CITY OF PORTLAND, OREGON



CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR AND EXPLOSIVE (CBRNE) INCIDENT ANNEX

July 2007

Primary Agency: Portland Police Bureau Support Agencies: Portland Fire and Rescue, Portland Office of Emergency Management

Portland Office of Emergency Management Planning and Mitigation Section (503) 823-3754 or 823-3809 Date of exercise or proposed exercise to test – TOPOFF 4, October 2007 Date of next update - TBD

CHECKLIST ASSUMPTIONS:

- 1. Checklists are for City EOC Planning Section and Disaster Policy Council (DPC) members to identify key response bureau actions
- 2. Local first responder resources have been deployed
- 3. Incident/unified command has been established
- 4. Determination of the nature of threat, scope and scale of impact has been made
- 5. The City EOC has been activated
- 6. Public Information is coordinated through the involvement of all active bureau Public Information Officers (PIO's) in a Joint Information Center (JIC)

MAYOR OR DESIGNEE:

- Activate DPC to assess and evaluate the physical, fiscal, and psycho/social impact of the disaster and consequences of policy decisions on the entire city
- Activate the City EOC if deemed necessary
- Declare State of Emergency for the city of Portland
- Request State of Emergency through Multnomah County
- Collaborate with the Chair of County Commissioners to determine whether to elevate the threat level of the city and the county, if appropriate
- □ Issue public announcement of emergency measures with the DPC
- ☐ Make employee and citizen notifications as needed through the City EOC Joint Information System
- Communicate with officials of local jurisdictions
- □ Is the final authority for all decisions concerning the event
- POEM Director will serve as Liaison between Mayor and the City EOC

The OFFICE OF EMERGENCY MANAGEMENT:

- ☐ Monitor actual and potential emergency conditions, open and staff the City EOC when appropriate
- Provide centralized location for coordination and emergency support function management for the city and its liaisons
- The Director of Emergency Management will provide briefings to the Mayor and DPC regarding status of the situation and identified policy needs
- Assure that any declarations of disaster or emergency declarations are processed to facilitate formal assistance requests from the state and federal government, and work with the Mayor and DPC to apply emergency powers, and expedite decision-making efforts of the EOC staff and responders
- Through the JIC/JIS, disseminate emergency information and instructions to city officials, neighboring government jurisdictions, and the public

In the event of a confirmed CBRNE incident the **JOINT INFORMATION SYSTEM (JIS)** may be activated and a local **JOINT INFORMATION CENTER (JIC)** operation may be established. A lead **PUBLIC INFORMATION OFFICER (PIO)** may be designated at the JIC and communication within the PIO network will be achieved through incorporation of a JIS. In the event that an incident impacts multiple jurisdictions, a regional JIC may be established. Supporting activities among public information officers (PIO) representing various bureaus include, but are not limited to:

- Develop and deliver coordinated interagency messages
- Develop general and bureau-specific information sheets for distribution to the media and the public
- Develop and execute public information plans and strategies on behalf of the incident commander
- Advise the incident commander concerning public affairs issues that could affect a response effort
- Control rumors and inaccurate information that could undermine public confidence in the emergency response effort
- Provide public education on recognition of diseases and exposure control measures, information on location and operating hours for point of distribution (POD) sites, medical care points and treatment facilities
- Provide communication of hotline numbers and alternate means for obtaining essential emergency information
- Serve as a conduit of information to the Director of Emergency Management

When presented with a CBRNE emergency, <u>ON SCENE FIRE AND RESCUE</u> companies may provide the following functions, regardless of the incident-specific release.

- Coordinate with IC/Unified Command
- Establish control zones hot, warm and cold zones as appropriate
- Evaluate scene safety/security and prioritize safety for responders
- Ensure appropriate self protective measures for responders and civilian populations
 - Proper PPE
 - Time, distance, and shielding
 - Protective action recommendations
- Perform rapid detection and identification of the nature, source, and location of the release and support for a potential criminal investigation
- \Box Identify victims in need of care and rescue those in the hazard zone as soon as possible
- Conduct medical triage and treatment as appropriate. If needed or requested, set up Medical Care Points (MCPs) with equipment on CBRNE squads
- □ Initiate notifications to hospitals, city, county and regional officials
- Through the IC/UC or EOC, request additional regional/state/federal resources agencies
- □ Conduct firefighting and hazardous materials operations
- Conduct search and rescue operations
- □ Provide decontamination for first responders and civilians

When presented with a CBRNE emergency **ON SCENE HAZMAT** may provide the following functions

- Coordinate with IC/Unified Command
 - Identify the material
 - Determine the hazards
 - Determine appropriate PPE requirements
 - Determine number of potential victims

Establish a decontamination procedure

- Gross decontamination appropriate if large number of victims
- Technical decontamination utilizing supplied tents
- Place <u>all</u> emergency personnel in level "B" suits if operating in the "Warm Zone"

□ With IC/Unified command evaluate need for evacuation or shelter in place

☐ Mitigate the Hazard

- Prevent further release of the material
- Contain the material
- Neutralize the material
- Dilute the material
- Allow the material to dissipate

Establish Cleanup Procedures

- Private contractor
- Public agencies
- Investigation requirements

When presented with a CBRNE emergency, **ON SCENE LAW ENFORCEMENT** may provide the following functions, regardless of the incident specific release:

- Coordinate with IC/Unified Command
- Establish security at the scene, establish control zones
- Establish incident priorities
- Establish the crime scene, document on-scene activities and conduct the preliminary criminal investigation
- ☐ Identify, protect and recover evidence from the scene and from victims
- Arrange for laboratory analysis
- Request additional regional/state/federal resources agencies through the IC/UC
- Gather witnesses in holding area and interview
- Conduct crowd and traffic control with assistance from public works
- Recover evidence from victims transported to hospitals
- Coordinate with the Medical Examiner (ME) for fatalities
- Detain/arrest suspects if located

In addition to the traditional roles of public safety, security, and command support functions, law enforcement personnel may also:

Assist the county health officer with isolation and quarantine orders during an outbreak

- □ Implement/assist with evacuations or shelter-in-place activities
- □ Support security plans for point-of-dispensing (POD) sites, alternative treatment facilities and medical care points and other key facilities included in the critical infrastructure supporting public health emergencies
- Coordinate the security of a US Postal Service facility in responding to the Biological Detection System (BDS) alert

On scene law enforcement agencies and/or <u>METROPOLITAN EXPLOSIVES DISPOSAL</u> <u>UNIT (MEDU)</u> may also conduct the following activities:

- □ Coordinate with IC/UC regarding scene safety and security
- □ Recommend perimeter safety
- Establish an exclusion zone
- Sweep for secondary devices
- □ Render safe the primary device
- ☐ Identify and protect evidence and the blast site

ON SCENE PUBLIC WORKS may provide the following functions during a CBRNE incident response:

- Coordinate with IC/Unified Command as required
- Ensure adequate water supply for fire fighting operations
- Assist with traffic management, establish road closures and detours, and assist with large-scale evacuations
- Provide technical assistance to the incident commander with respect to flooding, structure integrity assessments, and impact assessments of infrastructure
- □ Close and/or repair damaged segments of the transportation infrastructure
- Develop and initiate emergency collection, sorting, and disposal routes and sites for debris clearance and evidence collection from public and private property

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I. INTRODUCTION

A. Purpose

The purpose of the City of Portland's Chemical, Biological, Radiological, Nuclear and Explosive (CBRNE) Response Annex is to establish the City of Portland's response to terrorist incidents by aligning the response and recovery activities of the multiple disciplines from the City of Portland bureaus and the mutual aid assistance provided by the multiple jurisdictions which make up the Portland Urban Area.

The primary goal of the annex is to coordinate the activities of Portland bureaus to protect the people, property, economy, and environment of the City of Portland in the event of a terrorist CBRNE incident.

The City of Portland CBRNE Response Annex is formatted in compliance with State and Local Guide 101^1 and is in alignment with the National Incident Management System (NIMS)¹ and the National Response Plan (NRP)². This plan outlines situation and assumptions, concept of operations, organization and assignment of responsibilities, administration and logistics, and plan development and maintenance.

Corresponding county, regional, state, and federal response activities are outlined in their respective response plans, policies, protocols, and procedures.

II. SITUATION AND ASSUMPTIONS

A. Situation

Portland, Oregon is at the confluence of the Willamette and Columbia rivers with a population of $556,000^3$ and is Oregon's largest city, and the third largest in the Pacific Northwest. Approximately 2 million people live in the surrounding metropolitan area.

The City of Portland and the counties of Multnomah, Clackamas, Columbia, and Washington in Oregon; and Clark County in Washington, has been identified by the Department of Homeland Security as an Urban Area Security Initiative (UASI) region⁴.

The Portland Urban Area possesses numerous features and facilities identified as potential terrorist targets. The Federal Bureau of Investigation (FBI) has identified the following sectors within the region that present potential targets for terrorist attacks:

⁴ http://www.ojp.usdoj.gov/odp/grants_hsgp.htm

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¹ www.fema.gov/pdf/plan/slg101.pdf

http://www.fema.gov/emergency/nims/index.shtm

² http://www.dhs.gov/xprepresp/committees/editorial_0566.shtm

³ 2005 Oregon Population Report (PDF). Portland State University Population Research Center.

- Water (reservoirs, treatment facilities, distribution infrastructure, and dams)
- Transportation (airports, ports, mass transit, bridges, pipelines, highways, railways)
- Telecommunications (fiber optics, information technology sector, cyber)
- Energy (oil and gas supplies, bulk storage terminals, pipelines, nuclear facilities)
- Natural resources (forests, watersheds, rivers, and agriculture)
- Banking and financial institutions
- Manufacturing (major employers, hazardous material processing)
- Government infrastructure and public safety
- Monuments and Icons and commercial and cultural facilities

This plan encompasses the city of Portland's response to intentional or criminal uses of a CBRNE agent. The city will also rely on existing policies, plans and procedures to respond to and recover from these incidents.

Because of the nature of a CBRNE attack, particularly one directed against a large population center, the management of suspected or actual terrorist incidents will likely become a multi-agency/multi-jurisdictional coordinated event.

The city of Portland CBRNE Response Annex is based on the planning assumptions and considerations discussed below.

B. Assumptions

- 1. Terrorist attacks may or may not be preceded by a warning or a threat. Initially, an incident may appear to be a "routine" hazardous materials (HazMat) incident. Attacks may occur at single or multiple locations and may be accompanied by fire, explosion, or other destructive acts.
- **2.** A device may be set off to attract emergency responders, followed by a secondary device to harm them.
- **3.** A terrorist incident may affect a single location, or multiple locations, each of which may require and incident response and a crime scene investigation simultaneously.
- **4.** Effective response to the use of weapons of mass destruction (WMD) may require:
 - a) Specialized equipment and trained personnel to detect and identify chemical, biological or radiological agents.
 - **b**) A mass decontamination capability. Decontamination priorities will be set up using the following priorities, in order of importance:

- (1) Life Safety
- (2) Incident Stabilization
- (3) Property Conservation
- c) The capability to deal with mass fatalities.
- **d**) Quarantine procedures and control of movement, with the capacity to effectively evacuate or shelter-in-place through expedient public messaging.
- e) A reliable communications system that will adequately support response and recovery efforts
- **5.** A large number of patients, many worried well, may self refer to a health care facility and may require decontamination prior to evaluation and treatment.
- **6.** Health care providers may be subject to the effects of disasters and may need decontamination, prophylaxis, or immunization measures before being able to perform their response roles.
- 7. During a catastrophic incident, medical support will be required not only at medical facilities, but in large numbers at casualty evacuation points, evacuee and refugee points, and shelters as well as to support field operations.
- **8.** Triage done in the field will lessen the impact on the health care surge capacity system.
- **9.** There will be critical shortages of health care resources such as staff, hospital beds, mechanical ventilators, morgue capacity, temporary holding sites with refrigeration for storage of bodies and other resources.
- **10.** There will be a significant increase and demand for specialty healthcare personnel and beds (biological contagious, burn, trauma, pediatrics) depending on the specific event.
- **11.**Emergency functions performed by city bureaus responding to an emergency will generally parallel their normal day-to-day functions. To the extent possible, the same personnel and material resources will be employed in both cases. Each bureau is tasked with developing and maintaining emergency response plans.
 - a) Day-to-day city functions that do not contribute directly to response actions in an emergency may be suspended by the city Mayor for the duration of the emergency.

- **12.** All Fire and EMS first responders will be trained and equipped to the level necessary to deal with the threat and/or incidents.
- **13.**City resources for combating terrorist attacks are limited. Specialized resources are outlined in the roles and responsibilities section of this plan. In the event of a significant terrorist threat or incident, it is anticipated that regional, state, and federal resources will be requested in order to supplement city capabilities.
- **14.** When an emergency exceeds the city of Portland's capability to respond and vendor resources will not meet demand, mutual aid assistance from surrounding communities and jurisdictions may be requested at the direction of the emergency's incident commander.
 - a) Requested regional resources may be available and deployed to the city of Portland.
 - **b**) When an emergency exceeds or is anticipated to exceed the capabilities of both local and mutual aid responders, a State of Emergency may be declared by the Mayor of the City of Portland, through Multnomah County.
 - c) When an emergency exceeds the capabilities of local and mutual aid responders and the State of Oregon, the Governor may request federal assistance.
 - d) In most cases, significant state, and federal terrorism response resources are available, but it may take 6 to 12 hours or longer for large-scale activation and deployment of such resources.
- **15.**Recovery from a terrorist attack can be complicated by the presence of persistent agents, additional threats, extensive physical damages, and mass casualties.
- **16.**Public anxiety related to a CBRNE incident will require effective delivery of accurate and concise risk communication by the city of Portland through the Joint Information System.

III. CONCEPT OF OPERATIONS

The following provides an outline of the primary responsibilities and an approximate chronological summary of the operations of the various key response participants during a CBRNE incident.

