LABORATORY COMPLEX SECURITY PLAN AND PROCEDURES

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

LABORATORIES

2600 BLAIR STONE ROAD

TALLAHASSEE, FLORIDA 32399

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LABORATORY COMPLEX SECURITY PLAN AND PROCEDURES

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CHAPTER 1 - INTRODUCTION

1.1 Purpose

The purpose of this document is to establish policies, guidance, and standards for maintaining effective physical security at the Florida Department of Environmental Protection (FDEP), Laboratories (Labs), located at 2600 Blair Stone Road, Tallahassee, Florida 32399 within the Bob Martinez Center.

1.2 Applicability and Scope

1.2.1 The provisions of this manual are applicable to all supervisors, managers, and staff members employed by the FDEP Bureau of Laboratories. This plan addresses: security standards for FDEP laboratory activities; roles and responsibilities; security assessments; preparation of physical security plans; and security training and awareness.

1.2.2 Refer to the following Standard Operating Procedures (SOP) and related documents for additional information. These supporting documents are listed as references and contain critical details that may not be fully described within this SOP.

- Florida Department of Environmental Protection, Bob Martinez Center Emergency Action Plan, January 2016.
- Florida Department of Environmental Protection, Security Plan for Twin Towers Complex, March 28, 2000.
- Department of Management Services (DMS) Tenant Guide for Twin Towers Complex, June 10, 2009.
- State of Florida, Comprehensive Emergency Management Plan, February 1, 2004.
- Florida Department of Environmental Protection, Laboratory Health and Safety Plan, January 2016.
- Florida Department of Environmental Protection, Safety & Loss Control Program, Health and Safety Manual, May 2006.
- Training Procedures for the FDEP Laboratory, (SOP **LB-011**).
- Laboratory Accountability, Storage and Hazardous Communication Procedures, (SOP **ERLN-001**).
- Understanding Chemical Warefare agent Chemisty, Hazards, Toxicity,

and appropriate Response to Exposure, (SOP **ERLN-003**.

1.3 Definition of Physical Security

'Physical security' is defined as that part of security concerned with physical measures to:

- Provide an umbrella of safety and well-being for staff, visitors, contractors, and clients;
- Prevent unauthorized facility access; and
- Protect and safeguard information, equipment, materials, and documents within the facility against sabotage, damage, theft, and /or unauthorized disclosure.

1.4 Potential Threats/Vulnerabilities

Each of the potential security issues listed below will be addressed in this standard operating procedure, unless already covered in another document, in which case a description of the applicable procedural document(s) will be provided.

Potential Vulnerability	**Description**	**Action**
Security Breaches	Deficiencies, inadequate training, and/or the absence of effective plans and procedures relative to controlling access to the facility, installed equipment, files, records, and information systems.	For Physical Security Breach – Contact Capitol Police and Building Manager For Information Security Breach – Contact Office of Technology and lab manager
Emergency Situations	Situation involving emergency events such as fire, flood, gas/chemical release, or staff/ visitor injury.	Call 911, DMS building manager, safety officers and lab managers
Natural Disasters	Natural events such as flooding and hurricanes.	Shut off all critical equipment. Wait for "All Clear" signal from supervisors before going back to work.
Disruption of Services	Disruption of utilities or support services (electrical power, water supply, environmental control) due to acts of nature, equipment failure or malfunction of critical infrastructure.	Contact DMS & City of Tallahassee for critical electrical, gas, and water disruptions.

1.5 FDEP Security Design Principles

The physical security program for the FDEP Laboratories (Labs) has been established and implemented in accordance with security design principles established by the Florida Department of Management Services (DMS), the Department of Environmental Protection, and recommendations made by Midwest Research Institute in their assessment report dated February 13, 2009. Based on those principles and recommendations, this plan:

- Addresses the need to save lives and prevent injury, as well as protect the facility and its functions and assets.
- Outlines a flexible and reasonable approach to insure reliability, safety, and security of the facility;
- Considers cost effectiveness and geographic location;
- Acknowledges the acceptance of some risk; and
- Recognizes that the facility must connect with the public in a reasonably open and accessible manner.

1.6 FDEP Labs' Physical Security Policy

Each supervisor, manager, and individual employee is responsible for maintaining and ensuring the safety, protection and security of all information, resources and property over which he/she has knowledge and control, as well as providing for the safety and well being of all occupants of the facility.

1.7 FDEP Health & Safety/Physical Security Advisory Group

The FDEP joint Health & Safety/Physical Security (H&S/PS) Advisory Group provides a forum to review, coordinate, and make recommendations on the processes and procedures that ensure the Health & Safety and Physical Security of the facility.

In addition to H&S issues, the H&S/PS Advisory Group may assist with the following:

- Implementation of a strategy for maintaining an effective H&S and physical security program for FDEP Laboratories.
- Perform a periodic review of H&S/Security procedures.
- Test and audit the laboratory H&S/Security procedures.
- Make recommendations to improve and update H&S/Security measures.
- Maintain updated H&S/Security documentation.

1.7.1 Health & Safety/Physical Security (H&S/PS) Advisory Group Members

At a minimum, the following individuals must participate:

- Facility Health and Safety Officer
- Environmental Response Laboratory Network (ERLN) Representative
- One Representative each from the Biology Section and the Organic and Inorganic Groups within the Chemistry Section.

1.8 Coordination with Local Emergency Services

To insure a coordinated response in the event of an emergency, a Memorandum of Understanding (MOU) is to be maintained with the local police and fire department. An MOU is a document developed jointly to addresses issues that may save time, property, or life in the event of an actual emergency at the laboratory facility. An example MOU is in **Appendix A**.

CHAPTER 2 – PHYSICAL SECURITY STANDARDS

2.1 General

This Chapter presents the basic physical security standards for the FDEP Labs. These standards are based on guidelines presented in the Florida Department of Management Services (DMS) Security Plan and FDEP Security Plan for the Bob Martinez Center.

2.2 FDEP Site Condition

The laboratory complex consists of four buildings situated in the Bob Martinez Center. The four buildings are designated as Laboratory Office Building A, Laboratory Building B, Laboratory Building C and General Service Building D. The complex is accessible from the front entrance (east side) and from the gate entrances on the north and west sides. Please refer to **Appendix B** for building diagrams. The minimum security standards for the site are outlined and discussed in the sections below.

The laboratory complex was never designed to be an impregnable fortress and so it should be understood that the primary security measures will entail monitoring and controlling movement within the facility and impeding unauthorized activities until appropriate authorities can be summoned.

2.2.1 Security Standards – Perimeter Security

The perimeter area for the Bob Martinez center is the first line of security and mode of initial access. Because of the open nature of access into the perimeter of the Bob Martinez facility, the security measures entail mostly monitoring, with no significant physical barriers before the main entry doors of the buildings. The loading docks and service areas have limited physical barriers comprised of 8-footchain-link fencing and locked gates.

Figure 1: View of the main laboratory Buildings A and B. The BMC office building is the light colored structure in the left background.

The perimeter security measures include:

Perimeter Security Standards
Parking
Facility parking is designed for government employees, authorized visitors and contractors. Other vehicles are subject to being towed away.
Access controls to loading dock areas and service parking areas,
Signs are posted to alert the public to parking restrictions and arrangements have been made for towing unauthorized vehicles.
Adequate lighting is provided in parking areas to ensure the safety of employees and authorized visitors and to deter illegal or threatening activities.
Closed Circuit Television (CCTV) Monitoring
Fourteen surveillance cameras with time-lapse video recording are used for monitoring key exterior and interior areas.
Signs are posted advising of 24-hour video surveillance.
Exterior Lighting
Lighting with emergency back-up power is provided along the building exterior and at entrances and exits.
Windows
Tempered glass windows to all exterior windows.
Physical Barriers
Physical barriers (gates and chain-link fence) are in place along service areas of the facility.
State vehicle parking is in a fenced and gated area to prevent unauthorized vehicle access.
Buildings are of concrete and brick construction.

2.2.2 Security Standards – Entry Security

The primary entry into the Bob Martinez Center is through the East Wing front door. All visitors and delivery personnel must report to the desk located on the first floor of the East wing to sign-in and be issued a visitor identification badge which will be displayed at all times while in the building and returned to the Building Security staff upon departure.

All of the secondary entry doors are secured and monitored by a proximity card-reader system. The security standards for entry points are as follows:

Entry Security Standards
Access Control
Security staff is posted at the main entrance to control building access and/or access to the laboratory complex.
Entry control is accomplished through installation of proximity reader/locking devices and proximity card access on the entrance doors.
An Intrusion Detection System (IDS) with central monitoring capability is installed at the building exterior doors. This system is active during non-business hours.
Entrance/Exits
All mail/packages hand-carried into the building are subject to screening by visual inspection.
Glass doors are installed at the main entrance ensuring the immediate area outside of the entrance is visible from within. Glass doors are installed at the main entrance ensuring the immediate area outside of the entrance is visible from within.
All exterior entrances/exits have high security locks that meet DMS specifications.
Receiving/Shipping Areas
Package entry and access to receiving/shipping areas are restricted, requiring ID card access.

2.2.3 Security Standards – Interior Security

The interior of the Bob Martinez Center has additional security measures to secure restricted areas, insure health & safety, and maintain communication.

Interior Security Standards
Access Control
Entry control into restricted areas is accomplished through installation of proximity reader/locking devices and proximity card access on the entrance doors.
Public Address System (intercom)
A public address system has been installed to permit emergency announcements to occupants of FDEP Laboratory Complex.
Hard-wired phone system.
Badges and Escorting
All visitors and contractors (Access levels 1 and 2) must carry a badge that is visible at all times and be escorted by lab staff while in the lab facility.
Everyone (all Access levels) must carry a badge that is visible at all times while in the lab facility.
Badges (proximity cards) have custom entry permissions.

Utilities and Restrooms
Utility areas and restrooms in the facility are secure and only authorized personnel can gain entry.
Emergency back-up power to critical systems (e.g. alarms systems, telephone communications, and computers) is available.
Emergency lighting is provided throughout the facility including illuminated exit signs powered by emergency lighting system.
A fire detection and suppression (sprinkler) system is installed and provides 100 percent coverage to Lab. Building B, Lab. Building C and Service Building D.
Mechanical System and HVAC
Access to fresh air intakes, mechanical areas, and roof tops in the lab facility is strictly controlled.
Access to Key Watcher System
Access to critical keys is controlled via an electronic key box which controls and logs all activities involving facility keys and temporary access badges.
Access to Refrigerators and Freezers
Access to facility refrigerators containing samples and standards is controlled via proximity readers and, for certain refrigerators, keyed locks as a secondary security barrier.

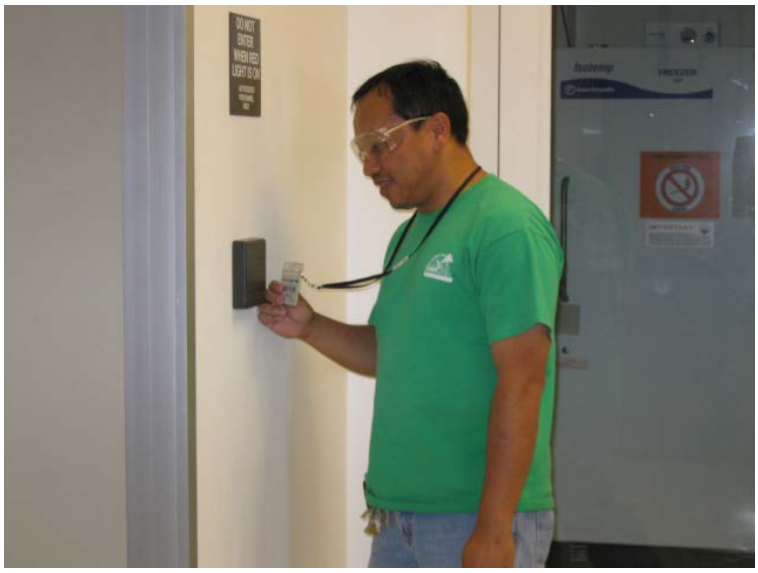


Figure 2: Proximity Readers provide access to restricted areas within the facility with an authorized proximity card.

2.2.4 Security Standards – Security Planning and Coordination

Maintaining up-to-date security plans and coordination is essential to insure the long-term integrity of a comprehensive security strategy. As such, our security documents and procedures are required to be evaluated and updated at least annually. In addition, all staff must fulfill regular safety training requirements. The standards for planning and coordination are provided below:

Security Planning and Coordination Standard
Physical Security Plan
A comprehensive Physical Security Plan exists and is kept current. This plan is reviewed at least annually.

Copies of the Physical Security Plan are made available to all employees.
Emergency Action Plan
An Emergency Action Plan has been established and includes the participation of all tenants in the facility. This plan is reviewed at least annually.
Security, Training, Education, and Awareness
Security training and awareness materials have been developed and distributed, to provide up-to-date information covering practices, employee security awareness and personal safety during emergencies.
A formal security-training program has been established, including new employee orientation and an annual update for all FDEP Labs employees.
Background Security Checks for Contract Service Personnel
Background security checks and security control procedures are required for all contract personnel within the facility. Select exempt service (SES) employees also undergo background checks and fingerprinting.
Background checks are required for all personnel having access to select chemical agents.

2.3 Equipment, Secured Areas and Vehicle Accessibility

Equipment, barriers, and other special hardware used for security in the laboratory are described. The operation, cleaning, and scheduled maintenance procedures prescribed by the equipment manufacturers are followed as provided in the Operator's Manuals.

