



FARMED ANIMAL MASS CARCASS DISPOSAL EMERGENCY PLAN

for the

**REGIONAL DISTRICT OF
CENTRAL KOOTENAY**

April 2010

Farmed Animal Mass Carcass Disposal Emergency Plan

for the

Regional District of Central Kootenay



This plan was developed under the provisions of the
UBCM Farmed Animal Mass Carcass Disposal Project
Emergency Planning Program

by

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Emergency Program Coordinator
250-352-6665



PROVINCIAL EMERGENCY PROGRAM

Provincial Emergency Coordination Centre
(24 hours)

1-800-663-3456
Southeast Region PREOC (Nelson)
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BC MINISTRY OF AGRICULTURE AND LANDS

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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 an 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 cooperate with provincial agencies to manage carcass disposal emergencies caused by events other than an animal disease.

When a carcass disposal emergency involves an 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 an animal disease, the provincial government will normally 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 transmissible 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. A Control Area includes an Infected Zone, a Restricted Zone and a Security Zone.

Disposal Protocols

The Resource Management Branch of the BC Ministry of Agriculture and Lands has developed draft protocols that can be used to create situation-specific action plans for disposal.

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 poultry, cattle, pigs, sheep, horses, goats, bison, llamas and alpacas. These are the farmed animal species which are present in sufficient numbers in the Regional District to create an emergency in the event of mass mortality.

Foreign Animal Disease Emergency

This term refers to an outbreak of foreign animal disease requiring immediate action to contain, control and eradicate the disease including: Slaughtering of infected animals, birds, disposal of carcasses or infected products, cleaning and disinfecting of infected premises and transport, limiting the spread of disease and tracing the origin of the disease.

Foreign Animal Disease Emergency Support (FADES) 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 Zone

A geographic area that includes all positive 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.

Joint Emergency Operations Centre

A designated facility established by multiple agencies or jurisdictions to coordinate overall response and support to an emergency response involving a foreign animal disease.

Joint Information Centre

An element of the Joint Emergency Operations Centre where agencies may collaborate in the planning and disseminating information during an emergency.

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. (*Farm Practices Protection Act*).

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.

Non-Zoonotic Disease

A disease present in animals that cannot be transmitted to people.

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.

Pre-emptive Slaughter

Depopulation of susceptible animal species in herds or flocks on premises that have been exposed to infection by direct animal-to-animal contact, or by indirect contact of a kind likely to cause the transmission of a disease virus.

Ratite

Denoting a bird having a flat breastbone without a keel and so unable to fly, such as an ostrich, emu, etc.

Rendering

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

Restricted Zone

An area surrounding an infected zone. The boundaries will be determined by physical and geographical features.

Security Zone

The geographic area between the outer perimeter of the Infected and Restricted Zone(s) to the edge of the Control Area.

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.

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.

Zoonosis

An infectious disease in animals that can be transmitted to people.

Zoonotic Disease

Pertaining to a zoonosis: a disease that can be transmitted from animals to people or, more specifically, a disease that normally exists in animals but that can infect humans.

Acronyms / Abbreviations

AAR	After Action Report
ALR	Agricultural Land Reserve
BCAS	British Columbia Ambulance Service
BCERMS	British Columbia Emergency Response Management System
CBSA	Canada Border Services Agency
CCG	Central Coordination Group
CFIA	Canadian Food Inspection Agency
EA	Electoral Area
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
MOHS	Ministry of Health Services
MOT	Ministry of Transportation and Infrastructure
PAB	Public Affairs Bureau
PEP	Provincial Emergency Program
PREOC	Provincial Regional Emergency Operations Centre
RDCK	Regional District of Central Kootenay
SRM	Specified Risk Material

1. Introductory Material

1.1 Purpose and Scope

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

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

The scope includes:

- a) a profile of agriculture in the RDCK with emphasis on local farmed animal populations;
- b) identification of hazards and vulnerabilities that could result in a mass carcass disposal emergency in the regional 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.

The plan applies to all electoral areas and municipalities within the jurisdictional area of the RDCK with the exception of the City of Castlegar and the Village of New Denver.

1.2 Responsibility for the Plan

This plan will be maintained on behalf of the RDCK by the Emergency Program Coordinator. The plan should be reviewed and updated in concert with regular reviews of other emergency plans, normally every two years in April.

1.3 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 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”.

1.4 RDCK Emergency Structure

The RDCK has prepared *Emergency Response Plans* for seven areas:

- a) Creston and Electoral Areas A, B and C;
- b) Salmo and Electoral Area G;
- c) Nakusp and Electoral Area K;
- d) Electoral Area H –The Slocan Valley;
- e) Nelson and Electoral Areas E and F;
- f) Kaslo and Electoral Area D; and
- g) Electoral Areas I and J.

A list of emergency coordinators for these areas is available at: http://www.rdck.bc.ca/community/emergency/emergency_coordinators.html

Emergency management relationships within the regional district are:

- a) Electoral Areas (A-K).
 - The 11 electoral areas are jurisdictional areas in accordance with the *Emergency Program Act*. The RDCK is both the local government and the local authority for the electoral areas and is responsible for emergency planning and management.

- Selected electoral areas and municipalities have been grouped together into emergency response areas as listed above.
 - During an emergency, one or more emergency response areas may open an EOC to manage emergency operations.
- b) Incorporated Municipalities (Castlegar, Nelson, Creston, Kaslo, Nakusp, New Denver, Salmo, Silverton and Slocan).
- Each incorporated municipality has its own local government and is a local authority in accordance with the *Emergency Program Act*. Under the regional emergency program, selected municipalities and electoral areas work together to deal with emergencies utilizing the applicable area response plan.
 - The City of Castlegar and the Village of New Denver do not participate in the regional emergency program and maintain their own emergency response plans and arrangements.

To provide consistency and coordination in planning for and responding to emergencies within the regional district, the RDCK has a regional emergency management program with oversight by a Board of Directors. For emergency planning and management the RDCK is divided into three sub-areas each led by an Emergency Program Coordinator

The structure of the emergency program is shown at Appendix 2.

1.5 EOC Locations

The locations and contact numbers of primary EOCs within the RDCK are:

<i>Creston and Areas A, B and C</i>	238-10 th Avenue North 250-428-2214
<i>Salmo and Area G</i>	414 Baker Street 250-357-9433
<i>Nakusp</i>	90-5 th Avenue NW 250-265-3563
<i>Slocan</i>	710 Harold Street 250-265-2815
<i>Nelson</i>	579 Stanley Street 250-352-7701
<i>Kaslo</i>	312 Fourth Street 250-353-2311

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

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 leads response efforts to control disease outbreaks through the CFIA.