- Incident Notification and dispatch of initial response
 - Bureau of Emergency Communications (BOEC)

— Initial Incident Response

- Portland Fire and Rescue
- American Medical Response (AMR)
- Regional HazMat
- Portland Police Bureau
- The first-arriving emergency response unit will establish supervision and command of the incident, perform a rapid size-up and notify BOEC
 - Incident Commander

- Rapid detection of a CBRNE release

- Portland Fire and Rescue
- Regional HazMat
- Incident Command makes an Alarm upgrade request to BOEC for additional personnel and resources including specialized teams and equipment as well as any additional notifications to City of Portland, regional Metro, Multnomah County, State and Federal response partners, which includes a Weapons of Mass Destruction (WMD) upgrade⁵
 - Additional fire resources including
 - Heavy Rescue
 - Additional Hazmat
 - CBRNE Squad
 - USAR Apparatus
 - Mobile Command Center
 - Public Information Personnel
 - Additional Supervisory/Command Personnel
 - Additional law enforcement resources including
 - Metropolitan Explosives Disposal Unit
 - Rapid Response Team
 - Additional Field Personnel
 - Supervisory Personnel
 - EMS Strike Team
 - Federal Bureau of Investigation
 - Multnomah County EMS Coordinator
 - If applicable, request response by the National Guard Civil Support Team
 - Request activation of City EOC
- Implementation of a unified command structure will occur as soon as appropriate interagency resources have arrived on scene. Unified command will expand and adapt as required to accommodate local, regional, state and federal resources needed to

⁵ Multnomah County WMD/CBRNE Concept of Operations Plan

respond to and recover from a CBRNE incident

- Move up of equipment and personnel from regional mutual aid response partners to ensure emergency response coverage for the city of Portland
 - BOEC
- Transmit "Regional Notification⁶" which notifies both Portland and regional partner personnel of the incident
 - BOEC Supervisor
- Establishing scene security, establishing control zones
 - Incident/Unified Command
 - Portland Fire and Rescue
 - Regional HazMat
 - Portland Police Bureau
 - Portland Public Works Bureaus (Environmental Services, Transportation, Maintenance and Water)
- Determination of the nature, source, and location of the release and support for a potential criminal investigation
 - Portland Police Bureau MEDU
 - Portland Fire and Rescue
 - Regional HazMat
 - Federal Bureau of Investigation
 - Oregon Health Division, Public Health Radiation Protection Services
 - National Guard Civil Support Team

- Rapid identification of the CBRNE agent released

- Portland Fire and Rescue
- Regional HazMat
- Oregon Health Division, Public Health Radiation Protection Services
- National Guard Civil Support Team

— Isolation and containment of the release to minimize the spread

- Portland Police Bureau MEDU
- Portland Fire and Rescue
- Regional HazMat
- Oregon Public Health Radiation Protection

⁶ BOEC SOP 10.20.000 – Regional Events and Major Incidents

- National Guard Civil Support Team
- Provision of personal protective equipment for first responders and support staff
 - Portland Fire and Rescue
 - Multnomah County Health Department
 - Metro Area Mutual Assist Fire/EMS Responders
- Notification of potential victims
 - Unified Command Fire/EMS, Law Enforcement, Health Department
 - Public Information Joint Information Center
- Implementation of evacuation or shelter-in-place procedures⁷ as authorized by the Mayor
 - Incident/Unified Command
 - Portland Police Bureau
 - Portland Department of Transportation
 - Portland Parks and Recreation
 - Tri-Met
 - Metro Law Enforcement Agencies
 - Metro Area Transportation and Public Works Departments
 - Oregon State Police
 - Oregon Department of Transportation
 - Red Cross
- Triage, treatment and transport of victims
 - Portland Fire and Rescue
 - AMR

— Establishing Medical Care Point(s)

- Portland Fire and Rescue CBRNE Squad
- AMR
- Multnomah County Health Department
- Health Reserve Corps
- Portland Parks and Recreation

⁷ City of Portland – Basic Emergency Operations Plan - Evacuation Annex 7/26/20073:59 PM City of Portland

- Monitoring and assessment of surge capacity at hospitals and other health care provider institutions
 - EMS Branch
 - Multnomah County Health Department
 - Regional Hospital
- Conducting decontamination operations
 - Portland Fire and Rescue
 - Regional HazMat
 - Multnomah County Health Department
 - Local hospital and care facilities
- Gross decontamination and transportation of injured victims for treatment
 - Portland Fire and Rescue
 - Regional HazMat
 - AMR
- Monitoring contaminated zones and victims
 - Portland Fire and Rescue
 - Regional HazMat
 - Multnomah County Health Department
- Conduct of criminal investigation
 - Portland Police Mutual Aid Providers
 - Federal Bureau of Investigations
- Protection of life, property, environment and the economy of the city of Portland
 - Incident/Unified Command
 - Mayor and elected officials of the City
 - Disaster Policy Council
- Continued provision of public information
 - Emergency Operations Center
 - Information Officer JIC/JIS
- Requesting Regional, State, and Federal Assistance Emergency Declaration
 - Emergency Operations Center
 - Multnomah County Emergency Management

- State of Oregon Emergency Coordination Center
- FEMA Region X Regional Operations Center/Regional Resource Coordination Center
- DHS Joint Field Office
- FBI Joint Operations Center
- DHS National Operations Center

A. Direction and Control

Final responsibility for emergency management and the protection of life and property within the city of Portland belongs to the Mayor. The Mayor, the DPC and Unified Command will serve as the decision-making group for all broad policy level decisions.

During an emergency, the city will work to maintain and restore any services that it provides and which it deems to be essential. Pre-designated and trained responders from various city bureaus will staff the city EOC. POEM, as EOC staff, will facilitate and coordinate with the Incident/Unified Command and the responders to accomplish the objectives of the event.

Upon determination of the need the Director of POEM or designee will ensure notification of the EOC responders, at the appropriate level, for standby mode or to mobilize a team to the EOC. Once staffed, the EOC can then support the ongoing notification and support of the incident. The EOC will coordinate with Multnomah County and the State of Oregon in declaring state of emergency and requesting necessary resources and assistance.

Coordination with local, regional, state, and federal agencies will continue to ensure coordination throughout consequence management activities.

B. Incident Communications

The Portland Bureau of Emergency Communications (BOEC) is operated by the City of Portland and provides call-taking and dispatch services using the Portland 800 MHz shared radio system used by the public safety agencies in Multnomah County.

Notification of first responders will be triggered by a report of a potential CBRNE event or the threat of an intentional CBRNE event for malicious purposes. Such reports or threats will be received by or referred to a local 9-1-1 Communications Center. The BOEC 9-1-1 staff will immediately dispatch local emergency first responders, which include **Portland Police, Portland Fire and Rescue and EMS,** to the scene. The Portland UASI Tactical Interoperable Communications Plan (TICP) ⁸provides guidelines for achieving interoperable communications. In a terrorism incident, unless it is known that all responding agencies will be operating on the same shared communication system, the Incident Commander should immediately order activation of any applicable fixed or mobile gateways through dispatch.

On scene interoperable communications will be attempted in the following order:

- Collocation of all Command and General Staff at the on scene incident command post.
- If the Command Staff and General Staff are users of a shared system, the shared system will be used to establish interoperable communications.
- If the Command Staff and General Staff do not have a common shared system, but operate on the 800 MHz frequency band, use of a mutual aid channel should be attempted to establish interoperable communications.
- If none of the methods above are available, a request should be made to make use of any gateway devices that can interconnect the disparate radio systems of the Command Staff and General Staff. Dispatch will identify any available resources. However, the highest level of operational command should be given first priority for available interoperable communications resources.

If no other method of interoperability can be established, the Command Staff and General Staff will relay communications through staff members or face to face.

The city of Portland's EOC utilizes a number of communications tools to provide depth, breadth, and redundancy. These tools include landline, cellular and satellite telephones, faxes, the Internet, amateur radios, and the 800 MHz radio system. Several VHF and UHF systems can also be used. Primary communications are via landline phones and the Internet. Sixteen 800 MHz channels are available for EOC use. Amateur radio is also utilized. Many Neighborhood Emergency Team (NET) members also have amateur radio skills and abilities.

C. Warning

It is understood that a confirmed or presumptive CBRNE incident may have regional implications and may even be considered an *Incident of National Significance*. Confirmation of a terrorist incident will result in a heightened local threat level and will require the need for heightened awareness by the city of Portland.

The Portland Police Bureau will monitor and advise the Disaster Policy Council and BOEC regarding any change in the homeland security condition code for the Portland Region in relation to the federal threat level⁹. In turn, BOEC will alert call lists of

⁸ Portland UASI Tactical Interoperable Communications Plan Version 4.1

⁹ Portland Police Bureau Directive 763.00 – Operational Conditions

officials within response bureaus. Since September 11, 2001 the city of Portland has been at a yellow/elevated condition code.

A number of specific methods and systems may be used to broadcast the warning information to the general public, including but not limited to:

- Mass media messaging
- Emergency Alert System (EAS)¹⁰
- Portland Emergency Notification System (PENS) used to notify all residents by phone¹¹
- Reverse 9-1-1
- Oregon Department of Transportation (ODOT) reader boards
- ODOT 5-1-1 phone number, the "intelligent transportation system" information line
- National Weather Service Alert System network
- Individual cell phones and personal communications equipment
- Postings on Portland Office of Emergency Management (POEM) website and Portland Online
- Door-to-door, room-to-room, as necessary through Neighborhood Emergency Team (NET), Business and School (BET, SET) team volunteers
- Through citizen volunteer community grass roots network(s) associated with Portland Citizen Corps Council (IRCO, Neighborhood Coalitions, Red Cross, faith-based organizations, etc.)
- Amateur radio, citizen band radio networks
- Tri-Met public address system available on transit vehicles and select transit stations

D. Emergency Public Information

The accurate and timely dissemination of critical information to the public in the aftermath of a CBRNE terrorist incident will be an integral element of the city of Portland's response and recovery elements. A CBRNE terrorist event will become the focus of national and international news media. Within hours of a major terrorist event, hundreds of reporters with satellite trucks, camera equipment and staff will descend on the city. The public will look to the news media as its primary source of information. Providing accurate, consistent, and expedited information in a crisis situation helps to calm anxieties and reduce problematic public interpretation and response.

A Joint Information System (JIS) will be implemented along with the establishment of a Joint Information Center (JIC), locally and/or regionally, depending on the scale of the incident to provide timely, accurate public information during a CBRNE incident.

¹⁰ BOEC SOP 10.20.010 – Emergency Alert System

¹¹ Portland Police Bureau Directive 850.39 – Missing, Runaway, Lost or Disoriented Person

E. Protective Actions

IC/Unified Command will isolate an incident scene and establish Hazard Control Zones¹² to protect victims and emergency responders.

The decision to implement evacuation measures or consider sheltering-in-place will ultimately be the responsibility of the Mayor.

Responders will utilize time, distance and shielding measures as well as use of personal protective clothing and equipment at the scene of any suspected CBRNE incident.

Hazard specific CBRNE information can be found in Tabs 1-4 of this document.

F. Resource Management

Each bureau is responsible for tracking and maintaining an accurate record of resource management. Through the city EOC, each bureau will utilize NIMS resource typing codes and existing policies to track resources.

G. Recovery

Once the immediate danger has been removed, recovery from the incident will begin.¹³

The recovery strategy is done in consultation with public officials, community members, and other local, regional, state, and federal stakeholders. Possible needed recovery activities are listed below.

- Reconstruction of critical infrastructure.
- Restoration of city and community services.
- Allocation of funding to the recovery efforts.
- Off-site removal or on-site destruction of residual hazardous materials. This includes the disposal of contaminated material, the decontamination of structures, and/or the construction of on-site encapsulation or treatment system construction.
- Creation of hotlines or other medical (physical or psychological) assistance services for members of the public who have suffered from the incident.
- Continued dissemination of warning and public information through the JIC.

¹² Radiological/Nuclear Tab 3 – Page 6

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¹³City of Portland – Basic Emergency Operations Plan "Draft" Debris Management Annex

IV. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

A. Local Fire and Rescue Response

Portland Fire and Rescue is capable of responding to various impacts resulting from fires and explosions.

Within the city of Portland, Emergency Medical Services (EMS) is a function of fire services although they are owned and operated by a private medical transport company, American Medical Response (AMR). Portland Fire and Rescue will provide emergency medical care in the field and prepare victims for transport by AMR from a CBRNE incident.

Regional response partners, including Portland Fire and Rescue have developed and maintain the following specialized teams which are available for response:

• Hazardous Materials Team (including radiation detection and monitoring) HazMat personnel will respond with apparatus that are specifically designed to carry the necessary equipment and tools required at these events. In Multnomah County, this includes Portland Fire & Rescue's HazMat 7 and Gresham Fire & Emergency Service's HazMat 73.

• Urban Search and Rescue (USAR) Team

USAR personnel will respond with apparatus that are specifically designed to carry the necessary equipment and tools required for a structural collapse. In Multnomah County, this includes Portland Fire & Rescue's **Heavy Rescue 1** ("Squad One") and **USAR 1** (Urban Search and Rescue Apparatus) and **Heavy Rescue 71** from Gresham Fire & Emergency Services.

• Mobile Command Unit

Portland Fire and Rescue **Mobile Command Center** will be located at Station 9 and maintains the capacity to communicate with any and all on-site city, county, regional, state and federal responders and support agencies.

• WMD Task Force

The first responder notifies BOEC and asks them to upgrade the call to a "WMD Box" assignment. Dispatch will then tap out the appropriate stations to produce the following **First Alarm** assignment:

- 4 Engines
- 2 Trucks
- 1 Heavy Rescue
- 1 HazMat Team
- 1-CBRNE Squad
- 1 USAR Apparatus
- 1 Mobile Command Center

- 2 Battalion Chiefs
- 1 PIO

If a commercial assignment is already working at an incident (i.e. fire resulting from an explosion) and they determine it is a WMD event, they request BOEC to balance the assignment to a "WMD Box". This will initiate the response of the additional specialized teams with their apparatus to complement the on-scene fire crews.

When presented with a CBRNE emergency, Fire and Rescue companies provide the following functions, regardless of the incident-specific release.

- Coordinate with IC/Unified Command
- Establish control zones -hot, warm and cold zones as appropriate
- Evaluate scene safety/security and prioritize safety for responders
- Ensure appropriate self protective measures for responders and civilian populations
- Perform rapid detection and identification of the nature, source, and location of the release and support for a potential criminal investigation
- Identify victims in need of care and rescue those in the hazard zone as soon as possible
- Conduct medical triage and treatment as appropriate. If needed or requested, set up Medical Care Points with equipment on CBRNE squads
- Initiate notifications to hospitals, city, county and regional officials
- Through the IC/UC or EOC, request additional regional/state/federal resources
- Stage incoming units
- Conduct firefighting and hazardous materials operations
- Conduct search and rescue operations
- Provide decontamination for first responders and civilians

Portland Fire and Rescue will also provide a PIO or fact sheet/public information bulletins for use by the JIC.

Depending on the specific materials that have been released, Portland Fire and Rescue will have the following unique roles and responsibilities.

1. Chemical Release Response

Portland Fire and Rescue responders and Hazardous Materials Response (HazMat) Teams routinely respond to industrial chemical releases, but chemical warfare agents present unusual and unique challenges for personal safety, protective clothing, and decontamination requirements. All Portland Fire and Rescue responders are equipped with basic multi-gas monitors and monitors that will detect ionizing radiation. In addition, they have WMD kits that contain radiation dosimeters, level B suits for nerve agent response and injectors containing antidotes appropriate for such agents. The detection equipment is of minimal use in the detection and identification of agents in a chemical WMD incident. Such material may extend beyond the hazardous categorization kits available even to HazMat teams. Additional resources are available through mutual aid, including but not limited to the National Guard Civil Support Team, Oregon DEQ, Federal EPA, and U.S. Coast Guard (USCG).

Information on any positively identified chemicals must be immediately relayed to the appropriate 9-1-1 public safety answering point (PSAPs), and EOCs so that local medical centers and health providers can be notified as to what to expect for purposes of protecting the hospitals and facilities with adequate decontamination and treatment.

EMS will need to treat patients with external chemical burns, and burned patients will need high evacuation priority to a burn center. Proper field decontamination is critical before moving patients to the medical centers.

The Centers for Disease Control and Prevention (CDC) Strategic National Stockpile (SNS)¹⁴ has provided the Portland area with a ChemPak¹⁵ which contains emergency stockpile supplies, equipment and antidotes for the treatment of large numbers of victims of chemical exposure.