2.3.1 Keyed and Proximity Card Door Security

The laboratory's primary doorways are equipped with a Card Key proximity card system to both restrict access and maintain a record of access. The proximity cards are programmed to restrict access based on an employee's access level. The access levels are established by the employee's supervisor and building management. The security software used to edit the laboratory access levels is called Pegasus and is only accessible by the building safety officer and building management.

Access to keys and general-use cards is controlled by an electronic Key Watcher Vault System that maintains access, security, and electronic log for all keys and cards issued. The building access and badge issuing authority is described in Section 2.5.

Figure 3. Employee accesses approved keys in the KeyWatcher System

2.3.2 Cameras and Recording Equipment

The cameras on the exterior of the buildings are fixed Sony or Samsung day/night units that are computer networked and record continuously. The interior cameras are Sony pan/tilt/zoom units that are controlled by computer network, but do not continuously record. All camera monitoring and controls are managed over a secure network system with access limited to management and security personnel.

Figure 4: Security cameras are located at strategic points around the facility.

2.3.3 Loading Dock Security

The laboratory loading dock areas are located behind a 6 to 8 foot high fence that is locked during non-work hours and are monitored 24/7 by the exterior camera surveillance system. Furthermore, all laboratory access

from the loading docks, including elevators, is secured either by key or proximity readers.

Figure 4 Secured loading dock area.

2.3.4. Vehicle Access Area

The secured state vehicle access area is located behind an 8-foot fence that is locked during non-work hours and requires a code access.

2.4 Enterprise Information Technology Security Policies

The purpose of the information technology security policies is to ensure that security of the laboratory's information resources is sufficient to reduce the risk of loss, modification, or disclosure of those assets. The policies put into place to accomplish this objective may be found in the Florida Department of Environmental Protection Administrative Directive 390 and references therein.

http://www.dep.state.fl.us/admin/depdirs/pdf/390.pdf

Information security policies and standards apply to all employees. They also apply to other government agencies, contractors, or vendors who are provided account access to the agency network and computer systems. The policies apply regardless of whether connection to agency information technology resources is from within or from outside the agency. Further, these policies and standards apply to DEP automated information systems which access, process, or have custody of data and to mainframe, minicomputer, microcomputer, distributed processing, and networking environments of the Department.

2.5 FDEP Building Accessibility Levels and Badge Issuing Authority

Access to the facility or equipment within the facility is determined by five accessibility levels. These levels are rank from lowest to highest as Level I, Level II, Level III, Level IV, and Level V.

Instructions for staff regarding the issuance of temporary security access badges within B/Labs and their associated controls are provided in **Appendix C**. The

security levels are summarized as shown below.

Figure 5. The badge design includes a DEP logo and the employee's picture, name, and title.

2.5.1 Level I Temporary Accessibility

Level I accessibility is granted to visitors and members of the general public who are scheduled to attend various meetings and functions that are coordinated by the Florida Department of Environmental Protection (FDEP). Typical functions for Level I accessibility are public hearings, laboratory tours, educational & learning activities, etc. All visitors must sign in at the front desk located on the first floor of the Bob Martinez Center Office Building. Visitors to the laboratory must have an FDEP sponsor and will be escorted by an FDEP laboratory employee at all times. Public access to the laboratory complex conference room in Building A may be arranged by a FDEP employee hosting an event or meeting.

2.5.2 Level II Temporary Accessibility

Level II accessibility is granted to service engineers, contractors and consultants who are conducting temporary businesses and must have access to designated working areas. These individuals must have undergone a security background check performed by the Florida Dept. of Law Enforcement (FDLE). The individual must wear their company's identification card and FDEP security badge at all time. The FDEP security badges are acquired in Lab Building A from building security staff. A B/Labs employee must escort the visitor and ensure their safety while on the premises. Facility accessibility for Level II visitors is from 8:00 am to 5:00 pm, Monday to Friday.

2.5.3 Level III Accessibility

Level III accessibility is granted to contractors and/or consultants who are conducting semi-permanent contractual agreement with FDEP and must have access to a designated working area. These individuals must have undergone a security background check performed by the FDLE and fill out the access ID card application. The individual must wear their company's identification card and approved FDEP security badge with their picture at all time.

Examples of contractors with Level III access are Janitorial Services employees, on-site computer programmers, etc.

2.5.4 Level IV Accessibility

Level IV accessibility is granted to all DEP Lab employees including OPS staff with their supervisor's approval. Level IV access allows employees entry to office building A, the Twin Towers office building, laboratory building B, selected areas of laboratory building C and other rooms within the facility depending on their duties. Employees must complete an identification card application and submit the application to their supervisor(s) for approval.

2.5.5 Level V Accessibility

Level V accessibility is granted to senior managers, selected supervisors, the DMS building manager and the facility engineer. Level V access authorizes managers and selected supervisors to access all buildings, entry gates and rooms with a security access card and/or facility keys.

2.5.6 Issuing Authority for Badges

Employees are issued Level IV or Level V access identification badges (as authorized by bureau managers), either by the Labs safety officer, the Labs Chemistry Section operational support officer or by the Bob Martinez Center (BMC) main security desk. Level IV or V access to the laboratory buildings (B or C) by non-Labs employees will be granted only for reasons satisfactory to B/Labs' management (Bureau Chief or designee). All non-B/Labs employees having access to B or C laboratory buildings must attend a laboratory safety course and security awareness course offered by the B/Labs. Visitor badges to the complex are issued by the BMC main security desk; however additional Level II badges may be issued by authorized staff within B/Labs.

Figure 6: Temporary Employee, Technician, and Contractor Badges are located on the 3rd floor near the KeyWatcher system

2.6 Emergency and Natural Disaster Situations

Detailed procedures for emergency situations and natural disasters are provided in the FDEP Health & Safety Plan and State of Florida Comprehensive Emergency Management Plan. These documents are the primary sources of information in the event of an emergency.

In addition, all staff must be knowledgeable of the chemicals/reagents used within their area of responsibility and the protocols in the event of a spill or accidental exposure.

Information for contacting emergency personnel, the laboratory safety officer, and addressing Worker Compensation issues is discussed in the FDEP Health & Safety document and is posted at every laboratory safety station.

2.7 Disruption of Service

Disruption of utilities or support services (electrical power, water supply, environmental control) due to acts of nature, equipment failure, or malfunction of critical infrastructure poses a potential security risk to the laboratory. The following measures have been put into place to insure continuity-of-service in the event of a service disruption:

2.7.1 Electrical Service Redundancy

- An 80 KVA Uninterruptible Power Supply (UPS) provides electrical power for critical equipment in the laboratory during a transient power outage or brown-out condition. In the event of a longer power outage, a back-up generator automatically starts-up to provide electricity. The UPS

is designed to provide continuity of service prior to the back-up generator coming on-line.

- A 350 KVA Back-up Diesel Generator provides electrical power for the laboratory, by means of an automated transfer switch, within 5 seconds after a power outage.
- In the event of an electrical service failure the Laboratory Safety Officer is contacted by DMS who monitors the main electrical supply 24/7.

2.7.2 Laboratory Hood Ventilation Redundancy

- The laboratory ventilation system is equipped with redundant ventilation fans in the event of a fan motor or equipment failure. The electrical supply for the fans is backed-up by the laboratory generator system.
- In the event of a hood ventilation failure the Laboratory Safety Officer is contacted by DMS who monitors hood electrical operations 24/7.

2.7.3 Refrigeration Monitoring

- The main refrigerators and freezers used for storing samples are monitored by networked sensors which trigger an alarm when the temperature is out of a set range. The automated system contacts on-call staff by email or electronic texting.

2.7.4 Water Supply Redundancy

- Two 300 gallon DI water tanks with multiple DI cylinders are maintained to supply DI water throughout the laboratory.
- The laboratory has an on-site well in addition to the municipal water supply.

2.7.5 Equipment Maintenance

- Equipment service contracts are maintained on all critical instruments to insure continuity of service and to minimize instrument down time.
- All equipment maintenance is recorded in dedicated instrument logs.

CHAPTER 3 – ROLES & RESPONSIBILITIES

3.1 General

This Chapter covers the organizational units that are responsible to ensure the protection of DEP employees, visitors, and property. Refer to the laboratory Quality Assurance Plan for identification of individuals and their detailed roles and responsibilities.

3.2 Organizational Structure

The DEP Laboratories, a scientific services component within the Division of

Environmental Assessment and Restoration, consists of three sections: Biology, Chemistry and Scientific Support Services. The Deputy Director is responsible for the overall administration of the sections' activities and recommends security guidelines for the laboratory complex. Security plans developed from those guidelines may be subject to approval by the Division Director or delegate.

A more detailed overview of the organization structure and individual responsibilities is available in the FDEP Labs Quality Manual.

3.3 Responsibilities for Security Plan Implementation

Each of the three sections within the Labs is managed by a section head and their cadre of senior scientific managers. The section heads and managers, along with the bureau's safety officer, are responsible for developing and maintaining this security plan and for ensuring its implementation. Ultimate responsibility for the safety of the laboratory's employees and visitors and for the security of the facility lies with the Deputy Director and the section heads.

Safety and security are not solely the responsibility of management. All Labs employees are required to undergo safety and security training and are expected to assume a degree of responsibility for their own safety and security as well as for their coworkers and visitors.

Security cameras are utilized for monitoring the building perimeter as shown in **Appendix B.** Monitoring and maintaining images captured by those cameras is the responsibility of the BMC main security desk. Labs have assumed responsibility for maintaining the cameras and supporting hardware under its role in the Environmental Response Laboratory Network.

Building security proximity card readers control access to exterior doors and to certain interior laboratory rooms via the access identification badges described in Section 2.5. The Florida Department of Management Services (DMS) maintains the proximity card readers on all exterior doors as well as the controlling software. The Labs is responsible for installing and maintaining proximity card readers on individual laboratory rooms.

CHAPTER 4 – IMPLEMENTATION & MANAGEMENT GUIDELINES

4.1 General

This Chapter provides guidelines for implementing an effective physical security program for FDEP Laboratories.

4.2 Risk Management Process

Because of the range of ongoing activities within the FDEP Lab Complex and

various risk components associated with each of them, there is no single security system that would work ideally for all of them. The solution adopted by the laboratory is a risk management strategy to guide the security process in how to address each of the risk components. This process entails five basic steps described below:

- Identify Assets – What are we protecting?
- Determine Potential Threats - Who are the adversaries?
- Analyze Vulnerabilities - How are we vulnerable?
- Assess Risks – What are our priorities?
- Apply Countermeasures – How do we protect assets and minimize risk?

In this regard, risk management is defined as a systematic and analytical process that considers the likelihood that a threat will endanger assets, individuals, or functions at a given location and identifies actions that will reduce the risk and mitigate the consequences of an incident intended to harm, disrupt, or destroy a facility and it occupants. An effective risk management approach includes the following three primary elements listed below.

Threat Assessment is a process that identifies and evaluates the impact of conditions that may cause injury, illness, or death of personnel, damage to or loss of equipment or property, or mission degradation.

Vulnerability Assessment is a process that identifies systematic weaknesses that may be exploited by potential adversaries.

Critical Assessment is a process designed to systematically identify and evaluate the facility assets based on the importance of its function.

4.3 Security Assessment

The risk management process described above will be considered each time the security plan is revised and will factor into a regular security assessment for the laboratory complex. The security assessment for the FDEP Laboratory Complex will be prepared every 4 to5 years after the first initial assessment or whenever significant changes in the facility have occurred. An initial site security assessment was conducted by Midwest Research Institute (see **Appendix D**). It is important that the assessment is conducted by a qualified representative(s) of an independent office or agency that does not have direct responsibility for the physical security of the facility. Candidate entities for conducting the assessment include the Bureau of Emergency Response, Dept. of Management Services, Security and Fire Section, Tallahassee Police Department and other security service contractors.

The DEP/Labs' Safety Officer will arrange for and coordinate the scheduling and conduct the security survey on which the Assessment will be based. Coordination and scheduling will be accomplished with the B/Labs Bureau Chief and other

laboratory managers.

CHAPTER 5 – TRAINING AND AWARENESS

5.1 General

Training is one of the most important elements in a Health, Safety and Security program. Training and awareness materials have been developed and distributed to provide up-to-date information covering practices, employee security awareness, and personal safety during emergencies. Refer to the Laboratory Training SOP **LB-011** and the FDEP Laboratory Information Management System training module for additional details.

5.2 Training Objectives

The objectives of training are to:

- Familiarize employees with FDEP safety policies security policies, and workplace practices;
- Maintain an effective injury and illness prevention program;
- Maintain physical security of FDEP facilities and resources;
- Insure compliance with safety rules, policies, and job-specific procedures;
- Decrease the potential for incidents and injuries in the workplace;
- Develop and maintain skills in health, safety and security;
- Minimize operating costs and maximize productivity;
- Maintain up-to-date records of training;
- Achieve compliance with federal and/or state regulations.

5.3 New Employee Orientation

Health, safety, and security orientation begins on the first day of initial employment or job transfer. Each employee must have access to a copy of the Health and Safety Manual, safety rules, policies, and laboratory procedures pertaining to his or her job. Supervisors should ask questions of employees and answer their questions to ensure knowledge and understanding of safety rules, policies, and job-specific procedures. **Compliance with the safety rules is required.**

The training is designed to enable employees to learn their jobs properly, bring new ideas to the workplace, reinforce existing safety and security policies, and put the injury and illness prevention programs into practice. Many positions require specific types of safety and security training. Some examples are Hazard Waste awareness, Hazardous Waste handling, CPR/First Aid, and Lab Safety. It is the Supervisor's responsibility to see that this training is provided in a timely manner. Training is required for both supervisors and employees alike.

