

N C State Bureau of Investigation

Crime Laboratory Safety Manual

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1.0

AUTHORITY AND ACCOUNTABILITY

1.1 PURPOSE

This manual supplements the *NORTH CAROLINA DEPARTMENT OF JUSTICE SAFETY AND HEALTH MANUAL (DOJ Safety Manual)* to meet the special conditions that are unique to the SBI Crime Laboratory. This requirement is outlined in Section 2.1 of **Administration and Authority**, subsection **Procedures** of the *DOJ Safety Manual*.

1.2 SCOPE

This section applies to all sections of the North Carolina State Bureau of Investigation Crime Laboratory (NCSBI Crime Laboratory), Raleigh, N. C. and the Western Regional Laboratory, Asheville, N. C. Also applies to any unit or section which may be assigned to the NCSBI Crime Laboratory Building in Raleigh, North Carolina.

1.3 DEFINITIONS

The term Safety Officer (SO) and Chemical Hygiene Officer (CHO) will be referred to as the Safety and Chemical Hygiene Officer (S&CHO) throughout the rest of this document. The Chemical Hygiene Officer is concerned with the Chemical Hygiene Plan and the safe use of chemicals within the laboratory. The Safety Officer is responsible for all other aspects of workplace safety (e.g. emergency evacuation plans, safety audits, accident reporting, and fire safety). These positions could be occupied by one or two persons at the discretion of the SAC/Supervisor.

1.4 ACCIDENT/INCIDENT REPORTING

An accident usually includes physical injury of some type. An incident may not include physical injury but involves safety issues (e.g., chemical spill, discharge of a firearm, etc.). All accidents and/or incidents will be reported in accordance with Section VI, Accident Reporting and Investigation of the *DOJ Safety Manual*.

1.5 NCSBI CRIME LABORATORY SAFETY COMMITTEE

The NCSBI Crime Laboratory Safety Committee shall be established with representatives from every unit or section of the NCSBI Crime Laboratory and to any unit or section which may be assigned to the NCSBI Crime Laboratory Building.

The member should be the Unit or Section S&CHO. The committee may meet monthly but no less than quarterly.

The purpose of the meeting will be to:

1. Assure that jobs are planned for the safety of the employees;
2. Assure employees are receiving appropriate safety and health training;
3. Assure employees are involved in the safety and health program;
4. Assure the workplace is inspected monthly and hazards are controlled.

The committee will have a chairperson elected from/by the committee members. The chairperson will ensure a written summary of each meeting is prepared and submitted to the Deputy Assistant Director. The Crime Laboratory Director will serve as the *ex officio chair*.

1.6 CRIME LABORATORY DIRECTOR

The Crime Laboratory Assistant Director is ultimately responsible for assuring that the NCSBI Crime Laboratory Safety Program is implemented and maintained. Additional responsibilities are to include:

1. Representing the NCSBI Crime Laboratory at the DOJ Central Safety Committee meeting.
2. Serve as *ex officio chair* of the NCSBI Crime Laboratory Safety Committee.
3. Adopting a plan for disciplinary action as a corrective measure against employees who violate procedures in the safety program.

1.7 SAC/SUPERVISOR

From Section II.1 of **Administration and Authority**, subsection **Supervisor** of the *DOJ Safety Manual*:

“Each Supervisor is responsible for providing safe working conditions for those being supervised and for following up on reports of violations of safe working conditions. Each supervisor is also responsible for knowing the safety and health guidelines, conducting safety meetings and audits, investigating accidents, reporting of accidents, and properly advising higher management of appropriate situations.”

Additional responsibilities include:

1. Appoint the Section or Unit S&CHO.
2. Ensure all members of their Section/Unit adhere to the NCSBI Crime Laboratory Safety Program.

1.8 SECTION/UNIT SAFETY AND CHEMICAL HYGIENE OFFICER

Each Section SAC/Supervisor will appoint a Safety & Chemical Hygiene Officer for their respective section. Additional responsibilities include:

1. Serving as the Section/Unit representative to the Laboratory Safety Committee. Must work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices.
2. Knowing NCSBI and NCDOJ safety and health guidelines.
3. Determining that facilities and training levels are adequate for the chemicals in use within their section.
4. Ensuring and documenting that appropriate training has been provided to employees, maintain safety training records for the Section/Unit.
5. Performing monthly, formal chemical hygiene and housekeeping inspections including inspections of emergency equipment; documenting and maintaining records of the inspection for a period of no less than five (5) years,
6. Reviewing and improving the Chemical Hygiene Plan on an annual basis,
7. Determining the proper level of personal protective equipment, ensuring that such protective equipment is available and in working order.
8. Monitoring the waste disposal program (if applicable).

1.9 EMPLOYEE

From Section II.1 of **Administration and Authority**, subsection **Employee** of the *DOJ Safety Manual*:

“Each DOJ employee is to place safety and health requirements as first importance in the performance of their work duties. The protection of fellow employees and the public on State property is a shared responsibility of every employee.”

“An employee is responsible for notifying his/her immediate supervisor of a violation or deficiency in a safe and healthful working conditions and for recommending corrective measures, if possible.

Additionally, the employee's immediate supervisor is to be notified of every injury or accident regardless of how trivial such accident may appear at that time."

