog was defined by the Lab as any open request. The U.S. Department of Justice (U.S. DOJ), on its DNA Initiative website, defines backlog as cases not tested within 30 days of submission. Four Units, as well as CODIS Analysis and the sub-disciplines listed in "Other," had backlogs equal to or less than the average monthly completed cases, indicating no backlog existed, simply cases were in process. Three Units had a backlog, but were completing more cases than submitted, and two additional Units were completing just less than the number of cases submitted. Increased productivity, or overtime specifically designated for backlog, could have reduced backlog in these Units. The Identification and Drug Analysis Units were exceptions, where approximately 17,800 additional hours (8.6 FTE positions) were needed to resolve the backlogs in one year; although as shown in Table 2, only 1.75 FTE positions were needed for both Units to keep up with average monthly demand. Table 3 summarizes backlog data and estimated FTE positions needed to address overall discipline shortfalls during the audit period.

Data Issues

We found the Lab's data contained discrepancies in the reported monthly backlogs based on an analysis of submitted and completed cases. The Lab reported cases in 14 disciplines, sub-disciplines, and functions for the 24 months of the audit period equating to 336 monthly backlog data "fields." Forty-four of the 336 (13 percent) monthly backlog reporting fields were incorrect. Additionally, while discrepancies existed in 14 of 252 (six percent) data fields during the first 18 months of the audit period, in the last six months - when the Lab began to rely on automated reporting from the Laboratory Information Management System (LIMS) - discrepancies existed in 30 of 84 (36 percent) possible data fields. These errors were attributed to data entry errors and failure to cancel deleted or modified original requests. There were no written procedures in the Lab's standard operating procedures regarding entering, modifying, or deleting LIMS data.

Cancelled cases were counted as completed cases, reducing the Lab's backlog totals and underestimating the personnel required to keep up with submitted cases. A Lab manager defined cancelled cases as older cases no longer requiring processing. For the last six months of the audit period, 692 of 6,125 cases (11 percent) were cancelled. In the Digital Evidence Unit, the backlog would have increased by 15 cases over the same six-month period had cancelled cases not been included as completed. Instead the backlog was reported as a decreasing by 27 cases.

Improved reporting could aid management in assessing efficiency and effectiveness. Effective controls were needed to ensure backlog data were more useful.

Table 3

Estimated Full-Time Equivalent Positions Needed To Complete Backlogs, As Of June 30, 2010

Unit/Sub-discipline/Function	FTE Assigned To Discipline	Discipline Backlog As Of June 30, 2010	Additional FTEs Needed To Complete Discipline Backlog In One Year [b]
Drug Analysis	7.8	1,906	2.24
Identification (Fingerprints only)	4.9	626	6.32
Total	**12.7**	**2,532**	**8.56**
Firearms	1.8	48	0.95
Imaging	1.0	12	0.37
Total	**2.8**	**60**	**1.32**
Trace	0.5	38	0.21
Digital Analysis [a]	2.0	50	1.40
Blood Toxicology	5.2	120	0.22
Total	**7.7**	**208**	**1.83**
Serology	2.6	20	0.11
DNA	2.0	28	0.17
Other (Blood Stain Pattern Analysis, Footwear)	0.5	11	0.03
CODIS Analysis	0.8	60	0.07
Breath Alcohol Analyzers	3.0	3	0.01
Urine Toxicology	4.2	103	0.02
Total	**13.1**	**225**	**0.40**
Lab Total	**36.3**	**3,025**	**12.12**

Notes:

[a] Digital Analysis data over-report completed cases which resulted from two corrective actions in 2009 identifying 37 assigned but incomplete cases dating to 2002. These cases were cancelled but added to the completed case count. This deflates the additional FTE needed to complete discipline backlog in one year.

[b] Totals may not add due to rounding.

Source: LBA analysis of unaudited Lab data.

Recommendations:

We recommend Lab management improve backlog controls by:

- **defining backlog;**
- **improving reporting of backlog and turn-around times;**
- **making necessary internal changes to practice, policy, and personnel assignments, minimizing monthly backlogs, and limiting the increase to the Lab's standing backlog; and**
- **developing, implementing, and monitoring a plan to minimize standing backlog.**

Auditee Response:

We concur in part.

The audit cites the US Department of Justice DNA Initiative website definition of backlog as a request "that has not been tested 30 days after it was submitted to the laboratory." However, the same website also states "There is no industry wide definition of a backlog. Some laboratories consider a case backlogged if the DNA has not been analyzed after 90 days. Others consider any case backlogged if the DNA has not been analyzed and the final report has not been sent to the agency that submitted the DNA."

Action item: In practice, our Laboratory defines backlog as any case in which analysis is not complete and the final report has not been issued. We will better define this in our policies during the current year.

As an example of unpredictable situations that can affect backlogs, in October 2009, during the audit period, a home invasion involving a homicide and an attempted homicide occurred in Mont Vernon, NH. As an example of services and resources that can be expended in just one case, causing a significant discontinuation to addressing backlogs in a cadenced fashion, the following is a listing of hours spent by over a dozen Lab personnel in various forensic disciplines processing crime scenes, collecting over 450 exhibits, conducting examinations, reporting and testifying during the Mont Vernon homicide investigation, which occurred during the audit period:

Fingerprints	*425 hours*
Tool marks & fracture match	*135 hours*
Footwear & tire tracks	*240 hours*
Serology, DNA, blood spatter documentation	*205 hours*
Digital evidence (computers, cell phones, etc.)	*425 hours*
Photo processing	*15 hours*
Hair, fibers	*16 hours*
Total – Forensic Laboratory	***1,461 hours***

It is impossible to predict the number of cases such as this that the Laboratory will be requested to assist in any given year. Historically, at least one major homicide, missing person investigation or police involved shooting requiring extensive laboratory involvement occurs at some point during the year. Recent examples that have expended similar resources include a double homicide involving Dartmouth College professors, two capital murder cases within the past five years, two fatal boating accidents on Lake Winnipesaukee, a homicide involving a

female murderer and multiple victims, and a 5-year investigation into a missing person. It is virtually impossible to develop a realistic plan to eliminate all standing case backlogs given the potential disruptions a single homicide case, for example, may cause.

In January 2010 the Laboratory transitioned from a manual backlog tally system to an automated computer generated system. This new system enables the Laboratory to retrieve real-time data regarding open request backlog. The audit report states "We found the Lab's data contained discrepancies in the reported monthly backlogs based on an analysis of submitted and completed cases." Submitted and completed requests are tallied from data in the system and may be affected by workflow anomalies, which we are working on rectifying. In contrast, the backlogged request numbers are a count of open requests in the system and are not calculated from the number of submitted and completed requests. Therefore, the backlog data is not susceptible to the workflow anomalies and is in fact accurate. The Laboratory does not currently report turn-around times due to problems inherent in establishing a timeframe that is constantly changing due to the complexity and resources required to complete each request.

The audit team's analysis of the Laboratory's case output to determine optimum staffing levels did not incorporate the amount of overtime hours worked by the existing staff as well as the number of cancelled requests that are counted as "completed." The overtime hours inflate the average number of requests an analyst can complete in a normal workday and affect the "Full-time Equivalent" calculations. Cancelled requests, which accounted for 11% of the total completed requests by the Laboratory during the last six months of the audit period, are requests for which the submitting agency decided that analysis was no longer needed, often because a plea bargain was reached well in advance of trial. Including these requests as "completed" examinations for determining staffing levels does not take into consideration that request output per analyst is actually lower than the completed request numbers would make it appear, thus affecting the calculations which were provided in the audit.

The audit discusses productivity measures and increased focus on casework from analysts in order to minimize the backlog. This can be done in some cases; however this approach has its limitations. Today's forensic laboratories are held under high scrutiny and the analysts performing the work must be well qualified; therefore, analysts must undergo extensive training which can span up to two (2) years. This training will bring the analyst to an appropriate level of competency to conduct independent casework, but they must also stay proficient in the discipline by attending continuing education opportunities and completing proficiency tests. Additionally, the educational requirement for each forensic discipline is different and further complicates the possibility of re-assigning analysts (i.e., a toxicologist cannot be moved to the DNA unit unless they have completed college coursework in biochemistry, genetics and molecular biology). After this type of investment, one cannot consider this a temporary re-assignment but, rather, a career change.

However, as the audit points out, there are some instances where analysts have experience in more than one discipline. Laboratory management will identify those instances where added flexibility in assignment to meet shifting backlog situations is feasible, and change assignments accordingly, as a first resort.

Action item: Laboratory management will attempt to identify instances where examiners with credentials and experience in more than one field can be used to address backlog situations in a second discipline. Any such adjustments will be made as soon as possible.

Action item: To the extent that other measures are unsuccessful in resolving growing backlogs, we will recommend the creation of additional forensic examiner positions subject to space limitations, or contracting with private laboratories to help reduce the backlog and maintain acceptable case turnaround times.

As we note elsewhere in this report, we are reluctant to assign performance goals to individual analytical staff in an effort to drive up case output or reduce backlog. This type of performance expectation in other laboratories has bred carelessness, as quantity was overemphasized in comparison to quality. Although some agencies have set quotas, we have found that their analysts are not actually held to the standards. Forensic analysts are responsible for an extraordinary amount of tangential duties directly associated with the cases they complete. These include, but are not limited to: depositions, case meetings, research, validations, reagent preparation, equipment maintenance, and crime scene processing and court testimony throughout the state.

The Laboratory has already implemented backlog controls. These controls are handled by supervisors at the unit level. Because each unit's clients have differing demands, there is a need for tailored controls.

Action Item: We will survey comparable laboratories in an effort to identify performance goals and backlog controls that might be implemented Lab-wide that would not have an adverse effect on quality.

Observation No. 4

Improve Efficiency And Effectiveness Of The Digital Evidence Unit

The efficiency and effectiveness of the Digital Evidence Unit (DEU) should have been improved by reviewing staffing needs, prioritizing data review, pursuing collaborative opportunities, improving workflow, reducing backlog, and considering options for outsourcing.

Staffing

The DEU may not have had appropriate staffing levels based on its average monthly backlog of 68 cases throughout the audit period. The State Police Director, Lab Director, and the DEU staff noted a need for additional analysts. The estimated need ranged from two to six additional analysts. The Lab Director stated keeping up with demands for service was a concern.

The DEU consisted of two FTE employees: a Technical Support Specialist V (TSS V) and a Criminalist II. The supplemental job descriptions (SJD) for these two positions included performing digital evidence examinations, interpreting and compiling examination results,

testifying, reviewing casework for each other, performing quality control for the Lab's computer systems, and keeping digital evidence procedures current. Additionally, the TSS V was the DEU technical lead, provided training and technical advice to law enforcement, and performed all of the duties of a TSS V for the Lab, including resolving system software and hardware problems, developing operating system procedures, planning system utilization, monitoring system performance, researching technical materials, and training agency personnel on information technology (IT) issues.

The two DEU analysts reported spending approximately 23 hours total per week on non-analytical, IT-related tasks. Based on analysts' estimates, the time associated with these additional responsibilities reduced the number of FTE positions working on digital evidence analysis by more than 0.5 FTE positions, adjusting actual FTE positions to less than 1.5.

Data Review

According to the author of *Local Law Enforcement and its Digital Forensics Future*, digital evidence can include personal computers, portable or flash drives, digital media players, cameras, and cell phones with "[e]very transfer of data through these electronic devices…" leaving trails of information with the potential to be "retrieved through forensic examination" and totaling terabytes of information. Nationally, the amount of seized digital evidence increases each year making it difficult for investigators to keep up with massive amounts of data contained in the evidence.

During the audit period, the Lab implemented corrective action processes for the DEU. In addition to being backlogged, the DEU did not complete any cases, other than cancelled cases, from January through March 2010. Cancelled cases are older cases which are no longer active. Cases were reportedly cancelled after consulting with the submitting agency to assess case status as part of the effort to clear the growing DEU backlog originally caused by poor workflow and processing. Additionally, the two corrective actions in 2009 identified 37 assigned but incomplete cases dating back as far as 2002 and an additional 46 unassigned cases. These issues were attributed, in part, to the large capacity of the technology and priority cases taking precedence with other cases continually pushed aside.

The U.S. DOJ in *Forensic Examination of Digital Evidence: A Guide for Law Enforcement: Special Report* states "digital evidence should be thoroughly assessed with respect to the scope of the case to determine the course of action…," while also stating "the judgment of the examiner should be given deference in the implementation of the procedures suggested in this guide." The Digital Forensic Investigator (DFI), in its article "5 Ways to Increase Efficiency in Digital Forensics," noted digital forensic caseloads were growing in 2010, as were the amounts of the data that must be analyzed. The DFI concluded identifying need and coordinating with investigators should allow analysts to identify what information is most relevant, thereby reducing the amount of data necessary for analysis and creating more manageable caseloads. The DEU's Unit-specific policies did not include any reference to coordinating with investigators or determining the most relevant evidence to the case. There was no documented policy identifying methods for the DEU to prioritize analysis and minimize workload.

Outsourcing And Collaboration

Opportunities existed to collaborate with other laboratories or outsource analyses, providing benefits such as increased knowledge pools and increased capacity. Our 2010 survey of Lab customers found law enforcement agencies relied on entities outside of the Lab for digital evidence analysis, including the New Hampshire Internet Crimes Against Children Task Force (NH ICAC). NH ICAC is a multiagency, multijurisdictional organization that has developed responses to prevent, interdict, investigate and prosecute Internet crimes against children. The State Police Director reported the Lab should have a larger role with NH ICAC. A more active role in NH ICAC seems in line with the Lab's mission and statutorily established purpose. Additionally, there may be opportunities for the Lab to collaborate with other regional state laboratories or with a federal regional computer forensic laboratory.

Recommendations:

We recommend Lab management improve the efficiency and effectiveness of the DEU by:

- **reviewing staffing, to include opportunities to reprioritize resources within the Lab;**
- **implementing policies and procedures for prioritizing data review; and**
- **maximizing opportunities for collaboration and outsourcing.**

Auditee Response:

We concur in part.

In April 2010, prior to the audit, the Laboratory implemented a review of the efficiency and effectiveness of the Digital Evidence Unit (DEU). We identified factors impacting the backlog numbers and undertook a corrective action plan to improve workflow through the unit. The audit cites the average monthly backlog during the audit period as 68 requests. With the implementation of aforementioned corrective action, the average monthly backlog has improved from 68 requests during the audit period to 44 requests from July 2010 to June 2011. This improvement has been achieved primarily through greater oversight of the unit's workflow by Laboratory management. The audit noted that the DEU had "37 assigned but incomplete requests dating back as far as 2002." The Laboratory's own investigation documented that for most of the assigned but incomplete requests, the work had already been performed. The examiner had often provided a CD of potential evidentiary files to the investigator, but a formal report had not been issued and the request was not closed in LIMS. As a result of the aforementioned investigation and corrective action plan, the Laboratory reached out to the investigating agencies. Formal reports were issued or requests were cancelled as agreed upon with the investigating agencies.

The Laboratory already uses data review prioritization practices. In requests with multiple exhibits, the examiners communicate with the submitting agency to prioritize the exhibits for examination. This practice will be formalized in policy before the end of the year.

Action item: We will continue to pursue further improvement through the documented corrective action plan.

Action item: Additional streamlining of examination and reviewing procedures is in progress. We believe that these efforts will further reduce the turnaround time of requests, as well as further reduce the backlog, provided request submissions remain consistent. Knowing how much has been accomplished already, even without the addition of staff and resources, gives us confidence that funding for additional personnel and resources, such as state-of-the-art forensic tools for digital evidence examination and service contracts for hardware, would allow the Lab to meet the ever expanding capacity of digital evidence in crime investigation.

The audit cites responses to the survey of time spent on non-analytical IT related tasks; however, "non-analytical IT related" was never clearly defined. The examination of digital evidence is married to information technology. For example, time spent by the digital evidence examiners on validating and performing quality control of software and hardware prior to examination and backing up/archiving digital evidence files and digital (electronic) examination documentation are critical required components of the analytical work. They ensure the integrity of the analysis and security of the digital evidence and digital (electronic) examination documentation. Removing time spent on these activities reduces the reported amount of time the digital evidence examiners spend per week on "non-analytical" IT related tasks.

Because the forensic review of computers and peripherals in itself requires extensive use of information technology equipment, it is almost inevitable that the scientists working in this area spend a significant amount of time on IT issues. The long term solution is to have a dedicated IT person assigned to the Lab, given the large amount of computers, peripherals and dedicated digital analysis equipment that is part and parcel of a forensic laboratory today.

Action item: Together with Department management we will meet with DoIT to seek support for having a dedicated IT person for the Laboratory to further reduce the amount of time spent away from digital evidence examinations and bring the number of positions in the DEU back up to two (2) FTEs.

With regard to the observations on outsourcing and collaboration, we are the regional laboratory for New Hampshire and we serve all levels of law enforcement. From time to time we have even been called upon to assist federal prosecutors in major cases when a case has originated as a result of the efforts of a New Hampshire law enforcement agency. Efforts by police departments to triage digital evidence prior to submitting cases to the Lab would be advantageous. In combination with our existing efforts to coordinate with the agency for priorities, this would help the Laboratory's efficiency.

We have arranged assistance from federal agencies in the past to address the backlog and would not hesitate to do so again. However, federal agencies themselves face increased demand for digital evidence examinations and are also experiencing increased backlogs. Consequently, their case acceptance policies have tightened.

The audit highlights the NH ICAC in its observation. While we would like to be more involved with NH ICAC, grant funding rules limit collaboration with that organization to internet crimes against children. This is only one subset of case types prevalent in the DEU backlog. Collaboration with NH ICAC would not be applicable to other case types (e.g., homicide, fraud, sexual assault, identity theft, drug trafficking, etc.).

Action item: In an effort to help submitting agencies triage their digital evidence cases prior to submission, additional information will be included in the next edition of the Handbook of Forensic Services, to be issued during the FY 2012-2013 biennium. The laboratory will also include contact information for outside agencies, such as ICAC, which can also provide assistance with specific types of cases should the submitting agency decide to explore other available options for analysis.

Observation No. 5

Improve Cost Effectiveness Of The Urine Toxicology Program

The cost effectiveness of the Lab's process for testing urine samples for illicit drugs submitted by the Department of Corrections (DOC) during the audit period should have been improved. In 2004, the Legislature transferred to the Lab all functions, powers, duties, and responsibilities of: 1) the DOC drug testing laboratory, and 2) the blood, urine, and breath testing functions of the Department of Health and Human Services, Public Health Laboratory (Chapter 319, Laws of 2003). During the audit period, the Lab conducted 37,842 urine analyses, of which approximately 25 percent returned a positive result for illicit drugs. Most of the samples were provided by the DOC.

According to the Statements of Appropriation, the Urine Toxicology Unit expended $563,811 in SFY 2009 and $621,977 in SFY 2010, which funded four full-time staff. Our analysis indicated screening out negative results at the DOC could have reduced the overall cost of determining compliance for those under its supervision.

Multi-Drug Testing Cups

Using an in-Lab technique, the Lab tested for the following six drug classes: benzoylecgonine (cocaine metabolite), cannabinoid, opiates and oxycodone, amphetamine, benzodiazepines, and methadone. Instant drug testing cups are commercially available from various manufacturers for these and additional drug classes. If DOC drug testing had begun with an instant test at the source (e.g., in a DOC facility), approximately 75 percent of the in-Lab tests could have been eliminated. Initial positive tests could have been forwarded to the Lab for a confirmation test. Table 4 describes the potential cost savings if commercial instant drug testing had been used to screen samples and the Lab verified only positive results in the urine testing program during SFY 2009 and 2010.

Table 4

Potential Cost Savings Using Instant-Result Urine Test Cups And Verifying Positive Results, SFYs 2009 And 2010

SFY	Estimated DOS Screening Cost [a]	Estimated Lab Verification Cost [b]	Total Estimated Cost	Actual Lab Expenditures [c]	Potential Savings [d]
2009	$104,437	$137,471	$241,908	$563,811	$321,903
2010	90,449	164,515	254,964	621,977	367,013
Total	$194,886	$301,986	$496,872	$1,185,788	$688,916

Notes:

[a] Reflects the cost of urine testing cups only.
[b] Reflects personnel costs based on a 75 percent reduction in workload during the audit period.
[c] From Statements of Appropriation, SFYs 2009 and 2010 for Urine Toxicology Unit.
[d] Difference between Total Estimated Cost and Actual Lab Expenditures.

Source: LBA analysis of SFYs 2009 and 2010 Statements of Appropriation and other unaudited Lab data.

DOC screening, with Lab verification of positive urinalysis results, could have resulted in an estimated 75 percent reduction in Lab full-time equivalent positions dedicated to the Urine Toxicology Unit. Re-tasking resources and personnel from the Urine Toxicology Unit to other areas of the Lab may have helped address other Lab resource shortfalls.

Recommendations:

We recommend Lab management consider implementing instant drug tests to improve the cost efficiency of urine testing by verifying only positive results.

Auditee Response:

We concur.

Laboratory management has not only considered the use of instant drug test specimen cups, but has previously tested several manufacturers' products for ease of use and stability. We were already in the process of establishing contract pricing and transitioning from the current method of drug screening to the use of these specimen cups when this audit began. With administrative demands in conjunction with the ongoing audit process, budget preparation for the new biennium and other conflicting demands the urine screening changeover project was delayed.

Action item: With the completion of these other activities, resources will now be focused on the implementation of this cost-saving measure. It is expected that the Lab will fully implement

the transition process, including the training of DOC staff, within six months of the start of SFY 2012.

Observation No. 6

Improve Cost Effectiveness Of The Evidence Control Unit

Three Evidence Technicians employed by the Evidence Control Unit had fewer duties and responsibilities, higher education and experience requirements, and were paid above the average wage for evidence technicians we examined in other jurisdictions.

During the audit period, the Lab employed one part-time and two full-time Evidence Technicians. Table 5 summarizes the employee SJD classification and position title; actual job title; wage range/step and schedule (either A000 at 37.5 hours per week or X416 at 40 hours per week plus 20 percent of base wage); and actual wage for Evidence Technicians. Two Evidence Technicians were classified as Criminalist I and the other was classified as a Laboratory Scientist III.

Table 5

Evidence Technician Wage Comparison, Calendar Years 2009 and 2010

SJD Classification And Job Title	Wage Range/Step (Schedule)	2009 Wage	2010 Wage
Criminalist I	19/8 (X416)	$ 61,312	$ 59,405
Laboratory Scientist III	20/6 (A000)	44,217	44,497
Criminalist I (Part-time)	19/4 (X416)	22,977	29,397
	Total Wage Paid	**$ 128,506**	**$ 133,299**

Source: LBA analysis of unaudited Lab data.

None of the incumbent Evidence Technicians worked under an SJD actually entitled *Evidence Technician*. While Lab Evidence Technician duty requirements were generally equivalent to other evidence technician positions in jurisdictions we reviewed and positions in State classified service with similar responsibilities and lower educational requirements, they were paid significantly more.

One Criminalist had a Bachelor of Arts degree in Criminal Justice and experience in fingerprint analysis, including continuing education in fingerprint-specific courses and Advanced Latent Fingerprint Training. The other Criminalist had a Bachelor of Science degree in Bio-Medical Science and experience analyzing blood samples for ethanol and other volatiles, testifying in court, conducting training and recertifying law enforcement officials on breath alcohol testing equipment, and repairing breath alcohol testing equipment.

The fingerprint and drug analysis disciplines consistently maintained monthly backlogs during the audit period. Utilizing the current Evidence Technicians to perform duties consistent with their expertise could help reduce these backlogs.

Other Jurisdictions

We obtained evidence technician salary data for seven other jurisdictions. We selected higher and lower cost of living areas, including two New England states. Both the average minimum and maximum salaries for the Lab Evidence Technician were above the average of the seven jurisdictions examined. Evidence Technicians in the seven other jurisdictions reviewed had an average minimum and maximum salary range between $35,180 and $49,049, while full-time Lab Evidence Technician salary ranged between $44,497 and $59,405. The minimum difference was $9,448 (27 percent) above the other jurisdictions' average, while the maximum difference was $10,356 above (21 percent) above the other jurisdictions' average.

Recommendations:

We recommend Lab management improve the cost effectiveness of the evidence management function by requesting the reclassification of current Evidence Technicians and re-grading the current Evidence Technician positions to reflect the actual tasks performed by the personnel of the Lab's Evidence Control Unit. We further recommend Lab management utilize personnel currently employed as Evidence Technicians to their fullest potential as analytical staff to assist in alleviating Lab backlog and assign Evidence Technician responsibilities to other administrative personnel whose wage and qualifications more closely match the demands of the position.

Auditee Response:

We concur in part.

The Laboratory is concerned with the ability to attract suitable applicants with the qualifications necessary to perform the required duties should existing positions be reclassified. Looking to the future, as we consider Laboratory staffing needs, we will carefully weigh the extent to which creating a new, semi-professional Evidence Technician position might benefit the Laboratory in the future.

The audit refers to wage differences between outside jurisdictions examined and the Laboratory's Evidence Technicians. The Laboratory's own examination of Evidence Technician salaries from forensic laboratories in different regions of the United States with widely accepted cost of living adjustments applied using data provided by researchers at The Council for Community and Economic Research is as follows:

Nashville, TN	*$36,199*	*$56,110*
Lincoln, NE	*$29,821*	*$43,850*
Las Vegas, NV	*$47,927*	*$70,937*
Phoenix, AZ	*$40,753*	*$55,013*
Wichita, KS	*$33,718*	*$49,449*
Minneapolis, MN	*$37,466*	*$59,071*
Syracuse, NY	*$41,178*	*$45,530*
Criminalist I (SFY 2010)		*$59,405*
Lab Scientist III (SFY 2010)		*$44,497*

When adjusted as above, the current salaries of the Evidence Technicians in our Laboratory seem reasonable. Time did not permit us to compare other types of cost of living adjustments such as those that factor in state and local tax rates in various geographic areas but we will do so.

We have also considered assigning the Evidence Technician responsibilities to existing administrative personnel such as secretaries. This does not seem feasible given the workload of the existing administrative personnel. These individuals are already responsible for performing extensive office duties to support the 44 analytical staff in the Lab.

Action item: We will explore the creation of a future Evidence Technician classification. Laboratory management has requested the Department of Administrative Services – Division of Personnel to also conduct a review of the current classification of the Evidence Technician/Criminalist position.

Observation No. 7

Improve Efficiency Of The Blood Toxicology Unit Evidence Documentation Process

The Blood Toxicology Unit's evidence documentation process should have been improved. The practice contributed to inflated reported case counts. During the audit period, the Blood Toxicology Unit reported receiving 5,660 cases.

Both the Blood Toxicology Unit and the Criminalistics Group used the same electronic LIMS to track evidence. However, in the Blood Toxicology Unit, each item of evidence, even from the same case, received a unique case number. Consequently, one case involving a single suspect for one incident could have received multiple case numbers. In the Criminalistics Group, the LIMS allowed multiple pieces of evidence to be assigned to the same case number.

Prior to the creation of the Toxicology Group in 2004, personnel from the Department of Health and Human Services, Public Health Laboratory reportedly utilized an electronic management system which did not allow users to assign more than one test sample to each case. To document all samples and maintain case and sample cohesion, personnel used a manual process which included hand writing similar notes on all related case files. This process migrated to the Lab with Department of Health and Human Services, Public Health Laboratory personnel and when

the Toxicology Group began using the LIMS, the process was not re-engineered. According to Toxicology Group management, the Lab began encouraging law enforcement officers to list all pieces of evidence on the Department of Safety, State Police (DSSP) 20, *Evidence Examination Request Form*, allowing entry of multiple pieces of evidence into LIMS under one case number. For cases with a single suspect involving one incident but multiple pieces of evidence, inefficiencies in the Blood Toxicology Unit's evidence documentation process included:

- The Toxicology Group receptionist entered the same basic personal information, including the suspect's name, date of birth, address, and offense, into the LIMS multiple times.
- Case folders involving the same suspect "link" together with color-coded stickers containing the case numbers pertaining to the other pieces of evidence. When generating barcodes for the evidence, personnel had to hand write notes in all related case folders describing all pieces of evidence received.

Toxicology Group management stated the LIMS was not being used to its full potential and the existing system was "a bit inefficient." While the Toxicology Group has been a part of the Lab since 2004, the Lab did not make needed changes to the LIMS. Tutorials, available on the Internet, provided by the LIMS manufacturer, describe how to add additional evidence to an existing case.

Recommendations:

We recommend Lab management improve the efficiency of the Blood Toxicology Unit's case and evidence intake process by fully utilizing available software.

Auditee Response:

We concur in part.

Our Blood Toxicology Unit has the fastest turnaround time (average of less than one week for routine alcohol analysis) and the smallest backlog of the entire Laboratory. Minimal time is spent entering duplicate case information for the small percentage of sample submissions considered "linked" to other sample submissions (less than 10%). Visual clues, such as, color coded labels on the case folder and handwritten evidence descriptions, are used as quick references during case assessment prior to sample analysis, destruction or release.

Action item: Laboratory management recognizes the opportunity to utilize LIMS to combine multiple items of evidence into one case. Although the Laboratory has identified several concerns related to changing its process due to the highly litigious nature of impaired driving cases, Laboratory management will implement a pilot program in the Blood Toxicology Unit to evaluate using LIMS to combine multiple items of evidence into a single lab case when the evidence is received at the same time. This pilot program will be developed and coordinated to begin within the first six months of SFY 2012, and will be scheduled to run for three months. At the end of the pilot period, the Department will assess whether any efficiencies have been

realized or if unforeseen concerns arose. At that point, the continuation of the program will be determined.