5.4 Security and Awareness Training

Security and awareness training must be provided to all laboratory employees as part of their initial orientation. This training may be incorporated as part of the on-going Health & Safety training program. The security and awareness training will emphasize the following:

- Awareness of the various security features of the facility, including doors, gates, cameras, and signage;
- Awareness of the facility's policies regarding visitors, contractors, and other service providers;
- Importance of maintaining gates, doors, and other security measures;
- Questioning unfamiliar persons within the facility without proper ID;
- Familiarization with the KeyWatcher system for maintaining keys;
- Maintaining confidentiality of client and laboratory information;
- Access levels are assigned based on need only;
- Each user has a unique user identification;
- Security of passwords;
- Laptop and physical security of computers;
- Document all persons with temporary or occasional authorized access and to escort them at all times;
- Entrances to areas of highest sensitivity must be secure and monitored;
- Define information security and describe why it is necessary, and how it relates to your job;
- Identify who is responsible for information security;
- Identify the roles and positions established to help you safeguard information;
- Explain how as a team member you safeguard information;
- Identify the criterion for "Authorized Staff" and identify required ;authorization for access, update, and release of information;
- Utilize appropriate business practices and technologies;
- Explain what to do if you suspect a breach of security, breach of confidentiality, or violation of policy & procedures;
- Appropriately report incidents involving security violations;
- Things to look for (causes of suspected breaches and violations);
- Penalties and consequences that can be avoided by being risk aware;
- Confidential information should never be released or discussed over the phone without verifying that the caller is legitimate, and
- All telephone conversations in which confidential information is discussed must be made from an area that ensures confidentiality.
- Release of information must follow DEP procedures.

CHAPTER 6 – REFERENCES

6.1 Florida Department of Environmental Protection, Bob Martinez Center Emergency Action Plan, 2012.

6.2 Florida Department of Environmental Protection, Security Plan for Twin Towers Complex, March 28, 2000.

6.3 Florida Department of Environmental Protection, Department of Management Services Tenant Guide for Twin Towers Complex, June 10, 2009.

6.4 State of Florida, Comprehensive Emergency Management Plan, February 1, 2010.

6.5 Florida Department of Environmental Protection, Laboratory Health and Safety Plan, 2012

6.6 Florida Department of Environmental Protection, Safety & Loss Control Program, Health and Safety Manual, May 2006.

6.7 Florida Department of Environmental Protection Comprehensive Quality Assurance Plan, Chemistry Section, Bureau of Laboratories, 2012.

6.8 Florida Department of Environmental Protection, Administrative Directive DEP 390, 2012.

6.9 Florida Department of Environmental Protection, Training Procedures for the FDEP Laboratory, (SOP **ERLN-004-1.0**).

6.10 Florida Department of Environmental Protection, Laboratory Accountability, Storage and Hazardous Communication Procedures, (SOP **ERLN-001-1.0**).

6.11 Florida Department of Environmental Protection, Chemical MSDS Documents and Resources for the FDEP Laboratory, (SOP **ERLN-003-1.0**).

6.12 Midwest Research Institute, Initial Assessment of the FDEP Laboratory in Support of the U.S. EPA Ultra-Dilute CWA Program, February 13, 2009.

Appendix A

Memo of Understanding

Florida Department of Environmental Protection
Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

July 18, 2011

Lt. Annette Brown
Tallahassee Fire Department
Station #6
2901 Apalachee Parkway
Tallahassee, Florida 32304

Dear Lt. Brown:

Thank you very much for visiting the FDEP laboratory complex on April 6, 2011. In our earlier conversation, we discussed ongoing efforts to update our emergency plans to better comply with the Florida Right to Know Law, Chapter 442 and the Federal Hazardous Waste Regulations, 40 CFR 265.37. As a small quantity waste generator, we have a requirement to establish relationships with local emergency responders and to inform those entities of the toxic substances and hazardous wastes generated in our complex.

Attached is a schematic of the laboratory complex showing all critical components and listing the hazardous chemicals typically present in those areas. I hope this information is adequate to assist you in any preparation necessary to respond to emergencies at our facility. If any questions arise, please do not hesitate to contact me.

Sincerely,

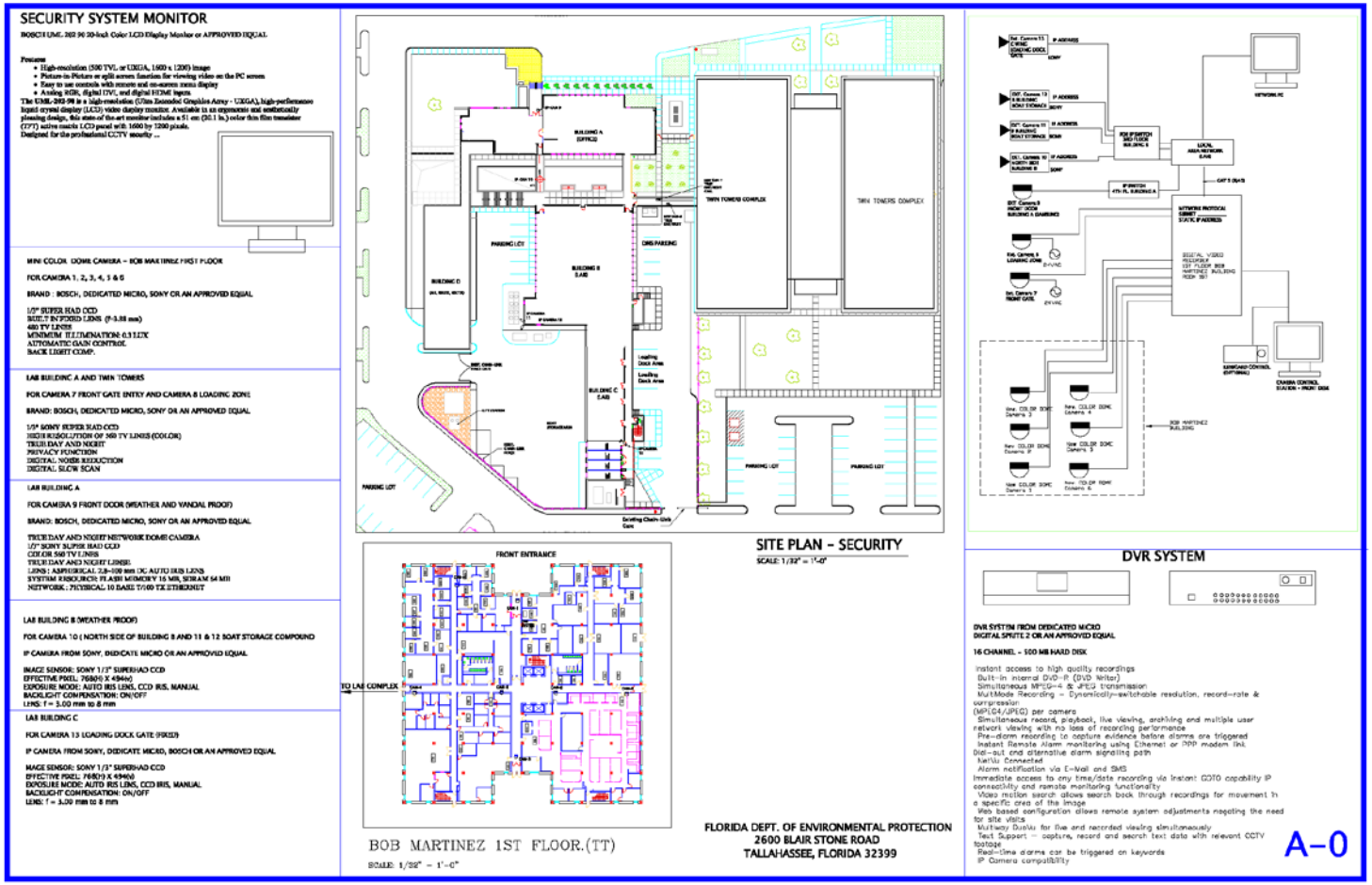
Nhon V. Vo

Nhon Vo
Engineer Specialist IV
Safety and Health Officer
Florida Dept. of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

www.dep.state.fl.us

Appendix B

Diagram of Bob Martinez Center



Appendix C

Temporary Laboratory Badges

DEP Temporary Badges

NO BADGE IS TO BE LEFT UNATTENDED AT ANY TIME

Custodians who are authorized to give badges:
Sara Armour
Barbie Wozniak
Candance Sereico
Nhon Vo
Tim Fitzpatrick
David Whiting
All EMs and EAs

All temporary badges must be assigned a DEP sponsor, who is responsible for the actions and safety of the individual possessing the badge and for the return of the badge.

The sponsor (or designee) must return the badge to a custodian. If that is not possible, they must drop the badge in the drop box. A custodian must check the drop each morning to ensure the return of the badges that have been assigned the day before.

E: Temporary Employee

This person is allowed temporary access to the Laboratory and Twin Towers 24/5 without an escort. The supervisor (or designee) will be notified of this badge issuance and will need to sign as sponsor.

This is a programmed badge.

This badge is to be checked out and returned each day.

T: Technician

This person is allowed temporary access to the Laboratory from 8am-5pm Monday-Friday without an escort. A DEP sponsor must be assigned.

This is a programmed badge.

This badge is to be checked out and returned each day. When returned, the badge must be signed for by a permanent DEP Laboratory employee confirming its return.

C: Contractor

This person is allowed temporary access to the Laboratory 24/7 without an escort. A DEP sponsor must be assigned.

This badge is to be checked out and returned each day. When returned, the badge must be signed

for by a permanent DEP Laboratory employee confirming its return.

Questions or concerns about contractors can be directed to Nhon Vo or Sara Armour.

G: Guest

This person is allowed access to the Laboratory and must be escorted at all times. A DEP sponsor must be assigned.

This is a non-programmed badge.

This badge is to be checked out and returned each day. When returned, the badge must be signed for by a permanent DEP Laboratory employee confirming its return. A numbered badge issued by the main security desk will also suffice.

Appendix D

MidWest Research Institute - FDEP Security Analysis

Midwest Research Institute

Initial Assessment of the Florida Department of Environmental Protection Laboratory in Support of the U.S. EPA Ultradilute Chemical Warfare Agent Program

Report

For
Florida Department of Environmental Protection
Bureau of Laboratories, MS 6500
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

MRI Project No. 110646

February 13, 2009

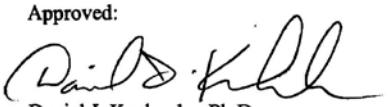
Preface

This report presents an assessment (gap analysis) of the Florida Department of Environmental Protection's (Tallahassee Laboratory) current infrastructure and functional capabilities for the receipt and handling ultradilute chemical warfare agents (CWA) as defined under an Interagency Agreement (IAA) between the U.S. Environmental Protection Agency (EPA) and the Department of Defense (DoD), dated on or about November 22, 2006. This work was performed under Purchase Order No. DO1244192 and based on the MRI Proposal 814616 R-1, dated November 20, 2008.

MIDWEST RESEARCH INSTITUTE

Dennis Hooton
Manager, Chem Demil/CA Section

Approved:



Daniel J. Kuchynka, Ph.D.
Director
Chemical Detection Division

February 13, 2009

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Executive Summary

The Florida Department of Environmental Protection's (FL DEP) Tallahassee Laboratory is developing capabilities and infrastructure to accept and use ultradilute chemical warfare agent (CWA) solutions as part of the U.S. EPA Environmental Laboratory Response Network (eLRN) program. An initial assessment of the FL DEP's laboratory was performed by MRI on January 13 – 14, 2009, to identify functional areas for development or improvement to help meet this objective. A summary of these findings is presented below.

Infrastructure

With few minor changes or additions, the location and design of the proposed suite of laboratories (designated as rooms C201 through C214) appear to meet or exceed Army guidelines for use as a dilute CWA laboratory and offers several advantages from a security, safety, program management, and analytical perspective.

The facility's consolidated location in the back of the FL DEP campus is easier to secure than multiple laboratories throughout the facility and allows sample receipt operations to be performed away from public view. Although it is possible to transfer dilute CWA solutions through secure common areas (with proper containment), the integrated facility would eliminate the risks associated with transfer of samples outside a locked laboratory. In addition, the proposed facility has the necessary ventilation systems (e.g., no recirculation of laboratory air, backup power and blower systems, etc.) to meet the Edgewood Chemical Biological Center (ECBC) guidelines. The plan restricts CWA operations to a smaller laboratory space for purposes of method development and performance testing, while allowing room for expansion under "surge" or high-throughput conditions if needed. Access to the back delivery area/parking lot provides additional staging areas for overflow sample or waste storage during surge conditions or other supplemental laboratory support. The designed flow of samples within the suite of laboratories, (i.e., from sample receipt to preparation to analysis) minimizes the likelihood of instrument or facility contamination by sequentially reducing the sample size and CWA concentration of the analytical sample as it moves through a series of airlocks and ventilation controlled laboratories.