2.0

CHEMICAL HYGIENE PLAN

2.1 COMPANY DATA

North Carolina State Bureau of Investigation Crime Laboratory
121 East Tryon Road
Raleigh, North Carolina 27603

North Carolina State Bureau of Investigation Western Laboratory
9B Walden Ridge Drive
Asheville, North Carolina 28803

2.2 FORWARD

On 31 January, 1990 the Occupational Safety and Health Administration (OSHA) promulgated a final rule for occupational exposure to hazardous chemicals in laboratories. Included in the standard, which became effective on 1 May, 1990 is a requirement for all employers covered by the standard to develop and carry out the provisions of a Chemical Hygiene Plan (CHP).

A CHP is defined as a written program which sets forth procedures, equipment, personal protective equipment and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace. Components of the CHP must include standard operating procedures for safety and health, criteria for the implementation of control measures, measures to ensure proper operation of engineering controls, provisions for training and information dissemination, permitting requirements, provisions for medical consultation, designation of responsible personnel, and identification of particularly hazardous substances.

This plan is the Chemical Hygiene Plan developed for the NCSBI Crime Laboratories located at 121 East Tryon Road in Raleigh, NC and 9B Walden Ridge Drive in Asheville, North Carolina. This CHP is maintained readily available to laboratory employees. All laboratory personnel must know and follow the procedures outlined in this plan. All operations performed in the laboratory must be planned and executed in accordance with the enclosed procedures. In addition, each employee is expected to develop safe personal chemical hygiene habits aimed at the reduction of chemical exposures to themselves and co-workers.

This document was developed to comply with paragraph (e) of the referenced OSHA 1910.1450 standard. Each Section Safety & Chemical Hygiene Officer (S&CHO) will maintain the facilities and procedures employed in their section of the laboratory compatible with current knowledge and regulations in laboratory safety. This CHP will be reviewed, evaluated and updated at least annually and is readily available to employees, their representatives and any representative of the Assistant Secretary of Labor of OSHA.

2.3 Standard Operating Procedures (SOP) for Laboratory Chemicals

A. Chemical Procurement

1. The decision to procure a chemical shall be a commitment to handle and use the chemical properly from initial receipt to ultimate disposal.
2. All chemicals shall be received in a central location. Personnel who receive chemical shipments shall be knowledgeable of the proper procedures for receipt. Chemical containers shall not be accepted without accompanying labels and packaging in accordance with all appropriate regulations. All chemical shipments should be dated when received and opened. MSDS must be available.

B. Chemical Storage

1. Received chemicals shall be moved to the designated storage area for the section. Large glass containers shall be placed in carrying containers or shipping containers during transportation.
2. The storage area shall be well-illuminated, with all chemical storage maintained below eye level. Large containers shall be stored as close to the ground as possible.
3. Chemicals shall be segregated by hazard classification and compatibility in a well-identified area, with local exhaust ventilation.
4. Mineral acids should be separated from flammable and combustible materials. Separation is defined by NFPA 49 as storage within the same fire area but separated by as much space as practicable or by intervening storage from incompatible materials.
5. Acid-resistant trays shall be placed under bottles of mineral acids.
6. Acid-sensitive materials such as cyanides and sulfides shall be separated from acids or protected from contact with acids.
7. Highly toxic chemicals shall be stored in unbreakable secondary containers.
8. The storage area shall be accessible during normal working hours.
9. When highly toxic, caustic, or flammable chemicals are taken from the storage area, they shall be placed in an outside container or bucket.
10. Storage of chemicals at the laboratory bench or other work areas shall be limited to amounts as small as practical. Chemicals in the workplace shall not be exposed to sunlight or heat.
11. Stored chemicals shall be examined at least annually by the Section S&CHO for replacement, deterioration, and container integrity. The inspection should determine whether any corrosion, deterioration, or damage has occurred to the storage facility as a result of leaking chemicals.

C. Chemical Handling

Each laboratory employee with the training, education and resources provided by supervision, shall develop and implement work habits consistent with this CHP to minimize personal and coworker exposure to the chemicals in the laboratory. Based on the realization that all chemicals inherently present hazards in certain conditions, exposure to all chemicals shall be minimized.

General precautions which shall be followed for the handling and use of all chemicals are:

1. Skin contact with all chemicals shall be avoided.
2. All employees shall wash all areas of exposed skin prior to leaving the laboratory.
3. Mouth pipetting or starting a siphon is prohibited.
4. Eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present is prohibited. Hands shall be thoroughly washed prior to performing these activities.
5. Storage, handling and consumption of food or beverages shall not occur in storage areas, refrigerators, glassware or utensils used for laboratory operations.
6. Risk determinations shall be conservative in nature.
7. Any chemical mixture shall be assumed to be as toxic as its most toxic component.
8. Substances of unknown toxicity shall be assumed to be toxic.
9. Laboratory employees shall read the MSDS of all chemicals being used and shall be familiar with the symptoms of exposure for the chemicals with which they work and the precautions necessary to prevent exposure.
10. The intent and procedures of this Chemical Hygiene Plan shall be adhered to continuously.
11. In all cases of chemical exposure, neither the Permissible Exposure Limits (PELs) of OSHA or the Threshold Limit Values (TLVs) of the American Conference of

- Governmental Industrial Hygienists (ACGIH) shall be exceeded.
13. Specific precautions based on the toxicological characteristics of individual chemicals shall be implemented as deemed necessary by the Section S&CHO.

D. Laboratory Equipment and Glassware

Each employee shall keep the work area clean and uncluttered. All chemicals and equipment shall be properly labeled. At the completion of each work day or operation, the work area shall be thoroughly cleaned and all equipment properly cleaned and stored.

