Developing an Industrial Emergency Response Plan (ERP) for Lamont County

I. Introduction

1.0 Purpose and Scope

The primary purpose of these guidelines is to provide owners and operators of industrial facilities with guidance in the development of an Emergency Response Plan for a timely and effective response to industrial emergencies involving the release of hazardous chemicals or dangerous goods to the environment, industrial accidents, fires, explosions as well natural disasters.

The guidelines are intended for application by industry to assess hazards, do a risk assessment and develop a plan. The plan will become a living document that is reassessed, practiced and reassessed again.

2.0 Definitions

Accident means an unexpected event that result in loss or injury to a person and/or damage to property or the environment.

Dangerous Goods means goods defined in section 2 of the *Transportation of Dangerous Goods Act* (Canada) and regulated in the federal regulations. Dangerous goods include explosives, compressed and liquefied gases, flammable and combustible materials, oxidizing materials and organic peroxides, poisonous and infectious substances, radioactive materials, corrosives, and miscellaneous dangerous goods.

Emergency means, in the context of these guidelines, an accidental situation involving the release or imminent release of dangerous goods or other substances that could result in serious adverse effects on the health and/or safety of persons or the environment. Emergencies may involve a fires, explosions, machinery accidents, structure collapse, or injuries. An emergency may be the result of

man-caused or natural occurrences such as, but not limited to, process upsets, uncontrolled reactions, fires, explosions, threats, structural failures, tornados, earthquakes, floods, and storms.

Emergency Response (Contingency) Plan (ERP) means a detailed program of action to control and/or minimize the effects of an emergency requiring prompt corrective measures beyond normal procedures to protect human life, minimize injury, to optimize loss control, and to reduce the exposure of physical assets and the environment from an accident.

Hazard means an event with a potential for human injury, damage to property, damage to the environment, or some combination thereof.

Incident Command System (ICS) is the accepted system of developing a command structure during an emergency practiced by emergency services in Lamont County and surrounding mutual aid partners. It is strongly advised that your industry make itself familiar with this widely accepted form (FEMA in US and across Canada) of incident command.

Risk means the chance of a specific undesired event occurring within a specified period or in specified circumstances. It may be either a frequency or a probability of a specific undesired event taking place.

Risk Analysis means the identification of undesired events that lead to the materialization of a hazard, the analysis of the mechanisms by which these undesired events could occur and, usually, the estimation of the extent, magnitude, and likelihood of any harmful effects. Lamont County has within its Planning and development documents the accepted criteria for doing a risk analysis in the County that being MIACC (Major Industrial Accidents Council of Canada) criteria. Other analysis methods that may be required by industry but not limited to are hazard and operability study (HAZOP) and failure modes and effects analysis (FMEA).

Risk Assessment means the quantitative evaluation of the likelihood of undesired events and the likelihood of harm or damage being caused by them, together with the value judgments made concerning the significance of the results.

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Risk Frequency means the number of occurrences per unit of time.

Risk Management means the program that embraces all administrative and operational programs that are designed to reduce the risk of emergencies involving acutely hazardous materials. Such programs include, but are not limited to, ensuring the design safety of new and existing equipment, standard operating procedures, preventive maintenance, operator training, accident investigation procedures, risk assessment for unit operations, emergency planning, and internal and external procedures to ensure that these programs are being executed as planned.

Spill means an unauthorized release or discharge of a dangerous good into the environment.

II. Contents of a Typical Plan (Complete ERP for Industry)

1.0 Policy Statement

A company should have a policy statement reflecting its commitment to emergency prevention and preparedness. The statement is usually signed by a senior official such as the Chief Executive Officer or the company president. A policy statement should include:

- management's commitment to safeguard the health and safety of the employees and the public and to protect the environment;
- a statement of the company's priorities in the event of a spill. Generally priority is in the order of the immediate safety of employees at the site and the members of the surrounding community, followed by protection of the environment;
- a clear indication of the first-line supervisor's authority for emergency action and expenditure;
- a statement of authority regarding who will deal with public and media inquiries;
- a statement concerning the company's plan to monitor compliance with this policy;
- the effective date of the plan;
- a schedule for review and for testing/exercising of the plan.