Carcass disposal response plans require all levels of government to work together along with local livestock industries.

1.7 Related Plans

This emergency plan is related to other plans, the most important of which are:

- a) Emergency Response Plans for the seven RDCK emergency response areas;
- b) Emergency Response Plan for BC MAL, 2006; and
- c) [FADES – Foreign Animal Disease Emergency Support Plan \(2009 Plan\)](#).

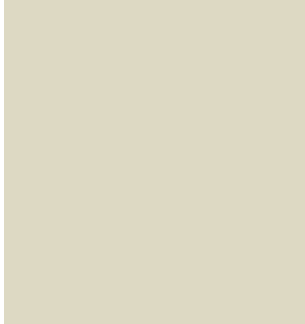
1.8 Cross-Border Issues

As the southern border of the RDCK is also an international border carcass disposal operations may require cross-border consultation, particularly if the mass mortality resulted from an animal disease event.

Potential cross-border issues are covered in Section 4, *Concept of Operations*, sub-section 4.7.

1.9 Activation of Plan

The requirement to activate this plan will be determined by the RDCK Emergency Coordinator, in consultation with PEP and MAL:

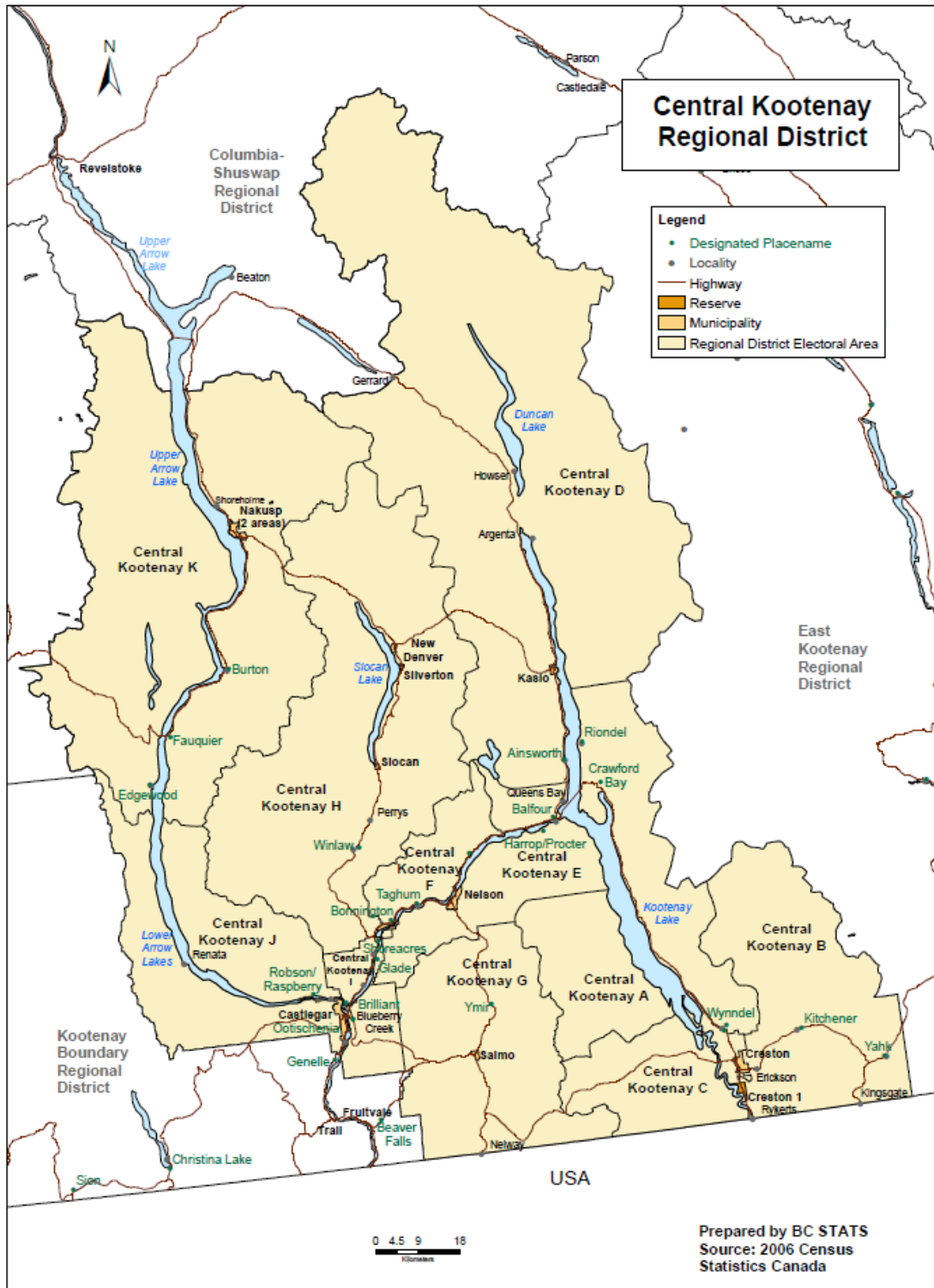


FOR ACTIVATION OF THIS PLAN, CONSULT WITH:

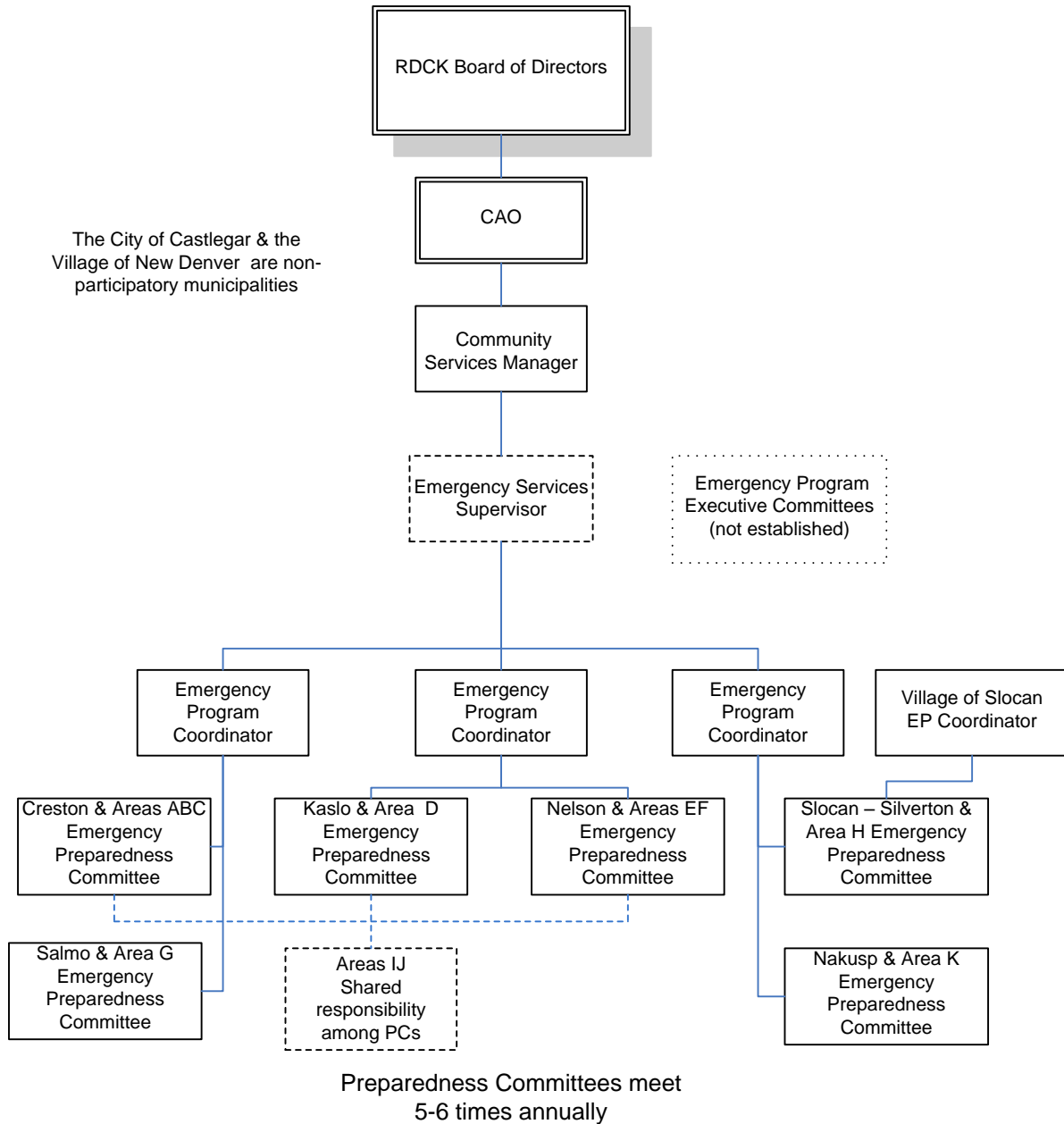
**Provincial Emergency Program
1-800-663-3456
(24 hours)**

**Ministry of Agriculture and Lands
604-556-3100
(Business hours)**

Appendix 1 to Section 1
RDCK Area Map



Appendix 2
RDCK Emergency Program Structure



2. Local Area Data

2.1 Local Agricultural Profile

The RDCK is located in the southeast interior of BC, extending from the headwaters of the Duncan River in the north to the Canada-US international border just south of Fruitvale. It encompasses 22,130 km² and had a population of 55,800 in 2006.

The RDCK is bounded in the north by the Columbia-Shuswap Regional District, to the east by the East Kootenay Regional District and to the west by the Kootenay Boundary and North Okanagan regional districts.



The RDCK is comprised of nine incorporated municipalities (the cities of Castlegar and Nelson, the Town of Creston and the villages of Kaslo, Nakusp, New Denver, Salmo, Silverton and Slocan) and 11 mainly rural electoral areas.

The RDCK forms part of the larger Kootenay region of BC, which is characterized by rugged, mountainous terrain, steep valley slopes and a large number of lakes and rivers. The Monashee, Selkirk and Purcell mountain ranges and the Arrow and Kootenay Lake systems are the dominant geographical features of the regional district.

There are three major river systems in the RDCK:

- the Columbia River, which enters the regional district in the north and flows from the Nakusp area to Castlegar, forming the Upper and Lower Arrow Lakes along its course;
- the Kootenay River, which enters the RDCK from the south, crossing the international border near Creston. The river widens to become Kootenay Lake, where the Duncan River joins from the north. The Kootenay becomes a river again at Balfour, flowing west to Castlegar where it empties into the Columbia River; and
- the Slocan River, which flows out of Slocan Lake and joins the Columbia River system between Nelson and Castlegar.

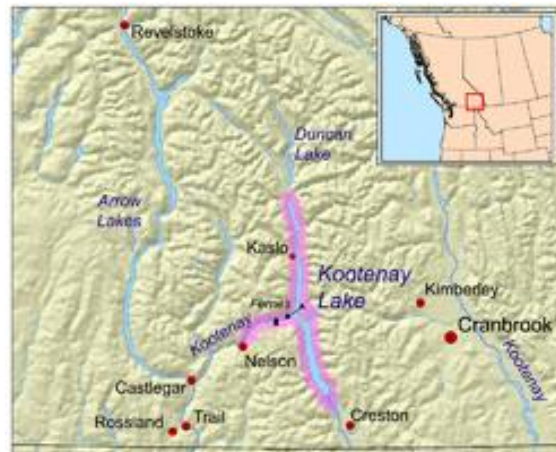
Kootenay Lake has historically flooded a long marsh within the Creston Valley on a seasonal basis. However, this area has been now been protected by the Libby dam and dykes and converted to commercial agriculture.

There are floodplains along all of the major river systems and their

tributaries. The potential for major flooding is moderate to high, with significant floodplains existing around the Columbia, Duncan, Kootenay, Salmo and Slocan rivers. Detailed floodplain information on these areas can be obtained from the MOE Water Stewardship Division, available online at:

http://www.env.gov.bc.ca/wsd/data_searches/fpm/reports/region4.html

The dominant river and lake systems of the regional district, with Kootenay Lake highlighted, are shown below:



The main road transportation corridor is Highway 3, which traverses the regional district from east to west, from Castlegar to Creston. Highway 6 provides transportation north to the Nakusp area.

The regional district's climate is variable but is characterized by moderately warm summers and cool winters with heavy snowfalls. Average minimum and maximum temperatures vary from -5°C to 5°C in winter and 14°C to 25°C in the summer. Monthly rainfall averages 25mm from March to October. Snowfall normally occurs from November to March with December and January averaging 70cm each. Upslope, and on the windward slopes of the Monashee, Selkirk and Purcell Mountains, higher precipitation and cooler temperatures prevail.



