



FARMED ANIMAL MASS CARCASS DISPOSAL PLAN
FOR
CARIBOO REGIONAL DISTRICT

Version 1.1 (Interim)
December 2006

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FOR
CARIBOO REGIONAL DISTRICT



**This plan was developed under the provisions of the
Farmed Animal Mass Carcass Disposal Project – Phase 1
by**

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OVERVIEW RESPONSIBILITIES FOR CARCASS DISPOSAL

LOCAL LIVESTOCK INDUSTRIES

Local livestock industries are the *first line responders* in a carcass disposal emergency. Producers are required to manage routine animal mortality and should have emergency plans for mass carcass disposal.

When mass carcass disposal is related to a foreign animal disease emergency, or is beyond industry’s capability to manage, producers cooperate with all levels of government to ensure an effective response.

LOCAL GOVERNMENTS

Local governments should have emergency plans for carcass disposal and will manage carcass disposal emergencies caused by natural disasters or by non-reportable animal diseases.

When a carcass disposal emergency involves a foreign animal disease, or is too large to be managed locally, the local government participates in an expanded response in conjunction with other levels of government.

GOVERNMENT OF BRITISH COLUMBIA

The Provincial Emergency Program (PEP), in conjunction with the Ministry of Agriculture and Lands and the Ministry of Environment, will provide support to local governments for planning and responding to carcass disposal emergencies. When a local government EOC opens in response to a carcass disposal emergency, PEP will activate and provide support appropriate to the situation.

When a carcass disposal emergency is the result of a foreign animal disease, the provincial government will participate in a joint federal-provincial response in accordance with the *Foreign Animal Disease Emergency Support Plan*.

GOVERNMENT OF CANADA

Foreign animal diseases fall into the federal arena of legislated authority and responsibility. When a carcass disposal emergency is the result of a foreign animal disease the federal government, through the Canadian Food Inspection Agency, will initiate and lead a joint federal-provincial response, in accordance with the *Foreign Animal Disease Emergency Support Plan*.

COLLECTIVE RESPONSIBILITY

The complex nature of carcass disposal operations require that all levels of government and local livestock industries work together to resolve the situation quickly and efficiently, with minimum risk to human health and the environment.

Glossary

Composting

Carcass composting is a natural biological decomposition process that takes place in the presence of oxygen (air).

Control Area

A geographical area that is legally defined in a Ministerial declaration and which is subject to specified activities to contain and/or eradicate a Foreign Animal Disease outbreak.

Disaster

A calamity caused by accident, intent, fire, explosion or technical failure, or by the forces of nature, which results in serious harm to the health, safety or welfare of people, the environment, or in widespread damage to property.

Emergency

A present or imminent event caused by accident, intention, fire, explosion or technical failure, or by the forces of nature which requires prompt coordination of action or special regulation of persons or property to protect the health, safety or welfare of people or to limit damage to property.

Farmed Animals

For the purposes of this plan, farmed animals include alpacas, cattle, donkeys, fur farmed animals, goats, horses, llamas, mules, poultry, rabbits, sheep and swine.

Fomites

Inanimate objects (e.g., boots, clothing, equipment, vehicles, crates, packaging) that can carry an exotic agent and spread a disease through mechanical transmission.

Foreign Animal Disease

All federally-reportable foreign animal diseases listed by the Office International des Epizooties as transmissible diseases that have the potential for very serious socio-economic or public health consequences, and are of major importance in the international trade of animals and animal products. (A list of Foreign Animal Diseases is at Annex A).

Foreign Animal Disease Emergency Support Plan

A plan which provides an agreement whereby federal and provincial agencies accept responsibilities for a collaborative response to a foreign animal disease event in BC.

Hazard

A source of potential harm, or a situation with a potential for causing harm in terms of human injury, damage to health, property, the environment or some combination of these.

Infected Premises

A private or public building and appurtenant buildings and land area in which a Foreign Animal Disease agent has been found or is suspected.

Infected Zone

A geographic area that contains infected premises. Depending on the disease, the perimeter of the infected zone shall extend a minimum of three kilometers beyond all known infected premises and shall follow, when possible, natural barriers and roadways to facilitate implementation of disease control procedures.

Livestock

The term *livestock* in BC includes alpacas, aquaculture animals, cattle, donkeys, fur farmed animals, game farmed animals, goats, horses, llamas, mules, musk oxen, poultry, rabbits, sheep, swine and other exotic animals as prescribed by the Minister of Agriculture and Lands.

Local Authority

Defined by the BC Emergency Program Act to include:

- for a municipality, the municipal council; and
- for an electoral area in a regional district, the board of the regional district.

Movement Control

The primary process of reducing the spread of a foreign animal disease, as most diseases spread by contact with infected or contaminated animals, animal product, by-products, feeds and items used to feed and care for animals. The movement of all pertinent animals or things within the prescribed area may be tracked, monitored and controlled through a permit system.

Office International des Epizooties (OIE)

The OIE is an intergovernmental organization created by international agreement. The 28 member countries undertake to report the animal diseases detected on their territory. The OIE then disseminates the information to other countries, which can take the necessary preventive action.

Pathogen

Any organism capable of producing disease or infection. Often found in waste material, most pathogens are killed by high temperatures.

Rendering

The breaking down of animal tissues into constituent fat and protein elements by the application of heat, pressure or other means.

Reportable Disease

These diseases are outlined in the federal *Health of Animals Act and Regulations* and are usually of significant importance to human or animal health or to the Canadian economy. Animal owners, veterinarians and laboratories are required to immediately report the presence of an animal that is contaminated or suspected of being contaminated with one of these diseases to a CFIA district veterinarian. Control or eradication measures will be applied immediately. (A list of Reportable Diseases is at Annex A).

Specified Risk Material

The skull, brain, trigeminal ganglia (nerves attached to the brain, eyes, tonsils, spinal cord) and dorsal root ganglia (nerves attached to the spinal cord) of cattle aged 30 months or older, and the distal ileum (portion of the small intestine) of cattle of all ages. Plus all material from dead stock and condemned cattle containing SRM.

Surveillance Zone

A geographic area that extends from the perimeter of an infected zone to a minimum of ten kilometers from any infected premise or to the outer perimeter of a control area.

Vector

An animal that has the potential to transmit a disease, directly or indirectly, from one animal or its excreta to another animal.

Zoonosis

Any disease that can be transmitted to humans from animals.

Acronyms / Abbreviations

AAR	After Action Report
BCAS	British Columbia Ambulance Service
BCERMS	British Columbia Emergency Response Management System
CCG	Central Coordination Group
CFIA	Canadian Food Inspection Agency
CRD	Cariboo Regional District
EOC	Emergency Operations Centre
FAD	Foreign Animal Disease
FADES	Foreign Animal Disease Emergency Support
INAC	Indian and Northern Affairs Canada
JEOC	Joint Emergency Operations Centre
MAL	Ministry of Agriculture and Lands
MOE	Ministry of Environment
MOH	Ministry of Health
MOT	Ministry of Transportation
PAB	Public Affairs Bureau
PEP	Provincial Emergency Program
PREOC	Provincial Regional Emergency Operations Centre
SRM	Specified Risk Material

1. Introductory Material

1.1 Purpose and Scope

The primary purpose of this plan is to guide the CRD response for dealing with mass animal carcasses generated in an emergency. The plan is designed to enhance the district's capacity to recover quickly from a mass animal carcass emergency and reduce the impact on the local agriculture industry.

A corollary purpose of the plan is to provide a source of local information related to a carcass disposal emergency which may be used by federal, provincial and local agencies which participate in an expanded response to a carcass disposal emergency. This information includes a profile of animal farming sites and activities in the CRD, and a list of district resources and capabilities which may be utilized in an emergency response.

The scope of this plan includes:

- a) a description of the agriculture in the area with emphasis on local farmed animal populations;
- b) identification of hazards and vulnerabilities that could result in a mass carcass disposal emergency situation in the district area;
- c) a concept of operations for disposal operations;
- d) approved methodologies for mass carcass disposal;
- e) identification of disposal resources and key personnel required to respond to an emergency situation;
- f) activities that must be performed in the event of a mass carcass disposal emergency;
- g) identification of resources required and available;
- h) identification of resource shortfalls; and
- i) a framework for post-emergency recovery.

1.2 Responsibility for the Plan

This plan will be maintained by the CRD *Emergency Program Coordinator*. The plan will be reviewed in its entirety and updated once a year, in conjunction with the review of the CRD Emergency Plan, to reflect any new procedures and information.

Any inputs or suggestions for changes to this plan should be submitted in writing to the *Emergency Program Coordinator* by December 31 each year for review, consideration and adoption in the next revision.

1.3 Authorities

Disposal of animal carcasses is governed by a number of federal and provincial regulations. Principal among these are:

Federal

- a) [Emergency Preparedness Act](#)
- b) [Emergencies Act](#)
- c) [Health of Animals Act](#)
- d) [Health of Animals Regulations](#)

Provincial

- a) [Emergency Program Act](#)
- b) [Emergency Management Regulation](#)
- c) [Local Authority Emergency Management Regulation](#)
- d) [Animal Disease Control Act](#)
- e) [Animal Disease Control Regulation](#)
- f) [Agricultural Waste Control Regulation](#)
- g) [Environmental Management Act](#)
- h) [Health Act](#)

Foreign animal diseases fall into the federal arena of legislated authority and responsibility. The Government of Canada considers such diseases a threat to national security and, through the Canadian Food Inspection Agency (CFIA), leads response efforts to control the disease. However, it is recognized that no single federal agency can manage the risks from foreign animal disease, and response plans require all levels of government to work together along with local livestock industries.

1.4 Requirement for the Plan

Section 2(1) of the *BC Local Authority Emergency Management Regulation –1995* requires local authorities to prepare emergency plans that reflect the local authority's assessment of the relative risk of occurrence and the potential impact on people and property of the emergencies or disasters that could affect all or any part of the jurisdictional area for which the local authority has responsibility.

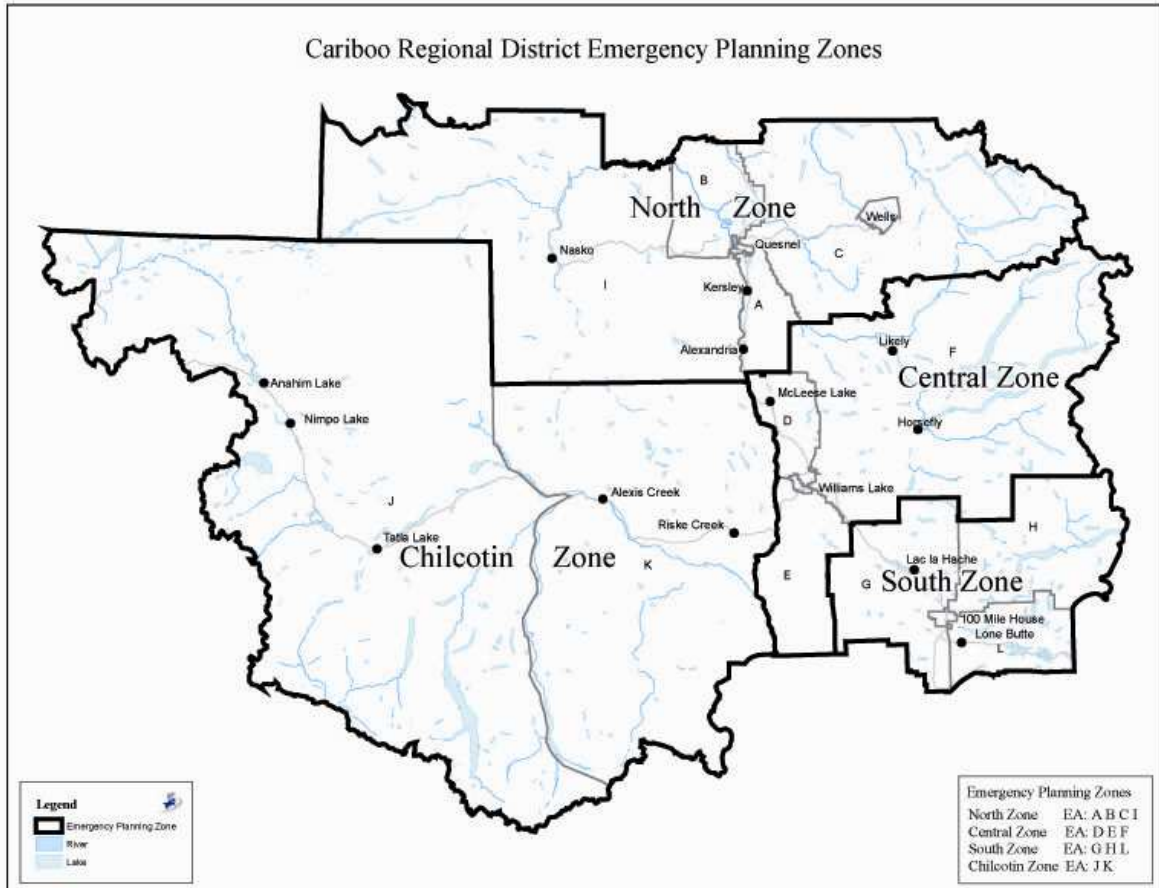
The desirability of having a carcass disposal plan at the local government level is set out in the *Ministry of Agriculture and Lands Emergency Response Plan 2006*, which states in part:

“BC local authorities should have emergency plans to deal with livestock mortalities from livestock disease outbreaks, as well as to address dead stock arising from natural disasters such as floods, fires and earthquakes.