2. Biological Release Response

In the event of an overt biological attack and an identified "hot" area (e.g., a public building), fire and hazardous materials response teams will first prevent the spread of the release (e.g., by shutting ventilation systems, closing windows, isolating the area from activity), decontaminating victims, and maintaining the command staff near the site.

In the event of a covert biological release, likely to be identified via public health department surveillance, fire and EMS services will likewise be asked to isolate areas and support command functions and decontamination. EMS may play a role in surveillance and/or reporting of unusual cases or clusters of cases.

3. Radiological or Nuclear Release Response

The response to a radiological attack has some key differences from the response to a chemical attack.

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¹⁴ http://www.bt.cdc.gov/stockpile/

¹⁵ http://www.bt.cdc.gov/planning/coopagreement/

There are several types of radiation incidents but a Radiological Dispersal Device is a likely scenario for a terrorist caused incident. If the dissemination is via an Improvised Explosive Device (IED), the IED itself will likely be the source of any gross injuries received on scene. In addition, patient care will take precedence over the concern of radiation exposure to first responders. Decontamination although important, will be less of an immediate issue than with chemical WMD incidents. Finally, the use of respiratory protection in the form of Self Contained Breathing Apparatus (SCBA), Air Purifying Respirator (APR) or filter mask is of paramount importance for exposure to alpha and beta particles.

The local first responders, along with specialized state and federal response partners, will:

- Monitor the area with standard radiation detection meters and set clear safety zones
- Conduct plume modeling using the Interagency Modeling and Atmospheric Assessment Center (IMAAC)
- Support the field detection of, response to, and decontamination of radioactive agents
- Employ distance, time and shielding is the best way to protect responders and the public from the effects of a radiological release
- Consider various decontamination options. Patients may receive some decontamination on scene or will be advised to take decontamination steps upon their arrival at home. Note that the majority of radiation contamination is taken care of by the removal of the victim's outer clothing layer Communication with regional medical centers with respect to patient contamination is essential before the arrival of patients.

4. Explosive Device Response

IED's are the most likely form of a terrorist attack. And because they are "improvised" they are by their nature very difficult to detect. The design and look of an IED is as varied as the builder's imagination for violence. IEDs are sometimes co-mingled with chemical or radiological substances to create dirty bombs. Fire services' role when dealing with IEDs is to provide safety zones in anticipation of a secondary device and command post support and, in the case of a dirty bomb, support the field detection of, response to, and decontamination of the chemical, biological or radioactive agents.

EMS will respond to a mass casualty incident (MCI) as per agency policies, plans and procedures and may need to support the decontamination and rapid transport of victims from any explosion.

5. State and Federal Response

a) Civil Support Team

The 102nd Civil Support Team (CST), based in Salem, is a unit of 22 full-time Army and Air National Guard members that can be rapidly mobilized to an incident anywhere in Oregon to assist civil authorities with early detection and analysis capabilities of a chemical, biological, radiological or nuclear incident. The goal is to minimize the impact on civilian populations and facilitate requests for follow-on emergency and military support by civil authorities.

The team can provide technical advice, and pave the way for the identification and arrival of follow-on state and federal military response assets. They could provide initial advice on what the agent may be, assist first responders in that detection assessment process, and are the first military responders on the ground so that if additional Federal resources are requested, they can serve as an advance party that can liaise with the Joint Task Force Civil Support. Although the CST is federally resourced, federally trained, and federally evaluated, and they operate under federal doctrine, they will perform their mission primarily under the command and control of the Governor of Oregon. As a result, they will be available to respond to a CBRNE incident in the city of Portland as part of a state response, well before federal response assets would be called upon to provide assistance.

Requests for CST assistance shall be made through the Oregon Emergency Response System (OERS). OERS will ensure notification to the Commanding Officer who will then contact the requesting Incident Commander for additional incident information. If the request is valid, the CST call out procedures will be initiated by the Commanding Officer who will also notify the Adjutant General for validation. The Adjutant General will notify the Governor.

b) Oregon Department of Human Services Public Health Division

The **Oregon State Public Health Division (OSPHD)**¹⁶ is the lead state agency for radiological incidents involving a terrorist incident or an accident at a hospital, research lab, or industrial site. The **Radiation Protection Services (RPS)**¹⁷ response guidelines are outlined in the Oregon Department of Human Services, Public Health Radiological Emergency Response Plan. OSPHD provides technical assistance by responding to the scene, as appropriate, and by providing information on the health effects of a radiological incident.

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¹⁶ http://www.oregon.gov/DHS/ph/index.shtml

¹⁷ http://www.oregon.gov/DHS/ph/rps/about_us.shtml

c) Oregon Department of Energy

The **Oregon Department of Energy (ODOE)** is the lead state agency for incidents that occur during the transport of radioactive materials and for incidents at nuclear reactors or nuclear fuel storage facilities.

d) Oregon State Fire Marshal

The **Office of the State Fire Marshal**¹⁸ assists and supports the Oregon fire services during major emergency operations through the Conflagration Act (ORS 476.510). HazMat teams are also available to assist with emergency response. Oregon has 15 HazMat teams. Teams 3 (Gresham), 6 (Portland), and 9 (Tualatin Valley) and the City of Vancouver, Washington HazMat Team support the Portland metropolitan region.

e) Department of Environmental Quality

The **Oregon Department of Environmental Quality (DEQ)** is responsible for protecting and enhancing Oregon's water and air quality, cleaning up spills and releases of hazardous materials, and managing the proper disposal of hazardous and solid wastes. In addition, DEQ's Emergency Response Team is part of the overall statewide preparedness network established to plan for and respond to many different types of emergencies. DEQ's laboratory works with the Oregon State Public Health Laboratory (OSPHL) and Laboratory Response Network (LRN) to support the FBI and local first responders for transporting, analyzing, and verifying the presence of unidentified substances found during the investigation of an IED incident.

In the event of an oil spill or hazardous materials release, the DEQ would provide the primary coordination for the state's response to and recovery from hazardous material releases. DEQ's laboratory works with the OSPHL to support the FBI and local first responders to safely analyze unidentified substances for the presence of chemical or biological agents.

The **DEQ Laboratory** is the principal state of Oregon resource for the analysis of unknown chemicals. It is currently equipped and trained for most contingencies, and is continuing to improve its capabilities and readiness. The lab does not function as a first response element, but is rather a support and resource for the United States Coast Guard, U.S. Environmental Protection Agency, the FBI, Oregon State Police, local law enforcement, HazMat teams, and local government. Laboratory teams deployed outside the lab are normally used to provide equipment and expertise to first response personnel. During the cleanup phase of a response, laboratory teams may do actual sampling.

f) Federal Radiological Monitoring and Assessment Center

The **Federal Radiological Monitoring and Assessment Center (FRMAC)** is a federal asset available on request by the U.S. Department of Homeland Security (DHS) to respond to nuclear/radiological incidents. FRMAC provides an operational framework for coordinating all federal off-site radiological monitoring and assessment activities during a response to a radiological emergency to support the coordinating agency, state(s), local, and/or tribal governments.

B. Local Law Enforcement Response

In a CBRNE incident, the **Portland Police Bureau** is the initial response law enforcement agency supported by regional, city, and county police agencies and the Oregon State Police as needed. The FBI has, by Presidential Directives 39 and 62, ultimate responsibility for investigating a terrorist event, and would be assisted and/or supported by the listed agencies in such an investigation.

The City of Portland Police Bureau has special emergency response teams that may be called upon for emergency response, tactical missions, or specialized functions. These units include:

- Transit Police
- Traffic Control Unit
- Metropolitan Explosives Disposal Unit (MEDU)
- Explosive Sniffing Canines
- Special Emergency Response Team (SERT)
- Rapid Response Team (RRT)
- Clandestine Drug Laboratory Team
- Hostage Negotiation Team (HNT)

These specialized units and teams have specific missions to secure and search the incident area, make safe possible secondary devices, remotely monitor the area for CBRNE, make initial determinations of means and methods of the dispersal/ dissemination, gather intelligence, and conduct preliminary investigations at the incident location. Some of these units are capable of operating in contaminated environments with appropriate PPE.

When presented with a CBRNE emergency, Portland Police and law enforcement provides the following functions, regardless of the incident specific release:¹⁹

- Coordinate with IC/Unified Command
- Establish security at the scene, establish control zones

¹⁹ Portland Police Bureau Tactical Operations Checklist – Terrorism, CBRNE Checklist, WMD Checklist

- Establish incident priorities
- Establish the crime scene, document on-scene activities and conduct the preliminary criminal investigation
- Identify, protect and recover evidence from the scene and from victims
- Arrange for laboratory analysis
- Request additional regional/state/federal resources agencies through the IC/UC
- Gather witnesses in holding area and interview
- Conduct crowd and traffic control with assistance from public works
- Recover evidence from victims transported to hospitals
- Coordinate with the Medical Examiner (ME) for fatalities
- Detain/arrest suspects if located

The Police Bureau will also provide a PIO or fact sheet/public information bulletins for use by the JIC.

Depending on the specific materials that have been released, the Police Bureau will have the following unique roles and responsibilities.

1. Chemical Release Response²⁰

In the case of a chemical incident, the Portland Police Bureau may support first responders by isolating the scene and diverting pedestrian and vehicular traffic away from the affected areas. In a chemical related incident, that involves toxic vapors or chemical clouds/contamination, shelter-in-place or evacuation procedures may need to be enacted.

2. Biological Release Response ²¹

In addition to the traditional roles of public safety, security, and command support functions, law enforcement personnel may also:

- Assist the county health officer with isolation and quarantine orders during an outbreak
- Implement/assist with evacuations or shelter-in-place activities
- Support security plans for point-of-dispensing (POD) sites, alternative treatment facilities and medical care points and other key facilities included in the critical infrastructure supporting public health emergencies
- Coordinate the security of a US Postal Service facility in responding to the Biological Detection System (BDS) alert

²⁰ Portland Police Bureau Directives 741.00 - Chemical and Biological Agents and Weapons and 761.00 Hazardous Materials Incidents
²¹ Portland Police Bureau Directive 741.00 - Chemical and Biological Agents and Weapons

3. Radiological and Nuclear Incident Response

A response to a radiological incident will be similar to the response to a chemical release.

If the radiation release or threatened release is a component of a radioactive dirty bomb, then MEDU will need to be aware of both the explosive hazards and radiological hazards. Because the easiest radiological materials to obtain by a terrorist are low-level emitters, the explosive hazard may be the more dangerous element of a dirty bomb. Radiation detection equipment and personal dosimeters should accompany all first responders during entries to sites that have potential radiological contamination.

4. Explosive Device Response²²

The expertise and specialized training of the MEDU will be called upon to create a plan for both removing the known explosive threat and identifying additional threats. Officers are also responsible for securing the safety of the scene.

Law enforcement agencies and/or MEDU will also conduct the following activities:

- Render safe the primary device
- Sweep for secondary devices
- Establish an exclusion zone
- Identify and protect evidence and the blast site

Other law enforcement roles would include providing security for safety zones and supporting staff and functions of the command post. If a terrorist-related IED has been detonated, law enforcement will also conduct and support federal crime scene investigations.

5. State and Federal Response

a) Oregon State Police

The **Oregon State Police (OSP)** assists in planning and preparing for and responding to emergencies or disasters. They coordinate programs and resources with federal, state, and local entities in order to protect life, property, and the natural resources of the state. During an IED incident, OSP will interface with the local law enforcement agencies as warranted by the situation. OSP will serve as the lead agency for SNS security operations and provide escorts for transport and distribution of SNS materials, as necessary.

 $^{^{\}rm 22}$ Portland Police Bureau Directive 740.00 - Explosive Device Incidents and EDU

b) Federal Bureau of Investigation

The **Portland FBI Special Agent in Charge** will respond and assess incident information, support Portland Police Bureau, and assist in determining whether a CBRNE WMD terrorist incident has occurred.

The FBI serves as the lead law enforcement agency for all terrorist incidents in the United States. The Joint Operations Center (JOC) will be activated by the FBI in the affected area/jurisdiction with the cooperation of other federal, state, and local agencies. Threat assessment activities and criminal investigation procedures will be coordinated among the FBI, the local FBI field office, and other state and local law enforcement agencies.

The Portland FBI has a Hazardous Materials Response Team (HMRT) whose sole mission is to collect evidence in a hazardous environment. The team is qualified to enter the exclusion zone (hot zone.) Assistance for the Portland team would be provided by the FBI National Response Team (NRT) located at FBI Headquarters in Quantico, Virginia. Evidence collected would be analyzed at one of the approved national laboratories using protocols established by the CDC.

(1) Joint Operations Center

The **Federal Bureau of Investigation (FBI)** will activate their preestablished City of Portland command post, known as the Joint Operation Center (JOC), for any intentional CBRNE release. The FBI will act as the lead agency for the crime investigation aspect of the incident. From the JOC they will coordinate law enforcement actions for responding to the cause of the incident.

FBI field agents will also mobilize to the incident area. They will set up a command post in the field, usually co-located with the local incident command post. Working within the unified command structure, their staff will be a component of the Operations section, along with fire, local law, medical units, etc. If the field activities grow to a large extent, the FBI field command may expand and become a JOC. Other federal officials, such as senior FEMA officials, will meet at the FBI JOC to support allocation of federal resources between law enforcement and incident mitigation activities.

C. Public Health and Medical Surge

As initial responders to any catastrophic event or other public health emergency Portland Fire and Rescue will call for additional resources as needed and follow MCI protocols. As the incident progresses and it becomes clear the event could cause strain on area hospitals, Incident Command, in conjunction with county or federal agencies, may decide
to designate a Medical Care Point. After the decision to create a MCP has been made policy and guidelines for Medical Care Points shall be followed. The infrastructure for the MCP should be finalized within the first 24 hours of initiating the MCP. Objectives for a MCP include:

- Prevention of overcrowding of hospital facilities, thereby preserving valuable resources for those in need of care
- Providing definitive evaluation and/or decontamination for all patients and definitive hospital care for ambulatory patients
- Promoting active surveillance for disease trends
- Providing care for 100 patients within a 24-hour period of which 10 are critical, 20 serious, and the remainder ambulatory

1. Multnomah County Health Department (MCHD)

In the City of Portland, **Multnomah County Health Department (MCHD)**²³ is responsible for preparing health, medical and emergency response communities to take quick and appropriate actions in response to acute public health threats and emergencies, including CBRNE incidents.

Initial response to a CBRNE incident uses local resources. MCHD and the surrounding medical community may:

- Use passive and/or active surveillance
- Determine the nature and extent of the health impacts
- Collect samples and arrange laboratory analysis
- Define cases and differential diagnosis guidelines
- Investigate sources and contacts
- Initiate treatment such as vaccines and antibiotics
- Isolate and/or quarantine
- Consult and manage resources with contributing/cooperating organizations and community partners, including staffing of command posts, incident facilities, Department Incident Command Post (ICP) located at MCHD, and county and/or regional city EOCs
- Educate the public and provide information through the JIC/JIS
- Establish treatment facilities/shelters and medical care points with community partners
- Distribute pharmaceutical and medical supplies from the Strategic National Stockpile (SNS)

In any CBRNE incident, public health and the medical health system will be integral to the successful resolution and restoration of public safety and normalcy.