Functional Documents and Plans

The FL DEP is in the process of completing two essential documents. A Physical Security Plan (PSP) is being developed with involvement of the local police department and management safety representatives are working with their counterparts within the EPA network on developing a comprehensive Safety and Health plan. These two documents are important in establishing the policies and procedures for receipt, handling, and control of dilute CWA agents.

This report also identifies and recommends additional laboratory documents and plans covering other essential aspects relevant to CWA operations as part of the overall

program. The functionality of these documents may be prepared as new separate or combined documents, or as addendums to existing documents.

It is recommended that the policies, documents and plans be written in compliance with ECBC guidelines and Army requirements for use of Research Development Testing Evaluation (RDTE) Dilute solutions, which have CWA concentration thresholds higher than those listed for ultradilute CWA solutions. This conservative approach is recommended because the designated ultradilute CWA concentration thresholds may increase for program reasons and because test samples may have unknown CWA levels or potentially higher concentrations due to limitations of CWA field screening methods.

Technical Operations

Findings and recommendations for technical operations are divided into the three major components of the ECBC guidelines: safety and health, physical security, and accountability.

Safety and Health

The FL DEP already has several of the required safety and health functions in place, such as medical surveillance, personal protective equipment (PPE), respiratory mask fit-testing, waste management, and chemical hygiene plans. These current systems may be amended to incorporate the proposed new functions to meet ECBC guidelines. Specific recommendations are to:

- Expand the role and responsibility of the chemical hygiene officer and/or safety officer (CHO) to address the specific use of dilute CWA solutions and maintain the associated records as evidence of compliance.
- Institute policies and procedures for assuring hazard awareness and training (e.g., PPE, symptoms of CWA exposure, emergency evacuation, etc.) for staff, visitors, and security personnel.
- Conduct hazard analyses of all technical procedures, and witnessing staff proficiency during "dry runs" of analytical methods and related protocols.
- Maintain detailed and complete records of compliance that demonstrate that ECBC requirements are being met.
- Adopt a "personnel reliability" approach in which staff are encouraged to self-report situations (medications, temporary physical/emotional conditions, etc.), in which laboratory safety could be compromised and be alert to similar conditions in coworkers.
- Establish a collective and consistent policy within the safety and health network for use of Mark I CWA antidote kits. This policy may need to be amended in the future due to availability of the Mark I kits. Additionally, a policy on risk and general medical prescription for the kits may be needed.

- It is suggested that any community concerns be alleviated by emphasizing the proactive mission of the program relative to emergency response and return of contaminated areas to normal use after an upset condition and that ultradilute levels of CWA are, by design, intended for relatively safe use in conducting trace level chemical analyses.

Physical Security

With few minor changes, the security systems at the FL DEP would meet RDTE dilute solution laboratory requirements. However, there appears to be a need for better administration of the security system. These difficulties can be addressed through finalization of the Physical Security Plan (PSP) and by implementing and enforcing more stringent policies and procedures. Security enhancement recommendations include:

- Fully implementing the current electronic badge system.
- Designating and posting CWA dilute solution storage areas that have the necessary primary and secondary physical barriers.
- Developing a lock and key control system compliant with ECBC guidelines.
- Implementing daily security checks for CWA dilute solution storage areas.
- Assuring laboratory personnel are screened in accordance with the requirements listed in the IAA.
- Enlist the services of a professional security consultant to evaluate overall campus security.
- Establish Memorandum of Understandings (MOUs) with local police and fire departments.

Accountability

Accountability of ultradilute CWA solutions is required under IAA. By definition, the CWA thresholds for maximum concentrations and maximum total amounts allowed on site at any one time dictate the need for a complete and accurate chemical accountability system.

The FL DEP does not currently have a chemical accountability system that tracks chemical standard solutions down to micro-liter quantities. However, the development and implementation of the proposed standard operating protocols may be used to meet the requirements for CWA dilute solutions. The recommendations are to:

- Appoint a Dilute CWA Solution Custodian for management of ultradilute CWA solutions.
- Develop a system for tracking the use, distribution, and location of CWA dilute solutions from receipt to destruction.

- Maintain accurate (micro-liter level quantity) inventories of ultradilute CWA solutions, and assure that the inventories comply within the IAA specifications.
- Assure proper labeling and storage of all dilute CWA solutions and derivative standards, and keep these separated from all other general sample and standard storage areas.
- File the contractually required paperwork for the request and receipt of dilute CWA solutions, as described in the IAA.

Path Forward

The final section of this report provides recommendations for implementing a fully functional CWA laboratory and addresses some of the program management issues that were discussed during the on-site meetings. These recommendations are primarily based on MRI's long history with working with CWA and working within the associated regulatory requirements. This section covers: actions needed prior to receiving and working with CWA solutions, day-to-day health and safety requirements, "dual use" laboratory considerations, potential risks from working with CWA solutions, and precautions in receiving field samples.

Section 1. Introduction

This report presents the initial assessment and recommendations for the Florida Department of Environmental Protection's (FL DEP) laboratory functions in preparation for their participation in the U.S. EPA Ultra-dilute CWA laboratory network program. The objectives were to:

- Evaluate, identify, and report on current operations and physical conditions of the FL DEP laboratory that may impact the receipt and use of ultra-dilute CWA solutions.
- Provide recommendations for design, functional documents, and other changes that may be needed from the gap analysis.

The assessment was based on the documents listed below.

- Army Regulations 50-6 "Chemical Surety" (AR 50-6), Chapter 6, dated June 26, 2001
- Edgewood Chemical Biological Center (ECBC) "Guidelines for Managing a Research Development Testing Evaluation (RDTE) Dilute Solution Laboratory," dated September 2005
- Interagency Agreement (IAA) between the U.S. Environmental Protection Agency (EPA) and the Department of Defense (DoD), signed November 22, 2006, for the use of ultra-dilute chemical weapons agent (CWA) solutions

The initial assessment was performed on January 13 and 14, 2009, by a team from Midwest Research Institute (MRI) consisting of Matthew O'Callaghan, Facility Security Officer, Jeff Smith, Chemical Agent Manager, Christopher Bailey, Chemical Agent Safety and Health Officer, and Dennis Hooton, Manager of the Chem Demil/CA Section of MRI's Chemical Detection Division. During the on-site assessment, a preliminary meeting with FL DEP management and staff was held to discuss the relevant issues and objectives, followed by a tour of the facilities. At the conclusion of the assessment, the MRI team met with the FL DEP management to review and discuss preliminary findings and recommendations. The MRI team also met with laboratory staff and observed and discussed specific activities related to the current CWA extraction method.

This report formally presents the initial assessment of the FL DEP operations relative to maintaining the appropriate security, accountability, and safety functions for the receipt, control, and handling of ultra-dilute CWA solutions. The intent of this report is to present both findings and recommendations to correct any perceived deficiencies or needs identified during the assessment. Specific findings and recommendations are presented in Section 2 by subject or functional area. General recommendations for actions going forward are discussed in Section 3.

Section 2.
Findings and Recommendations

The assessment findings are organized into the following general categories:

1. Laboratory design and infrastructure
2. Documents and plans
3. Technical operations (safety and health, security and accountability)

2.1 Laboratory Design and Infrastructure

Figure 1 presents the current FL DEP plan (laboratory layout) for the proposed CWA facility. This plan incorporates rooms currently used for chemical storage and administrative services (mail room) in order to provide additional space for sample preparation and analysis. MRI toured the exterior of this area and inside room C214 (the proposed Sample Analysis laboratory for the CWA facility).

Figure 1 presents an overview of the proposed FL DEP laboratory complex, followed by descriptions of the four main areas.

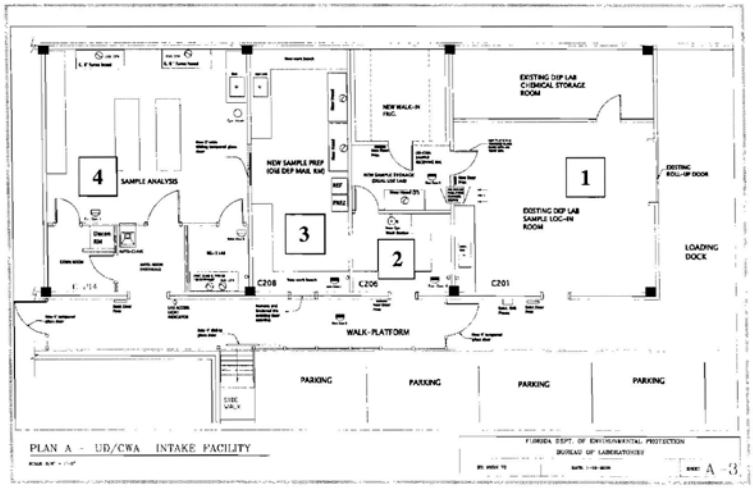

Figure 1. Proposed Laboratory Design for Ultradilute CWA Operations

Based on MRI's understanding of the proposed plan, the designated functional areas would be:

(1) Room C201 (Existing Sample Log-in Room):

This room would continue to exist as a sample receipt area for both routine operations and for entry of samples received from a CWA contamination event. CWA program samples would go through a "pass through" air lock into Room C206

(2) Room C206 (adjacent to C201, currently not used as a laboratory):

This room would have multiple purposes. It would serve as the sample receipt, log-in and storage area for CWA program samples; an adjacent laboratory would serve as a "dual use" laboratory for the analysis of both routine (non-CWA) samples and for CWA samples. CWA performance audit samples submitted under the EPA program would be analyzed in this laboratory. There is physical separation of space within the complex that could allow a "clean" area for preparation of CWA standard solutions away from potentially contaminated samples.

(3) Room C208 (currently used as a mail room):

This room, originally configured as a laboratory, would be the primary sample preparation laboratory after the installation of equipment (e.g., refrigerators, extractors, bench tops, etc.) and engineering controls (i.e., laboratory fume hoods). Samples would be passed through to this laboratory from C206 for preparation (e.g., weighed, extracted) from.

(4) Room C214 (currently configured as a fully functional laboratory):

This laboratory would be designated and used as a "dual use" analytical laboratory, equipped with the necessary instruments and safety functions to allow for CWA functions during a "surge" event (high-throughput of samples after a CWA contamination event) or for possible expansion of the CWA program operations, such as adding new (non-GC/MS) instrumentation or capabilities for Lewisite. CWA solutions would not be introduced into this laboratory until deemed necessary by program management.

The proposed laboratory complex is located at the back of the FL DEP campus, allowing drive up delivery of samples. Security fencing, exterior lighting, and video monitoring equipment to enhance control of this area. Figure 2 presents photographs taken outside the proposed CWA facility.

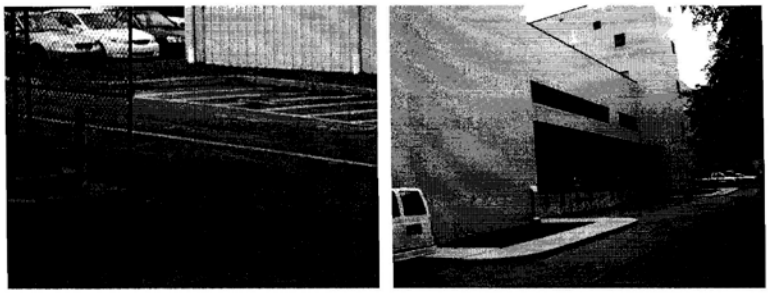

Figure 2. Exterior Photographs of the Proposed CWA Laboratory Complex

Based on MRI's review and inspection of the proposed design and location of the CWA facility, the FL DEP plan provides adequate infrastructure and would be acceptable for placement of the CWA program. Moreover, the proposed design offers several advantages from a security, safety, and analytical operations standpoint over other configurations discussed during the on-site visit. These potential advantages are described in Table 1 below.

Table 1. Advantages of Proposed Ultradilute CWA Laboratory Design

Advantages
• The back entrance location within the FL DEP campus provides isolation from general administrative office functions (assuming the current mail room facility is relocated), which is preferable from a security standpoint (less area to monitor and control).
• Surge samples would enter the complex from the back of the FL DEP campus which has perimeter fencing, offers privacy (screened from public view), and a parking lot that could be used as a staging area (e.g., adding trailers for excess sample storage or decontaminated waste, portable laboratory support, etc.) if needed.
• The linear, continuous laboratory design flow is desirable both from a containment and from an analytical perspective in that potentially contaminated samples enter the facility from one end of the complex, with each successive stage of the process (i.e., sub-sampling operations, sample preparation, sample analysis, etc.) diminishing the amount of sample (and potential CWA) moving forward in the process, and minimizing the risk of cross-contamination of samples or compromising laboratory areas with CWA exposure.
• The laboratory plans eliminate the need to transport samples (sample extracts, CWA standard solutions) outside the CWA complex to other laboratories within the FL DEP campus. The containment of CWA operations is desirable for safety and security reasons.
• There would be a potential reduction of implementation costs through the use of existing facilities and renovation of space that is already plumbed/equipped for laboratory operations (e.g., sealed floors, stand-alone ventilation systems, etc.) with potentially faster startup of operations.
• The entire laboratory complex is maintained on the same engineering ventilation controls, which is compliant with Army guidelines for single pass through design, exhausting laboratory air to outside the building, with backup power and blower in place.
• The plan allows room for expansion within the current design (into room 214C) for a surge condition or the addition of new or additional analytical instrumentation.

2.1.1 Recommended Laboratory Infrastructure Changes

Table 2 presents a summary of findings and recommendations related to infrastructure.