“Local plans should allow for timely and efficient disposal of dead stock so as to minimize impacts on human, environmental and livestock health. Local authorities should take into account animal-related threats to human health and the environment; identify resources and key personnel to deal with the threats; identify methods of utilizing resources; and outline activities that must be performed in the event of an emergency”.

1.5 Related Plans	<p>This emergency plan is related to other plans, the most important of which are:</p> <ul style="list-style-type: none">a) FADES – Foreign Animal Disease Emergency Support Plan (2006 Interim Plan);b) Emergency Response Plan for BC Ministry of Agriculture and Lands (2006);c) Cariboo Regional District Emergency Plan; andd) Cariboo Regional District EOC Plan.
1.6 CRD Emergency Organization	<p>The primary function of the CRD in an emergency response is the management and operation of an EOC, where local officials will provide inter-agency or inter-function coordination, communication, and high level decision-making in support of the response and recovery efforts in the field.</p> <p style="text-align: center;">The primary EOC is located at the main CRD offices: Suite D – 180 North 3rd Avenue, Williams Lake, BC</p> <p>The CRD is divided into four zones for the purposes of emergency planning and response, as illustrated at Appendix 1 to this section.</p> <p>The <i>Concept of Operations</i> for a mass carcass disposal emergency is set out in Section 3.</p>
1.7 Plan Activation	<p>The requirement to activate this plan will normally be determined jointly by the Emergency Coordinator and Environmental Services Manager. A recommendation for activation will be passed to the <i>Emergency Planning Committee</i> for decision.</p> <p style="text-align: center;">ON ACTIVATION OF THIS PLAN CONTACT: Provincial Emergency Program: 1-800-663-3456 [24 hours] and Ministry of Agriculture and Lands: (250) 398-4500 [Business hours]</p>

Appendix 1 to Section 1 CRD Emergency Planning Zones Map



2. Local Area Data

2.1 Local Agricultural Profile

The CRD encompasses approximately 8.3 million hectares in the central interior of BC (8.7% of the provincial land area). The region is comprised of two major biophysical landforms: the broad interior plateau through the centre of the region and two significant mountain ranges, the Coast Mountains in the southwest and the Cariboo Mountains to the east of the Quesnel Highlands. The Cariboo, or eastern half of the region, refers to the Interior Plateau spreading east of the Fraser River to the Cariboo Mountains. The area to the west of the Fraser is called the Chilcotin.

Precipitation varies with the geography of the region, with areas in the rain shadow of the Coast Mountains experiencing the driest conditions with less than 30 cm annually, increasing to greater than 56 cm in the Quesnel Highlands. The centre north-south belt, primarily following the Fraser River valley, forms a transition zone.

Agriculture is a vital economic sector in the CRD. The sector is characterized by a large beef cattle industry and supporting forage production, and a variety of smaller scale, non-beef enterprises.

There are approximately 1,200 farms in the district. The large majority (>90%) of farmers reside on their farms and conduct business as sole proprietors, unlimited partnerships or family corporations. Only eight farm operations (<0.01% of the total) are non-family corporations. More than half of farm operators are also employed in off-farm work not related to their agricultural operation.

The average farm size is 832 acres, although the majority are less than 180 acres. The approximate numbers of commercial livestock farms in the district (reporting annual gross farm receipts greater than \$2500) are shown below by type:

Beef Cattle:	574
Dairy:	7
Poultry and Eggs:	16
Swine:	10
Mixed Livestock:	41

Beef cattle production is the primary agricultural activity and the backbone of the agriculture industry. Ranchers husband approximately 135,150 head, or about 19% of the provincial herd. Beef farms account for approximately 80% of the farm area in the district, and over 50% of agricultural enterprises are beef operations. Beef production is based on the region's extensive

rangelands, which provide a seasonal supply of forage.

Cow-calf operations are the most prevalent type of beef ranching, with an average herd size of 250-300. Livestock are pastured on crown and private rangelands from the spring through the early autumn, when most calves are sold and shipped out of the region. Depending on location, winter feeding extends from four to six months, relying on hay and silage stores.

Other livestock production in the CRD is diverse, however with the exception of beef cattle and horses it is generally small scale, as summarized below:

- a) *Horses*: Second in size to beef cattle production, horses comprise a substantial portion of regional livestock production and account for over 12% of the horse industry in BC. Horses are raised on over 61% of regional farms.
- b) *Dairy*: Dairy cattle are produced on 29 farms in Cariboo-Chilcotin, representing only 0.3% of the provincial herd. Other dairy animals raised in the region are typically used to supply personal consumption and/or to nurse orphaned beef calves.
- c) *Poultry*: Poultry and egg production comprises a minor portion of regional agriculture. A small portion of provincial commercial flocks (0.1 to 0.2%) is located in the CRD and are kept primarily for personal use and limited farm-gate sales of meat and eggs. There are no commercial poultry hatcheries in the district.
- d) *Swine*: There are two registered hog farms in the district: Run Away Ranch, Nimpo Lake, and Flying R Ranch, Lac La Hache. Some farms in the region raise hogs for their own consumption.
- e) *Sheep*: Sheep and lamb flocks are small and account for approximately 7% of sheep farmed in BC. Approximately 3,100 lambs are produced annually and the average flock size is 22.7 ewes per farm.
- f) *Other Livestock*: Other livestock husbandry in the region includes a small number of farms raising goats and rabbits and specialty livestock such as llamas and alpacas. There are five bison operations. These livestock producers rely heavily on private and farm-gate sales.

2.2 Local Farmed Animal Population

Approximate total numbers of farmed animals in the CRD are:

Beef cattle	135,150
Dairy cattle:	300
Swine:	970
Sheep/Goat:	6,500
Horses and ponies:	6,400
Poultry:	19,000

These numbers are derived from Statistics Canada information and will fluctuate annually.

Calculation of volume and mass by species is at Appendix 1 to this section.

2.3 Distribution of Farmed Animals

Farmed animal distribution in the CRD generally follows the pattern of human population, except that animals are not normally located within the boundaries of the main communities of Williams Lake, Quesnel, Wells or 100-Mile House.

Farm properties are located primarily along or near the main north-south traffic route (Highway 97), along or near the main east-west traffic route (Highway 20) and on both sides of the Fraser River and Chilcotin River valleys. Smaller farms may also be found along secondary routes throughout the region.

Much of the higher land west of the Fraser River benchlands represents an extension of the Chilcotin cattle range to the south, but conditions on the plateau are less favourable and the industry there remains small. Agricultural development is concentrated on terraces along both sides of the Fraser River.

Beef cattle have the widest distribution within the area, with Williams Lake serving as the hub of the ranching industry. There are many small operations with herds of 35 or fewer animals, and a few large operations with up to 3000 head. The largest cattle operations are located in the southern part of the district adjacent to the Fraser and Lower Chilcotin river valleys south of their confluence, where there is high agricultural capacity with extensive grazing areas.

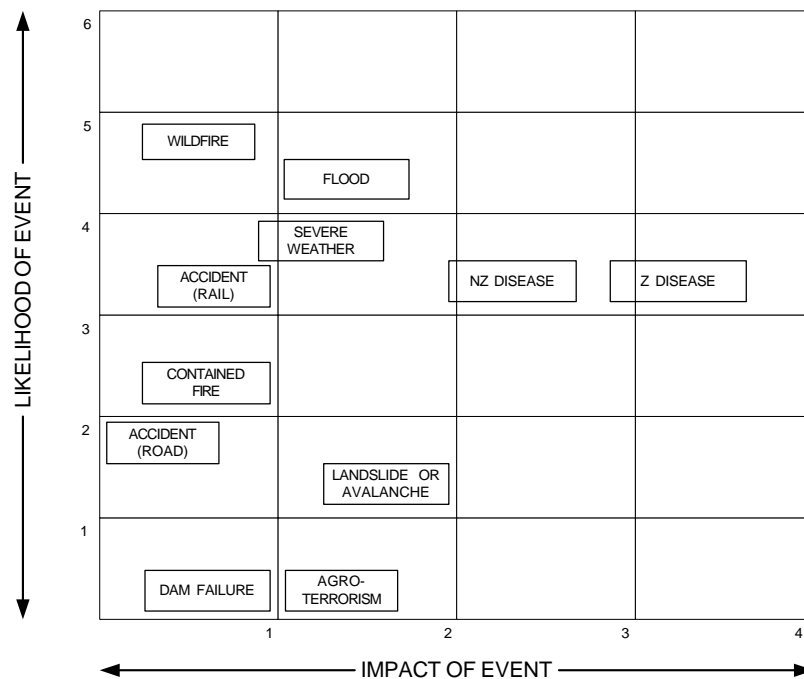
Home ranches are concentrated in the valleys where hay is grown for winter feed. Grazing land at higher elevations is almost all Crown land, although some is held by individual ranches under grazing leases.

Herds are normally turned out to graze for the spring, summer and fall on Crown and private rangeland. Most calves are sold in the fall shortly after coming in off the range, but up to 25% may be held for replacements or further feeding. Because of this the distribution and number of animals varies significantly depending on the time of year and the farmer’s grazing arrangements.

Distribution of beef cattle by electoral district is shown on the map at Appendix 2 to this section, and contact information for major cattle operations is provided at Appendix 3.

2.4 Risk Profile

The risk profile for farmed animal mass mortality in CRD is illustrated below (see Note 1):



Note 1: The grid illustrates the likelihood of specified hazards causing mass animal mortality and the relative impact of the event. (Z = Zoonotic, NZ = Non-Zoonotic). For further information on the grid see <http://www.pep.bc.ca/hrva/toolkit.html>.

A generic *Hazard, Risk and Vulnerability Analysis* for the region is contained in the CRD Emergency Plan, Section 3.

2.5 History of Mass Animal Mortality in the Region

There have been no recorded instances in the CRD of mass animal mortality on a scale which would have represented an emergency.

2.6 Commodity and Advisory Groups

A list of CRD regional agricultural organizations, with contact information, is at Appendix 4 to this section.

Appendix 1 to Section 2 Calculation of Volume and Mass by Species

Livestock	Number of Head [Note 1]	Average Mass (kg) [Notes 2, 4]	Total Mass (tonnes) [Note 3]	Volume Factor (cu metres) [Note 2]	Total Volume (cu metres) [Note 4]
Hens and Chickens	15,995	≈1.65	26.4	.015	240
Turkeys	1,544	5	7.7	.0375	579
Other Poultry	1,398	≈2.5	3.5	.019	26
Total	18,937		37.6		845

Cows (Dairy)	221	635	140.3	1.5	332
Heifers (replace dairy)	66	455	30	1.0	66
Bulls >1 year old	3,359	727	2,442	1.5	5,039
Cows (beef)	57,498	635	36,511	1.5	86,247
Heifers (replace beef)	16,544	455	7,527.5	1.0	16,544
Steers >1 year old	6,140	635	3,898.9	1.5	9,210
Calves <1 year old	51,607	210	10,837.5	0.5	25,804
Total	135,435		61,387.2		143,242