Regardless of which CBRNE agent is released, public health will require the support of other response agencies in providing security, transportation, medical treatment, distribution of medical supplies and/or pharmaceuticals, remediation, and a variety of other response activities and should coordinate requests through the appropriate EOC.

Multnomah County health activities include:

- Providing a liaison to the City EOC
- Advising responding agencies regarding the health effects of exposure to the agents or substances that have been deployed
- Providing command, control, and coordination at the public health incident command post
- Coordinating and conducting epidemiological investigations and tracking, especially in the case of patients affected by biological releases
- Providing support for the medical health system by assuring access to appropriate health care such as hospital in-patient, pre-hospital care, and behavioral health
- Providing personnel and laboratory facilities to assist in identifying agents or substances
- Recommending community-level and individual monitoring programs and protocols for victims exposed to CBRNE agents
- Providing PIOs or press releases to support public information regarding the CBRNE agent and the basic precautions and actions the public should take
- Considering the needs of special populations (e.g., elderly and school-age children) that may be affected by the release and coordinating with law enforcement and fire agencies to provide specialized protection (e.g., shelter-in-place, minimum evacuations, bringing prophylaxis to those who cannot mobilize to a POD site)
- Managing medical volunteer placement in coordination with the city or county EOC or State ECC

a) Health Reserve Corps

Multnomah County Health Department has developed the Health Reserve Corps (HRC). The program is a voluntary unit, made up of local licensed health care professionals who may be called upon to assist in the response to large-scale health or medical emergencies including but not limited to: Medical Care Points, mass prophylaxis clinics, and triage centers.

2. Chemical Release Response

MCHD in conjunction with the State of Oregon Department of Human Services

(DHS), DEQ, and U.S. Coast Guard (USCG) will provide information and services to the public and first responder community on treatment for chemical exposure, long term treatment recommendations and follow-up, epidemiological investigation and recovery activities. Release of information will be coordinated through the JIS/JIC.

Resources such as chemical antidotes and the chemical stockpile should be identified and deployed as necessary, and the public health command staff will need to plan for long-term logistical support of such resources.

3. Biological Release Response

MCHD will typically act as the lead agency in a unified command or provide a liaison to the City of Portland EOC during a biological agent release incident. MCHD roles and responsibilities are outlined in the Public Health Emergency Response Plan Tab A – Epidemiology and Surveillance²⁴. In the event of a biological release, MCHD will open an ICP and follow the ICP guidelines found in their respective emergency plans for command, control, and operations.

The MCHD ICP will also communicate with the Oregon State Public Health Agency Operation Center (AOC) located in the Portland Building, 800 NE Oregon Street, Portland. MCHD will work in coordination with state and federal resources, as necessary, to access resources, expertise, or other support in identifying and understanding the biological threats. The Oregon State Public Health Laboratory (OSPHL) and others contracted through the Laboratory Response Network (LRN) will be needed to expedite the identification of the bio agent(s). Public health will propose specific response actions, which may include:

- Plan for providing the most reliable prophylaxis for the public and the response community²⁵
- Coordinate the delivery of the medications²⁶ to primary and secondary POD sites and medical care points ²⁷
- Coordinate with POD volunteers and create a volunteer staffing plan for the duration of long-term POD operations and medical care points

4. Radiological or Nuclear Release Response

Public health departments will provide to the public and first responder community:

- Information on radiation exposure, risk, and travel recommendations
- Epidemiological investigation of exposure, risk and levels of contamination, in conjunction with other local, State, and Federal agencies
- Appropriate medical treatment and follow-up for those exposed to radiation

²⁴http://www.mchealth.org/emergprep/regionalplan/tab_A.pdf

²⁵ http://www.mchealth.org/emergprep/regionalplan/tab_B.pdf

²⁶ http://www.mchealth.org/emergprep/regionalplan/tab_S.pdf²⁷ http://www.mchealth.org/emergprep/regionalplan/tab_C.pdf

5. Explosive Device Response

During an IED threat or actual explosion, public health departments should also alert the entire medical health community to the threat and encourage increased security at all medical health community sites.

6. State and Federal Response

a) Oregon Department of Human Services (DHS)

The **Oregon Department of Human Services (DHS)** has many programs currently in place that support emergency preparedness, planning, and response initiatives. An overarching goal of this Department is protecting public health through services such as monitoring and controlling communicable disease, maintaining vital records, and preparing for bio terrorism attack and radiation identification. The DHS will provide technical expertise, assistance, and laboratory support for IED incidents.

(1) Oregon State Public Health Division²⁸

The Oregon State Public Health Division (OSPHD) includes Emergency Medical Services (EMS) and Radiation Protection Services and ensures highquality resources are available to communities in Oregon. Services include providing on-call staff capable of responding to radiological emergencies and supporting follow-up investigations. These offices also provide information to educate the public and occupational groups on radiation hazards and methods for exposure reduction. Radiation Protection Services can assist first responders with the identification of radioactive isotopes.

(2) Oregon Public Health Preparedness Program

The Public Health Preparedness Program (PHP) develops plans and procedures to better prepare the state of Oregon to respond to bioterrorism and other public health emergencies. Ongoing periodic assessments of public health system capacities related to bioterrorism and other public health emergencies are used to improve planning, coordination, and implementation activities. Responsibilities include coordinating with federal agencies to support state, local, and regional preparedness; ensuring that public health systems have the capacity to respond to public health emergencies; and preparing for and managing the SNS, should it be requested and distributed in Oregon.

(3) Oregon State Public Health Laboratory (OSPHL)

The primary responsibility of the OSPHL is to provide testing in support of community health and to provide laboratory services to Oregon Public Health Division. In coordination with other state laboratories, the OSPHL supports the FBI and local first responders to safely analyze unidentified substances for the presence of biological agents. As applicable, OSPHL ensures that chain of custody procedures are followed for sample transport. During a biological incident, OSPHL would confirm test results and ensure that accurate data is communicated to appropriate public health and health care personnel.

The OSPHL and the LRN laboratories will support rapid identification and verification of a positive finding for biological agents. Existing procedures for sample transport, chain of custody, and communication of positive sample results will be implemented during a biological event. Formal reporting procedures for certain communicable diseases are required under state and federal law. Health care providers and laboratories will use an existing reporting system to alert local and state health officials of a diagnosis or suspicious circumstances surrounding an ill person or a cluster of ill persons.

b) Department of Health and Human Services (HHS)

The **Department of Health and Human Services (HHS)** is the lead federal agency for public health and medical support functions during the response to a natural disaster or CBRNE incident. The agency can also provide assistance in the evaluation of threats to human health and safety through the Agency for Toxic Substances and Disease Registry (ATSDR).

c) Centers for Disease Control and Prevention (CDC)

Centers for Disease Control and Prevention (CDC) is a component of HHS, which is the principal agency within the United States government for protecting public health and safety and providing essential human services. One of the goals of the CDC is to increase the use and development of interventions known to prevent human illness from chemical, biological, and radiological agents. The CDC can provide resources such as subject matter experts, pharmaceutical and medical supplies, and technical advisory staff in response to a CBRNE or other large-scale incident.

D. Hospitals and Health Care System

Most of the health care services in the city of Portland, such as hospitals, clinics, private health care providers, and EMS, are privately owned and operated.

The city of Portland hosts the state-funded Oregon Health and Sciences University (OHSU), which has been designated as the regional hospital. When a CBRNE incident has been recognized, OHSU will support the response and mitigation by coordinating the Regional Hospital Communication System for the urban area. Information will be communicated via this system to and from the hospitals and EMS providers regarding bed space, situational status, available resources, and other pertinent information.

All city of Portland hospitals (and the majority of other hospitals throughout Oregon) are linked to the CDC-supported Sentinel Provider Network. The network consists of health care providers throughout Oregon that report the number of patients with flu-like symptoms. These results are disseminated on a website and could help identify a bioagent release and might even help determine its source area.

Health care system personnel, including those at hospitals and clinics as well as local physicians and EMS responders, will most likely be among the first individuals to recognize an outbreak of illness resulting from release of a biological agent or a naturally occurring epidemic. State law requires physicians to notify local and/or state public health departments of suspected cases of certain diseases. All biological agents are included in that notification process. This process includes notification of the FBI. However, in the case of a recognized threat, hospitals should communicate through their Hospital Emergency Incident Command System (HEICS), and emergency staff will communicate findings to the public health ICP, who will forward the information to the city and/or county EOC so that unfolding information can be properly disseminated.

Heightened awareness among infection control professionals aids in the recognition of the release of a biological agent or a communicable disease. Infection control professionals are involved in many aspects of hospital operations. Consequently, they may recognize changing patterns or clusters in a hospital or in a community that warrant significant concern. Public health will support the epidemiological studies and tracking of patients.

EMS provides emergency field care and transport for victims of a CBRNE emergency. In the case of a covert biological release, the EMS personnel must likewise be alert to recognizing the signs of unusual occurrences in the population they serve.

EMS will also play a major role in protecting the hospitals. Assuring that all patients are sufficiently decontaminated before transport allows their unit to stay in service and prevents gross contamination from entering the hospital emergency department and general areas.

Each hospital in the city of Portland will respond to a CBRNE incident in the area by activating their EOC and operating under HEICS. The hospital EOC(s) will coordinate with the public health ICP to share critical information regarding presenting patients, security threats, and resource needs. The public health ICP will share hospital information with the local EOC.

Other medical health system activities include:

- Conduct triage and decontamination at the medical centers throughout the region
- Treatment of the victims of the CBRNE release
- Identify and prepare alternate care sites if there is a surge of victims
- Share information with OHSU as they initiate their emergency management and communications plans and coordinate communication via the Regional Hospital Communications System

1. Chemical, Radiological and Nuclear Release Response

Hospitals will coordinate with OHSU and share data gained from the self-presenting patients. OHSU will coordinate with the public health ICP. The hospitals will request needed supplies such as Mark 1 antidote kits through the public health ICP, and the public health command staff will need to plan for long-term logistical support of such resources. Any positively identified chemical must be immediately relayed to the appropriate PSAPs and city and county EOCs so that local medical centers can be notified as to what to expect for purposes of protecting the hospitals with adequate decontamination and treatment. Radiation monitoring equipment is distributed throughout the system for use in this effort.

2. Biological Release Response

Health care providers will be at the forefront of monitoring a covert biological release through surveillance and tracking, coordinating with public health, and reporting to OHSU, which will in turn report to the public health ICP.

Medical facilities may need to provide a quarantine or isolation area for affected persons, both public and medical personnel. A plan for immediate and long term support of hospital staff and their families should be put in place and long-term staffing schedules created by the HEICS staff at the EOC.

3. Explosive Device Response

In the event of an IED explosion or release in the community, the health system should prepare to receive a large number of trauma and burn patients and coordinate with OHSU to manage patients to the appropriate facilities. Hospitals, clinics and EMS should increase security and awareness of secondary threats to the health care system.

4. Veterans Administration

The **Veterans Administration Portland Medical Center** has been designated as a Federal Coordinating Center for the National Disaster Medical System (NDMS).

NDMS was created to care for victims of any incident that exceeds the medical care capability of any affected regional, state, or federal medical care system.

The NDMS may be activated for a CBRNE incident in Portland. Procedures are outlined in the Portland Metropolitan Area NDMS Operations Plan.

E. Public Works Agencies

Portland public works bureaus include **Environmental Services, Transportation, Maintenance, and Water Works.** Metro area debris haulers will also play a large role in debris management.

Coordination among the public works agencies, incident command and operational EOCs is essential during a CBRNE incident. Public works and transportation agencies may be called upon to support the activation of emergency facilities and any field emergency command post.

Public works typically provides the following functions during a CBRNE incident response:

- Coordinate with IC/Unified Command as required
- Ensure adequate water supply for fire fighting operations
- Assist with traffic management, establish road closures and detours, and assist with large-scale evacuations
- Provide technical assistance to the incident commander with respect to flooding, structure integrity assessments, and impact assessments of infrastructure
- Close and/or repair damaged segments of the transportation infrastructure
- Develop and initiate emergency collection, sorting, and disposal routes and sites for debris clearance and evidence collection from public and private property

They will also provide a PIO or fact sheet/public information bulletins for use by the JIC.

Depending on the specific materials that have been released, public works agencies may have the following unique roles and responsibilities

1. Chemical Release Response

Public works may be needed to support the mitigation and remediation of contaminated structures that involves more than decontamination. Area containment of decontamination water runoff may be one responsibility.

2. Biological Release Response

Response activities associated with a biological incident may incorporate a number of entities within the public works bureaus. Most likely support would be required at points of distribution (POD) sites, medical care points and alternative treatment facilities. Response activities may include evaluating traffic patterns and identifying parking issues; designating vehicles for transporting personnel, equipment, and supplies to and from the site(s); and providing equipment and supplies to support overall operations at POD sites, medical care points and/or treatment facilities.

Public works bureau activities also include assisting law enforcement in establishing evacuation routes and exclusionary zones. They may also be requested to support quarantine or crowd control measures through development of useful evacuation or incoming support traffic management plans.

3. Radiological and Nuclear Release Response

The public works agencies would respond during a radiological release much as they would after a chemical release.

4. Explosive Device Response

Public works would support fire and law enforcement with debris management, barricades and other equipment needed to secure the incident site or move people.

- 5. Tri-Met Mass Transit may provide the following during a CBRNE event
 - **a**) Coordinate with the IC/UC as required
 - **b**) Maintain or restore core fixed-route mass transit service to the region
 - c) If needed, provide buses to serve as temporary shelter (warming bus, cooling station)
 - **d**) If needed, assist in evacuation by providing transport of civilians or emergency workers (on a limited basis does not apply to a general evacuation of the population)

6. State Response

The **Oregon Department of Transportation (ODOT)** can provide staff, equipment, support, and valuable resources during a response to a CBRNE incident. ODOT may serve as partners with other agencies by working with Oregon Emergency Management (OEM) to coordinate and allocate resources if incidents impact Oregon's system of highways, roads, bridges, railways, and public transportation services.

F. Emergency Management

1. Portland Office of Emergency Management

In the event of a CBRNE event the City of Portland EOC will activate.

The EOC, when activated, serves as a centralized coordination center to facilitate policy making, and provide assistance to IC/UC in the direction of responding forces in large-scale emergencies.

- a) The **Mayor** or successor shall have ultimate responsibility for the resolution of conflicts regarding the application of limited resources to a variety of concurrent emergency situations.
 - The Mayor's authority and responsibility is outlined in Title 15 of the City Code²⁹
- **b)** The **Director of Emergency Management** has the following responsibilities concerning the EOC which include but are not limited to the following:
 - Monitor actual and potential emergency conditions and open the EOC when appropriate
 - Determine the overall level of EOC response and activate the EOC to an appropriate level to ensure satisfactory incident management
 - Provide briefings to the DPC regarding status of the situation and identified policy needs
 - Notify the County and other contiguous counties impacted by the incident of the EOC activation
 - Assure that any declarations of disaster or emergency declarations are processed to facilitate formal assistance requests from the state and federal government, and work with DPC to apply emergency powers, and expedite decision-making efforts of the EOC staff and responders
 - Coordinate the implementation of city level continuity of operations and continuity of government procedures

²⁹ http://www.portlandonline.com/auditor/index.cfm?c=28179

- Through the JIC/JIS, disseminate emergency information and instructions to city officials, neighboring government jurisdictions, and the public
- Advise and/or assist the Mayor as appropriate

During an emergency event, including CBRNE incidents, the primary role of POEM remains emergency operations coordination and facilitation. As outlined in the Basic Emergency Operations Plan (BEOP), POEM will facilitate incident management steps through the City's EOC or other available command center as necessary. POEM staff will ensure that EOC responders have the necessary resources and contacts to operate to the best of their ability.