QUALITY ASSURANCE

Quality is an essential characteristic of forensic laboratory operations. According to the National Research Council (NRC), in *Strengthening Forensic Science in the United States: A Path Forward (A Path Forward)*,

> Forensic laboratories should establish routine quality assurance and quality control procedures to ensure the accuracy of forensic analyses and the work of forensic practitioners. Quality control procedures should be designed to identify mistakes, fraud, and bias; confirm the continued validity and reliability of standard operating procedures and protocols; ensure that best practices are being followed; and correct procedures and protocols that are found to need improvement.

Forensic laboratory quality systems continually assess accuracy and precision, identify procedural problems, and ensure analytical data can withstand legal scrutiny. Quality systems organize quality management and provide a framework for planning, implementing, and assessing work performed by an organization. Quality systems include: organization and management, personnel, facilities, evidence control, equipment calibration and maintenance, process control, documentation and reports, review and audit, safety, purchasing and inventory, accreditation, proficiency testing, policies and procedures, and training.

Quality Assurance (QA) is a management control function which sets policy and relies on planning, implementing, and reviewing data collection activities, and using data in decision-making. QA can reduce vulnerabilities; increase an organization's ability to make reliable, cost-effective, and defensible decisions; and assure integrity of scientific data. QA relies on proper evaluation of internal and external activities. QA requires dedicated quality assurance personnel, who report on quality issues to senior management, provide independent oversight, and assure implementation of the QA system.

Quality Control (QC) is a management control function including all the scientific actions and precautions necessary to acquire data of known and adequate quality. It consists of steps taken during the analysis of samples to ensure the accuracy and precision of the result. It should identify if there is a problem immediately. QC procedures can include both internal checks performed by Lab employees and external checks performed by an outside laboratory. QC also involves setting end product target values, using statistics to accurately describe, evaluate, and help control variability. QC practices encompass instrument/equipment performance checks, calibration, recertification, and maintenance; internal audits; and verification of results and reliability by third parties.

We found the Division of State Police (State Police) Forensic Laboratory (Lab) can improve quality-related policies and procedures controlling non-conforming work, adequacy of policies and procedures, deviations, measures of uncertainty, personnel, technical and administrative review, backlog, and digital evidence.

Observation No. 8

Review Reliance On Accreditation Standards And Expand Audit And Evaluation Practices

Lab reliance on accreditation standards, audits, and self-assessments provided only partial assurance policies and procedures were routinely utilized, efficient, and achieved the management control objectives envisioned.

Management controls are the plans, policies, methods, and procedures management relies upon to meet agency missions, goals, and objectives and help mitigate risk. Management controls include systems for measuring, reporting, and monitoring program performance. Management should: 1) conduct top level performance reviews comparing agency performance to goals, analyzing significant differences and 2) review performance, analyze trends, and measure against objectives at the functional level. Program changes, improvement efforts, and technological developments require management continually assess and evaluate controls to ensure ongoing effectiveness and update controls as necessary. Monitoring mechanisms should include reviews and audits independent of program management. However, we found no Lab-wide strategic and annual performance goals or reports measuring performance and progress toward goals. Additionally, Department of Safety (DOS) and State Police management did not audit or formally review the efficiency or effectiveness of Lab operations.

Accreditation

Lab standard operating procedure (SOP) *QA 190, Audits and Quality System Review, Sections 1.1 and 1.3*, codified American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) Legacy standards accreditation schedules. The Lab maintained voluntary accreditation since 2004 under ASCLD/LAB Legacy standards. Accreditation is a five-year cycle, relying on external audits by ASCLD/LAB once every five years and Lab-completed *Annual Accreditation Audit Reports* submitted in the other four years, to assess continuing compliance with accreditation criteria. We found ASCLD/LAB Legacy accreditation required certain policies and procedures exist, but accreditation did not ensure efficient or effective implementation. Accreditation attests to the *presence* of the tools necessary for good laboratory practice, but laboratory management must ensure operational efficiency and effective policy implementation. Separately, Lab management is responsible for efficient and effective operation of a public agency, which ASCLD/LAB Legacy standards do not address. Despite accreditation, we found implementation of underlying Lab policies and procedures could have been improved. The Lab and other jurisdictions found ASCLD/LAB Legacy standards were not as robust as first thought and some concluded they should be viewed as a minimum standard. Consequently, accreditation alone does not demonstrate management fulfilled its oversight and control obligations.

External Technical Audits

Lab SOP *QA 190, Section 1.2*, codified the Deoxyribonucleic Acid (DNA) Unit's requirement to follow Federal Bureau of Investigation (FBI) *Quality Assurance Standards for Forensic DNA Testing Laboratories* and *Quality Assurance Standards for Convicted Offender DNA Databasing*

Laboratories, standards which were harmonized with ASCLD/LAB Legacy standards. The DNA Unit underwent an external audit biennially to ensure compliance with the FBI DNA Standards. The Lab self-assessed performance against these standards in alternating years. FBI DNA audits relied on a review of Lab policies and staff interviews. Like ASCLD/LAB Legacy standards, FBI DNA standards did not examine efficiency or effectiveness of DNA operations, some areas of which we found should be improved.

Internal Audits And Quality System Reviews

While Lab SOP provided for both internal reviews and internal audits, the SOP required only an annual quality system review, did not mandate any area of Lab operation be audited, nor was there an embedded risk assessment process to focus audit and other review work. Lab SOP *QA-190, Section 1.4*, asserted ASCLD/LAB Legacy-required annual quality system reviews were to "ensure the continued suitability and effectiveness of the quality system." Quality system reviews relied on "[s]ummaries…" of information from various areas and did not appear focused on uncovering management control deficiencies or improved efficiency.

Lab SOP *QA-190, Section 1.5*, provided the basis for internal audits without specifying an audit scope. The Lab conducted no comprehensive audits, which could have considered broader efficiency and effectiveness aspects. However, the Lab conducted one evidence audit during the audit period, in July 2008, and one after the audit period concluded, in August 2010. The July 2008 evidence audit found 33 of 49 items examined (67.3 percent) conformed to Lab standards. The 49 items reviewed represented 0.14 percent of the 33,994 requests received in State fiscal year (SFY) 2009, based on unaudited Lab data. The August 2010 evidence audit found 143 of 150 pieces of evidence examined (95.3 percent) conformed to Lab standards. The 150 items reviewed represented 0.48 percent of the 31,078 requests received in SFY 2010, based on unaudited Lab data. The results of the Lab's audits could not have been reliably projected to the entire case population due to the small sample size.

Remediation And Audit Close-Out

Remediation and audit close-out should have been improved. Management should promptly resolve audit findings by correcting deficiencies and demonstrating improvements. Lab SOP *QA-190, Section 3.3,* required audit remediation be outlined in a corrective/preventative action report; however, we found no corrective actions issued for evidence audits during the audit period. Lab SOP *QA-190, Section 3.4*, closed out audit findings upon remediation or decisions on Lab appeals of findings. Lab SOP *QA-190, Section 3.5,* required audit results, and *Section 4,* required the summary report from annual quality system reviews be disseminated to Lab staff to read. We found quality program reviews discussed Lab-wide, but the Lab had no plans documented to resolve issues. Lab-conducted evidence audits concluded by reviewing deficiencies with the applicable analyst and having general discussions in Lab-wide meetings. We found no evidence the Lab followed up by examining the implications for the larger body of evidence or the effectiveness of those remedial steps taken. Further, there was no process to revisit areas subject to findings or remediation to ensure proper implementation and attainment of control objectives.

Overall, Lab SOPs, *QA-010, Quality System and Policy Statement,* and *QA 190, Audits and Quality System Review,* focused on maintaining accreditation by external quality assurance bodies and examined the status quo, seeking only to correct deviation from the norm. Lab policy did not focus on operational *improvement* or increasing *efficiency* or *effectiveness*. Similar to current management control practices, the more rigorous International Organization for Standardization/International Electrotechnical Commission (ISO) in *General Requirements* laboratory accreditation standards require laboratories conduct ongoing management reviews on a predetermined schedule and use an established procedure to assess effectiveness. Lab management must continually improve management system effectiveness and conduct internal management system audits to determine continued compliance with standards. ASCLD/LAB-International, *Supplemental Requirements for the Accreditation of Breath Alcohol Calibration Laboratories* require the management system include all activities which contribute directly or indirectly to quality management, including the organizational structure, responsibility, procedures, processes, and resources. Lab management reported planning to seek accreditation under the more rigorous ISO accreditation standard. However, no detailed plan for Lab migration to ISO standards exists, a process which can take up to two years. Current Lab accreditation expires in 2014.

Recommendations:

We recommend DOS and State Police management develop and implement external oversight and review procedures of Lab management and operations while ensuring independence of the Lab.

We further recommend Lab management:

- **develop Lab-wide strategic and annual performance goals;**
- **develop an audit plan to evaluate the efficiency and effectiveness of the management system, including policies and procedures, rather than a focus on the existence of such policies;**
- **expand the scope of internal audits and program reviews beyond conceptual requirements of accrediting bodies and include efficiency and effectiveness of processes and ensure controls are working as designed;**
- **increase the statistical reliability of evidence audits;**
- **generate documented corrective and preventative actions for non-conformities uncovered during internal audits and evaluations;**
- **improve remediation and close-out to include conducting follow-up on audits and reviews to ensure effective implementation of recommendations; and**
- **develop a detailed project plan to migrate Lab operations and management from Legacy accreditation standards to ISO standards.**

Auditee Response

We concur in part.

The Laboratory is already committed to transitioning to ASCLD/LAB-International accreditation based on the ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). Most of the audit recommendations are inherent to meeting the subset of ISO/IEC 17025 requirements related to management systems. These requirements pertain to the operation and effectiveness of the quality management system within the laboratory. They aim to ensure that a management system is implemented, maintained, monitored, and continually improved.

In November 2009, the Laboratory completed the remediation process associated with its June 2009 ASCLD/LAB Legacy accreditation audit. In April 2010, the Lab's Quality Assurance (QA) Managers began meeting weekly specifically to plan the required migration to the ASCLD/LAB-International Program based on ISO/IEC 17025. The required user licenses and documents were obtained and a gap analysis to evaluate the current QA program against the requirements of the ISO/IEC 17025 and ASCLD/LAB-International Supplemental Requirements had just been started when the LBA audit team arrived in September 2010. The Lab's QA Managers delayed work on the ISO/IEC 17025 project in order to ensure properly researched responses to the Audit Team's requests for information and documentation and to ensure that the audit recommendations were taken into consideration in our planning efforts.

Action item: Laboratory management will meet with Department and Division management within the first six months of FY 2012 to discuss and develop appropriate Lab-wide strategic and annual performance goals.

Action item: With accreditation to the ASCLD/LAB-International Program based on ISO/IEC 17025, elements including strategic planning, oversight, continuous improvement, audit program/procedures, corrective/preventive actions, remediation, close-out, follow-up and most of all, review of efficiency and effectiveness of processes will all be addressed by the Laboratory.

Action item: With completion of the audit process, the Lab is now creating a detailed project plan with milestones and the corresponding process of migrating to ASCLD/LAB-International in time for the lab's scheduled re-accreditation inspection in 2014.

Early in the gap analysis process, Laboratory management recognized the need to improve the accreditation audit program. In December 2010, we sent four employees to internal auditor training in order to meet the ISO/IEC 17025 requirement that the Laboratory have a team of qualified auditors to conduct internal audits. This training covered all aspects of the auditing process from design and scope of audits, to reporting audit findings, to remediation/follow-up and audit close-out.

Action item: Additional improvements to audit policies and procedures, including the development of a formal audit plan and the generation of corrective action reports for non-

conformities identified during internal audits, will occur as the Laboratory transitions to meeting the ISO/IEC 17025 standards.

The August 2010 evidence audit was conducted as part of the annual ASCLD/LAB accreditation audit and was performed to specifically address the standards related to proper identifying marks and sealing integrity. We believe that the evidence audit was sufficient to serve this purpose. The Laboratory's evidence audit report separates the results for the Toxicology Group and the Criminalistics Group. The evidence checked in Toxicology was 100% compliant with Lab policies and ASCLD/LAB standards. Of the 128 items reviewed in the Criminalistics Group main storage location, seven items were problematic. Specifically, four items were not properly sealed, two items had slight tears in the paper packaging, and one item was missing the initials of the person that accepted it into the laboratory.

The vaults do not contain all the evidence from all the requests for the year. Evidence items are coming and going from the Laboratory constantly day to day. New items come in and other items go out as testing is completed. The 128 items reviewed in the Criminalistics Group represent a sub-set of the total number of items in the storage location at the time. Moreover, the total number of items in the storage location is just a snapshot in time of the total number of items that come in and go out from the Laboratory over the course of a year. Specifically for the Criminalistics Group, the 128 items represented about 3 percent of the approximately 4500 evidence items in storage on that day.

Observation No. 9

Establish Controls Over, And Review Adequacy Of, Policies And Procedures

Document controls over Lab policies and procedures should have been improved. The Lab maintained several SOPs including: QA, training (TRA), safety, general, and Unit-specific protocols. The NRC's *A Path Forward* specifies "Quality control and quality assurance begin with the implementation of standardized policies and procedures…." According to the Government Accountability Office, in *Internal Control Management and Evaluation Tool*, policies and procedures are an integral control activity used to mitigate risk and ensure effective and efficient results.

Document Control

Lab SOPs were maintained in electronic format, as read-only Microsoft Word documents. However, *QA 150, Procedures, Manuals, and Document Controls*, stated "current, write-protected (e.g., PDF [portable document file format], read only), electronic versions of all manuals are kept on the [Lab] computer for all employees to access…."

Many Lab SOPs contained inaccuracies and errors, indicating document control policies needed improvement. Our review of QA and TRA SOPs found:

- five of 28 (18 percent) QA SOPs and five of 18 (28 percent) TRA SOPs did not document required review in the electronic copy, which analysts rely on, although hard copies included review sign-off;
- Lab SOP *TRA 030, Quality Assurance Program Training,* was dated and signed off as authorized and reviewed, but the content of the policy did not correspond with updates made to the related quality manual and training checklist; and
- Lab SOP *QA 060, Forensic Laboratory Scope,* inaccurately identified Evidence Control as a Unit in the Lab with its own policies and procedures and providing expert testimony.

Policies And Procedures As A Management Control Activity

ASCLD/LAB Legacy accreditation constitutes a minimum standard. ISO standards in *General Requirements* offer improved controls and the Lab anticipates ISO compliance in 2014. ISO standards identify 110 requirements for policy and procedure documentation, compared to 32 by ASCLD/LAB Legacy standards. The Lab appeared to meet many ISO standards; however, of 65 (59 percent) ISO standards met, 20 (31 percent) did not achieve anticipated results when implemented. These procedures included: security, document control, chain of custody, corrective actions, documentation, quality reviews and audits, training and development, competency, and housekeeping. Therefore, while the Lab's SOPs met ASCLD/LAB Legacy standards, they did not achieve necessary management control objectives.

For example, a March 2010 revision to Lab SOP *QA 120, Criminalistics Group Evidence Controls, Section 4.1.6,* no longer required the return evidence storage area to remain locked at all times. Also, according to ASCLD/LAB-International *Supplemental Requirements for the Accreditation of Forensic Science Testing Laboratories,* technical reviews should ensure "conclusions of analysts are reasonable, within the constraints of validated scientific knowledge, and supported by the examination documentation." Lab SOP *QA 130, Case Documentation and Review, Section 4.2,* generally required technical review; however, the paint and plastic, fiber, hair, and filaments sub-disciplines within the Trace Unit were not subjected to technical review. The Lab noted technical review was recommended, as opposed to required, for sub-disciplines with only one examiner. While options existed, the Lab did not require external technical review.

Many Lab policies and procedures were written very broadly, potentially limiting their effectiveness as a management control. For example, Lab SOP *QA 130, Case Documentation and Review, Section 3.9,* stated "no test results shall be relayed … to non-laboratory personnel until the required technical reviews of results are completed and documented…." However, Lab SOP *QA 130, Section 3.9.1* stated, "'second reads' and 'verifications' qualify as a partial technical review of the results for the purpose of relaying those results outside the laboratory…." Second reads and verifications were not defined in this section nor did they reference applicable Unit-specific policies which address their appropriate use, creating an opportunity for misinterpretation. Additionally, Lab SOP *QA 200, Non-Conforming Work and Corrective/Preventative Action* stated the significance of all non-conformities should have been weighed on a case-by-case basis and reports issued at the discretion of the QA Manager or the Lab Director.

Recommendations :

We recommend Lab management improve controls by:

- **improving document controls including ensuring SOPs are write-protected, accurate, and electronic versions are updated to include current review status;**
- **improving language and processes in SOPs to maximize management controls and minimize ambiguity; and**
- **migrating to best practice standards for all SOPs.**

Auditee Response

We concur.

With the number of controlled documents (standardized policies and procedures) in the SOP manuals approaching one thousand (1,000), the Laboratory has made a concerted effort to implement an integral control activity to mitigate risk and ensure effective and efficient results. The document control process is an enormous task.

Action item: The Laboratory has researched and identified commercially available document control software programs that offer greater document security, will streamline the development, review, implementation, and archiving of policies and procedures, facilitate the communication required for procedure revisions, and include a training module to help ensure employee understanding of policies and procedures. An attempt to purchase such software in 2009 failed due to lack of funds, but currently a federal funding source has been identified and the proposal for grant funding is being submitted.

The hundreds of documented policies and procedures are written for and directed at Laboratory staff. The employees of the Laboratory do not hesitate to ask questions or raise concerns about wording or application for management consideration. Revisions are incorporated to clarify meaning where necessary and improve management controls.

The Laboratory's quality system, including all of the documented policies and procedures, is a fluid entity. We constantly review the procedures with the goal of improving processes to account for advances in science and technology, maximize controls, and eliminate recognized inefficiencies. There are instances when the Laboratory discovers that the policies and procedures in place are overly stringent and, as a result, cause an unnecessary waste of resources.

The Laboratory's written policies and procedures balance an attempt to create "a more effective, efficient, risk-minimized environment" within what the Laboratory's staffing, facilities and financial resources can support. Forensic laboratories are under immense scrutiny. In light of this, a common industry philosophy can be summarized as "say what you do, do what you say." The Lab's procedures disclose what we do in practice. That practice must and does meet or exceed the requirements of our accreditation program.

As indicated in the previous response, the Laboratory is committed to achieving accreditation through the ASCLD/LAB-International Program based on the ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). With this commitment, the Lab has long been aware that improvement in the area of document control is needed.

Action item: The Laboratory has undertaken a complete overhaul of the Quality Assurance (QA) Manual and all additional SOPs to align with the ISO/IEC 17025 standards and ensure each standard is addressed. The Training Manual, Safety Manual, General Manual and the eleven (11) additional discipline/sub-discipline specific procedure manuals will all be revised, write-protected, use ambiguous language when it is identified, reflect best practices to the extent that they can be identified, and will be reorganized accordingly.

Observation No. 10

Improve Quality Of, And Controls Over, Non-Conforming Work And Deviations

The Lab should have 1) consistently applied its policy on non-conforming work and deviations, 2) fully documented all non-conforming work and deviations, and 3) followed its policy for deviations.

Non-Conforming Work

Non-conformities are any departure from Lab policy and procedure recognized after-the-fact. Lab policy and best practice required a root-cause analysis for all non-conforming work, potentially leading to corrective and preventative actions. *Corrective actions* are action plans instituted after identifying an instance of non-conforming work. Forty-eight corrective actions were documented by the Lab during the audit period.

The Lab's written policy aligned with industry practice. ISO concludes the Lab must follow its procedures for handling non-conforming work when "any aspect of its testing and/or calibration work, or the results of this work, do not conform to its own procedures...." ISO standards address procedures for addressing non-conforming work which should include: identifying responsibility for managing the non-conformity and actions to be taken (including halting work); evaluating the significance of the non-conformity; making immediate corrections; deciding on the acceptability of non-conforming work; notifying the customer and recalling work if necessary; and identifying who authorizes work resumption. Additionally, if the non-conformity could recur, or if compliance with laboratory policies and procedures is questioned, the non-conformity should be elevated to a corrective action requiring root-cause analysis. While the Lab's written policy aligned with industry practice, its reviews of non-conforming work, application of corrective actions, and documentation needed improvement.

We found no criteria or analytical tools for consistently and systematically assessing the severity and impact of non-conformities or the likelihood of non-conformities recurring. Lack of criteria could lead to subjectivity and inconsistency. Additionally, not all non-conformities were

documented. Those identified as not requiring a corrective action had no documentation and therefore no method of tracking. Root-cause analysis or risk assessment associated with each non-conformity was not documented. We found incomplete corrective action documentation regarding root-cause analysis and case timelines in at least two of 48 cases. According to our review of 48 reported nonconformities, seven were a failure to follow a procedure; ten were related to equipment certification expiration, improper calibration, expired reagent, or improperly prepared reagents; five were discrepant proficiency test results; 11 were safety issues; three were chain of custody issues; and the remaining 12 were related to third-party reagents, external audits, digital evidence processing, etc.

Lab policy did not require corrective action documentation be included in the case file; however, it was in some case files and not in others. Reportedly, the Lab did not include corrective actions in case files because corrective action root-cause analyses document *all* the potential issues or shortcomings which *could* have led to the non-conformity. According to the NRC in *A Path Forward*, "Forensic reports, and any courtroom testimony stemming from them, must include clear characterizations of the limitations of the analyses…." By excluding corrective action documentation related to non-conformities in processing the case, the Lab did not identify all potential limitations of analyses.

Finally, two Units accounted for more than 50 percent of all documented corrective actions and deviations during the audit period. At least seven of 48 corrective actions (15 percent) documented analysts failing to follow proper procedures or other shortcomings and three additional corrective actions identified chain of custody issues. The Lab relied on self-reporting for initiating corrective actions and did not want to discourage reporting. As a result, the Lab did not use corrective actions as a disciplinary tool, a consideration in performance evaluations, or to identify repetitive or Unit-wide problems. Including issues identified in corrective actions in performance measures, evaluations, and developing trends by Unit could have enhanced management control.

Deviations

Deviations are any proposed divergence from Lab procedures which must be necessary and justified. Deviations may be implemented to improve a process, provide a temporary deviation from current practice, or to address a unique situation. Thirty-five deviations were documented during the audit period.

Lab policy required all deviations be reported and approved prior to implementation, but we found 22 of 35 deviations (63 percent) occurred after the actual event. In these 22 cases, the Lab identified a deviation and documented the decision to proceed after an initial non-conformity. Because these deviations related to non-conforming work, all should have had corresponding corrective actions documenting the initial non-conformity, but this did not occur. According to unaudited Lab data, seven of 35 deviations (20 percent) had related corrective actions during the audit period, although there was no documentation linking related corrective actions and deviations.

The application of deviations should have been more consistent, objective, and thoroughly documented. While documentation for each deviation existed, the documentation had no explanation of the appropriateness and technical justification required by Lab policy. There also were no criteria or analytical tools for consistently and systematically assessing the severity, impact, and technical justification for deviations.

Use Of Corrective Actions And Deviations

Corrective action and deviation processes should have been consistently applied to similar situations. During the audit period, similar situations were treated in one case as a deviation and in another case as a corrective action. Examples included equipment calibration concerns, issues with reagents, using an improper procedure, and chain of custody concerns. Lab policy specifically stated a deviation was for requesting to deviate from written SOP *prior to* committing the deviation while non-conforming work and related corrective actions should document any actual, unapproved departures from policy and procedure or the quality system. The Lab applied the deviation process to examples of non-conforming work without applying the corrective action process.

Application of Lab policy and documentation practice for non-conformities, corrective actions, and deviations prevented the Lab from identifying trends or providing complete documentation of all non-conformities. Additionally, analysis of non-conforming work and deviations did not prevent the issues from recurring and did not successfully address the impact of each non-conformity and deviation. Without a complete overview of non-conforming work, without thorough documentation of root-cause or systematic analysis of the non-conforming work, and by applying a deviation process after-the-fact and without systematic analysis of appropriateness and technical justification, the Lab exposed itself to unnecessary risk and did not identify habitual issues, risks, and concerns. Additionally, the Lab's reported practice of excluding non-conformity documentation in the case file that did not impact a particular analysis relegated such disclosure to the court discovery process.

Recommendations:

We recommend Lab management improve controls by:

- **identifying and documenting all non-conforming work and ensuring all suspected and actual non-conforming work receive QA Manager review for consistent analysis;**
- **creating an analysis tool to aid in objective and systematic assessment of the severity and impact of each instance non-conforming work, including trends by Unit;**
- **establishing clear criteria for determining when non-conforming work requires a full corrective and preventative action plan;**
- **establishing clear criteria and processes for determining appropriateness and technical justification for each deviation;**
- **consistently reporting on any non-conformities, corrective actions, and deviations in all case files; and**

- **considering corrective actions when evaluating analyst and Unit job performance, including identification of training needs.**

Auditee Response:

We concur in part.

During State fiscal years 2009 and 2010, the Lab completed 64,291 requests. Not including non-conformances which were documented as the result of a safety issue, the 37 remaining non-conformances affected only a very small fraction of the work performed by the Lab, less than 0.1% of the completed work. The Laboratory applies the corrective action process to all aspects of Lab policy and procedure, analytical and/or otherwise, including safety. This goes above and beyond what is required by the forensic science industry which more specifically applies the corrective action process to instances of non-conforming analytical work. According to the ASCLD/LAB Legacy standards, "The laboratory must have a written procedure which it uses to initiate a review and to take corrective action when the laboratory has an indication of a significant problem with a technical procedure or the work of an analyst."

The corrective action process is related to mistakes. Mistakes can be of many different types and can happen for many different reasons. Sometimes they are easy to diagnose and rectify. Sometimes they involve human error. Sometimes they are systemic errors inherent in the way the laboratory policy, procedure, instrumentation, etc. is designed. Depending on the situation, the corrective action process could take 30 seconds or it could take 30 days. To do it right, all contributing factors must be evaluated for the extent to which they contributed to a situation.

The amount of time and resources the Lab puts into the corrective action must be weighed against the significance/impact of the problem. The subjective nature of this evaluation is what the Laboratory believes contributes to the observation of inconsistencies in the application of the corrective action process.

With regard to the corrective action reports filed during the audit period, two (2) of the 48 were actually the result of a "significant problem with a technical procedure or the work of an analyst," both of which were brought to light through the Lab's proficiency testing program. Twelve (12) were related to safety incidents with no bearing on analytical procedures or quality. Some of the reports were associated with analytical missteps caught by the analyst him/herself or identified during the routine technical review encompassing isolated incidents of lesser significance which were easily remediated with no impact to the results reported in the case. In all such minor incidents, corrective actions taken and associated technical justification were supported by documentation in the case file, even though the corrective action report itself may not have been present. Only a small fraction of the corrective action situations had an impact on analytical results. Of the more than 64,000 requests received over the course of the audit period, less than 0.1% required the reanalysis of samples or the issuance of an amended report due to nonconformances.

Although the form used to document the QA Manager's root cause investigation and corrective action and preventive action plan is kept separate from the case file, the Laboratory does not

agree that "By excluding corrective action documentation related to non-conformities in processing the case, the Lab is not identifying all potential limitations of the analyses." If a non-conformity is specifically related to the work performed in a case, the examination notes and administrative documentation disclosing the non-conforming work, the determined cause and the remedial actions are always included in the applicable case files. In addition, most of the time the non-conforming work is not due to a limitation of the analysis, but rather can be attributed to procedural mistakes.

Deviations from procedures are necessary to allow the Laboratory the flexibility to handle occasional extenuating circumstances differently than documented policy. This is particularly important when it is recognized that following policy would cause more harm (wasted time and consumables and/or unnecessary consumption of evidence) than good results when current results meet acceptance criteria.

We agree that not all non-conforming work resulted in documented corrective action reports. The generation of corrective action reports was based on the significance and/or impact of the non-conformance. All of the documented deviations were, as required and appropriate, pre-approved departures from procedure that were technically justified.

We do not believe that corrective actions should be used when evaluating individual analyst and unit job performance. The corrective action process is founded on voluntary compliance, and the willingness of analysts to inform the QA Manager of issues of non-conformance so that appropriate remedial actions can be identified is crucial. If an analyst knows that bringing a non-conformance to the attention of the QA Manager may be reflected on their performance appraisal, that individual might be less likely to bring the problem to light, and might even take steps to cover up their actions, even if that action was a simple mistake. Corrective actions are an integral part of a continuous improvement process, and should not be used or viewed as a potential punitive measure. Incorporating the consideration of corrective actions as part of evaluating an analyst's job performance could undermine the ability to properly address potential shortcomings in the Lab.

However, we agree with the Audit Team that it is important to identify instances where the same analyst or the same unit makes the same mistake on more than one occasion and to take appropriate remedial action, and the QA manager will be required to take this into consideration in tracking and dealing with corrective actions.

Action item: Laboratory management recognizes that its commitment to achieving ASCLD/LAB-International accreditation will require improvements to the Lab's policy and procedure related to non-conforming work. Identifying non-conforming work is a critical component of quality assurance that the Lab does not take lightly. As part of the migration to meeting the ISO/IEC 17025 standards, we will implement logs to document all instances of non-conforming work, criteria for evaluating the significance of non-conforming work, and when corrective action is required.

Action item: Laboratory management has also identified a more formalized procedure for conducting the corrective action process when required, to include defining the problem,

identifying the causes, identifying and implementing solutions and monitoring overall effectiveness.

Observation No. 11

Implement Measures Of Uncertainty

The Lab did not report measures of uncertainty clarifying the levels of accuracy and precision associated with each result. Measures of uncertainty can provide additional clarity and confidence to Lab processes and reported results.