In addition, the following procedures shall apply to the use of laboratory equipment:

1. All laboratory equipment shall be used only for its intended purpose.
2. All glassware will be handled and stored with care to minimize breakage; all broken glassware will be immediately disposed of in the broken glass container.
3. All evacuated glass apparatus shall be shielded to contain chemicals and glass fragments should implosion occur.

E. Personal Protective Equipment

1. Chemical goggles and/or a full face shield shall be worn during chemical transfer and handling operations as procedures dictate.
2. Sandals, perforated shoes, cloth sneakers/tennis shoes and bare feet are prohibited when working with hazardous chemicals. Safety shoes are required where employees routinely lift heavy objects.
3. Laboratory coats are provided and should be worn in the laboratory when the possibility of contamination exists. Laboratory coats will be laundered on a periodic basis, not to exceed monthly. Laboratory coats shall be removed immediately upon discovery of significant contamination.
4. Appropriate chemical-resistant gloves shall be worn at all times when there may be skin contact with chemicals. Used gloves shall be inspected and washed prior to re-use. Damaged or deteriorated gloves will be immediately replaced.
5. Thermal-resistant gloves shall be worn for operations involving the handling of heated materials, exothermic reaction vessels, or with extremely cold substances. Thermal-resistant gloves shall be non-asbestos and shall be replaced when damaged or deteriorated.

F. Personal Work Practices

1. Laboratory supervision shall ensure that each employee knows and follows the rules and procedures established in this plan.
2. All employees shall remain vigilant to unsafe practices and conditions in the laboratory and shall immediately report such practices and/or conditions to the laboratory supervisor. The supervisor must correct unsafe practices and or conditions promptly.
3. Long hair and loose-fitting clothing shall be confined close to the body to avoid being caught in moving machine/equipment parts.
4. Use only those chemicals appropriate for the ventilation system.
5. Avoid unnecessary exposure to all chemicals by any route.
6. Do not smell or taste any chemicals.
7. Encourage safe work practices in coworkers by setting the proper example. Horseplay is strictly forbidden.
8. Seek information and advice from knowledgeable persons, standards and codes

about the hazards present in the laboratory. Plan operations, equipment and protective measures accordingly.

9. Inspect personal protective equipment prior to use, and wear appropriate protective equipment as procedures dictate and when necessary to avoid exposure.

G. Labeling

1. All containers in the laboratory that contain chemicals shall be labeled. The label shall be informative and durable, and at a minimum, will identify contents, date of acquisition or date prepared, expiration date and if hazardous, the indication of hazard.
2. Portable containers shall be labeled by the individual using the container.
3. Exemptions for labeling requirements shall be made for chemical transfers from a labeled container into a container which is intended only for the immediate use of the employee who performed the transfer.
4. Before transferring chemicals for immediate use, the employee shall be trained in the use of Material Safety Data Sheets (MSDS) and shall have read the MSDS and for the specific chemical being transferred as per the Hazardous Communication Policy in the DOJ Safety & Health Manual.
5. The labeling of reagents & chemicals within each Section shall be inspected annually by the Section S&CHO (to coincide with audits of each Section as per ASCLD-LAB criteria 1.4.2.10) to ensure labels have not been defaced or removed.

2.4 Criteria for Implementation of Control Measures

A. Air Sampling

1. Upon addition of new chemicals or changes in control procedures, additional air sampling will be considered to determine the exposures. If there is reason to believe exposure levels for regulated substances that require sampling routinely exceed the action level, or in the absence of an action level, the PEL, air sampling shall be conducted according to the current industry standard.
2. The results of air sampling studies performed in the laboratory shall be maintained and recorded by the Section S&CHO.

B. Housekeeping

1. Each laboratory worker is directly responsible for the cleanliness of his or her work space, and jointly responsible for common areas of the laboratory. Laboratory management shall insist on the maintenance of housekeeping standards.
2. The following procedures apply to the housekeeping standards of the laboratory:
 - (a) All chemical wastes will be disposed of properly.
 - (b) The laboratory benches shall be kept clear of equipment and chemicals except those necessary for the work currently being performed.
 - (c) The work area shall be cleaned at the end of each operation and each shift, if used.
 - (d) All apparatus shall be thoroughly cleaned and returned to storage upon completion of usage.
 - (e) All floors, aisles, exits, fire extinguishing equipment, eye washes, showers, electrical disconnects and other emergency equipment shall remain unobstructed.
 - (f) All labels should face forward.

- (g) Chemical containers shall be clean, properly labeled and returned to storage upon completion of usage.

C. Safety and Emergency Equipment

1. Telephone numbers of emergency personnel, supervisors and other workers as deemed appropriate shall be posted in a common and accessible area.
2. Some laboratory personnel will be trained in the proper use of fire extinguishers. Prior to the procurement of new chemicals, the Section S&CHO shall verify that existing extinguishers and other emergency equipment are appropriate for such chemicals.
3. All employees who might be exposed to chemical splashes shall be instructed in the location and proper usage of emergency showers and eye washes. The eyewash and emergency shower shall be inspected monthly. These inspections shall be performed by the Section S&CHO. Records shall be maintained.
4. Location signs for safety and emergency equipment shall be posted.
5. Fire extinguishers and any other fire safety equipment will be inspected monthly by the Section S&CHO.

2.5 Engineering Controls

A. Intent

The engineering controls installed in the laboratory are intended to minimize employee exposure to chemical and physical hazards in the workplace. These controls must be maintained in proper working order for this goal to be realized.

B. Modification

No modification of engineering controls will occur unless testing indicates that worker protection will continue to be adequate.