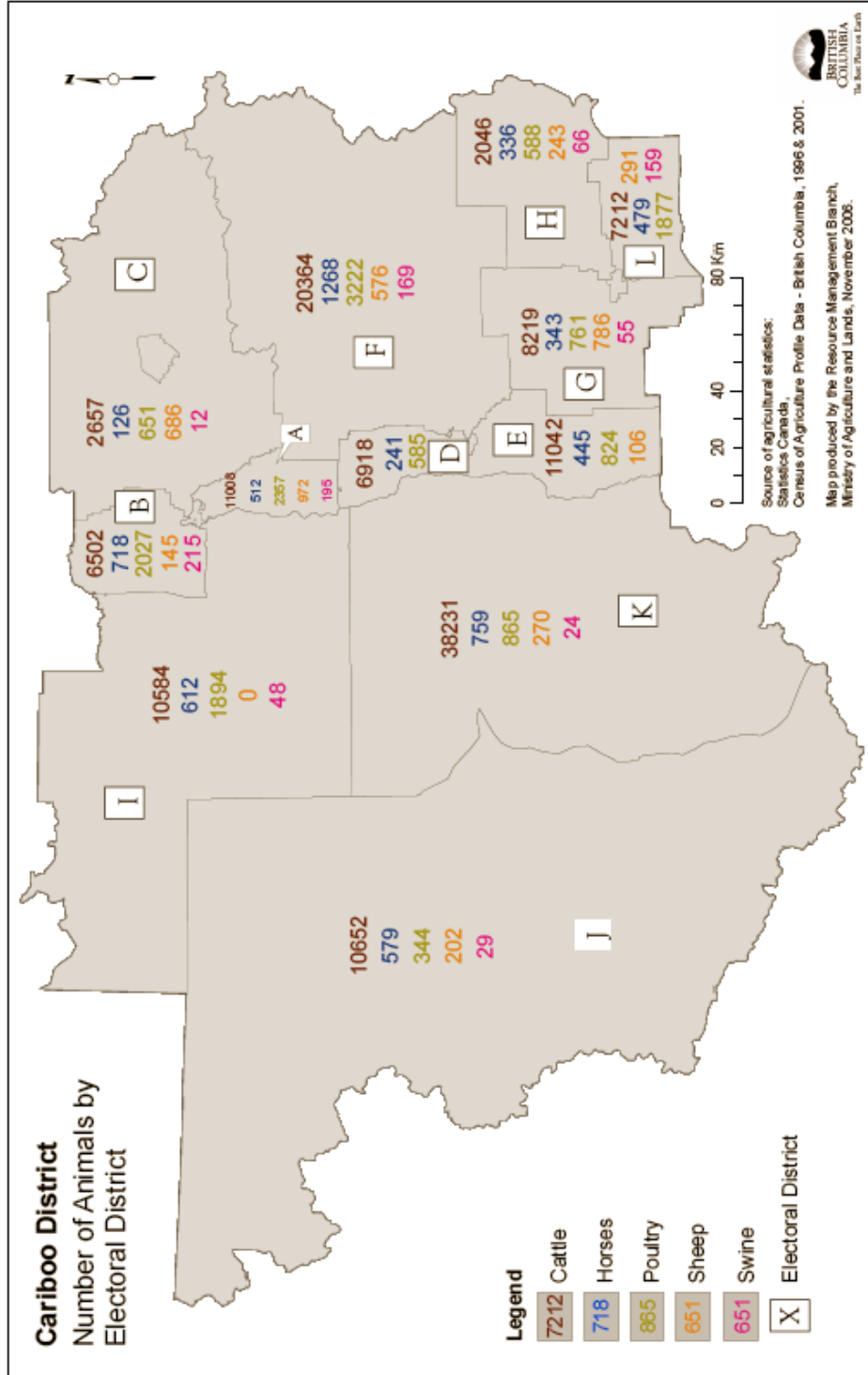
Swine	972	200	194.4	0.375	365
Sheep	5,908	80	472.6	0.3	1,772
Horses	6,418	523	3,356.6	1.5	9,627
Goats	585	70	41	0.3	176
Llamas and Alpacas	271	75	20.3	0.6	163

Notes:

- 1 Number of head is derived from Statistics Canada 2001 Census data.
- 2 The average mass and volume factors for each livestock category are per CFIA publication, *Mass Slaughter and Disposal of Livestock, Rural Municipality of Hanover, Manitoba, Information Book, July 21, 2006 (Draft)*.
- 3 The total mass calculation is based on the average livestock weight in kilograms multiplied by the number of head. This is converted to metric tonnes by multiplying the total weigh in kilograms by the conversion factor 0.001.
- 4 The total volume is the space required for burial based on the number of head multiplied by the volume factor. The volume factors were derived from the number of head that would equal one adult bovine unit, requiring 1.5 cubic metres of space for burial. To calculate pit dimensions, the following can be used for a rule-of-thumb: 1 bovine unit = 5 adult sheep = 4-5 mature swine = 100 mature chickens = 40 mature turkeys.

**Appendix 2 to Section 2
CRD Distribution of Livestock**

**Cariboo Regional District
Livestock Distribution by Electoral Area**



Appendix 3 to Section 2 CRD Major Cattle Operations

The following CRD cattle operations have herds of 300 head or larger: ^{Note 1}

Category	Ranch/Owner Name	Location by Area (refer to map at Appendix 2)	Contact No.	Association
1	Gang Ranch	K	(250) 459-7923	Big Creek
1	Alkalai Ranch	E	(250) 440-5635	Chimney Creek
1	Riske Creek Ranch	K	(250) 659-5633	Riske Creek
2	Alexis Creek Ranch	I & K	(250) 394-4235	Chilcotin
2	Chilco Ranch	K	(250) 394-4260	
2	Moon Ranch	K	(250) 392-5512	Meldrum Creek
2	Onward/Mission Ranch	E	(250) 296-0081	Chimney Creek
2	Jeff Wills	A	(250) 747-1286	Quesnel
2	Fraser River Ranch	K	(250) 989-4450	Meldrum Creek
2	River Ranch	K	(250) 659-5682	Chilcotin
2	Circle S Ranch	E	(250) 440-5633	
3	Wineglass Cattle Co.	K	(250) 305-8491	Riske Creek
3	Clesspocket Ranch	J	(250) 742-3350	Anahim Lake
3	Chilancoh Ranch	J	(250) 394-4404	Chilcotin
3	141 Mile Ranch	G	(250) 296-3398	150 Mile
3	Bar X Ranch	B	(250) 992-0975	Quesnel
3	Ken Cameron	A	(250) 747-3463	Quesnel
3	Springfield Ranch	D	(250) 989-4281	Soda Creek
3	Newton Ranch	J	(250) 394-4380	Chilcotin
3	Bridge Creek Estate	G	(250) 395-3354	Bridge Lake
3	Deer Creek Ranch	K	(250) 394-4369	Chilcotin
3 (Dairy)	Fox Dairy	A	(250) 747-8680	Kersley Institute

Note 1: Herd categories have been defined as follows for the purposes of this list:

Category 1: >1500 head

Category 2: 701-1500 head

Category 3: 300-700 head

Exact numbers of head, if required, can be obtained through the Regional Office, Ministry of Agriculture and Lands, Williams Lake, Tel: (250) 398-4500 or 398-4504.

Appendix 4 to Section 2 CRD Regional Agricultural Organizations

Organization	Contact
150 Mile Livestock Association Box 699 150 Mile House, BC V0K 2G0	Clint Thompson, President (250) 296-4592
Anahim Lake Cattlemen's Association Box 3392 Anahim Lake, BC V0L 1C0	Glenn Shortreed, President (250) 476-1152
Big and Beaver Lakes Livestock Association Box 129 Big Lake, BC V0L 1X0	Dan Hamblin, President (250) 243-2282
Big Creek Livestock Association Box 16 Hanceville, BC V0L 1K0	Walt Mychaluk, President (250) 394-4381
Bridge Lake Livestock Association C-10, Buchanan Site, RR#1 Lone Butte, BC V0K 1X0	Gordon Ross, President (250) 593-2231
Cariboo Regional Cattlemen's Association Box 4389 Williams Lake, BC V2G 2V4	Walt Foster, President (250) 476-1259
Cariboo Sheep Breeders' Association Box 2, RR#1, Shanley Quesnel, BC V2J 3H5	Rod Hennecker (250) 395-3580
Chilcotin Stockmen's Association Box 42 Alexis Creek, BC V0L 1A0	Bev Madley, President (250) 394-4287
Chimney Creek Livestock Association Box 23 RR#1, Widgeon Road Williams Lake, BC V2G 2P1	Corrina Thompson, President (250) 392-1171
Clinton and District Cattlemen's Association	Lawrence Joiner, President (250) 459-2311
Green Lake-North Bonaparte Stockmen's Association RR#1, Watch Lake 70 Mile House, BC V0K 1L0	Dimps Horn, President (250) 456-7741
Horsefly Livestock Association Box 249 Horsefly, BC V0L 1L0	Silvia Laffer, President (250) 620-3339
Lac La Hache Livestock Association Box 225 Lac La Hache, BC V0K 1T0	Marvin Monical, President (250) 791-7272

<p>Quesnel Regional Cattlemen's Association RR#3 Rawlings Road Quesnel, BC V2J 3H7</p>	<p>Martin Rossman, President (250) 747-2230</p>
<p>Riske Creek Livestock Association Box 4389 Williams Lake, BC V2G 2V4</p>	<p>John Moon, President (250) 392-5515</p>
<p>Rose Lake Livestock Association Box 37 150 Mile House, BC V0K 2G0</p>	<p>Mervin Morrow, President (250) 296-4474</p>
<p>Soda Creek Cattlemen's Association Box 8, RR#2 Bailey Road Williams Lake, BC V2G 2P2</p>	<p>John Nan, President (250) 297-6278</p>
<p>South Cariboo Regional Cattlemen's Association RR#1 North Bonaparte Road 70 Mile House, BC V0K 2K0</p>	<p>Gus Horn, President (250) 395-4276</p>
<p>Tatla Lake Livestock Association Box 669 Tatla Lake, BC V0L 1V0</p>	<p>Dave King, President (250) 476-1285</p>

3. Concept of Operations

3.1 General

Mortality losses are a normal part of livestock production. Producers may have losses due to disease, natural events such as extreme weather, fires, accidents or inter-animal competition. It is the responsibility of the producer to dispose of these routine mortalities in an acceptable manner. Industry and primary producers are responsible for developing their own plans for carcass disposal.

Mass carcass disposal will only become an emergency if the scale and extent of farmed animal mortality is beyond the capability of local producers, results from a reportable or foreign animal disease or if there is otherwise a significant and widespread risk to public health.

The primary objectives of disposal of carcasses are to prevent the dissemination of infection and to protect the environment. This process is therefore an essential part of an animal disease eradication program and is also important from both a public health and environmental perspective.

Potential causes of mass farmed animal mortality range from natural disasters to more complex situations involving infectious diseases. Notwithstanding the cause, timely and effective local response is essential in order to limit impact on the industry and community, and to allow for the mobilization of resources from other levels of government if required.

The efficient and environmentally safe disposal of mass animal carcasses requires:

- a) early notification;
- b) the selection of an appropriate disposal methodology;
- c) the availability of suitable disposal sites; and
- d) the timely provision of applicable resources.

3.2 Operational Context

Emergency planning for mass livestock carcass management anticipates a cooperative partnership between local livestock producers, local authorities, the province and CFIA. While producers will take the lead role in any livestock emergency, local authorities are expected to manage a consultative framework that allows for a timely and efficient approach to the emergency.

There are few circumstances in which a carcass disposal emergency will exist independently of a larger emergency or disaster situation. The circumstances which caused the animal

mortality, e.g., a natural disaster such as a flood or a foreign animal disease, will frequently in itself trigger an emergency response. Carcass disposal will therefore normally be a component of a larger emergency situation and will fit in to the existing response and recovery structure.

There are two categories of response applicable to a mass animal mortality emergency:

Non-FAD Response
<p>When a carcass disposal emergency is caused by mass animal mortality from natural disasters or animal diseases other than FAD, carcass disposal operations will, to the extent possible, be managed by the local government in cooperation with the livestock industry.</p> <p>In all such cases PEP will activate and provide an appropriate level of direction and assistance under the provincial integrated response structure.</p>

FAD Response
<p>In mass mortality events involving a foreign animal disease (FAD), the carcass disposal operation will be managed within an expanded response structure involving other levels of government in accordance with the FADES Plan. ^{Note 1}</p> <p>In such cases a <i>Joint Emergency Operations Centre</i> (JEOC) will normally be established in the operational area. Local government emergency resources must be effectively integrated with this expanded federal-provincial structure.</p>

Note 1. A FAD response may also be conducted for a federal *Reportable Disease* of significant importance to human or animal health or to the Canadian economy. The determination of the level of response will be made by CFIA.

It should be noted that the CRD has neither the staff nor the resources to mount a site-level response for carcass disposal emergency. **In a non-FAD emergency the Regional District will work together with the local livestock industry, the Ministry of Agriculture and Lands and the Ministry of Environment to implement this plan.**

During a FAD Response, the district’s emergency structure will work in conjunction with the federal/provincial JEOC in the affected area. District officials will play a key role in advising on local

conditions, coordinating with the local livestock industry, providing information on disposal sites and resources, providing district resources to the disposal effort and keeping the public advised. The district may be required to undertake a variety of operational tasks within or as coordinated by the JEOC.

The structure of a JEOC which may be established during a FAD Response is illustrated at Appendix 1 to this section.

3.3 Probable Roles and Tasks

Roles and tasks for local government in a carcass disposal emergency may include, either directly or in support of a federal/provincial emergency management structure, the following:

- a) *Assessment of Requirements*
Determine the scope and scale of emergency in local area. Review disposal protocols, adapt to the situation at hand and obtain the appropriate approvals.
- b) *Identification of Disposal Methods* ^{Note 1}
Review disposal options and identify the most acceptable alternatives. Promote/implement site-specific environmental mitigation and determine equipment and supplies required.
- c) *Disposal Site Selection*
Identify sites within the local area suitable for carcass disposal.
- d) *Transport of Carcasses*
Identify the primary and alternate means of transporting carcasses to disposal sites, and arrange suitable transportation resources.
- e) *Coordinating Support*
Determine requirements for equipment and other support resources, and assist in coordination throughout the emergency.
- f) *Monitoring*
Visit off-farm disposal facilities to ensure compliance with plans.
- g) *Documentation*
Gather and record information on carcass management.
- h) *Communications*
The timely passage of information among participating

entities is of key importance during a carcass disposal emergency. A sustained effort is required to ensure that current information is passed to all stakeholders, including local industry representatives, neighbouring jurisdictions, health sector organizations and all other organizations engaged in, or associated with, the emergency response.

i) Assisting Federal/Provincial Agencies

Provide support to federal and provincial organizations as required, including PEP, MAL, MOE and CFIA.

[Note 1. Disposal protocols are currently under development. Advice should be sought from MAL].

These potential roles and tasks notwithstanding, the CRD can support carcass disposal at an EOC level only.