Measures of uncertainty allow results to be reported with a specified confidence within a calculated margin of error. According to the NRC, *A Path Forward,* "All results for every forensic science method should indicate the uncertainty in the measurements that are made…." ISO states, in *General Requirements*, sources contributing to uncertainty may include reference standards and materials, methods, equipment, environmental conditions, the item being tested, and the operator.

A Path Forward concludes uncertainty measures are necessary for both reporting and courtroom testimony. For reporting to be sufficient, it must include "methods and materials, procedures, results, and conclusions, and they should identify, as appropriate, the sources of uncertainty in the procedures and conclusions along with estimates of their scale (to indicate the level of confidence in the results)." This detail allows "informed, unbiased scrutiny of the conclusion." Additionally, "[f]orensic science reports, and any courtroom testimony stemming from them, must include clear characterizations of the limitations of the analyses, including associated probabilities where possible."

ASCLD/LAB Legacy standards do not require reporting on measures of uncertainty including error and bias. However, ISO in *General Requirements* requires an "estimation of uncertainty of measurement." Specifically, "[t]esting laboratories shall have and shall apply procedures for estimating uncertainty of measurement" and "[w]hen estimating the uncertainty of measurement, all uncertainty components which are of importance in the given situation shall be taken into account using appropriate methods of analysis."

The Lab did not report on uncertainties, consider the error inherent in the tools and equipment used to create solutions or perform analysis, or consider the error associated with each procedure or operator. Accreditation under ISO standards will require this level of specificity when reporting measures of uncertainty in the future and is a tenet of good laboratory practice according to *A Path Forward* and ISO standards.

Recommendation:

We recommend Lab management implement measures of uncertainty in reported results and courtroom testimony, where applicable.

Auditee Response

We concur in part.

The Laboratory understands the importance of ensuring quality analysis and reporting. Where applicable, the Laboratory currently utilizes daily quality control (QC) to help identify and ensure quality analyses are being performed. Our standard operating procedures outline the number of QC samples required to be analyzed, and the acceptable range for QC results as determined from industry standards and through internal validation studies. These practices include consideration of the errors inherent to the equipment, solution preparation, and other aspects of the technical procedures.

The audit quotes the National Academy of Sciences (NAS) report titled Strengthening Forensic Science in the United States: A Path Forward, "All results for every forensic science method should indicate the uncertainty in the measurements that are made…" The NAS report further states uncertainties should be included in reports "as appropriate." According to ASCLD/LAB's Updated Approach to Uncertainty of Measurement Requirements, ASCLD/LAB requires "…all applicant and accredited laboratories in the ASCLD/LAB-International program to have completed estimating uncertainty of measurement for all reported 'measurements that matter'." [emphasis added] They further define a measurement that matters as "one that is used, or may reasonably be expected to be used, by an immediate or extended customer (anyone in the judicial process) to determine, prosecute or defend the type or level of criminal charges(s)." Measurements that matter would not include, for example, the length of a baseball bat used in an assault, as the length is not pertinent to the charges involved with the offense.

According to ASCLD/LAB's Estimating Uncertainty of Measurement Policy, "Qualitative tests (identifications) do not currently require estimates of uncertainty. Examples of when uncertainty of measurement is not applicable include but are not limited to: identifying a drug in a controlled substance analysis; identifying a latent fingerprint as originating from a specific person; identifying a document as originating from a specific person as the writer." [emphasis added]

The Laboratory is currently accredited to the ASCLD/LAB Legacy Program requirements which do not require that a measurement of uncertainty be determined. Well before this audit began, the QA Managers began regular meetings to familiarize themselves with the new set of ASCLD/LAB-International Program requirements and perform a gap analysis of what and where changes to current protocols need to be made. The new standards will require measurements of uncertainty.

Action item: The Laboratory will meet all of the requirements of the ASCLD/LAB-International Program requirements, including calculating measurement of uncertainty for measurements that matter, before the Lab's scheduled re-accreditation inspection in 2014.

Observation No. 12

Improve Technical And Administrative Review Standards

The Lab's technical and administrative review process should be improved to allow the highest level of quality controls possible.

Technical Reviews

Technical reviews are a part of the internal quality control and quality assurance program and according to ASCLD/LAB Legacy standards "[i]t is essential that a representative number of reports be subjected to a technical review." A written policy detailing the "parameters for technical review…" and the "scope of the review…" is required. A review by analysts with expertise in the discipline is required, but the reviewer need not be proficiency tested in the discipline. Technical reviews should be completed prior to case release.

Lab SOP *QA 130, Case Documentation and Review, Section 4.2.1,* stated, "technical reviews are conducted to ensure the conclusions and opinions in reports are supported by data available in the case record…." *Section 4.2* covered the technical review process including parameters and scope. The Lab's procedure listed all documentation and data requiring technical review. Proof of review completion was the reviewer's initials on the front flap of the case file. No checklist or other documentation demonstrated each technical review process requirement had been met, except in the DNA Unit where reviewers were required to initial each document reviewed. Checklists can be used to enhance the control environment and ensure complete coverage. The Lab's requirement for sign-off during the DNA Unit technical review increased control and similar control levels could have been applied throughout the Lab.

ASCLD/LAB Legacy standards also specify the number of cases subject to review should be defined. Lab SOP required a 100 percent technical review of cases in DNA, Combined DNA Index System (CODIS), serology, bloodstain pattern analysis, drug, digital evidence, blood and urine toxicology, arson, ink analysis, and explosives. Policy did not maximize efficiency by requiring 100 percent review, particularly in disciplines with high case loads and large backlogs, such as drug analysis.

In contrast, *Section 4.2.4* required the Identification and Firearms Units review "at minimum (when available), one case per analyst per month…." Trace sub-disciplines including paints and plastics, fibers, hairs, and filaments, did not require any technical review although the procedure *recommends* one case per analyst each year. The number of cases in Identification sub-disciplines varied from two to 444 cases per year. Using the same review standards for this variation in caseloads was not representative and did not maximize controls, efficiency, and effectiveness. Further, small sample sizes were not representative samples and did not provide the level of quality controls the technical review process intended. Table 6 shows the variation in cases completed in each discipline and sub-discipline during calendar year 2010.

Lab procedures and ASCLD/LAB Legacy standards stated the technical review must be conducted by an analyst with expertise in the discipline. However, Lab policy did not require any technical review in trace sub-disciplines where there was only one qualified analyst.

We found it is common practice for analysts to perform technical reviews of each other's work, including subordinates reviewing their supervisor's case files. While Lab SOP allowed cases be submitted to an external, accredited laboratory for technical review when only one qualified examiner was on staff, there was no authority for external technical review when there were two analysts, but one analyst reviewed their supervisor's work or only two personnel possess the required knowledge. Also, the Lab did not regularly contract with testing laboratories for technical reviews, although during the audit period the Lab sent one case per year for lamp filament and fibers and textiles to external laboratories for technical review. The reduced level of segregation of duties inherent in the technical review process and subordinates reviewing supervisors' work decreased the effectiveness of Lab quality controls.

Administrative Review

The ASCLD/LAB Legacy standards states administrative review is "an additional form of casework review which is conducted to enhance the quality of a report's administrative content" and must be done on all cases.

Lab SOP *QA 130, Section 4.3*, required administrative review of all cases "prior to the report or evidence leaving the laboratory." The review could have been conducted by "anyone who demonstrated familiarity with laboratory or documentation reporting policies." As with the technical review process, the Lab did not maintain checklists or other tools ensuring all components of an administrative review were completed. An initial and date on the front of the case file folder constituted documentation of completed administrative review. Without a process ensuring all elements of administrative review were completed, the Lab risked reports leaving the Lab with administrative errors.

According to ASCLD/LAB Legacy standards, administrative reviews may be conducted by the report author and Lab policy did not exclude the report's author from reviewing his/her own work. However, administrative review verified non-administrative information such as "completeness of chain of custody." Allowing an analyst to self-review reports and self-verify chain of custody was not the most effective control. Segregation of duties is necessary to reduce the risk of error, waste, or fraud according to GAO in *Internal Control Management and Evaluation Tool*.

Table 6

Completed Requests, Calendar Year 2010 [a, b]

Discipline/ Sub-discipline	Request Totals	Average Completed Requests Per Month[c]	Discipline/ Sub-discipline	Request Totals	Average Completed Requests Per Month[c]
Blood Toxicology	**3,073**	**256.1**	**Imaging**	**33**	**2.8**
Alcohol Analysis	1,850	154.2			
Carboxyhemoglobin	122	10.2	**Identification**	**462**	**38.5**
Drug Screen	1,101	91.8	Footwear And Tire Tracks	16	1.3
			Impression Evidence	2	0.2
CODIS [d]	**219**	**18.3**	Latent Print	444	37.0
Digital Analysis	**46**	**3.8**	**Serology**	**416**	**34.7**
			General Serology	406	33.8
DNA	**340**	**28.3**	Blood Spatter	10	0.8
Drug Chemistry	**5,310**	**442.5**	**Trace**	**98**	**8.2**
			Chemical Analysis	1	0.1
Firearms	**54**	**4.5**	Explosives	3	0.3
Firearms	36	3.0	Ignitable Liquid	35	2.9
Physical Match	6	0.5	Paint And Plastic	10	0.8
Serial Number Restoration	5	0.4	Hair And Fiber	43	3.6
Toolmark	7	0.6	Filaments	6	0.5

Notes:

[a] Completed request data were not provided for the Urine Toxicology and the Breath Alcohol Units as data were maintained separately.
[b] Sub-discipline data may not add to discipline totals due to rounding.
[c] Actual requests per month varied from the average.
[d] CODIS is not a discipline; however, the Lab provided data for this function.

Source: LBA analysis of unaudited Lab data.

The Lab should ensure thorough documentation of a completed technical and administrative review. Also, the Lab's standards for who can perform technical and administrative reviews and the Lab's technical review parameters did not maximize management controls.

Recommendations:

We recommend Lab management improve controls over technical and administrative reviews by:

- **revising policy to require documenting completion of all elements of the technical and administrative review process in each case file, possibly through completing a checklist or page-by-page reviews similar to those conducted in the DNA Unit;**
- **ensuring technical review occurs for a representative sample of cases in all disciplines and sub-disciplines of the Lab;**
- **revising policy to ensure controls over reviewers are based on instituting mitigating controls when an adequate segregation of duties is not practical; and**
- **revising policy to establish requirements for outsourcing technical reviews in disciplines and sub-disciplines with too few analysts to ensure effective control.**

Auditee Response:

We concur in part.

The Laboratory's current controls over technical and administrative reviews ensure the accuracy of the results being produced and the quality of the reports issued. The audit recognizes that the Lab's policy and practices meet the requirements of the ASCLD/LAB Legacy accreditation requirements. In fact, the ASCLD/LAB 2008 Manual states that technical reviews "should not be carried out to the extent that it shifts the perceived responsibility for the scientific findings from the examiner to the reviewer." Nowhere in the discussion of the standard for technical and administrative reviewing does ASCLD/LAB recommend the use of a checklist for that purpose. Rather, they leave it to the laboratory to establish and follow its own policy because they understand that documentation of reviews conducted can be captured in many ways. Though the Lab does not require review checklists, some employees that perform technical reviews have developed checklists for personal use; others do not find checklists beneficial. Information regarding who performed the technical and administrative reviews on each case is documented, along with when the reviews were completed.

We agree that improvements can be made to Lab policy by further defining the individual elements of the technical review as it relates to the specific disciplines of forensic examinations offered by the Lab. However, technical and administrative reviewing requires a level of thoughtfulness and thoroughness that is not necessarily enhanced by implementing a checklist or by initialing pages.

The established frequency of 100% technical review of cases for most of the disciplines/sub-disciplines is appropriate based on the complexities of forensic testing, amount of examination documentation generated and the significance of accurate results for the investigation, prosecution and defense of alleged criminal activity in New Hampshire. We hesitate to reduce this frequency to maximize efficiency. Considering that the Lab's reports are used in criminal

investigations and court proceedings, the significance of ensuring accurate results and complete examination documentation that supports the reported conclusions is more important than efficiency. Rather than reduce the frequency of reviewing, we hope through added staff and resources that we can institute 100% internal technical review for all disciplines and sub-disciplines.

Even in the disciplines/sub-disciplines with less than 100% technical review, the Lab's established frequency constitutes a representative sample of cases.

Action item: Additional training has been completed since the date range of the audit and the Lab currently only has two categories of testing with only one qualified examiner, namely the Trace Evidence sub-disciplines of lamp filaments and fibers. In practice the Lab has arranged for and documented the external technical reviews of lamp filament and fiber cases each year and Lab policy has now been changed to reflect these external technical reviews as a requirement instead of a recommendation.

Specifically for calendar year 2010, one out of the six lamp filament cases completed (17%) and one out of the four fibers cases completed (25%) were subjected to an external technical review by a qualified examiner from another accredited forensic laboratory in the New England region.

With regard to the technical review conducted internally in Identification and Firearms, the established frequencies of technical review constitute review of a representative sample of cases. For example in Identification, the sub-disciplines of Footwear/Tire track and Impression Evidence in practice conduct and document 100% technical review, thus exceeding the Lab's minimum of one case per analyst per month. For Latent Prints, the Laboratory's required minimum represents seven (corresponding to the seven Latent Print examiners) out of the sub-discipline's 37 average monthly completed requests (19%). The same kind of analysis of the Firearms discipline shows that with two examiners, the required frequency means that at minimum 50% of the 4.5 average monthly completed requests are subjected to technical review.

Action item: Though the Laboratory policy does not forbid an examiner from performing an administrative review of their personal casework, in practice this does not occur. The technical reviewer does the administrative review as well. Or, in the event that no technical review is done, the discipline's senior criminalist performs the administrative review. Laboratory management will change policy this year to reflect actual practice.

We recognize the concern with regard to situations in the Laboratory where only two examiners possess the required technical knowledge is the potential for collusion. The Laboratory has practices in place to decrease the likelihood of any such incidents. All of the Lab staff has been subjected to background checks; ethics training is mandatory; standard operating procedures dictate specifically how work is performed; work performed is technically and administratively reviewed by fellow scientists; *and the Lab's case files are critically reviewed as part of the ASCLD/LAB accreditation inspections, as well as by defense attorneys and/or other outside experts. The Laboratory's forensic examiners know that every time they sign an analytical report or present their findings in a court of law, their reputation and career and that of the lab are on*

the line. With the above safeguards in place, we significantly reduce the possibility of an undetected rogue scientist.

The technical review process in place at the Laboratory, like all other aspects of work performed here, is taken extremely seriously. Technical reviewers in the various forensic disciplines have been identified and authorized by senior criminalists and the Laboratory Director to perform the reviewing function. Criminalists authorized to conduct reviews receive specialized training focused on the discipline specific review components, scope and parameters to ensure review thoroughness and consistency. In addition, they are trained in the Lab's documented policy regarding what to do and who to notify should differences of opinion arise during the review process. Laboratory management surveyed other accredited forensic laboratories represented in the membership of the Association of Forensic Quality Assurance Managers (AFQAM), and found that subordinates reviewing supervisor's work is a common and necessary practice in the industry. It is not feasible, given the limited personnel and increasing backlogs, to remove supervisors from participation in casework solely to avoid the concern regarding a subordinate reviewing a supervisor's work. With established policies for avoiding undue influence and resolving differences during review, we ensure the integrity of the process.

As indicated above, the Laboratory currently only has two categories of testing with only one qualified examiner, namely the Trace Evidence sub-disciplines of lamp filaments and fibers. The Laboratory already participates in an established network of accredited forensic laboratories to which it can and does turn for a variety of assistance including technical reviews without the added expense of outsourcing.

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FACILITIES AND SECURITY

Entities must employ physical controls to secure assets which are particularly vulnerable to loss, theft, or damage; limit physical access to facilities; and restrict after-hours access. According to the American Society of Crime Laboratory Directors / Laboratory Accreditation Board (ASCLD/LAB) Legacy standards, "[a] forensic laboratory must have a system that ensures the integrity of all evidence under its control….The laboratory's chain of custody must document each transfer of evidence and the date of the transfer."

We found some of the Division of State Police (State Police) Forensic Laboratory's (Lab) evidence security practices needed improvement. The Lab's facility was inadequate to accommodate existing personnel, and did not provide appropriate space for each activity. Lab practices should be improved to better: secure analytical and evidence storage areas within the Criminalistics Group area; restrict after-hours access; secure in-process evidence; secure high-profile items including narcotics, currency, and firearms; and secure physical keys.

Observation No. 13

Improve Practices To Reduce Risks To Evidence Integrity

Chain of custody is a record documenting every person who had custody or control of evidence from the time it was collected until it is introduced in court. Preserving chain of custody is important to maintain evidence integrity according to the National Center for State Courts, in "Evidence Storage and Handling Overview."

Laboratory Information Management System (LIMS)

The Lab used a LIMS to document cases and related evidence, and to record chain of custody. Personnel accessed the LIMS using a barcode associated with their identification (ID) badge and a personal identification number (PIN). We found personnel were not required to periodically change their PIN. Additionally, on two occasions, we found the LIMS terminal at the Criminalistics Group intake counter was unattended and not locked with a password screen, risking system access by unauthorized users. These practices increased risk to the chain of custody, and presented opportunities for unauthorized LIMS access. However, we did not observe any unauthorized access.

Evidence Handling Practices

We found the following instances where evidence handling could affect evidence integrity and chain of custody:

- The LIMS did not produce an audit trail when errors were made documenting chain of custody, for example, if an analyst logged evidence into the wrong storage area or forgot to log a transfer. When errors were identified, Lab personnel designated as LIMS administrators changed the information in the LIMS. However, changes overwrote the original information and the electronic chain of custody report did not

show changes were made. The Lab documented these changes manually using a *Chain of Custody Change Report*; however, these errors were not reported externally, were not included in the analysis report, and did not result in a non-conformity or corrective action. The Lab could not quantify the number of times these reports had been generated during the audit period.

- The Lab did not perform adequate physical counts of evidence in its custody. While Lab personnel reviewed completed case files to identify evidence which could have been destroyed or transferred to long-term storage once a month, there was no systematic process to ensure all evidence documented in the LIMS was still in the Lab's custody. Regular physical counts of inventories instill accountability and integrity and help mitigate the risk of internal loss of evidence. During the audit period, the Lab discovered two pieces of drug evidence were missing.
- We found two instances, one during the audit period, where Lab personnel returned evidence to the wrong submitting agency. Lab management was not informed and consequently, the actions required to identify, analyze root-cause failings, develop and implement corrective or preventative actions, and ensure effectiveness of changes made were not taken. We were unable to determine from Lab data how frequently this might have occurred.
- We found one analyst on medical leave for two months still possessed Lab keys and an active electronic keycard throughout the period of leave.
- Lab standard operating procedures (SOP) Quality Assurance (*QA) 120, Section 5.11,* required analysts to repackage, reseal, and transfer custody of evidence back to an evidence storage area if the analysis had been suspended and would not resume within five business days. In-process trace, identification, and drug evidence retained in an analyst's custody was placed on a portion of a shelf in the main evidence storage area at the end of the day. This area was accessible to all Criminalistics Group personnel and the door to the main evidence storage area located within the Lab usually remained open. We found one instance where an analyst did not transfer multiple pieces of evidence pertaining to one case back into the evidence storage area for over one month.
- Evidence submitted to the Criminalistics Group was placed on a holding cart in an administrative area until an Evidence Technician entered it into the LIMS and placed it in the appropriate storage area. Evidence not entered into the LIMS at the end of the day was placed in the main evidence storage area overnight. Non-Lab personnel were sometimes assigned to work in administrative areas of the Lab and Lab SOP *QA 030, Section 2.2.3,* allowed employees from the Toxicology Group to be "left in locked administrative areas, unescorted," during which time the doors to the analytical areas were reportedly closed and locked.
- Evidence Technicians placed large pieces of evidence submitted to the Lab on a table in the Identification Unit until entry into the LIMS. On two separate occasions, we observed large pieces of drug evidence left unattended in the Identification Unit.
- One Evidence Technician performed evidence intake for several cases at once, prior to placing the evidence in the designated storage area. The evidence intake process consisted of entering case information into the LIMS, logging each piece of evidence into the LIMS, generating a barcode and attaching it to each piece of evidence, transferring custody of the evidence from the Evidence Technician to a storage area,

and placing the evidence in the storage area designated in the LIMS. Another Technician performed the entire intake process for one case at a time to reduce the risk of errors or omissions.

- On five occasions, we observed in-process evidence left unattended within the secure Lab area when the processing room was open and unlocked. In one instance, in-process serology evidence had been left on the table for two days when the auditor observed it, although the analyst covered, initialed, and dated the evidence as required by Lab policy.
- Strict chain of custody rules must be followed with digital evidence due to the ease of corrupting electronic files and data. Digital evidence must be admissible, authentic, complete, reliable, and believable. On one occasion, we found the digital evidence room within the secure Lab area unlocked and evidence left unattended when analysts were out of the Lab for the entire day.

Recommendations:

We recommend Lab management improve security over processing and storage of evidence through the following:

- **Review the feasibility of including the *Chain of Custody Change Report* in the analysis report to the submitting agency and ensure an audit trail exists in the system.**
- **Review levels of access to in-process evidence storage areas and methods used by analysts to secure in-process evidence.**
- **Review policies allowing in-process evidence to be stored in an area accessible to all Lab personnel.**
- **Assess the adequacy of long-term, short-term, and in-process evidence storage facilities, and use available technology to secure and monitor evidence storage areas.**
- **Ensure access to the LIMS is safeguarded, requiring personnel to periodically change PINs.**
- **Review evidence intake procedures to ensure they do not present undue risk of theft, omission, mislabeling, or misplacement.**
- **Periodically conduct physical inventory cycle counts of evidence in the Lab's custody to help ensure evidence is not missing or misplaced.**

Auditee Response:

We concur in part.

The Laboratory's current LIMS does not support an audit trail, so we have instituted the Chain of Custody Change Report to document any changes a LIMS administrator makes to an exhibits' internal (within laboratory) chain of custody. With the exception of a formal laboratory report, the laboratory does not routinely provide any case documentation to submitting agencies. This includes the Evidence Examination Request form, analyst case notes, photographs, internal chain of custody, as well as the Chain of Custody Change Report if present. However, these

materials are provided when the Lab receives a formal request (i.e., court order, discovery request, etc.) for said documentation.

The designated examination areas within the Laboratory, which itself resides in a secured access area, consists of segregated work spaces that are removed from the normal path of foot traffic to the extent possible given the current design of the Lab. The current physical plant layout of the Lab does not allow for separate, individual storage areas for in-process evidence. Also, the more in-process evidence is moved and repackaged, such as when an analyst takes a break, lunch, etc., the more potential that trace evidence may be lost.

Inspecting evidence packaging and seals is the best available way to ensure evidence integrity. This belief is apparent in the forensic community in the widely accepted practice of shipping evidence via a common carrier. In these instances, it is solely the packaging and seals that ensure the evidence is not compromised in transit. Current laboratory practice is to inspect packaging and seals at various stages while the items are at the laboratory, to include at the time of submission, prior to examination, and at the time of return. The confirmation of intact and appropriate seals helps to assure the laboratory that evidence has been protected from contamination, deleterious change and theft.

Action item: Lab management will implement the requirement for personnel to periodically change their PIN. Additionally, security glass has already been installed at the front counter to further safeguard access to the LIMS computer and the Lab.

Action item: We are currently redesigning workspace in the Lab that will be used exclusively for processing incoming evidence. This will allow for a more uniform flow for evidence submissions. This will discontinue the practice of evidence being temporarily left in the administrative area or on the Identification Unit bench. Upon completion of the redesign, Lab management will review the evidence intake procedures to ensure they do not present undue risk of theft, omission, mislabeling or misplacement. This review will include looking at batching versus one-at-a-time log-in and may allow for either method if both do not add a greater inherent risk to evidence integrity. The redesign and review is expected to be completed within the first six months of SFY 2012.

Action item: The Laboratory is in the process of designating each storage room shelf as a unique storage area. This will allow us to inventory only selected shelves over time rather than the entire room at once, which is not practical when dealing with an ever-changing inventory. This will also allow for a full inventory in small increments over time without requiring that the Laboratory close down.

Action Item: The Laboratory will experiment with inventory cycle counts during the latter part of SFY 2012 as a means of enhanced inventory control.

The audit cites various perceived risks to evidence integrity based upon the current laboratory facilities and layout. We believe we have implemented the best available security practices when taking into consideration the laboratory's current allotted space and financial budget. The

controls cited as the most effective are not currently feasible considering the limited availability of funds. This is discussed in more detail in our response to Observation No. 17.

Observation No. 14

Ensure Facilities Are Adequate For Personnel To Accomplish Assigned Tasks

The Lab's facilities should be improved to maximize laboratory functions and activities, better safeguard physical evidence, and provide a well-ventilated working environment. We found the design of the Criminalistics Group area did not provide adequate segregation, the majority of administrative workspaces in both the Criminalistics Group and Toxicology Group areas were insufficient to accommodate existing staff, and analytical workspaces were insufficient in the Drug Analysis and Digital Evidence Units. We also found storage for drugs, narcotics, currency, and other valuables; electrical resources; and inadequate ventilation in the Criminalistics Group area should have been improved.

ASCLD/LAB Legacy standards state, "[f]or the laboratory to achieve its goals and objectives, adequate and appropriate space should be allocated for each activity and/or function." This includes adequate workspace for each employee to accomplish assigned tasks; sufficient space for storing supplies, equipment, and tools; adequate space for performing administrative duties; adequate and appropriate space for records and reference materials; and sufficient space for instruments, equipment, and accessories. Also, inadequate workspace may contribute to health and safety problems, compromise efficiency, adversely effect morale and productivity, and increase the risk of mishandled or contaminated evidence.

Laboratory facilities should be designed to ensure environmental conditions do not invalidate results or adversely affect the quality of measurements according to International Organization for Standardization/International Electrotechnical Commission (ISO), *General Requirements for the Competence of Testing and Calibration Laboratories (General Requirements)*. "Laboratory facilities,…energy sources, lighting and environmental conditions…[should]…facilitate correct performance of the tests and/or calibrations" according to ISO standards. Laboratory design should permit efficient evidence flow from acceptance to disposal; ensure adequate and proper lighting, plumbing, and wiring for personnel to carry out assigned tasks; and ensure proper ventilation, heating, cooling, and humidity control according to ASCLD/LAB Legacy standards.

General Laboratory Design

According to the U.S. Department of Justice, National Institute for Justice (NIJ), *Forensic Laboratories: Handbook for Facility Planning, Design, Construction, and Moving (Handbook)*, a forensic laboratory is "various laboratories within the overall facility," comprised of a main laboratory space for each Unit with enclosed rooms adjacent to the main laboratory space to accommodate specific equipment or for performing specific procedures. "[E]ffective separation between neighboring areas in which there are incompatible activities" is required according to ISO in *General Requirements*. According to International Laboratory Accreditation Cooperation, *Guidelines for Forensic Science Laboratories* and Standards Council of Canada, *Guidelines for*

the Accreditation of Forensic Testing Laboratories, access should be restricted for areas used in analyzing DNA and trace evidence, and the work should be carefully controlled. We found the following concerns with the Criminalistics Group area:

- The Lab did not have secure in-process evidence storage areas but should, preferably in an analyst's work space according to ASCLD/LAB Legacy standards and the *Handbook*.
- In-process evidence in the Drug Analysis and Identification Units are located in high-traffic areas. To access the main evidence storage area, the return evidence storage area, and the receptionist area, personnel from the Trace, Firearms, Digital Evidence, and Serology Units must pass through the Drug Analysis or the Identification Units, exposing in-process identification and drug evidence to unnecessary foot traffic, and increasing the risk of contamination or theft.
- The Lab's fire-suppression system was water-based, but should have been a dry fire-suppression system in rooms containing analytical equipment or computers according to the NIJ in the *Handbook*.
- Trace, DNA, Serology, and Firearm Units should have been designated as biologically hazardous areas and equipped with biovestibules, but were not. Biovestibules are designed to limit the spread of potentially hazardous airborne contaminants according to the NIJ in the *Handbook*.

Adequate Laboratory Space

Lab personnel reported general Lab space in the Criminalistics Group area was inadequate with small and confining work areas. The Lab began occupying the Criminalistics Group area of the Lab in 1976, and renovated three times to annex additional space. Since 1976, the Criminalistics Group increased almost 400 percent, from eight personnel to 31 personnel, while the Criminalistics Group area increased by 44 percent from approximately 6,000 square feet to approximately 10,700 square feet. Lab management reported a need to assign more analysts to the Digital Evidence, Drug Analysis, and Identification Units to alleviate backlog; but lack of available space prohibited this.

The NIJ *Handbook* establishes, as a "very loose rule of thumb," gross laboratory space ranging between 700 and 1,000 square feet per staff member including managers, administrators, and analysts, based on several variables. Adequate space for the 47 personnel employed by the Lab should have been between 32,900 and 47,000 square feet. The Lab's approximately 18,700 square feet, including lower storage, resulted in an average of 398 square feet per staff member. While the *Handbook* was published in 1998, the Lab Director stated it is the most current resource for forensic facility planning. Additionally, ASCLD/LAB Legacy Standards references the publication as a valuable reference for determining "how much space is recommended to provide an adequate and safe working environment in a forensic laboratory."

The analytical workspaces for the Digital Evidence and Drug Analysis Units were less than half of the recommended size. Two Digital Evidence Unit analysts worked in a space recommended for one analyst, while the Drug Analysis Unit had three more personnel than the space should have accommodated. It appeared the Lab had enough analytical workspace to accommodate

three additional personnel in the Identification Unit; however, administrative workspace may have been constrained.

Administrative workspaces for nine of the Lab's ten Units were inadequate for current employees, based on NIJ recommendations. Only Serology met the recommended amount of administrative workspace. On average, Lab administrative workspaces were two-thirds the recommended size.