The Mayor, President of the Council, and Bureau Directors will confer as necessary to aid in making the policy decisions needed and for the expedient recovery of the city as a whole. Key directors, representing bureaus playing primary roles and whose operations personnel are in the unified command seat of the event, such as police, fire and transportation will be immediate advisors to the Mayor. All roles of the Disaster Policy Council (DPC), the Emergency Management Committee (EMC), and the Mayor are outlined in the BEOP, Functional Annex Emergency Operations Center Activation Guidelines³⁰, the DPC Guidebook and City Code Title 15³¹ and Charter Title 3 Administration³².

Policy decisions will be made by the Mayor with advisement of the incident/unified commander.

(1) Chemical, Radiological, and Nuclear Release Response

Once the initiating event has been brought under control by the field responders, a removal or remediation plan will need to be created by or approved by the Operations and Planning sections in the EOC. Affected soils, buildings, waters, and other materials will need to be decontaminated, treated, and/or disposed. The EOC and/or field IC will decide on final remedy decisions and support state or federal environmental agencies (e.g., Oregon Department of Environmental Quality [OR DEQ], or the EPA) with their environmental remediation and restorations activities.

(2) Biological Release Response

In the case of a biological release, the harmful agent may or may not be easily remediate in a traditional way. Where the agent can be isolated and contained the EOC will provide the same type of support as in a chemical release. In cases where the release is manifested through symptomatic persons, emergency management for the situation will support the public

³⁰ City of Portland - Basic Emergency Operations Plan "Draft" EOC Activation Guidelines

³¹ http://www.portlandonline.com/auditor/index.cfm?c=28179 ³² http://www.portlandonline.com/auditor/index.cfm?c=28168

health agencies in isolating the disease, providing prophylactic medications as a remedy, quarantining or isolating affected areas, and supporting fire and public health with their priorities.

2. Multnomah County Emergency Management

Multnomah County Emergency Management (MCEM) provides comprehensive emergency management planning for county agencies in preparing for, mitigating against, responding to, and recovering from disasters and emergencies impacting Multnomah County. MCEM will facilitate the coordination of county services during an emergency, including but not limited to: animal services; health and social services; road maintenance, bridge services and public works.

They also provide an interface between the city of Portland EOC, and the state ECC, facilitating resource support, processing of emergency declarations and providing continued support.

3. Oregon Office of Emergency Management

The **Oregon Office of Emergency Management** (**OEM**)³³ is responsible for coordinating and facilitating emergency planning, preparedness, response, and recovery activities with the state and local emergency services agencies and organizations. OEM is responsible for activating the State Emergency Coordination Center (ECC) in Salem and operating the Oregon Emergency Response System (OERS).

a) State Emergency Coordination Center

The State ECC will support county level EOC's as required. The ECC will coordinate communications, federal resource requests and allocations, and make state resources available to support the response activities. The State ECC will facilitate communication and coordination with the following federal agencies.

b) Oregon Emergency Response System (OERS)

The purpose of the **Oregon Emergency Response System (OERS)** is to coordinate and manage state resources in response to natural and technological emergencies and civil unrest involving multi-jurisdictional cooperation between all levels of government and the private sector. OERS is the primary point of contact by which any public agency provides the state notification of an emergency or disaster, or requests access to state or federal resources.

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³³ http://www.oregon.gov/OOHS/OEM/index.shtml

4. Federal Government

a) Federal Emergency Management Agency (FEMA)

FEMA coordinates the non-technical aspects of emergency response and recovery from a disaster incident. FEMA administers disaster assistance programs that provide assistance to individuals and state and local governments during and following disasters.

(1) FEMA Regional Operations Center

The pre-established FEMA Regional Operations Center (ROC) will activate at the FEMA region X office in Bothell, Washington while FEMA agency officials are mobilizing to the field. Once a Joint Field Office (JFO) has been established and is operational, the ROC may stand down.

b) The Department of Homeland Security (DHS)

The **Department of Homeland Security (DHS)** is responsible for coordinating federal operations within the United States to prepare for, respond to, and recover from terrorist attacks, major disasters, and other emergencies. HSPD-5 further designates the Secretary of Homeland Security as the "Principal Federal Official" for domestic incident management. In this role, the Secretary is also responsible for coordinating federal resources that may be deployed to provide technical assistance once a state of emergency has been declared.

(1) Joint Field Office

A JFO may be established during an incident involving the arrival of numerous federal responders. The JFO is a temporary facility which provides a central meeting point for federal, tribal, state, and local representatives who have incident support and coordination responsibilities.

(2) National Operations Center

The National Operations Center (NOC) is located near Washington, D.C., and serves as the primary national-level multi-agency situational awareness and operational coordination center. The NOC includes representatives from the Department of Homeland Security and other Federal departments and agencies. It also acts as the nerve center for ongoing information sharing and incident management 24 hours per day, 7 days per week, 365 days per year.

V. ADMINISTRATION AND LOGISTICS

The Emergency Management Steering Committee will serve as the focal point for review and critique of this plan.

A. Regional Response Partners

Due to the nature of terrorist events, which have a major consequences that can overwhelm the capability of local governments to respond, the City of Portland relies on mutual aid from agencies within the urban area including most first responder agencies in Clackamas, Columbia, Multnomah and Washington Counties in Oregon and Clark County in Washington; as well as the Port of Portland Police and Fire and Tri-Met Transit Police.

B. Mutual Aid/Interagency Agreements

All law enforcement agencies have formal or informal mutual aid agreements with neighboring counties and with the City of Portland. There is a Master Inter-local Agreement which has been an overarching mutual aid agreement used for law enforcement in Oregon.

Most of the public works agencies in Oregon are signatory to a cooperative assistance agreement, and the larger public works agencies are signatory to a cooperative assistance agreement with the Oregon Department of Transportation (ODOT).

1. Existing Mutual Aid Agreements

- Emergency Management Assistance Compact (EMAC)—Provides legal agreement and standard operating procedures for states to receive interstate aid in a disaster. Passed through Public Law 104-321 approved 1996
- Office of Management & Finance, Communication Division—Intergovernmental agreement as a multi-agency provider; agreements with Qwest
- Portland Office of Emergency Management—agreements with Liaison Agency members
- Bureau of Fire & Rescue—All neighboring fire departments as well as the State Department of Forestry
- Bureau of Police—Agreements with 15 law enforcement agencies, city, county, departments, port, State and Federal
- Policy 631.30 Cooperation with other agencies—File #9894; 1996 empowers law enforcement agencies to request assistance from other units of government listed in the agreement

- Bureau of Maintenance—written Public Works Cooperation Assistance Agreements with Multnomah Co., Gresham & Multnomah County Drainage Districts, State Highway Division, and others
- Bureau of Environmental Services—agreements with Consolidated Drainage Districts (MCDD, Peninsula Drainage District Nos. 1 & 2, and Sandy Drainage District)
- Bureau of Water Works—agreements with Army Corps of Engineers, Multnomah County Drainage District, water utilities in Oregon and Washington and other public and private sector agreements for the restoration of water service

VI. PLAN DEVELOPMENT AND MAINTENANCE

The Emergency Management Steering Committee, will be responsible for updating this plan.

POEM planning staff will coordinate the update process and can be contacted at 503-823-4375.

Date of Exercise or proposed exercise to test, TOPOFF 4, October 2007.

Date of next update TBD

VII. LEGAL AUTHORITIES

To achieve the strategic security goals set for the city of Portland it is understood that governmental responsibility for responding to emergencies lies at the local government level. Neighboring jurisdictions and state and federal agencies will not assume authority or responsibility for responding to any emergency incident, including a CBRNE event, unless the response resources of the local government are exhausted or local jurisdictions request this outside assistance. When requested, these agencies will provide support to local command and control. The city of Portland legal authorities are outlined in the city of Portland Emergency Code, Title 15

- City
 - Basic Emergency Operations Plan
- County
 - Multnomah County Emergency Operations Plan (EOP)
 - Multnomah County Public Health Emergency Response Plan
- State
 - Hazard specific annexes to the Oregon Emergency Management Plan (under development)
 - Hazard specific annexes to the Oregon Public Health Emergency Preparedness Plan
- Federal

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- Homeland Security Act of 2002
- Homeland Security Presidential Directive (HSPD) 5: Management of Domestic Incidents
- HSPD-7: Critical Infrastructure Identification, Prioritization, and Protection
- HSPD-8: National Preparedness
- HSPD-10: Biodefense for the 21st Century
- U.S. Department of Homeland Security (DHS), *National Incident Management* System (NIMS)
- DHS, National Response Plan (NRP)
- Presidential Directives 39 and 62 which direct primary terrorism investigative authority to U.S. Department of Justice/FBI

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TAB 1 CHEMICAL AGENT HAZARDS

BLISTER AGENTS/VESICANTS

DESCRIPTION: The most likely routes of exposure for blister agents and vesicants are inhalation, dermal contact, and ocular contact. Vesicants are highly reactive chemicals that combine with proteins, DNA, and other cellular components and result in cellular changes. These agents cause blistering of the skin and mucous membranes on contact. Phosgene oxime is a type of agent called an urticant or nettle agent, because on contact with the skin, it produces intense itching and a rash similar to hives. It is also referred to as a corrosive agent because of the type of skin and tissue damage it causes.

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
Mustard gas & sulfur mustard (H, HD, and HT)	Smells like garlic, onions, horseradish, or sweet and sometimes has no odor. Can be a vapor (the gaseous form of a liquid), an oily- textured liquid, or a solid. Clear to yellow or brown when it is in liquid or solid form.	Dermal: skin erythema and yellow blistering (delayed 2- 24 hours), second- and third- degree burns (liquid). Respiratory: cough, bloody nose, dyspnea, pneumonitis, and acute lung injury. Ocular: conjunctivitis, eyelid edema, and burns. Gastrointestinal (ingestion route): vomiting, abdominal pain, and diarrhea. Long-term exposure: Human carcinogen.	Rapid onset of effects (minutes) but could be delayed (2-24 hours)	No antidotes exist. Rapidly remove the agent from the body as soon as possible after exposure to prevent or decrease tissue damage to the body. Immediately wash any exposed part of the body thoroughly with plain, clean water. Flush eyes with water for 5 to 10 minutes. Do not cover eyes with bandages, but protect them with dark glasses or goggles. Ingestion: do not induce vomiting.	N/A	Can persist 1 to 2 days in the environment under average weather conditions; weeks to months under very cold conditions. Breaks down slowly in the body, so repeated exposure may have a cumulative effect. Vapor is heavier than air, so it will settle in low-lying areas. Bulk mustard can persist for decades in soil or water. Sulfur mustard does not move from soil to groundwater nor build up in the tissues of animals.
Nitrogen mustard (HN- 1, HN-2, and HN-3)	Oily-textured liquid, a vapor, or a solid. Liquid at room temperature (70°F).	Dermal: skin erythema and blistering (delayed 224 hours), second- and third- degree burns (liquid). Respiratory: cough, dyspnea,	Rapid onset of effects (minutes) but could be delayed (2-24 hours)	No antidotes exist. Rapidly remove the agent from the body as soon as possible after exposure to prevent or decrease tissue	N/A	Vapor is heavier than air, so it will settle in low-lying areas. May persist in air for a few days before being broken

City of Portland CBRNE Response Plan Chemical Tab 1 – Page 1 Version -10

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
	Smells fishy, musty, soapy, or fruity. Clear, pale amber, or yellow-colored (liquid or solid). HN-1: faint, fishy or musty odor HN-2: soapy odor at low conc. and fruity odor at high conc. HN-3: may smell like butter almond.	pneumonitis, and acute lung injury. Ocular: conjunctivitis, eyelid edema, and burns. Gastrointestinal (ingestion route): vomiting, abdominal pain, and diarrhea. Long-term exposure: Probable human carcinogen.		damage to the body. Immediately wash any exposed part of the body thoroughly with plain, clean water. Flush eyes with water for 5 to 10 minutes. Ingestion: do not induce vomiting.		down. Will be broken down in water quickly. Does not accumulate in the food chain.
Lewisite (L)	Oily, colorless liquid (pure form). Amber to black (impure form). Odor like geraniums.	Dermal: immediate skin erythema and blistering (212 hours). Note: blister begins as a small blister in the middle of the red areas and then expands to cover the entire reddened area of skin. Cardiovascular: Hypotension (with high-dose exposure), "Lewisite shock" or low blood pressure, Respiratory: cough, dyspnea, pneumonitis, and acute lung injury. Ocular: conjunctivitis, eyelid edema, and burns. Gastrointestinal (ingestion route): vomiting, abdominal	Clinical effects - immediate	Remove lewisite from the body as soon as possible and provide supportive medical care in a hospital setting. An antidote is available and is most useful if given as soon as possible after exposure.		Vapor is heavier than air, so it will settle in low-lying areas. Remains a liquid under a wide range of environmental conditions (below freezing to very hot temps), so it can persist for in the environment for long periods of time.

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
		pain, and diarrhea. Contains arsenic: can exhibit effects similar to arsenic poisoning, including stomach ailments and low blood pressure.				
Phosgene oxime (CX)	Colorless (solid form) and yellowish-brown (liquid). Irritating odor.	Dermal: blistering (within 1 hour), immediate blanching and erythema, pain occurring within a few seconds. Within about 15 minutes: skin develops hives. After 24 hours: whitened areas of skin become brown and die followed by scab formation. Respiratory: cough, dyspnea, pneumonitis, and acute lung injury Dermal absorption or inhaling: fluid in the lungs (pulmonary edema) with symptoms of shortness of breath and cough Ocular: conjunctivitis, eyelid edema, and burns	Clinical effects - immediately	No antidote exists. Treatment consists of removing the agent from the body as soon as possible and providing supportive medical care in a hospital setting.	N/A	Vapor is heavier than air, so it will settle in low-lying areas. Does not persist in the environment. Breaks down in soil within 2 hours when temperatures are normal and breaks down in water within a few days. When released to air, will exist solely in the gas- phase; vapors are broken down in the atmosphere but this is a very slow process. Will not stick to the soil, but small amounts may evaporate into air or travel below the soil surface and contaminate groundwater. Does not accumulate in the food chain.

INDUSTRIAL CHEMICALS/AGENT HAZARDS

INDUSTRIAL CHEMICALS/AGENTS

DESCRIPTION: Blood agents are chemicals that exhibit adverse effects following their absorption into the bloodstream. Caustic agents exhibit adverse effects by burning/corroding mucous membranes, skin, and eyes following direct contact. Choking/lung/pulmonary agents can cause severe irritation or swelling of the respiratory tract through inhalation and/or ingestion.