Agricultural land usage is primarily within the ALR which comprises 63,550 hectares, although less than 50% of that area is being actively farmed. Most of the land suited to cultivated agriculture is restricted to the valleys of rivers and streams. The distribution of the ALR is primarily in the south and northwest areas of the regional district, as illustrated on the ALR map at Appendix 2.

Agricultural activity is largely centred in the larger valley areas where the rich soils and moderate climate are well suited to crop production. The valley areas also provide some useful ranch land with pastures as well as field crops and forage production, particularly in the south and northwest. At higher elevations, the only significant agricultural activity is summer livestock grazing due to the adverse climate and difficult terrain.



The majority of agricultural land use is associated with livestock production, including pasture, forage and hay production and beef farms. Other livestock production in the district is diverse but with the exception of beef and, to a lesser extent horses, is generally small scale.

There are numerous small farms in the district on which pigs, sheep and goats are kept, but they are mainly small holdings. Poultry of various types are present on many farms and acreages but there are no large poultry operations in the regional district.

A summary of farms and the number of animals in the RDCK is shown below. ^{Note 1}

Species	No. of Farms	No. of Animals
Cattle and Calves	194	10,871
Poultry (all types)	217	12,871
Horses and Ponies	144	799
Sheep and Lambs	36	826
Goats	24	423
Pigs	30	189
Llamas and Alpacas	11	118

Note 1: Agricultural data is primarily from Statistics Canada Census 2006, Agriculture Community Profiles. The number of farms in the table exceeds the district total, as many farms support more than one livestock species

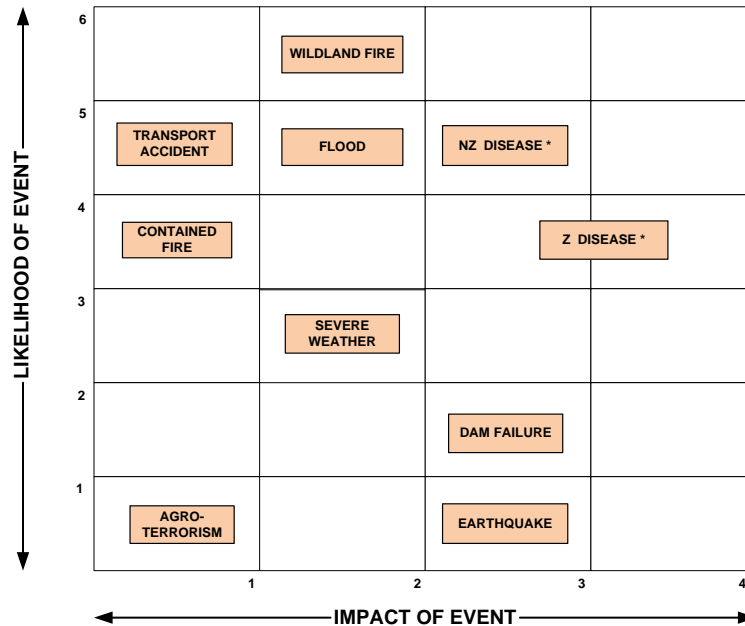
Calculation of volume and mass by species is at Appendix 1 to this section. Maps showing the livestock distribution within the RDCK are at Appendices 3, 4 and 5.

Additional data for the area may be found in *RDCK – Agricultural in Brief*, published by the Ministry of Agriculture and Lands, available on line at:

http://www.agf.gov.bc.ca/resmgmt/sf/agbriefs_2006census/AgInBriefFactsheet_KootenayBoundary.pdf

2.2 Risk Profile

The risk profile for farmed animal mass mortality in the RDCK is illustrated below:



* Z = Zoonotic; NZ = Non-Zoonotic (see [glossary](#) for definitions)

The grid illustrates the relative likelihood and impact of hazards/risks which may cause animal mortality in the RDCK. It relates only to the potential causes of a carcass disposal emergency.

2.3 History of Mass Animal Mortality in the Region

There is no record of animal mortality in the RDCK causing a carcass disposal emergency.

2.4 Commodity and Advisory Groups / Organizations

A list of livestock producer associations and agricultural advisory groups is at Appendix 5.

MAL has established agriculture advisory teams (Agri-teams) to support local governments with agricultural concerns or issues. These teams will be key advisors in a carcass disposal emergency. The principal contact for the RDCK is:

Resource Stewardship Agrologist

Unit G – 205 Industrial Road
Cranbrook, BC V1C 7G5
250-489-8507

Darrell.Smith@gov.bc.ca

Current contact information for all MAL Agri-team member may be found at:

http://www.al.gov.bc.ca/resmgmt/sf/Contacts.htm#Agri-Team_Members

A further source of current farmed animal producer location and contact information can be derived from data generated under the premises ID and traceability programs being undertaken by the CFIA, MAL and key producer associations. Contact information is as follows:

DAIRY

BC Milk Producer's Association
3236 Beta Avenue
Burnaby, BC V5G 4K4
604-294-3737 or 1-877-462-2672
contactus@bcmilkproducers.ca

POULTRY

BC Chicken Marketing Board
101-32450 Simon Avenue
Abbotsford, BC V2T 4J2
604-859-6828
info@bcchicken.ca

BEEF

BC Cattlemen's Association
#4-10145 Dallas Drive
Kamloops, BC V2C 6T4
250-573-3611
info@cattlemen.bc.ca

HORSES

Horse Council of BC
2669 Deacon St.
Abbotsford, BC V2T 6H3
604-856-4304
<http://www.hcbc.ca/>

The information provided by the ID and traceability programs is confidential and only to be used in an emergency.