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2.0 Purpose and Scope

The purpose of formulating a response plan is to develop a state of readiness which will allow for a prompt and orderly response to an emergency. This section of a response plan should state the intent and scope of the plan. Response plans should be structured around four major objectives:
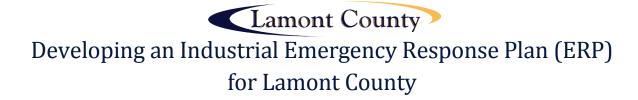
- understanding the type and extent of a potential emergency (risk/exposures);
- establishing a high order of preparedness (equipment, personnel) commensurate with the risk;
- ensuring an orderly and timely decision-making and response process (notification, standard operating procedures); and
- providing an incident management organization with clear missions and lines of authority (Incident Command System, field supervision, unified command).

Prevention is by far the most effective way of reducing or eliminating the potential for a spill, as well as impact mitigation to reduce community and environmental impacts should a spill occur. Development of spill prevention measures (e.g. product loss control) and mitigation measures (buffer-zones, dangerous goods transportation corridors, land-use plans) are separate endeavours to a response plan. These approaches are beyond the scope of these guidelines and are not addressed.

The terms of reference for the plan should include such items as:

- whether the plan is for an individual operation or a part of an industry cooperative in a given area;
- the geographic and physical location(s) covered by the plan;
- types of emissions or spills which the plan is designed to address including spills to land, water and air. This should include all dangerous goods and hazardous chemicals being handled along transportation routes and at the particular plant for which the plan is being developed;
- a list of any other organizations or groups having responsibility under the plan.

Finally, the response plan must be compatible and integrated with the disaster, fire and/or emergency response plans of local, provincial, and federal agencies. The latter is largely achieved by using the international and proven Incident Command System of emergency management and by working according to the Safer Community Program of the Canadian Association of Fire Chiefs.
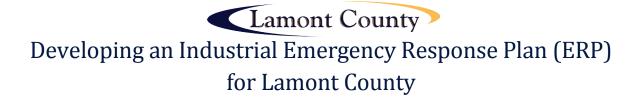
3.0 Pre-Emergency Planning

3.1 Hazard Identification

The first step is to identify potential hazards. This section of a response plan should identify all potential on-site and off-site hazards of the operation, and the type of damage that may result. This requires information on toxicological, physical, and chemical properties of the substances being handled. The potential impact on downwind air quality or downstream water quality from an accidental release and danger to human and animal health should be clearly identified. A mitigation plan** can be developed to passively reduce exposures to the community or the environment should a spill occur (e.g. buffer-zones, fencing, dykes/barriers, transportation corridors). Man-made perils such as fire, explosion, transportation accidents, pipeline breaks or equipment failure should be considered in addition to the natural perils such as floods, earthquakes or landslides.

3.2 Risk Analysis

The second step of the process is to determine the risk of an incident associated with each hazard. The basic procedure in a risk analysis is as follows:

- identify potential failures or accidents (including frequency);
- calculate the quantity of material that may be released in each failure, estimate the probability of such occurrences, and
- evaluate the consequences of such occurrences based on scenarios such as most probable and worst case events.

This combination of consequences and probability will allow the hazards to be ranked in a logical fashion to indicate the zones of important risk. Criteria should then be established by which the quantified level of risk may be considered acceptable to all parties concerned.

To reduce or eliminate risk, consideration should also be given to spill prevention and spill mitigation in conjunction with the preparation of a response plan. For this purpose, workers involved in operating the plant, equipment or systems should be encouraged to provide information concerning weaknesses in systems or operating procedures, "near misses," and potential problems they have observed, along with recommended measures for prevention/mitigation of such occurrences.

3.3 Legislation and Industry Standards

The response plan should identify federal, provincial and local regulations which apply to the facility and its operation. Examples include the federal *Canada Shipping Act*, *Canadian Environmental Protection Act* and others. Where appropriate, regulatory agencies should be contacted for identification of requirements for the environment, pipelines, mining, fire, oil and gas, boiler and pressure vessels, dangerous goods, transportation, health and safety, and other operational considerations.

In certain cases a particular industry may be bound to follow procedures recommended in Codes of Practice. Codes of Practice reflect an ethic, an attitude, and method of thinking about the way in which member companies do business and their role in society. Industry associations should be contacted in identifying appropriate codes. A good example of Codes of Practice are those under the "Responsible Care" initiative of the Chemistry Industry Association of Canada.