3.4 Natural Disasters

Natural disasters such as floods, fires or extreme weather can cause significant animal mortality. The natural events considered most likely to affect the CRD are identified in Section 2.4, *Risk Profile*.

Response to mortality caused by natural disasters remains a local responsibility, and in some cases local livestock industry representatives will make all of the necessary arrangements. However, when the number of animal carcasses exceeds the disposal capacity of the producers, or when a significant public health impact is present, a carcass disposal emergency may result.

3.5 Animal Diseases

In accordance with the *Health of Animals Act* and *Animal Disease Control Act*, warning of animal mortality caused by an animal disease will originate with producer(s), and carcasses must be inspected immediately by a local veterinarian. If mortality is determined to be the result of a non-reportable disease, the producers are initially responsible for carcass disposal.

If the scale of mortality from a non-reportable disease is beyond the capabilities of the livestock industry, the matter becomes an emergency and the CRD will provide the response framework for emergency carcass disposal operations. In such an event, it is essential that the PEP, MAL, MOE and the Northern Health Authority be consulted on all aspects of the Regional District's response. Potential threats to public health and the environment must be closely and continually monitored.

If a FAD is suspected or present, an expanded federal-provincial response will be initiated. Initial notification may come from a producer, abattoir, diagnostic laboratory, local veterinary

practitioner, public health unit or the BC Chief Veterinary Officer who, in turn, contacts the CFIA District Veterinarian or Regional Director.

CFIA evaluates the situation and determines what steps, if any, are necessary to further characterize the disease based on the epidemiology report from the initial visit to the suspect premises.

If the existence of a FAD is determined, a CFIA *Emergency Response Team* will be mobilized for further assessment of the situation and to commence control and eradication activities. The need for a JEOC will be assessed and, if required, will be established in the affected area.

Control and eradication activities will normally begin by controlling movements of animals and people in zones where the disease has been diagnosed. There may be one or more infected zones containing the infected premises. Depending upon the disease, the perimeter of the infected zone(s) would extend a finite distance beyond all known infected premises and would follow, when possible, natural barriers and roadways to facilitate implementation of disease control procedures.

Surrounding the infected zone(s), will be a security zone extending from the perimeter of the infected zone(s) to a specified distance, which could vary according to the disease. A buffer zone will extend from the outer limit of the security zone to the limit of the control area. The three zones will constitute a *control area* where certain measures would be applied according to a pre-approved disease control/eradication strategy.

In situations involving mass animal mortality, the JEOC will contain a *Disposal Group* to oversee carcass disposal operations. This group directs the disposal of carcasses and regulated materials associated with destruction ordered in the FAD response. The *Disposal Group* designs a disposal plan to prevent the spread of the pathogen and mitigate public health or environmental risks.

3.6 Destruction of Animals

The destruction of animals to support attempts to control the spread of disease is an integral part of a response to an animal health emergency involving a FAD. In such cases the JEOC will normally contain a *Destruction Group*.

Given information about the disease, animal type, location of infected premises and disposal methods, the *Destruction Group* develops a strategy for destroying all animals that are known or suspected to be infected in an attempt to eradicate the disease. Pre-emptive destruction may extend, in some emergencies, to

hobby farms and/or backyard poultry flocks.

Animals destroyed in this way may not be infected with the underlying disease, but will still become part of the carcass disposal operation. Such carcasses may require separate transportation and disposal channels.

Disposal should be completed as soon as possible after destruction to minimize opportunities for infectious material to disperse and to complete handling of carcasses before decomposition has set in.

Officials must recognize the significant emotional impact on the owners of destroyed animals and deal with these situations with appropriate empathy. Representatives from the respective producer associations may be engaged to mitigate any conflicts which arise between the producers and the Destruction Group.

3.7 Impact on Human Health

The presence of a zoonotic disease, which has a potential impact on human health, will require close cooperation between animal health and human health officials in a carcass disposal emergency. Zoonotic diseases with a high risk of animal mortality are listed at Annex A.

In the event of a FAD emergency the general public will be concerned with the implication of disease on their own health and that of their families. A key part of the emergency response will be ensuring that potential threats to human health are fully understood and managed effectively, which will necessitate a comprehensive public information strategy.

In an animal disease/carcass disposal event the JEOC will normally include a *Human Health Branch*, which will be activated whenever the identified FAD presents public risks associated with a zoonotic disease.

The CRD EOC will maintain close communication with the Northern Health Authority and local medical facilities throughout carcass disposal operations, and ensure that potential threats to human health, and mitigating strategies, are clearly understood and communicated.

**NORTHERN HEALTH AUTHORITY:
Emergency Management – (250) 565-2108
[Business hours]**

3.8 Safety

Personnel safety is an overriding consideration during disposal operations. Before commencing disposal work, personnel must be fully briefed on the nature of the disease, and any specific hygiene

requirements.

Safety issues to consider include personal hygiene facilities, the availability of rescue equipment, hearing protection and protection from dust.

Protective clothing including respirators must be supplied to personnel when there is any risk to humans from the organism involved, or if large amounts of dust or odour are generated.

3.9 Environmental Issues

Disposal of animal carcasses and other infectious material may have adverse environmental consequences. It is essential for the environmental aspects of proposed disposal activities to be thoroughly evaluated so as to ensure that the impact of such consequences are minimized.

Proper environmental monitoring before and after carcass disposal is essential. Sampling frequency and volume should be determined based on a standard sampling method to prevent human-induced errors and to provide true characteristics and variability of the pollutant(s) from carcass disposal areas.

Consultation with the MOE during any carcass disposal operation is required to obtain specific information and ensure that current guidelines and best practices are being applied.

MINISTRY OF ENVIRONMENT

(250) 387-8319

[Business hours]

3.10 First Nations

First responders are permitted to enter First Nations lands **only if specifically requested by the native bands and INAC.**

Should a carcass disposal emergency affect First Nations lands, prior authorization for entry must be obtained. This will normally be done through the JEOC or PEP, but in emergency situation may be done directly with INAC and the First Nations entity involved if this is practicable.

3.11 Media/Public Information

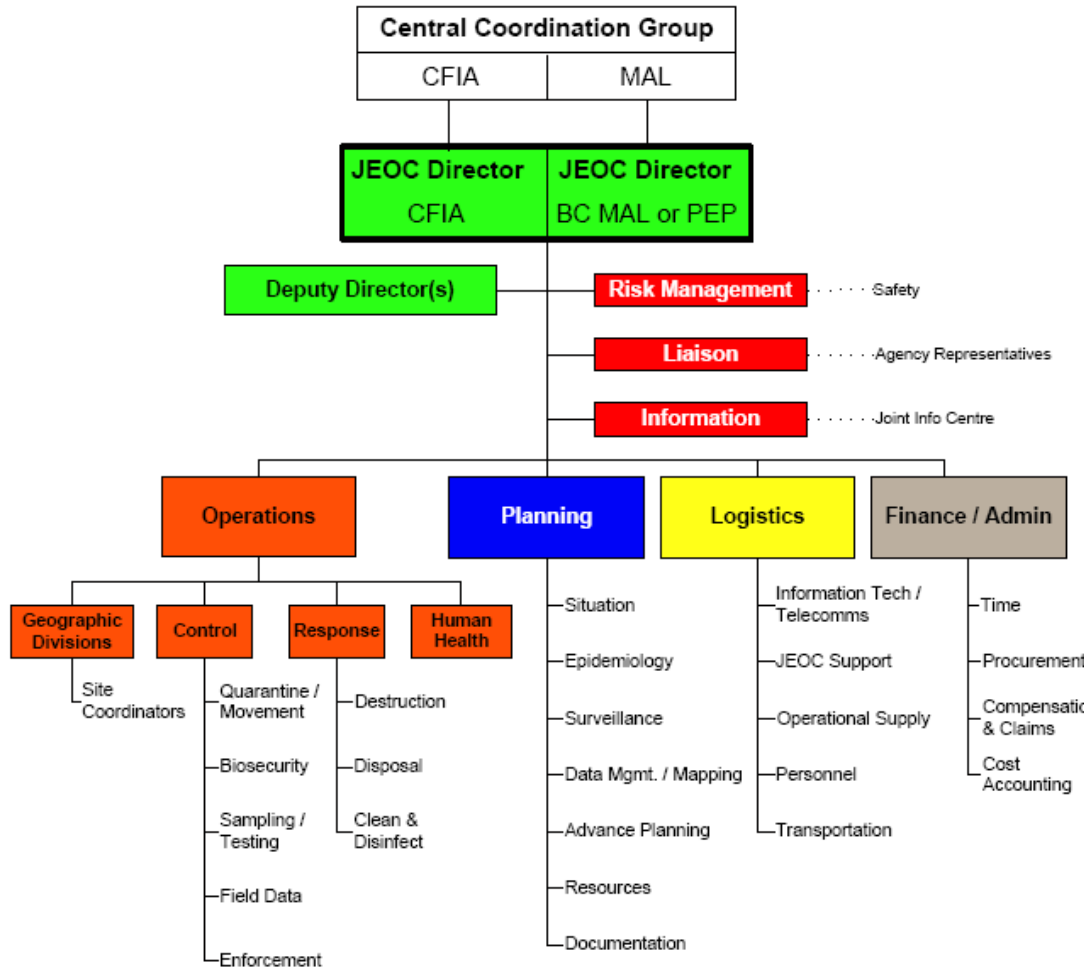
An effective public information strategy is an essential part of managing an emergency. The public will demand information even if the effects of the emergency are limited, which will put an enormous premium on what district officials say publicly and how they say it. Negative public reaction can often be defused by an articulate, calm and confident spokesperson who is able to reassure the public that the response is appropriate and effective.

Experience has shown that a carcass disposal emergency is of significant public interest and that there will be a high demand for information throughout disposal operations. The effective fusion of information is particularly important, as there are likely to be several levels of responders involved. The key is to have designated public information officers and/or spokespersons from the outset, including industry representatives, who cooperate closely with each other. A clear, timely and consistent message is essential.

Despite the pressures and demands of dealing with the emergency, all organizations involved must ensure that the overarching requirement to deliver information is not unduly delayed by a perceived need to assemble complete information. The public wants to know the current situation, and should be briefed accordingly.

An information officer should be in the EOC at all times to collect and coordinate the information being received, and to ensure that the media and public are briefed regularly and comprehensively.

**Appendix 1 to Section 3
FAD Response – JEOC Structure**



The CRD EOC will interact with and/or provide liaison directly to the JEOC as required by the emergency situation. The CRD can support carcass disposal at an EOC level only.

4. Disposal Operations

4.1 General

Effective disposal operations will be those that are planned in advance and managed by knowledgeable and trained emergency managers and responders. Decisions on disposal may have to balance the interests of animal health officials, whose primary goal is to quickly eradicate the disease, with potentially competing concerns about environmental protection and safeguarding public health.

It is essential that disposal operations be carefully coordinated among all levels of government and producers, the public and other stakeholders.

A key to success will be the identification in advance of suitable disposal methods and facilities. There will be little time to do this once the animal carcass emergency is underway, and the benefits of advance preparation will be quickly evident.

The objective is to select the disposal method that offers the best disease control without creating unacceptable human health and environmental risks. More than one method of carcass disposal may be required.

4.2 Disposal Protocols

The protocols for emergency carcass disposal depend primarily on the cause of mortality.

a) *Non-Infected Animals*

For non-infected animals the full range of disposal choices are available, with market or rendering being the preferred options. Rendering may be limited as a choice for disposal of cattle carcasses in CRD due to the distance from rendering facilities.

b) *Infected Animals*

For infected animals, emergency disposal methods must meet five key criteria:

- suitability (disease agent inactivation);
- legality (environmental protection);
- safety (public safety not compromised);
- practicality (time and cost efficient); and
- if a FAD is present, CFIA approval of the disposal method is required.

Disposal of infected carcasses may be on-site, depending on the type of carcasses and the cause of mortality, and is normally the preferred option unless environmental and social factors dictate other choices. If movement of carcasses off-site for disposal is required, this must be carried out according to strict bio-security controls.

MAL is developing a comprehensive package of protocols which establish approved methods of disposal for each type of disease and animal species. The responsible office in the Ministry should be contacted for information on current protocols at the outset of any carcass disposal emergency.

MINISTRY OF AGRICULTURE AND LANDS:
(604) 556-3100 [Business hours]
 RESOURCE MANAGEMENT BRANCH, WASTE MANAGEMENT ENGINEER

4.3 Disposal Methodology

Available disposal methodologies for use in an emergency are described at Annex B.

4.4 Local Disposal Options

The majority of land in the CRD area is Crown owned, comprising over 3 million hectares. In general, the two major biophysical landforms combined with a low population density present few obstacles with respect to disposal of mass carcasses.

Selection of suitable disposal methods will have to be made with due regard to environmental concerns, safety and public opinion. A range of options is available, as described below.

