

NSW Public Health Services SOP for Hazmat/CBRN Emergencies

Summary The purpose of this Guideline is to provide guidance to NSW public health services on their roles and responsibilities in the prevention of, preparation for, response to and recovery from a major Hazardous Materials/Chemical, Biological, Radiological, Nuclear (Hazmat/CBRN) emergency.

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NSW PUBLIC HEALTH SERVICES STANDARD OPERATING PROCEDURE FOR HAZARDOUS MATERIALS / CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR EMERGENCIES

PURPOSE

The purpose of the *NSW Public Health Services Standard Operating Procedure for Hazardous Materials / Chemical, Biological, Radiological, Nuclear Emergencies* is to provide guidance to NSW public health services on their roles and responsibilities in the prevention of, preparation for, response to and recovery from a major hazardous materials / chemical, biological, radiological, nuclear (Hazmat / CBRN) emergency.

KEY PRINCIPLES

A major Hazmat / CBRN emergency is any event that results in loss of control of a hazardous material which requires a significant and coordinated multi-agency response.

Public health services may be involved in the response to a Hazmat / CBRN emergency if the event poses an actual or imminent risk to the health of the public.

In response to notification of a Hazmat / CBRN emergency, public health services should:

1. Ensure appropriate personnel have been notified
2. Work with the Local Health District Health Services Functional Area Coordinator and the State Public Health Controller to ensure mutual understanding of communication channels and responsibilities
3. Support the combat agency with public health risk assessment and risk management activities as required
4. Provide advice on risk communication messages to the public, partner agencies and health professionals as required.

USE OF THE GUIDELINE

This Guideline provides guidance for public health services regarding their roles and responsibilities in prevention of, preparation for, response to and recovery from a Hazmat / CBRN emergency.

This document should be used as a guide rather than a mandatory directive. It does not replace the need for the application of expert judgement to each individual situation.

This Guideline should be read in conjunction with the NSW emergency management plans outlined in section 1.

REVISION HISTORY

Version	Approved by	Amendment notes
May 2016 (GL2016_014)	Deputy Secretary Population and Public Health, and Chief Health Officer	New guideline

ATTACHMENT

1. NSW Public Health Services Standard Operating Procedure for Hazardous Materials / Chemical, Biological, Radiological, Nuclear Emergencies – Guideline.

**NSW Public Health Services Standard Operating
Procedure for Hazardous Materials / Chemical,
Biological, Radiological, Nuclear Emergencies**



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1. PURPOSE

The purpose of this document is to provide guidance to NSW public health services on their roles and responsibilities in the prevention of, preparation for, response to and recovery from a major Hazardous Materials/Chemical, Biological, Radiological, Nuclear (Hazmat / CBRN) emergency.

A Hazmat/CBRN emergency is any event that results in loss of control of a hazardous material which requires a significant and coordinated multi-agency response. It may occur as a single event, several simultaneous events, or events that follow in quick succession.

A hazardous material is defined as anything that, when produced, stored, moved, used or otherwise dealt with without adequate safeguards, may cause injury or death or damage to property (Fire Brigades Act, 1989). Hazardous materials incidents occur frequently, but it is relatively rare for an event to be significant enough for incident managers to seek advice from public health services.

Fire and Rescue NSW (FRNSW) is responsible for protecting the public from hazardous materials incidents (Fire Brigades Act 1989) and is the combat agency (lead) for all Hazmat incident responses. For terrorism / CBRN events, the NSW Police Force has pre-determined multi-agency arrangements. Public health services may be involved in the response to a Hazmat / CBRN emergency if the event poses an actual or imminent risk to the health of the public.

Key actions for public health services

If you are reading this plan because you have been notified of a Hazmat/CBRN emergency, you should do the following:

1. Ensure the appropriate personnel have been notified
2. Work with your LHD HSFAC and the State Public Health Controller to ensure mutual understanding of communication channels and responsibilities
3. Support the combat agency with public health risk assessment and risk management activities as required
4. Provide advice on risk communication messages to the public, partner agencies and health professionals as required.

This procedure should be read in conjunction with the following documents:

Whole of Government Sector	NSW State Emergency Management Plan (EMPLAN) https://www.emergency.nsw.gov.au/publications/plans/emplan.html
	NSW Hazmat/CBRN Emergency Sub Plan https://www.emergency.nsw.gov.au/publications/plans/sub-plans/hazardous-materials.html
	NSW State Counter Terrorism Plan http://www.secure.nsw.gov.au/about-us/nsw-counter-terrorism-plan/
	NSW Recovery Plan https://www.emergency.nsw.gov.au/publications/plans/supporting-plans/recovery.html
Whole of Health Sector	NSW Health Services Functional Area Supporting Plan (NSW HEALTHPLAN) http://www0.health.nsw.gov.au/policies/PD/2014/PD2014_012.html ,
Public Health Sector	NSW Public Health Services Supporting Plan http://www0.health.nsw.gov.au/policies/pd/2015/PD2015_002.html
	NSW Public Health Services Standard Operating Procedure for an Explosive Event http://www0.health.nsw.gov.au/policies/gl/2016/GL2016_013.html

The NSW Hazmat / CBRN Emergency Sub Plan describes the arrangements for the control and coordination of major hazardous material emergencies requiring coordinated multi-agency response and recovery activities. The Hazmat / CBRN Emergency Sub Plan identifies NSW Health’s role as a supporting agency with responsibility for providing health services in accordance with NSW HEALTHPLAN.

During a Hazmat / CBRN emergency, NSW Health is responsible for providing healthcare to casualties, protecting the physical and mental health of the public during response and recovery operations, and providing health advice to other agencies and the public during all phases of the emergency management cycle. The roles and responsibilities of each of the major contributing Health segments are detailed in NSW HEALTHPLAN.

This document focusses on the role of public health services.

2. PREVENTION

There is a complex legislative framework to reduce the risk of hazardous materials incidents occurring and reducing their impact on both the environment and public health when they do occur. Within this framework, various Commonwealth and NSW Government agencies have powers to control the manufacture, handling, use and transportation of hazardous materials. While public health may work with partner

agencies to provide advice during the development of measures to prevent Hazmat / CBRN emergencies, the primary role of public health services is assisting with consequence management (i.e. conducting a risk assessment once an incident has occurred).