C. Improper Function

Improper function of engineering controls must be reported to the Section S&CHO immediately. The system shall be taken out of service until proper repairs have been executed.

D. Usage

All employees shall follow proper work practices when using the engineering controls.

1. Local Exhaust Ventilation:
The following procedures shall apply to the use of local exhaust ventilation:
 - (a) Openings of hoods shall be placed as close as possible to sources of the air contaminant.
 - (b) Clear the screen on the face of the hood prior to usage.
 - (c) Hood fans shall operate when hoods are being used.
 - (d) After using hoods, operate the fan for an additional period of time sufficient to clear residual contaminants from the duct work.
2. Laboratory Hoods:
The laboratory hoods shall be utilized for all chemical procedures which might result in release of hazardous chemical vapors or dust. As a general rule, the hood shall be used for all chemical procedures involving substances which are

appreciably volatile or toxic.

The following work practices shall apply to the use of hoods:

- (a) Confirm adequate hood ventilation performance prior to opening chemical containers inside the hood.
- (b) Keep the sash of the hood lowered at all times except when working within the hood. At these times, maintain the sash height as low as possible.
- (c) Storage of chemicals and equipment inside the hood shall be kept to a minimum.
- (d) Minimize interference with the inward flow of air into the hood.
- (e) Leave the hood operating when it is not in active use if hazardous chemicals are contained inside the hood or if it is uncertain whether adequate general laboratory ventilation will be maintained when the hood is non-operational.
- (f) The ventilation system shall be certified annually by a designated vendor. The hood face velocity should be maintained between 75 and 125 feet per minute.
- (g) The hood shall not be used as a means of disposal for volatile chemicals.
- (h) Prior to the introduction of new chemicals, the adequacy of hood ventilation systems shall be determined by the Section S&CHO.

3. Storage Cabinets:

Storage cabinets for flammable and hazardous chemicals will be ventilated in accordance with the local building code for laboratory type buildings.

2.6 Employee Information and Training

A. Hazard Information

All employees will be apprized of the hazards presented by the chemicals in use in the laboratory. Each employee shall receive training at the time of initial assignment to the laboratory and prior to assignments involving new exposure situations.

B. Training

This training shall include methods of detecting the presence of a hazardous chemical, physical and health hazards of chemicals in the laboratory, and measures employees can take to protect themselves from these hazards. The training shall present the details of the Chemical Hygiene Plan, and shall include:

1. the location and availability of the Chemical Hygiene Plan;
2. signs and symptoms associated with exposure to the chemicals present in the laboratory;
3. location and availability of reference material on chemical hygiene;
4. training shall be conducted by the Section S&CHO or designee.

2.7 Prior Approval of Laboratory Activities

A. Special Work Schedules or Conditions

Some laboratory activities present specific, foreseeable hazards to the employees. These activities include off-hours work, sole occupancy of building, hazardous operations and unattended operations. Permission from the SAC must be given to work under these conditions.

1. Off-Hours Work Procedures:
Laboratory personnel are not permitted to perform hazardous operations outside normal business hours. Normal business hours are generally 8:00am to 5:00pm , Monday through Friday. These hours may vary by Section.
2. Sole Occupancy:
At no time shall hazardous work be performed in the laboratory when the only person in the building is the laboratory person performing the work. Under unusual conditions, cross checks, periodic security guard checks, closed circuit television, or other measures may be taken when permitted.
3. Hazardous Work:
All hazardous operations are to be performed during a time when at least two personnel are present in the section. At no time shall a laboratory person, while working alone in the laboratory, perform work that is considered hazardous. The determination of hazardous operations shall be made by the laboratory supervisor.
4. Unattended Operations: (Except automated and/or robotic operations)
When potentially hazardous laboratory operations are performed which will be unattended by laboratory personnel (continuous operations, overnight reactions, etc.), the following procedures will be employed:
 - (a) Inform immediate coworkers of the operation.
 - (b) The laboratory supervisor will review work procedures to ensure for the safe completion of the operation.
 - (c) An appropriate sign will be posted at all entrances to the laboratory.
 - (d) The overhead lights in the laboratory will be left on.
 - (e) Precautions shall be made for the interruption of utility service during the unattended operation (loss of water pressure, electricity, etc.).
 - (f) The person responsible for the operation will return to the laboratory at the conclusion of the operation to assist in the dismantling of the apparatus.

2.8 Medical Consultations and Examinations

A. Opportunity for Medical Attention

An opportunity to receive medical attention is available to all employees who work with hazardous chemicals in the laboratory. The opportunity for medical attention will be made available to employees under the following circumstances:

1. Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory,
2. Medical surveillance programs will be established where exposure monitoring reveals an exposure level above the action level for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, and/or,
3. Whenever an event takes place in the laboratory such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure the employee will be provided an opportunity for medical consultation for the purpose of determining the need for medical examination.

B. Cost

These medical consultations and examinations shall be provided without cost to the employees, without loss of pay and at a reasonable time and place.

C. Supervision

These medical consultations and examinations shall be administered by or under the direct supervision of a licensed physician. A current list of available physicians is maintained by the DOJ Health & Safety Officer. Employees seeking the opportunity of medical consultation should request the listing from the DOJ Health & Safety Officer.

2.9 Special Precautions

When laboratory procedures change to require the use of additional classifications of chemicals (allergens, embryo toxins, teratogen, carcinogens, etc.), additional special precautions shall be implemented as deemed necessary by the Section S&CHO.