The Lab could have readjusted workspaces to better align caseload with personnel space needs. For instance, the Lab could have redesigned the Urine Toxicology Unit, potentially re-tasking these positions to other disciplines, or freed up both analytical and administrative workspace in the Toxicology section. The Serology Unit also occupied more space than recommended. The Serology Unit occupied an examination room and 44 linear feet of analytical workspace located at the back of the Drug Analysis Unit. With modifications, the Serology Unit's workspace in the Drug Analysis Unit could have accommodated three additional drug analysts. Finally, limited analytical workspace in the Digital Evidence Unit could have been alleviated by implementing two shifts. Lab management has considered relocating the Digital Evidence Unit to a larger workspace outside the current perimeter of the Lab.

Adequate Electrical Resources

Laboratory design should ensure adequate and proper wiring to carry out assigned tasks according to ASCLD/LAB Legacy standards, and emergency power and lighting should be provided for all refrigerators, freezers, and photographic darkrooms according to the NIJ *Handbook*. Lab refrigerators and freezers used to store chemical and biological samples and most analytical instruments were not connected to a back-up generator. Analytical instruments and the storage area network were not connected to an uninterruptable power source. Lab personnel reported power surges have occasionally taken equipment off-line overnight or over weekends, and the Digital Evidence and Digital Media rooms have reportedly blown circuits when multiple pieces of equipment were running concurrently.

Lab Ventilation

ASCLD/LAB Legacy standards state laboratory design should ensure proper ventilation, with odors and fumes vented to the exterior. The Criminalistics Group area did not have proper ventilation or ventilation in rooms storing narcotics. The Lab's Safety Officer reported the Toxicology Group area had fresh air intake, while air circulation in the Criminalistics Group area was recycled. During fieldwork, we detected, and Lab personnel commented on, pungent odors in the main evidence storage area and return storage area in the Criminalistics Group area. Additionally, personnel working in lower evidence storage area propped open doors due to the overwhelming odor.

Recommendations:

We recommend Lab management review the adequacy of the Criminalistics Group area to meet its goals and objectives. The review should consider if:

- **there is adequate physical segregation between Units;**
- **the Criminalistics Group area's air handling system provides adequate ventilation of odors and fumes and adequately mitigates potential biological hazards;**
- **existing electrical resources are adequate and determine future electrical needs; and**
- **internal adjustments can better align caseload with personnel space needs, ensuring disciplines with the highest demand for services or most amount of backlog have adequate space resources.**

We also recommend Department of Safety, State Police, and Lab management conduct a long-term needs assessment for future Lab space requirements.

Auditee Response:

We concur in part.

The Laboratory's Criminalistics area has space constraints due in part to how it was constructed over time, and the ability of the Laboratory to renovate the space it was provided. The core space, which was originally designed for the purpose of establishing a Forensic Laboratory when the Department of Safety (DOS) building was designed in the 1970s, houses Controlled Drugs, Serology, the Identification Unit, the Photo lab, a ballistics test fire room, and all of the main evidence storage areas. In the late 1990s, existing State Police office space was converted for use as the DNA lab area. Finally, in the 2000s, additional State Police offices were converted to laboratory and administrative space, currently housing the analytical areas of Firearms & Toolmarks, some Trace evidence analyses, and the Digital Evidence Unit.

The NIJ publication referenced in the observation contains the results of a study initiated in 1996, and as a result, and although it may have some reference value, it is somewhat outdated. Several forensic science disciplines have changed a great deal since then (for example, numerous advances have been made in DNA and digital evidence technology) and consequently, space needs have evolved as well. In fact, the publication cited does not offer a specific recommendation for the amount of square feet which should be allotted per analyst, but states that most new facilities at the time had space ratios of 700-1000 square feet per analyst, and references another study which recommended 1000 square feet per analyst. The publication also states that these numbers constitute a very loose rule of thumb and are affected by a number of individual lab variables. The only way to truly determine a specific lab's need is with a formal and accurate individualized needs assessment. There is little dispute that the current laboratory space is severely limited, and we agree that a long-terms needs assessment is desirable.

Physical segregation of units was incorporated in the latest two additions to the Criminalistics Lab; however, due to the layout of the original core space, physical segregation of the units there is impossible without major layout changes. These would include tearing down and rebuilding walls throughout the core space. As an example, the only access to the serology section is to walk through the controlled drug analysis area. As in other units, the established footpath does not require one to pass immediately next to areas where evidence is out in the open. There is no option absent major construction to create new access points to that area, or to move serology to a different part of the Laboratory which would not require one to travel through another unit to access it. In addition, it is near impossible to create additional space for analysts within their assigned unit if the Laboratory is at some future time provided the opportunity to add staff members; nor is there additional or separate space available for analysts to store in-process evidence. The boundaries of the current laboratory space do not allow for any further expansion of individual units. Even in the newest space, the room provided for the Digital Evidence Unit is not an ideal size, but is the best the Lab could do with the space which was provided and the money which could be spent on renovations.

The Toxicology Group and Criminalistics Group are located in physically separate laboratory areas. The Toxicology Lab has a dedicated air handling system, separate from that in Criminalistics. This design is intentional, and is in place to prevent cross contamination which may affect analyses. Although the Controlled Drug Unit is one identified as requiring more space, freed up space in the Toxicology Lab cannot be used for this purpose, absent major construction. Whereas the Controlled Drug Unit analyzes what are sometimes large quantities of drugs, and the goal of the Toxicology Group is to detect small amounts of drugs in biological fluids, these analysis activities are not compatible and cannot take place in shared space.

Laboratory management has consistently looked for ways to make the limited space stretch to accommodate either more analysts, new equipment, or to provide more elbow room for current analysts to work. Internal space needs cannot be determined singly by looking at the units with the highest demand for services, or the highest backlog, as suggested in the recommendation. Many factors must be considered when determining space needs, including the number of analysts in a unit, the amount and associated footprints of instrumentation in use, the types (or sizes) of evidence which is being examined, and the space needed for such analysis.

For example, the serology unit consists of two (2) analytical spaces, one enclosed room with a centrally located table, and an outer open lab space. The enclosed room is necessary for certain examinations which must be performed in a darkened room. Should the open lab space be reassigned to the drug unit as suggested in the observation, serology work would need to cease when one analyst is examining a comforter, other bedding or items of clothing commonly submitted for analysis on the table in the enclosed room, as there would be no additional space available for another analyst to perform work. So although the controlled drug backlog or demand for analysis is higher than that for serology, creating work spaces for three drug analysts in the open serology work space would actually impede work.

More than merely the request count or backlog must be considered in order to determine what kind of space would be appropriate for each unit. The Laboratory has tried incorporating a second shift of analysts to allow for the sharing of limited space. That pilot project proved to be

unsuccessful due to court issues which required analysts to change to day shifts on an irregular basis, and safety issues. It has been determined that shift work in the Laboratory is not a viable solution.

Action item: Laboratory management will continue to work with Department of Safety and State Police management to identify the funds required to contract with a well qualified long term assessment team to assist with identifying future laboratory physical resource needs.

We agree that the Laboratory would benefit from additional electrical and ventilation solutions. While refrigerators and freezers are not connected to a backup generator, each unit is monitored by a system which notifies Laboratory staff 24/7 if the temperature of any of the units is outside of the designated acceptable range at any time, so that action can be taken if the unit stores critical reagents or items. In practice, this monitoring system has been effective, but does not provide safeguards in the event of a long term power outage.

Action item: Laboratory management will continue to work with the Department of Safety and State Police management to identify the significant resources necessary to acquire backup generator(s) of sufficient capacity for all critical systems housed within the Laboratory and additional ventilation systems for the evidence vaults.

The fire suppression system for the analytical Laboratory was installed within the past two (2) years and was approved by the State Fire Marshal as a pre-action system. Cost estimates for a dry-chemical fire suppression system for the Lab were approximately $500,000 and will have to await an adequate funding source.

Observation No. 15

Improve Security Over Lab Access

The Lab should improve security controls over physical access to Criminalistics Group analytical areas and after-hours access to the Lab. Additionally, security over access to the Toxicology Group area could be improved. Industry standards suggest access to and circulation throughout a laboratory facility should be controlled and limited through the use of proximity or keycard access to document all access attempts ensuring unauthorized persons do not enter secure areas. Doors throughout the facility, particularly to exterior and evidence storage spaces, need adequate security controls and should be electronically monitored for open and closed status. Additionally, doors to internal areas requiring limited or controlled access should have a locking system.

Access To Criminalistics Group Analytical Areas

Lab SOP *QA 120, Criminalistics Group Evidence Control, Section 4.1,* and *QA 250, Toxicology Group Evidence Control, Section 3.1*, stated the entire Lab, including administrative areas, was a secure area. Further, *QA 030, Facilities, Section 2.2.1,* stated access to the Lab was controlled by keeping the area locked at all times. While these policies required entryways to the Lab remain locked, doors to the analytical areas of the Criminalistics Group area within the Lab were open

during business hours. The Lab had three internal entry points leading from the secure Criminalistics Group administrative areas to analytical areas. All three entry points remained open during business hours. Two of the doors were equipped with an electric card reader and the other was equipped with a keyed lock.

According to the Lab Director, the door between the receptionist area and the DNA laboratory was designated for an electronic lock. Additionally, it was more convenient to keep these internal Lab doors open or unlocked during business hours as Criminalistics Group personnel routinely accessed these areas. Because of the number of personnel at the front intake area, there was little perceived chance unauthorized personnel would have been able to enter analytical areas without being noticed.

Non-Lab personnel entering the Lab were required to sign into a logbook; however, Lab SOP *QA 030, Section 2.2.3,* allowed Toxicology Group employees to enter the Criminalistics Group area without signing into the logbook and stated Toxicology Group personnel must be escorted in examination areas but may be left unescorted in locked administrative areas. Additionally, non-Lab personnel temporarily assigned to work in the Criminalistics Group may also be left unescorted in locked administrative areas. By leaving doors to Criminalistics Group analytical areas unsecured, the Lab increased the number of Lab personnel who could gain access to restricted areas.

Lab After-Hours Access

The Lab needs better controls over after-hours entry. According to the Lab Director, the Lab did not maintain a log of personnel entering after-hours, nor was the electronic keycard system capable of tracking everyone who enters or leaves the Lab. It was possible for personnel to use their physical key to access the Lab, or enter with another employee, leaving no record of their Lab access.

Lab SOP *Training (TRA) 010, Administrative Orientation, Section 2.4.7,* required no less than two people in the Lab when analysis was performed. According to the Lab Director, some situations did not require two people to be in the Lab, including personnel coming in after-hours to conduct administrative work or review reports. Additionally, analytical work not posing a safety hazard may not have warranted multiple analysts in the Lab. However, once personnel accessed the main doors to the Criminalistics Group area, they had access to all rooms including the Criminalistics Group main evidence storage area, the return evidence storage area, and the firearms storage area, as they all required the Criminalistics Group master key to open. Twenty-eight of 29 Criminalistics Group personnel were assigned a Criminalistics Group master key. Once personnel gained access to the main door of the Criminalistics Group area, they also had access to evidence stored in the DNA evidence storage area and DNA extractions in the DNA laboratory; and in-process evidence stored in the trace, firearms, digital evidence, digital evidence storage area, and serology rooms, as emergency keys in tamper-evident envelopes are accessible outside the doors of these rooms. A similar situation existed in the Toxicology Group area. Further, the Lab did not routinely count evidence; therefore, theft may not be noticed for a period of time. All exterior doors to the Lab were alarmed and had motion detectors. However, the Lab did not have an electronic system to monitor access to the Lab after-hours that would

have enabled Lab management to know whether personnel were accessing the Lab for appropriate purposes.

General Access To Criminalistics And Toxicology Group Areas

Both Criminalistics and Toxicology Group intake counters had open windows large enough for a person to climb through. Additionally, unlike the Criminalistics Group where there were four personnel at the intake counter, the Toxicology Group had one secretary assigned to the intake counter. On at least five occasions, auditors visited the Toxicology Group area when no one was present at the intake counter.

Recommendations:

We recommend Lab management improve security by ensuring doors leading to Criminalistics Group analytical areas are secured during business hours and require all personnel utilize keycards to gain access to analytical areas.

We also recommend Lab management ensure adequate coverage at the Toxicology Group intake counter or close the window, restricting access when personnel are not present at the intake counter.

Finally, we recommend Lab management establish a process for monitoring after-hours access to the Lab and evidence storage areas. The process should include investigating a system capable of producing an audit trail of everyone who enters the Lab and evidence storage areas after hours, and the time each person leaves. Lab management should establish a policy requiring all personnel acquire pre-approval for after-hours access and use their keycards when entering the Lab after hours.

Auditee Response:

We concur in part.

The department believes that the guiding principles established by ASLCD/LAB are the most appropriate to be followed overall as a crime laboratory. The Laboratory has been certified and accredited by ASCLD/LAB since 2004 in the following disciplines: Biology, Controlled Substances, Firearms & Toolmarks, Latent Prints, Digital and Multimedia Evidence (computer forensics only) and Trace Evidence. The toxicology discipline was added in 2006 to this accreditation.

Action item: Laboratory management has previously identified the need for the installation of security glass doors on the front counters of both the Criminalistics and Toxicology Groups. Since the time of the audit, this security glass has been installed and procedures for its use have been established.

Action item: Laboratory management has secured grant funding to add proximity or keycard access points to those doors which do not currently have them installed, in an effort to replace

the current metal keys. A quotation for the installation of additional proximity keys has been received and will be scheduled as soon as practical, but not later than six months after the start of SFY 2012.

The Laboratory considers the entire laboratory space a secure facility and currently permits certain internal doors to remain open during normal business hours. If non-laboratory personnel are assigned to the locked administrative areas, the entrances to the examination areas are secured and at no time would these individuals have unfettered access to any critical areas in the Laboratory.

Action item: Laboratory management will meet with Department and State Police management to discuss the feasibility of further implementing the building-wide electronic access system at 33 Hazen Drive in an effort to provide additional security measures. It is anticipated that a meeting of this nature will occur within six months of the start of SFY 2012.

To implement a policy that includes the full recommendations for after-hours access to the laboratory and vault areas would require the use of RFID chip technology and sensors at every doorway in the Lab. The DOS cannot explore the use of this technology at this time. Currently all staff are authorized for pre/after-hour and weekend access to the Laboratory for processing casework (requires a second criminalist present), crime scene call-outs or completing administrative reports (does not require a second criminalist to be present).

Observation No. 16

Improve Security Over Access To Keys

The Lab should improve controls over physical keys including keys to the lower storage area, the warehouse, restricted rooms within the Criminalistics Group area, and the Toxicology Group refrigerators and freezers. Additionally, the Lab granted keycard access to one person, who according to Lab policy, should not have been assigned a keycard.

ASCLD/LAB International standards assert a system of accountability is required for all keys and keycards, including a system to ensure keys and access cards are "limited to those individuals designated by the laboratory director" as needing access. Keys should be issued only to those with a legitimate and official need.

Lab SOP, *QA 030, Section 2.2.4*, stated keys, security system pass codes, key fobs, and push button codes should only be assigned to the Department of Safety (DOS) Commissioner, State Police Director, and Lab personnel. The Lab issued physical keys to 46 of 47 Lab personnel (98 percent) and keycards to all 47 Lab personnel, the DOS Commissioner, and State Police Director. Additionally, we found the DOS Assistant Commissioner was assigned a keycard with access to the Lab without policy permission.

Backup keys should not be used unless they are kept by the facility commander, a designee, or are stored in a locked safe or drawer. Emergency keys should not be unsecured in a location

where multiple persons can access them. The Lab maintained keys throughout the Criminalistics Group area for emergency access to specific rooms storing in-process evidence and for the Toxicology Group's refrigerators and freezers. Lab SOP *QA 030, Section 2.2.14,* allowed keys to be kept in envelopes sealed with tamper-evident tape for the six rooms requiring a separate key for entry. Based upon information from the Lab Director, it appeared these keys were used twice during the audit period to gain access when those authorized to have keys were not present. Additionally, the physical keys for the warehouse and the lower storage area were stored in an unlocked box where all Criminalistics Group personnel could access them.

Key management is a critical control, reducing unauthorized access and protecting assets. Systems ranging from key boxes allowing access to only authorized personnel to key fobs embedded with radio frequency identification tags are available commercially and could allow better control over the Lab's physical keys.

Recommendations:

We recommend DOS management improve key control and security by:

- **complying with Lab policy restricting access to only the DOS Commissioner, the State Police Director, and Lab personnel;**
- **establishing a more secure system for centralized storage and oversight of emergency keys, keys to the lower storage area, and keys to the warehouse; and**
- **allowing levels of restricted access only to authorized personnel.**

Further, if a business need exists to provide access to the Assistant Commissioner, we recommend the Lab change policy.

Auditee Response:

We concur.

We believe that the guiding principles established by ASLCD/LAB are the most appropriate to be followed overall as a crime laboratory. The Lab has been certified and accredited by ASCLD/LAB since 2004 in six recognized disciplines, as noted in a previous response. In 2006 the toxicology discipline was added to this accreditation.

Action item: Laboratory policy has been revised to permit access to the Laboratory for the Assistant Commissioner of Safety for emergency purposes. He holds a current top security clearance from the United States government and is responsible for the safety of individuals and property within the DOS in the absence of the Commissioner.

Because access to lower storage and the warehouse also require a personalized access card or code, the availability of a metal key in the current key box housed within the main evidence vault is believed to be an adequate control. Emergency access to locked examination rooms can be gained by opening an integrity-sealed envelope containing a key. The Laboratory Director is notified if and for what reason the seal on the envelope is broken and these keys are used by any

staff member. It is not feasible to remove this emergency access feature, which has been used by on-call laboratory personnel in conjunction with the Concord Fire Department in response to after-hour alarms.

Action item: Laboratory management has secured grant funding to add proximity or keycard access points to those doors which do not currently have them installed in an effort to replace the current metal keys. A quotation for the installation of additional proximity keys has been received and will be scheduled as soon as practical, but not later than 6 months after the start of fiscal year 2012. After the installation has been completed, all metal keys, to include emergency keys, will be relinquished to Lab management.

Observation No. 17

Improve Security Over Criminalistics Group Evidence Storage

The Lab should improve controls over Criminalistics Group evidence storage areas. Industry standards recommend a secure, controlled area for evidence storage to ensure the evidentiary value of the items and to safeguard against interference, removal, theft, destruction, or other activities potentially compromising the material before and after examination.

General Evidence Storage

The Lab should better safeguard evidence. Some evidence storage areas within the secure Lab were not locked, and none of the evidence storage areas were alarmed or monitored. The Lab also did not have a system to monitor who accessed evidence storage areas, or to automatically track pieces of evidence leaving a storage area.

The Criminalistics Group had eight areas specifically designated for storing evidence including the main evidence storage area, the return evidence storage area, lower storage, DNA evidence storage area, serology evidence storage area, the ballistics test fire room, the digital evidence storage area, and the warehouse. All Criminalistics Group personnel had access to the main evidence storage area, the return evidence storage area, and the test fire room. A March 2010 revision to Lab SOP *QA 120, Criminalistics Group Evidence Controls, Section 4.1.6,* no longer required the return evidence storage area within the secure Lab to remain locked during business hours. We observed doors to internal evidence storage areas open or unlocked during business hours. We also observed internal examination rooms left open where evidence was awaiting or undergoing analysis when the analyst was absent during business hours.

In-Process Evidence Storage

The Lab did not have individual secure areas for each analyst for temporary storage of in-process evidence within the secure Lab. For short-term storage, analysts in the Drug Analysis, Identification, and Trace Units were assigned a portion of a shelf in the main evidence storage area where they placed evidence they were actively analyzing. This area was accessible to all Criminalistics Group personnel and the internal door to the main evidence storage area was

unlocked or open during business hours. Lab SOP *QA 120, Section 5.11,* allowed evidence to be covered with paper and secured to the work surface with tamper-evident tape or kept unsealed in a locked, limited access room. We observed in-process evidence from five separate cases on examination tables. This included evidence covered loosely by white paper, not secured to the table, and left out for two days; samples left on the table unattended and not secured; and evidence unsealed, uncovered, and unattended left on an examination table. A separate area, preferably in an analyst's work space, should be available to maintain temporary storage of in-process evidence according to ASCLD/LAB Legacy standards and the NIJ *Handbook*.

Storage Of High-Profile Items

The Criminalistics Group policy permitted the storage of evidence including firearms, narcotics, currency, and other valuables in the main evidence storage area, the return evidence storage area, and lower storage area with other evidence. The main and lower evidence storage areas had general areas for different types of evidence; however, there were no separate secure areas or video camera monitoring, nor was there an alarm system for the main evidence storage area. Additionally, for short-term storage of in-process evidence, analysts were assigned a portion of a shelf in the main evidence storage area where they placed in-process evidence, including narcotics, currency, and other valuables. The main evidence storage area in the secure Lab was accessible to all Criminalistics Group personnel and the door was left open during business hours. The return evidence storage area did not segregate these items from other evidence, and had no camera or separate alarm. After analysis, evidence was placed in the return evidence storage area in boxes or folders labeled with the submitting entity's name. The return evidence storage area was left open during business hours.

Caution should be used when handling, storing, and maintaining high-profile items such as narcotics, firearms, currency, and other valuables. Further, these items should be stored separately from general evidence in a location with enhanced security, potentially including an independent method of locking, separate alarm, and video camera to monitor activity.

Monitoring Of Lower Storage And Warehouse Access

Monitoring lower storage and warehouse access should be improved. Lower storage was accessed with a physical key, the analyst's keycard, and a PIN shared by all Lab staff. The warehouse was accessed through a physical key and a unique PIN. Keycards for 25 of 29 Criminalistics Group personnel (86 percent) granted them access to lower storage, while 27 of 29 Criminalistics Group personnel (93 percent) had access to the warehouse. Physical keys to lower storage and the warehouse were stored in an unlocked key box within the secure Lab. All Criminalistics Group personnel had access to the key box, including the four personnel who had not been granted access to lower storage and two personnel who had not been granted access to the warehouse. The keycard system for the doors to lower storage and the warehouse tracked the keycard of the person accessing lower storage and the PIN of the person accessing the warehouse. However, Lab management reported entry logs for these facilities were not routinely received or reviewed.

Better monitoring of storage areas would decrease risk to evidence. The frequency and scope of the Lab's physical counts of evidence was insufficient. According to Lab management, the Lab partly relied on trust in its personnel as a control to ensure evidence is not stolen or otherwise compromised. Lab management also stated personnel are trained not to touch other analysts' work and are trusted to follow established Lab policies.

Recommendations:

We recommend Lab management improve security over Criminalistics Group evidence storage by:

- **Ensuring all areas designated for evidence storage are locked during business hours.**
- **Seeking funding to expand electronic door access to all areas designated for evidence storage. Once installed, the Lab should ensure doors remain locked and Lab management routinely review access logs to ensure only appropriate personnel access evidence storage areas.**
- **Considering installation of a system capable of logging or otherwise monitoring individuals accessing the main and return evidence storage areas, and individual pieces of evidence as it exits the evidence storage areas.**
- **Improving security over high-profile items such as narcotics, firearms, currency, and other valuables by segregating them from general evidence. The Lab should consider placing these items within an enhanced security area, including an independent method of locking and alarm. Lab management should further secure these areas by only permitting access to personnel requiring access.**
- **Providing individual, secure temporary storage areas for analysts by seeking funding for equipment so that in-process evidence is stored in an area where only the assigned analyst may access it.**
- **Providing individual lockable spaces for each analyst in any future renovations or expansion of the Lab.**
- **Regularly reviewing access logs for lower storage and the warehouse.**

Auditee Response:

We concur in part.

The guiding principles established by ASLCD/LAB are the most appropriate to be followed overall as a crime laboratory. As mentioned in responses to other recommendations in this report, The Lab has been certified and accredited by ASCLD/LAB since 2004 in six disciplines and the toxicology discipline was added in 2006 to this accreditation.

Action item: Laboratory management has secured grant funding to add proximity or keycard access points to those doors which do not currently have them installed. A quotation for the installation of additional proximity keys has been received and will be scheduled as soon as practical, but not later than six months after the start of SFY 2012. With the anticipated

installation of additional proximity card readers, the doors to areas designated for evidence storage will be closed and locked during normal business hours.

The Laboratory, itself, is a limited access facility with locked perimeter doors and equipped with an alarm system for off-hours. In addition, the DOS building is locked and alarmed against after-hours access. Our evidence rooms are located within the locked, alarmed confines of the Lab. In addition, all visitors that enter the confines of the Laboratory must sign a log book and be escorted by Lab personnel.

We believe that the best way to determine if an item of evidence has been compromised is to inspect its packaging and integrity seals for tampering. Written Laboratory policy requires that the as-found condition of evidence packaging and integrity seals be inspected and documented prior to commencing examinations.

We believe that with the achievement of the above action item regarding additional proximity or keycard access points, we will have implemented the best available security practices when taking into consideration the Laboratory's current allotted space and financial budget. These practices have been subjected to numerous inspections by external entities. The current physical plant layout of the Laboratory does not allow for additional and separate spaces for individual storage areas or special high profile evidence vaults. The more in-process evidence is moved and repackaged such as when an analyst takes a break, lunch, etc., the more potential that trace evidence may be lost.

Access to the alarmed lower storage and warehouse facilities require the employee PIN or individual access card. Access logs for these areas are available for review should a concern arise.

HUMAN RESOURCE MANAGEMENT

Effective human resource management is essential for achieving intended results. Good human resource management policies and practices are a critical component of a good management control structure. This structure includes practices for hiring, orienting, training, evaluating, counseling, promoting, compensating, disciplining, and terminating employees. Background checks should be conducted on candidates for employment. Hiring practices should emphasize education, experience, accomplishment, and ethical behavior. Qualified and continuous supervision should be provided to ensure management control objectives are achieved.

The Division of State Police (State Police) Forensic Laboratory (Lab) was overseen by a Director and employed:

- an Assistant Director, classified as a Criminalist V;
- two Quality Assurance Managers, classified as Criminalist IIs;
- one Technical Support Specialist V, responsible for digital forensic analysis and non-analytical, IT-related tasks;
- two Executive Secretaries;
- one Secretary II;
- one Senior Laboratory Scientist;
- one Laboratory Scientist III; and
- 33 full-time and four part-time forensic analysts classified as Criminalists ranging from Criminalist I through III.

We found Lab controls over timekeeping and overtime should be improved. Limited tracking of overtime by discipline or job classification inhibited management's ability to evaluate whether overtime was effective in reducing backlog or whether overtime funds were expended in the most appropriate or effective manner. Time-consuming, non-analytical tasks were assigned to qualified analysts reducing the time spent on analysis. Personnel transferred to the Lab from other State laboratories resulted in increased wage expenditures. The process to reclassify 41 of 47 positions to a law enforcement wage schedule did not appear consistent with statute and administrative rule. Additionally, the Lab had no formal process to determine ongoing educational needs or to assess training quality.

We found Lab policy allowed analysts to record a successful pass on a proficiency test despite discrepant results. We also found two Units lacked adequate supervision as supervisory personnel did not have training or documented competency in the respective discipline and one Unit did not have a senior criminalist or technical supervisor during the audit period. Finally, we found the Lab did not conduct background reinvestigations to determine current influences impacting personnel competence, impartiality, or integrity.

Observation No. 18

Ensure Personnel Are Under An Appropriate Wage Schedule

The Lab's use of the *Collective Bargaining Agreement Between The State of New Hampshire and the State Employees' Association* (CBA) to reclassify 41 of 47 positions under the X416 plus 20 percent wage schedule (X416) was not cost effective. Before 1997, Lab personnel were classified under the Law Enforcement X416 wage schedule and were, at one time, members of the Group II retirement system. The X416 wage schedule is defined by a non-standard, 40 hour work week plus 20 percent of base wages. In 1997, the CBA removed Lab personnel from the non-standard X416 work week and wage schedule. Subsequently, Lab personnel were transferred to the A000 wage schedule and the standard 37.5 hour work week, the basic work week for every full-time clerical, supervisory, and professional employee in State classified service. In October, 1998, the Lab Director requested reinstatement of Lab Criminalists under X416, asserting: 1) Lab employees, in recognition of their off-duty availability, should receive wages 20 percent higher than employees classified under the A000 wage schedule, and 2) the X416 wage schedule enabled the Lab to hire and retain the highest caliber of scientific and technical personnel. X416 was reinstated for Lab employees, including subsequent new hires and transfers from other State laboratories, through the collective bargaining process.

The difference between wage schedules was significant. Most Lab employees were listed as Department of Safety (DOS), Non-Standard/Non-Exempt (Criminalist I and II) and Non-Standard/Exempt (Criminalist III and Supervising Criminalists), in Appendix C of the CBA. Table 7 compares the X416 and A000 wage schedules and illustrates the difference between the two, based on annual wages annotated in the 2007 – 2009 CBA. Table 7 also compares the X416 to the A130 wage scale. The A130 wage scale is a 40 hour-per-week wage scale and is provided as another comparator.

The CBA stated the 20 percent additional wages were in lieu of any compensation for recall status and employees covered by this provision were expected to be available for return to work during off-duty hours. However, recalls were not summarize and monitored by Lab management and the frequency of recalls was reportedly not regular, limited to several times a month, Lab-wide. Lab recalls included after-hours response to failing refrigerators and freezers storing evidence; response to crime scenes; and extended court-related activity, including depositions, trial preparation meetings, and testimony. Because the frequency and number of personnel involved was not tracked by Lab management, neither we nor agency management were able to verify the appropriateness of 20 percent wage additions to salaries when recalls did not occur regularly or frequently. The A000 pay schedule appears to more accurately describe Lab employees' duties and callback responsibilities.