3. PREPARATION

To respond effectively to a Hazmat / CBRN emergency, public health services must engage with and support coordinated preparedness activities in collaboration with their Local Health District Health Services Functional Area Coordinator (LHD HSFAC).

Preparedness activities relating to Hazmat / CBRN emergencies may include:

- Fulfilling requirements as per the *Public Health Emergency Response Preparedness Minimum Standards* (PD2013-039)
http://www0.health.nsw.gov.au/policies/pd/2013/PD2013_039.html
- Contributing to work undertaken by partner agencies to identify the types of incidents which may occur in the community and assess the likelihood of such incidents
- Ensuring a common understanding of the roles and responsibilities of all agencies involved in Hazmat/CBRN emergency response and recovery operations in advance, to support a coordinated approach
- Participating in multi-agency training exercises to educate public health responders on their expected roles in a Hazmat/CBRN emergency and to inform planning for future response and recovery operations
- Establishing and maintaining relationships with relevant agencies and expert groups (e.g. establishing relationships with expert toxicologists and identifying appropriate personnel for expert panels)
- Maintaining the State Medical Stockpile (e.g. antidotes)
- Establishing operational communication channels (including reporting and briefing processes) and identifying information sources which may be used during a coordinated response effort
- Ensuring familiarity with the *NSW Public Health Workforce Surge Guidelines* (GL2014_003) in the event of an incident which exceeds the existing public health capacity. http://www0.health.nsw.gov.au/policies/gl/2014/GL2014_003.html

4. RESPONSE

Hazmat / CBRN emergencies are complex and NSW relies upon a multi-agency response model. NSW Health, and more specifically public health services, have a supporting role and work alongside partner agencies which lead the response efforts. The public health contribution to a response effort is determined by the needs of the combat agency and must be proportionate to the size and nature of the incident and potential risk posed to public health.

Public health resources may be mobilised if the public has been, or is likely to be, exposed to the hazardous material, or the public is concerned about possible health effects.

Key NSW agencies include:

- Fire and Rescue NSW (FRNSW) is the combat (lead) agency for operational responses to Hazmat emergencies and is responsible for maintaining procedures, equipment, training and resources to command, detect, render safe property and areas, and decontaminate people affected by hazardous materials.
- NSW Police Force (NSWPF) is the combat agency for acts of terrorism within NSW. NSWPF will work with relevant agencies (State and Federal) to conduct investigations related to the deliberate release of hazardous materials.
- The Environmental Services Functional Area (EnvSFA) is responsible for mitigating the impact of hazardous materials on the environment during the response phase to a Hazmat/CBRN emergency. EnvSFA provides advice and coordinates scientific support to the combat agencies to assist in the identification of the hazardous material, assess probable impacts on the environment (and by extension public health) and how the site may be rendered safe to achieve environment (and public health) protection objectives. The NSW Environment Protection Authority (EPA) is the EnvSFA coordinating agency.
- Ambulance Service of New South Wales (NSW Ambulance) will provide triage and treatment of any patients exposed to substances at an incident. NSW Ambulance also provides medical monitoring of first responders at an incident site.

For events that span jurisdictional borders, NSW agencies will work in collaboration with interstate and national counterparts as required.

4.1. Public Health Objectives

In a multi-agency emergency response, public health services have a supporting role. Objectives of the public health response following a Hazmat / CBRN emergency event include:

1. **Notification of key responders within the health system:** Ensuring the LHD HSFAC and State Public Health Controller are notified of the incident as early as practicable.

2. **Supporting risk assessment activities:** Contributing to ascertaining the nature of the public health risks posed to the population by the hazardous material.
e.g. providing advice on the public health risks posed by food/water/environment contamination and the potential for outbreaks of infectious disease
3. **Providing advice on risk communication:** Providing advice on risk communication messages for the population, partner agencies and the health system.
e.g. advice for exposed or potentially exposed populations, advice for hospitals and general practitioners treating exposed casualties and advice to other agencies as required
4. **Supporting risk management activities:** Contributing advice on the identification of populations at risk of exposure, advising on recommendations for appropriate actions to prevent significant acute, medium or long-term risks to public health and providing advice on appropriate sampling methodology.
e.g. working with LHDs to establish clinics to provide prophylactic treatments and vaccinations

The four key objectives of a public health response may be undertaken concurrently throughout the emergency response phases, as identified in Figure 1.

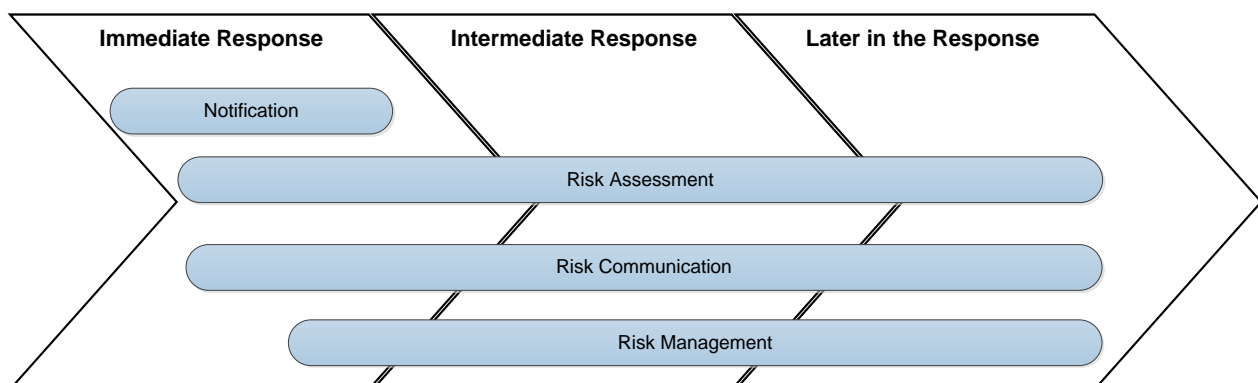


Figure 1. Delivery of public health objectives during a Hazmat/CBRN emergency response

Additional public health considerations for radiological and nuclear emergencies can be found in **Appendix A**.