A. Working with Allergens and Embryo toxins

1. Suitable gloves to prevent hand contact shall be worn when exposed to allergens or substances of unknown allergen activity.
2. Women of child-bearing age will handle embryo toxins only in a hood with confirmed satisfactory performance and will use protective equipment to prevent skin contact as prescribed by the supervisor and Section S&CHO.
3. Embryo toxins will be stored in adequately ventilated areas in unbreakable secondary containers.
4. The supervisor and Section S&CHO will be notified of spills and other exposure incidents. A physician will be consulted when appropriate.

B. Working with Chemicals of Moderate Chronic or High Acute Toxicity

1. Areas where these chemicals are stored and used are of restricted access and have special warning signs.
2. A chemical fume hood with a minimum face velocity of 60 linear feet per minute or other containment device will be used. Released vapors will not discharge with the hood exhaust, but will be trapped.
3. Gloves and long sleeves will be used. Hands and arms will be washed immediately after working with these chemicals.
4. Two people will always be present during work with these chemicals.

C. Working with Chemicals of High Chronic Toxicity

1. All transfer and work with these substances shall be in a designated area: a restricted access hood, glove box or portion of laboratory.
2. Approval of the supervisor will be obtained before use.
3. Vacuum pumps must have scrubbers or high efficiency particulate absolute (HEPA) filters.
4. Any contaminated equipment or glassware will be decontaminated in the hood before removing them from the designated area.
5. For powders, a wet mop or vacuum with a HEPA filter will be used for cleanup.
6. The designated area will be marked with warning and restricted access signs.
7. Containers will be stored in a ventilated, limited access area in labeled, unbreakable, chemically resistant, secondary containers.

2.10 Record Keeping

- A. Accident investigations will be conducted by the immediate supervisor with assistance from other personnel as deemed necessary.
- B. Accidents reports will be written and retained for 5 years.
- C. Exposure records for hazardous chemicals and harmful physical agents will be maintained for 30 years per 29 CFR 1910.20 by Department of Justice Safety Officer.
- D. Medical records for employees exposed to hazardous chemicals and harmful physical agents will be maintained for the duration of employment plus 30 years per 29 CFR 1910.20 by Department of Justice Safety Officer.
- E. Records of inspections of equipment will be maintained for 5 years by the Section S&CHO.
- G. Records of employee training will be maintained for 5years by the Section S&CHO.

2.11 Chemical Spills, Releases and Accidents

- a) All small spills on laboratory benches or floors shall be immediately cleaned and the waste shall be properly disposed. If the worker who causes or notices the spill does not feel they can clean up the spill safely, then a supervisor should be notified and the supervisor should determine the best course of action for cleaning up the spill.
- b) Hazardous or Large spills: If a large chemical spill or a hazardous spill or release occurs, then a determination must be made quickly as to a course of action. If the spill or release is too large or the material is too hazardous to be cleaned up safely, the area should be evacuated (and possibly the entire building depending on the severity of the spill and hazard of the chemical), and the local Hazardous Material Spill team will be notified immediately. For the Raleigh NCSBI Crime Laboratory, the Raleigh Haz*Mat Team will be called. For the Western Regional Laboratory, the Asheville Haz*Mat Team will be called.

2.12 Annual Chemical Hygiene Plan Audit

The Crime Laboratory Safety Committee will conduct an audit of all phases of the Chemical Hygiene Plan each year. Results will be provided to the Deputy Assistant Director. Supervisors are responsible for taking corrective action.

2.13 References and Recommended Reading

National Research Council, Prudent Practices for Handling Hazardous Chemicals in laboratories, National Academy Press, Washington, D.C. 1981.

National Research Council, Prudent Practices for Disposal of Chemicals from Laboratories, National Academy Press, Washington, D.C., 1983.

Freeman, N.T., Introduction to Safety in the Chemical Laboratory, Academy Press, 1982.

Manufacturing Chemists' Association, Inc., Guide For Safety In The Chemical Laboratory, D. Van Nostrand Company, Inc., 1954.

Green, Michael E., Safety In Working With Chemicals, MacMillan Publishing Co., Inc. 1978.

Pipitone, David A., Safe Storage of Laboratory Chemicals, Wiley & Sons, Inc. 1984.

Code of Federal Regulations, 29 CFR part 1910 sub part Z section 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories, 1990.

2.14 Specific Section S&CHO Responsibilities Outlined in the Chemical Hygiene Plan:

- Sec. 2.4.C.3 Shower and eyewash stations shall be inspected monthly, and the inspection shall be documented by the Section S&CHO.
- Sec. 2.6.B.4 Safety training for new employees is required. Should include, but not be limited to, the fire evacuation plan, location of hazardous work areas (i.e., chemical storage rooms), and other items listed in the Chemical Hygiene Plan.
- Sec. 2.3.G.5 The labeling of reagents & chemicals shall be inspected annually by the Section S&CHO to ensure that labels have not been defaced or removed.
- Sec. 2.4.C.5 Fire extinguishers and any other fire safety equipment within each section will be inspected monthly by the Section S&CHO.
- Sec. 2.9.B.1-9
1. Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices,
 2. Determine that facilities and training levels are adequate for the chemicals in use.
 3. Perform monthly, formal chemical hygiene and housekeeping inspections including inspections of emergency equipment and document and maintain records of the inspection for a period of no less than five (5) years,
 4. Help project directors develop precautions and adequate facilities,
 5. Review and improve the Chemical Hygiene Plan on an annual basis,
 6. Maintain overall responsibility for the laboratory operation,
 7. Ensure that workers know the chemical hygiene rules,
 8. Determine the proper level of personal protective equipment, ensure that such protective equipment is available and in working order,
 9. Ensure that appropriate training has been provided to employees,