Table 7

Wage Comparison Between X416 And A000 And A130 Annual Pay Schedules, Based On 2007 – 2009 CBA

Job Classification / Labor Grade	Wages Under X416 – 40 Hour Week	Wages Under A000 – 37.5 Hour Week	Difference Between X416 And A000	Wages Under A130 - 40 Hour Week	Difference Between X416 And A130
Criminalist I, 19	$44,628 – 59,405	$34,866 – 46,410	$9,762 – 12,995	$37,190 – 49,504	$7,438 – 9,901
Criminalist II, 24	54,837 – 74,156	42,842 – 57,935	11,995 – 16,221	45,698 – 61,797	9,139 – 12,359
Criminalist III, 26	59,804 – 80,870	46,722 – 63,180	13,082 – 17,690	49,837 – 67,392	9,967 – 13,478
Criminalist IV, 28	65,171 – 89,032	50,915 – 69,557	14,256 – 19,475	54309 – 74194	10,862 – 14,838
Criminalist V, 30	71,036 – 97,519	55,497 – 76,187	15,539 – 21,332	59,197 – 81,266	11,839 – 16,253
Director, 33	81,320 – 111,347	63,531 – 86,990	17,789 – 24,357	67,766 – 92,789	13,554 – 18,558

Source: LBA analysis of the CBA.

In addition, the Lab Director indicated the higher salaries were needed to attract and retain staff. Criminalists classified under the X416 wage schedule not only received their base wage plus 20 percent, they also received $252,522 in overtime wages during calendar years 2009 and 2010. The overtime wages per employee varied from $0 to $36,281 during the two-year period. One employee resigned from the Lab during the audit period.

The Lab Director's wage range equated to JJ in the unclassified schedule. It exceeded the range for unclassified DOS Division Directors for Homeland Security, Emergency Communications, Motor Vehicles, Fire Standards, Administration, Safety Services, and State Police; the State Fire Marshal; and the Chief of Policy and Planning. This excluded overtime and other compensation.

Other State laboratory professionals were under the A000 pay schedule. Table 8 shows job classifications, labor grades, and wage schedule for Laboratory Scientists positions in the State.

Table 8

Laboratory Scientist I Through V Labor Grades And Annual Wages Under A000 Wage Schedule

Job Classification	Labor Grade Under A000 – 37.5 hour Schedule	Wages Under A000 Schedule
Laboratory Scientist I	16	$30,986 – $41,087
Laboratory Scientist II	18	33,540 – 44,538
Laboratory Scientist III	20	36,290 – 48,770
Laboratory Scientist IV	25	44,753 – 60,567
Laboratory Scientist V	27	48,779 – 66,008

Source: LBA analysis of CBA wage data.

The wage for a Criminalist I under the X416 pay schedule was similar to the wage for Laboratory Scientist IV who fell under the A000 pay schedule. The highest Laboratory Scientist (Laboratory Scientist V) wage was midway between a Criminalist III and IV.

Forty-one of 47 Lab employees (87 percent) were paid salaries under the X416 wage schedule which was significantly above the salaries for the same labor grade under the A000 wage schedule applicable to other State laboratory professionals. Procedures existed under the A000 wage schedule to compensate Lab employees for recalls and other overtime.

Under the CBA, the A130 wage schedule exists for a basic 40-hour (or more) work week. Unlike the X416 wage schedule, it does not have a premium built into the wage rates.

Recommendations:

We recommend DOS, State Police, and Lab management:

- **consider reclassifying Lab positions from the X416 wage schedule to corresponding levels on the A000 or A130 wage schedule, as appropriate, and**
- **summarize and monitor recalls when Lab employees return to work during off-duty hours.**

We recommend the Legislature consider reclassification of the Lab Director's position to the unclassified wage scale.

Auditee Response:

We do not concur.

The assignment of the current X416 pay scale to lab scientists and analysts has been in effect for the past 13 years. The employment classification and labor grade have been in effect for more

than 25 years. The labor grade was assigned by the Division of Personnel in the same manner as labor grades for other State employees are assigned, according to a matrix that takes into consideration the requisite knowledge, skills and abilities to perform the job, along with other considerations such as exposure to toxic materials, physical effort, etc.

For many years all Lab employees were part of the Group II (police) retirement system. Subsequently they were removed from the Group II system and placed in Group I by legislative action, and existing employees were grandfathered. As new employees were hired, this resulted in a two-tiered system of compensation where with two different employees performing the same duties, one could retire at age 45 with 20 years of service or stay later for more lucrative retirement benefits than the other, who had to work until at least age 60 to earn base retirement benefits. It was partially to correct this perceived inequity and to attract and retain the best qualified personnel, as well as in acknowledgment of the fact that lab personnel were subject to call out to crime scenes, after-hours problems at the Lab such as refrigeration failures, and preparation for court testimony that they were able to collectively bargain the X416 pay scale. The nature of collective bargaining is that of a tradeoff – during each bargaining cycle, management asks employees to forgo something they are requesting and offers them something in return. To revert to the A000 pay scale would affect terms and conditions of employment, and thus is an item that would have to be collectively bargained at the end of a contract period.

At one time it was common practice for lab personnel to respond to crime scenes and collect physical evidence. In recent years this has not occurred as often because of growing backlogs in the Lab and better training of responding police officers. However, this trend is changing due to advances in science that make the collection of crime scene evidence in the most serious crimes more complex and precise in nature. Recently we are seeing more instances where lab personnel are required to respond to crime scenes and assist with or direct the collection of scientific evidence. Also, an increase in the number of illegal methamphetamine labs which presents a danger of fire, explosion, and widespread contamination now requires lab personnel to accompany narcotics officers when these illicit labs are discovered. New Hampshire for several years has led New England in the seizure of meth labs. Lab personnel also receive telephone calls from prosecutors and defense attorneys at home during the evenings and spend time at home reviewing case files and testimony for cases that will be heard the next day. The X416 pay scale is an acknowledgment of that requirement of after-hours availability. The option under the personnel rules and labor agreement if we did not have the X416 scale would be to place these employees or at least some of them on an "on-call" status after hours, which would require compensating them one hour of overtime pay for every four hours they were subject to call. Although we record physical callouts on weekly duty reports and corresponding overtime/compensatory time authorization sheets, up to this point we have not been tracking when lab personnel receive telephone calls at home on nights and weekends that are resolved without a callout. A recent example involved at 3:00 a.m. call interrupting a criminalist who was on vacation time. Although we do not have precise data on all of these instances we believe the net result of placing employees formally "on call", even on a rotating basis, could cost the State more and have an inflationary effect on our future budgets compared with using the X416 scale.

Reverting to an A000 wage scale would also cut each laboratory staff member's working hours by 2.5 hours per week, for a total of 87.5 hours per week, lab-wide with current staffing levels, and would increase the current backlog.

We understand the argument could be made that not all of these personnel would respond to crime scenes – for example the blood toxicology group would seldom do this. However, the audit report recommends that criminalists be cross-trained in other disciplines to assist with backlog reduction, and this would be much more difficult for us to accomplish if some were paid on the X416 scale and others on the A000 scale.

The current low turnover in lab personnel is commendable rather than concerning in a discipline where constant turnover could result in chaos given the delays of sometimes years in processing major felony cases through the court system. With a higher turnover analysts might not be available to testify in cases years later or if they had moved to another state in search of higher wages they would have to be transported back to New Hampshire at the expense of the State.

We do not concur that the Lab Director should be an unclassified employee. Such a change would make the Lab Director a political appointee and this could conflict with the audit report's recommendation in the section titled "Other Issues and Concerns", that the Lab apply due diligence in maintaining its independence. Additionally, we believe it would be more difficult to hire a top quality Lab Director who might be moving here from another state if the candidate knew that the job was subject to a term of office and reappointment contingent on the politics at the time, and therefore he or she was facing an uncertain future.

LBA Rejoinder:

We understand Lab employees may be called upon to perform scientific or technical functions outside the Lab, under potentially hazardous conditions, and use hazardous chemicals and biohazardous material. However, the Lab fails to specify why the State must pre-pay each criminalist in advance for the potential one or a few may be called to perform these functions intermittently.

Numerous unclassified positions are appointed without Governor and Council involvement, presumably where political pressure may theoretically be exerted.

Observation No. 19

Improve Controls Over Timekeeping And Overtime, And More Effectively Allocate Personnel Resources

The Lab should have improved the effectiveness of controls over timekeeping and overtime, and more effectively utilized some personnel. The Lab expended $257,364 in overtime payments during calendar years 2009 and 2010, but could not evaluate if analysts were utilizing their regular or overtime hours efficiently and effectively. The Lab did not track overtime by discipline or job classification, prohibiting management from evaluating whether overtime

effectively reduced backlog, or whether overtime funds were expended most appropriately or effectively. Additionally, the Lab assigned time-consuming, non-analytical tasks to analysts, employed one analyst as an expert witness who testified infrequently, and allowed relatively high-paid analysts to escort Department of Information Technology (DoIT) personnel, vendors, cleaning staff, and other non-Lab personnel during visits to the Lab.

Timekeeping

Lab personnel were required to complete and submit State Police Weekly Duty Reports (weeklies) to account for time spent on duty, on leave, in court, or performing overtime. Because the form focused primarily on tasks performed by Troopers, few task codes were applicable to Lab personnel. Lab management did not require Lab personnel account for how their regular or overtime hours were spent, such as time spent on analyses; additional, non-analytical duties; or administrative tasks. Lab management could not effectively track employee production and progress or account for time spent on analytical and non-analytical tasks with this timekeeping tool.

Control Of Overtime Usage

There was no preapproval of overtime or supervisory review of the weeklies. The review of weeklies was an after-the-fact reconciliation with leave requests performed by the Director or Assistant Director. Lab employees completed and submitted weeklies for review by the Director or Assistant Director, who then submitted the weeklies to the State Police Field Operations Bureau. The Field Operations Bureau submitted the weeklies to the DOS Business Office. Also, supervisors did not track employees' overtime hours by individual or Unit. Improved overtime controls would increase efficiency.

We found overtime expenditures did not consistently result in reduced Lab backlogs. As shown in Table 9, several disciplines receiving the most overtime funds retained high monthly average and end-of-audit period request backlogs. Of the $257,364 of Lab overtime expended in calendar years 2009 and 2010, fingerprints and controlled drug analyses accounted for $114,187 (44 percent).

Overall, Lab Units, disciplines, and sub-disciplines ending State fiscal year (SFY) 2010 with increased backlogs incurred $143,163 (56 percent) in overtime. Several Units, disciplines, and sub-disciplines with overtime expenditures ended SFY 2010 with fewer backlogged cases. Overtime expenditures were $78,554 (31 percent) for these Units, disciplines, and sub-disciplines. The remaining $35,647, or 14 percent, of overtime funds was allocated to disciplines with no backlog or no change in backlog, and to other non-analytical Lab functions.

Table 9

Overtime Expenditures And Request Backlogs [a]

Discipline/Sub-discipline	Overtime Spent	Percent Of Total Overtime Spent	Average Monthly Backlog	Starting Backlog	Ending Backlog	Change In Backlog	Percent Change In Backlog
Fingerprints	$67,004	26	462	294	626	332	113
Drug Analysis	47,183	18	1,488	1,417	1,906	489	35
Serology	35,366	14	58	78	20	-58	-74
Firearms	28,431	11	44	17	48	31	182 [b]
Deoxyribonucleic Acid (DNA)	24,846	10	33	43	28	-15	-35
Other (Blood spatter pattern analysis and footwear)	9,598	4	37	42	11	-31	-74
Digital Analysis [c]	4,842	2	68	83	50	-33	-40
Trace	3,656	1	45	49	38	-11	-22
Imaging	236	<1	2	0	12	12	- [d]
Blood Alcohol	156	<1	37	46	65	19	41
Blood Toxicology	153	<1	36	47	55	8	17
Urine Analysis	148	<1	319	173	103	-70	-40
CODIS [e]	$ 96	<1	152	745	60	-685	-92

Notes:

[a] Personnel expenditures are based on calendar year data from 2009 and 2010 and backlog data are based on SFYs 2009 and 2010.
[b] Increase was due to a one-month spike in request submissions.
[c] Digital Analysis data over-report completed cases which resulted from two corrective actions in 2009 identifying 37 assigned but incomplete cases dating to 2002. These cases were cancelled but added to the completed case count. This inflates the average cases completed per month and deflated the additional FTE needed to complete cases submitted monthly.
[d] Percent of increase is undefined because the period began with zero backlog.
[e] CODIS, the Combined DNA Index System, is not a discipline; however, the Lab provided data for this function.

Source: LBA analysis of unaudited Lab data.

Excess Overtime Paid

We found one Lab employee was overpaid $5,844 in overtime from May 2008 to March 2011 based on unaudited DOS-provided data. The employee was promoted from a Non-Exempt to an

Exempt grade in April 2008. Exempt employees were entitled to either compensatory time-off or overtime pay at straight time after 40 hours of regular duty. However, after promotion, the employee continued to receive the Non-Exempt, time and one-half rate for overtime, instead of straight time, resulting in the overpayment. The DOS Business Office, Lab Director, and the analyst reported being unaware of the overpayment until we brought it to their attention. Lab management reported developing a repayment plan.

Personnel Resource Utilization

Non-analytical duties consumed analysts' time. The Lab under-utilized three employees as Evidence Technicians instead of using them in an analytical capacity, and used analysts to perform non-analytical, IT-related tasks. We also found:

- The Lab assigned a Criminalist II as fleet manager for the Lab's seven vehicles, responsible for monthly paperwork, coordinating maintenance, and moving the vehicles during snow storms to allow for plowing. This employee performed analyses in two disciplines, one of which had a 113 percent increase in backlog during the audit period. This analyst received overtime payments of $36,281 during calendar years 2009 and 2010. We question the cost effectiveness of assigning fleet management responsibilities to an analyst, particularly when the Lab employs lower-paid administrative personnel who could be assigned this task.
- The Lab could have more efficiently managed weeklies by utilizing Lab secretaries to perform a thorough initial review. As we reported in our DOS State Police Performance Audit, October 2010, State Police Troop secretaries collated, reviewed, ensured accuracy, and followed-up with Troopers regarding discrepancies on their weeklies. The Troop Secretaries then submitted the weeklies to the Troop Commanders for review and approval. Although the Lab Director or Assistant Director must review and approve the weeklies, Lab secretaries could collate, review, ensure accuracy, and perform needed follow-up of Lab weeklies similar to Troop secretaries.
- Time spent escorting DoIT and other non-Lab personnel detracted from analyses and need not be performed by higher-paid Lab employees employed in disciplines with increasing backlogs. Two Criminalist IIs and the Assistant Lab Director reported escorting visitors detracted from time spent on analytical duties. One of these Criminalist IIs, who received $20,563 in overtime during calendar years 2009 and 2010, performed analyses in two disciplines with increased backlogs over the audit period of 113 percent and 182 percent, respectively.
- Since August 2008, the Lab used one Criminalist II as a full-time expert witness in driving-while-intoxicated, probation violations, drug-facilitated sexual assaults, and post-mortem cases. The analyst testified in court proceedings, conducted technical and administrative reviews of toxicology data and reports, participated in Drug Recognition Expert training, and prepared and presented lectures and seminars in toxicology to law enforcement agencies and the legal community. The Lab Director reported this analyst was technically competent to accomplish about 97 percent of the testimony required, while the other three percent required outside expertise. The Director estimated 75 percent of the analyst's hours were spent on either preparing

for or testifying at hearings or trials. Lab management did not require the analyst to annotate hours spent preparing or testifying for each case, or instances where the analyst appeared in court without giving testimony because an agreement was reached. Unaudited Lab data demonstrated the analyst testified in ten cases in six months during calendar year 2009 and 20 cases in all of calendar year 2010. Because Lab management did not record time spent preparing for cases or appearing for cases where an agreement was reached, we could not determine if employing a full-time expert witness efficiently and effectively used Lab resources.

Recommendations:

We recommend Lab management improve controls by:

- **implementing a timekeeping tool able to capture actual work performed by Lab personnel, and differentiating between administrative and analytic tasks;**
- **requiring supervisory preapproval and review of all employee overtime;**
- **implementing a Lab-wide overtime tracking mechanism, and conducting periodic overtime reviews by analyst, job classification, and discipline to increase control over overtime expenditures and focus on backlogs;**
- **evaluating the efficiency of assigning administrative personnel, such as secretaries, administrative functions currently performed by Lab managers or analysts; and**
- **evaluating expert witness duties, time spent on cases, and the cost-effectiveness of utilizing a full-time analyst for this function.**

We also recommend DOS management implement controls to prevent future overtime overpayments and take steps to recover the overpayment.

Auditee Response:

We concur in part.

The audit report states that "overtime expenditures did not consistently result in reduced Lab backlogs." Overtime has been used to maintain the level of service and to process cases in an effort to not allow the backlog to increase which, accordingly, did not consistently result in reduction of backlogs. Had overtime not been available and utilized, backlogs would have significantly increased. As it has been extremely difficult through budgetary constraints to create new positions, temporary federal funds have been obtained to pay the existing staff overtime so that they may voluntarily work extra hours in an attempt to keep up with the demand for services. Although employees are not required to have their overtime hours pre-approved, careful oversight by supervisors ensures the hours are being used properly.

Action item: Laboratory management will evaluate available timekeeping and overtime tracking mechanisms. DOS has been selected to be part of a pilot project for the implementation of a new timekeeping module in the NH First system. This module will provide timely accountability of employee time, to include daily reports on duty hours. A

higher scrutiny over payroll and a greater level of accountability and approvals will be instituted with this comprehensive system. It also should render impossible the erroneous payment of premium overtime pay to exempt employees. Use of this module is scheduled to begin in January 2012.

There are many non-analytical tasks that must be performed in any fully functional laboratory. While we agree that relieving the analytical staff of non-analytical duties is appropriate, we disagree with the recommendation of reassigning these tasks to the three administrative assistants (secretaries). These individuals are already responsible for performing extensive office duties to support the 44 analytical staff in the Laboratory, and to add duties may not provide the desired result or in fact, may reduce their effectiveness in service to the Lab staff. The proper solution would be to create an additional support staff position whose duties and responsibilities would include the non-analytical tasks.

The senior criminalist assigned to perform expert witness duties has filled the role which was once assigned to two unclassified forensic toxicologists. Both of these positions have been vacant and unfunded since 2009. The elimination of these positions has saved the more than $200,000 in salaries and benefits associated with them each year since that time.

The Lab and DOS are working to resolve the issue of the potential overpayment of overtime to one employee. This employee was reclassified into a Criminalist III position which had been downgraded from Assistant Lab Director when additional Criminalist classifications were created. We need to resolve whether the redefined position would fall into the Exempt or Non-Exempt listing.

Action item: If the investigation concludes that the position should be Exempt and the time and one-half payments were made in error, a repayment schedule will be established with the employee.

Observation No. 20

Evaluate Current Personnel Responsibilities Related To Non-Analytical, Information Technology-Related Tasks

Using Lab analysts to perform non-analytical, information technology (IT)-related tasks is estimated to have cost the State over $203,000 of analytical employee time during the audit period. Non-analytical, IT-related tasks reportedly performed by analytical personnel included data backups; providing technical support to Lab personnel, including general system and equipment maintenance, software installation, troubleshooting printer and network/communication issues; and escorting non-Lab personnel during visits to the Lab. Lab personnel responding to our questionnaire on non-analytical, IT-related tasks reported performing approximately 3,133 hours per year on these tasks, or an estimated 6,200 hours during SFYs 2009 and 2010, based on weekly averages. Table 10 summarizes the time Lab employees reported spending on non-analytical, IT-related tasks.

Table 10

**Time Reported Spent On Non-Analytical, IT-Related Tasks,
SFYs 2009 And 2010**

Time Reported Spent On IT-Related Tasks Each Week	Personnel Spending This Amount Of Time	
	Number	Percent [a]
No Time Spent	17	36
Less Than 1 Hour	18	38
1 To 2 Hours	6	13
3 To 4 Hours	2	4
5 To 6 Hours	1	2
More Than 7 Hours	3	6

Note:
[a] Percents do not total 100 due to rounding.

Source: LBA analysis of questionnaire responses.

During the audit period, the Lab paid personnel an estimated $203,000 to perform non-analytical, IT-related tasks while the DOS concurrently transferred approximately $14.5 million to the DoIT for DOS-wide IT services. Table 11 summarizes the time reportedly spent on non-analytical, IT-related tasks by position title and estimated costs associated with this time.

Having Lab analysts perform non-analytical, IT-related tasks detracted from the Lab's primary mission and contributed to increased overtime costs. Sixteen of the 30 Lab employees (53 percent) who reported performing non-analytical, IT-related tasks, reported performing these tasks detracted from their abilities to perform their primary duties; while 14 (47 percent) reported performing these tasks did not detract from their primary duties. Three of 16 personnel (19 percent) who reported they were taken away from their primary duties to escort non-Lab personnel included two Criminalist IIs and the Assistant Lab Director, while lower-paid employees, including three secretaries, reported spending no time on non-analytical, IT-related tasks. Also, two out of the three employees (67 percent) who reported spending more than seven hours on these tasks work in the Digital Evidence Unit of the Lab. These two personnel reported spending on average a total of 23 hours per week (30 percent) performing non-analytical, IT-related tasks, while the average monthly backlog in the Digital Evidence Unit during the audit period was 68 cases.

Further, we found Lab personnel who reported performing non-analytical, IT-related tasks accrued 1,640 hours of overtime in calendar year 2009 and 1,681 hours of overtime during calendar year 2010, for a total of 3,321 hours. In addition, unaudited Lab data show the Lab had an average monthly case backlog of 2,792 cases during SFY 2009 and 2010. Analysts could have focused on backlog were they not performing non-analytical, IT-related tasks.

Table 11

Estimated Resources Expended On Non-Analytical, IT-Related Tasks, SFYs 2009 And 2010

Position Title And Number Of Personnel Assigned	Hours Spent	Average Cost Per Employee	Total Cost By Position Title
Secretary (3)	0	$ 0	$ 0
Lab Scientist III (1)	26	581	581
Senior Lab Scientist (1)	26	838	838
Criminalist I (11)	806	1,789	19,678
Director (1)	52	2,604	2,604
Assistant Director (1)	104	4,426	4,426
Criminalist II (13)	3,172	7,535	97,950
Criminalist III (1)	520	19,116	19,116
Technical Support Specialist V (1)	1,560	$ 58,095	58,095
Total	**6,266**	**Total**	**$ 203,288**

Note: All dollar figures are rounded to the nearest whole dollar and use base wage hourly rates.

Source: LBA analysis of DOS and unaudited Lab-provided data.

The Lab could improve the efficiency and effectiveness of Lab personnel performing their primary duties instead of non-analytical, IT-related tasks. Twenty-three personnel offered no suggestions on how to reduce the time Lab employees spend on non-analytical, IT-related tasks. Twenty-four employees offered suggestions on how to reduce time spent on these tasks. Sixteen of the 24 (67 percent) recommended hiring a dedicated IT person familiar with Lab systems who would not require an escort. Two Lab employees suggested changes to data backups, including automating back-up procedures, could reduce time spent on non-analytical, IT-related tasks. This could enable Lab personnel to perform analyses instead of performing data backups.

Recommendations:

We recommend Lab management evaluate current personnel responsibilities related to non-analytical, IT-related tasks; consider reassigning routine non-analytical, IT-related tasks from analysts to support staff; and redeploy resources in the most cost effective manner to ensure efficient and effective use of personnel and funds.

We also recommend Lab management consider seeking a DoIT employee dedicated solely to supporting highly technical Lab IT functions supporting analytical equipment, hardware, and software.

Auditee Response:

We concur in part.

DoIT is not permitted to work on any of the instrumentation utilized to analyze evidence. Therefore, criminalists are trained on the various software and hardware that controls the instrumentation in most every forensic discipline (DNA genetic analyzers, gas chromatographs/mass spectrometers, Fourier Transform Infra-Red Spectrophotometers, etc.). Lab analysts obtained training on archiving data, upgrading or adding fixes to the software, etc. during instrument installation and specialized training workshops. Transferring this function to support staff, such as secretaries or evidence technicians could put the systems in jeopardy.

Action item: We are working with DoIT to obtain a dedicated IT person for the Laboratory who would become familiar with lab equipment IT systems and would report directly to the Lab Director. Such an individual will be part of the Lab staff and will not require an escort. This will enable analysts to focus on analytical functions and not IT-related duties. Discussions with DoIT have begun, and it is expected that an MOU between the DOS and DoIT regarding the assignment of a DoIT employee dedicated to the Lab will be in place within the first six months of SFY 2012.

Observation No. 21

Adhere To Fiscal Note Assumptions For Personnel Transferred From Other State Laboratories And Reconsider Future Position Reclassifications

Personnel transferred to the Lab from other State laboratories resulted in increased personnel expenditures. In 2004, sections of the Department of Corrections (DOC) and Department of Health and Human Services (DHHS), Public Health Laboratory responsible for analyzing blood, urine, and breath for alcohol concentration and controlled drug content, were transferred to the Lab. According to a 2003 fiscal note for the legislation authorizing the transfers, the DOS concluded the highway fund would experience savings due to the consolidation, but it could not quantify the expected savings. Effective April 1, 2008, three positions were transferred from the Pari-Mutuel Commission to the Lab. This transfer, according to the associated fiscal note, would have no net fiscal impact.

In January 2004, 23 positions were transferred from the DOC and DHHS laboratories to the Lab. In August 2004, the Lab Director requested these positions be reclassified under the X416 40-hour work week, plus 20 percent of base wages pay schedule, as we discuss in Observation No. 18. This request was approved by the Department of Administrative Services, Division of Personnel. Ten employees transferred from the DHHS in 2004 and three from the Pari-Mutuel Commission in 2008 remained employed by the Lab during the audit period. One secretary transferred from the DHHS remained under the 37.5-hour work week A000 wage schedule, and as of December 2010, the Lab was attempting to reclassify two of the three former Pari-Mutuel Commission employees to the X416 wage schedule. The ten remaining transferred employees were reclassified under the X416 wage schedule by October 2009.

We found reclassifying the transferred laboratory personnel increased base wage costs by $92,603 in calendar year 2009 and $91,670 in calendar year 2010, or a total $184,273. This estimate assumed each employee would have been granted increments in their labor grades held before X416 reclassification. This estimate did not include the fiscal impact of increased salaries from 2004 through 2008, nor did it reflect cost of benefits, overtime pay, or other additional payments. Upon reclassification, analysts received pay increases between one and 72 percent. During calendar year 2009, the reclassified analysts were compensated between four and 33 percent more and in calendar year 2010 between seven and 29 percent more, than they would have been without the reclassification.

Reclassifying two remaining employees transferred from the Pari-Mutuel Commission will result in an additional increase in Lab wage expenditures. The Lab Director justified the 2004 reclassification proposal by citing the difficulty in managing the disparity in hours worked by Lab staff (40 hours under X416 versus 37.5 hours under A000). However, the Lab currently has six positions classified under the 37.5-hour wage schedule with no proposal to reclassify them to 40-hour X416 schedules.

Recommendations:

We recommend DOS management adhere to its fiscal note impact statements regarding any future positions transferred to the Lab.

We also recommend DOS management reconsider proposals to reclassify Lab positions to align with the fiscal note for the legislation authorizing the transfer of positions from the former Pari-Mutuel Commission.

Auditee Response:

We do not concur.

As a result of transferring the DHHS Public Health Lab (blood, urine and breath components) and the DOC Drug Testing Lab to the DOS in 2004, several forensically positive and/or cost effective measures were manifested. First, these sections which formed the Toxicology Group became nationally accredited in 2006, increasing the value of the analytical reporting and testimony provided in criminal proceedings from that point forward. Second, reclassifying scientists to criminalists has had a positive impact on retention of laboratory staff (only one criminalist has resigned in the Toxicology Group in the past five years). This minimizes the time and expense of training new employees (a typical training period is six to nine months and takes a qualified criminalist off the bench for much of that time frame for training/mentoring). As we have discussed in our response to recommendation no. 18 above, a low personnel turnover rate in a forensic laboratory provides important continuity. Third, the criminalists took increased responsibility for their analytical work, authoring their own reports and offering expert witness testimony instead of the past practice of relying only on the State Forensic Toxicologist for these functions. These actions decreased the turn-around time for reporting from the former one to two months for blood alcohol to one to two weeks, and from six to nine months for blood toxicology

to one to two months. Lastly, due to unfunding the two previously unclassified forensic toxicologist positions, the DOS has saved more than $164,000 in base salaries since SFY 2009, which are not savings contemplated in the fiscal note from 2004.

Subsequent to the above transfers of DHHS and DOC laboratory personnel and functions, in 2008, the Pari-Mutuel Laboratory closed and through legislation, the three remaining employees were transferred to the DOS. These employees were integrated into Laboratory functional areas where the most need existed for additional staff and they were assigned the duties and responsibilities of a Criminalist. Reclassifications were authorized by the Division of Personnel to ensure equal pay for equal duties. In the instance of one position, Laboratory management was prepared to request a reclassification/demotion as a result of decreasing responsibility; however, this 37.5-hour position was eliminated in the FY 2012-2013 budget and therefore this is no longer an issue. The laboratory was also required to eliminate two Toxicology positions and two Urine Toxicology positions in the FY 2012-2013 budget. This will further save over $134,500 in base salaries going forward, additionally lessening the impact of the fiscal note that was originally established.

The observation notes that the Laboratory had six positions which are currently classified under the 37.5 hour wage schedule. However, one of those positions no longer exists. Three of the positions are secretarial which will not be reclassified into the 40-hour wage schedule. One of the remaining positions is a Technical Support Specialist V, which falls under the 37.5-hour wage schedule, and the final position is one of the Evidence Technicians, for which a suitable reclassification is being sought.