3.4 Emergency Organization and Responsibilities

The response plan should identify the transition from normal operations to emergency operations and the delegation of authority from operations personnel to emergency response personnel. For this purpose, the plan should identify an emergency response organization with appropriate lines of authority and how the response management will escalate. Responsibilities for decision making should be clearly shown in an emergency organization chart. The plan should identify each responder's position; mission, duties and reporting relationship (refer to Incident Command System below). Sufficient details should be provided to ensure that all critical activities are covered.

The provincial government has recognized the international Incident Command System (ICS) as the preferred organizational structure during an emergency event. A self-guided course is available. The ICS is an organized approach to effectively control and manage emergency operations where there requires:

- direct supervision of field personnel (task forces, single resources, strike teams) from an Incident Command Post;
- development of an Incident Action Plan and delivery of tactical (operational) decisions;
- where unified (shared) command with other jurisdictions (local, provincial and/or federal governments) or response functions (fire, police, ambulance, hazmat) with the Responsible Party (spiller/polluter).

In the ICS, the emergency response is categorized into functional components such as - *Command*, *Operations*, *Planning*, *Logistics*, *Finance/Administration* - and response is undertaken according to a standard set of protocols (e.g. rules of engagement). As well, there are a establish set of response personnel positions, each with defined missions and duties under the five ICS functions.

Under ICS, the individual(s) in charge of the incident - the Incident Commander(s) - have the final authorities to jointly make the strategic and tactical decisions and have a complete responsibility for the management of the incident. Government (local, provincial, federal), *via* their Incident Commanders and team members, have the authority to monitor the Responsible Party's

(spiller/polluter) response efforts and to determine public safety and environmental protection priorities. Government may also augment the company's response efforts by providing government personnel and equipment. The latter is generally based on a cost-recovery for such services, as per the *Environmental Management Act's*.

Additional response levels above the field and site, are recommended to support the companies incident management team. These are the "off-site" Emergency Operations Centre located at a company's regional office and Headquarters office and their Crisis Management Team.

3.5 Resources

This section will identify sources of local assistance including telephone numbers and names of contacts for:

- fire departments
- police
- municipal and provincial agencies
- hospitals
- doctors
- other company facilities
- mutual aid organizations
- co-operatives

Other resources that should be considered to assist in the incident include:

- helicopter and air transport services
- surface transport services
- safety and monitoring equipment suppliers
- spill response and/or cleanup services

Companies should also determine what resources (equipment, personnel, technology, expertise) can be provided by the federal and provincial government, and under what conditions.

3.6 Internal Alerting

In an emergency, information must be communicated quickly and accurately throughout the affected organization. The purpose of this portion of a plan is to establish an effective emergency communication network and a procedure for the prompt notification of individuals and agencies involved in an emergency response.

The section must identify means for 24-hour notification of first responders and officials who can provide direction and control to the response effort and who can authorize evacuation. A notification guide should also include a list of backup personnel for emergency response and their telephone numbers (cellular, pager, home numbers). To prevent system breakdown, an "alternate" person should be designated for each key position of designated responsibility.

The notification procedure may include flow charts and checklists indicating who should be involved, who has the responsibility to notify these individuals, how the notification is accomplished (e.g., paging systems, cellular or mobile phones) and the use of "fan out" (a call to one person/agency who in turn calls one or more key individuals during major emergencies). These numbers and checklists may be posted in critical areas for ready use or distributed as pocket cards.

3.7 External Alerting

The plan should describe how and when the fire and police departments, emergency measures organizations, federal (Environment Canada) and provincial authorities, news media, and volunteer or off-duty workers will be contacted during working and non-working hours. The responsibility may be designated to senior company personnel. Contacts for reporting purposes should also be included in the contact telephone listing. Roles and responsibilities of all external organizations and agencies involved in the emergency response and/or support function should be clearly defined. Duplication can be eliminated by ensuring coordination among the various agencies that provide similar services.

3.8 Electronic Communications

During an emergency, effective and reliable electronic communications equipment and procedures are vital. This section of the plan should detail the types of communication equipment to be used by personnel during an emergency response. Since normal means of communication can break down in an emergency, alternative means must be considered. Cellular telephones, public address systems, two-way radios and messengers can be used.