The public health response is likely to continue after the site has been rendered safe by Fire and Rescue NSW.

4.2. Immediate Response Activities

During the immediate response phase, the major objectives are to ensure that the appropriate personnel and agencies have been notified as soon as practicable and that information to inform a preliminary public health risk assessment is collected.

4.2.1. Notification

Public health service personnel may be notified of the emergency through various channels, including: the combat agency, LHD HSFAC, State Public Health Controller, the NSW EPA, a representative of the industry (calling to report an incident directly) or the media.

The LHD Public Health Controller (Public Health Unit Director) should be immediately notified of any incidents, and ensure the following notifications are made:

- LHD HSFAC
- The State Public Health Controller (for any non-routine incidents or incidents with state-wide significance).

It is also essential to confirm that Fire and Rescue NSW and the NSW EPA have been notified.

The State Public Health Controller will liaise with the State HSFAC.

It is important to ensure all communications are through the LHD HSFAC, as the LHD HSFAC will be responsible for:

- Commencing / completing a notification cascade to key LHD stakeholders
- Coordinating the health response within the LHD, including deploying health resources
- Liaising with the State HSFAC.

The LHD Public Health Controller will assess the situation in consultation with the LHD HSFAC and the State Public Health Controller and mobilise a public health response as appropriate.

4.2.2. Gather information regarding the notification

The public health ramifications of some incidents involving hazardous materials are self-evident due to their large-scale impacts on the community and their known potential to affect large populations. However, most hazardous material events are relatively minor, with the potential to impact only those people in the immediate vicinity.

Information may be sparse in the immediate aftermath of a Hazmat / CBRN incident. It is important to collect as much relevant information as possible through reliable sources to determine whether a public health response is required, and to keep reviewing that information as the scenario unfolds.

The acronym **E.T.H.A.N.E.S** may help guide information collection. The Hazmat / CBRN Incident Notification Form (**Appendix B**) may be used to collect information regarding the incident. It is important to clarify with the LHD HSFAC who is collecting what information.

- **Exact location and time:** The location and time of the incident
- **Type:** The nature (e.g. Hazmat / CBRN) and size of the incident including size of impacted area, how many vehicles/buildings are involved, and whether more than one LHD is likely to be affected

- **Hazard:**
 - Identify any present and / or potential hazards to public health (often informed by information received from industry or partner agencies) and
 - Confirm the hazardous material(s) involved including the amount present and the amount released (if known or estimated). Details may include:
 - Type of the hazardous material (i.e. exact name, quantity, concentration)
 - Means of the release (e.g. atmospheric dispersion, explosion, fire or spill)
 - Size of the release (estimated weight/volume/amount of hazardous materials dispersed)
 - Known exposure pathways
 - Whether the release has been contained or not (i.e. does the risk of continuing exposure remain?)
 - Manufacturer of the hazardous material
 - Local medical and healthcare facilities potentially in the impacted area (in discussion with LHD HSFAC)
 - Current and forecasted weather conditions at the scene
- **Access:** A description of the locality (e.g. rural, residential, industrial, workplace) and access to the site (impact on roads/ transport infrastructure)
- **Number:** Details of the population at risk, including details of casualties and receiving hospitals, if known, as well as estimated numbers of those who are threatened, affected, exposed, injured or dead and whether there is likely to be further exposure
- **Emergency services on-scene:** Details of the notifier and their agency and any other services currently onsite, the purpose of the notification and contact details for further information, as well as current actions underway (e.g. evacuations, sheltering in place)
- **Significant:** Any other information considered relevant by the notifier – especially exactly what is being requested of public health services

NOTES

- i. The time of notification should also be recorded
- ii. Not all of the above information will be available or known at the time of initial contact. Information may become available as the incident response phase progresses and should be shared amongst agencies involved. Also it is important to remember that much of the initial information received may not be confirmed and will need to be updated as more information becomes available.

4.2.3. Preliminary health risk assessment

A preliminary health risk assessment should attempt to answer the following questions:

1. Hazard identification:

- What hazardous materials are known or thought to be involved?
- What are the known acute and chronic effects of these materials with particular reference to carcinogenic risk?
- At what dose (or level of exposure) do these effects occur?
- What is the clinical management of those exposed?

2. Exposure assessment:

- What pathways exist through which members of the public could be exposed?
- What is the most appropriate method(s) to assess exposure (e.g. environmental monitoring, dispersion modelling or biological sampling (biota or human))?
- What is the size of the population at risk of exposure?
- Are there vulnerable groups within the population at risk?
- What measures are available to prevent exposure?

3. Risk characterisation

- Given the information about the hazard and exposure, what is the nature of the health risk?
- What are the uncertainties in this assessment, and what further information is required?

4. Risk management and communication

- What options are available to reduce the health risk?
- What are the key health messages to the public, partner agencies and health professionals at this point?

Risk assessment is an ongoing process and the preliminary assessment should be updated and validated as more information becomes available.

1. Hazard identification and assessment of the dose-response relationship

i. Detection, confirmation and control of material

FRNSW (combat agency) will usually detect and identify the material involved. Other supporting agencies (e.g. EPA) may support the combat agency with identifying any unknown hazardous materials. If the materials involved are not immediately and reliably identifiable, confirmation may take more than 24 hours. Ecotoxicology may indicate toxicity to trial species and therefore likely impacts on the environment but will not generate enough useful information for public health purposes.

Health services (including public health services and pathology services) may therefore need to assist in the identification of hazardous material based on assessment of clinical syndromes and collection and analysis of biological samples.

The combat agency is responsible for containment and rendering the site safe. This may include controlling the release of the hazardous material and limiting further exposure, however, material or oxidation products may be released into the atmosphere during the incident or via groundwater, such as in firewater. Public health services may be required to support decision making by providing an assessment of the public health impacts of alternative methods of controlling the release (e.g. extinguishing a fire or letting it burn out, sheltering in place or evacuating).

ii. Accessing toxicological information

Once the hazardous material has been identified and a method of detection employed, the public health response team may need to rapidly access additional information and data on the properties of the chemical, biological or radiological substance and the potential for associated public health risks.