Appendix 1 to Section 2
RDCK - Calculation of Farmed Animal Volume
and Mass by Species

Livestock	Number of Head (1)	Average Mass (kg) (2)	Total Mass (metric tons) (3)	Volume Factor (cu meters) (2)	Total Volume (cu meters) (4)
Hens and Chickens	11,545	1.65	12.49	.015	173.1
Turkeys	418	5	.44	.0375	15.7
Other Poultry	908	2.5	1.64	.019	17.2
Total	12,871		14.57		206

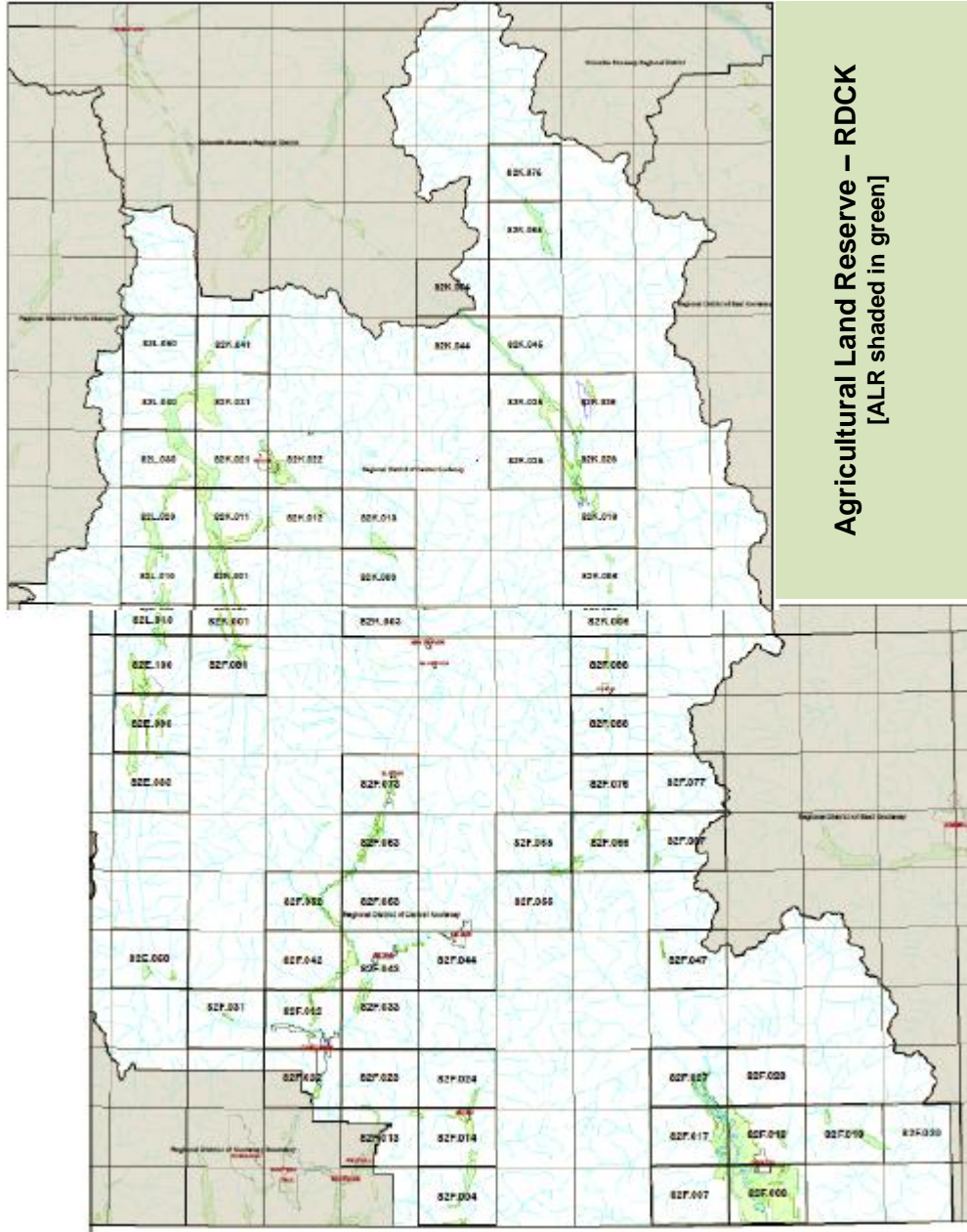
Cows (Dairy and Beef)	4,822	635	3,801.11	1.5	7,233
Bulls >1 year old	193	727	251.54	1.5	290
Steers >1 year old	827	635	533.4	1.5	1,241
Heifers	1,322	455	541.45	1.0	1,322
Calves	3,707	210	1,108.38	0.5	1,854
Total	10,871		6,235.88		11,940

Pigs	189	200	37.8	0.375	71
Sheep and lambs	826	80	66.1	0.3	248
Horses and ponies	799	523	417.9	1.5	1,199
Goats	423	80	33.8	0.3	127
Llamas and Alpacas	118	75	8.9	0.6	71

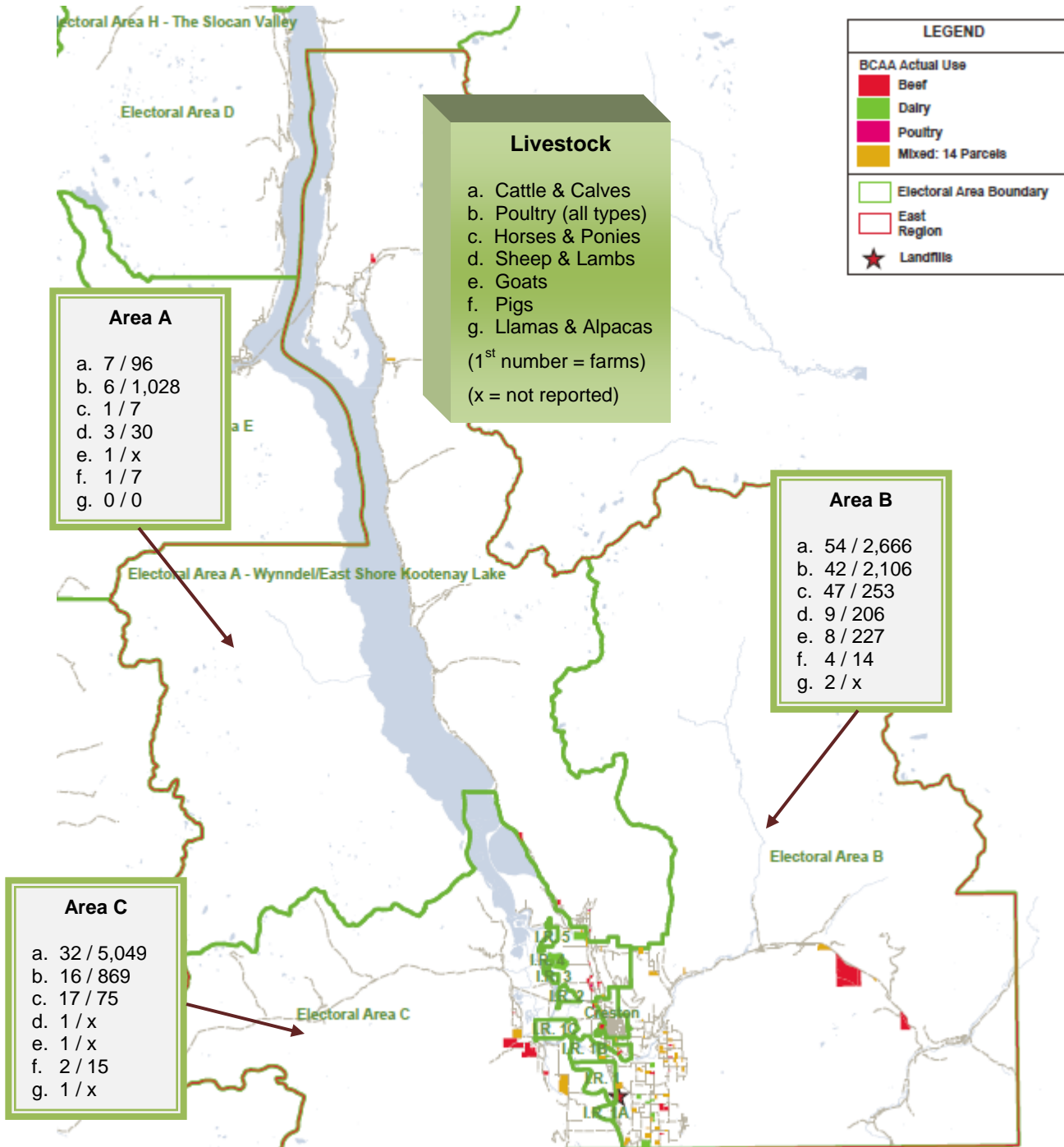
Notes:

- Number of head is derived from Statistics Canada Census 2006 – Agriculture Community Profiles. Where exact figures were not available due to statistics confidentiality an extrapolation from similar or previous data has been made.
- 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)*.
- The total mass calculation is based on the average livestock weight in kilograms multiplied by the number of head. This is converted to metric tons by multiplying the total weight in kilograms by the conversion factor 0.001.
- 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 meters 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.

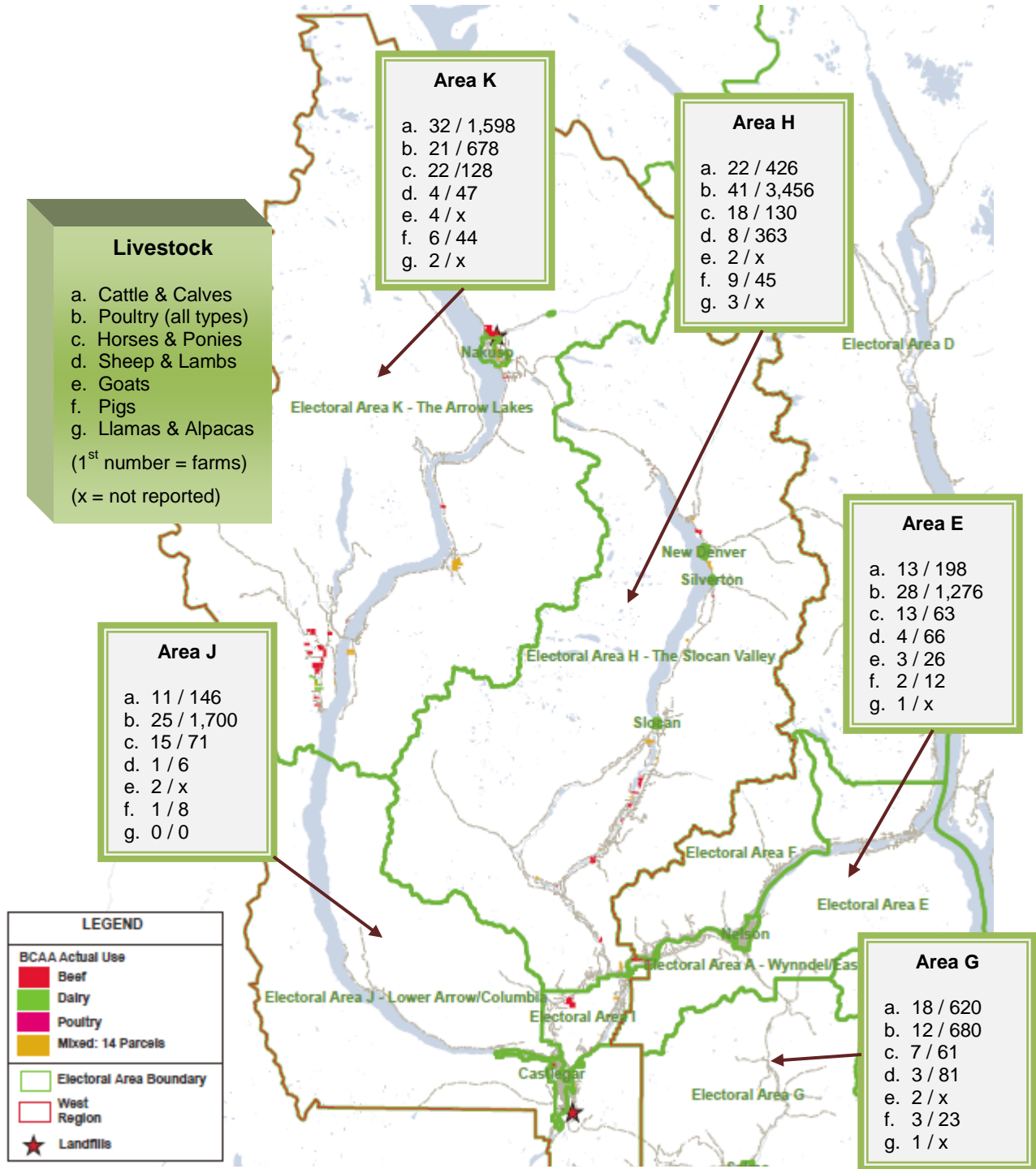
Appendix 2 to Section 2
Agricultural Land Reserve – RDCK