Table 2. Laboratory Infrastructure Findings and Recommendations

Functional area	Findings and Recommendations
Laboratory fume hoods and exhaust system	There are adequate safeguards to prevent backflow of vented air in case of single point failure. The laboratory complex is on a dual blower system for a combined hood exhaust manifold. The dual blower system, should each have the capacity to maintain a minimum of 60%, and preferably 100%, of the required air exhaust rate, which would provide an emergency backup in case one of the blowers fails
Laboratory ventilation system	The existing ventilation system provides fresh air for makeup which is compliant with RDTE guidelines that do not allow recirculation of laboratory air; 100% outside air is required to be provided for exhausted laboratory air. The laboratory has a separate system from other laboratories in the building and has the same supply air. The ventilation system has filter bag in /bag out in place. This is more than required for CWA dilute solution work. Documentation should be available to show that the stack height and exit velocity requirements are adequate to avoid re-entraining the vented air. Control of the laboratory ventilation system needs to be maintained 100% of the time. Inadvertent shutoff during active CWA operations may present a safety and/or contamination hazard within the laboratory. Energy-conserving "low flow" settings should not be used for laboratory fume hoods that will be used for CWA operations. Low flow conditions (i.e., < 80 cfm) do not meet Army guidelines for RDTE dilute CWA operations.

Table 2. Laboratory Infrastructure Findings and Recommendations (Continued)

Functional area	Findings and Recommendations
Air exchange rates within laboratories	For existing laboratories, the makeup air and air conditioning system are constructed to maintain an air exchange rate that optimizes hood performance and minimizes indoor air turbulence. Occupied laboratory spaces should meet a minimum of 10 to 15 changes of fresh air each hour. Laboratory expansion into C206 and C208 should also meet a minimum of 10 to 15 changes of fresh air each hour. Room 214C contained a glove box that recirculated air into the lab room. It is recommended that this device be removed from the laboratory and no ventilation/protection devices be used/installed that recirculates ventilated air. If low humidity is of concern due to static electricity issues, it is suggested that humidification be considered to drive humidity levels upwards of 35% RH or higher.
Establishing and maintaining negative pressure within complex as appropriate	Installation of interlocking systems on exterior / interior doors or pass-through air lock systems are proposed in the design to assure containment of highly contaminated samples, maintain air pressurization between laboratories, and assure background integrity of laboratory operations. After installation of laboratory hardware (e.g., fume hoods, ventilated work stations, doors, etc.), performance checks and baffle adjustments will need to be performed to assure that negative pressure is maintained within the laboratories with respect to the exterior entrances, neutral pressure between laboratories, and slightly negative pressure to sample receipt from the sample preparation laboratory. These checks are critical to laboratory operations for safety and health reasons and for preventing cross-contamination of laboratory environment and instrumentation.
Carbon Adsorption systems for handling ultradilute CWA solutions	The FL DEP hood exhaust system for the proposed complex includes a capture system for organic vapors and potential emissions of CWA. Although carbon filtration is not a requirement for dilute agent operations under ECBC guidelines, the FL DEP management expressed a desire to maintain the carbon adsorption to the laboratory fume hood exhaust system for safety and health reasons. The volatility of CWA is significantly reduced in solution and vapor concentrations are decreased by the large volume of air exchange through the hoods.

Table 2. Laboratory Infrastructure Findings and Recommendations (Continued)

Functional area	Findings and Recommendations
Laboratory fume hood design specifications	Current and future laboratory fume hoods will need to meet ECBC guidelines for safety and security. Interior working space of the hoods will need to accommodate analytical equipment and the anticipated number of samples for surge capability. Some of the existing hoods in C214 have cup sinks and regular sinks inside. These should be plugged or removed so that no contamination is allowed to enter the sanitary sewer system during an upset condition. Laboratory hoods will need to meet basic requirements for laboratory exhaust rates (80 to 120 cfm) and safety functions, including: flow sensors, audio and visual flow alarms, and padlock systems added to secure CWA solutions during unattended operations. Hoods should be equipped with secondary containment devices (e.g., spill trays) in case of accidental spills, non-porous/solvent-resistant work surfaces, and plugged or capped cup sinks. Hoods should be designed and sized to provide adequate work space (depth, width, clearances, etc.) for analytical instruments and for performing operations beyond 20 cm of the hood sash opening. Information on the analytical methods, SOPs, and equipment specifications, as well as the daily sample throughput estimates or targets, will need to be evaluated relative to space needs.
Utility lines and drainage sink.	The emergency shower drain in C214 has a containment feature that allows capture of contaminated water during an emergency event. Water lines should be added for supplementary equipment, such as glassware washers, personal hygiene sinks, and eyewash stations, as needed, for renovated laboratory spaces.
Floor surfaces	The floor surface in 214C was of a non-porous, seamless, and solvent-resistant material as a precautionary measure to help contain spills and facilitate cleanup/decontamination of the floor surfaces. Laboratory floors throughout the complex should be equipped with similar floor surfaces.
Security reinforcement of laboratory walls	The walls of the proposed CWA dilute solution laboratories are constructed of materials that provide adequate protection against surreptitious entry and unauthorized access to dilute CWA solutions. Current construction meets ECBC guidelines.
Doors and hinges	Changes are needed to some of the doors and hinges within the laboratory complex to increase security. ECBC requires doors to be closed and locked at all times when authorized personnel are not present within the storage area or laboratory. During operating hours, unlocked doors should have access controls to preclude entry by unauthorized persons. All other doors are to be locked with an inside locking mechanism that cannot be opened from the outside. Based on ECBC requirements, locking mechanisms and sign postings should be added to all access doors. All doors opening to the exterior of the CWA laboratory should be locked at all times, with the only exception being when there are deliveries of agent or samples. All exterior doorways should have the hinges brazed or welded to ensure that the doors are tamper-proof, if not already so equipped.

2.2 Documents and Plans

Table 3 describes operational documents and plans that should be addressed within the program, separated into management, safety and health, security, accountability, and operational functions. This list of documents is modeled on those used by MRI for RDTE dilute solution operations which are based on ECBC guidelines. It is recommended that the general functionality of these documents be addressed in the FL DEP program operations either as stand-alone documents or combined/appended to existing documents.

The FL DEP, along with several EPA regional offices, is developing a comprehensive safety and health guidance and policy document. This effort should help assure consistency of operations and policies throughout the program.

The list of documents does not include laboratory or method-specific protocols that would be expected to be part of the overall laboratory CWA program, such as:

- CWA standards preparation
- Receipt and screening methods for mixed threat samples
- Sample receipt, inspection and storage
- Sample preparation and analysis methods
- Data validation and reporting
- Electronic deliverables and use of Laboratory Information Management Systems (LIMS)
- Facilities Decertification Plan and associated cost
- Batch- or program-specific quality control procedures and data quality objectives
- Contractual-related requirements under the IAA or delivery order

Table 3. Descriptions of Recommended Functional Documents and Plans

Document name	Description
Management	
1. Facilities Specification Document	A formal Facilities Specification Document that includes design specifications, performance criteria, and records of testing and acceptance that meet ECBC (or EPA) standards.
2. Quality Assurance Program Plan for Dilute Chemical Agent Programs	ECBC guidelines require a formal, 3rd party, QA/QC Program be maintained at the laboratory, such as an ISO certification. The requirements of this section may be met through achieving third-party Quality System Certification and/or Accreditation under a national standard (e.g., ISO 9000:2000, ISO 17025, or ISO 14000). Alternatively, a quality system modeled on one of the above standards is required to cover the following areas at a minimum: document control; purchases; evaluation of subcontractors; control of inspection, measuring and test equipment.
3. Organization and Management of Dilute Chemical Agent Facility	This document presents the authority, standards, and requirements under which the facility operates along with the overall management philosophy, organization, and responsibilities of designated individuals or management positions.
4. Introduction to the Ultradilute Solution Hygiene Plan	This document may be used to introduce an addendum to the general CHP. This introductory document primarily specifies responsibilities of laboratory management and the staff who will be working with ultradilute CWA solutions.
5. Training for the Ultradilute Solution Laboratories	This SOP provides policies and procedures covering safety, security, and laboratory operations. The SOP identifies course content and frequency of training, including proficiency training, "dry runs," hazard awareness, and visitor training.
6. Preparation of Chemical Agent Dilute Solution SOPs and Administrative Practices	This document identifies general requirements for development and implementation of SOPs involving dilute CWA solutions, including required format, content, technical review, administrative approvals, and schedule/rules for review and revision.
7. Records management plan	The records management plan provides information and traceability of all operational records such as calibration and maintenance of equipment and engineering controls, training records, medical records, and waste management. This document identifies personnel responsible for maintaining these records and where the records are filed.
Safety and Health	
8. Design and Operating Requirements for the Ultradilute Solution Laboratories	This document describes the design and operating requirements of laboratories where dilute solutions of agents are used. There are separate sections on laboratory entrance requirements for workers and visitors, daily operational checklists, emergency notification information, facility maintenance, and internal safety audits.
9. Laboratory Ventilation for Ultradilute Solution Laboratories	This SOP covers general requirements for exhaust ventilation systems that are specific to dilute agent laboratories. This document covers maintenance and performance certifications of fume hoods, filtration systems, backup power, glove box requirements, monitoring devices (e.g., photohelic gauges and hood alarms), roof exhaust warning systems, and daily operator checks of airflow and face velocity of fume hoods.
10. Personal Protective Clothing and Equipment (PPE) for Use With Ultradilute Solutions	This document incorporates workplace assessment and hazard analyses, proper use of PPE (e.g., type of glove, wear time, etc.), respiratory protection (including fit-test, training, maintenance, and care of respirators), recordkeeping, and other associated responsibilities.
11. Medical Surveillance Program	This SOP addresses the need for a medical surveillance program to ensure personnel are not placed at a greater risk if they were accidentally exposed to dilute chemical agents. This document describes an ongoing, systematic method for evaluating the health status of personnel who may be at risk of exposure to chemical agents. The scope of this document is intended to be relevant to laboratory staff, maintenance staff, and those with emergency response duties which require entering potentially contaminated areas.

Table 3. Descriptions of Recommended Functional Documents and Plans (Continued)

Document name	Description
12. Hazard Analysis Evaluations	This SOP includes responsibilities and procedures for conducting a hazard analysis, which is required for all operations involving the handling, transport, storage, and disposal of chemical agent and items contaminated with chemical agent.
13. Chemical Events and Response Assistance	This document describes procedures to be performed in the event of an agent spill and/or exposure involving dilute agent solutions, including procedures to address liquid or vapor exposure of personnel, out-of-ventilation control, hood failures, incident reporting, and cleanup procedures.
Security	
14. Procedures for Control of Locks, Keys, and Combinations Designated for Use in the Ultradilute Solution Facilities	This document describes procedures to ensure that locks, keys and combinations required to secure CWA dilute solutions containers and storage areas will be strictly controlled, accounted for at all times, and be accessible only to individuals whose duties require access.
15. Physical Security Plan (PSP) for the Ultradilute Solution Laboratories	The PSP discusses the standards and practices used to ensure that dilute CWA solutions are safeguarded from inadvertent access, theft, and diversion or removal from the facility. This is a required document under ECBC guidelines. This document should be amended to include any approved exceptions for ultra-dilute CWA solution laboratories.
Accountability	
16. Accountability Procedures for Ultradilute CWA Solutions	This document describes procedures that will be used to track the preparation, use, and disposal of RDTE Dilute solutions of chemical agent. This document also describes the concepts of primary standard, non-primary standards, working standards, and also inventory, audit and reporting processes. This is a required component under ECBC and IAA guidelines.
17. Procedures for Release of Ultra-dilute Solutions	This document describes procedures to use for release of samples, sample extracts, or dilute standard solutions within the same physical building. This document is relevant to transfers between laboratories (e.g., sample receipt to sample preparation; sample preparation to sample analysis, sample analysis to archive storage, etc.)
18. Storage Requirements and Hazard Communication	This SOP addresses storage requirements, transfers using double or triple (for public access areas) containment, labeling of containers, hazard communication (e.g., warning signs, material data safety sheets), and recognition of exposure symptoms for both nerve agents and blister agents. This document should also cover storage temperature conditions, temperature monitoring procedures, and storage checks (e.g., marking or weighing the content level on storage vial, evidence tape, etc.)
Operations	
19. Chemical Agent General Operating Procedures	This document describes general operating procedures that will be used for ultradilute operations, such as: safety/chemical agent requirements, hazard analysis, laboratory access requirements, preoperational checklist, security requirements for agents, transfer into and out of RDTE Dilute hoods, decontamination and waste handling procedures and glassware handling procedures. This is a general document that covers the basics of laboratory operations in a dilute CWA solution laboratory environment. More specific SOPs will sometimes reference sections of this document instead of repeating the same basic operational procedure.
20. Procedures for Manual or Automated Extraction or Cleanup Procedures that may result in Elevated Concentrations of CWA	Trace and ultra-trace analysis of samples for chemical agent often require special handling procedures for the cleanup, extraction, or concentration of sample extracts. Volume reductions of extract solutions have the potential to increase CWA concentrations above dilute and/or ultradilute limits. SOPs are needed to ensure that the volume and concentration of final solutions are at or below regulated levels.