Training and arrangements may be necessary to ensure that telephone services are available for official calls during an emergency and that unauthorized calls will not be placed. Within and Incident Command Post, telephone circuits may quickly become jammed with calls. Direct hot lines that are not available to outside lines may be considered for critical communications. Use of 1-800 numbers for public enquires is another option to manage external calls.

3.9 Public Affairs

A good public relations program is extremely important in an emergency situation. Inquiries will normally be received from the media, government agencies, local organizations and the general public. This section of the Response Plan should include a public relations or media plan. It should identify an Information Officer that is well-equipped and trained in media relations.

Initial releases should be restricted to statements of facts such as the name of the installation involved, type and quantity of spill, time of spill, and countermeasure actions being taken. All facts must be stated clearly and consistently to everyone. Discrepancies will raise unnecessary concerns and speculation. To avoid mix-messages, the Ministry of Environment's preferred way of issuance medial releases is through a Joint Information Centre (JIC) that is separate from the Incident

Command Post and that is staffed by Information Officers by both industry and government. Joint media releases are approved under Unified Command.

Plans should also be developed to utilize local media and television stations for periodic announcements during an emergency. This will also assist in reducing rumours and speculation.
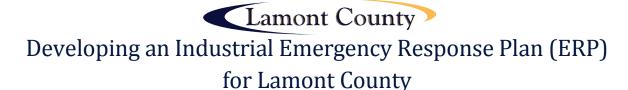
4.0 Emergency Response

4.1 Response Action Decision

A Response Plan should have emergency coding that defines the severity and potential impact of an emergency. The three levels of emergencies may be identified as follows:

34. LEVEL 1: minor spills requiring an on-site worker to respond and take necessary collective actions.
35. LEVEL II: intermediate level spills requiring response by on-site or off-site trained staff but posing no danger to the public.
36. LEVEL III: a major incident beyond the resources of a single facility, where there are subsidiary problems to complicate the situation such as fire, explosion, toxic compounds, and threat to life, property and the environment. Assistance will be required from local, regional, and/or provincial organizations. The media will be present and politicians at all levels will be requesting action.

Incident detection, information gathering and action decisions are the first steps in responding to an emergency incident. All these steps may occur over a short or protracted time period depending on the circumstances and magnitude of the incident. The plan should identify the responsibility of the personnel having on-scene authority to evaluate the situation, assess the magnitude of the problem and activate the emergency response plan.

A flowchart or decision tree posted in the facility or distributed as a pocket guide will assist in ensuring these first critical decisions are made.

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4.2 Plan Activation and Response Mobilization

Normally, upon receiving initial notification of an incident, the individual having on-scene authority will assess the magnitude of the problem and potential threat to personnel, equipment, and environment. If the situation warrants, the person having authority to invoke the response plan will activate the plan, notify members of the Incident Management (Response) team and, as soon as possible, report to the Incident Commander. Situations must be assessed on an on-going basis to develop an appropriate response strategy.

For each type of emergency, the plan should include a specific Emergency Action Checklist. The action items may include the following:

- identify the nature of the emergency and ascertain if there are casualties;
- locate the source, the area of immediate risk and the potential for escalation;
- raise the alarm, alert the local, provincial and federal emergency services and activate the appropriate warning system;
- mobilize the appropriate resources to isolate the hazard as far as possible and to implement "first aid" remedial actions;
- initiate procedures for the protection of personnel, plant, property and the environment. Consider the need to evacuate non-essential personnel and the need for an emergency shut-down of operations. A detailed procedure for each foreseeable emergency should be included in the plan;
- implement procedures for the protection of vital resources, continuity of critical services and security of the property and records;
- arrange to account for personnel and to log events;
- activate emergency communications links. Notify senior personnel, the appropriate agencies and neighbors where appropriate;
- liaise with officers of the emergency services and with other senior personnel as they arrive on-site, and cooperate as required;
- call for further emergency assistance as may be necessary;

- keep abreast of developments and ensure that the means of giving and receiving information, advice and assistance are functioning effectively, including that related to public relations;
- as appropriate, implement approved procedures for rehabilitation.

4.3 Response Action/Containment/Cleanup

This section should identify the operational methods to manage an accidental spill or emission, as well as, and the location, capability, and limitations of equipment to be used. The Response Plan should not provide detailed descriptions, but refer to separate Operational Guidelines (Standard Operation Procedures) or detailed technical documents that apply to a given situation or industry specific event.