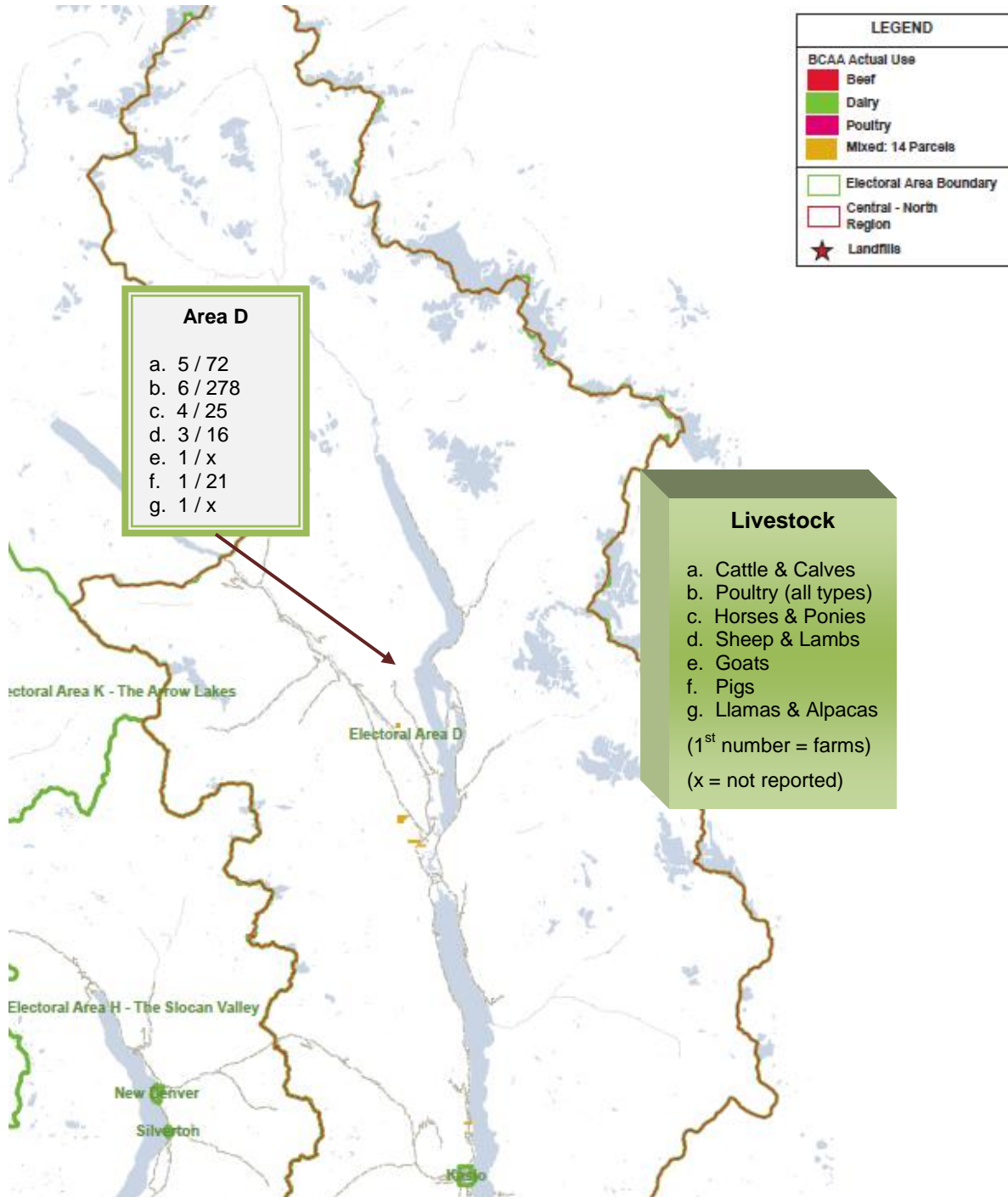
Appendix 3 to Section 2
Livestock Distribution – RDCK East



Appendix 4 to Section 2
Livestock Distribution – RDCK West



Appendix 5 to Section 2
Livestock Distribution – RDCK North



Appendix 6 to Section 2 Livestock Commodity and Advisory Groups

<p>BC Chicken Growers' Association P.O. Box 581 Abbotsford, BC V2T 6Z8 604-859-9332 bccga@telus.net</p>	<p>BC Cattlemen's Association 4-10145 Dallas Drive Kamloops, BC V2C 6T4 250-573-3611 info@cattlemen.bc.ca</p>
<p>Horse Council of BC 2669 Deacon St. Abbotsford, BC V2T 6H3 604-856-4304 http://www.hcbc.ca/</p>	<p>BC Sheep Federation 2881 Mountain Road Duncan, BC V9L 6N4 250-295-6419 http://www.bcsheepfed.com/</p>
<p>BC Goat Breeders' Association 30854 Olund Road Mt Lehman, BC V4X 1Z9 604-854-6261 http://www.bcgba.netfirms.com/</p>	<p>BC Turkey Growers' Association 19329 Enterprise Way Surrey, BC V3S 6J8 604-534-5644 smallory@bcturkey.com</p>
<p>BC Dairy Council 7000 Blackwell Road Kamloops, BC V2C 6V7 250-573-4747 http://www.bcdairyCouncil.ca/</p>	<p>BC Milk Producers' Association 3236 Beta Avenue Burnaby, BC V5G 4K4 604-294-3775 contactus@bcmilkproducers.ca</p>
<p>BC Pork Producers' Association 2010 Abbotsford Way Abbotsford, BC V2S 6X8 604-853-9461 http://www.bcpork.ca/BC_Pork/</p>	<p>BC Llama and Alpaca Association 1045 – 165th Street White Rock, BC V4P 2P3 604-541-4141 http://www.bclaa.com/</p>
<p>First Nations Agricultural Association 408 Paul Lake Road Kamloops, BC V2H 1J8 250-314-6809 http://www.fnala.com/</p>	<p>Kootenay Livestock Association Box 173, Hwy 95A & Mission Road Cranbrook, BC V1C 4H7 250-426-4315 wendy@kootenaylivestock.ca</p>

Additional information on livestock associations and other provincial agriculture organizations is available through the *BC Agriculture Resource Guide 2008* at: <http://www.agridigest.com/guide/ResourceGuide08.pdf>.

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.

In intensive livestock operations such as poultry farming, the disposal of large numbers of carcasses caused, for example, by loss of ventilation due to power failure during severe hot weather, may be considered routine. 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 an animal disease or if there is a significant risk to public health.

The primary objectives of a carcass disposal operation 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 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 locally and from other levels of government if required.