Appendix C provides a selection of resources which may also provide further information about hazardous materials.

2. Exposure assessment

i. Identify human exposure pathways

Potential routes of exposure are inhalation, ingestion, dermal or injection. Public health impacts are directly determined by the routes and amounts of exposure for humans. Each should be considered:

- **Inhalation** may occur if the hazardous material forms gas or vapour or involves airborne dust or particulate matter (usually occurring during the immediate impact phase)
- **Ingestion** may occur from hand-to-mouth behaviour after contact with contaminated surfaces or consumption of contaminated food, water or products (usually occurring in the immediate impact phase or post-impact phase)
- **Dermal** exposure generally occurs through direct contact with objects (usually occurring in the post-impact phase)
- **Injection** can occur if the skin is penetrated or punctured by contaminated objects.

Defining potential pathways of human exposure is an important step in the public health risk assessment. Once exposure pathways are defined, steps may be taken to analyse the exposure to the public in terms of each exposure route. It is likely that several exposure pathways will exist so all potential routes must be assessed.

ii. Supporting environmental sampling

Environmental sampling may be required to facilitate an assessment of the level of exposure. Public health services may be requested to contribute environmental health expertise, in collaboration with other agencies (e.g. EPA, water supplier etc.).

Depending on the hazardous material(s) involved rapid environmental sampling may be applicable. FRNSW has some capacity for field testing but this is limited in terms of determining total area of impact and the range of materials that may be tested. If the incident management response / recovery phases are still underway, the EnvSFA may be able to source specialists and subsequent analysis for environmental monitoring.

Environmental data that informs public health risk should be accessed by the public health team to determine the likely extent of the contamination, contamination concentration levels and the geographical distribution. Where the information is insufficient to categorise public health risk then additional sampling and analysis may need to be undertaken by public health.

Sampling methods may include either contact media (e.g. air, food, settled dust) or biological substance (e.g. blood, urine). The sampling of biological substances would be an uncommon occurrence and would typically be performed when it is believed that there are important health-related exposures. This sampling would be undertaken following careful consideration, usually as part of an epidemiological study.

Information regarding exposure may be accessed through EPA or FRNSW sampling (and plume modelling, if undertaken) taken during the event or immediately (as soon as feasible) after the event. The sampling plan should be established by the EPA in discussion with public health and sampling should be representative of general public exposure.

iii. Assessment of the potential spread of the material

Public health may be required to provide advice on methods used to predict the potential spread of the material. Predictive models are often used to identify potentially affected populations and estimate any evacuation requirements. The exposure pathways will determine the extent of contamination to people and the surrounding environment and may include results from local environmental sampling, weather forecasts and environmental and predictive modelling. Air modelling may be required to map spatial concentration. Specialised advice and support from agencies such EPA, Bureau of Meteorology (atmospheric), the Australian Radiation Protection and Nuclear Safety Agency (radiological atmospheric), and Australian Nuclear Science and Technology Organisation (specific to Lucas Heights site) may be required. Accessing specialist advice should be done in consultation with Health Protection NSW.

3. Risk Characterisation

Data from the hazard and exposure assessment should be used to characterise risk.

i. Convene an expert panel

An expert panel may be urgently established to provide technical advice on the public health risks associated with a Hazmat / CBRN emergency and the subsequent response. The panel would usually be assembled by the Environmental Health Branch (Health Protection NSW) and may involve relevant experts such as toxicologists, public health physicians, pharmacists, epidemiologists, NSW Health Pathology representatives, microbiologists or infectious disease clinicians. Experts may be selected from a range of organisations including NSW EPA, Office of Environment and Heritage (OEH), SafeWork NSW, LHD public health units, Ministry of Health (Office of the Chief Health Officer,

Public Affairs) and Health Protection NSW (Environmental Health Branch, Communicable Diseases Branch) to provide advice to the Chief Health Officer on the risk and recommended response.

The expert panel may also need to provide additional advice in the days and weeks following an incident as more information becomes available.

ii. Determine if a public health risk is present

Public health services will likely be required to provide advice on:

- The overall impact of the incident on the health of the public
- Any acute or delayed public health effects which may be present or likely to arise based on the information currently available
- Potential health effects on first responders, exposed people, vulnerable populations or environments that may be in the immediate vicinity of the site (e.g. a hospital, childcare centre, water supply etc.).

4. Risk management and communication

i. Formulate an incident action plan if a public health risk is present or may develop

If a risk to the health of the public is identified, public health personnel must determine what actions need to be taken to minimise those risks. This should be documented in an incident action plan (templates available on PopNet), which will include the following information:

- A summary of the situation and predicted changes over time
- An overview of the public health response objectives
- Details regarding the execution (including response strategies, public information requirements, potential workforce surge requirements and strategies for maintaining core public health services)
- Details regarding administration and logistical requirements for the response (including equipment, services, personnel and safety)
- Details regarding control, coordination and communication (including governance arrangements, reporting, links with partner agencies and communication strategies).

ii. Undertake any immediate actions to minimise further health risks

Public health services may be required to make recommendations and implement measures to manage any acute effects and / or prevent any further health risks posed to responders and the community as a result of the incident. Information about the hazardous material will be used to inform these decisions.

Public health services may play a role in advising on the prevention of environmental spread, limiting further transmission of hazardous materials and exposure by undertaking rapid health assessment of control options, providing advice on decontamination activities and appropriate personal protective equipment (PPE).

In the case of a biological incident, public health services may recommend infection control measures to limit the secondary transmission of infection between people. Public

health services may be required to provide advice on any health risks or potential outbreaks which may result from exposure to the hazardous material and containment measures which may be implemented to limit the spread of infection (e.g. shelter in place, use of PPE).

iii. Dispatch of appropriate personnel to the event (if requested)

If requested by the HSFAC, public health services may deploy a Public Health Commander to the affected area or a liaison officer to an emergency operations centre. The Public Health Commander would report jointly to the onsite Health Commander and either the State or Local Public Health Controller (depending on who issued the deployment request).