Methodology	Notes
<p>Market</p>	<p>Market is the option of choice for non-infected carcasses.</p> <p>A carcass disposal emergency is likely to have a large number of carcasses from destroyed non-infected animals available for processing through normal channels. However, particularly in the early stages of an emergency, slaughter facilities might not continue to process livestock if there was no immediate prospect for sale.</p> <p>Maximum cattle slaughter capacity in BC is approximately 2,500 animals weekly; in the CRD area the maximum weekly slaughter is approximately 170 animals.</p>

<p>Rendering</p>	<p>Rendering is an option of choice for non-infected animals, particularly for bovine carcasses, however there is a lack of appropriate facilities in the local area. There is one suitable rendering plant within reasonable distance of CRD, West Coast Reductions Ltd (WCR), in Vancouver.</p> <p>WCR ships all bovine carcasses out of the area for processing, primarily to a subsidiary WCR plant in Calgary. The plant capacity is up to two million pounds daily and a second plant is planned for handling specified risk material.</p> <p>If carcasses are infected contact WCR to see if they are able to receive the carcasses.</p> <p>NB: Rendering of cattle carcasses results in a by-product that has to be disposed of in accordance with SRM regulations.</p>
<p>Composting</p>	<p>Composting can provide for the bio-containment and safe disposal of cattle and other species of livestock and their wastes at the site of a FAD outbreak.</p> <p>New composting methodologies are being developed which reduce environmental impacts and accelerate destruction of pathogens and the degradation of carcasses.</p> <p>The volume of cattle carcasses in a mass disposal emergency will limit the amount of composting that can practically be undertaken. This can be mitigated in part by grinding carcasses prior to composting, however one or more portable grinders would have to be acquired from outside the district.</p> <p>NB: The end product from composting cattle carcasses must be disposed of in accordance with SRM regulations.</p>
<p>Incineration</p>	<p>High-temperature incineration is a suitable disposal option.</p> <p>There are currently no large biological incinerators in the CRD or the surrounding area. Portable incinerators may be sourced but these have a relatively small capacity and may have a long lag time to obtain, assemble and set up.</p>

	<p>Large incinerators exist in the Swan Hills facility in Alberta, however costs and bio-security risks of long distance transport would have to be assessed for any emergency situation.</p> <p>NB: Incineration of cattle carcasses must meet specified critical temperatures in accordance with SRM regulations.</p>
Burning	<p>Pyre (outdoor, fuel-fired) burning is an option for non-bovine carcasses where environmentally suitable areas exist.</p> <p>Air curtain burning utilizing a trench or contained system is more effective than pyre burning, although high fuel consumption per unit volume of carcasses is a negative aspect of this option.</p> <p>A list of suppliers of air curtain burning equipment is at Appendix 1 to Section 5.</p> <p>NB: Neither pyre nor air curtain burning is suitable for cattle carcasses due to SRM regulations.</p>
Burial	<p>On-site burial is a suitable option for small numbers of carcasses where geological and hydrological conditions are suitable. Burial gets rid of the carcasses but the residue within a burial site will persist for many years and ultimate elimination of the carcass material represents a long-term process. On-site burial should therefore be used cautiously for mass disposal.</p> <p>Mass burial is an option within less populated areas of the CRD.</p>
Landfill	<p>There are 14 landfills in the CRD, with varying capacities and potential suitability for disposal. Locations of and information on the landfills are at Appendices 1 and 2 to this section.</p>

4.5 On-site or Off-site Disposal

Historically, disposal of diseased carcasses was done on the infected premise to avoid spreading the infection by transporting the carcasses to an off-site facility. However, the two most common on-site disposal methods, burial and burning, have potentially serious environmental consequences.

On-site disposal is still the preferred option, however off-site

methods may increasingly be used in emergencies, particularly for the carcasses of large animals. It is important to differentiate between limited disposal action for routine mortalities and the vast disposal challenges of, for example, a foot-and-mouth disease emergency. A decision to move the disposal activities off-site will be related to an analysis of the scale of event (i.e., the volume of material), potential human health concerns and environmental concerns.

For off-site disposal, the primary issue will be the transportation of carcasses in a safe, sanitary and timely fashion to avoid spreading the disease and/or endangering public health.

4.6 Transport of Carcasses

Transport of infected carcasses must be planned and executed with care, utilizing leak-proof vehicles approved for transporting hazardous material. Refrigerator trucks may be used.

Vehicles should not be overloaded – at least 18 inches, depending on distance to be travelled and temperature, should be left clear for expansion of carcasses. Smaller carcasses should be bagged if feasible and larger carcasses covered with a layer of poly sheeting. If vehicles are not enclosed, an airtight vinyl tarp should be placed over the top.

All vehicles must be cleaned and disinfected before leaving the infected premise and after unloading.

Vehicles should travel on designated routes, preferably with an escort vehicle. They must travel slowly to avoid splashing of contaminated material, and a supply of an approved disinfectant should be carried to deal with minor spills enroute.

Carcasses and other items awaiting disposal should be secured to prevent unauthorized access and to prevent wild animals and birds removing potentially infectious material. Control of insects should be considered if there is a risk of passive transmission by insects to nearby susceptible species. If disposal is delayed, carcasses should be thoroughly sprayed with an approved disinfectant.

Federal and provincial protocols for the transportation of FAD material are under development by CFIA/MAL. Once issued, these protocols will guide decisions on applicable transportation issues.

4.7 Specified Risk Material The *Health of Animals Act* regulates the handling of specified risk material (SRM). SRM are tissues that, in BSE-infected cattle, have been shown to contain the infective agent and transmit the disease.

The handling of bovine carcasses is affected by the SRM regulations. Regulations on the handling of SRM in landfills and by other disposal methods are currently under development in CFIA.

As the mass disposal of bovine carcasses will present unique issues with respect to SRM handling, guidance for specific situations must be sought from CFIA before any decision on the disposal or movement of bovine carcasses is taken.

4.8 Making Choices Selection of an appropriate methodology for carcass disposal in an emergency is situation dependent – choices must be based on the animal species involved, the scale of the mortality, environmental concerns, public opinion and other factors.

The selection of a preferred method of disposal will usually be determined by the cause of death. When a natural disaster is the cause, the disposal method chosen should be the most environmentally acceptable. If the death was due to an infectious organism, then the method that most efficiently prevents further disease spread is usually the preferred choice, while taking all possible actions to protect the environment.

The animal species involved will be a major consideration. For cattle carcasses, which is the type most likely in the CRD, the hierarchy of disposal for carcasses will normally be, *subject to current SRM regulations*:

Non-Infected Carcasses		
Priority	Methodology	Notes
1	Market	Processing plants may have limited surge capacity, which will limit this option.
2	Rendering	If transportation is cost-effective and freshness can be preserved.
3	Composting	Limited by volume in large scale emergencies. Equipment may have to be sourced from outside CRD area.
4	Mass burial (off-site)	Pre-engineered site as close to place of mortality as possible, based on geo-technical survey.
5	Approved landfill	No landfills in the CRD area are currently approved. See

		Appendix 2 for potential landfill suitability.
6	Burial (on-site)	If site is environmentally acceptable (approved by MOE).
7	Incineration	Incineration is a preferred option, but suitable high temperature incinerators are not readily available. Air curtain burning is not suitable for cattle carcasses.

Infected Carcasses		
Priority	Methodology	Notes
1	Composting (on-site)	Limited by volume. Composting equipment may have to be sourced from outside CRD area.
2	Burial (on-site)	Limited by volume. Burial site must be approved by MOE.
3	Mass burial	Pre-engineered site as close to place of mortality as possible, based on geo-technical survey.
4	Approved landfill	No landfills in the CRD area are currently approved. See Appendix 2 for potential landfill suitability.
5	Composting (off-site)	Limited by volume.
6	Incineration or air-curtain burning	Incineration is a preferred option, but suitable high temperature incinerators are not readily available. Air curtain burning is not suitable for cattle carcasses.
7	Rendering	Rendering facility (WCR) is not currently approved for infected carcasses. If approval is obtained rendering becomes an option but will be limited by transportation resources.

The choice of disposal option must always be made in consultation with MAL and/or CFIA.

In a large scale disaster, the volume of carcasses created will influence the method of carcass disposal. The significant partners in a carcass disposal emergency (environmental, animal health, public health and emergency management officials) possess specialized expertise, all of them must contribute to the final disposal decisions. Public opinion will always be a factor.

The final consideration is that when public health issues are involved, mitigation of harm to humans must take priority.

The CRD does not have the technical ability to assess and apply various options for a given disposal/disease scenario.

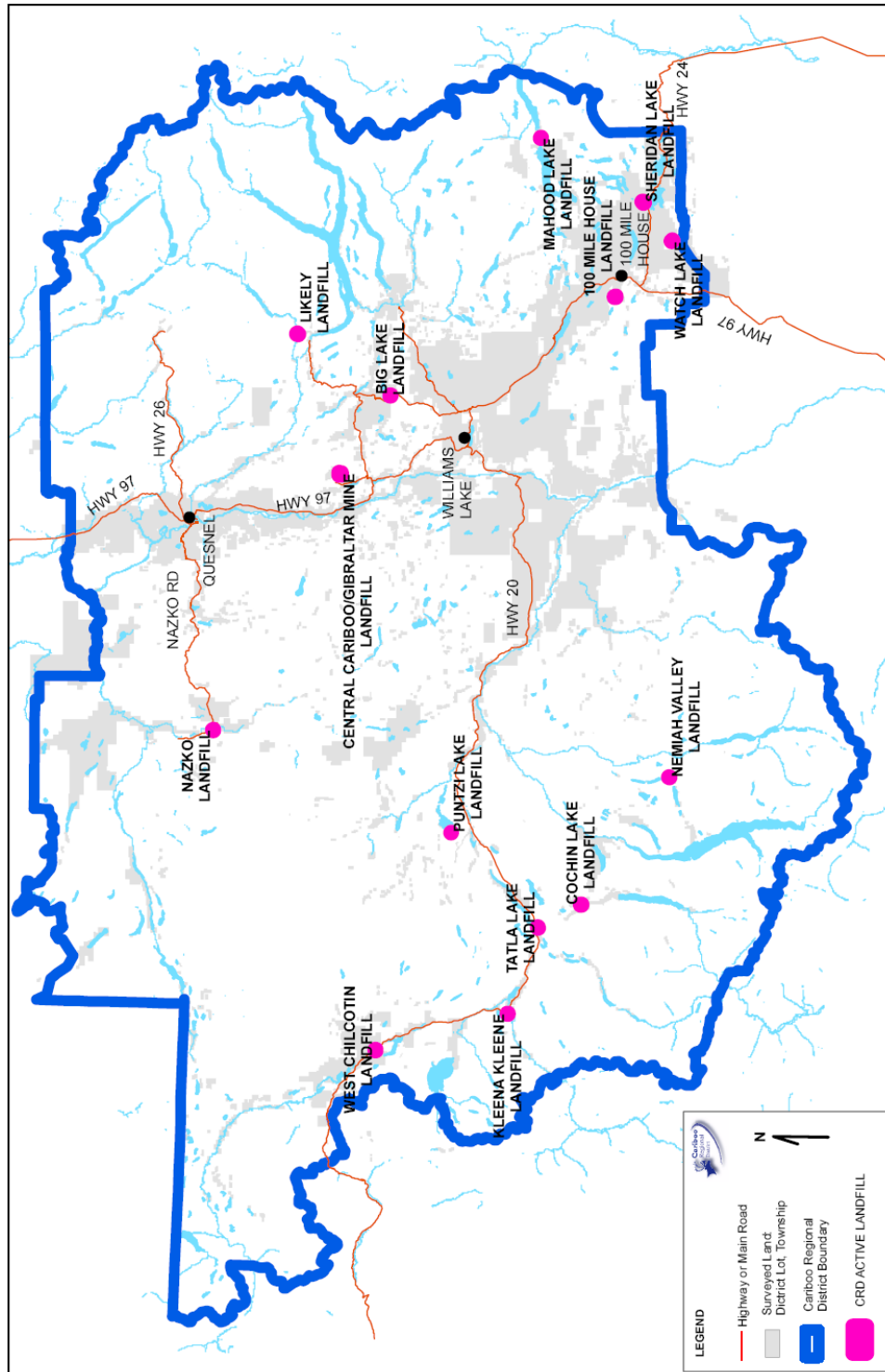
The MAL disposal protocols, currently under development, will provide detailed information concerning disposal choices, and the Ministry must be contacted for current information prior to any final decisions about disposal methods being made.