3.0 BLOODBORNE PATHOGEN COMPLIANCE PROGRAM

Standard Operating Procedures (SOP)

3.1 POLICY

- 1.1 This policy is designed to help NCSBI Crime Laboratory employees eliminate or minimize exposure to bloodborne pathogens or other potentially infectious materials. The degree of risk of acquiring bloodborne pathogens on the job is directly related to the frequency of parental exposure to blood. Non-intact skin, eye and mucous membrane exposure to blood poses a lower risk, and exposure to other potentially infectious body materials, still a lower risk.
- 1.2 The NCSBI Crime Laboratory complies with 29 CFR 1910.1030, the OSHA Bloodborne Pathogens Standard and relevant sections of the North Carolina communicable disease law and rules [G.S. 130A-144, 15A NCAC 19A .0201(b)(4)(e) and (f), .0202(4) and (9)], and .0203(b)(3)], and North Carolina medical waste management laws and rules [G.S. 130A-309.26 and 15A NCAC 13B .1200 to .1207.
- 1.3 The policy outlines steps to prevent occupational exposure and specific procedures to be followed if an inadvertent percutaneous or permucosal exposure occurs.
- 1.4 The policy and procedures shall be reviewed and updated at least annually and whenever necessary to reflect new job descriptions and modified tasks and procedures that affect occupational exposure.

3.2 EMPLOYEES AFFECTED

All full-time and part-time employees to include interns who have occupational exposure to bloodborne pathogens are covered by this policy and its standard operating procedures.

3.3 DEFINITIONS

- 3.3.1 Bloodborne Pathogens: Microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).
- 3.3.2 Potentially Infectious Materials: Includes body fluids (including but not limited to blood, semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures) and any body tissue.
- 3.3.3 Occupational Exposure: Actual or potential parenteral, skin, eye or mucous membrane contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.
- 3.3.4 Universal Blood and Body Fluid Precautions: An approach to infection control. According to the concept of universal precautions, all human blood; body components including serum; other body fluids (including visible blood; semen; vaginal secretions; tissues; and cerebrospinal, synovial, pleural, peritoneal, pericardial, and amniotic fluids) are treated as if they are infectious for HIV, HBV, and other bloodborne pathogens.

3.4 SOP FOR PREVENTION OF DISEASE(S) CAUSED BY BLOODBORNE PATHOGENS

- 3.4.1 The NCSBI Crime Laboratory has developed written exposure determinations and maintains a list of all job classifications in which employees have occupational exposure to bloodborne pathogens. All job tasks and procedures are classified into one of three categories to facilitate exposure determination.

a. Exposure Determinations include:

1. Category T1: Tasks that involve potential for mucous membrane or skin contact with blood, body fluids, or tissues, or potential for spills or splashes of them.
2. Category T2: Tasks that involve no exposure to blood, body fluids, or tissues, but employment may require performing unplanned Category I tasks.
3. Category T3: Tasks that involve no exposure to blood, body fluids, or tissues, and Category I tasks are not a condition of employment.

- 3.4.2 The NCSBI Crime Laboratory establishes work practices and standard operating procedures to eliminate or minimize contact with blood or other potentially infectious materials.

NCSBI Crime Laboratory employees should follow standard operating procedures while performing job duties classified as Category T1 and T2.

- 3.4.3 The NCSBI Crime Laboratory uses modifications to the work environment and changes in work practices and procedures as the primary method to eliminate or minimize employee exposure.

- 3.4.4 All NCSBI Crime Laboratory employees who have occupational exposure to bloodborne pathogens will have the hepatitis B vaccination series provided at no charge. This is voluntary.

- a. The first dose of vaccine is to be made available to employees within 10 working days of initial assignment. Subsequent doses are to be administered according to current Centers for Disease Control recommendations.
- b. Employees who decline hepatitis B vaccine are required to sign a Hepatitis B Vaccine Declination Form and have the option of taking the vaccine at a later date if occupational exposure continues.

- 3.4.5 The NCSBI Crime Laboratory offers initial, preplacement, annual and new or modified procedures training to all employees who perform Category T1 and T2 tasks.

At a minimum, the training covers:

- access to and explanations of the Bloodborne Pathogens Standard,
- information about bloodborne diseases and their transmission,
- the agency's exposure control plan,
- job classifications,
- information about Hepatitis B vaccine,
- decontamination and disposal procedures,
- universal blood and body fluid precautions,
- protective equipment, and
- information and protocols for reporting and treatment for an inadvertent exposure to bloodborne pathogens.

- 3.4.6 The NCSBI Crime Laboratory has implemented a written schedule for cleaning and the method of decontamination based upon the location within or outside the facility (laboratory, clinic, home setting, etc.), type of surface to be cleaned, type of soil present, and tasks or procedures being performed in the area.

Employees are required to clean equipment, environmental and work surfaces and decontaminate them immediately after contact with blood or other body fluids using an EPA-

approved disinfectant, such as phenolic or quaternary ammonium germicidal detergent solution or a 1:10 to a 1:100 dilution of bleach.

3.4.7 The NCSBI Crime Laboratory follows the North Carolina medical waste management laws and rules except when the OSHA standard preempts the North Carolina rules because the state rules are less restrictive.