Observation No. 22

Improve Controls Over Staff Qualifications

Requirements and controls for competency, staff training, and proficiency should be improved.

Competency

The Lab should consistently apply training and competency requirements across disciplines and should improve documented verification of analyst competency. Additionally, while the Lab maintains policies and procedures on training and competency requirements and documentation, there were several exceptions to the written policy.

Training and documenting demonstrated competency is both best practice and required for accreditation. The National Research Council in *Strengthening Forensic Science in the United States: A Path Forward (A Path Forward)*, states "[p]rior to conducting analysis on evidence, forensic scientists require both basic scientific education and discipline-specific training...[e]ach examiner must also have successfully completed a competency test (usually after a training period) prior to assuming independent casework." American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) Legacy standards require "the

laboratory have and use a documented training program in each discipline and subdiscipline for employees who are new, untrained, or in need of remedial training."

The Lab maintained a documented training program in Lab standard operating procedure (SOP) Training (*TRA) 010* through *TRA 180*. Lab SOP *TRA 010* through *TRA 050* documented training required for all Lab employees. Lab SOP *TRA 060* through *TRA 180* documented required competency training and testing for each discipline and some sub-disciplines practiced by the Lab, and included completion checklists for seven of 11 disciplines. According to these policies, demonstrated competencies were required in methods, safety, processes, and equipment prior to beginning casework.

Our file review of staff development binders found training policies were in place, but over half of Lab analysts lacked thorough documentation of training completion in their files. Beginning in 2001, when training policies were implemented, seven of 25 (28 percent) lacked thorough documentation for Lab SOP *TRA 010* through *TRA 030*. A Lab manager noted there were several exceptions to training and competency documentation requirements, including exemptions for analysts working in the Lab prior to policy implementation and transfers from the Public Health Laboratory. This did not explain all discrepancies as two transfers had checklists while two non-transfers did not, and these exceptions were not explicit in policy.

Lab SOP *TRA 060* through *TRA 180* included checklist attachments for seven of the 11 Units in the Lab. Firearms, Identification, and Trace Units did not use checklists, but still had training requirements. The Imaging Unit had no training checklist, procedures, or requirements. Lab management noted this discipline was not accredited and had no training program. Three sub-disciplines also had specific training procedures including: footwear/tire tracks, blood spatter pattern analysis, and clandestine laboratories. Lab management noted this variability was likely due to each senior criminalist having flexibility "to document training in a style of his/her preference" when the training procedures were originally created. Finally, there was evidence in some milestone memos of analysts training on new equipment; however, milestone memos documenting training did not exist for all new equipment. We found no memos documenting training or competency on new analytical methods introduced by the Lab, nor were there policy requirements evident for training on new equipment or methods.

Continuing Education And Training

A Path Forward concludes continuing education and training is necessary to ensure Lab analysts remain current in their field by maintaining and updating "knowledge and skills in new technology, equipment, and methods." Management should formulate education and training goals, and establish policies and procedures identifying relevant training needs and ways to evaluate training effectiveness according to International Organization for Standardization /International Electrotechnical Commission (ISO) *General Requirements*. Further, *A Path Forward* asserts continuing education for crime laboratory personnel "is critical…" and recognized as "a means of expanding expertise…" which must be substantive and of quality.

However, Lab SOP Quality Assurance (*QA) 090, Training, Development, and Communication*, *Section 3,* addressed ongoing training and development, concluding Lab personnel "should

pursue development training at least once a calendar year" and "requiring" DNA analysts "participate" in training annually. These standards seem minimal compared to emphasis placed on continuing education by best practice and ASCLD/LAB Legacy standards. Additionally, the Lab had no formal needs determination for ongoing education, nor any formal assessment of training quality. Finally, while ISO standards in *General Requirements* conclude training should be based on need and development, Lab SOP *QA 090, Section 3.4*, stated training was based on "funding" and the "appropriate nature" relative to analyst's duties.

Proficiency Testing

Analysts should be continually tested via examinations, practicals, and other methods to review technical ability according to *A Path Forward*, since proficiency testing is "an integral part of an effective quality assurance program." Further, according to the National Institute for Standards and Technology, *Handbook 150, 2006 Edition, National Voluntary Laboratory Accreditation Program: Procedures and General Requirements*, testing is a tool to measure performance, a means for validating procedures and methods, and necessary for identifying areas for improvement. DNA analysts must complete semi-annual proficiency tests, and all other analysts must complete one proficiency test in each discipline where casework was performed. Also, each analyst must be tested in all practiced sub-disciplines at least once in a five-year cycle according to the ASCLD/LAB Legacy standards. Legacy standards recommend blind testing or re-examinations. In blind testing the analyst is unaware the sample is not a real case according to *A Path Forward,* which also concluded blind proficiency testing is a more precise test of an analyst's accuracy. Only 26 percent of laboratories participating in proficiency tests reported using blind testing in 2009, however. Blind testing appears to be a superior method. ISO standards state blind testing ensures analysts treat the test sample like any other sample instead of applying additional diligence. The Lab did not participate in blind testing. Lab SOP *QA 080, Competency and Proficiency Testing, Section 5* required re-examination of "one completed case from at least half of the units…." This policy required re-examination of approximately five cases per year. Consequently, the work of as few as five analysts may have been re-examined.

During the audit period, the Lab administered 230 proficiency tests to 35 different analysts. As of September 14, 2010, 16 (seven percent) were still awaiting response, 19 (eight percent) were in progress, 193 (84 percent of all, or 99 percent of completed tests) had a satisfactory result, and two were unsatisfactory. Although only two proficiency tests were found unsuccessful, five tests contained discrepant results, or results differing from the accepted consensus result. Policy allows discrepant results to be reviewed and identified as a successful pass if "appropriate." The Lab completed this through the corrective action process. While each discrepant result was explained, we found no objective standard or criteria to assess if a discrepant result will be identified as a successful pass. Further, we found two analysts did not complete proficiency tests required by the Federal Bureau of Investigation quality assurance standards for the DNA section of the Lab.

Recommendations:

We recommend Lab management improve controls by:

- **consistently applying training and competency requirements across all disciplines of the Lab, including non-accredited disciplines;**
- **consistently and completely documenting training and competency assessments;**
- **eliminating exemptions or exclusions from the training and competency requirements;**
- **instituting training and competency requirements and documentation for new equipment and methods;**
- **developing a training plan for each analyst ensuring relevant and substantive training, including annual training requirements;**
- **utilizing blind proficiency tests in appropriate circumstances; and**
- **developing objective standards for determining if a discrepant proficiency result can be considered a successful pass.**

Auditee Response:

We concur in part.

The foundation of formal education and training in an individual's specific forensic discipline is extremely important, as is the continuation of competency, measured through ongoing proficiency testing. We agree that continuing education is important and ideally would prefer to offer each analyst the opportunity for continuing education on an annual basis. Management pursues every available grant opportunity and includes funding for continuing education wherever possible, yet that still is not sufficient to allow for continuing education for everyone, all the time. Most of the training is not available in New Hampshire and requires out-of-state travel. At this time, the Laboratory is unable to require each analyst receive annual external training, as the funding is not available for such a broad requirement and we would not be able to accomplish such a mandate.

Action item: We will continue to pursue all available avenues to fund additional external training opportunities when possible. Laboratory management will further review these recommendations with Department of Safety management to inform them of the additional funding required to provide more continuing education opportunities consistently across the Lab.

The Laboratory has a documented training and competency testing program for analysts new to the Lab or new to a forensic discipline. Some of the missing checklists referred to in the audit report observation are explained by the analyst's status at the time of the audit. Several of the people included in the audit report observation "…over half of Lab analysts lacked thorough documentation of training completion in their files" were employed by the Lab prior to the existence of the formalized checklists. Lab management felt it was unnecessary to document the Administrative Orientation (duty hours, telephone use, dress code, etc.) and Laboratory Orientation (assigned work area, location of laboratory and office supplies, etc.) at the time the

training program was formalized since those employees were long aware of the checklist components.

At the time of the first ASCLD/LAB inspection, the Lab needed to document competency of current examiners, and so milestone memos were established to grandfather analysts with years of experience who did not go through the newly created formalized training program. The lack of a checklist accompanying the milestone memo does not take away from the fact that all Lab analysts successfully meet the necessary criteria to perform analyses.

Further complicating the documentation was the transfer of analysts from the DHHS Public Health Labs and the DOC Drug Testing lab. The transferred analysts were already working in established disciplines, and the Toxicology Lab was new space built specifically for and with the input of those employees. Since the transferred employees organized the laboratory supplies, safety equipment and literature in the new space, the components of the Laboratory Orientation were already familiar to them. The two non-transfers who did not have checklists were hired into the Urine Toxicology Unit prior to that unit moving to the Lab facility in Concord. While they were "non-transfers" in the sense that they were hired by DOS, they were also moving into newly created lab space that they helped organize, and for the same reason, would not necessarily have that completed checklist.

Action item: Moving forward, all new analysts to the Laboratory will undergo the documented training program, to include completion of the appropriate paperwork to memorialize the activity. In the event of an unexpected future consolidation, any modified training expectations will be appropriately documented.

In addition to the checklists and milestone memos, all work completed by a trainee is maintained on file and can be reviewed at any time. Complete support for the issuance of the milestone memos is documented.

Action item: Laboratory policy will be updated this year to specify when additional competency testing and/or milestones may be necessary if new procedures or new types of equipment which require additional training are introduced to the Laboratory. Lab management will review the application of training and competency requirements across all disciplines and consider whether formal individualized training plans are appropriate or necessary.

Following a training period and before commencing casework, all analysts are required to take a competency test. The competency test is comprised of an oral and/or written examination as well as hands-on work on mock casework samples. The practical portion of the competency test is equivalent to an internal proficiency test, where an analyst is provided with evidence –type samples to be analyzed to the extent that an analyst will be performing casework. In that way, the Laboratory is in fact ensuring that analysts take an internal proficiency test prior to conducting analytical work.

ASCLD/LAB recommends either blind proficiency testing or re-examinations be performed and does not state a preference for either. No outside proficiency testing service offers blind proficiency tests.

Because the topic of blind proficiency testing had been raised in the past, a study was commissioned by the NIJ to look at the feasibility of instituting blind proficiency testing. In 2003, the results of the study which examined the feasibility of blind proficiency testing specifically for DNA analysis was published in a peer reviewed journal (Journal of Forensic Science. The Feasibility of External Blind DNA Proficiency Testing. I. Background and Findings. Jan. 2003, Vol. 48, No. 1). After much study, the recommendation was that blind proficiency testing is "fraught" with problems, not the least of which is the significant cost to administer. The study determined that to prepare one blind DNA proficiency test would cost approximately $3,500. For the Lab, this would mean that offering blind testing to the five (5) DNA analysts on staff would cost at least $35,000 each year. That estimate does not include any markup that commercial test providers would include in their purchase price. For the entire Lab, a program of blind testing could cost more than $320,000 per year, which is more than our current consumable supply budget.

Another issue identified by the authors of the cited study is that blind proficiency tests may get caught in a laboratory's backlog and not be tested in a timely manner. This is a real concern. If a blind proficiency test were submitted as a routine request, it would be placed in the unit's regular backlog. Considering some units have rather extensive backlogs, the proficiency test might not be analyzed for several months, or even a year. If the Laboratory relied on blind tests for all proficiency tests as recommended in the audit, we would risk being non-compliant with the stringent proficiency test frequencies required by ASCLD/LAB and the FBI's Quality Assurance Standards. The published study further concluded that at least for the time being, blind proficiency testing programs should be deferred.

The authors of that study recommend that an easier form of blind testing, in terms of administering the test, would be random reanalysis, which the Forensic Laboratory does perform, and which is also recommended by ASCLD/LAB as an alternative to external blind proficiency tests. Instituting random reanalysis lab-wide has limitations, as the Lab must ensure that sufficient evidence remains for additional testing, and not all types of analyses are able to be repeated. For example, once an item has been processed for latent prints and the case is complete, another analyst could not go back and duplicate the analysis by reprocessing the same evidence, as the evidence is not in the same condition as when it was received into the Lab and any prints which were found during the initial examination would have been removed from the item. Similarly, once an item is examined in serology and biological stains have been identified and cut out, the item would not be suitable for re-analysis as the second examiner will find the item already marked by the first examiner, and possibly without the stains of interest still intact. While the Lab is unable to perform random reanalysis in every unit, we will continue our commitment to pursuing random reanalysis annually in the areas which permit such analysis, such as in DNA and controlled drugs among other units.

Proficiency testing is often incorrectly viewed as a test specific to an analyst's ability to obtain a correct answer. In reality, it is a measure of a laboratory's performance and a mechanism which may identify areas where improvement may be needed. It monitors both that a laboratory's technical procedures are providing reliable results, and whether an analyst's quality of work is being maintained.

ASCLD/LAB defines successful completion of a proficiency test as when either the correct responses have been obtained or that corrective actions were completed pursuant to the laboratory's written policies. The proficiency test paperwork reviewed during the audit grades only the analyst's performance as satisfactory or unsatisfactory. There are valid reasons why an analyst may be graded as performing in a satisfactory manner even though the reported results were discrepant from consensus. It may be that the analyst followed procedure, but it was found that the procedure was inadequate or could be improved. To then grade the analyst's performance as unsatisfactory is not appropriate. The analyst is only one part of the proficiency testing process.

Action item: The Laboratory has written procedures which address the evaluation of discrepant proficiency test results. We agree that not all factors which are considered during the evaluation of proficiency test results are captured in Lab policy, and the policy will be strengthened this year to be more inclusive of those considerations.

Regarding the audit reference to what was characterized as a failure of two DNA analysts to complete required proficiency tests, all DNA analysts have completed two proficiency tests per year, as required by the FBI Quality Assurance Standards for DNA Laboratories, as well as the Laboratory's own SOPs. During the last internal DNA audit, it was recognized that two analysts did not choose to utilize an automated method to isolate DNA from reference samples, and so those analysts were not tested in their use of that particular procedure. The analysts did in fact successfully complete the required proficiency tests utilizing an alternate Lab-approved method.

Observation No. 23

Improve Staff Monitoring Process

Lab personnel were not subjected to monitoring for changes in personal circumstances. The State Police *Civilian Packet* for employment required prospective employees complete all sections, including the background investigation consent, personal data, education, prior military service, prior employment history, criminal and motor vehicle checks, financial data, and references. All Lab employees received a pre-employment background investigation before hire. However, we found 14 (30 percent) Lab personnel were missing at least one background investigation document, including six of 47 Lab employees (13 percent) who did not have financial information in the file. An additional three personnel (six percent) had only applicant-reported financial information in their file with no supporting documentation (i.e., credit report). Without information on employees' finances, the Lab could not reasonably ensure Lab personnel did not have financial pressures which could have compromised their reliability or integrity. We also found five of 47 Lab employees' background investigation files (11 percent) did not contain references or any indication references were checked. Without reviewing references, the Lab could not reasonably ensure personnel were not associating with persons who such association would cast doubt upon the employee's integrity and moral character. Finally, we found one employee (two percent) without a documented check of criminal or motor vehicle history.

Once hired, the Lab did not formally document monitoring changes to employees' lives. Lab personnel were employed by the Lab ranging from over one year to almost 28 years. Nineteen of 47 Lab employees (40 percent) worked at the Lab for ten years or more, and four of 47 Lab employees (nine percent) worked at the Lab for 20 years or more. The most tenured person in the Lab started employment in 1983 and monitoring for changes in circumstances was never documented.

According to industry standards, pre- and post-employment screening is important. Laboratories should develop "policies and procedures to avoid involvement in any activities that would diminish confidence in its competence, impartiality, judgment or operational integrity" according to ISO standards. State Police *Professional Standards of Conduct, Chapter 1,* addresses topics such as personal behavior, association, financial responsibility, gratuities and gifts, and use of alcohol and drugs. Employees are required to "conduct themselves in a manner that will reflect credit on themselves and the Division of State Police. No employees shall engage in conduct that tends to bring the Division into disrepute or reflects discredit upon the employee as a member of the Division...." Lab employees are prohibited from associating with "persons who are known or should be known by the employees as criminals, gamblers or others with whom such association would cast doubt upon the employee's integrity and moral character...." Finally, employees "shall not willfully and/or recklessly disregard the payments of just debts."

Entities such as the U.S. Drug Enforcement Administration (DEA) stress the importance of pre- and post-employment screening. Pre-employment screening serves to identify potential problems when working in or around high-profile evidence, such as narcotics, firearms, currency and other valuables. According to the DEA, assigning personnel with past or present drug or financial problems to handle these items greatly increases the possibility of theft or mishandling, and may jeopardize the integrity of the evidence system. Similar precautionary measures may be taken before transferring or promoting employees even if they have undergone a pre-employment background check. The DEA states in its *Controlled Substance Security Manual*, "[e]vents in employees' lives can change their reliability and integrity" and "[w]hen employees are considered for promotion to positions of greater responsibility, additional comprehensive screening may be appropriate." Without periodic monitoring, the Lab could not reasonably ensure employees were not engaged in conduct which could have brought the Lab into "disrepute or [reflect] discredit upon the employee as a member of the Division," nor could it reasonably ensure employees were not experiencing undue financial or personal pressures.

Recommendations:

We recommend Lab management improve its process for staff background monitoring by ensuring background investigations are complete, by requiring ongoing monitoring for Lab personnel, and by establishing the necessary frequency of monitoring.

Auditee Response:

We concur in part.

All Laboratory staff must undergo a stringent background investigation conducted by State Police prior to employment. The administrative rules for the management of state employees, including those at the DOS and the Lab, are set forth in the Division of Personnel Rules. Lab management cannot change the terms and conditions of a full-time state employee based solely on the outcome of a post-employment monitoring. Even if DOS took affirmative steps to change employees' class specifications to include regular monitoring, the current Personnel system does not provide a mechanism to remove an employee or change their duties when monitoring reveals that an employee is experiencing financial pressure or other life events that could possibly impact their reliability.

Observation No. 24

Improve Controls Over Unit-Level Supervision

Management controls needed improvement in the Trace and Digital Evidence Units due to inadequate segregation of duties, and a lack of documented competency in the supervised discipline.

The U.S. Government Accountability Office (GAO), in *Internal Control Management and Evaluation Tool*, states there must be "an appropriate balance between the delegation of authority at lower levels to 'get the job done' and the involvement of senior-level personnel." Additionally, "[q]ualified and continuous supervision [should be] provided to ensure that internal control objectives are being met." Consequently, "[t]he laboratory must employ one or more individuals who are qualified by education and either training or experience to provide technical supervision for each of the specialties and subspecialties of service in which the laboratory performs high complexity tests or procedures," according to the federal *Clinical Laboratory Improvement Act*, 42 CFR, Sec. 493.1449. The GAO concludes segregation of duties is necessary to reduce the risk of error, waste, or fraud and "[n]o one individual is allowed to control all key aspects of a[n]…event."

The Trace Unit, a discipline consisting of multiple sub-disciplines such as arson, explosives, ink analysis, paints and plastics, fibers, filaments, and hairs, did not have a senior criminalist or technical supervisor; therefore, limiting supervision. Additionally, one control activity of the Lab was technical review; however, several sub-disciplines in the Trace Unit did not require technical review. In these cases, one employee, without supervision, was responsible for all key aspects of an event. Lack of supervision, without adequate segregation of duties, limited the effectiveness of management controls and increased the risk of undetected errors or inappropriate activities.

The Digital Evidence Unit (DEU) was overseen by a Quality Assurance (QA) manager without education, training, and experience in digital evidence. The QA Manager was also responsible for enforcing the QA program and completing reviews of the quality program Lab-wide, including the DEU. Because the QA Manager also supervised this Unit, an inadequate segregation of duties existed. Additionally, the QA Manager oversaw the DEU due to workflow and productivity issues. These issues were discovered upon implementing a new reporting tool for tracking Unit-level output, which resulted in questions regarding the supervision of the Unit.

Recommendations:

We recommend Lab management improve controls by:

- **increasing supervision of the Trace Unit and ensuring all supervisors possess competencies in all Units supervised;**
- **implementing adequate segregation of duties in the Trace Unit, ensuring no employee is responsible for all parts of an event; and**
- **instituting mitigating controls when adequate segregation of duties is not practical.**

Auditee Response:

We concur in part.

The Trace discipline incorporates several different areas of analysis, each requiring different knowledge bases and competencies. None of the trace analysts perform analyses in the trace area full time, nor does any one person perform all types of trace analyses offered. There is no one individual who possesses adequate knowledge and competency in all the varied trace sub-disciplines who would be appropriate to serve as a formal technical supervisor of the trace unit as a whole.

Action item: In practice, all Trace sub-disciplines with two qualified analysts perform 100% technical review; however, written Lab procedures need to and will be updated to reflect this.

There are currently only two Trace sub-disciplines with only a single qualified analyst. While it is not possible to allow for 100% technical reviews in those areas due to the complications of sending out cases to other labs for review, the Lab has a second forensic examiner perform administrative reviews of the case files. Additionally, one case per year at a minimum is sent out for external review. Therefore, the Trace analyst is not truly responsible for "all parts of an event" as characterized in the observation.

Action item: Laboratory procedures have been updated to require, rather than recommend, this external review. Due to current budget restrictions and low case submissions, these lesser used sub-disciplines with only a single analyst are likely to be phased out of the Lab. The ultimate goal is to have all units, including Trace sub-disciplines, have at least two qualified analysts and perform 100% technical review.

The QA Manager's role regarding the DEU is limited to overseeing the workflow (throughput) through the DEU only, and includes no technical responsibilities. In conjunction with the digital evidence staff, case assignments are made and output goals are established. On a regular basis, the QA Manager checks in to determine if the unit is accomplishing the throughput goals, and assists in determining what cases should take priority. She is not involved in the review of case reports, and maintains her role as QA Manager over the entire Lab, including the DEU. This

role in assisting workflow in that unit is not a permanent one, but will remain in effect until the workflow issues are fully resolved.

Observation No. 25

Improve Process For Investigating Complaints And Employee Non-compliance

Lab policies and procedures for handling employee non-compliance with rules, policy, procedures, regulations, or disciplinary-related complaints lacked clarity and appeared to conflict with State Police policies and procedures. Clear policies could lead to objective handling of non-compliance and complaints.

State Police policies were binding on Lab employees, including policies related to discipline, complaints, and internal affairs investigations. These policies authorized the State Police Director to investigate violations of rules, regulation, and other directives; and required employees and supervisory personnel to report all violations. While the Lab was a unit within the State Police, its investigation policies differed from State Police policies. Both State Police *Professional Standards of Conduct* and Lab SOP required all violations and instances of non-compliance be reported by any witness, yet we found several inconsistencies between the State Police and Lab policies.

Complaint Reporting

State Police *Professional Standards of Conduct Chapter 1-AA Discipline, Section 2.0*, required supervisors to notify the Professional Standards Unit (PSU) Commander immediately of serious allegations or within 24 hours for all other complaints. Lab SOP *QA 200*, *Non-conforming Work and Corrective Action/Preventative Action, Section 2.1,* required reporting non-conformities (i.e., work not conforming to Lab policies and procedures) to the QA Manager or the senior criminalist instead of to the unit commander (i.e., the Lab Director). *QA 200* did not require reporting non-conformities to the PSU.

Complaint Investigation

State Police *Professional Standards of Conduct, Chapter 26-E Personnel Complaint / Administrative Investigation Policy and Procedures, Section 3.0,* allowed unit commanders to conduct administrative investigations of personnel complaints alleging non-criminal misconduct; minor motor vehicle violations; or minor violations of rules, regulations, or procedures but required the PSU to administratively investigate all criminal and serious non-criminal complaints. *Chapter 26-E, Section 4.2,* required the unit commander, with the concurrence of the PSU Commander, to assign investigators. In contrast, *QA 200 Sections 2.2, 2.3,* and *4.1* made the QA Manager, with the help of the senior criminalist or other applicable employees, responsible for evaluating the significance of all violations or non-conformities, conducting a cause analysis, investigating the contributing factors, and implementing and documenting the corrective action.

Additionally, *Chapter 26-E, Section 5.2,* required investigations and reports be completed within 21 days from the date of assignment and sent to the PSU Commander. However, *QA 200*, *Section 5.4,* stated follow-up time "will vary greatly…," permitting corrective action reports to remain open indefinitely. Additionally, *QA 200* did not require reporting to the PSU.

Complaint Documentation

Chapter 1-AA, Section 2.0, required supervisors collect initial information, while *Chapter 26-E, Sections 4.2 and 5.2,* required documentation of all complaints. For non-actionable complaints, *Section 4.2* required the unit commander complete and forward a *Complaint Reception Report, Department of Safety, State Police (DSSP) 293,* describing the reason the complaint was classified as non-actionable, while *Section 5.2* required a report of all investigations. Additionally, *Section 5.2* required the investigative report include the allegation(s), complaint details, Division Member's response, findings of fact, conclusions, recommendations, and attachments. *QA 200*, *Section 5.1,* allowed the QA Manager the option of documenting the action based on the "significance" of the incident. *QA 200* only required the investigation be documented if it resulted in a corrective or preventative action.

Complaint Follow-up

Chapter 26-E, Section 4.2, required the unit commander notify the PSU of significant developments and provide periodic investigation updates. *QA 200* did not require the QA Manager provide status reports to the Lab Director or the PSU.

A memorandum of understanding between the DOS and the New Hampshire Department of Justice (DOJ) pertaining to the federal Coverdell grants required the Lab report allegations of serious negligence or misconduct to the DOJ. The MOU also required the DOJ investigate the Lab when significant allegations potentially affecting Lab results occurred.

During the audit period, the Lab received two external complaints, one regarding an analyst's testimony and an anonymous complaint pertaining to a conflict between an analyst and the complainant. The Lab forwarded both complaints to the PSU. Two separate cases of missing drug evidence inside the Lab, which occurred within one month of each other, were handled internally without reporting to the PSU. Both cases resulted in corrective actions; however, case files did not include notes detailing the circumstances surrounding the missing evidence, interviews with responsible analysts and co-workers, results of searches for the evidence, or State Police and Lab management conclusions. Additionally, despite the Lab Director categorizing these incidents as significant, they were not forwarded to the PSU which, according to State Police policy, is required to investigate all criminal and serious non-criminal complaints, nor were they reported to the DOJ. The Lab Director reported informing the State Police Director, who did not require PSU involvement.

Finally, Q*A 200* created a bifurcated system allowing analysts to report non-conformities either to the QA Manager or the senior criminalist. This reporting system and the subjective nature of documenting non-conforming work created a condition where Lab management could have been

unaware of non-conformities and increased the risk of inconsistent treatment of non-conformities.

Recommendations:

We recommend State Police and Lab management:

- **determine whether there should be consistency between *QA 200* and the State Police complaints investigation policies, including whether *Chapters 26-E* and *1-AA* apply to the Lab, and**
- **review the Lab's complaint and non-conformance policy, establish when complaints and instances of non-conformance can be addressed internally and when they must be forwarded to the PSU or the DOJ for investigation, and update policies to reflect these changes.**

Auditee Response:

We concur.

There is a difference between a disciplinary complaint as described in the State Police Professional Standards of Conduct (PSC) and a laboratory non-conformance covered by QA policy. The PSC Chapter 26-E, Personnel Complaint / Internal Affairs Investigation Policy and Procedures, defines its purpose as the "investigation of citizen complaints and internal affairs investigations concerning allegations of personnel misconduct." Specifically, "complaints referred to in this policy concern those received from internal or external sources that allege a Division member has: l) committed a criminal or motor vehicle offense, 2) committed a violation of Division rules, regulations, policies, or procedures or 3) conducted themselves in a manner that reflects unfavorably upon them or the Division while on or off duty." The Laboratory interprets this to exclude technical non-conformances. It would not make sense to involve the Professional Standards Unit (PSU) in laboratory technical procedure non-conformances.

The Lab's QA program takes non-conformances very seriously, and each one is reviewed and handled appropriately for the specific situation. The PSU does not have the background and technical knowledge necessary to evaluate non-conformances related to technical issues. As noted in the audit, the Laboratory Director did forward two external personnel complaints to the PSU commander. Also noted in the audit, the Laboratory Director addressed two instances of missing evidence to his immediate supervisor, the State Police Director, and was informed that there was no need for PSU to be involved.

Action item: Laboratory management will work with State Police management to better define the application of the PSC policy to the Lab. We will also review, and update as necessary, the Lab's complaint and non-conformance policies to make them consistent and complimentary to the revised PSC, where applicable. A meeting with State Police management to initiate this process will take place within the first six months of SFY 2012.

OTHER MANAGEMENT CONTROLS

Management controls provide reasonable assurance an organization achieves its goals, operates efficiently and effectively, reports reliable information, and complies with laws and regulations. Controls span all aspects of an organization's operations, help an agency accomplish its mission, improve accountability, minimize operational problems through effective stewardship of public resources, and must be continually assessed and updated to reflect changes in the operating environment. In addition to controls over efficiency, quality, security, facilities, and human resources, the Division of State Police (State Police) Forensic Laboratory (Lab) also must control information technology (IT), ensure continuity of operations, and conform to State law.

The Lab relied on the Department of Information Technology (DoIT), private contractors, the federal government, and Lab employees to support its IT systems. Major systems include two distinct Laboratory Information Management Systems (LIMS) supported by different vendors, a digital image evidence management system, a forensic storage and review system, a video testimony system, a stand-alone alarm system, and discipline-specific analytical systems. Systems supported primarily by the federal government, or a commercial contractor through the federal government, included the Integrated Automated Fingerprint Identification System, Integrated Ballistics Information Systems, and Combined Deoxyribonucleic Acid (DNA) Index System (CODIS). The DoIT provided limited support to CODIS and LIMS and was primarily responsible for the Lab network, personal computers and laptops, and printers connected to the Department of Safety (DOS) network. The DoIT did not support the independent, stand-alone analytical instruments, the security system, DNA equipment, the storage area network (SAN), or digital evidence equipment.