MINISTRY OF AGRICULTURE AND LANDS:

(604) 556-3100 [Business hours]

RESOURCE MANAGEMENT BRANCH, WASTE MANAGEMENT ENGINEER

Appendix 1 to Section 4 CRD Landfill Locations



**Appendix 2 to Section 4
CRD Landfill Sites**

LANDFILL SITES

	Site	Size (ha)	Termination Date	Description <small>Notes 1, 2</small>	Potential for Carcass Disposal <small>Note 3</small>
1	Tatla Lake	2.52	2060	Small community landfill located adjacent to Highway 20.	Not Suitable
2	Sheridan Lake	11.0	2047	Medium size community landfill located in a wooded upland area, located in the inter-lakes recreation area.	Not Suitable
3	Nazko	1.89	2032	Small community landfill located near Marmot Lake and associated recreation sites.	Not Suitable
4	Likely	5.98	2031	Small community landfill located in a wooded upland area with a high groundwater table.	Not Suitable
5	Mahood Lake	2.33	2028	Small community landfill located in a wooded area not far from the Canim River.	Not Suitable
6	Watch Lake	5.18	2038	Small community landfill located in a wooded upland area located in the inter-lakes recreation area.	Not Suitable
7	Cochin Lake	4.57	2039	Small community landfill locate on elevated wooded terrain. Could be expanded if required.	Potentially Suitable <small>Note 3</small>
8	Kleena Kleene	1.92	2032	Small community landfill located adjacent to Highway 20.	Not Suitable
9	West Chilcotin	5.28	2031	Small community landfill located adjacent to Highway 20.	Not Suitable
10	100 Mile House	18.4	2043	Large community landfill. Currently used for limited disposal of slaughterhouse waste under a waiver to July 2007.	Potentially Suitable <small>Note 3</small>
11	Nemaiah Valley	2.0	2030	Small community landfill located a few hundred meters from a small lake and creek.	Not Suitable
12	Big Lake	3.8	2035	Small community landfill located in a wooded upland area. Could be expanded if required. Currently used for limited disposal of local slaughterhouse waste under a waiver to July 2007.	Potentially Suitable <small>Note 3</small>
13	Purtzi Lake	3.01	2030	Small community landfill located adjacent to Highway 20 and close to the community of Chilanko Forks.	Not Suitable
14	Gibraltar Mine	57.15	2063	Large landfill with engineered leachate containment, collection and treatment systems.	Potentially Suitable <small>Note 3</small>

Note 1. Landfill sites are characterized as: Small (0-7 ha), Medium (8-14 ha) or Large (>15 ha).

Note 2. The CRD has 3 portable air curtain trench burners which can be moved to different disposal locations as required.

Note 3. **The potential suitability for carcass disposal is based on the size and capacity of the CRD landfill sites only and does not denote formal approval by MOE and/or CFIA. None of the CRD landfills are formally approved for mass carcass disposal.** This matter is currently (Dec 06) under review by provincial and federal authorities.

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5. Disposal Resources

5.1 General

The key to managing mass carcass disposal lies in the identification and provision of appropriate resources. This includes resources for the storage and transportation of carcasses as well as those needed for the actual disposal.

Each mass carcass disposal event will be unique, and therefore no complete list of required disposal resources can be developed. The resources will always have to be specifically tailored to the situation.

5.2 Resource Requirements

Disposal resources for carcass disposal will normally include transportation, heavy equipment and protective/safety equipment for personnel. The following generic list is provided for planning guidance:

- Transportation:** Trucks up to 1-ton for equipment transport.
Vans/minibuses for personal transport.
Approved vehicles for transporting hazardous material (refrigerator trucks may be used).
- Heavy Equipment:** Excavator (for burial operations).
Grader (for burial operations).
Tractor with front-end loader.
Backhoe with front-end loader.
Midsize skid-steer loader.
Front-end loader.
Small bulldozer.
Water tanker (if no water source at sites).
- Light Equipment:** Motorized pressure spray unit (cleaning, washing and disinfection of vehicles and containers)
Generators, various capacity.
Air curtain burners.
Portable incinerators.
Pumps.
Compressors.
- Safety and Security:** Warning signs.
Portable disposal site lighting.
Road pylons.
Site marking tape.
Identification badges.

Personal Protection: Protective clothing including footwear.
 Coveralls (for temporary visitors to disposal sites).
 Masks or respirators.
 Decontamination equipment and chemicals.
 Medications such as anti-virals (controlled by medical staff).
 Portable toilets.
 Temporary shower and changing facilities.
 Clothes washing facilities.
 Walk-through footwear disinfectant facility.

Miscellaneous: Tow chains.
 Bins for temporary storage of carcasses.
 Bags if required for transport of small carcasses.
 Poly sheeting and tarpaulins.
 Plastic film.
 Garbage cans and/or metal bins.
 Disinfectant.
 Lime.
 Digging tools.
 Cleaning and disinfectant supplies.
 Hand tools (shovels, picks, rakes, etc).
 Pickets.
 Composting thermometers.
 Carbon source (litter, sawdust, etc).
 Water hoses.
 Fuel for pyres.
 Cellphones.
 Digital cameras or camcorders.

Documentation: Office equipment and supplies.
 Forms and templates.
 Printing facilities.

Specialized equipment lists for selected disposal methodologies are at Annex C.

5.3 Specialized Disposal Resources

Specialized disposal resources may also be required in certain circumstances. They include a broad range of items from professional engineering, environmental and geotechnical consultants to specialized equipment and supplies. Examples are:

- a) mobile incinerators;
- b) container equipment;
- c) generators; and

d) decontamination equipment and chemicals.

5.4 Resource Availability

The CRD does not hold or have ready access to the types of equipment or resources required for a carcass disposal emergency. However, local suppliers/contractors can provide a good range of resources on a commercial basis. A list of potential suppliers is at Appendix 1 to this section.

The larger municipalities within the CRD have access to suitable equipment through their Public Works departments. There are currently no standing arrangements or agreements which would permit the CRD to have access to this equipment.

5.5 Resource Shortfalls

As noted above, the CRD does not possess the equipment or resources to manage a carcass disposal emergency. Most required resources can be obtained in the local area, although shortfalls will continue to exist in the following areas:

- a) **Incinerating Capacity.** There are no large biological incinerators in CRD or the surrounding area. Portable incinerators may be sourced but these have a relatively small capacity.
- b) **Rendering Capacity.** The one reasonably available facility, WCR, has little surge capacity and ships bovine carcasses to Calgary for processing. WCR is not currently approved to handle infected carcasses. A planned second plant, with the capacity to handle SRM, may mitigate this shortfall in part if CFIA approval can be obtained.
- c) **Approved Landfills.** None of the CRD landfill facilities are currently authorized to receive SRM or approved for carcass disposal.
- d) **Composting Equipment and Supplies.** Should composting be selected as a primary means of disposing of cattle or other large carcasses, necessary supplies and equipment would have to be sourced from outside the district.
- e) **Personal Protective Clothing.** The CRD does not hold stocks of personal protective clothing for individuals who may have to visit infected premises or handle carcasses in a disposal emergency.

Appendix 1 to Section 5 Disposal Resource and Equipment Suppliers

Geotechnical Services

Supplier	Address / Contact	Service / Resources
AMEC	610 Richard, Prince George 250-564-3243	Geo-technical and groundwater surveys / testing.
Geo-north Engineering Ltd	1301 Kelliher, Prince George 250-564-4304	Geo-technical surveys / testing.
Kodiak Drilling Ltd.	402 Elm, Quesnel 250-747-4648	Geo-technical surveys / testing.

Environmental/Ecological Services

Supplier	Address / Contact	Service / Resources
AMEC	610 Richard, Prince George 250-564-3243	Contaminated sites and groundwater testing / monitoring.
Cullinane & Powell Consulting Inc	#2-953 Laval Crescent, Kamloops 250-374-1775	Environmental engineering surveys and monitoring.
Environmental Dynamics Inc.	2011 PG Pulpmill, Prince George 250-562-5412	Environmental impact assessments / planning.
Golder Associates Ltd	#100-388 1 st Ave, Kamloops 1-800-414-8314	Ecological services, geo-technical surveys / testing, hydrological surveys / monitoring.
McElhanney Consulting Services Ltd	1633 1 st Ave, Prince George 250-561-2229	Contaminated sites and groundwater testing / monitoring.
PHH Arc Environmental Consultants	3088 Clapperton, Prince George 250-562-5333 1-877-322-4744	Environmental assessments, hazardous waste management.

Air-Curtain Burners

Supplier	Address / Contact	Service / Resources
ABY-2 Environmental	Bill Barnes Prince George, BC 250-614-1483	Locally manufactured auxiliary fuel-fired (propane) portable air curtain burner.
Air Burners LLC	Marketing and Sales Department 4390 Cargo Way Palm City, Florida 34990, USA 1-888-566-3900	Manufactures a range of above-ground air curtain destructors and in-ground trench burner systems.

Envirogreen Technologies Ltd.	Suite 480, 4400 Dominion Street Burnaby 604-689-53236	Incineration facilities and a range of environmental remediation services.
Industrial Cleanburn	7796 Mays Road Duncan Tom Mitchell 250-746-1918	Sell, rent, lease and contract air curtain units manufactured in USA.
Bruce Lougheed	Box 76, Heffley Creek 250-578-7532	Portable, trailer-mounted air curtain destructor.
WAYCON Manufacturing Ltd	275 Waterloo Ave Penticton 1-877-492-7718	Manufactures ABC Destructor, a trailer-mounted portable air curtain destructor.
Western Destructor Burn	Box 1199 Salmon Arm Joe Burnett 604-240-1111	Manufactures air curtain trench burners for sale/rental.

Transportation Services

Supplier	Address / Contact	Service / Resources
Bandstra Transportation Systems Ltd.	115 Keis, Quesnel 250-992-6448	General freight, refrigerator service.
B & J Trucking	Frizzi Rd, Williams Lake 1-877-398-571	General freight.
Bri-Mel Lowbedding & Piloting	#26 Rutherford Rd, 150 Mile House 250-296-3111	Low bed, heavy haul, piloting.
Byers Transportation Systems Inc	405 MacKenzie S, Williams Lake 250-392-5868	General freight.
Clark Freightways	386 N MacKenzie, Williams Lake 250-398-7622	General freight.
Cariboo Interior Roads	4775 Cattle Lake Rd, Williams Lake 250-392-6673	Road construction equipment.
Gibraltar Mines Ltd.	10251 Gibraltar Mine Road 250-297-6211	Earth moving / excavation equipment.
JAR Transport Ltd.	115 Keis, Quesnel 250-992-7492	Flat deck.
Kel-West Carriers Ltd.	Kelowna Office (250) 765-8080 1-800-665-8788	General freight.
Lynx Transportation	887 MacKenzie N, Williams Lake 250-305-2470	General freight.
MSL Transport	Box 70, 100 Mile House 250-395-3967	Low bed, heavy haul.
NOR-AM Enterprises Ltd.	210-369 Oliver, Williams Lake 250-989-5541	General freight, low bed, heavy haul.

Quesnel Industrial Transportation	127 Hilltop, Quesnel 250-992-5824	General freight.
United Concrete & Gravel Ltd.	245 Hodgson Rd, Williams Lake 250-3923443	Loaders, excavators, dumps, sand and gravel.

Excavation Services

Supplier	Address / Contact	Service / Resources
Clark Excavating Ltd.	2114 White, Williams Lake 250-392-2266	Loaders, excavators, dumps.
Four Star Contracting	883 Hesketh, Quesnel 250-992-8714	Backhoe, excavators, dozers, dumps.
Joe Kopetski Ltd.	1427 N Fraser, Quesnel 250-992-5824	Dumps, excavators.
Kingsgate Excavating	982 Alpine, 100 Mile 250-395-2311	Loaders, excavators, dumps.
Len Gamache Construction	201-2001 Hwy 97 N, Quesnel 250-992-938	Excavators, compactors, scrapers, dozers.
Lake Excavating Ltd.	1070 MacKenzie N, Williams Lake 250-392-6291	Heavy construction and excavating equipment.
Peterson Contracting	1550 Broadway S, Williams Lake 250-392-3292	Heavy construction and excavating equipment.
Rafter K Contracting	1119 Marsh Rd, Quesnel 250-992-7911	Excavators, dozers, dumps.
RB Backhoe Service	PO Box 4658 Williams Lake 250-392-6168	Excavator, loader, backhoe, dump truck.

6. Finance and Administration

6.1 General

Provincial guidelines and regulations for financial management in an emergency are contained in the *Emergency Program Act* and its *Compensation and Disaster Financial Assistance Regulation*.

Some financial information for emergency situations is also provided in the *MAL Emergency Response Plan, 2006*.

It is important to note that the financial programs which apply to compensation for animal mortality in an emergency are separated between provincial programs which apply during a non-FAD emergency, and federal programs which apply when a FAD is present. In the latter case, claims are normally made directly by producers to the applicable federal agency, either through the *JEOC Compensation Unit* or under other arrangements promulgated by federal authorities.

Instructions regarding compensation and application procedures will be issued during an animal health emergency by PEP and/or CFIA as applicable.

6.2 Provincial Programs

Producers who suffer losses through farmed animal mortalities from causes other than a FAD may be eligible for *Disaster Financial Assistance* arranged through PEP. This program is for uninsurable losses.

The PEP financial guidelines applicable to farmers and ranchers are contained in *Disaster Financial Assistance Guidelines For Private Sector*. The Guidelines may be reviewed at:

http://www.pep.bc.ca/dfa_claims/Private_Sector_DFA_Guidelines_Nov06.pdf

Financial assistance from PEP may also be provided to local authorities for specified types of response and recovery costs. The PEP financial guidelines for local governments are contained in *Financial Assistance for Emergency Response and Recovery Costs – A Guide for BC Local Authorities and First Nations, September 2005 (Revised September 2006)*. This document may be reviewed at: http://www.pep.bc.ca/dfa_claims/Financial_Assistance_Guide-Final-2005_09_01.pdf

6.3 Federal Programs

Owners of animals ordered destroyed during a FAD emergency may be compensated directly by the federal government under the federal *Health of Animals Act* and *Regulations*. Compensation under these regulations will normally be arranged through the

JEOC, or may be arranged directly between producers and the applicable federal agency when no JEOC has been established.