Responsibilities of the Public Health Commander may include coordination of a team of public health professionals, providing public health information to exposed individuals or providing public health advice to other response agencies. The *Public Health Field Response Guidelines* (GL2014_001) include additional considerations for planning a safe and appropriate deployment (http://www0.health.nsw.gov.au/policies/gl/2014/GL2014_001.html).

In rural areas, the distance to the incident site may be an important factor in determining whether an officer attends the site. If deployment is considered necessary but distances make a timely attendance difficult, the LHD Public Health Controller may consider seeking assistance from the Local Government Authority.

4.3. Intermediate Response Activities

As part of the continuing response effort, public health personnel should ensure that they continue to perform those activities initiated during the immediate response phase (as detailed in Section 4.2), while initiating the following activities:

4.3.1. Verify that health surveillance systems are operational

Surveillance systems such as the Public Health Real-time Emergency Department Surveillance System (PHREDSS) may provide information regarding casualties presenting with Hazmat/CBRN-related exposure symptomology and may be utilised in the detection of an incident and identification of exposed people.

Additional or enhanced surveillance may be recommended to assist with identifying people with exposure-related illnesses or contacts.

Once short-term health assessments have been conducted, additional information regarding the likely severity of the incident and potential long-term risks to the community may become available over time through routine surveillance systems or laboratory notifications. Public health personnel should ensure data is synthesised and communicated to appropriate personnel through the LHD HSFAC (if a local incident) and the State Public Health Controller (if a larger incident).

Public health may be requested to provide ongoing advice to the public or health services on:

- Ongoing health effects of the exposure

- Effects related to being part of, or being aware of this type of event
- Possible signs or symptoms resulting from exposure which the public should be aware of and the details of the appropriate medical services to contact should they appear
- Any measures the public can undertake to mitigate risks.

In the case of the deliberate release of a hazardous material, information collected by health surveillance systems may be collated with current threat assessments provided by partner agencies as a source of meaningful health intelligence.

In the case of a biological incident, the delay of the onset of symptoms, the movement of exposed individuals during the incubation period and the possibility that a transmissible agent has been involved means that outbreaks may affect communities across a wide geographical area. The efficient and coordinated collection of data will therefore be necessary to track the outbreak and may be used to direct resources to the areas of greatest need.

4.3.2. Ensure laboratories are notified and operational

Public health services are required to notify laboratories that are likely to be requested to urgently process specimens and ensure that processes are in place to enable the safe and timely transport of urgent specimens for testing. This is coordinated by the State Pathology Controller and NSW Health Pathology.

4.3.3. Provide advice on evacuations of affected areas

In the event of evacuations, public health may be required to provide advice and/or site review, through existing emergency management channels, on the suitability of the temporary accommodation and recommend measures to maintain satisfactory public health standards. This includes food and water supply, and waste disposal.

For more information refer to *NSW Guidelines for Major Evacuation Centre: Public Health Considerations* (GL2011_011)

http://www0.health.nsw.gov.au/policies/gl/2011/GL2011_011.html.

4.3.4. Provide advice on public risk communication messaging

Following an incident involving a hazardous material which may cause widespread concern or fear, it is important to provide clear and accurate public messaging. In a larger incident, all public communication would be coordinated by the combat agency, and information would likely be released through the Public Information Functional Area Coordinator (PIFAC).

Public health services may be requested to contribute content regarding any health risks to public risk communication messages.

As mental health impacts are likely to be a significant issue, input on appropriate messaging can be sought from the Mental Health Controller through NSW Health emergency channels.

4.3.5. Provide advice to hospitals treating casualties

Public health services may be required to provide advice to hospitals and other healthcare professionals on subjects including but not limited to: case definitions, patient risk assessments, appropriate prophylactic treatments, clinical/toxic waste or establishing clinics to provide post-exposure treatments.

4.3.6. Ensure the needs of the vulnerable populations are being addressed

Some populations may have specific information, assistance or healthcare needs which should be considered as part of risk assessment, management and communication. During the preparation phase, it is important to build and maintain a relationship with health service providers to any vulnerable populations.

Examples of vulnerable populations include:

- Children
- Dialysis patients
- Persons with a disability
- Homeless persons
- Patients dependent on home healthcare services
- Institutionalised persons
- Persons with limited English proficiency
- The elderly
- Cultural and linguistically diverse persons or groups
- Aboriginal and Torres Strait Islander people
- Those with airway diseases (e.g. asthma or chronic obstructive pulmonary disease).

4.3.7. Special considerations for incidents with deliberate intent

Incidents that are thought to be of malicious intent will have a high level of NSW Police Force involvement. The public health response to the incident will remain largely the same, although public health services may need to work with Police through existing emergency management channels to support an investigation. Some information surrounding the investigation may be subject to additional security restrictions.

5. RECOVERY

The recovery phase of an incident may be prolonged, especially where further evaluation of the longer-term effects of the material released remain uncertain. Following a Hazmat / CBRN incident, public health may provide:

- Advice on recovery of an affected area and remediation to an acceptable level
- Advice on the social, built, economic and natural environments of the affected community and expected return to normality
- Advice to other agencies and the community on the public health implications during recovery.

5.1. Managing Information

5.1.1. Liaison with NSW Police disaster victim registration

Preparing an accurate list of all people exposed or potentially exposed (including response personal, media and onlookers) will be important if ongoing symptom monitoring is required. An exposure definition will be important to clarify who is considered to be at risk and their level of risk.

NSW Police Force coordinates a NSW disaster victim register. It is possible to request information from this system for public health purposes. This should be coordinated through the State HSFAC via the State Public Health Controller.

5.1.2 Use of health surveillance systems

The NSW Ministry of Health operates the Public Health Real-time Emergency Department Surveillance System (PHREDSS). The PHREDSS team can be consulted in the days following the event to search the database for patients who are presenting with Hazmat / CBRN-related symptomatology.

Retrospective surveillance can be undertaken using a key word search of words or phrases related to the event or likely injury patterns to assist in mapping the presentation and demographic pattern of those exposed (e.g. self-presenters to non-designated hospitals).

Exposed people may also present to their general practitioner or pharmacist and communication with these groups may assist with further identification of cases.