- a. North Carolina regulated medical waste is blood and body fluids in individual containers in volumes greater than 20 ml; microbiological waste, such as laboratory cultures and stocks; and pathological waste such as human tissue, organs or body parts. These three types of waste must be treated (rendered nonhazardous by a method such as incineration, steam sterilization, or sanitary sewage disposal for bulk blood of >20 ml per container) prior to disposal with other general solid waste.
 1. Sharps or sharp items, including contaminated needles, scalpels, plastic slides and cover slips, broken glass and capillary tubes, ends of dental wires, and other contaminated objects that can penetrate the skin, are regulated medical waste and must be:
 - a) Packaged in a biohazard-labeled (fluorescent orange or orange-red with lettering or symbols in contrasting color) or red container that is rigid, closable, puncture-resistant and leak-proof (when in an upright position);
 - b) Sharps containers must be located close to the work areas and replaced before overfilled;
 - c) During removal of sharps containers from areas of use, they must be closed and placed in a second biohazard labeled, leak-proof container or a red plastic bag (160 lb. burst strength polyethylene), if there is the possibility of leakage.
 2. To avoid unnecessary employee exposure to small volumes of blood (<20 ml) in individual containers, such as laboratory vacuum tubes, they should not be emptied. Containers of ≤ 20 ml of blood that are to be discarded and stored while awaiting off-site transport must be either stored in a secure area, restricted to authorized personnel or packaged in a container suitable for sharps, or in a plastic bag (160 lb. burst strength polyethylene) that is placed in a rigid biohazard-labeled fiberboard box or drum..
- b. The NCSBI Crime Laboratory contracts with a Medical Waste disposal company who incinerates (renders nonhazardous) all of the agency's regulated medical waste prior to disposal.
- c. Contaminated disposable items, such as dressings, drapes, etc., that would release blood or body fluids in a liquid or semi-liquid state if compressed or items that are caked with dried blood are regulated waste as defined by OSHA. Regulated waste does not require treatment and may be disposed of as general solid waste.

However, while onsite, blood-soaked or caked items must be discarded, stored and transported in red plastic bags or in closable, leak-proof, biohazard labeled containers.

3.4.8 As defined by OSHA, contaminated laundry means laundry that is soiled with blood or body fluids or that may contain sharps.

- a. When handling contaminated laundry, employees are to practice universal precautions, including wearing gloves. Contaminated laundry is to be handled as little as possible, with minimum agitation.

- b. Contaminated laundry must be placed in red plastic bags or biohazard-labeled, leak-proof containers wherever it is generated. It is not to be sorted or rinsed at the location where it is used.
 - c. Although contaminated laundry must be handled more carefully and stored in labeled or red bags, it can be washed with the regular laundry.
- 3.4.9 The Department of Justice has established and maintains a record keeping system that consists of:
- a. a confidential medical record for each employee who performs Category I and II tasks, and
 - b. training records including content, faculty and attendance.

3.5 SOP FOR EMPLOYEE EXPOSURE TO BLOODBORNE PATHOGENS

When an inadvertent percutaneous or permucosal exposure to blood or other potentially infectious materials occur:

- 3.5.1 Employees are required to:
- a. Remove contaminated personal protective equipment and place it in a red or biohazard labeled bag.
 - b. Wash exposed areas (hands and other skin surfaces) with soap and water. Immediately flush exposed mucous membranes with water, and, if exposed, flush eyes with large amounts of water or eye wash solution.
 - c. If there is a spill, immediately arrange for decontamination with an EPA-approved disinfectant.
 - d. Seek medical care if first aid is needed or if signs of infection, such as redness or swelling, occur.
 - e. Immediately report exposure incident to the direct supervisor and/or section safety officer. If the exposure occurs after 5:00 pm or on a weekend or holiday, the employee should immediately notify the Health Care Provider on an emergency basis.
 - f. Obtain an Incident Report form from the supervisor. Complete and return it to the supervisor within 24 hours.

When an employee reports an inadvertent percutaneous or permucosal exposure to blood or other potentially infectious materials:

- 3.5.2 Supervisor and/or section safety officer are required to:
- a. Immediately arrange or conduct exposure follow-up.
 - b. Review standard operating procedures and methods to prevent future exposures with the employee.
 - c. Provide employee with the Incident Report Form.

4.0

EXPOSURE CONTROL PLAN

The handling of or contact with evidence containing blood or other body fluids poses certain health and safety risks. The degree of risk in most cases is unknown even with information about the victim and suspect.

Exposure to blood borne pathogens is most likely when examining evidence such as liquid blood, syringe needles and other sharp objects, bloody clothing and weapons. Everyone is occasionally required to handle or examine bloody or contaminated evidence, and universal precautions should always be used when in contact with such items.

Key:

Positions Performing Tasks

ADM = Administrator

CLA = Crime Laboratory Analyst/Technician/Intern

ECU = Evidence Control Unit

SEC = Secretary

Fluid Categories Under Universal Blood and Body Fluid Precautions

F1 = Body fluids to which universal precautions apply: blood, blood components, e.g. serum, other body fluids containing visible blood, semen, vaginal fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid.

F2 = Body fluids to which universal blood and blood fluid precautions do not apply (unless there is visible blood): feces, nasal secretions, sputum, sweat, tears, urine, vomitus and saliva.

Protective Barriers Recommended

1 = gloves

2 = gloves and lab coats

3 = Gloves, lab coats and face shields or safety glasses

4 = Gloves, lab coats and safety hood

Task Exposure Category

T1 = Tasks that involve actual or potential for mucous membrane or skin contact with blood, body fluids or tissues. (Refer to F1 or F2 for fluids to which universal precautions apply.)