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
Blood Agents						
Arsine (and Stibine)	Colorless, flammable, toxic gas. Arsine: nonirritating gas with a mild odor (odorless at low doses and garlic/fishy odor at higher doses). Stibine: much more noticeable odor (raw eggs).	Common symptoms within 2-24 hours of low-dose exposure: • Weakness/fatigue • Headache • Confusion • Shortness of breath/rapid breathing • Nausea, vomiting, and/or abdominal pain • Red or dark urine • Yellow skin and eyes (jaundice) • Muscle cramps Exposure to liquid arsine can result in frostbite. Symptoms associated with high-dose exposure: • Loss of consciousness	Inhalation is the major route of exposure. Depending on the intensity of exposure, symptoms may occur 2 to 24 hours after exposure. Acute exposure to high doses of arsine can be immediately fatal.	No antidote exists. Leave the area and seek fresh air. Remove your clothing, rapidly wash your entire body with soap and water, and seek medical care.	Odor is not an adequate indicator of arsine's presence and does not provide reliable warning of hazardous concentrations.	Vapor is heavier than air, so it would be more likely to settle in low-lying areas.

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
		ConvulsionsParalysisRespiratory failure, death				
Carbon monoxide	Odorless colorless gas.	Common symptoms include headache, dizziness, weakness, nausea, vomiting, chest pain, and confusion. Symptoms associated with high-dose ingestion exposure: loss of consciousness and death.	Unless suspected, carbon monoxide poisoning can be difficult to diagnose because the symptoms mimic other illnesses. People who are sleeping or intoxicated can die from carbon monoxide poisoning before experiencing symptoms.	Leave the area and seek fresh air.	No information	No information
Cyanide	 Exists in various forms, including: Colorless gas (HCN or CNCI). Crystal form (NaCN or KCN): Pale blue liquid. May carry a bitter almond smell. 	Common symptoms with low-dose exposure: •Rapid breathing • Restlessness •Almond-like odor in the breath • Dizziness/Headache •Weakness • Nausea and vomiting •Rapid heart rate Common symptoms with high-dose exposure: • Convulsions •Low blood pressure •Slow heart rate • Loss of consciousness	Exposure can occur through inhalation, ingestion (cyanide salts), and dermal absorption. At low levels of exposure to cyanide compounds, most of the cyanide and its products leave the body within the first 24 hours after exposure.	Leave the area where the cyanide gas was released and get to fresh air. Remove your clothing, rapidly wash your entire body with soap and water, and seek medical care. Cyanide poisoning is treated with specific antidotes and supportive medical care in a hospital setting.		Most cyanide in surface water will form hydrogen cyanide and evaporate. Some cyanide in water will be transformed into less harmful chemicals by microorganisms (plants and animals of very small size) or will form a complex with metals such as iron. The half- life of cyanide in water is not

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
		 Lung injury Respiratory failure leading to death 				known. Cyanide in water does not build up in the bodies of fish. Cyanides are fairly mobile in soil. Cyanides usually do not seep into underground water.
Sodium Monofluoroace tate (compound 1080)	No Information	Possible effects of acute exposure include metabolic acidosis, hypotension, dysrhythmias, seizures, coma, and respiratory depression (1-3)	Clinical effects usually develop within 30 minutes to 2.5 hours of exposure but might be delayed as long as 20 hours.	No information	No biologic marker is available.	No information
Caustic Agents						
Hydrogen fluoride (Hydrofluoric acid)	Colorless gas or a fuming liquid. Can also be dissolved in water.	Inhalation: can burn lung tissue and cause swelling and fluid accumulation in the lungs (pulmonary edema) Dermal contact: may cause severe burns that develop after several hours and form skin ulcers. High-dose exposure: death from irregular heartbeat or from fluid buildup in the lungs; systemic symptoms include hypocalcemia and hyperkalemia, which leads to dysrhythmias, seizures,	Exposure to low concentrations on the skin may not show effects right away. Severe pain at the exposure site may be the only symptom for several hours. Visible damage may not be shown until 12 to 24 hours after the exposure.	Leave the area and seek fresh air. Remove your clothing, rapidly wash your entire body with soap and water, and seek medical care. Do not induce vomiting if swallowed. Do not give the person activated charcoal. If the person is alert and able to swallow, give calcium or magnesium- containing antacid tablets with 1 to 2	No information	Fluorine cannot be destroyed in the environment; it can only change its form. Fluorides may be taken up from soil and accumulate in plants, or they may be deposited on the upper parts of the plants in dust. Fluoride accumulates in the skeletal tissues of terrestrial animals

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
Cholring/Lung/	Pulmonom: A gonto	and possibly death		glasses of water/milk. Calcium gluconate gels, solutions, and medications are used to neutralize the effects.		that consume fluoride- containing foliage.
Ammonia	Colorless gas with a very sharp odor.	Inhalation exposure: ocular, nasal, and respiratory irritation; eye redness and lacrimation, nose and throat irritation, cough, suffocation or choking sensation, and dyspnea. Dermal and ingestion exposure: corrosive effects to mucous membranes and burns on skin, eyes, nose, throat, or lungs.	Most of the ammonia that enters the body from food or water rapidly changes into other substances that will not cause harm. The rest of this ammonia leaves the body in urine within a couple of days. Ammonia's pungent odor and irritating properties usually provide adequate warning of its presence.	There is no antidote for ammonia poisoning. Treatment consists of support of respiratory and cardiovascular functions. Leave the area and seek fresh air. Remove contaminated clothing while flushing exposed areas. Irrigate exposed or irritated eyes with plain water or saline for at least 15 minutes.	No biologic marker is available for ammonia exposure.	Ammonia does not last very long in the environment. In soil or water, plants and microorganisms rapidly take up ammonia. In the air, ammonia will last about 1 week. Ammonia does not build up in the food chain but serves as a nutrient for plants and bacteria.
Bromine	Liquid at room temperature. Brownish-red color with a bleach-like odor.	Dermal contact: general irritation and burning. Ingestion: nausea and vomiting. Inhalation: irritation to mucous membranes, headache, and dizziness. Liquid bromine that	Primary route of exposure is by inhalation. Direct contact with skin, mucous membranes, and tissues results in immediate irritation and burning	No specific antidote exists for bromine poisoning. Leave the area and seek fresh air. Remove contaminated clothing while flushing exposed areas.	No information	Bromine gas is heavier than air, so it would settle in low-lying areas.

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
		touches skin may first cause a cooling sensation followed by a burning feeling.	effects.			
Chlorine	Chlorine gas has a pungent, irritating odor, like the odor of bleach, and is yellow-green in color. Not flammable but can react explosively with other chemicals such as turpentine and ammonia.	Common symptoms with acute exposure: • Coughing •Chest tightness •Burning in nose, throat, and eyes •Watery eyes •Blurred vision • Nausea and vomiting • Burning pain, redness, and blisters on the skin if exposed to gas; skin injury similar to frostbite if exposed to liquid chlorine •Difficulty breathing •Fluid in the lungs (pulmonary edema) within 2 to 4 hours	When chlorine gas comes into contact with moist tissues such as the eyes, throat, and lungs, an acid is produced that can damage these tissues. Risk for exposure depends on how close they are to the place where the chlorine was released.	Leave the area and seek fresh air. Treatment consists of removing the chlorine from the body as soon as possible and providing supportive medical care in a hospital setting.	No antidote exists for chlorine exposure	The gas stays close to the ground and spreads rapidly. When released to air, chlorine will react with water to form hypochlorous acid and hydrochloric acid, which are removed from the atmosphere by rainfall. If released to soil, chlorine will react with moisture forming hypochlorous acid and hydrochloric acid. Does not accumulate in the food chain.
Methyl bromide		Poisoning primarily occurs after inhalational exposure, but concurrent dermal exposure might also occur. Inhalational: cough and dyspnea, which can develop into pneumonitis	Onset of symptoms might be delayed 1 to 48 hours. Symptoms from inhalation exposure might be delayed up to 4-5 days.	No information	No specific test for methyl bromide is available but detection of elevated bromide levels in serum (reference level: 50-100 mg/L)	No information

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
		and pulmonary edema.			might indicate that an exposure has occurred.	
Methyl isocyanate	Colorless liquid at room temperature with a pungent odor. Volatile and explosive in air. Flammable liquid that readily evaporates when exposed to air.	Acute symptoms include cough, dyspnea, chest pain, lacrimation, eyelid edema, and unconsciousness. Chronic symptoms include acute lung injury, cardiac arrest, and death and can occur 24-72 hours following exposure. May be a dermal and respiratory sensitizer.	Exposure to methyl isocyanate typically occurs through inhalation or dermal absorption. Toxicity might develop over 1 to 4 hours after exposure. Odors of methyl isocyanate may not provide adequate warning of hazardous concentrations. Acute exposure to high concentrations of methyl isocyanate may result in delayed onset of pulmonary edema and risk of secondary infection of the lungs or eyes.	Treatment consists of removal of the victim from the contaminated area and support of respiratory and cardiovascular functions.	No biologic marker for methyl isocyanate exposure is available. There is no antidote for methyl isocyanate.	N/A
Osmium tetroxide	Colorless, crystalline solid or pale-yellow mass with an unpleasant, acrid, chlorine-like odor.	Symptoms include eye irritation, irritation of the respiratory system, lacrimation, visual disturbance, conjunctivitis, headache, cough, dyspnea (breathing difficulty), and dermatitis, Repeated or prolonged	Irritation is generally the initial symptom of exposure to low concentrations of osmium tetroxide vapor. In most cases, recovery occurs in a few days. This substance is	Leave the area and seek fresh air. Remove contaminated clothing while flushing exposed areas.	No information	Not expected to persist in the environment.

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Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
		contact with skin may cause dermatitis.	regarded as having poor warning properties.			
Phosgene	Poisonous gas at room temperature appearing colorless or as a white to pale yellow cloud. It has a pleasant odor of freshly cut hay (low conc.). Odor may be strong and unpleasant at high concentrations.	Acute symptoms include coughing, burning sensation in the throat and eyes, watery eyes, blurred vision, difficulty breathing, nausea and vomiting. Skin contact can result in lesions similar to those from frostbite or burns. Symptoms from exposure to high concentrations of phosgene include developing fluid in the lungs (pulmonary edema) within 2 to 6 hours. Delayed effects may be coughing up white/pink fluid, low blood pressure and heart failure	Exposure to phosgene may cause delayed effects that may not be apparent for up to 48 hours after exposure, even if the person feels better or appears well following removal from exposure.	No antidote exists for phosgene. Treatment for phosgene exposure consists of removing phosgene from the body as soon as possible and providing supportive medical care in a hospital setting.	People who have been exposed to phosgene should be monitored for 48 hours afterward.	When liquid phosgene is released, it quickly turns into a gas that stays close to the ground and spreads rapidly. Phosgene gas is heavier than air, so it would be more likely found in low-lying areas. Phosgene gas is degraded in the atmosphere by reacting with substances commonly found in the air, but this is a very slow process. When released to soil, phosgene will not stick to the soil. It does not accumulate in the food chain.

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
Phosphine	Colorless, flammable, and explosive gas at ambient temperature. Has odor of garlic or decaying fish.	Acute symptoms include pain in the diaphragm, nausea, vomiting, excitement, and a phosphorus smell on the breath. Exposure to high concentration may result in weakness, bronchitis, pulmonary edema, shortness of breath, convulsions, and death. Possibly delayed or prolonged effects include pulmonary edema, convulsions, and liver injury. Liquid phosphine in contact with skin can cause frostbite.	Primary route of exposure is inhalation and symptoms may have a delayed onset of 72 hours or more. Dermal exposure can occur and may result in systemic effects (possibly delayed).	There is no antidote for phosphine poisoning. Treatment consists of support of respiratory and cardiovascular functions. Following inhalation exposure, symptomatic patients should receive supplemental oxygen for dyspnea and should be observed for at least 72 hours with repeated chest examinations and other appropriate studies.	Odor is not an adequate indicator of phosphine's presence and may not provide a reliable warning of hazardous concentrations.	Breaks down rapidly in the environment. In air, phosphine will exist solely as a gas. Half of the phosphine in the air degrades in about 1 day. At high concentrations, vapors may spontaneously combust in air. It does not accumulate in the food chain.
Phosphorus	White phosphorus is a colorless, white, or yellow waxy solid with a garlic-like odor.	Symptoms following inhalation exposure include coughing and irritation of the throat and lungs. Long-term inhalation exposure may result in "phossy jaw," which involves poor wound healing of the mouth and breakdown of the jaw bone. Effects of ingestion: liver, heart, or kidney damage, vomiting, stomach cramps,	No information	Remove contaminated clothing while flushing exposed areas.	No information	In water with low oxygen, white phosphorus may degrade to a highly toxic compound called phosphine, which eventually evaporates to the air and is changed to less harmful chemicals. White phosphorus can build up slightly in the bodies of fish that live in

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
		drowsiness, or death. Symptoms following				contaminated lakes or streams.
		dermal contact include burning and/or liver, heart, and kidney damage				In deep soil or sediments with little oxygen, white phosphorus may remain unchanged for many years.
						Does not persist in air (minutes to days).
						Moderately bioconcentrates in aquatic organisms.
Sulfuryl fluoride	Colorless, odorless gas	Symptoms following acute exposure include lacrimation, nose or throat	No information	Remove contaminated clothing while flushing exposed areas.	No information	No information
		irritation, cough, dyspnea, paresthesias, and seizures.		Leave the area and seek fresh air.		
		Dermal contact with the liquid can cause frostbite.				
Metals						
Arsenic	Steel grey metal- like material. White or colorless powders (inorganic and organic) with no smell or taste	Symptoms following acute ingestion of toxic amounts of inorganic arsenic include severe gastrointestinal signs and symptoms (e.g., vomiting, abdominal pain, and	Most arsenic leaves the body within a few days; inorganic and organic arsenic is primarily cleared from the body via urine.	No information	Measuring arsenic in urine is the most reliable means for detecting exposure.	Cannot be destroyed in the environment but can change form or become attached to other particles.
		to dehydration and shock (possibly death). Symptoms following				Arsenic that is attached to other particles can stay in the air for many

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Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
		inhalation: sore throat and/or irritated lungs.				days and travel long distances.
		Chronic ingestion or inhalation of low levels of inorganic arsenic can cause a darkening of the skin and				Most arsenic in water ends up in soils and sediments.
		the appearance of small "corns" or "warts" on the palms, soles, and torso.				Fish and shellfish can accumulate arsenic; most of this arsenic is in an organic form called arsenobetaine that
						is much less harmful.
Barium	A silvery-white metal that exists in nature only in ores containing mixtures of elements.	Ingestion of certain forms in toxic amounts leads to gastrointestinal symptoms (e.g., vomiting, abdominal pain, and watery diarrhea). Within 1-4 hours of ingestion, profound hypokalemia develops in certain instances and potassium levels <1.0 mmol/L are associated with generalized muscle weakness that might progress to paralysis of the limbs and respiratory muscles.	Barium compounds that do not dissolve well, such as barium sulfate, are not generally harmful. Primary route of excretion is through the feces. Elimination half-life of absorbed barium is about 3 days.	No information.	A case in which an elevated spot urine barium level (>7 μg/L) exists (20), as determined by commercial laboratory tests.	Barium compounds such as barium sulfate and barium carbonate, which do not dissolve well in water, can last a long time in the environment. Fish and aquatic organisms can accumulate barium.