5.1.3 Contacts of cases

In some circumstances contact tracing may be warranted if there is a health risk to close contacts (for example exposure to an infectious disease).

5.1.4 Environmental Assessment

FRNSW and the EPA should be consulted about any additional clean-up involving hazardous materials.

5.1.5 Epidemiological Studies

An expert advisory group may be convened by the Public Health Controller to consider if epidemiological studies are necessary. For most incidents a health register would not be required.

Ongoing monitoring of the health status of affected individuals is best managed by their primary health providers, with advice from specialists as required.

5.2. Additional Recovery Actions

Public health services play an important role in the recovery aspects of a Hazmat / CBRN incident, which may begin while response activities are underway. NSW HEALTHPLAN and the Public Health Services Supporting Plan both detail specific activities which may be undertaken by public health during the recovery phase, including:

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- Restoring any disrupted public health services
 - Conducting debrief sessions to identify response strengths and opportunities for refinements or adjustments to plans
 - Evaluating technical aspects of the response and sharing findings with the wider health protection community (where appropriate)
 - Ensuring that resources utilised in the response are cleaned, restocked, stored and in good working order.

A Public Health Unit Hazmat / CBRN Incident Response Checklist can be found in **Appendix D**.

APPENDICES

APPENDIX 1 - Additional considerations for radiological and nuclear emergencies

Introduction

NSW Health is involved in the planning of radiological and nuclear emergencies through its membership on the State Emergency Management Committee and the NSW Chemical Biological Radiological Nuclear and Hazardous Materials Steering Committee. Response to radiological and nuclear emergencies is a highly specialised activity that is outside the usual scope of work of NSW Health public health staff.

If a radiological or nuclear emergency were to occur, a critical element of the public health response will be to obtain advice from experts in radiation protection. Within the health system, nuclear medicine specialists, health physicists and radiation safety officers have knowledge and experience of radiation protection. More broadly, the NSW emergency management arrangements provide a clear mechanism for accessing radiological expertise from national agencies.

Accessing expert radiation protection advice

The [Australian Nuclear Science and Technology Organisation](#) (ANSTO) maintains comprehensive radiation safety and emergency response capabilities. Under the NSW Hazmat / CBRN Emergency Sub Plan, ANSTO will assist in a radiological or nuclear incident by providing scientific expert advice and technical assistance and will make available on-site resources, facilities and systems to the emergency services where they are needed.

The [Australian Radiation Protection and Nuclear Safety Agency](#) (ARPANSA) has established the Radiation Emergency Coordination Centre in Melbourne. This provides 24 hour access to expert radiation protection advice. Assistance from ARPANSA should be sought via the arrangements described in the [NSW State Emergency Management Plan](#) (EMPLAN), and the [Australian Government Disaster Response Plan](#) (COMDISPLAN).

Public health services can access this support through the State Health Services Functional Area Coordinator (HSFAC) via the State Public Health Controller. It is important to ensure that those with radiation protection expertise are included on any public health expert panel established to support the response.

Additional considerations in a nuclear or radiological emergency

Public health service activities in response to a Hazmat / CBRN emergency are outlined in Sections [4](#) and [5](#). Additional considerations for a nuclear or radiological emergency are outlined below.

1. Urgent protective actions

Urgent protective actions are interventions that will protect the public from radiation exposure that must be implemented within hours if they are to be effective.

Responsibility for implementing these actions lies with the combat agency and will be taken with advice from agencies with expertise in radiation emergency response (e.g. ANSTO and ARPANSA). Decision making depends on assessment of the radionuclides involved and the dose that could be averted by the actions. Public health services may be required to support the decision making and implementation of certain urgent protective actions.

ARPANSA's [Radiation Protection Series No.7: Interventions in Emergency Situations Involving Radiation Exposure](#) (RPSNo.7) provides guidance on emergency interventions and specifies criteria (intervention levels) at which these interventions should be implemented. Intervention levels are set to ensure that the benefits of the protective action outweigh the harm. The emergency response should ensure that protective actions are implemented rapidly in areas where they are warranted, and not introduced in areas where intervention is not recommended.

Primary urgent protective actions include:

- Shelter-in-place
 - Moving or staying inside rather than trying to evacuate may be the appropriate measure in certain situations. Further information on safely sheltering in place can be found at:
http://www.health.nsw.gov.au/emergency_preparedness/radchem/Pages/shelter-in-place.aspx.
- Evacuation
 - [GL 2011-011 Major Evacuation Centres: Public Health Considerations](#) provides guidance on public health matters that may be considered in the establishment and monitoring of a major evacuation centre. Public health services may be asked to provide advice on health screening at evacuation centres.
http://www0.health.nsw.gov.au/policies/gl/2011/GL2011_011.html
- Administration of stable iodine prophylaxis
 - Stable iodine can be of benefit in protecting the thyroid against radioactive iodine released following a nuclear incident. The uptake of radioiodine will substantially reduce with prompt administration of stable iodine. Administering stable iodine eight hours after exposure is only 50% effective in preventing the uptake of radioiodine. This compares with almost 100% effectiveness with immediate administration of stable iodine. This assumes that there is not ongoing exposure.
 - A supply of stable iodine prophylaxis is maintained within the State Medical Stockpile. The Chief Health Officer or State HSFAC will determine the need to distribute this stock.
- Restrictions on consumption of potentially contaminated food and water.
 - This will also be an ongoing consideration.

2. Registration for long-term medical follow up

Ongoing monitoring of the health status of affected individuals is best managed by their primary health providers, with advice from specialists as required.

Long-term medical follow up may be indicated for those who receive a significant dose radiation. Table F2 in the International Atomic Energy Agency / World Health Organization guidance [EPR Medical 2005: Generic procedures for medical response during a nuclear or radiological emergency](#) provides recommended levels for registration and long-term follow up.

The State Public Health Controller (with support from an expert advisory group) will consider if epidemiological studies are necessary.

3. Clinical partners

Public health services should be prepared to facilitate provision of advice to clinicians about the treatment and management of casualties (see *Table 1 - Practical classification of casualties from a nuclear or radiation emergency*). Particular advice should be considered for children, pregnant women and breastfeeding women.