The *Compensation for Destroyed Animals Regulations* establish the maximum amount of compensation payable for an animal that is required to be destroyed in a FAD emergency. The *Regulations* are available online at: <http://laws.justice.gc.ca/en/h-3.3/sor-2000-233/217074.html>.

Compensation awarded to owners is determined by an assessment of the market value of an animal and takes into consideration factors such as genetic background, age and production records. The assessment is made by a team of experts that includes the CFIA veterinary inspector and two evaluators – one chosen by the owner and the other by the CFIA.

The compensation awarded is subject to maximum levels set out in the *Regulations*. The owner is awarded market value less the value of the carcass received if salvage is possible, but if the animal's market value is equal to or exceeds the maximum allowed, the owner is awarded the maximum compensation amount.

Owners of animals ordered destroyed may also be awarded compensation for disposal costs including transportation, slaughter, labour, and equipment.

6.4 First Nations

First Nations in BC qualify for federal assistance for emergency response, including eligible costs for animal services. The provincial and federal governments have agreed to work together in providing financial assistance to First Nations.

First Nations are required to prepare and submit their own claims for response costs to PEP, even if they participate with a local authority or with the Ministry in response.

First Nations are subject to the same eligibility and documentation requirements for disaster financial assistance in BC that apply to local authorities (see Section 6.2 above).

6.5 Application Procedures

Authorization and application procedures for financial compensation will be confirmed and promulgated on an event-specific basis, by PEP and/or CFIA.

6.6 Compensation Q&A

Local government may expect to receive queries on compensation issues from producers who have experienced animal mortality during an emergency. Some common *Questions and Answers* are provided at Appendix 1 to this section.

6.7 Requirement for Record Keeping

The key to receiving prompt payment of submitted response costs, disaster financial assistance or compensation claims is good record keeping. All claims must be properly documented with supporting receipts or other written justification.

The EOC for carcass disposal operations must receive and retain all mortality documentation and ensure that the following minimum items are documented:

- a) names and contact numbers of person reporting animal mortality;
- b) dates of disposal;
- c) species of animals, numbers and locations of origin;
- d) selected method of disposal and locations;
- e) follow-up actions required to monitor and remediate disposal site;
- f) soil and water testing results;
- g) names and contact numbers of experts utilized in disposal operations; and
- h) environmental assessments pursuant to *Canadian Environmental Assessment Act*.

Detailed record keeping of carcass burial sites is particularly important, including the following essential information on each site:

- a) exact location in relation to a fixed point;
- b) the date of burial;
- c) the type and size of carcasses buried;
- d) the approximate total weight of the carcasses; and
- e) the cause of death.

Appendix 1 to Section 6 Compensation Questions and Answers

Q1. All of my animals were destroyed during the recent FAD emergency. How much can I expect to be compensated?

A1. Each animal is evaluated and its market value is determined; however, the compensation awarded is subject to maximum levels set out in the *Compensation for Destroyed Animals Regulations*. Maximum compensation amounts may be found in the *Regulations*. Examples of current amounts for common farm stock are:

Cattle	\$2,500	It should be noted that these amounts are currently under review (Dec 2006) and a new table of proposed payable amounts has been published in the <i>Canada Gazette, Vol 140, No. 46</i> . The proposed amounts may be reviewed at http://canadagazette.gc.ca/part1/2006/20061118/html/regle1-e.html
Horse	\$2,750	
Swine	\$800	
Sheep	\$600	
Chicken	\$33	

Q2. In addition to compensation for each animal destroyed during an FAD emergency, are there other costs for which I may be reimbursed?

A2. Yes – under the *Compensation for Destroyed Animals Regulations*, owners of animals ordered destroyed may also be awarded compensation for disposal costs such as transportation, slaughter, labour, and equipment.

Q3. My prize-winning registered bull was destroyed in a recent FAD emergency. Can I be reimbursed for the replacement value of the bull?

A3. Current regulations permit reimbursement only up to the maximum values listed in the *Compensation for Destroyed Animals Regulations*. The proposed amendments to the *Regulations* contain categories which have higher maximum amounts for registered animals, grandparent poultry breeder flocks and male cervids to allow recognition of the genetic value of these animals.

Q4. I believe that I have an entitlement to Disaster Financial Assistance to compensate me for animals lost in the recent wildfire emergency. How do I apply for DFA?

A4. PEP will coordinate the processing of private sector claims and will provide local advice on the application process. It can be anticipated that PEP will provide this advice to potential claimants and it may be done through newspaper notices and/or arranging public meetings in affected communities.

Q5. The horses and goats on my hobby farm were drowned in the recent floods and I can't afford to replace them. Am I entitled to Disaster Financial Assistance?

A5. In such events Disaster Financial Assistance is limited to farmers and ranchers whose livelihood is based on their farming and ranching activity.

7. Recovery

7.1 General

In most cases, disposal operations will be conducted within a larger emergency scenario. There will therefore be no recovery phase or process linked directly to disposal operations. Rather, it will be related to the foreign animal disease or other event within which the animal mortality occurred. The recovery phase may include activities to support restocking, re-establishing markets and rebuilding viable industry activities.

Recovery serves several linked objectives, including:

- a) administering financial compensation for critical losses incurred (as outlined in Section 6);
- b) capturing lessons learned during the emergency so that they may be applied to any future emergency response;
- c) re-establishing the local livestock industry to pre-emergency levels and capabilities as cost-effectively as possible; and
- d) providing community support for those who have suffered severe impacts from the event.

Environmental issues related to disposal will also be key to a successful recovery. Monitoring of disposal sites will be required over a specified period to ensure that appropriate environmental safeguards are in place and there is no degradation of the sites which could have long-term environmental impacts.

7.2 Recovery Objectives

Recovery objectives may include damage assessment, restoration and reconstruction, economic impact studies and financial assistance.

Local authorities will lead activities designed to support animal producers, in conjunction with industry associations and other producer groups.

7.3 Recovery Organization

A small recovery team will be required to guide the recovery process. The composition of the team will depend on the scale and extent of the emergency, and the scale of carcass disposal. Local authorities should work closely with any provincial recovery team that may be instituted.

7.4 After-Action Report

On the completion of response activities an *After-Action Report* (AAR) should be prepared. The primary purpose of the AAR is to document the lessons learned from the experience.

Core questions to be addressed in the AAR include:

- a) What went right?
- b) What went wrong? and
- c) How can we improve?

The intent of this step is not to find fault, but to uncover opportunities for improving plans, procedures, equipment, and personnel training for the district's emergency program.

The Emergency Program Coordinator is responsible for ensuring that an AAR is completed and that all documented records are complete and available for internal review.

ANNEXES

Annex A Animal Diseases

Foreign Animal Diseases

The following diseases are currently listed by the OIE as transmissible diseases that have the potential for very serious socio-economic or public health consequences, and are of major importance in the international trade of animals and animal products:

African Horse Sickness	Newcastle Disease
African Swine Fever	Peste des Petits Ruminants
Bluetongue	Rift Valley Fever
Classical Swine Fever	Rinderpest
Contagious Bovine Pleuropneumonia	Sheep Pox and Goat Pox
Foot and Mouth Disease	Swine Vesicular Disease
Highly Pathogenic Avian Influenza	Vesicular Stomatitis
Lumpy Skin Disease	

Reportable Diseases – Federal

The following are reportable diseases per the *Reportable Diseases Regulations* pursuant to the *Health of Animals Act*.

African horse sickness	Highly pathogenic avian influenza
African swine fever	Hog cholera (classical swine fever)
Anaplasmosis	Lumpy skin disease
Anthrax	Newcastle disease
Bluetongue	Peste des petits ruminants
Bovine spongiform encephalopathy	Pseudorabies (Aujeszky's disease)
Bovine tuberculosis (<i>M. bovis</i>)	Pullorum disease (<i>S. pullorum</i>)
Brucellosis	Rabies
Chronic wasting disease of cervids	Rift Valley fever
Contagious bovine pleuropneumonia	Rinderpest
Contagious equine metritis	Scrapie
Cysticercosis	Sheep and goat pox
Equine infectious anaemia	Swine vesicular disease
Equine piroplasmiasis (<i>B. equi</i> and <i>B. caballi</i>)	Trichinellosis
Foot and mouth disease	Venezuelan equine encephalomyelitis
Fowl typhoid (<i>Salmonella gallinarum</i>)	Vesicular stomatitis

Reportable Diseases – Provincial

The following diseases are reportable under the BC *Animal Disease Control Act*:

Tuberculosis
Brucellosis

The following are "infectious or contagious diseases" as defined by the *Animal Disease Control Regulations* of BC and must be reported:

Infectious Laryngotracheitis (Avian)
Mycoplasma gallisepticum of turkeys

Diseases with High Potential for Mass Mortality

Following is a list of diseases with a *likelihood of occurring* of possible, likely or certain, and a *risk to animal health* of medium, high or very high. The diseases identified as zoonotic potentially present a risk to human health:

Disease	Likelihood	Risk to Animal Health	Zoonotic Status (Risk to Human Health) ^{Note 1}	Species at Risk
	Rare Unlikely Possible Likely Certain	Very Low Low Medium High Very High	Yes/No If zoonotic: (Insignificant) (Low) (Moderate) (High)	
Anthrax (<i>Bacillus anthracis</i>)	Possible	High	Yes (Moderate)	Multiple
Avian Infectious Laryngotracheitis (Herpesvirus)	Certain	Very High	No	Avian
Avian Influenza – highly pathogenic (Orthomyxovirus)	Likely	Very High	Yes (Low to High, strain dependent)	Avian
Bovine babesiosis (<i>Babesia bovis</i>)	Possible	Medium	Yes (Moderate)	Cattle
Classical Swine Fever or Hog Cholera (<i>Pestivirus</i>)	Possible	High	No	Swine
Epizootic haemorrhagic disease (Orbivirus)	Likely	High	No	Multiple
Foot and Mouth Disease (<i>Picornavirus</i>)	Possible	High	No	Multiple
Fowl Cholera (<i>Pasteurella multocida</i>)	Certain	Very High	Yes (Low)	Avian
Newcastle Disease – Velogenic (exotic) (Avian paramyxovirus)	Possible	Very High	No	Poultry
Viral haemorrhagic disease of rabbits (Calicivirus)	Possible	High	No	Lagomorph (rabbit)
West Nile Fever (West Nile virus)	Possible	Medium	Yes (Insignificant) ^{Note 2}	Equine

Note 1: The risk to human health is relative (the risk posed by anthrax is higher than that for Newcastle, etc, however in an absolute sense even the risk of anthrax is low).

Note 2: Although West Nile Virus is zoonotic, infected horses present no risk to human health.

**Annex B
Disposal Methodology Options**

Methodology	Description
Market	<p>The market option involves the commercial sale of non-infected animals, usually resulting from pre-emptive slaughter for the purposes of containing the spread of disease. Marketing should be undertaken whenever possible.</p>
Rendering	<p>Rendering of animal carcasses involves conversion of the carcasses into three end products – carcass meal, melted fat or tallow, and water – using mechanical processes (grinding, mixing, pressing, decanting and separating), thermal processes (cooking, evaporating, and drying), and sometimes chemical processes (e.g., solvent extraction).</p> <p>The main carcass rendering processes include size reduction followed by cooking and separation of fat, water, and protein materials using techniques such as screening, pressing, sequential centrifugation, solvent extraction and drying. Resulting carcass meal can sometimes be used as an animal feed ingredient. If prohibited for animal feed use, or if produced from keratin materials of carcasses such as hooves and horns, the product will be classified as inedible and can be used as a fertilizer. Tallow can be used in producing livestock feed or the manufacture of soaps.</p> <p>A satisfactory rendering process would involve grinding the raw product, solvent extraction of lipids at about 100 °C for one hour and high temperature treatment of both carcass meal and tallow for at least a further 40 minutes. The end product of rendering must pass microbiological tests before release.</p> <p>Rendering is a useful alternative for carcass disposal including infected animals where the service is available (the WCR plant in BC is not approved for rendering of infected carcasses). However, rendering plants have minimal surge capacity and may not be able to accept large numbers of carcasses in an emergency.</p>
Composting	<p>Composting is the controlled biological decomposition and conversion of solid organic material into a humus-like substance called compost that can safely be used as a soil amendment. The process is aerobic, meaning it requires the presence of oxygen. Natural microorganisms such as bacteria and fungi break down the complex organic compounds into simpler compounds.</p> <p>Composting is cost-effective, environmentally sound and bio-secure provided that the compost is managed correctly (e.g., high temperatures are maintained and leachate is controlled effectively). Most pathogens are destroyed during the composting process. In-barn composting is the favoured option for poultry because it limits odour, enhances bio-security and is away from view. If this is not possible, the entire process can be handled</p>