Understanding IT systems controls is important when information systems are used extensively throughout the program under audit and the fundamental business processes related to the audit objectives rely on IT systems. However, we limited our examination of Lab IT-related systems to the extent necessary to indicate significant risks may exist in general controls. Consequently, our conclusions based on Lab-provided data were limited as we did not examine in detail the general or application controls over Lab IT systems, except for the Lab-managed electronic keycard system. We found Lab-provided data internally inconsistent; Lab management acknowledged limitations in data due to variability in collection methods and analysis.

We found the Lab's general controls over IT systems needed improvement and better protection against unauthorized access, and were not supported by the DoIT, resulting in Lab personnel using analytical time to support systems. Lab controls over the computer containing the electronic keycard system used to control physical access to the Lab could have been improved. The Lab did not have a continuity of operations or disaster recovery plan. Finally, the Department of Safety did not promulgate administrative rules outlining the Lab's organization, general agency operations, or establishing its relationship with external entities.

Observation No. 26

Improve Information Technology Management

The Lab relied heavily on IT to accomplish core functions. It also relied on the same IT support infrastructure the State Police relied upon, which we reviewed during our 2010 Field Operations Bureau Performance Audit. We found similar IT-related control issues with governance and general controls as the Field Operations Bureau Performance Audit. The Lab was American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) Legacy accredited during the audit period. However, the accreditation process did not evaluate IT-related controls nor did it assess their effectiveness.

Lab Personnel Supporting IT

DoIT employees embedded within the DOS managed technical aspects of the Lab's administrative network and certain desktop and laptop computers, printers, and other IT components. Embedded DoIT employees did not manage or support analytical instruments and ancillary IT systems used in the Lab. Instead, some Lab analysts performed IT-related duties in addition to their analytical responsibilities. According to one Lab analyst, the DoIT is not staffed, trained, or equipped to manage Lab technical support issues. Lab equipment must be validated and verified because of its dealings with evidence. We found the use of analytical personnel to perform non-analytical IT-related tasks was costly and detracted from their ability to perform their primary duties.

Laboratory Information Management Systems

LIMS are designed to integrate evidence management, analytical reporting, document management, and laboratory management in one system thereby reducing duplicative systems. The Criminalistics Group LIMS had the capabilities to work for all Lab sections. However, the Lab relied on two LIMS, one supporting the Criminalistics Group and Blood Toxicology Unit and one supporting the Urine Toxicology Unit. The Lab also used database and word processing applications to process casework. Operating one LIMS Lab-wide could increase efficiency and effectiveness by eliminating duplicate contracts, maintenance, and support. In addition, utilizing the LIMS reporting functionality could accelerate report delivery, by eliminating the type of ad hoc reporting currently used by some Lab personnel.

General Controls

General controls are policies and procedures designed to allow access to use of management-authorized IT systems. IT asset protection includes physical and logical access controls preventing or detecting unauthorized use, damage, loss, or modifications. The Lab relied on stand-alone alarm systems and discipline-specific analytical systems including photographic, chemical and drug analysis, alcohol analysis, and a storage area network to store case analysis files and digital evidence. These systems were not supported by the DoIT. We found: 1) the controls protecting IT equipment, operating systems, and media storage; 2) log management,

training, and segregation of duties; 3) disaster recovery controls; and 4) the electronic keycard system needed improvement.

The Criminalistics Group LIMS was user name and password protected but had no regular change of password requirements. Account lock-out policies were unknown by Lab staff. Only one of two Lab program managers knew where the server was located, where backups were kept, how often the system was backed up, how the system was protected, and who had access to the data.

We found no Lab-specific written policies or procedures related to the security controls over Lab systems access, and the Lab did not have readily accessible inventories and topologies detailing the Lab IT system structure, except for one subsystem, nor did the Lab have a strategic IT plan. The physical location of the computer room supporting digital evidence analysis was not appropriate to ensure security, with the primary and backup systems in the same room. The Lab's measures to prevent environmental damage to essential systems needed improvement, as the entire Lab area relies on water-based fire suppression, subjecting the Lab to significant loss if activated. Agencies should maintain formal intrusion response plans, escalation procedures, and a reporting system, and employ intrusion detection and prevention systems. We found while the DoIT established an incident response policy, there were no corresponding Lab plans, policies, or procedures to operationalize the policy. Also, management should complete periodic log reviews, conduct audits of agency devices and settings, and create and review audit trails. We found no evidence the Lab used such control measures.

The Lab had an Internet link to permit remote access to stored evidentiary files. We found no virtual private network or other security controls in place. The Lab reported the DoIT was unable to provide virtual private network access because the Lab could not provide every Internet protocol address needing access. The Lab also maintained a direct Internet connection which was secured by simply unplugging the network wire. When these systems were connected to the Internet, they were unprotected. Lab IT-related general controls could not be relied upon to ensure the IT systems function as intended.

Recommendations:

We recommend Lab management improve IT-related general controls by:

- **performing a comprehensive review of IT controls Lab-wide with the assistance of the DoIT or competent third party, should the DoIT lack the specific expertise required;**
- **developing and implementing detailed, written IT policies and procedures;**
- **implementing intrusion response plans, policies, and procedures, including a reporting system; and**
- **reviewing existing logging and audit trail capabilities and developing policies and procedures to institutionalize system monitoring.**

We also recommend Lab management:

- **develop a strategic IT plan addressing each system;**
- **maintain a complete inventory of IT assets and system topologies;**
- **consider fully implementing the Criminalistics Group LIMS Lab-wide; and**
- **review and limit employee hours spent on non-analytical, IT-related tasks and consider requesting additional IT assistance from the DoIT to increase analyst time available for analytical work.**

Auditee Response:

We concur.

Action item: DoIT and State Police, through the DOS, are currently working to create and execute a memorandum of agreement (MOA) covering all State Police systems that will detail support, service and segregation of duties as well as policies and procedures. Their goal is to complete an MOA by the end of SFY 2011.

Action item: Lab management recognizes the importance of information technology security and will also work with DoIT to develop a comprehensive strategic IT plan to include a review of IT controls and to develop, document and implement IT policies and procedures; implement intrusion response plans, policies and procedures; review of logging and audit trail capabilities; and the maintenance of a complete inventory of IT assets and system topologies. Lab management will work with DOS management to identify available resources to support these recommendations related to improving IT-related general controls. This may include the assignment of a DoIT representative or a competent third party. The Lab anticipates completion of this project by the end of SFY 2012.

The Urine Toxicology Unit is the only one operating on a different LIMS. The ability of the Urine Toxicology Unit's LIMS to communicate directly with its analytical drug-screening instrumentation allows time-saving automated "data dumping" for the purpose of reporting analytical results.

Action item: With the transition to urine testing cups discussed in Observation No. 5, the drug-screening instrumentation will be phased out and the laboratory will stop using the Urine Toxicology LIMS system. As stated in the response to Observation No. 5, Lab management is expected to be able to fully implement the transition to urine cups within six months of the start of SFY 2012.

Observation No. 27

Improve Controls Over Lab Electronic Keycard System

The Lab utilized an electronic keycard system as one method to control physical access to its facilities. Keycards were used to access the Lab's external entrances and interior doors leading to

analytical areas of the Lab. Lab personnel were assigned a keycard with access to the Criminalistics Group area, Toxicology Group area, or both depending on job requirements. Controls over the electronic keycard system could be improved.

Physical And Logical Access

Access controls include policies and procedures designed to allow use of data processing assets only as authorized by management. Protecting these assets requires both physical and logical access controls to prevent or detect unauthorized use, damage, loss, or modification. These resources should be accessed only by those authorized to process or maintain a particular system. We found the computer containing software which controlled the electronic keycard system was accessible to anyone with access to the Toxicology Group area, as the door to the room was left open and was not equipped with a card reader. During the audit period, 23 Lab personnel, the Commissioner, Assistant Commissioner, and State Police Director had access to the Toxicology Group area.

Logical access to the system was achieved through a user name and password; however, periodic password changes were not required. According to the Lab Director, password integrity was based on the integrity of the two personnel with access to the system. Additionally, the computer containing software controlling the electronic keycard system had no software to monitor unauthorized access attempts.

Change Controls

Change control is the process of modifying programs based on proper authorization and approval. Procedures should include an audit trail of changes, segregation of duties, and adequate documentation of changes. The Lab did not maintain written procedures for controlling access level changes. The Lab Director and Assistant Lab Director were the only personnel authorized to change access levels in the keycard system. While changes to access levels made by the Assistant Lab Director were documented in a memorandum to the Director; changes made by the Lab Director were not documented. Further, the system could not maintain an audit trail of changes to access levels, who made the changes, or when the changes were made, increasing the risk unauthorized users could change access levels without anyone's knowledge.

Recommendations:

We recommend Lab management improve controls over the electronic keycard system by:

- **ensuring adequate physical security over the computer containing system software;**
- **requiring passwords be changed periodically;**
- **monitoring attempts to access the system and following up on all unauthorized attempts; and**
- **documenting all changes to access levels, including the date of the change, reasons for the change, and who made the change.**

Auditee Response:

We concur in part.

The computer that processes the electronic access software is housed within the secure Toxicology Laboratory, where only authorized personnel with access to the Toxicology Lab's analytical area could potentially access it. The computer itself requires an independent password in order to even get to the electronic access program, at which point that software requires a unique user name and password. The software itself does not have a feature that allows for a requirement forcing a regular password/username change. Additionally, in this instance, the more passwords/usernames change, the more likely that these updated changes will result in some form of hard-copy annotation that could be accessed far more easily than some surreptitious hacking or unauthorized access by lab staff that we have already entrusted with sensitive evidence processing and reporting.

Action item: There is currently no software available on the computer to monitor and document any attempts to access the computer programs. We will evaluate possible technological solutions regarding this issue.

Action item: Laboratory management will create additional documentation for all changes to access levels with various staff from the Laboratory and DOS, beyond what is currently available within the software program and our current memoranda.

Observation No. 28

Improve Disaster Recovery And Continuity Of Operations Planning

The Lab could benefit from improved management controls over its disaster recovery plan (DRP) and continuity of operations plan (COOP).

Disaster Recovery Plan

The Lab relied heavily on IT for its operations. Agencies should take steps to prevent and minimize potential damage and interruption by using data and program backup procedures, offsite storage of backup data, environmental controls, and staff training. Disaster recovery focuses on issues related to: employee safety, emergency services, operational communications, and recovering power, hardware, and software; addresses immediate emergencies; and is differentiated from business continuity planning. We found the Lab lacked a DRP. Supporting controls over media storage, training, and data protection also needed improvement.

The DoIT backed-up Lab information stored on the DoIT network nightly and stored these backups offsite. However, the Lab also relied on stand-alone alarm systems and discipline-specific analytical systems including photographic, chemical and drug analysis, and alcohol analysis systems not supported by the DoIT and with no clear plan to backup and recover these analytical capabilities. For those systems that were backed-up, the backups were stored onsite.

The Lab also utilized a SAN to store case analysis files and digital evidence. The SAN was backed up locally and the data could be recovered in the event the SAN was disabled. Lab personnel reported most data on the SAN were backed up. We found completed case files were backed up, while cases currently under review or undergoing analysis were not; backup did not occur regularly due to the lack of available personnel to perform the backup; backups were stored onsite in a room protected by a water-based sprinkler system, subjecting all evidence and equipment stored there to loss; backup data were not encrypted; and the SAN was not connected to backup power.

Continuity Of Operations Plan

Lab management reported drafting a COOP as a component of the State Police plan; however, continuity of operations planning remains incomplete. Continuity of operations planning is a necessary and required management function and should address all hazards to ensure mission essential functions continue in an emergency. The Lab's plan could not be implemented as written as it lacked Lab-specific details, such as alternate business methods to permit implementation; relied on alternate facilities unable to house the number of personnel estimated to be necessary to perform mission-essential functions; and lacked resources, particularly hardware, necessary to accomplish analyses.

Further, the COOP was not approved, tested, or validated; lacked methods for management to identify and notify individuals next in the line-of-succession; inadequately addressed methods to protect vital resources and records; and lacked embedded plans outlining the process to return to normal operations. The COOP identified the DoIT as the entity responsible for ensuring mission-essential electronic records and systems were routinely backed up and maintained at a secured offsite facility and ensuring the safe keeping and availability of specific records needed in an emergency situation at an alternate work location. However, the DoIT did not back up the SAN or other analytical systems which precluded the DoIT from meeting the expectations set forth in the COOP. Finally, there was no training on the COOP.

Recommendations:

We recommend Lab management create a DRP and subsequently test, validate, revise, and implement the plan. The plan should incorporate employee training, require backups of the SAN and discipline-specific systems with secure offsite storage for backups; consider an alternate fire suppression method to ensure survivability in case of fire; and connect the SAN and other essential system to a backup power supply.

We also recommend Lab management create a realistic, resourced Lab-specific COOP and subsequently test, validate, revise, and implement the plan. The COOP should incorporate employee training and memoranda of understanding with the DoIT and other outside agencies to ensure resources are available in the event the plan is implemented.

Auditee Response:

We concur in part.

Action item: The Lab will continue to work with DOS and State Police management to identify the significant resources, including a qualified coordinator, necessary to create a DRP and to test and validate the plan.

Action item: As part of the DRP, resources will also be requested to acquire backup generator(s) of sufficient capacity for all critical systems housed within the Lab.

As this will require considerable resources, implementation is contingent upon receiving adequate funding. The fire suppression system for the Lab was installed within the past two years and was approved by the State Fire Marshal as a pre-action system. Cost estimates for a dry-chemical fire suppression system were approximately $500,000 and will have to await an adequate funding source.

Action item: Initial strategic meetings between Lab management and the State Police COOP coordinator on ascertaining requirements for enhancing the current COOP to more thoroughly incorporate Lab operations will be scheduled within the first 6 months of the beginning of SFY 2012.

Observation No. 29

Improve Administrative Rules

Lab-related administrative rules should be improved.

Required Rules

State law requires agencies adopt rules describing the agency's organization, the general course and method of agency operations, and the methods by which the public may obtain information or make submissions or requests (RSA 541-A:16, I (a)). Although a component of the State Police since 1937, the Lab was codified in statute by Chapter 319:85, Laws of 2003 (effective on January 1, 2004), and was never codified in DOS administrative rules. DOS rules did not mention or structure the Lab, describe the general course and method of Lab operation, or describe how the public may obtain information or make requests of the Lab.

State law also required agencies adopt rules of practice setting forth the nature and requirement of all formal and informal procedures (RSA 541-A:16, I (b)). Formal and informal procedures must be placed in the rule section to which they relate. No substantive section of DOS rules addressed Lab operations, requirements, guidance to using agencies, or procedures using agencies must follow; although many existed within the Lab *Handbook*, intended for general law enforcement community-wide use.

Further, effective January 1, 2010, statute required agencies adopt forms binding on persons outside the agency in administrative rule. Agencies could either adopt the form by reference or by establishing requirements in rule text (RSA 541-A:1, VII-a; 541-A:1, XV; and 541-A:19-b). One Lab-related form, the Department of Safety, State Police (DSSP) form 324, *Specimen Release Form*, was described in rule. However, the Lab required external entities use other forms, including the DSSP 20, *Evidence Examination Request Form*; DSSP 112, *Film Submittal Slip*; and the DSSP 322, *Urine Test Record/Chain of Custody Form*, which were not described in rule.

Finally, the Lab charged fees for images provided to the public under RSA 91-A, the Right-To-Know law; film processing for law enforcement agencies; and discovery requests made by attorneys. Film processing fees for law enforcement and discovery request fees were detailed in Lab policy; however, there was no adopted rule detailing the process or establishing a fee schedule. While RSA 91-A:4, IV, permits agencies to charge and collect the actual cost of providing copies, DOS Administrative Rule part Saf-C 103.01 provided only for copying administrative rules without a fee schedule and part Saf-C 203.14 provided a fee schedule for DOS-related hearings. We found no statutory authority permitting the Lab to charge outside entities for images, film processing, or discovery requests.

Changed References

RSA 265:85, V, was cited as the statutory authority for segments of chapter Saf-C 6300, *Breath Alcohol Procedure Using The Intoxilyzer 5000 Instrument*; however, this law was repealed by Chapter 260:37, Laws of 2006, effective January 1, 2007. Finally, Saf-C 6301.01(b) and 6302.03 intended to implement RSA 265:5, V, which did not exist. RSA 265-A contained the subject matter implemented by Saf-C 6300 rules.

Recommendations:

We recommend Department management improve Lab-related controls by:

- **promulgating administrative rules detailing Lab organizational structure;**
- **promulgating administrative rules detailing formal and informal Lab procedures, including 1) methods for making right-to-know requests and 2) fee schedules;**
- **seeking Legislative authority to charge law enforcement agencies for film processing;**
- **promulgating administrative rules detailing all forms required of external entities; and**
- **updating references in chapter Saf-C 6300.**

Auditee Response:

We concur in part.

The Lab has only recently been acknowledged legislatively by statute RSA 21-P: 7, I (e), which was effective January 1, 2004.

Action item: To the extent that the Organizational rules do not reflect the lab's existence, the Department will amend Saf-C 100 accordingly. In addition, the Department will amend Saf-C 100 this year to clarify the methods for making RSA 91-A requests.

However, to the extent that the auditors recommend that the Department adopt by rule the fee schedule for 91-A requests, the Department submits that nothing in RSA 541-A:16, I(a) requires the DOS to do so. The Department relies upon RSA 91-A: 4, IV for the authority for its fee schedule; that is, the actual cost of providing the copy of the governmental record.

Action item: The Division of State Police will update all outdated statutory references in Saf-C 6300 this year.

DOS legal counsel disagrees that the Lab is required to promulgate administrative rules detailing the use of forms. Prior to legislative amendment in 2006, RSA 541-A: 16, I (b) required all agencies to adopt "a description of all forms and instructions used by the agency" in addition to other rulemaking requirements imposed by law. This was mandated by the word "shall" in RSA 541-A: 16, I. However, in 2006, RSA 541-A: 16, I (b)(1) was repealed.

The report cites RSA 541-A: 1, VII-a, 541-A: 1, XV and 541-A: 19-b as authority for the audit observation. However, RSA 541-A: 19-b, unlike the former RSA 541-A: 16, I (b) uses discretionary language: "an agency ***may*** *adopt a form as defined in RSA 541-A: 1, VII-a by incorporating the actual form by reference or by setting forth the requirements of the form in rules adopted according to the procedures of this chapter." See RSA 541-A: 19-b, effective prior to, and after July 26, 2011 (Chapter 89, Laws of 2011).*

In further support of the Department's position, RSA 541-A: VII-a, defines a form as "…a document that establishes a requirement for persons outside the agency to provide information to an agency and the format in which such information must be submitted." The Department maintains that there is no statutory obligation for any law enforcement agency outside the Department of Safety to utilize its services. The forms referenced in the observation are ***internal*** *documents that are also utilized by outside agencies who request the services of the Forensic Laboratory. However, there is no statutory requirement that any third party utilize the Forensic Laboratory. To the extent that there is rulemaking authority prescribed by law and outside of RSA 541-A, the Department has adopted the necessary rules and forms (See Saf-C 6300, Saf-C 6400, Saf-C 6500, Saf-C 6700, and Saf-C 6800).*

Action Item: The Department will propose legislation to clarify fees schedules for producing photographic prints and similar services.

LBA Rejoinder:

If any law enforcement agency chooses to utilize the services of the Lab, it must use the Lab's forms. RSA 541-A:19-b requires an agency either reference forms or set forth its requirements in rules. We disagree with DOS legal counsel on this issue.

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OTHER ISSUES AND CONCERNS

In this section, we present issues we consider noteworthy, but were not developed into formal observations. The Legislature and Department of Safety (DOS), Division of State Police (State Police), and Forensic Laboratory (Lab) management may wish to consider whether these issues and concerns deserve further study or action.

Apply Due Diligence In Maintaining Independence

The Lab's functional location within the DOS and its statutory responsibility to "support the investigatory, analytical, and enforcement functions of the state criminal, motor vehicle, hazardous waste, and other public safety laws" could impede Lab independence.

According to the International Organization for Standardization/International Electrotechnical Commission (ISO) *General Requirements for the Competence of Testing and Calibration Laboratories (General Requirements)*, laboratories must ensure "management and personnel are free from … pressures and influences that may adversely affect the quality of their work." Additionally, the National Research Council (NRC) in *Strengthening Forensic Science in the United States, A Path Forward (A Path Forward)*, states:

> Scientific and medical assessment conducted in forensic investigations should be independent of law enforcement efforts either to prosecute criminal suspects or even to determine whether a criminal act has indeed been committed. Administratively, this means that forensic scientists should function independently of law enforcement administrators. The best science is conducted in a scientific setting as opposed to a law enforcement setting. Because forensic scientists often are driven in their work by a need to answer a particular question related to the issues of a particular case, they sometimes face pressure to sacrifice appropriate methodology for the sake of expediency.

The Lab was located within the State Police, and the State Police Director was also in charge of the Lab. Based on statute, administrative rules, and Lab documentation, the mission of the Lab was to provide local, State, and federal law enforcement with high quality forensic services for crimes which occurred in, or in some way were connected to, New Hampshire. This organizational structure and mission could affect the independence of the Lab; however, Lab customer survey results and interviews with Lab personnel rarely identified any independence concerns.

We suggest the Lab be aware of potential independence issues and ensure their policies and procedures meet their mission and statutory requirements, while also maintaining objectivity and independence.

Auditee Response:

We concur.

The New Hampshire State Police Forensic Laboratory has always been acutely aware of the need to maintain objectivity and independence. We have always placed, and will continue to place, the utmost attention to accuracy and scientific integrity of the analyses conducted within the laboratory. All laboratory personnel will continue to contribute to the successful completion of the Laboratory's central purpose of providing quality technical service to New Hampshire's law enforcement agencies, the criminal justice process and ultimately to the citizens of the state of New Hampshire.

Improve And Regularly Reaffirm Confidentiality Requirements

Lab policies and procedures regulating the confidentiality of electronic documents needed improvement. Additionally, policies and procedures did not annually require employee sign-off acknowledging confidentiality requirements.

Although not required by American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) Legacy standards, the Government Accountability Office (GAO) in *Standards for Internal Control* and *Internal Control Management and Evaluation Tool (Internal Control)* specifies controls over information be in place and ISO *General Requirements* require the laboratory "have policies and procedures to ensure the protection of its customers' confidential information and proprietary rights, including procedures for protecting the electronic storage and transmission of results." The Lab's confidentiality statement read, "[i]n general, employees are not to discuss cases outside the laboratory or with anyone other than representatives from the submitting agency or the prosecutor's office handling the case." The policy covered handling phone calls, reports, and Lab-related correspondence; however, did not cover electronic correspondence or any specific reference to what can and cannot be disclosed. The Lab documented additional requirements in standard operating procedure (SOP) Quality Assurance (*QA) 130, Case Documentation and Review*, regarding reporting when juveniles were involved.

We suggest Lab management establish additional detail in policy to regulate confidentiality of electronic documents and communications, and require annual Lab employee sign-off on the confidentiality policy to improve control by increasing awareness and accountability.

Auditee Response:

We concur.

Action item: Laboratory policy will be expanded to thoroughly address confidentiality issues specific to the varied modes of communication. Lab management will require all laboratory staff to perform an annual review of Laboratory protocols on confidentiality issues including communications and electronic documents. A reaffirmation form will be created for sign-off

during the employee's annual performance review, similar to the state-required form on Domestic Violence in the Workplace and Sexual Harassment.

Improve Reporting Policies And Practices

The Lab's reporting policies and practices lacked consistency and thoroughness. Additionally, we found examples of Lab reports not conforming to written policies.

Lab SOP *QA 130, Case Documentation and Review, Section 3,* detailed reporting requirements and the Lab maintained a report template applied to all Units, excluding the Urine Toxicology Unit. Eight of 11 Units also maintained Unit-specific reporting policies as either stand-alone policies or incorporated into procedural documents. The level of detail in Unit-specific reporting policies varied significantly, from mandatory, specific language for an array of potential reporting situations, to limited amounts of required language or minimal reporting requirements.

Reported data did not always follow written policy. For example, a drug analysis report included visual identification of a pharmaceutical product. Lab Drug Unit (DRU) SOP *DRU 012, Identification and Analysis of Pharmaceuticals,* established required reporting language; however, the report did not follow the required language for one exhibit and did for another.

Lab reports included language such as "No analysis performed" without providing justification. A Lab manager stated, "reported conclusions are supported by documented examinations in the case record." This required reviewing complete case records to understand the final report. However, while reports may not "provide as much detail as might be expected in a research paper…" they should nonetheless "allow the nonscientist reader to understand what has been done and permit informed, unbiased scrutiny of the conclusion" according to *A Path Forward*. Further, ASCLD/LAB Legacy standards, conclude reports must include conclusions and opinions addressing "the purpose for which the analytical work was undertaken" and the report must be "properly qualified and consistent with established laboratory interpretation standards." *A Path Forward*, concludes "[L]aboratory reports generated as the result of a scientific analysis should be complete and thorough. They should describe, at a minimum, methods and materials, procedures, results, and conclusions, and they should identify, as appropriate, the sources of uncertainty in the procedures and conclusions along with estimates of their scale…." Not all Lab reports included these components and no Lab reports provided measures or sources of uncertainty.

We suggest the Lab standardize reporting policies and practices, ensure those policies are followed, and improve the data presented by including methods, materials, processes, results, conclusions, and sources and measures of uncertainty.

Auditee Response:

We concur in part.

The Laboratory's reporting may be viewed as inconsistent due to the sheer variety of the forensic disciplines, examinations and types of results being reported. Controlled drug and toxicology results and reports must abide by certain statutes and will read differently than reports of DNA, firearms, or digital evidence examination results. What is contained within Laboratory policies are guidelines for report wording. It is virtually impossible to create report wording policies for every possible scenario involving evidence seized in connection with criminal investigations, therefore there is some flexibility regarding report wording. When wording differs from the written guidelines, the analyst and reviewer must agree on the appropriate wording.

Action item: With the transition to an ISO/IEC 17025-based accreditation program in the next several years, certain modifications will be made to reporting by virtue of that process. These modifications or enhancements will include, where appropriate, measurements of uncertainty and methods employed.

Action item: Lab management will review current analytical reporting protocols for possible enhancement of wording for improved reader comprehension.

Re-Evaluate Reliance On Federal Grants To Purchase Equipment

During the audit period, the Lab received over $1 million in federal revenue, or 11 percent of its total $9 million in revenue for State fiscal years (SFY) 2009 and 2010. Despite the Lab Director's concern over diminishing sources of federal revenue, the Lab does not have a plan to address declining federal funding for Lab equipment.

State-appropriated funds did not adequately cover the cost of Lab equipment. During SFYs 2009 and 2010, the Lab was appropriated $72,092 and $50,250, respectively, in State funds to purchase Lab equipment and supplies. The Lab relied heavily on federal grants including the Department of Justice Community Oriented Policing Services Methamphetamine Initiative grant, Operation Street Sweeper, National Forensic Science Improvement Act, and the Forensic Deoxyribonucleic Acid (DNA) Backlog Reduction grant to purchase analytical equipment. During the audit period, the Lab spent $437,254 on equipment including a genetic analyzer, gas chromatograph/mass spectrometer, digital microscope, infrared spectrometer, and upgrades to the Lab's information management system, 78 percent of which were from federal sources. Federal funding used to purchase Lab equipment has been declining. For example, federal funds dedicated to Operation Street Sweeper, which was used to purchase Lab equipment, pay overtime for drug analysis, and provide training. During 2010, the Lab's portion of Operation Street Sweeper funds decreased 51 percent from $549,320 in SFY 2009 to $270,660.

While states such as Missouri, Illinois, and Arkansas also relied on federal funds to replace laboratory equipment, they established an equipment fund to supplement equipment costs. Illinois and Missouri levy a $100 and $150 fee, respectively, on defendants in drug cases, which could have been used to maintain and purchase equipment, training, and analysis. Arkansas' fund consisted of proceeds from various asset forfeiture accounts. We suggest the DOS, State Police, and the Lab work with the Legislature to explore alternative funding for the Lab's equipment.

Auditee Response:

We concur.

DOS, State Police and Lab management all agree that the Lab relies heavily on federal grant initiatives for acquisition of equipment. These funds have dwindled over the years. We have previously proposed legislation to include laboratory fees for service and increased penalty assessments. These attempts to shore up an equipment fund for the Lab have thus far been unsuccessful.

Action item: The Department will continue to work with legislative leaders to explore alternative funding for the operation of the Laboratory.

Ensure Analytical Tools Are Current And Certified

During the audit period, the Lab used expired reagents and uncertified equipment, failing to timely order, prepare, and recertify reagents and equipment. Regularly checking inventory levels of materials, supplies, and other assets is necessary according to GAO in *Internal Control*.

During the audit period, four corrective actions addressed use of expired reagents or consumption of reagents without timely replacement. Additionally, two deviations permitted use of expired solutions in analysis, four deviations documented using uncertified equipment or measures in analysis, and two deviations identified the Lab's failure to order necessary analytical supplies timely.

Lab SOP *QA 230, Reagents and Supplies Ordering, Controls and Labels*, addressed placing orders using a purchase order and handling of reagent and supplies once received; however, there was no process ensuring timeliness, nor was responsibility assigned for the process. Additionally, Lab SOP *QA 170, Equipment Performance Checks, Calibration, and Maintenance*, detailed regular performance checks and assigned responsibility to analysts, senior criminalists, and a Quality Assurance Manager. This policy also stated, if equipment checks, calibration, or maintenance were past due, the equipment should be labeled "taken out of use" or "out of use." Nonetheless, equipment calibration was overdue and left in use during the audit period.