T2 = Tasks that involve no exposure to blood, body fluids or tissues, but employment may require performing unplanned Category T1 tasks.

T3 = Tasks that involve no exposure to blood, body fluids or tissues and Category T1 tasks are not a condition of employment.

OSHA Standards will require the following:

1. Contaminated work surfaces will be cleaned at the completion of an operation or at the end of a work day with appropriate cleaning materials.
2. All instruments used with contaminated evidence will be decontaminated within the manufacturers specifications at the conclusion of an operation or at the end of the work day.

3. Gloves must be worn at all times when in contact with contaminated evidence.
4. All personnel must have heptavax (hepatitis B Vaccination) or sign a waiver.
5. All sharps (blades and all glassware) must be disposed of in a hard container.

Exposure Control Plan

<u>Tasks</u>	Task Exposure Category	Position Performing Tasks	Categories Under Universal Precautions	Protective Barriers Used
Crime Scene Searches	T1	CLA	F1	3
Handling of all Bloody Evidence (Packaging, Opening, Examination, Evidence Collection, Labeling, Sample and/or Slide Prep., Repackaging, etc.)	T1	CLA ECU	F1	3 or 4
General Evidence Handling (Receiving, Storage, Microscopy, etc.)	T3	CLA, ECU	N/A	0
Suspected Contaminated Evidence	T2	CLA, ECU	F1 or F2	1 or 2
Cleaning Work Surfaces	T2	CLA, ECU	F1 or F2	1 or 2
Reports (Writing, Typing, Reviewing, etc.)	T3	ADM, CLA, ECU, SEC	N/A	0

N/A - Not applicable

5.0 FIRE AND EMERGENCY EVACUATION PLAN

5.1 PURPOSE

To provide a safe and expedient evacuation plan for all employees and visitors of the NCSBI Laboratory Facilities located in Raleigh and Asheville, North Carolina.

5.2 REQUIREMENTS FOR EVACUATION

- A. Anytime a fire, explosion, or hazardous incident (i.e., chemical spill and leaks, radiation leaks etc.) occurs this plan should be implemented.
- B. SAC/Supervisors will ensure the following areas are covered: acquire head count of employees on the complex for their section, and provide pertinent information to the firefighters/rescue personnel (possible employee still in building, type chemicals present, unseen dangers).
- C. SAC/Supervisors will designate a location for employees to meet upon evacuating the building.
(Each section/unit should state their evacuation location in their respective Section/Unit Policy and Procedure manual.)
- D. The emergency alarm system should be tested annually.

5.3 TRAINING

- A. A practical evacuation drill should be conducted at least once a year to familiarize all employees with exits, especially emergency exits not normally used, and their safe and efficient use. The Laboratory Safety Committee and SAC/Supervisor's should review all aspects of the practice evacuation drill to determine if any problems occurred and/or improvements of the plan should be implemented. The fire alarm system should be used during all drills to familiarize the employees with the actual alarm system. The fire department should be made aware of the drill prior to it's execution.
- B. NO ONE IS EXEMPT FROM FIRE DRILLS, EXCEPT BY APPROVAL FROM THEIR SAC/SUPERVISOR.
- C. All employees should be made aware of where all safety equipment is located while carrying out their normal duties. The employees should be instructed annually on the use of safety equipment (fire extinguishers, fire alarms, fire escapes, etc.). The training records should be maintained for a period of five years by the section safety officer.
- D. The Section Safety & Chemical Hygiene Officer (S&CHO) should conduct a monthly safety inspection of all emergency equipment, placards and safety exits. The SAC/Supervisor should review the reports regularly to make sure all emergency equipment is being properly maintained and managed by their S&CHO and their section's personnel.

5.4 PROCEDURE FOR EVACUATION

- A. At the sound of the fire alarm or activation of the alarm all personnel should do the following:
 - 1. All personnel should turn off all flames and sources of ignition, if possible to do so. If possible, all laboratory instruments should be powered down. If a dangerous source of ignition was not able to turn off, this information should be relayed to your SAC\Supervisor

or designee to be reported to the fire fighters\rescue personnel.

2. All personnel should proceed to the closest fire exit in a safe and orderly manner. DO NOT USE ELEVATORS. Upon exiting the building, individuals should proceed to their sections designated location to meet. A count of the number of people present should be compared to the number of people reported in for the day. If a discrepancy occurs, this information should be passed on to the section's SAC\Supervisor, who will in turn tell the Assistant Director of the Crime lab or his designee. The Western Laboratory personnel will report to the SAC of the Western Laboratory and then notify the Assistant Director of the Crime Lab or his designee.
 3. If possible, the SAC\Supervisor designee should sweep the section to make sure all personnel and visitors have exited their section safely.
 4. Building Re-entry.
 - (a) No employee(s) should re-enter the Raleigh facility until the Assistant Director of the Crime Lab or his designee and the Fire Department's Chief or designee have determined the Crime Laboratory building is safe to re-enter.
 - (b) No employee(s) should re-enter the Asheville Facility until the SAC Western Laboratory or his designee or the Fire Department's Chief or designee have determined that the Western Crime Laboratory building is safe to re-enter.
- B. If a strong storm or tornado is threatening, personnel should be contacted directly (e.g., person to person or via phone) if time allows and all personnel should proceed to a designated safe area of the section, away from all exterior windows. All personnel should remain in this designated safe area until their SAC\Supervisor or designee determines danger is no longer present.