Table 3. Descriptions of Recommended Functional Documents and Plans (Continued)

Document name	Description
21. Preparation of Standards and Spiking Solutions from Ultradilute Solutions (program-specific protocol)	The purpose of this SOP is to describe the preparation of dilute CWA solution standards and spiking solutions. Specific instructions are provided for solution transfer techniques such as pipetting, pouring, and diluting liquids. This topic may or may not be covered in the analytical method, but specific steps in the dilution process should be assessed for safety hazards and subject to dry run / proficiency training by staff using the method.
22. Extraction and Analysis of Chemical Agents from Environmental Samples (program-specific protocol)	Program specific SOPs for each extraction and analysis procedure should be developed. Each SOP should include specific safety requirements, a hazard analysis determination, a pre-operational checklist, QA/QC requirements, and descriptions of workspace preparation, cleanup, and decontamination. Each staff member performing the SOP must perform a "dry-run" performance demonstration that is witnessed by safety and management representatives..

2.3 Technical Operations

This section is divided into three main components of the ECBC Guidelines document: safety and health, security, and accountability.

2.3.1 Safety and Health

Table 4 presents a summary of findings and recommendations related to safety and health program areas. In addition, Appendix A provides an example checklist for internal inspection and certification of a CWA dilute solution laboratory.

Table 4. Safety and Health Program Findings and Recommendations

Functional area	Findings and Recommendations
Chemical hygiene plan (CHP)	The FL DEP is collectively addressing policies and procedures for the CWA program with EPA regional offices. This document is currently in draft form and under review. An addendum to the current Chemical Hygiene Plan should include the following provisions: • Is compliant with 29 *CFR* 1910.1450 • Is updated annually • Documents training and comprehension by staff • Incorporates a Safety Program Plan for all personnel involved in laboratory operations • Identifies the Chemical Hygiene Officer (CHO) by name and organizational function • Includes detailed policies for storage, handling and movement of RDTE dilute solutions within the facility • Identifies a process for establishing SOPs • Includes or references procedures for Accounting for RDTE solutions • Includes or references procedures for performing a Hazard Analysis of technical operations • Establishes criteria for describing the Hazard Assessment process for SOPs • Operates an Employee Hazard Communication Program upon initial assignment, introduction of new hazard, and operating within Army Regulations for maximum CWA quantity and concentration limits • Specifies the maximum analyte concentrations that can be safely handled • Specifies engineering controls, administrative controls, and PPE requirements • Identifies personnel responsibilities • Describes procedures to mitigate exposure in case of an accident or system failure • Includes provision for appropriate approvals, authorization, implementation, and on-going review of the program.
Chemical hygiene safety officer (CHO)	The FL DEP has an assigned Chemical Hygiene/Safety Officer who oversees waste management and safety-related operations. The CHO responsibilities section should be amended to designate additional duties for the Chemical Hygiene Officer relative to dilute CWA solution operations, including: • Development of safety policies and practices • Ensuring compliance inspections are performed • Ensuring records are maintained, up-to-date, complete, and accessible for inspection • Providing technical assistance to laboratory supervisors with safety matters • Reviewing and updating the CHP annually • Providing technical guidance for implementation of the CHP provisions • Determining the level and types of required PPE • Formally designating (in writing) a CWA Dilute Solution Custodian and authorized personnel • Communicating with Chemical Agent Accountable Officers • Enforcing safety policies established by FL DEP management • Monitoring storage of all unprocessed sample materials

Table 4. Safety and Health Program Findings and Recommendations (Continued)

Functional area	Findings and Recommendations
	• Monitoring disposition of extracts, excess sample materials, vials, and unused duplicate samples • Monitoring waste management program relative to CWA laboratory operations
PPE Respiratory Program	The FL DEP has a respirator usage program. Program management (e.g., the CHO) should continue to oversee all Personnel Protective Equipment (PPE) components of the safety and health program involving dilute CWA solutions, in order to ensure that there is adequate number of respirators and respirator protection in case of ventilation failures or accidental release of CWA solutions, protective clothing (as specified in SOPs), and eye/face protection (29 *CFR* 1910.133).
Hazard awareness training	Currently, there is no training specific to dilute CWA solution operations. Qualifications should be established for personnel conducting training of staff and visitors. It is recommended that this training be based on CWA Dilute Solution operations and incorporate the following ECBC guidelines: • Training is conducted by authorized personnel to all staff, prior to assignment to CWA Dilute Solution Operations • Training covers (at a minimum) the topics of: effects of chemical agents used in RDTE dilute and ultradilute solutions, potential routes of exposure, symptoms of agent toxicity, purpose of medical surveillance, use of engineering control and procedural controls, proper use of PPE, proper use of respiratory protection, use of decontaminants, emergency procedures, specific operational SOPs, and procedures for CWA accountability • Refresher training courses are conducted at least annually Written records of safety training (who, what, when) and evidence of competency should be maintained for a minimum duration of the employees employment, plus 3 years.
Waste management	Currently, the CHO oversees laboratory waste management practices. It is recommended that a functional SOP be written to include specific procedures for the handling and disposal of all waste related to ultra-dilute CWA solutions and associated samples, including expendable supplies, and use of decontamination solutions. Decontamination procedures should be appropriate for RDTE dilute solutions, and equally applied to decontamination of ultradilute CWA solutions.
Medical services	The FL DEP indicated that medical monitoring will include red blood cell cholinesterase testing of laboratory personnel. Medical services should also include written procedures or policy statements for the following areas: • Identification and preparedness of local emergency medical facilities • Awareness of emergency medical facility of the classes of compounds that pose exposure risks • Employee training in first aid / CPR • Identification and participation of a consulting physician • First aid supplies (approved by consulting physician) Medical surveillance for personnel with potential exposure to CWA dilute solutions (specific for both nerve agents and mustard agents) should include post-offer/pre-placement evaluations, periodic, and termination evaluations
Communication and duress system	An emergency response system for CWA was not indicated at this time. Provisions should be made to allow for rapid means of communication, and an electronic duress system between laboratory personnel, safety and security personnel in case of emergency.

Table 4. Safety and Health Program Findings and Recommendations (Continued)

Functional area	Findings and Recommendations
Two-person rule	The two-person rule applies to the use of RDTE dilute solutions according to requirements in AR 50-6, and is recommended for the CWA ultradilute operations. The "two-person rule" is a system designed to prohibit access by an individual to chemical agent by requiring the presence at all times of at least two authorized personnel, each capable of performing first aid in case of exposure to chemical agent or detecting incorrect or unauthorized procedures with respect to the task being performed. Each person must be familiar with applicable safety and security requirements. This provision should be addressed in the PSP or CHP as appropriate. MRI uses a system in which laboratory personnel are required to be within audible distance of a coworker so that assistance is available in an emergency situation. A similar system is recommended for the FL DEP operations.
General safety practices	During the on-site assessment, MRI staff met with laboratory personnel and observed them performing several of the sample extraction steps for methods anticipated under the program. Our general recommendation is to train staff on proper use of engineering controls, PPE, hazards, and evacuation procedures. The implementation of dry runs and hazard analysis as part of the method development process should also help to identify and correct any unsafe conditions or practices. For example, dry runs can be used to assure that personnel are working beyond 20 cm of the hood sash opening and specific extraction steps do not pose any undue risk (e.g., breakage of vials within a centrifuge). Written protocols should be developed and implemented through formal training and posted signs. Records of internal inspections, assuring compliance, should also be maintained by the CHO, covering the following areas: • Maintaining good laboratory housekeeping practices • Communicating chemical hazards to emergency personnel (first responders, firefighters, security guards, medical, etc.), such as providing copies of the MSDS and laboratory location of CWA dilute solutions • Ensuring that only mechanical pipetting aids are used for transfers and dilutes of CWA dilute solutions • Prohibiting food, drinks, and use of personal hygiene products within the CWA solution use or storage areas • Ensuring that a health provider is available for immediate call when RDTE solution laboratory operations are in progress • Verifying that emergency egress areas from the CWA facilities are properly labeled and free of obstructions • Assuring that any ultradilute CWA solution suspected or real exposure, spill or release, or other abnormal situation is immediately reported by staff to supervisory and medical personnel • Restricting clerical/administrative functions to areas other than RDTE dilute solution laboratories • Implementing a chemical incident response procedure to assure proper decontamination and notification • Assuring that competent safety, occupational health, and industrial hygiene services are available to staff • Verifying that all CWA dilute solutions are stored at depressed temperature, based on the solvent used • Providing the most recent copies of MSDS to laboratory workers and within the laboratory
Use of Mark I antidote kits	FL DEP asked about the liability with the Mark I antidote kit – when & who decides administration of the antidote. MRI suggests that there may be greater liability if the FL DEP did not have the antidote on site. However, this issue should be formally addressed as a general program policy.
Eye-wash & safety Shower checks	There are inconsistencies within the laboratory complex on frequency of checks for this first-line decontamination equipment. Some areas are following ANSI guidelines and others are

Table 4. Safety and Health Program Findings and Recommendations (Continued)

Functional area	Findings and Recommendations
	not. It is suggested that ANSI guidelines be used to perform checks weekly and inspections annually.
Hood certification/rating.	When hoods are rated/certified for use the plane of the hood opening is measured using an imaginary grid and taking linear air flow readings in the center of each grid square. This is the only measurement required by Army direction that is being followed. The hoods are not measured for cross draft velocity or smoke tested for visual containment of contaminant. Recommend hoods using Ultra dilute solution be rated for linear air flow, cross drafts, and smoke tested. An alternative would to be rate hoods using ANSI 110.
Spill response	Plans are to use EPA's Field Remediation Group in the event of a chemical upset outside ventilation controls in the Ultra-dilute laboratory complex. These personnel have respirators assigned and fit tested. MRI suggests a respirator, similar to the SCape CBRN[30], be available in the laboratory complex as an emergency escape respirator in the case of an upset event. A respirator similar to the SCape CBRN[30] would not need to be fit tested for each individual.

2.3.2 Security

Security at the laboratory appears to be high priority of the management and personnel undertaking the efforts to support the ultradilute solutions laboratory. Table 5 summarizes the findings and recommendations for security enhancements of the CWA complex.

Currently there are a number of facility wide improvements that should be addressed not as means to meet the ultradilute solutions regulations, but to meet minimum industry standards for building and campus Security. At the end of this section, several general recommendations are presented.

In addition, Appendix B provides an example template for a Memorandum of Understanding (MOU) with the local police department and Appendix C provides topics generally covered in a Physical Security Plan (PSP) which is currently being developed by the FL DEP.

Table 5. Security Program Findings and Recommendations

Function area	Findings and Recommendations
Physical Security Plan (PSP)	A PSP is being developed at this time. Physical security standards and criteria for the protection of CWA dilute solutions must be described in the PSP and the specific actions to be taken to implement security provisions. The FL DEP should develop and implement this internal document, created by their Security Officer and management, with input from other key departments (e.g., Laboratory Operations, Safety, and Maintenance). Suggestions as far as other recommended but not required documents: o Operational Security Plan o Annual Local Threat Documents o MOUs with local fire and police departments
Physical security barriers	The walls of the proposed labs are constructed of consistent construction methods, and meet or exceed any construction requirements for the storage of Dilute Solutions. All walls should be extended to reach the roof decking and be a true "slab to slab" type construction. Physical security requirements need to address unauthorized access to CWA dilute solutions through incorporation of at least two physical barriers. For example, the first barrier can be a locked storage container (i.e., refrigerator) or personnel having physical custody of the CWA dilute solutions; the second barrier would be the limited or restricted locked laboratory. At the current time, the necessary physical security elements are not generally in place, but can easily be added. It is recommended that the physical security system be enhanced by using multiple layers of security measures. Starting with the use of S&G 3-position combination locks on storage cabinets/ refrigerators, and the use of UNICAN / Electronic Push Button locks on entry doors into the CWA laboratories. These changes in conjunction with the current badge access system will help ensure the security of the CWA materials and samples. All the exterior and hallway doorways should have the hinges brazed or welded to ensure tamper proof construction.
CWA Dilute Solutions Storage	Currently, there are no designated CWA dilute solution storage areas. When these areas are designated and in use, all CWA dilute solutions should be stored within a locked security container (normally a refrigerator) which, in turn, is stored in a locked hood, chemical storage room, or laboratory. The storage room or laboratory is to be identified that access is limited, with an "AUTHORIZED PERSONNEL ONLY" sign. These requirements should be addressed in the appropriate SOP, implemented through training by the Security Officer, and documented through records of training and compliance inspections.
Security Checks	When the FL DEP is operational, authorized personnel will need to check the CWA dilute solutions storage room and container at least once each work day, normally at the close of the business day, to ensure that the CWA dilute solutions are secure and the room is locked. An end of day security check of the storage container is also required to be conducted by authorized personnel. The authorized personnel must be designated in writing and records should be maintained a minimum of 30 days. These requirements should be addressed in the appropriate SOP, implemented through training by the Security Officer, and documented through records of training and compliance inspections.
Inquiries	Under ECBC guidelines, FL DEP would be required to immediately notify the Contracting Officer of any inquiries, which originate outside of Government/Contractor/ Subcontractor/Client Channels concerning the use of RDTE dilute solutions. A similar policy should be considered for this program and addressed by the FL DEP management for reporting suspicious incidents. The assessment team and FL DEP management discussed the need for discretion and control of information about CWA operations given the proximity to urban areas.
Key and Lock	A key and lock control system, including an issue and turn-in procedure, should be