We suggest the Lab implement additional policies, procedures, and practices ensuring reagents and equipment certifications remain current and preventing the use of expired reagents and uncertified equipment in analysis. Additionally, the Lab should develop an inventory plan with assigned responsibility ensuring reagents and analytical supplies are ordered timely.

Auditee Response:

We concur in part.

The Lab does have processes and policies in place to ensure that reagents (chemicals, buffers, etc.) and equipment (fume hoods, thermometers, balances, etc.) remain current and certified. We

also have procedures to allow temporary and limited use of recently expired reagents and/or recently out-of-certification equipment, when such use can be technically justified as not impacting analytical results and performance can be verified by monitoring quality controls. The Lab utilizes an equipment database that is checked monthly to ensure the necessary checks are performed. In instances where issues deemed potentially critical to the results are identified, samples which may have been affected by the matter are rerun using the certified solutions/reagents and/or calibrated equipment.

The Lab has assigned analysts responsible for keeping inventory stocked and who inform the appropriate individual when ordering is required. There are factors beyond the Lab's control that are involved in ensuring supplies are received timely. These factors include items which may be backordered, items which may be delayed at customs (common with controlled drug standards), and the rate at which the order moves through the state purchasing process, all of which may cause delays.

Action item: Lab management will review current systems and more effectively ensure all analytical and supportive reagents and tools are current, ordered on time, and, when necessary, certified.

Develop Formal Agreements With All Governmental Laboratory Partners

The Lab did not maintain formal agreements with Lab partners such as outside government laboratories. The Lab utilized outside government laboratories for technical review and provided review to or conducted analyses for other laboratories. These relationships were not documented in memoranda of understanding or any other formal agreement. There were no memoranda of understanding documenting confidentiality requirements, expectations, or costs.

Effective communication with external partners, including clear articulation of ethical standards and quality requirements, is important. Lab SOP, *QA 240, Submitting Samples to Outside Laboratories for Analysis*, documented the process for obtaining external analysis when the Lab did not complete the requested analysis in-house. The Lab did not have standing agreements with outside government laboratories and the SOP did not establish Lab-required confidentiality or quality requirements nor did it address outside technical review requirements.

We suggest the Lab develop memoranda of understanding with outside government laboratories providing or receiving technical reviews and providing analysis not provided by the Lab.

Auditee Response:

We concur.

The Lab occasionally relies upon other ASCLD/LAB accredited laboratories in the New England area for technical reviews of casework in which only one analyst was available in New Hampshire. All New England State Police organizations already have in place a signed agreement to offer mutual aid in which an investigation of an aspect of criminal activity requires

augmentation, for a limited time, of the investigation or other resources of the state police department.

Action item: The Lab will propose the development of memoranda of understanding with other regional forensic laboratories in which technical reviews may be requested.

Review State Forensic Toxicologist Position

The State Forensic Toxicologist position transferred to the Lab in 2004 was unfunded since 2005, but carried statutory responsibility.

In 2004, personnel were transferred to the Lab from the Department of Health and Human Services, Public Health Laboratory, including the unclassified State Forensic Toxicologist, who subsequently retired in 2005. This position remained vacant and unfunded. However, RSA 146-G:6 relies on the State Forensic Toxicologist to determine hazardous levels of gasoline ethers in drinking water. According to the Director, the Lab had no role in setting such standards and this statutory responsibility appeared misplaced.

We suggest the Lab request the Legislature relieve the State Forensic Toxicologist from statutory responsibility for setting hazardous levels of gasoline ethers in drinking water.

Auditee Response:

We concur.

At no time since 2004 has the Department of Safety's State Forensic Toxicologist been involved with setting hazardous levels of gasoline ethers in drinking water.

Action item: It is felt that the statutory responsibility for determining the levels of gasoline ethers in drinking waters is misplaced and will be the subject of a proposed Legislative amendment to relieve the DOS from this responsibility.

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CONCLUSION

Our performance audit found the Forensic Laboratory (Lab) generally served its customers well and the quality of its services was viewed favorably by respondents to our survey. The Lab operated in a culture focused on continuous quality improvement. However, we found management controls could be improved in several areas, including increased use of performance and outcome measures to enhance the Lab's analysis of its productivity and goal achievement.

Quality was a major focus of the Lab. Even though the Lab has been accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) since 2004, it recognized the need to upgrade its standards to those of the more rigorous International Organization for Standardization/International Electrotechnical Commission (ISO). It intends to implement those standards in 2014. Regardless, many of the management control issues we found could have been identified by broader internal management reviews of Lab operations.

Human resource management is central to any agency's operations. We found several human resource practices needed improvement. For example, most Lab employees were paid under a law enforcement pay scale without being law enforcement personnel, and controls over timekeeping and overtime created opportunities for waste, leading, in one case, to overpayment of overtime of nearly $6,000 to an employee.

We found inadequacies in Lab design and space available. We also found improvements should be made to better safeguard evidence and restrict after-hours access. Weaknesses in information technology management controls, including controls over systems needed improvement. The Lab also lacked continuity of operations and disaster recovery plans, potentially limiting Lab availability in an emergency.

Implementing the recommendations in this report could improve Lab efficiency and effectiveness. During the audit period, the Lab may have had, with realignment of certain staff, opportunities to reduce its backlog in certain areas. However, many recommendations cannot be fully implemented immediately and should be incorporated into a Lab strategic plan. By establishing strategic goals, a performance monitoring and measurement system, more cost-effective human resource management practices, and with fully integrated and supported technology, the Lab can continue to improve the efficiency and effectiveness of forensic laboratory services in New Hampshire.

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APPENDIX A
DEPARTMENT RESPONSE TO AUDIT

State of New Hampshire
DEPARTMENT OF SAFETY
OFFICE OF THE COMMISSIONER
33 HAZEN DR. CONCORD, NH 03305
603/271-2791

JOHN J. BARTHELMES
COMMISSIONER

September 14, 2011

Richard J. Mahoney, CPA
Director of Audits
State House, Rm. #102
Concord, NH 03301-4906

Re: Performance Audit of the NH State Police – Forensic Laboratory

Dear Mr. Mahoney:

Thank you for the opportunity to comment on the audit of the State Police Forensic Laboratory conducted by the Office of the Legislative Budget Assistant.

We wish to recognize the time and effort the LBA Audit Team, led by Steve Grady, Senior Audit Manager, put into the audit and the preparation of the accompanying report, as well as their willingness to give us ample time to prepare our comments. This audit constitutes an important part of our ongoing effort to re-examine each of the Department's primary functions.

We are pleased that the audit noted that the Forensic Laboratory generally serves its customers well and that the quality of its services is viewed favorably by respondents to the audit team's survey, and that the Laboratory operates in a culture focused on continuous improvement.

In our responses we have included a variety of Action Items and established time frames for addressing the Audit Team's recommendations. Our written responses in the few areas where we are not in complete concurrence are extremely detailed because we feel it is important to provide this additional information.

We found the audit to be a thought provoking exercise and during the coming months, we will develop long and short range plans that utilize the document to enhance the efficiencies of the Laboratory as identified by the Audit Team and acknowledged by the Department.

Sincerely,

John J. Barthelmes
Commissioner

TDD ACCESS: RELAY NH 1-800-735-2964

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APPENDIX B
SURVEY OF LAB CUSTOMERS

n refers to the number of survey respondents responding to each separate question.

The total percentage for any single question may not equal 100 due to rounding. The total percentages for all questions requesting the respondent "check all that apply" are based on the number of respondents and not the number of responses. Consequently, the percentages associated with each response category exceed 100 percent.

Please answer the following questions referring to your agency's use of the State Police Forensic Laboratory.

Section I

In the questions below, please mark the appropriate response with an "**X**."

1. Which best describes your agency?

Count	Percent	Response n=73
8	11	State Agency
8	11	County Agency
52	71	Local Law Enforcement
2	3	Local Fire Department
2	3	Federal Agency
1	1	Other

2. What best describes your position? Please check only one.

Count	Percent	Response n=71
30	42	Chief Law Enforcement Official for my Jurisdiction
14	20	Law Enforcement Officer
14	20	Lead Investigator for my Jurisdiction
0	0	Fire Chief
0	0	Firefighter
3	4	Attorney
10	14	Other

3. On average, how often do you contact the State Police Forensic Lab for assistance each year?

Count	Percent	Response n=73
7	10	0 to 5 times
11	15	6 to 10 times
20	27	11 to 20 times
16	22	21 to 50 times
19	26	More than 50 times

Section II

Please rate the following areas of the State Police Forensic Lab using the rating scale identified below where 1 is Excellent and 5 is Poor. For any responses scoring Below Average (4) or Poor (5), please provide an explanation in the comment box at the end of this section. If you do not have any interaction or knowledge of a certain area, enter N/A for Not Applicable. Please see the example below:

Rating Scale:
1 = Excellent
2 = Good
3 = Fair
4 = Below Average
5 = Poor
N/A = Not Applicable

	Count (percent)						
4. Support Staff							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Knowledgeable	72	53 (74)	18 (25)	1 (1)	0 (0)	0 (0)	0 (0)
Accessible	73	53 (73)	20 (27)	0 (0)	0 (0)	0 (0)	0 (0)
Friendly	72	59 (82)	12 (17)	1 (1)	0 (0)	0 (0)	0 (0)
Professional	73	62 (85)	10 (14)	1 (1)	0 (0)	0 (0)	0 (0)
Appearance	72	57 (79)	14 (19)	0 (0)	0 (0)	0 (0)	1 (1)
Follow-Through	72	46 (64)	21 (29)	2 (3)	0 (0)	0 (0)	3 (4)
5. Analysts							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Knowledgeable	73	63 (86)	8 (11)	0 (0)	0 (0)	0 (0)	2 (3)
Accessible	73	52 (71)	16 (22)	3 (4)	0 (0)	0 (0)	2 (3)
Friendly	73	59 (81)	10 (14)	1 (1)	0 (0)	0 (0)	3 (4)
Professional	73	63 (86)	7 (10)	1 (1)	0 (0)	0 (0)	2 (3)
Appearance	73	61 (84)	6 (8)	1 (1)	0 (0)	0 (0)	5 (7)
Follow-Through	73	55 (75)	14 (19)	2 (3)	0 (0)	0 (0)	2 (3)
6. Timeliness							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Wait time for evidence submittal	73	28 (38)	26 (36)	18 (25)	0 (0)	0 (0)	1 (1)
Timeliness in returning calls	73	33 (45)	37 (51)	2 (3)	0 (0)	0 (0)	1 (1)
Timeliness in responding to emails	72	32 (44)	26 (36)	0 (0)	0 (0)	0 (0)	14 (19)

	Count (percent)						
7. Reporting							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Accuracy of Reports	72	58 (81)	14 (19)	0 (0)	0 (0)	0 (0)	0 (0)
Ease of Understanding/ Clarity of Report	72	52 (72)	17 (24)	3 (4)	0 (0)	0 (0)	0 (0)
Timeliness of Reports	72	33 (46)	29 (40)	8 (11)	2 (3)	0 (0)	0 (0)
Thoroughness of Reports	72	54 (75)	18 (25)	0 (0)	0 (0)	0 (0)	0 (0)
Overall Quality of Reports	72	50 (69)	22 (31)	0 (0)	0 (0)	0 (0)	0 (0)
8. Services							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Breadth of Services Available	71	34 (48)	30 (42)	3 (4)	2 (3)	0 (0)	2 (3)
Turn-around Time of Analysis	73	13 (18)	20 (27)	31 (42)	5 (7)	4 (5)	0 (0)
Availability of Analyst for Court	73	30 (41)	25 (34)	8 (11)	3 (4)	1 (1)	6 (8)
Quality of Court Testimony	73	48 (66)	12 (16)	0 (0)	0 (0)	0 (0)	13 (18)
Ability of Analyst to Communicate Results	72	51 (71)	18 (25)	0 (0)	0 (0)	0 (0)	3 (4)
Overall State Police Forensic Lab Services	73	38 (52)	31 (42)	3 (4)	1 (1)	0 (0)	0 (0)
9. Facilities							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Location	73	34 (47)	33 (45)	5 (7)	1 (1)	0 (0)	0 (0)
Accessibility	73	40 (55)	27 (37)	3 (4)	2 (3)	0 (0)	1 (1)
Cleanliness	73	53 (73)	18 (25)	1 (1)	0 (0)	0 (0)	1 (1)
Hours of Operation	73	43 (59)	28 (38)	1 (1)	0 (0)	0 (0)	1 (1)

10. Please add comments for any "below average" (4) or "poor" (5) responses.		
Count	*Percent*	*Comment n=14 (some comments identify more than one issue area)*
9	64	Poor turn around times (fingerprints, 4, other, 6)
3	21	Resource shortage at the Lab
5	36	Other (excellent job, missed court dates, need satellite locations for evidence pickup)

Section III

In the following table, please rate the services of the State Police Forensic Lab using the rating scale identified below where 1 is Excellent and 5 is Poor. Please enter Not Applicable (N/A) for any services your agency has not used.

Rating Scale: 1 = Excellent
2 = Good
3 = Fair
4 = Below Average
5 = Poor
N/A = Not Applicable

	Count (percent)						
11. Overall Quality of State Police Forensic Lab Services.							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Digital Evidence	63	23 (37)	17 (27)	3 (5)	2 (3)	0 (0)	18 (29)
DNA	65	28 (43)	18 (28)	1 (2)	0 (0)	0 (0)	18 (28)
Drugs	65	44 (68)	19 (29)	1 (2)	0 (0)	0 (0)	1 (2)
Firearm/Toolmarks	62	33 (53)	11 (18)	3 (5)	0 (0)	0 (0)	15 (24)
Trace (arson, paint, explosives, ink, etc.)	65	25 (38)	16 (25)	4 (6)	0 (0)	0 (0)	20 (31)
Breath Alcohol	65	39 (60)	11 (17)	1 (2)	0 (0)	0 (0)	14 (22)
Blood Alcohol	66	42 (64)	16 (24)	2 (3)	0 (0)	0 (0)	6 (9)
Identification (fingerprints, palm prints)	69	35 (51)	17 (25)	10 (14)	0 (0)	1 (1)	6 (9)
Identification (footwear, tire tracks)	63	22 (35)	15 (24)	3 (5)	0 (0)	0 (0)	23 (37)
Photo Lab	63	21 (33)	14 (22)	3 (5)	0 (0)	0 (0)	25 (40)
Serology	62	28 (45)	12 (19)	1 (2)	0 (0)	0 (0)	21 (34)
Urine Toxicology	63	23 (37)	10 (16)	2 (3)	0 (0)	0 (0)	28 (44)
Blood Toxicology	63	36 (57)	14 (22)	3 (5)	1 (2)	0 (0)	9 (14)
Other (Please specify:_____)	8	2 (25)	0 (0)	0 (0)	0 (0)	0 (0)	6 (75)
12. Turn-around Times (Time from evidence submittal to final reporting)							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Digital Evidence	61	9 (15)	16 (26)	13 (21)	1 (2)	4 (7)	18 (30)
DNA	63	12 (19)	25 (40)	6 (10)	1 (2)	1 (2)	18 (29)
Drugs	66	19 (29)	24 (36)	17 (26)	1 (2)	2 (3)	3 (5)
Firearm/Toolmarks	59	11 (19)	23 (39)	7 (12)	1 (2)	1 (2)	16 (27)
Trace (arson, paint, explosives, ink, etc.)	62	8 (13)	22 (35)	13 (21)	1 (2)	1 (2)	17 (27)
Breath Alcohol	63	22 (35)	21 (33)	5 (8)	0 (0)	0 (0)	15 (24)
Blood Alcohol	66	26 (39)	28 (42)	5 (8)	0 (0)	0 (0)	7 (11)
Identification (fingerprints, palm prints)	68	11 (16)	9 (13)	23 (34)	12 (18)	4 (6)	9 (13)
Identification (footwear, tire tracks)	58	8 (14)	13 (22)	12 (21)	2 (3)	2 (3)	21 (36)
Photo Lab	59	15 (25)	11 (19)	9 (15)	0 (0)	0 (0)	24 (41)
Serology	59	12 (20)	21 (36)	6 (10)	0 (0)	0 (0)	20 (34)
Urine Toxicology	60	12 (20)	16 (27)	5 (8)	0 (0)	0 (0)	27 (45)
Blood Toxicology	63	17 (27)	26 (41)	8 (13)	1 (2)	0 (0)	11 (17)
Other (Please specify:_____)	10	1 (10)	0 (0)	1 (10)	0 (0)	1 (10)	7 (70)

	Count (percent)						
13. Quality of Reporting							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Digital Evidence	60	27 (45)	12 (20)	3 (5)	1 (2)	0 (0)	17 (28)
DNA	62	32 (52)	12 (19)	1 (2)	0 (0)	0 (0)	17 (27)
Drugs	66	44 (67)	17 (26)	2 (3)	0 (0)	0 (0)	3 (5)
Firearm/Toolmarks	60	31 (52)	11 (18)	3 (5)	0 (0)	0 (0)	15 (25)
Trace (arson, paint, explosives, ink, etc.)	61	30 (49)	12 (20)	3 (5)	0 (0)	0 (0)	16 (26)
Breath Alcohol	62	36 (58)	11 (18)	2 (3)	0 (0)	0 (0)	13 (21)
Blood Alcohol	64	43 (67)	14 (22)	3 (5)	0 (0)	0 (0)	4 (6)
Identification (fingerprints, palm prints)	66	37 (56)	14 (21)	5 (8)	0 (0)	0 (0)	10 (15)
Identification (footwear, tire tracks)	59	28 (47)	8 (14)	3 (5)	0 (0)	0 (0)	20 (34)
Photo Lab	59	29 (49)	9 (15)	2 (3)	0 (0)	0 (0)	19 (32)
Serology	59	27 (46)	13 (22)	2 (3)	0 (0)	0 (0)	17 (29)
Urine Toxicology	59	25 (42)	11 (19)	0 (0)	0 (0)	0 (0)	23 (39)
Blood Toxicology	61	37 (61)	14 (23)	2 (3)	0 (0)	0 (0)	8 (13)
Other (Please specify:_____)	17	10 (59)	2 (12)	0 (0)	0 (0)	0 (0)	5 (29)
14. Quality of Analysts							
Category	*n*	*1*	*2*	*3*	*4*	*5*	*N/A*
Digital Evidence	59	32 (54)	10 (17)	1 (2)	1 (2)	0 (0)	15 (25)
DNA	61	35 (57)	10 (16)	0 (0)	0 (0)	0 (0)	16 (26)
Drugs	64	48 (75)	15 (23)	0 (0)	0 (0)	0 (0)	1 (2)
Firearm/Toolmarks	58	35 (60)	11 (19)	0 (0)	0 (0)	0 (0)	12 (21)
Trace (arson, paint, explosives, ink, etc.)	59	32 (54)	12 (20)	1 (2)	0 (0)	0 (0)	14 (24)
Breath Alcohol	60	40 (67)	10 (17)	0 (0)	0 (0)	0 (0)	10 (17)
Blood Alcohol	63	44 (70)	14 (22)	0 (0)	0 (0)	0 (0)	5 (8)
Identification (fingerprints, palm prints)	64	42 (66)	13 (20)	0 (0)	0 (0)	0 (0)	9 (14)
Identification (footwear, tire tracks)	57	32 (56)	9 (16)	0 (0)	0 (0)	0 (0)	16 (28)
Photo Lab	55	29 (53)	11 (20)	0 (0)	0 (0)	0 (0)	15 (27)
Serology	56	30 (54)	12 (21)	0 (0)	0 (0)	0 (0)	14 (25)
Urine Toxicology	56	28 (50)	8 (14)	0 (0)	0 (0)	0 (0)	20 (36)
Blood Toxicology	57	37 (65)	13 (23)	0 (0)	1 (2)	0 (0)	6 (11)
Other (Please specify:_____)	9	3 (33)	2 (22)	0 (0)	0 (0)	0 (0)	4 (44)

15. Please add comments for any "below average" (4) or "poor" (5) responses.		
Count	*Percent*	*Comment n=12 (some comments identify more than one issue area)*
10	83	Turn around times too long (fingerprints, 9; digital evidence, 2; other, 3)
2	17	Other (need more testing in blood tox)

Section IV

In the questions below, please mark the appropriate response with an "**X**", enter appropriate counts, or respond to the open-ended question.

Question	Response		
16. Does your agency conduct any of its own evidence analyses?	**Count**	**Percent**	**Response n=73**
	18	25	Yes
	55	75	No
17. If yes, please describe what analyses your agency conducts and under what circumstances.	List analyses:		
	Count	**Percent**	**Response n=16 (some comments identify more than one issue area)**
	10	63	Send out or analyze fingerprints
	3	19	Drugs
	1	6	Urine testing
	2	13	Digital evidence
	1	6	Other
18. Within the last two years, did your agency use any laboratories other than the State Police Forensic Laboratory for analysis?	**Count**	**Percent**	**Response n=73**
	28	38	Yes
	45	62	No
19. If you did use other laboratories, what other laboratories did you use and for what services?	List all other laboratories used and service obtained from those laboratories:		
	Count	**Percent**	**Response n=26**
	2	8	Internet Crimes Against Children
	3	12	New England State Police Information Network
	2	8	Drug Enforcement Administration
	3	12	Federal Bureau of Investigation
	4	15	Private Lab
	4	15	Other Public Lab
	8	31	Other (gunshot, digital evidence, 3, DNA, hair)
20. If you did use other laboratories, why did you use another laboratory?	Check all that apply:		
	Count	**Percent**	**Response n=26**
	14	54	Service not offered by State Police Forensic Lab
	12	46	Faster turn-around time needed
	7	27	Other

Question	Response		
21. If you did use other laboratories, how often did you use another laboratory in the past two years?	Please check one of the following:		
	Count	**Percent**	**Response n=28**
	18	64	1 to 5 times
	3	11	6 to 10 times
	2	7	11 to 24 times
	3	11	25 times or more
	2	7	No response
22. If you did use other laboratories, was there an additional cost?	**Count**	**Percent**	**Response n=31**
	12	39	Yes
	19	61	No

Question	Response		
23. Has the turn-around time (time taken from evidence submission to final report) ever negatively affected your agency's cases?	**Count**	**Percent**	**Response n=71**
	25	35	Yes
	46	65	No
24. If yes, in the past two years, how many cases were affected?	Number of cases affected: **Approximately 88 reported**		

Question	Response		
25. Does the State Police Forensic Lab ever report errors, deviations from their procedures, or other non-standard process used in analytical processes or evidence handling in reports to your agency?	**Count**	**Percent**	**Response n=70**
	16	23	Yes
	54	77	No
26. If yes, which errors have been reported?	Please check all that apply:		
	Count	**Percent**	**Response n=16**
	9	56	Deviations from standard processes
	9	56	Chain of custody issues
	2	13	Other
27. Have errors committed by the State Police Forensic Lab ever negatively affected your case?	**Count**	**Percent**	**Response n=66**
	1	2	Yes
	65	98	No
28. If yes, how many cases were affected in the past two years and please explain the situation.	**One comment provided.**		

Question	Response		
29. Has your organization received State Police Forensic Lab training in evidence collection?	**Count**	**Percent**	**Response n=70**
	32	46	Yes
	38	54	No
30. If yes, was the training adequate? (Of those responding Yes to question 29 (n=32), only 24 responded to this question.)	**Count**	**Percent**	**Response n=32**
	24	75	Yes
	0	0	No
31. When considering crime scene investigation and evidence collection does your agency need:	Please check all that apply:		
	Count	**Percent**	**Response n=70**
	44	63	More training
	18	26	Better training
	30	43	More trained individuals
	9	13	More support from State Police Forensic Lab personnel
	14	20	None of the Above
	1	1	Other
32. Has the skill level of personnel available for crime scene investigation and evidence collection ever negatively affected a case?	**Count**	**Percent**	**Response n=69**
	8	12	Yes
	61	88	No
33. If yes, please detail the number of cases affected in the past two years and explain the situation:	**Five total comments.**		

Question	Response		
34. Were all analyses requested by your agency completed?	**Count**	**Percent**	**Response n=71**
	59	83	Yes
	12	17	No
35. If no, what analyses were not completed and how many times did this occur in the past two years?	Analyses not completed:		
	Count	**Percent**	**Response n= 8**
	4	50	Fingerprints
	3	38	DNA
	1	13	Other
36. Was there sufficient justification for not completing the analyses?	**Count**	**Percent**	**Response n=22**
	18	82	Yes
	4	18	No

Question	Response		
37. Are you aware of any changes in State Police Forensic Lab procedures which have affected your agency's cases either positively or negatively?	**Count**	**Percent**	**Response n=71**
	3	4	Yes
	68	96	No
38. If yes, what changes have been made and how have they affected your cases?	Describe changes made and the affect on your agency's cases. **Three total comments**		
39. What changes could the State Police Forensic Lab make to better serve your agency's needs?	**Count**	**Percent**	**Response n=30 (some comments identify more than one issue area, percentages are based on total number of issues identified)**
	20	67	Improve turn around times
	9	30	Lab needs more resources
	2	7	Satellite pick-up locations needed
	2	7	More services needed
	2	7	More information on service available needed
	2	2	Other (outreach training, prima facia evidence)

Question	Response		
40. Is the State Police Forensic Lab sufficiently independent?	**Count**	**Percent**	**Response n=66**
	65	98	Yes
	1	2	No
41. If your agency has encountered any independence issues with the State Police Forensic Lab, how many times in the past two years and please explain the circumstances?	_____Number of occurrences Explanation of circumstances: **No Comments**		

Question	Response		
42. Please provide any additional comments including any specific strengths or weaknesses of the State Police Forensic Lab.	**Count**	**Percent**	**Response n=30 (some comments identify more than one issue area, percentages are based on total number of issues identified)**
	25	83	The Lab does a good job
	7	23	The Lab has resource shortages
	8	27	Turnaround times too long
	2	7	Other

PERFORMANCE AUDITS
ISSUED BY THE
OFFICE OF LEGISLATIVE BUDGET ASSISTANT

TITLE OF REPORT	DATE
Employee and Retiree Health Benefit Program	June 2011
Division of State Police Field Operations Bureau	October 2010
Community Mental Health System	July 2010
State Board for the Licensing and Regulation of Plumbers	December 2009
Fuel Oil Discharge Cleanup Fund	December 2009
Bureau of Elderly and Adult Services Medicaid Long-Term Care Program	July 2009
State Liquor Commission	April 2009
State of New Hampshire Service Contracting	March 2009
Department of Resources and Economic Development Division of Parks and Recreation Revenues of the State Park Fund	September 2008
Fleet Management	September 2008
Office of Information Technology	July 2008
State of New Hampshire Succession Planning	July 2008
Board of Medicine	April 2008
Department of Fish and Game	January 2008
Department of Environmental Services Alteration of Terrain and Wetlands Permitting	August 2007
Insurance Department Consumer Protection Functions	August 2007
Department of Education No Child Left Behind Fund Distribution	February 2007
Insurance Procurement Practices	September 2006

PERFORMANCE AUDITS
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TITLE OF REPORT	DATE
Enhanced 911 System	January 2006
Department of Education Adequate Education Grant Data	December 2004
Board of Mental Health Practice	November 2004
Home Care for Children with Severe Disabilities	April 2004
Department of Corrections Division of Field Services	December 2003
Judicial Branch Administration	November 2003
Department of Health and Human Services Division of Elderly and Adult Services Home- and Community-Based Care	April 2003
Department of Corrections Inmate Health Care	January 2003
Department of Corrections Sexual Harassment and Misconduct	October 2002
Department of Environmental Services Performance-Based Budgeting	March 2002
Department of Safety Division of Fire Safety	November 2001
Department of Education Construction and Renovation Programs	September 2001
Department of Health and Human Services Division for Children, Youth and Families Foster Family Care	September 2001
Department of Education Bureau of Vocational Rehabilitation and Service Delivery	August 2001
Department of Transportation – Bureau of Turnpikes Performance-Based Budgeting	April 2001
Judicial Branch Family Division Pilot Program	January 2000

PERFORMANCE AUDITS
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TITLE OF REPORT	DATE
Year 2000 Computing Crisis Special Report – Update	July 1999
Special Education Catastrophic Aid Program	July 1999
Year 2000 Computing Crisis Special Report	March 1999
Juvenile Justice Organization	November 1998
Marine Patrol Bureau Staffing	March 1998
Health Services Planning and Review Board	January 1998
Economic Development Programs	October 1997
Job Opportunities and Basic Skills Training Program	May 1997
Child Support Services	December 1995
Multiple DWI Offender Program	December 1995
Managed Care Programs for Workers' Compensation	November 1995
State Liquor Commission	July 1994
Property and Casualty Loss Control Program	November 1993
Child Settlement Program	March 1993
Workers' Compensation Program for State Employees	January 1993
Prison Expansion	April 1992
Developmental Services System	April 1991
Department of Administrative Services Division of Plant and Property Management State Procurement and Property Management Services	June 1990
Mental Health Services System	January 1990

PERFORMANCE AUDITS
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TITLE OF REPORT	DATE
Hazardous Waste Management Program	June 1989
Review of the Indigent Defense Program	January 1989
Review of the Allocation of Highway Fund Resources to Support Agencies and Programs	March 1988
Review of the Public Employees' Deferred Compensation Plan	December 1987
Review of the Management and Use of State-Owned Passenger Vehicles and Privately Owned Vehicles Used at State Expense	August 1984
Management Review of the Policies and Procedures of the Division of Plant and Property Management	June 1984

Copies of previously issued reports may be received by request from:

State of New Hampshire
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107 North main Street, Room 102
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(603) 271-2785

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