The plan should list available on-site and off-site equipment, how it is to be accessed and who has the responsibility for it. The plan should also describe how people and equipment will get to the site, how they will be supported during the crisis and how crews will be supplied for the duration of the incident.

4.4 Emergency Operations Centre - Incident Command Post

During emergencies, response operations should be directed from the Incident Command Post on site. An Emergency Operations Centre (EOC) is where the Incident Management (Response) Team resides and generally has these characteristics:

1. first line of support for operations.
2. response strategy, tactical decisions and Incident Action Plans are formulated.
3. if a "jurisdictional unfired command, then command is shared among other jurisdictions such as local, federal and provincial, or if a "functional" unified command, then command is shared among responding functions such fire, police, ambulance, hazmat.

4. Assess situations beyond the scope of the incident and act on them.

A location an EOC should be identified in the plan, as well as alternate locations for back-up. Incident Command Post(s) must be located a safe distance away from the incident itself so as not be subject to the threat(s) of an incident.

A supporting Emergency Operations Centre should also be established whereby members of the Incident Management Team can seek additional information and support from the company, such as additional personnel, specialized analysis, technology, etc.

At the top of the hierarchy of is a Crises Management Team (also referred to in government as an Agency Executive). The Crises Management Team is comprised of the company's senior executive (e.g. Chief Executive Officer), senior Public Relations Officer, and senior Safety/Emergency manager. The purpose of the Crises Management team is to address and resolve issues that arise on site that can only be addressed at the political/management level.

4.5 Evacuation

The purpose of this section is to ensure a safe and orderly emergency evacuation of each area or the entire plant. If required, the plan should also include procedures for the notification and evacuation of the surrounding community. The planning for communities is done as a joint effort with local government and industry. The following elements must be considered when developing evacuation plans:

- need for an alarm system capable of defining different areas and/or degrees of evacuation,
- maps showing both the primary and alternate evacuation routes,
- designation of primary as well as alternate off-site assembly areas,
- designation of employees responsible for checking the evacuation area and for taking personnel counts at the assembly area to ensure that the area has been safely evacuated,

- designation of emergency escape equipment,
- providing dispersion estimates for worst and most likely gas/vapour releases to better define the affected areas,
- procedures to increase the degree/extent of areas to be evacuated if the emergency situation escalates.

Evacuation decisions require knowledge by local authorities of the projected path of an air-borne chemical cloud, atmospheric dispersion rate, and ground level concentrations. The ability to warn residents on a rapid and reliable basis is also required. Use of appropriate and agreed on warning systems such as sirens, emergency broadcast systems, mobile public address systems and/or house-by-house contacts should be specified in the plan.

In some instances, it may be safer for citizens to remain inside with doors (shelter within) and windows closed rather than to be evacuated. A plume may move past homes very quickly. In these situations, the plan should include appropriate procedures to warn downwind residents to shut off all circulation systems including heating, air conditioning, vent fans and fire places.

4.6 Disposal of Spilled Contaminants and Debris

This section should contain procedures for the removal of recovered spilled material and contaminated soil or absorbents and location of temporary and/or permanent storage facilities for contaminated materials. The various possible treatment and disposal options such as incineration, reprocessing, burying, etc. should be covered in the plan along with procedures for obtaining the required approvals or permits from government agencies. Details on disposal should be provided in as separate Operation Guideline or technical document.

4.7 Site Restoration/Remediation

This is the action taken to restore the affected environment to the pre-spill conditions. The required degree of restoration will usually be determined through consultation between the party responsible for the spill and the government regulatory agency with primary responsibility in that situation.

Restoration can include physical removal of contaminated surface materials, high-pressure washing, chemical cleaning, replacing of contaminated soil materials, restocking of lakes, and bioremediation.
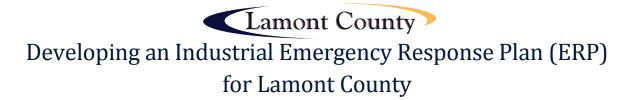
4.8 Post-Incident Evaluation

The plan should specify that a post-incident evaluation be done on both mock exercises and actual emergency incidents and describe the manner in which the evaluation is to be done. The primary purpose of the post-incident evaluation is to identify from the spill response operation the weaknesses or strengths in the Action Plan and to make appropriate corrections to the plan. Other uses for post-incident evaluation include accounting, legal, and public relations matters.