	<p>outdoors.</p> <p>Large animals can be successfully composted if the process is properly established and maintained. Composting also has the advantage of keeping infected material on site.</p> <p>Site selection is of key importance for composting operations. Considerations include:</p> <ul style="list-style-type: none"> – sites should be at least 30 metres away from wells or watercourses; – sites should be level and not prone to flooding; – runoff and/or leachate must be contained to protect surface and ground water; and – sites should be shielded from public view and secure from predators. <p>Flood-prone areas, steep slopes and bedrock must be avoided. Sites should be on high ground with good drainage and where pooling of water does not occur. A preferred base is a concrete pad, asphalt or packed gravel. However, a field with vegetative cover is acceptable if leachate can be effectively contained. The composting site must be at least 1 metre above the high water table level and 30 metres from any water source used for domestic purposes. Also, wildlife or domestic animals must be prevented from gaining access to composting carcasses.</p> <p>Partial composting, or bio-heat treatment, may also be used in some circumstances, particularly with poultry carcasses. Virus inactivation is achieved, but visually the end-product has not matured to the same level of biological decomposition as true compost.</p>
<p>Incineration</p>	<p>High temperature incineration is a method of thermal destruction of both the carcass and pathogens by converting volatile gases, vapours and particulate matter into carbon dioxide, water and ash. Properly designed and operated, biological incinerators produce a stack gas that is largely free of odours and particulate matter.</p> <p>Biological incinerators provide a very efficient carcass disposal system, achieving safe and complete disposal with the absence of virtually any pollution. However, their cost and lack of portability means they are unlikely to be readily available or easily accessible in many situations. Incinerators are usually only suited to disposal of small amounts of material.</p>
<p>Burning</p>	<p>Open burning of animal carcasses creates smoke that is extremely high in particulate matter and produces offensive odours. Accordingly, it is normally suitable for only a small number of animals (i.e., less than six bovine units). It may be conducted in above-ground pyres or in trenches, and requires the use of accelerants such as diesel fuel or auxiliary fuel such as wood and straw to achieve the combustion temperatures necessary for the complete destruction of animal carcasses.</p>

	<p>Air curtain burning is a technique for burning material in a pit aided by fan-forced air. The equipment consists of a large capacity fan and ducting to deliver the air, which may be preheated, down into the long side of a trench. The angle of the airflow results in a curtain of air acting as a top for the incinerator and provides oxygen that produces high burn temperatures. Sufficient hot air recirculates within the pit, achieving complete combustion. Additional fuel is required to initially establish combustion, but once operating the continuing fuel requirement is reduced. The use of misters can reduce the air emission concerns normally associated with open air-curtain technology.</p> <p>Air curtain burners are suitable for continuous operation, albeit on a relatively small scale and have the advantage of being transportable. Using an air curtain burner can significantly enhance the efficiency of open burning. Burning results in the destruction of most pathogens, reduces the volume of solid wastes and minimizes the impact on water quality. Residues left over from burning must be buried, composted or transported to a landfill.</p>
<p>Landfill</p>	<p>Depositing dead animals in a local landfill has been commonly used for disposal of a small numbers of large animal carcasses or a larger number of small animal carcasses.</p> <p>Only landfills that satisfy requirements with respect to flooding and aquifers, engineered containment, leachate management and gas management regimes should be considered for mass carcass disposal.</p> <p>Carcasses disposed in a landfill undergo chemical, bacteriological, and physical changes. Depending on the material and site conditions, decomposition in a landfill can proceed very slowly over a long period of time, in widely varying temperatures that are inadequate for the inactivation of heat resistant organisms and spore formers. There is also a potential for groundwater and surface water contamination from the release of landfill leachate, and the off-site migration of carbon dioxide, and methane gases. Small amounts of poisonous and noxious gases including hydrogen sulfide may also be emitted from landfills.</p>
<p>Burial</p>	<p>Mass livestock carcass burial requirements include the need for at least four meters of soil above the water table or bedrock, and separation distances of 122 meters from any well and 50 meters from a dugout, pond, stream, river or the property boundary. Also, flood prone areas and unconfined aquifers are excluded.</p> <p>Maximum loading rate for non-emergency on-site carcass burial is 700 kg per hectare per year. For mass burial in off-site locations, the loading rate will be determined by environmental considerations and must be determined in conjunction with MAL, MOE and MOH. Experience in past emergency events suggests a loading rate not exceeding approximately 15 cattle, 90 swine, 150 sheep or 800 poultry carcasses per hectare per year, in environmentally acceptable sites, for mass carcass disposal in a major emergency.</p>

	<p>Environmental risks associated with burial include:</p> <ul style="list-style-type: none"> – holding (burial) sites that result in surface and/or soil pollution and/or air pollution; – flies or rodent attraction that results in possible disease transfer to people, livestock or wildlife; and – attraction of predators to the site. <p>Important considerations for burial site selection include:</p> <ul style="list-style-type: none"> – <i>access to the site</i>: for both equipment to dig the burial pit and for the delivery of livestock, carcasses or other materials to be buried; – <i>environmental</i>: distance to watercourses, bores and wells; height of water-table; proximity to buildings, especially houses; proximity to neighbours or public lands including roads; slope of the land and drainage to and from the pit; permeability of soil; sufficient space for temporary storage of overburden; and direction of prevailing wind (odour); – <i>construction considerations</i>: avoid rocky areas (slows digging and increases costs) but select soils with good stability capable of withstanding the weight of equipment used to construct and fill the pits. Surface runoff should be prevented from entering the pit by the construction of diversion banks if required. Similar banks should be constructed to prevent any liquids escaping from the burial site. Fencing may be necessary to exclude animals until the site is safe for use. <p>Gas production from decomposition within unopened carcasses may result in considerable expansion in the volume of the buried material to the extent that the surface of the closed pit may rise and carcasses may be expelled from the pit. It is recommended that large animal carcasses be opened by slashing the rumen of cattle or the caeca of horses to permit escape of gas. There appears to be little benefit in opening small animal carcasses.</p> <p>Lime may be added to pits to prevent earthworms bringing contaminated material to the surface after pit closure. The carcasses must be completely covered with soil, and an unbroken layer of slaked lime [Ca (OH)₂] should be added before filling is completed. Lime should not be placed directly on carcasses because it slows, and may prevent, decomposition.</p>
<p>Other Potential Methodologies</p>	<p><u>Fermentation</u></p> <p>The process of lactic acid fermentation is simple and requires little equipment – the process needs only a tank and a grinder. Fermentation is an anaerobic process that can proceed in any sized non-corrosive container provided it is sealed and vented for carbon dioxide release. During this process, carcasses can be decontaminated and there is a possibility of recycling the final products into feedstuff. Fermentation products can be stored until they are transported to a disposal site.</p> <p>Carcasses are ground to fine particles, mixed with a fermentable</p>

	<p>carbohydrate source and culture inoculant, and then added to a fermentation container. Grinding aids in homogenizing the ingredients. For lactic acid fermentation, lactose, glucose, sucrose, whey, whey permeates, and molasses are all suitable carbohydrate sources. The carbohydrate source is fermented to lactic acid by <i>Lactobacillus acidophilus</i>.</p> <p>Under optimal conditions, including a fermentation temperature of about 35°C, the pH of fresh carcasses is reduced to less than 4.5 within two days. Fermentation with <i>L. acidophilus</i> destroys many bacteria. There may be some micro-organisms that can survive lactic acid fermentation, but these can be destroyed by heat treatment through rendering.</p> <p><u>Gasification and Incineration</u></p> <p>A thermal process in which organic carbonaceous materials are incinerated under limited oxygen conditions in a primary chamber utilizing syngas and charcoal. In most systems the syngas and char will be oxidized through a secondary chamber at a higher temperature, leaving 1-3% ash. Surplus syngas from the primary chamber is cleaned and utilized as a fuel.</p> <p><u>Alkaline Hydrolysis</u></p> <p>Alkaline hydrolysis uses sodium hydroxide or potassium hydroxide to catalyze the hydrolysis of biological material (protein, nucleic acids, carbohydrates, lipids, etc.) into a sterile aqueous solution consisting of small peptides, amino acids, sugars and soaps. Heat is also applied to significantly accelerate the process. The only solid byproducts of alkaline hydrolysis are the mineral constituents of the bones and teeth of vertebrates. This undigested residue, which typically constitutes approximately two percent of the original weight and volume of carcass material, is sterile and easily crushed into a powder that may be used as a soil additive.</p> <p>Alkaline hydrolysis is carried out in a tissue digester that consists of an insulated, steam-jacketed, stainless-steel pressure vessel with a lid that is manually or automatically clamped. The vessel contains a retainer basket for bone remnants and other materials. The vessel is operated at up to 70 psig to achieve a processing temperature of 150°C. The process releases no emissions into the atmosphere and results in only minor odour production. The end product is a sterile, coffee coloured, alkaline solution with a soap-like odour.</p> <p><u>Thermal Hydrolysis</u></p> <p>Thermal hydrolysis refers to a process in which biological material is treated with high-temperature high pressure steam. It blasts steam at material in specialized vessels at high temperatures for 30 minutes or longer in order to destroy the cell walls. The process destroys a wide range of pathogens, has a low odour and is normally completed within six hours.</p>
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Annex C Specialized Equipment List

This list provides guidance for specific disposal methodologies. It is not intended to provide a complete inventory of equipment/resources required for every foreseeable situation – each disposal emergency will have its own detailed needs. The list does, however, provide a basis for planning and a starting point for the allocation and deployment of resources.

Disposal Methodology	Resources Required
Burial	<p>For burial, the preferred equipment for digging burial pits is an excavator. This equipment is the most efficient available for the construction of long, deep, vertically sided pits. Other advantages include the ability to easily store topsoil separate from subsoil and the equipment can be used if required to fill the pit with carcasses or other materials and closing the pit without disturbing the carcasses.</p> <p>Carcass conveyance such as a tractor with front-end loader. Tow chain. Disposal bins. Vans or other vehicles for personnel transport. Vehicles approved for transporting hazardous material. Bags if required for transport of carcasses (poultry). Poly sheeting and tarpaulins. Disinfectant. Protective clothing.</p>
Burning	<p>Backhoe with front-end loader. Digging tools. Vans or other vehicles for personnel transport. Vehicles approved for transporting hazardous material. Bags if required for transport of carcasses (poultry). Poly sheeting and tarpaulins with anchors. Disinfectant. Protective clothing. Suitable fuel for pyres. Preferred: air curtain burners.</p>
Rendering	<p>Vehicles suitable for transporting hazardous material. Poly sheeting and tarpaulins with anchors. Bags if required for transport of carcasses (poultry). Front-end loader. Tow chain. Vans or other vehicles for personnel. Disinfectant. Protective clothing.</p>
Composting	<p>Midsized front-end or skid-steer loader. Hand tools. Composting thermometers.</p>

	<p>Carbon source (litter, sawdust, etc). Moisture meter. Water hose and supply. Warning signs. Poly sheeting and tarpaulins with anchors. Cleaning and disinfectant supplies.</p>
Incineration	<p>Vehicles suitable for transporting hazardous material. Poly sheeting and tarpaulins. Front-end loader. Tow chain. Incineration equipment suitable for the carcass type(s) being disposed of. Vans or other vehicles for personnel. Protective clothing.</p>
Fermentation	<p>Containers:</p> <ul style="list-style-type: none"> - Garbage cans (2 per unit) for less than six bovine units. - Large metal bins from renderer or large garbage bins for 6-60 bovine units. - Above-ground horizontal silo or trench silo or a liquid manure tank for more than 100 bovine units. <p>Plastic film to cover containers. Front-end loaders. Grinder capable of reducing carcasses to 2cm cubes. Mixer capable of mixing animal tissue, water and culture. Lactobacillus culture. Carbohydrate source, such as processed animal feed or high starch vegetable waste.</p>

Annex D Training Requirements

All personnel involved with carcass disposal operations need training, particularly with respect to safety, health and environmental requirements. This includes all CRD emergency and support staff and, where possible, representatives from municipalities and the local farming industry.

To ensure the validity of operational plans and the effectiveness of training, a carcass disposal exercise should be conducted once annually. The exercises can take one of the following forms, working incrementally from the simplest (Level 1) to more complicated methods.

Level	Type/Format	Structure
1	Orientation (Discussion-based)	The orientation exercise is conducted at an introductory level to familiarize participants with roles, plans, procedures or equipment. It is presented as an informal discussion in a group setting with little or no simulation. A variety of seminar formats can be used, including lecture, discussion, slide or video presentation, computer demonstration or panel discussion.
2	Tabletop (Discussion-based)	A tabletop exercise is a facilitated analysis of an emergency situation in an informal, low-stress environment. It is designed to elicit constructive discussion as participants examine and resolve problems based on existing operational plans. Tabletop exercises lend themselves to broad discussion of policies and procedures, provide an opportunity for participating organizations and staffs to become acquainted with one another and are good preparation for more complex exercises.
3	Drill (Operations-based)	A drill is a coordinated, supervised exercise activity normally used to test a single specific operation or function. With a drill, there is no attempt to coordinate organizations or fully activate an EOC. Its role is to practice and perfect one clearly defined part of a response plan and to help prepare for more extensive exercises.
4	Functional (Operations-based)	A functional exercise is a simulated, interactive exercise that tests the capability of an organization to respond to a simulated event. This is a moderate-to-high stress activity which simulates an incident in the most realistic manner possible short of moving resources to a field site. A functional exercise is always a prerequisite to a full-scale exercise.
5	Full-Scale (Operations-based)	A full-scale exercise simulates a real event as closely as possible. It is an exercise designed to evaluate the operational capability of emergency management systems in a stressful environment that simulates actual response conditions and requires the mobilization and actual movement of emergency personnel, equipment, and resources.