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate	
Mercury	The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas. It can also occur as an inorganic salt, which is usually a white powder or crystal. Vapors are colorless and odorless. Mercuric sulfide is a red powder that turns black after exposure to light	Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems. Short-term exposure to high levels of metallic mercury vapors may cause lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation.	No information	Chelation therapy is the treatment of choice for reducing the body burden of mercury.	Blood or urine samples are used to test for exposure to metallic mercury and to inorganic forms of mercury. Mercury in whole blood or in scalp hair is measured to determine exposure to methylmercury.	Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.	
Thallium	Pure thallium is a bluish-white metal that is odorless and tasteless. When it is combined with other substances, it appears colorless- to-white or yellow.	Symptoms resulting from chronic inhalation include nervous system effects such as numbness of fingers and toes. Symptoms of acute ingestion include vomiting, diarrhea, temporary hair loss, and effects on the nervous system, lungs, heart, liver, and kidneys, and possibly death.	No information.	No information.	Medical tests are available to measure levels of thallium in urine and hair.	Remains in the air, water, and soil for a long time and is not broken down. Absorbed by plants and enters the food chain and builds up in fish and shellfish.	
Organic Solvents							
Benzene	Colorless liquid	Inhalation of very high	No Information	Benzene exposure can be	The metabolite	Can pass into the	
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Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate		
	with a sweet odor	levels of benzene can result in death; high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Ingestion of high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death. Chronic exposure may result in effects on the blood, harmful effects on the bone marrow, a decrease in red blood cells leading to anemia, excessive bleeding, and impacts on the immune system. The Department of Health and Human Services (DHHS) has determined that benzene causes cancer in humans. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.		reduced by limiting contact with gasoline and cigarette smoke. Remove contaminated clothing while flushing exposed areas. Leave the area and seek fresh air. Benzene poisoning is treated with supportive medical care in a hospital setting. No specific antidote exists for benzene poisoning.	Sphenylmercapturic acid in urine is a sensitive indicator of benzene exposure and a test exists for measuring benzene in the breath. Both of these tests must be done shortly after exposure.	air from water and soil. Reacts with other chemicals in the air and breaks down within a few days. Breaks down more slowly in water and soil and can pass through the soil into underground water. Does not build up in plants or animals. The vapor is heavier than air and may sink into low-lying areas. Dissolves only slightly in water and will float on top of water.		
Toxic Alcohols								
Ethylene glycol	Clear, colorless, slightly syrupy liquid at room	Eating or drinking very large amounts can result in death, while large amounts	A progression of toxic effects can be divided into three stages,	Timely treatment is effective and consists of supportive care,	Odor does not provide any warning of hazardous	About half of the compounds that enter the air will		
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Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
	temperature. May exist in air in the vapor form. Odorless but has a sweet taste. Commonly found in anti-freeze.	can result in nausea, convulsions, slurred speech, disorientation, and heart and kidney problems. Ingestion leads to systemic toxicity beginning with CNS effects, followed by cardiopulmonary effects, and finally renal failure.	although overlap is possible: Stage 1: From 30 min- 12 hours after exposure, unmetabolized ethylene glycol produces CNS depression, intoxication, and hyperosmolarity similar to that produced by ethanol. Stage 2: From 1248 hours, metabolites produce severe acidosis with compensatory hyperventilation. The acidosis is primarily the result of an increase in glycolic acid, although glyoxylic, oxalic, and lactic acids also contribute in small part. Calcium oxalate crystals are deposited in the brain, lungs, kidneys, and heart. Stage 3: From 2472 hours, the direct toxic effects of ethylene glycol metabolites in the kidneys can cause acute renal failure.	hemodialysis, and administration of a specific antidote.	concentrations. Breaks down very quickly in the body so it is very difficult to detect, even though symptoms may be present.	break down in 24- 50 hours. Will break down within several days to a week in water and soil.

CHEMICAL AGENT HAZARDS

NERVE AGENTS

DESCRIPTION: Regardless of the route of exposure, nerve agents cause their toxic effects by preventing the proper operation of the chemical that acts as the body's "off=switch" for glands and muscles (acetylcholinesterase inhibition). Thus, glands and muscles are constantly stimulated, resulting in exhaustion and the inability to sustain breathing function. Nerve agents GA (tabun), GB (soman), and VX are manufactured compounds. FB is the most volatile nerve agent. VX is the least volatile nerve agent.

Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate
Tabun (GA)	Clear, colorless, tasteless liquid. Slightly fruity odor	Runny nose, excessive sweating, dimness of vision, pinpoint pupils, tightness in chest, difficulty breathing, drooling cramping, frontal headaches, increased urination, nausea, muscle twitching, drowsiness, convulsions, paralysis, respiratory failure, death.	Very rapid. Vapor- seconds; liquid- minutes to hours. Persists 1-2 days if heavy concentration. Fatal effects can occur within 1-10 minutes. Fatigue, irritability, nervousness, and memory defects may persist for as long as 6 weeks after recovery from an exposure episode.	MARK I = 2 mg. Atropine and 600 mg 2-Pam Cl (Pralidoxime Chloride) Diazepam follows 3 MARK-1s IV effects within 1 min. IM 8 min. Ventilate and suction airway.	M-8 or M-9 CAM Colorimetric tubes Detection kits: M- 256A1, M-18A2, Pesticide Tickets, Electronic Meters	Can persist in air for up to a few days. Breaks down in water and moist soil quickly, but could travel below soil surface and contaminate groundwater. Does not accumulate in the food chain. Decomposition of GA may produce HCN, oxides of nitrogen, oxides of phosphorus, carbon monoxide, and hydrogen cyanide.
Sarin (GB)	Clear, colorless liquid. Odorless.	Runny nose, excessive sweating, dimness of vision, pinpoint pupils, tightness in chest, difficulty breathing,	Very rapid. Can persist 102 days Readily evaporates	MARK I = 2 mg. Atropine and 600 mg 2-Pam Cl (Pralidoxime Chloride)	M-8 or M-9 CAM Colorimetric tubes Detection kits: M- 256A1, M-18A2,	Can persist in air for up to a few days. Sarin vapor is heavier than air so it will sink

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Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate	
		drooling, cramping, frontal headaches, increase urination, nausea, muscle twitching, drowsiness, convulsions, paralysis, respiratory failure, death.	Fatal effects can occur within 1-10 minutes. Fatigue, irritability, nervousness, and memory defects may persist for as long as 6 weeks after recovery from an exposure episode.	Diazepam follows 3 MARK-1s IV effects within 1 min. IM 8 min. Ventilate and suction airway.	Pesticide Tickets, Electronic Meters	to low-lying areas. Can react with water to produce toxic vapors. Mixes with water but breaks down readily. Could travel below soil surface and contaminate groundwater. Does not accumulate in the food chain. Under acid conditions GB and GD hydrolyze to form HF.	
Soman (GD)	Clear, colorless liquid. Slight camphor odor. Slight rotting fruit odor.	Runny nose, excessive sweating, dimness of vision, pinpoint pupils, tightness in chest, difficulty breathing, drooling, cramping, frontal headaches, increased urination, nausea, muscle twitching, drowsiness, convulsions, paralysis, respiratory failure, death.	Vapor-seconds. Liquid-minutes to hours. Fatal effects can occur within 1-10 minutes. Breaks down slowly in the body and can have a cumulative effect.	MARK I = 2 mg. Atropine and 600 mg 2-Pam Cl (Pralidoxime Chloride) Diazepam follows 3 MARK-1s. IV effects within 1 min IM 8 min Ventilation and suction airway	M-8 or M-9 CAM Colorimetric tubes Detection kits: M- 256A1, M-18A2, Pesticide Tickets, Electronic Meters	Can persist in air for up to a few days; Soman vapor is heavier than air so it will sink to low-lying areas. High volatility that creates an immediate but short-lived threat and does not persist in the environment. Under acid conditions GB and GD hydrolyze to form HF.	
GF	Refer to information on G-type agents above						
Agent	Properties	Signs and Symptoms	Onset and Persistence	Initial Treatment	Detection	Environmental Fate	
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VX (V Agent)	Odorless and tasteless liquid Oily liquid that is amber in color	Most potent of all nerve agents. Primarily a liquid exposure hazard but can turn into vapor at very high temps. Runny nose, excessive sweating, dimness of vision, pinpoint pupils, tightness in chest, difficulty breathing, drooling, cramping, frontal headaches, increased urination, nausea, muscle twitching, drowsiness, convulsions, paralysis, respiratory failure, death.	Vapor-seconds. Liquid-minutes to hours. Very slow to evaporate (evaporates as slowly as motor oil). Does not mix readily with water. Breaks down slowly in the body and can have a cumulative effect Fatal effects can occur within 4-18 hours.	MARK I = 2 mg. Atropine and 600 mg 2-Pam Cl (Pralidoxime Chloride) Diazepam follows 3 MARK-1s. IV effects within 1 min IM 8 min Ventilation and suction airway	M-8 or M-9 CAM Colorimetric tubes Detection kits: M- 256A1, M-18A2, Pesticide Tickets, Electronic Meters	VX vapor is heavier than air so it will sink to low-lying areas. The least volatile of the nerve agents and is slow to evaporate from a liquid into a vapor. Very persistent in the environment. Average weather conditions – days. Very cold conditions – months. Hydrolysis of VX produces a class B poison.	

TAB 2 BIOLOGICAL AGENT HAZARDS

BACTERIA

DESCRIPTION: The bacterial pathogens listed below have been or could be used for biological terrorism. These agents correspond to threats described in the Homeland Security Council's National Planning Scenarios and/or they are included among the Centers for Disease Control and Prevention Category A and B priority risks to national security. Although diverse in terms of their infectious characteristics, these agents can be easily or moderately easily disseminated or transmitted from person to person, have the potential for major public health impact, and require special action for public health preparedness.

Disease/ Pathogen	Likely Methods of Dissemination	Transmissible Man to Man	Infectivity	Incubation Time	Duration of Illness	Lethality	Persistence	Vaccination Available	Anti- Microbial Therapy	Antisera
Anthrax (Inhalation)/ Bacillus anthacis	Spores in aerosols	No	Moderate	1-6 days	3-5 days	High	Spores are highly stable	Yes	Little effect	Experimental
Brucellosis/ Brucella species	1.Aerosol 2.Sabotage (food supply)	No	High	Days to months	Weeks to years	Low	Long persistence in wet soil & food	Yes	Moderately effective	No
Cholera/ Vibrio cholerae	1.Sabotoge (food & water supply) 2.Aerosol	Negligible	Low	1-5 days	l or more weeks	Moderate to high	Unstable in aerosols & pure water/ more stable in polluted water	Yes	Moderately effective	No
Melioidiosis/ Burkholderia pseudomallei	1.Aerosol 2.Sabotoge (food supply)	Negligible	High	Days to years	4-20 days	Variable	Stable	None	Moderately effective	No
Psittacosis/ Chlamydia psittaci	1.Aerosol 2.Sabotoge (food supply)	Negligible	Moderate	4-15 days	Weeks to months	Very low	Stable	No	Effective	No
Plague (Pneumonic)/ Yersinia pestis	1.Aerosol 2.Infected vectors	High	High	2-3 days	1-2 days	Very high	Less important due to high transmissibility	Yes	Moderately effective	No

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Disease/ Pathogen	Likely Methods of Dissemination	Transmissible Man to Man	Infectivity	Incubation Time	Duration of Illness	Lethality	Persistence	Vaccination Available	Anti- Microbial Therapy	Antisera
Q-Fever/ Coxiella burnetii	1.Aerosol 2.Sabotage	No	High	10-20 days	2 days to 2 weeks	Very low	Stable	Yes	Effective	No
Tularemia/ Francisella tularensis	Aerosol	No	High	2-10 days	2 or more weeks	Moderate if untreated	Not very stable	Yes	Effective	No
Typhoid Fever/ Salmonella Typhi	1.Sabotoge (food & water supply) 2.Aerosol	Negligible	Moderate	7-21 days	Several weeks	Moderate if untreated		Yes	Moderately effective	No

VIRUSES

DESCRIPTION: As with the preceding bacterial pathogens, the viral pathogens listed below have been or could be used for biological terrorism. These agents correspond to threats described in the Homeland Security Council's National Planning Scenarios and/or they are included among the Centers for Disease Control and Prevention Category A and B priority risks to national security. Although diverse in terms of their infectious characteristics, these agents can be easily or moderately easily disseminated or transmitted from person to person, have the potential for major public health impact, and require special action for public health preparedness.

Disease/ Pathogen	Likely Methods of Dissemination	Transmissable Man to Man	Infectivity	Incubation Time	Duration of Illness	Lethality	Persistence	Vaccination Available	Anti- Microbial Therapy	Antisera
Avian Influenza/ H5N1	Infected animals	Rare	Low	1-5 days	Uncertain	Moderate to high	Relatively unstable	Under development	Not effective	No
Encephalitis/ Eastern Equine	Aerosol	None	High	5-15 days	1-3 weeks	High	Relatively unstable	Yes	Not effective	No
Encephalitis/ Russian Spring- Summer	1.Aerosol 2.Milk	None	High	8-14 days	Days to months	Moderate	Relatively unstable	Yes	Not effective	Yes

Disease/ Pathogen	Likely Methods of Dissemination	Transmissable Man to Man	Infectivity	Incubation Time	Duration of Illness	Lethality	Persistence	Vaccination Available	Anti- Microbial Therapy	Antisera
Hemorrhagic Fever/ Ebola and Marburg filoviruses	Aerosol	Moderate	High	5-10 days	5-15 days	High	Relatively unstable	No	Not effective	No
Hemorrhagic Fever/Lassa arenavirus	Aerosol	Low to moderate	High	10-14 days	1-4 weeks	Unknown	Relatively stable	No	Effective	Experimental
Smallpox	Aerosol	High	High	10-17 days	1-2 weeks	High	Stable	Yes	Not effective	Yes
Typhus fever/ Rickettsia prowazekii	1.Sabotoge (food & water supply) 2.Aerosol	Negligible	Moderate	7-21 days	Several weeks	Moderate if untreated		Yes	Moderately effective	No

TOXINS

DESCRIPTION: Toxins are biological byproducts that cause human disease or injury, often when encountered in very small quantities. They act more like a chemical toxin (or poison) than a biological pathogen. They are not living organisms, do not multiply, and cannot be transmitted from person to person, but they have been or could be used for biological terrorism. The toxins below correspond to threats described in the Homeland Security Council's National Planning Scenarios and/or they are included among the Centers for Disease Control and Prevention Category A and B priority risks to national security. Although diverse in terms of their infections characteristics, these agents can be easily or moderately easily disseminated, have the potential for major public health impact, and require special action for public health preparedness.