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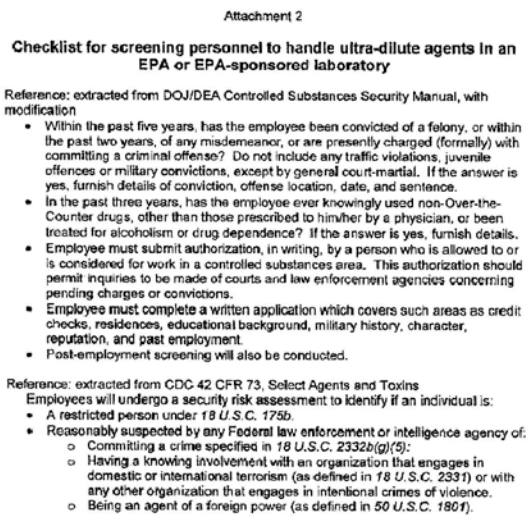
Table 5. Security Program Findings and Recommendations (Continued)

Function area	Findings and Recommendations
Control System	established. Access to keys/combinations for locks are held to an absolute minimum and records are to be kept of all personnel possessing keys and/or combinations. When combinations and codes are used in lieu of keys, similar control procedures are to be developed to assure the integrity of the combinations and codes. Much like the PSP, the Key and Lock program is an internal document that will need to be created by Security. For the key and lock system, it would a good practice to not use keys but rather combination locks as the method to secure rooms and storage containers. With the use of keys there is always the possibility of losing those keys, which administratively can be very cumbersome and costly. If there is a compromise of a combination or any other reason that access must be changed, combination locks are a simple and low cost solution.
Entry Control	Access to the CWA dilute solutions storage room or laboratory should be limited to individuals authorized to access to CWA storage areas and laboratories. An electronic badge reading system is installed throughout some areas of the complex. During operations the AUTHORIZED PERSONNEL ONLY sign and a CAUTION sign with the hazard indicated should be posted at the entrance to the laboratory. A list of personnel to be notified in the event of an emergency as well as emergency phone numbers should also be posted at the entrance to the room at all times. Authorized personnel should escort all visitors to the storage room or laboratory at all times. A security awareness program is recommended prior to receiving CWA dilute solutions and compliance monitored through internal audits. FL DEP management should be notified of any violations to security policies. Corrective actions should be taken and documented in these cases. After-hours or emergency entries should be covered in the Physical Security Plan. Other after-hours entry must be appropriately authorized and the facts/circumstances documented in each case. All doors opening to the exterior of the ultradilute CWA labs should be locked at all times, with the only exception being when there are deliveries of agent or samples. In order to have a true dual layer security, the use of the current badge access systems in conjunction with another method of authentication would be the means to ensure the security of the ultradilute solutions. MRI encourages the use of both badge readers and UNICAN/Electronic Push Button locks on hall way doors into the ultradilute Solution labs thus creating using multiple layers of security measures and eliminating a single point of failure. This type of system will easily meet the requirement of dual layer security.
Protection of classified or sensitive documents	There may be a potential for the FL DEP to handle various restricted levels of documentation, such as For Official Use Only (FOUO), Secret, or other sensitive documents. A document control SOP, with appropriate levels of security, should be developed for the protection of sensitive documents based on project or legal requirements. These procedures may be incorporated into the records management plan.
Security lighting	Security lighting could not be adequately assessed during daytime hours. Security lighting should be provided for all exterior doors, other potential intrusion areas, and entrance doors of rooms or laboratories that contain chemical agents.

Table 5. Security Program Findings and Recommendations (Continued)

Function area	Findings and Recommendations
Intrusion detection system (IDS)	Electronic-based IDS systems are not required under ECBC guidelines. It is recommended that intrusion prevention should be covered in the PSP through lock and key/access systems rather than electronic controls. MRI recommends against the use of IDS (Intrusion Detection System) because there is no requirement for this and the administrative overhead would be overwhelming and would outweigh the benefits.
Reporting security incidents	The PSP should include procedures and directives for immediately reporting all losses (suspected or actual), recovery of chemical agents, attempt to steal chemical agents, or damage a CA storage facility to law enforcement authorities and the Contracting Officer.
Screening of personnel that will be working with ultradilute CWA solutions	The IAA directs the laboratory to conduct screening of personnel in accordance with DOJ/DEA Controlled Substances Security Manual. Compliance to the screening protocols listed in the Attachment 2 of the IAA (see Figure 3) is required. The records management plan should designate who performs and maintains the screening records and where confidential records are filed.



Attachment 2

Checklist for screening personnel to handle ultra-dilute agents in an EPA or EPA-sponsored laboratory

Reference: extracted from DOJ/DEA Controlled Substances Security Manual, with modification

- Within the past five years, has the employee been convicted of a felony, or within the past two years, of any misdemeanor, or are presently charged (formally) with committing a criminal offense? Do not include any traffic violations, juvenile offences or military convictions, except by general court-martial. If the answer is yes, furnish details of conviction, offense location, date, and sentence.
- In the past three years, has the employee ever knowingly used non-Over-the-Counter drugs, other than those prescribed to him/her by a physician, or been treated for alcoholism or drug dependence? If the answer is yes, furnish details.
- Employee must submit authorization, in writing, by a person who is allowed to or is considered for work in a controlled substances area. This authorization should permit inquiries to be made of courts and law enforcement agencies concerning pending charges or convictions.
- Employee must complete a written application which covers such areas as credit checks, residences, educational background, military history, character, reputation, and past employment.
- Post-employment screening will also be conducted.

Reference: extracted from CDC 42 CFR 73, Select Agents and Toxins

Employees will undergo a security risk assessment to identify if an individual is:

- A restricted person under *18 U.S.C. 175b*.
- Reasonably suspected by any Federal law enforcement or intelligence agency of:
  - Committing a crime specified in *18 U.S.C. 2332b(g)(5)*;
  - Having a knowing involvement with an organization that engages in domestic or international terrorism (as defined in *18 U.S.C. 2331*) or with any other organization that engages in intentional crimes of violence.
  - Being an agent of a foreign power (as defined in *50 U.S.C. 1801*).

Figure 3. IAA Required Employee Screening Protocols

The following list of general security enhancements is based on observations of the facility made during the on-site inspection. These suggestions are intended to help the FL DEP improve the overall security posture of the facility:

- Replace, repair or reinstall the perimeter gating and fencing that has been either removed or damaged. By doing this the facility will have a better perimeter control during nonworking hours, since there is no on-site security during non-working hours.
- Upgrade the padlocks currently used to secure all of the gates on the perimeter of the facility. The use of a high security padlocks with a proprietary keyway would be a vast improvement to the low security padlocks currently in use.
- Repair or upgrade the camera equipment currently in place, not only as means of crime prevention, but also as a means of evidence collection.
- Improve the lock up procedures and overall building door security especially in the lower and ground floor doors and windows.
- Review the badge access system needs to improve maintenance and oversight, including the elimination of:
  - Badge readers or strikes not working or that have been disabled
  - Badges not being programmed correctly
- Re-evaluate the current guest policy to assure correct use and uniform enforcement.

2.3.3 Accountability

Accountability of CWA dilute solutions is one of the main components of the ECBC guidelines and IAA requirements. This section includes information regarding general ECBC requirements, definitions of RDTE dilute solution and ultradilute solutions in terms of concentration and amount thresholds.

The FL DEP is working to develop procedures for accountability as part of this assessment effort. The general recommendation is to use the SOPs and operational plans, identified in Section 2.2, to develop appropriate procedures and to implement training and internal monitoring programs.

Table 6 presents the recommendations for meeting ECBC guidelines in this area.

Table 6. Recommendations for Accountability Functions

Functional area	Guidelines and Recommendations
Appointment of a RDTE Dilute Solution Custodian	The Chemical Hygiene Officer should appoint a CWA Solution Custodian and additional personnel who are authorized to request and receive CWA dilute solutions. Names and positions of appointed individuals should be submitted to regulatory authorities as required under the program annually or when updated.
Tracking of CWA dilute solutions	CWA Dilute Solutions Custodians should develop a process to ensure that all quantities of ultradilute CWA solutions are maintained under a formal system of records that provides for accountability at a vial level. The records system consists of formal accountability records and supporting custodial records that provide an audit trail from CWA Solution receipt, use, transfer, and destruction.

Table 6. Recommendations for Accountability Functions (Continued)

Functional area	Guidelines and Recommendations
	Official laboratory notebooks may be used as accountability records relative to documenting concentration, quantity, location, and use after the chemical agent is issued to the investigator, user or analyst. The level of accountability requires that micro-liter aliquots removed from CWA dilute solution vials are measured and tracked. It is recommended that analytical SOPs include the equipment used to transfer these aliquots (e.g., "... a 100-µL syringe was used to transfer 80 µL of solution into....") so that tolerances may be established that would account for incidental loss of solution.
Labeling of CWA dilute solutions and secondary dilutions	CWA dilute solution containers must be clearly labeled to show its identity, the type of CWA solution, the quantity of material (total volume or mass of solution), and its concentration. It is recommended that the labeling procedure be applied to both the original CWA dilute solution vial and all secondary dilutions from the stock standard. It is also recommended that the container label include a unique tracking code (traceable back to the preparation notebook), initials of the preparer, and date the solution was prepared. Whenever possible, It is also good practice to mark the meniscus of the solution in the vial to help identify losses due to loose seals, solvent evaporation, etc.
Inventory and audits of CWA stock solutions	The custodians should prepare CWA consumption reports as needed (e.g., on a quarterly basis) as a check of inventory and control. Line item blind physical inventories should be witnessed and conducted on a defined frequency (e.g., semiannually) and measured in the smallest practicable unit of mass or volume. It is recommended that relevant SOPs include copies or examples of the required forms and that a formal schedule be maintained for complying with the suggested or required reporting requirements.
Compliance with regulated CWA dilute solution concentrations and total amounts.	Total CWA dilute solutions concentrations and amounts are to be maintained at or below those limits listed in the IAA. See Figure 4.
Monitoring of CWA Dilute Solutions Operations	ECBC guidelines require that, if a RDTE dilute solution is released (spilled, etc.) outside of engineering controls, a mathematical determination of potential exposure should be performed within 2 hours to see if Worker Protection Limit (WPL) could have been exceeded. If the WPL is exceeded, the incident must be reported to the COR within 4 hours of the incident. Records of incidents and exposure determinations and calculations must be maintained. It is recommended that similar monitoring and assessment procedures be addressed in the appropriate Safety and Health related SOP (e.g., Chemical Events and Response Assistance or the CHP for Dilute Chemical Agent Programs) as determined by program policies.
Shipping Reports and Storage of CWA Dilute Solutions	Prior to opening a CWA dilute solution vial, the vial should be removed from cold storage and allowed to equilibrate to room temperature before it is opened to minimize contamination from condensation of atmospheric moisture, which would hasten agent degradation. The time of all operations with CWA dilute solutions outside of cold storage should be kept to a minimum. Vials of CWA dilute solution are intended for one time usage. It is recommended that Certificates-of-Analysis and expiration dates be maintained for all CWA dilute solutions and that temperature records for all FL DEP solution and sample storage areas be maintained and monitored. If possible, an analytical system should be established to monitor for degradation of chemical agents in solution, such as analysis verification against a second-source standard, setting minimum response criteria versus an internal standard, etc.
Facilities Decertification Plan (upon decommissioning of the	A plan for the dismantling, testing, handling, and disposal of decontaminated CWA dilute solutions and facilities should be developed.

Table 6. Recommendations for Accountability Functions (Continued)

Functional area	Guidelines and Recommendations
laboratory)	The plan should include reporting on the status of decontamination of laboratory surfaces and equipment that have been exposed to CWA dilute solutions and include: appropriate decontamination reagents used, removal/proper disposal of filters, certification of completion, and CWA monitoring results following decontamination. Provisions for developing this plan may be included in general terms within one of the facility plans or SOPs as appropriate.

Figure 4 presents a summary of the maximum allowable concentrations and total masses for RDTE dilute solutions, ultra-dilute CWA solutions, and the Army's drinking water standards, as listed in Attachment 1 of the IAA. These concentration and chemical mass thresholds form the basis of the accountability SOPs. t should be noted that the RDTE dilute solution concentrations may be generally interpreted as a range of concentrations extending from the upper threshold down to the ultra-dilute concentration limit. Similarly, the ultradilute CWA solution ranges from the upper threshold to the Army drinking water standard.

Attachment 1

Proposed Agent Concentrations and total mass at EPA labs:

Agent	Proposed Agent Conc	Total mass at the lab
Sarin (GB)	10mg/L	100ug total (in 10, 1ml vials)
Soman (GD)	10mg/L	100ug total (in 10, 1ml vials)
Cyclohexyl Sarin (GF)	10mg/L	100ug total (in 10, 1ml vials)
VX	10mg/L	100ug total (in 10, 1ml vials)
Sulfur Mustard (HD)	10mg/L	100ug total (in 10, 1ml vials)
Lewisite (L)	10mg/L	100ug total (in 10, 1ml vials)

Surety Thresholds from AR 50-6:

Agent	AR 50-6 RDT&E Conc	AR 50-6 RDT&E Mass
Sarin (GB)	2 mg/mL = 2 g/L	20 mg = 20,000 ug
Soman (GD)	2 mg/mL = 2 g/L	20 mg = 20,000 ug
Cyclohexyl Sarin (GF)	2 mg/mL = 2 g/L	20 mg = 20,000 ug
VX	1 mg/mL = 1 g/L	10 mg = 10,000 ug
Sulfur Mustard (HD)	10 mg/mL = 10 g/L	100 mg = 100,000 ug
Lewisite (L)	5 mg/mL = 5 g/L	50 mg = 50,000 ug

Drinking Water Standards from CHPPM TB MED 577, dated December 05

Agent	5L/day CHPPM DWS Conc	5L/day CHPPM DWS Daily Mass Allowance
Sarin (GB)	12 ug/L	60 ug
Soman (GD)	12 ug/L	60 ug
Cyclohexyl Sarin (GF)	12 ug/L	60 ug
VX	12 ug/L	60 ug
Sulfur Mustard (HD)	140 ug/L	700 ug
Lewisite (L)	80 ug/L	400 ug

Figure 4. IAA Summary (Attachment 1) of Proposed Agent Concentrations and Total Mass Limits for RDTE Dilute and Ultra-Dilute CWA Solutions

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Section 3.
Discussion and Path Forward

The status of the FL DEP relative to ultradilute operations is in the planning phase of development but the infrastructure, operational documents, and analytical methods should provide the basis for achieving status as a fully functional CWA dilute solution laboratory.