Advice may be available from nuclear medicine specialists and medical physicists within NSW Health or obtained from national agencies (e.g. ANSTO, ARPANSA).

In addition, the [Australian Clinical Guidelines for Radiological Emergencies](#) is a comprehensive technical guide for clinicians and public health professionals to enable better understanding of radiation hazards and effects, and optimal management of radiation casualties and concerned communities

([http://www.health.gov.au/internet/publications/publishing.nsf/Content/CA2578620005D57ACA257ACD000965A8/\\$File/Aust-Rad-Guidelines-Sept2012.pdf](http://www.health.gov.au/internet/publications/publishing.nsf/Content/CA2578620005D57ACA257ACD000965A8/$File/Aust-Rad-Guidelines-Sept2012.pdf)).

General information about nuclear and radiological emergencies

1. Types of nuclear and radiological emergency

Radiological and nuclear emergencies may involve sealed sources or dispersed radioactive material. Emergencies involving sealed sources may result in external exposure to radiation only. Those involving dispersed radioactive material may also result in external and internal contamination.

The risk of a radiological or nuclear emergency in NSW is low. However, the following scenarios could potentially occur in NSW:

- An uncontrolled release from the Lucas Heights nuclear reactor – note that such release is unlikely to have off-site consequences
- Transport accidents involving radioactive sources
- Accidents involving radioactive sources in industrial facilities, hospitals or laboratories
- Malicious use of conventional explosives or other mechanisms to disperse radioactive or nuclear material
- Loss or destruction of shielding for a high activity radioactive source.

2. Types of casualties from radiological and nuclear emergencies

Casualties from a radiation emergency will fall into one of four categories:

1. Conventional injury
2. External exposure
3. Contamination
4. Combined injury.

These categories can be further subdivided to provide a practical classification for planning and medical response (**Table 1**).

There is likely to be a great demand for psychological counselling. Input on appropriate health communications can be sought from the Local or State Mental Health Controller through the NSW Health emergency channels.

Table 1: Practical classification of casualties from a nuclear or radiation emergency

People with radiation injuries only	<p>The most common early signs of acute radiation exposure to a large body volume (whole body) in high dose are nausea and vomiting. Except for very large doses, nausea and vomiting will begin hours after exposure. Radiation burns have a latency of days to weeks, so burns to the skin during an acute emergency will have other causes. Decontamination may be required to minimise ingestion or inhalation of the injured, and exposure to other individuals.</p> <p>Because of the long latency of radiation injuries, some emergencies that lead to symptoms and signs of radiation exposure may not be discovered for days or weeks after exposure. This is especially true in situations involving the general public (such as those where a dangerous source is lost or stolen) or when workers fail to report events. These types of emergencies will only be detected if physicians are able to recognise and diagnose radiation injuries.</p>
People with combined injuries	<p>Combined injuries are conventional trauma combined with radiation exposure or contamination. Combined injuries may worsen the prognosis of radiation injuries. Whatever the cause of the radiation injury, exposure or contamination, treatment of radiation injuries has lowest priority. Decontamination may be required.</p>
People with potential external or internal contamination	<p>These individuals require monitoring to assess the degree of contamination. Decontamination is required to prevent or reduce further exposure and to reduce the risk of inhalation or ingestion. Their dose must be assessed to determine further management.</p>
People with potential radiation injury	<p>These people have been exposed but do not yet have symptoms or signs of radiation injury. They require urgent dose assessment in order to be managed appropriately.</p>
Unexposed people with conventional trauma	<p>These casualties should be managed in accordance with their needs.</p>
People who are uninjured and unexposed	<p>All people known to be uninjured and unexposed should be allowed to return to their own homes (or evacuation centre). Registration of people living or working within the immediate vicinity of an emergency may be required in order to facilitate proper medium to long-term reassurance/follow up and to avoid false claims after the emergency.</p>
People requiring counselling for psychological distress	<p>People impacted by a radiation emergency may experience varying degrees of psychological distress. Such distress may present at any time during or following the event. The magnitude of distress can be greatly increased when the radiation emergency is the result of a malicious act. Adequate support must be provided in a timely manner by trained, experienced professionals. Psychological distress presents a risk to the health services response. Distressed individuals who believe their health has been threatened may present to medical facilities in large numbers, overwhelming these facilities. Community monitoring centres can be established to accommodate psychologically distressed, uninjured individuals (worried well).</p>

Adapted from *EPR Medical 2005*

APPENDIX 2 – Hazmat / CBRN Incident Notification Form

Name of person making notification		Date of notification		Time/timezone of notification	
Notifier's organisation		Position			
Notifier's contact number		Email			

Has Fire & Rescue NSW attended the scene?	Y / N	Has Ambulance attended the scene?	Y / N	What is the EPA reference number?	
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Description of material (information to be obtained from the notifier)

What happened, what were the means of release and what is contaminated? (e.g. a spill of liquid or leak of gas contaminating air, water, land, food etc.)			
What is the contaminating material? (e.g. a chemical compound, biological or radiological material)			
Contaminating Material Details (if applicable or available)			
Name and UN number			
Manufacturer			
Chemical formula			
Volume			
Concentration			

Description of the incident

Where and when did the incident happen?			
Address or location of incident			
Distance to nearest residence		Distance to nearest business	
Time release began		Is the release ongoing?	Y / N
Is the release contained? If not, what action is being taken to contain the release and prevent continuing exposure?			
Has any contaminated solid, liquid, gas or airborne material gone off-site? (provide details)			
Is there a plausible mechanism by which people have been/may be exposed to the contaminating material?			

Has anyone complained of health effects?		Y / N	Has anyone been hospitalised?		Y / N
If yes:	Who is unwell?	Workers	Y / N	Local residents	Y / N
	How many people are affected?	Workers		Local residents	
	What are the symptoms?				
	Where were the affected people?				

If there is any doubt about whether the incident could result in a plausible route of exposure, the EPA should be contacted to provide clarification. **The Regional Duty Officer may be contacted via the Environment Line (131 555).**

Additional information may be recorded here:

<p>Is further action required? Further action is most likely to be required if there are complaints of health effects or if contamination has spread beyond the site boundary and there is a plausible mechanism of public exposure.</p>	<p>Y / N</p>
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If yes, immediate notification of the LHD HSFAC should be considered.