Disease/ Pathogen	Likely Methods of Dissemination	Transmissable Man to Man	Infectivity	Incubation Time	Duration of Illness	Lethality	Persistence	Vaccination Available	Anti- Microbial Therapy	Antisera
Botulism toxin/ produced by <i>Clostridium</i> <i>botulinum</i>	1.Sabotoge (food & water supply) 2.Aerosol	No	N/A	Variable (hours to days)	24-72 hours	High	Stable	Yes	Not effective	Yes

Disease/ Pathogen	Likely Methods of Dissemination	Transmissable Man to Man	Infectivity	Incubation Time	Duration of Illness	Lethality	Persistence	Vaccination Available	Anti- Microbial Therapy	Antisera
Epsilon toxin/ Clostridium perfringens toxins	1.Sabotoge 2.Aerosol	No	N/A	8-12 hours	24 hours	Low	Stable	No	Not effective	No
Ricin toxin/ Castor bean derivative	Aerosol	No	N/A	Hours	Days	High	Stable	Under development	Not effective	No
Staphylococcal enterotoxin B	1.Aerosol 2.Sabotage	No	N/A	1-6 hours	Days to weeks	Low	Stable	Under development	Not effective	No

Sources:

- NATO Handbook on Medical Aspects of NBC Defensive Operations, AMedP-6(B), Part II Biological, Annex C
- Centers for Disease Control and Prevention, Emergency Preparedness and Response Guides, Biological Agents
- The Homeland Security Council, National Planning Scenarios, numbers 2-4, 13, 14
- World Health Organization, Avian Influenza fact sheet

TAB 3 RADIOLOGICAL/NUCLEAR HAZARD

MAJOR USES OF RADIOISOTOPES IN THE UNITED STATES

DESCRIPTION: The radioactive isotopes listed below are used for commercial and military purposes. Weapons-grade materials such as uranium-233/235 and enriched uranium and plutonium are found within nuclear warheads and are used as fuel for some nuclear reactors. More common commercially used isotopes could be assembled by a terrorist into a dirty bomb. When radiation levels exceed approximately 2 to 3 times background, responders should investigate the source and level of radiation and take precautions for self-protection.

Isotope	Half-life	Radioactive Emission	Use
Americum-241	433 years	Alpha, gamma	 Smoke detectors Measure levels of toxic lead Ensure uniform thickness in rolling processes (i.e., steel and paper production) Determine where oil wells should be drilled
Cadmium-109	462 days	Gamma	• Analyze metal alloys
Calcium-47	4.5 days	Beta, gamma	Biomedical research
Californium-252	2.6 years	Alpha, gamma	 Inspect airline luggage Gauge the moisture content of soil Measure the moisture of materials stored in soils
Carbon-14	5715 years	Beta	Biological research, agriculture, pollution control
Cesium-137	30 years	Beta, gamma	 Treat cancerous tumors Measure correct patient dosages Measure and control the liquid flow in oil pipelines Packaging of food, drugs, and other products
Chromium-51	27.7 days	Gamma	Research in red blood cell survival
Cobalt-57	272 days	Gamma	Medical diagnostic
Cobalt-60	5.3 years	Beta, gamma	 Sterilize surgical instruments Improve the safety and reliability of fuel oil burners Cancer treatment, food irradiation, gauges, and radiography
Copper-67	2.6 days	Beta, gamma	Cancer treatment

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Isotope	Half-life	Radioactive Emission	Use			
Curium-244	18 years	Alpha, gamma	Mining and drilling to analyze material excavated from pits			
Gallium-67	3.3 days	Gamma	Medical diagnosis			
Iodine-123	13 hours	Gamma	Diagnose metabolic disorders			
Iodine-125	59 days	Gamma	Biomedical research Diagnose metabolic disorders			
Iodine-129	15,700,000 years	Beta, gamma	Check radioactivity counters			
Iodine-131	8 days	Beta, gamma	Treat thyroid disorders			
Iridium-192	74 days	Beta, gamma	Test integrity of pipeline welds, boilers, and aircraft partsBrachytherapy/tumor irradiation.			
Iron-55	2.7 years	Alpha, gamma	 Analyze electroplating solutions Detect the presence of sulphur in the air Metabolism research 			
Krypton-85	10.8 years	Beta, gamma	 Indicator lights in appliances Gauge the thickness of misc. materials Measure dust and pollutant levels 			
Nickel-63	100 years	Beta	 Detect explosives Voltage regulators and current surge protectors Electron capture detectors for gas chromatographs 			
Phosphorus-32	14 days	Beta	Molecular biology and genetics research			
Phosphorus-33	25 days	Beta	Molecular biology and genetics research			
Plutonium-238	88 years	Alpha, gamma	Powered NASA spacecraft			
Polonium-210	138 days	Alpha, gamma	Reduce static charge in materials (photographic film)			
Promethium-147	2.6 years	Beta, gamma	Electric thermostatsGauge the thickness of misc. materials			
Radium-226	1599 years	Alpha, gamma	Makes lighting rods more effective			
Selenium-75	120 days	Gamma	Protein studies			
Sodium-24	15 hours	Beta, gamma	Locate leaks in industrial pipe linesOil well studies			
Strontium-85	65 days	Gamma	Study bone formation and metabolism			

Isotope	Half-life	Radioactive Emission	Use				
Sulphur-35	87 days	Beta	 Survey meters Cigarette manufacturing sensors Medical treatment 				
Technetium-99m	6 hours	Beta, gamma	 Genetics and molecular biology research Radioactive pharmaceutical (nuclear medicine) Medical imaging (x-ray) 				
Thallium-201	3 days	Gamma	Nuclear medicine				
Thallium-204	4 days	Beta	Measure dust and pollutant levelsGauges the thickness of misc. materials				
Thorium-229	7300 years	Alpha, gamma	Increases longevity of fluorescent lights				
Thorium-230	75,400 years	Alpha, gamma	Coloring and fluorescence in colored glazes and glassware				
Tritium			 Biomedical research Life science and drug metabolism Self-luminous aircraft and commercial exit signs Luminous dials, gauges and wrist watches Luminous paint Geological prospecting and hydrology 				
Uranium-234	12 years	Alpha, gamma	Dental fixtures				
Uranium-235	704,000,000 years	Alpha, gamma	 Nuclear power plant fuel Fluorescent glassware, variety of colored glazes/wall tiles 				
Xenon-133	5.2 days	Beta	Nuclear medicine				

UNITS, CONVERSIONS, AND CALCULATIONS

DESCRIPTION: A material's radioactivity indicates how much radiation it produces, but the amount of radiation is not the same as the exposure or dose to the general public or first responders. Radiation response-capable workers in the U.S. typically operate radiation detection instruments, which read in common units (roentgens or roentgens per hour) or in counts per minute (CPM), which is an instrument-specific measure. Human external exposure to 1 roentgen/hour is approximately equivalent to an exposure of 1 rem/hour. Shipping papers often describe radiation hazards in standard (SI) units.

	Common (U.S.) Units	Standard (SI) Units	Converting from Common to SI Units, Multiply By:	Converting from SI to Common Units, Multiply By:
Radioactivity	Curie (Ci)	Becquerel (Bq)	3.7 x 1010	2.7 x 10-11
Exposure	Roentgen (R)	Coulomb/kilogram (C/kg)	3,880	0.000258
Dose Equivalent	Rem	Sievert (Sv)	0.01	100
Absorbed Dose	Rad	Gray (Gy)	0.01	100

BIOLOGICAL EFFECTS OF SHORT-TERM RADIATION EXPOSURE ON HUMANS (IN PERSPECTIVE)

DESCRIPTION: This table shows the relationship of acute (short-term) radiation exposure to non-cancer physiological effects. Typical annual exposures due to radiation background and the NRC's annual occupational limit are included for comparison.

Dose (Rems)	Effect
.03 (30 millirems)	No non-cancer effects. Approximate annual dose from cosmic rays.
.36 (360 millirems)	No non-cancer effects. Approximate annual dose from natural background (radon gas, cosmic rays, terrestrial sources, x-rays, and medical exams).
5	No non-cancer effects. NRC's annual occupational limit.
5-50	Non-cancer health impact to fetuses possible but unlikely.
20-100	Measurable transient blood changes. Temporary decrease in white blood cell count.
45-100	Radiation sickness possible. Vomiting possible more than 2 hours following dose.
> 50	Significant risk of non-cancer health effects to fetuses.

Dose (Rems)	Effect
100-200	Acute Radiation Sickness (ARS) -nausea, vomiting, longer term decrease in white blood cells. Onset of vomiting more than 2 hours following dose.
200-400	Vomiting, diarrhea, loss of appetite, listlessness, death in some cases. Reversible skin effects if skin directly exposed. Permanent sterility possible for men and women. Onset of vomiting in 1-2 hours following dose.
300-500	Lethal for 50% of cases without medical treatment. Temporary hair loss if skin directly exposed.
400-600	Vomiting, diarrhea, hemorrhaging. Skin erythema if skin directly exposed. Onset of vomiting less than 1 hour following dose.
Above 600	Eventual death in almost all cases. Onset of vomiting 0-30 minutes following dose.

REGULATORY DOSE LIMITS

DESCRIPTION: The U.S. Nuclear Regulator Commission (NRC) sets regulatory dose limits for exposure resulting from licensed nuclear sources. There are no national civilian regulatory dose limits for emergency workers, who might be exposed to higher radiation levels in order to save lives or property. The United States Environmental Protection Agency (USEPA) publishes recommended emergency action dose guidelines for its employees in the "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (EPA 400-R-92-001).

Dose	Limit		
500 millirems/year	NRC annual occupational whole-body dose limit (applicable to employees who work near NRC-licensed sources).		
5 rems/year	USEPA recommended annual whole-body dose limit for all emergency response activities.		
10 rems	USEPA recommended single incident whole-body dose limit for protecting valuable property.		
25 rems	USEPA recommended single incident whole-body dose limit for lifesaving or protection of large populations.		
> 25 rems	USEPA recommended single incident whole-body dose limit for lifesaving or protection of large populations, only by volunteers who understand the risks.		

Dose Rate	Locations	Protective Equipment	Restrictions/Precautions
2 mrem/hour	Outer Exclusion Zone	Work Uniform	Outer boundary for small incidents. No legal restrictions outside this area. Command centers, staging areas, etc. that need to be set up close to the event can be within this boundary.
$\frac{10 \text{ mrem/hour}}{\text{Contamination}}$ $\frac{\beta\gamma 1,000}{\text{Bq /cm}^2}$ $\alpha 100 \text{ Bq /cm}^2$	Outer Boundary of Radiation Hazard	Minimum: work uniform and radiation monitoring equipment. Preferred: Respiratory protection and clothing can be decontaminated if contamination is also present. Active, alarming dose monitoring equipment.	Proceed for Emergency Operations (life saving, fire fighting, etc.). Shelter/Evacuate public, isolate area, and minimize responder time spent in the area. If available, monitor and record response force exposures. If possible, rotate responder workforce to avoid exceeding cumulative dose limits.
410,000 mrem/hour	Inner Perimeter, high radiation hazard	Minimum: work uniform and active alarming dose monitoring equipment. Preferred: Respiratory protection and clothing that can be decontaminate4d if contamination is also present.	Proceed for time sensitive, mission critical emergency operations such as life saving. Minimize time in the area and use active, alarming dose and dose rate monitoring equipment to ensure turn back levels are not exceeded. Evacuate public, isolate area, and minimize responder time spent in the area.
200,00 mrem/hour	"Turn Back" Level, even for life saving actions.	Same as above. Proceeding should only be done for short (<15 minutes),planned rescue attempts and active, alarming dosimeters should be used to ensure responder safety.	At this does rate, the likelihood of successful rescue of victims is outweighed by dose effects to the responders. This guideline represents the level that rescue operations <i>may</i> not be justified. Enter such areas only after it has been determined that the likelihood of success outweighs potential harm to the rescuers. Survival of non ambulatory victims who have been in the area for more than 60 minutes is questionable

Control Zone Definitions

Sources:

- U.S. Nuclear Regulatory Commission (NRC), *The Regulation and Use of Radioisotopes in Today's World*
- NRC, Fact Sheet on Biological Effects of Radiation
- National Commission on Radiation Protection and Measurement (NCRP) Report No. 38, Management of Terrorist Events Involving Radioactive Material
- Centers for Disease Control and Prevention, *Prenatal Radiation Exposure: A Fact Sheet for Physicians*
- United States Environmental Protection Agency, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* (EPA 400-R-92-001)
- Radiation Emergency Assistance Training Center, *Guidance for Radiation Accident Management*

TAB 4 STANDOFF DISTANCE TABLES

ATF Vehicle-Borne Improvised Explosive Device Hazard and Evacuation Distance Table

Vehicle Description	Maximum Explosives Capacity	Lethal Air Blast Range	Minimum Evacuation Distance	Falling Glass Hazard
Compact Sedan	500 Pounds 227 Kilos (In Trunk)	100 Feet 30 Meters	1,500 Feet 457 Meters	1,250 Feet 381 Meters
Full Size Sedan	1,000 Pounds 455 Kilos (In Trunk)	125 Feet 38 Meters	1,750 Feet 534 Meters	1,750 Feet 534 Meters
Passenger Van or	4,000 Pounds	200 Feet	2,750 Feet	2,750 Feet
Cargo Van	1,818 Kilos	61 Meters	838 Meters	838 Meters
Small Box Van	10,000 Pounds	300 Feet	3,750 Feet	3,750 Feet
(14 Feet)	13,636 Kilos	91 Meters	1,143 Meters	1,143 Meters
Box Van or Water/	30,000 Pounds	450 Feet	6,500 Feet	6,500 Feet
Fuel Truck	13,636 Kilos	137 Meters	1,982 Meters	1,982 Meters
Semi-Trailer	60,000 Pounds	600 Feet	7,000 Feet	7,000 Feet
	27,273 Kilos	183 Meters	2,134 Meters	2,134 Meters



UNCLASSIFIED Improvised Explosive Device (IED) Safe Standoff Distance Sheet

			Evolosives Mass ¹	Building Evacuation	Outdoor Evacuation
	Threat I	Description	(TNT Equivalent)	Distance ²	Distance ³
		Pipe Bomb	5 1bs	70 ft	850 ft
	Cues		2.3 kg	21 m	259 m
	C Deventer	Suicide Belt	10 lbs	90 ft	1,080 ft
	Company of the second s		4.5 kg	27 m	330 m
	114	Suicide Vest	20 lbs	110 ft	1,360 ft
			9 kg	34 m	415 m
		Briefcase/Suitcase	50 lbs	150 ft	1,850 ft
	the etc.	Bomb	23 kg	46 m	564 m
	M	Compact Sedan	500 lbs	320 ft	1,500 ft
lent)	00		227 kg	98 m	457 m
uiv	Van	Sedan	1,000 lbs	400 ft	1,750 ft
I Equ			454 kg	122 m	534 m
Z		Passenger/Cargo Van	4,000 lbs	640 ft	2,750 ft
ves (J			1,814 kg	195 m	838 m
osiv	State of State of State	Small Moving Van/	10,000 lbs	860 ft	3,750 ft
Expl		Delivery Truck	4,536 kg	263 m	1,143 m
gh	(Moving Van/Water	30,000 lbs	1,240 ft	6,500 ft
Ħ	Topico	Truck	13,608 kg	375 m	1,982 m
		Semitrailer	60,000 lbs	1,570 ft	7,000 ft
	CHILDREN THE		27,216 kg	475 m	2,134 m
	PROPANE	Commercial/	2,000 lbs	184 ft	736 ft
		Residential LPG Tank	500 gal 907 kg/1,893 l	56 m	224 m
	100	Small LPG Truck	8,000 lbs/2,000 gal	292 ft	1,168 ft
	0-0		3,630 kg/7,570 l	89 m	356 m
		Semi tanker LPG	40,000 lbs/10,000 gal	499 ft	1,996 ft
	our weeks		18,144 kg/37,850 l	152 m	608 m