Table 7 presents some general guidance for completing the implementation of the CWA program and recommendations on some program management issues that were discussed during the on-site visit.

Table 7. General Recommendations for Implementation of the Ultradilute CWA Laboratory

Implementation Phase or Situation	Recommended actions
What is needed prior to receiving CA standards?	1. Physical security barriers and procedures in place 2. Agent accountability procedures in place 3. Safety and health procedures in place 4. Engineering and containment systems in place and verified 5. Staff training on all the above 6. Evidence of management approval and staff compliance
What is needed prior to working with CA standard solutions?	1. General operating procedures established 2. Technical procedures (SOPs) developed and approved 3. Staff training and practice completed on technical procedures 4. Hazard analysis and dry runs completed 5. Evidence of management approval and staff compliance
Once CWA solutions are introduced to a CWA laboratory, what are the day-to-day health & safety requirements?	1. CWA solutions appropriately contained and secured under lock and key system. 2. All staff working in the laboratory (even if not working with CWA compounds) have competed the basic CWA dilute solution safety training 3. Medical monitoring if indicated by the hazard analysis 4. Administrative controls (log books, posted signs) designate areas or instruments that were previously used for CWA analyses. 5. Administrate controls to identify instruments and areas that are prohibited from use for ultradilute CWA work (i.e., no possibility of contamination).
What safety & health requirements are needed for using the same GC instrument for both CWA and non-CWA analyses?	1. Prior to using CWA, there are no special restrictions. 2. GC emitting systems vented to hood (e.g., detector) 3. Sealed systems for all solutions (e.g., sealed vials for samples and solutions, outflow of syringe rinses, etc.) 4. Once CWA ultra-dilute solutions are introduced to the instrument, appropriate PPE must be used for any maintenance or manipulation of the chemical path. The chemical path would include all of the following: • injector assembly • septum • pump oil • injection syringes • auto sampler vials • vial racks • columns • detector assembly • syringe rinse tubing and collection containers 5. Removal of potentially contaminated equipment should be placed in a plastic bag and moved to a RDTE-rated hood. 6. Release of potentially contaminated equipment for general use (i.e.,

Table 7. General Recommendations for Implementation of the Ultradilute CWA Laboratory (Continued)

	decommissioning) requires decontamination and/or monitoring of the above components to assure that it is below GPL.
How can non-CWA routine analyses be conducted on the same instrument and in the same laboratory when CWA ultra-dilute solutions are not currently in use?	1. The laboratory should be treated as potentially contaminated once CWA has been introduced, unless the entire laboratory (including exhaust vents) is decommissioned. 2. Instruments that have been administratively segregated from ultra-dilute CWA work may be used with normal PPE; instruments that were previously used for ultradilute CWA should be treated as potentially contaminated relative to maintenance or operation. 3. Non-CWA samples can be run on the same instrument as long as training is safety and health protocols are followed and appropriate PPE is used as if there were trace CWA present.
What are the potential risks involved with ultradilute CWA solutions?	With appropriate administrative controls, the hazards associated with ultradilute CWA solutions have been diminished by the specified concentration and total mass thresholds. For example, if procedures limit the use of ultradilute CWA solutions to a single vial at any one time, the most toxic chemical agent (VX) would be ~ 30 times below the IDLH concentration and ~ 10 times above the STEL concentration for an unmasked person using a 15-min TWA, assuming complete and instantaneous volatilization outside of engineering controls. All other CAs identified in the IAA would be at or below STEL concentrations under this "worst-case" scenario. Based on our experience, the most significant hazards would be related to: • Potential contamination from spills or splashes when initially transferring or removing an aliquot of the CWA ultra-dilute stock solution in its most concentrated form • Accidents or omissions caused by human factors (e.g., inadequate preparation, inattention to detail, physical impairment, etc.) • Hazards associated with non-CWA chemicals and reagents (e.g., organic solvents, decontaminant reagents, etc.) • Unsafe laboratory environments due to clutter, obstructions, electrical or fire hazards • Failure, shutdown, or compromise of engineering controls during critical operations (requiring evacuation of laboratory and corrective action)
What are the risks associated with environmental samples?	There is a potential that environmental or investigative samples may exceed the thresholds identified for ultradilute CWA solutions. However, there are a number of ways in which the safety can be assured when working with unknown samples, specifically: • Field screening of samples and validation of data • Limiting the size or amount of sample logged into the laboratory • Diluting the sample to assure that CWA concentrations would be at or below ultra-dilute CWA thresholds based on the detection limit capability of the screening method, then analyzing the sample at progressively lower dilution factors (i.e., increased concentration) until reporting limit objectives have been met • Secondary screening of incoming samples using an air monitor instrument

Attachment A

Example Checklist for Certification of Dilute CWA Laboratory

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XDS Lab Certification

Activity or Item	Lab
Lab Exterior	
Door hinges concealed by door structure or tamper-protected	Facilities
XDS security shutdown log (shows container checked at end of day)	Lab staff
XDS entry log visitors	Lab staff
Entry requirements and warning signs Active lab "Caution" & "Authorized Personnel Only" Non-active lab "Authorized Personnel Only"	Safety
Sign for Panic Button Light (action to take when lit)	Safety
pressure differential indicator be on the exterior of the lab (magnehelic gauge)	Facilities
Hood	
20 cm (8 inch) line placed in hood	Lab staff
Spill tray in hood and behind 20 cm line	Facilities
Hanging vanemeter present	Lab staff
Hood hasps	Facilities
Safety Equipment	
Personal Decon Solutions in immediate vicinity of operations & decon area	Lab Staff
Agent Decon Solutions in immediate vicinity of operations & decon area in sufficient amounts to decon entire stock of XDS.	Lab Staff
Shower installed within lab, tested & recorded	Partially blocked by desk & recycle bin
Path to emergency equipment clear	Blinds on floor
Protective Clothing (Lab coats)	Lab Staff
Eye/Face protection	Lab Staff
Signs	
Exit marked	Safety
Emergency exit marked	Safety
Hood sign "not approved for XDS operations"	Safety
Daily operations check list	Safety
Emergency #'s posted (1111, safety pager)	Lab staff need to post CAM & supervisor's contact numbers
Documentation	
MSDS in lab complex	lab staff
SOPs readily available	lab staff
Other	
Locks available (FF-P-110)	Lab staff and security
Accountability use & final disposition recorded in lab notebooks	Lab staff
Hood XDS activity log	Safety

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Attachment B

Example Memorandum of Understanding between Laboratory and Local Police Department

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Attachment B
Example Memorandum of Understanding between Laboratory and Local Police Department

Memorandum of Understanding

Between XXXXXXXXX XXXXXXXXX
and
Police Department Metro Patrol Division

The following procedures have been agreed to regarding the XXXXXXXXX Police Department's response to an intrusion alarm at XYZ Lab.

-
- Upon notification of an alarm from XYZ Security Personnel or ADT Security Alarm Company (or both), a minimum of two patrol officers will be dispatched to XYZ, as well as a Police Department supervisor, based on manpower availability. KCPD anticipates an average response time of 10 minutes. The rendezvous point will be the XXXXXXXXXXXXXXXXXXXXX parking lot unless otherwise directed.
- The outside of the building will be checked if the alarm is received as a breach of the facility perimeter. If additional officers are required, they will immediately be requested. Established procedures will be followed regarding perimeter searches, if intrusion is discovered.
- If an intrusion is discovered, one of the officers will proceed to the security office with XYZ personnel to view the CCTV monitors for that specific area.
- If a breach has not occurred in one of the sensitive areas and a building search is warranted, established procedures for building searches will be followed.
- If a sensitive or hazardous materials area has been entered, the on-scene Police Department supervisor will ascertain the risk factor involved for that specific area, secure the facility, and request the necessary department and outside resources to adequately resolve the situation.
-
- At no time will an officer enter a hazardous materials area when the possibility that the material has been removed from its storage area exists. The facility will be secured only to ensure that suspect(s) escape does not occur.
-
- Specialists in the handling of hazardous materials will be utilized whenever any recovery is necessary.
-
- These procedures should serve as general guidelines; however, some deviation may be necessary for specific situations.

_____ _____
XXXXXXXXXXXXXXX Date
Senior Vice President and
Director of Research Operations

_____ _____
XXXXXXXXXX Date
Chief of Police
XXXXXXXXXX, Police Department

Attachment C

Example Outline for Physical Security Plan

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Appendix C
Example Outline for Physical Security Plan

Physical security plan outline

a. Name of facility. Self-explanatory.
b. Address. Self-explanatory.
c. Mission of the facility. Self-explanatory.
d. Purpose. Cite a brief purpose of the plan. In general, the plan should ensure that good planning has integrated all forces, devices, and equipment into an effective security system.
e. Objectives. Cite the objectives of the plan.
f. Threat analysis. Review DA postulated security threat for chemical agents. Consider local threat assessment based upon the local security officer's evaluation of the threat from terrorism, espionage, sabotage, theft, and vandalism. Persons and organizations threatening or attempting any of these acts will be identified. The threat analysis will be updated at least yearly and more frequently if changing conditions warrant.
g. Vulnerabilities. Review results of the facility vulnerability assessment. Identify critical and other structures, containers, buildings, and work areas that require protection. Consider their location, size, function, and contents even if they are only used occasionally.
h. Priorities. Establish priorities for protecting various areas within the facility.
i. Limited and exclusion areas. Delineate these areas.
j. Equipment and devices to detect or delay intrusion.
(1) *Type and construction of storage areas/containers.* Walls, windows, openings, ceilings, and floors of such areas; and containers. Provide estimated delay time for forced entry.
(2) *Security lighting.*
(a) Types.
(b) Locations.
(c) Inspections and maintenance.
(d) Emergency actions for power failure.
(3) *Protective alarms.*
(a) Types.
(b) Locations.
(c) Monitoring and use.
(d) Tests.
(e) Inspections and maintenance.
(f) Sensitivity settings.
(g) Records and logs.
(h) Actions by security forces, or local police, and designated facility personnel when alarms occur or when the system, or any part of the system, becomes inoperative.
(i) Duress system.
(j) Warnings and alarms.
(k) Power sources (types and capabilities).
(4) *Communications systems.*
(a) Types.
(b) Locations.
(c) Use.
(d) Tests.
(e) Inspections and maintenance.
(f) Records/logs.
(5) *Locks and keys.*
(a) Types.
(b) Use.
(c) Locations.
(d) Controls, logs, and accountability.
(e) Two-person control keys.
k. Measures to control personnel and material.
(1) Personnel access controls.

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(a) Assigned personnel.
(b) Visitors—cleared and uncleared.
(c) Maintenance personnel.
(2) Escort requirements.
(3) Search procedures.
(4) Duress system.
(5) Non-operational hours access procedures.
(6) Emergency entrance procedures. Means of immediate entry for fire, security, disposal, and medical personnel.
l. Personnel identification system. Assigned personnel, visitors, maintenance personnel, and entry control rosters.
(1) Identification cards (or personal recognition).
(2) Badges, if used.
(3) Entry control rosters.
m. Material control.
(1) Incoming.
(a) Requirements for admission, to include restrictions.
(b) Inspection and search.
(c) Sealed packages and containers.
(2) Outgoing.
(a) Documentation required.
(b) Inspection and search.
(3) Classified documents or materials relevant to this contract or transported in or out of the area.
n. Security forces (as applicable).
(1) Type (employee, contract, and local police).
(2) Composition and organization.
(3) Authority and jurisdiction.
(4) Weapons, ammunition, and equipment.
(5) Rules of engagement and use of deadly force.
(6) Training.
(7) Information on posts as follows:
(a) Locations.
(b) Areas of responsibility.
(c) Hours.
(d) Duties and functions including general patrol routes. Vary patrol routes and times and rotate stationary posts to combat boredom.
(e) Reporting procedures.
(8) Back-up forces—
(a) Purpose and mission.
(b) Size, composition, and organization.
(c) Weapons, ammunition, and equipment.
(d) Location and call-out procedures.
(e) Reaction time.
(f) Training, if applicable.
o. Emergency actions of general nature. Actions not covered by this plan which are required for emergencies, such as fire, bomb threats, serious injuries, and so forth.
p. Movements of chemical agents. Procedures to ensure security compliance.
q . Coordination. Liaison and coordination with cognizant civil agencies including local police and FBI, as appropriate.
r. Appendixes.
(1) Local security threat.
(2) Vulnerability assessment.
(3) Recapture or recovery plan.
(4) Guard orders, if applicable.
(5) MOA with local police, if applicable.
(6) Security incident reporting procedures.