The post-incident evaluation should include the following:

- Suitability of the organization structure, equipment, communication system, etc.
- Adequacy of training, alarm systems, contingency manual, control centre, communication plans, security, spill containment and recovery procedures, monitoring, etc.
- Appropriateness of the emergency response action plan, media communications plan, mutual aid plans, etc.

An emergency response plan should provide for a written report on each incident. The report should include:

- a general description of the incident
- source and cause of the incident
- description of the response effort
- quantity of the spill and percent recovered
- itemized cleanup costs
- recommendations for preventative and mitigated measures
- plans for upgrading emergency preparedness and response plans

5.0 Training and Practice Drills

5.1 Training

Competency in responding to emergency incidents requires a complete understanding of the roles and duties of each person responsible on the team. Comprehensive training in the use of emergency response equipment and personnel protection devices and tactics is necessary to ensure the best response capability. Provision for training is an integral part of a complete contingency planning and implementation program. Initial training must be followed by periodic updates to maintain familiarity with all aspects of the plan.

This section of the plan should provide details of training programs for the company personnel and mutual aid agencies involved in responding to an emergency. The amount, type and frequency of training for each member of the team should be clearly spelled out.

Training should be provided at least annually and in the following situations:

- for new employees during their orientation period
- for existing employees when there is a change in their duties
- when new equipment or materials are introduced
- when emergency procedures are revised
- when a drill indicates need for improvement

It is wise to extend training as far as possible, even beyond the plant gates. The plan should provide for familiarizing local agencies such as fire, police and ambulance staff with the potential hazards of the operation.

5.2 Practice Drills

This section should provide for periodic simulation exercises or practice drills. It is important to develop employee skills and evaluate the adequacy of the contingency plan through the use of mock exercises or drills. The objectives of a drill include evaluation of the following:

- practicality of the plan (structure and organization)
- adequacy of communications and interactions among parties
- emergency equipment effectiveness
- adequacy of first aid and rescue procedures
- adequacy of emergency personnel response and training
- public relations skills
- evacuation and personnel count procedures

Drills may be conducted in various forms such as desktop, on-site or computer-synthesized. The complexity of the drill may be increased as the response team gains proficiency. Drills must be frequent enough to ensure that the response team maintains proficiency in all aspects of the contingency plan. Drills should be conducted in a variety of situations. It is also desirable to include mutual aid organizations and public emergency response organizations in these drills.

6.0 Plan Evaluation

This section of the plan should describe step-by-step procedure by which the plan may be evaluated internally. The purpose of evaluation of an emergency plan is to determine the adequacy and thoroughness of the plan. The ease of understanding and using the plan will also be important considerations.

7.0 Plan Updates

A procedure, should be in place to update the contingency plan on a regular basis so that its call-out numbers and procedures are current. When an amendment is made to a plan, the amendment date should be noted on the updated page of the plan. A senior employee of the company should be designated to ensure that all plan-holders are notified of changes as soon as possible. Plan-holders should be requested to verify that they have received the changes.

The most common amendments include telephone listings, response personnel, equipment, chemicals handled, emergency services available and resource lists.

Plan holders should be notified immediately of any key changes regardless of review period.

8.0 Appendices and Operational Guidelines

In an emergency situation it is extremely important that response personnel have immediate access to vital information. For this purpose some of the information may be organized in easy-to-follow tables in the appendices.

Types of information that may be included in the appendices include:

- response team and key company personnel call out list
- provincial, federal and local government agencies, news media and medical services telephone list
- community residents contact list
- facility maps, drawings and product hazard list
- organization, roles and responsibilities
- emergency incident report forms
- emergency shutdown procedures
- on-site mobile and emergency equipment list by location

- off-site mobile and emergency equipment list by location

- equipment inspection and maintenance schedules

- air, and water-quality monitoring procedures

- weather information contacts

- statutes/laws/regulations (e.g., Spill Reporting Regulation)

- emergency evacuation plan and escape routes

- cleanup contractors

- mutual aid contacts

- decontamination procedure

- material safety data sheets

- emergency response manual distribution list