Name of person completing form		Date	
Signature		Time	
Local Health District		Time taken to assess notification	

APPENDIX 3 - Additional resources

Relevant government emergency plans are listed in Section 1. Hazard-specific resources are listed below.

Chemical:

- Australian Clinical Guidelines for Acute Exposures to Chemical Agents of Health Concern: A Guide for Emergency Department Personnel
<http://www.public.health.wa.gov.au/cproot/2546/2/Chemical-guidelines-final-edition.pdf>
- Health Protection UK Chemical Compendium
<https://www.gov.uk/health-protection/chemical-hazards>
- National Institute for Occupational Safety and Health (NIOSH)
<http://www.cdc.gov/niosh/>

Biological:

- Health Protection UK Biological Hazards (Infectious Disease)
<https://www.gov.uk/health-protection/infectious-diseases>
- NSW Notifiable Conditions Information Management System (NCIMS)
<http://www.health.nsw.gov.au/epidemiology/Pages/notifiable-diseases.aspx>
- NSW Health Communicable Disease Branch
<http://www.health.nsw.gov.au/infectious/pages/default.aspx>
- Public Health Laboratory Network (Australia) – collaborative group of labs with expertise in providing public health microbiology
<http://www.health.gov.au/phln>

Radiological and Nuclear:

- Australian Clinical Guidelines for Radiological Emergencies
[http://www.health.gov.au/internet/publications/publishing.nsf/Content/CA2578620005D57ACA257ACD000965A8/\\$File/Aust-Rad-Guidelines-Sept2012.pdf](http://www.health.gov.au/internet/publications/publishing.nsf/Content/CA2578620005D57ACA257ACD000965A8/$File/Aust-Rad-Guidelines-Sept2012.pdf)
- NSW Environment Protection Authority (EPA)
<http://www.epa.nsw.gov.au/>
- NSW Lucas Heights Emergency Sub Plan
<https://www.emergency.nsw.gov.au/publications/plans/sub-plans/lucas-heights.html>

- Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)
<http://www.arpansa.gov.au/>
 - *ARPANSA Radiation Protection Series No.7: Interventions in Emergency Situations Involving Radiation Exposure* provides guidance on radiation protection criteria for use in mitigating the consequence of emergencies involving radiation exposure
- Australian Nuclear Science and Technology Organisation
<http://www.ansto.gov.au/>
- Centers for Disease Control and Prevention Radiation Emergency Preparedness and Response website
<http://emergency.cdc.gov/radiation/>
- Health Protection UK Radiation Resources
<https://www.gov.uk/health-protection/radiation>
- Peter MacCallum Cancer Centre
<http://www.petermac.org/>
- *EPR Medical 2005: Generic procedures for medical response during a nuclear or radiological emergency* provides a comprehensive set of procedures, including public health procedures, for use in the response to a nuclear or radiological emergency.
http://www-pub.iaea.org/MTCD/publications/PDF/EPR-Medical-2005_web.pdf
- Radiation Emergency Medical Management – A website maintained by the US Department of Health and Human Services that provides numerous resources to support radiation emergency response
<https://www.remm.nlm.gov/>

APPENDIX 4 - Public Health Unit Hazmat / CBRN Incident Response Checklist

Action item	Date:
Immediate Response Activities	
<p>1. Ensure all necessary notifications been made through appropriate channels</p> <ul style="list-style-type: none"> - PHU Director - LHD HSFAC - Chief Health Officer - State Public Health Controller - Fire and Rescue NSW - EPA - Laboratories - State Pathology Controller 	<p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>
<p>2. Gather information regarding the notification (utilising Hazmat/CBRN incident notification form)</p>	<p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>
<p>3. Hazard identification:</p> <p>a). Detection, confirmation and control of material</p> <p>b). Access toxicological information for hazardous material</p>	<p>In Progress / Complete / Incomplete</p> <p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>

<p>4. Undertake exposure assessment:</p> <p>a). Identify human exposure pathways</p> <p>b). Support environmental sampling</p> <p>c). Assess potential spread of the material</p>	<p>In Progress / Complete / Incomplete</p> <p>In Progress / Complete / Incomplete</p> <p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>
<p>5. Risk characterisation:</p> <p>a). Convene an expert panel</p> <p>b). Establish if a public health risk is present</p>	<p>In Progress / Complete / Incomplete</p> <p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>
<p>6. Risk management</p> <p>a) Formulate an incident action plan if public health risk is present or likely) (available on Popnet)</p> <p>b) Undertake immediate actions to minimise further health risks</p> <p>c) Dispatch personnel to event if requested</p>	<p>In Progress / Complete / Incomplete</p> <p>In Progress / Complete / Incomplete</p> <p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>
<p>Intermediate Response Activities (implement as needed)</p>	

<p>7. Verify that surveillance systems are operational</p>	<p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>
<p>8. Liaise with laboratories to ensure they are aware and operational</p>	<p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>
<p>9. Provide advice on evacuations of affected areas</p>	<p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>
<p>10. Provide advice on public risk communication messaging</p>	<p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>
<p>11. Provide advice to hospitals and community health providers treating casualties</p>	<p>In Progress / Complete / Incomplete</p> <p><u>Notes:</u></p>

<p>12. Ensure the needs of vulnerable groups are being addressed</p>	<p>In Progress / Complete / Incomplete <u>Notes:</u></p>
<p>13. Address any special considerations for events with deliberate intent</p>	<p>In Progress / Complete / Incomplete <u>Notes:</u></p>
<p>Recovery Considerations</p>	
<p>14. Provide additional clinical guidance, if required, regarding long-term health needs of the population</p>	<p>In Progress / Complete / Incomplete <u>Notes:</u></p>
<p>15. Consider the necessity of undertaking additional epidemiological studies (via Public Health Controller)</p>	<p>In Progress / Complete / Incomplete <u>Notes:</u></p>
<p>16. Undertake any necessary additional recovery actions</p>	<p>In Progress / Complete / Incomplete <u>Notes:</u></p>