The efficient and environmentally safe disposal of mass animal carcasses will require:

- a) early notification;
- b) an estimate of the scale of carcass disposal required;
- c) the selection of an appropriate disposal methodology;
- d) the availability of suitable disposal sites; and
- e) 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 circumstance that caused the animal mortality, e.g. a foreign animal disease or a natural disaster such as a flood, will frequently in itself trigger an emergency response. Carcass disposal therefore, will normally be a component of a larger emergency situation and will fit into the existing response and recovery structure.

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

Non-Disease Event ^{Note 1}

When a carcass disposal emergency is caused by mass animal mortality from natural or man-made disasters, carcass disposal operations will, to the extent possible, be managed by individual producers in cooperation with the local livestock industry.

If the scale of the carcass disposal requirement exceeds the capacity of individual producers/industry and/or there is public health or environmental concerns, local government will be required to provide emergency management support, resources and coordination.

Depending on the scale of the emergency, a local government EOC may have to be activated. In such cases, PEP will activate and provide an appropriate level of direction and assistance under the provincial integrated response structure.

Note 1: Although historically some carcass disposal emergencies have been caused by a non-disease event, the probability of animals dying from a natural or man-made disaster in sufficient numbers to cause an emergency is low. This is the less likely of the two categories of events.

Animal Disease Event

In mass farmed animal mortality events involving an animal disease, the carcass disposal operation will be managed within an expanded response structure involving other levels of government in accordance with the joint federal-provincial FADES Plan, or as otherwise considered necessary by CFIA.

The scale of response will depend on a variety of factors such as the type and severity of the disease, the risk of spread / transmission, risk to human health and the environment, and the potential impact on the Canadian economy. CFIA will employ a graduated approach to a suspected animal disease outbreak:

Initial Response – A CFIA case officer or the district veterinarian visits suspected premises to undertake testing and apply any necessary controls.

Enhanced Response – Upon confirmation of disease, response is augmented as necessary to carry out data collection, enforcement, destruction, disposal and cleaning/disinfection to ensure control and eradication of the disease.

Expanded Response – Based on the seriousness of the situation, the CFIA Regional Director may recommend an expanded response to include activation of a joint federal-provincial emergency operations centre (JEOC) to control all operations.

During an animal disease event, the local government emergency structure will work in conjunction with the federal-provincial JEOC in the affected area. Local government 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 resources to the disposal effort and keeping the public advised.

The local government may be required to undertake a variety of operational tasks within or as coordinated by the JEOC. See the [FADES Plan Annex D](#) for a description of the roles and responsibilities of all organizations and agencies that may be involved in a farmed animal health/carcass disposal emergency.

The structure of a federal-provincial JEOC that may be established during an animal disease response is illustrated at Appendix 1 to this section.

3.3 Non-Disease Event

Natural disasters such as floods, fires or extreme weather can cause significant animal mortality, particularly in intensive livestock farming operations where a high density of farmed animals is present. In some cases, preventive measures in themselves may result in significant mortality – for example, the mass movement of dairy cattle to a safe area in advance of a predicted flood may result in mortalities in the range of 3 to 5 percent of the animals moved.

When animal mortality caused by a natural disaster is beyond the capability of producers to manage, or when mass mortality has a potentially significant public health impact, it becomes a carcass disposal emergency which must be managed by the local government.

In such a situation, the local government will be expected to manage the emergency response, supported by the appropriate provincial organizations and agencies. As with other emergency situations, the local government must remain in close contact with PEP, which will provide a level of support appropriate to the situation. Both MAL and the applicable Regional Health Authority must also be kept aware of the situation during any mass mortality event, and each will provide appropriate advice and support.

The local government response will depend on whether the animal mortality is part of a larger emergency (e.g., flood or earthquake) for which an emergency response has already been initiated, or the carcass disposal emergency is independent of a broader response.

A critical path showing the steps to be taken in each of these situations is at Appendix 1 to Section 4.

3.4 Animal Disease Event

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. Until the mortality is confirmed to be the result of a reportable disease, the producers are initially responsible for carcass disposal.

If the scale of mortality from any disease is beyond the capabilities of the local livestock industry, the matter becomes an emergency and 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 Regional/District Veterinarian or District Office Manager.

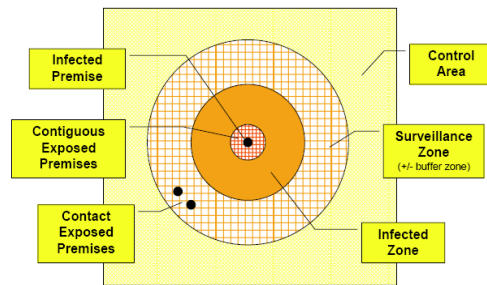
Each CFIA Regional/District Office is responsible to maintain a contingency response plan to guide their response to an animal health emergency. CFIA evaluates the situation and determines what steps, if any, are necessary to further characterize the disease based on the epidemiology report from the initial visit to the suspect premises.

If the existence of a serious/reportable disease situation is confirmed, 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 vicinity of the affected area.

The JEOC will require a suitable facility along with communications and logistics support. Federal/provincial authorities may ask the local authority for assistance in finding a facility, setting it up and

making the necessary local support arrangements.

Control and eradication activities will normally begin by controlling



CFIA – Reportable Disease / FAD
Control Area Schematic.

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 minimum of three kilometres 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 restricted zone extending from the perimeter of the infected zone(s) to a specified distance, which could vary according to the disease. A security zone will extend from the outer limit of the infected and restricted zones 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 (see schematic above).

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 disease response. The *Disposal Group* designs a disposal plan to prevent the spread of the pathogen and mitigate public health or environmental risks. It is essential that the Disposal Group receives assistance from the local government in order to identify appropriate sites for disposal of carcasses.

Local governments will be required to assist the federal/provincial JEOC by providing local coordination and support. The nature of the assistance will vary according to the situation, but may include: advice on local conditions; coordination with local industry; provision of local emergency services including police, fire and communications services; the provision of local resources and the coordination of federal, provincial and local media. Amplification on possible local government and local police roles is included in [FADES Plan Annex D](#).

A critical path showing the main steps to be taken in an animal disease event is at Appendix 3 to Section 4.

3.5 Disposal Options and Protocols

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 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 is available, with market or rendering being preferred options. Only live animals are suitable for market slaughter and processing and this will normally include only non-infected animals.

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 an animal disease 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 this 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 continues to develop 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 and guidance at the outset of any carcass disposal emergency.

- 3.6 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. Consequently, these tissues are considered to be SRM in all cattle as defined in the glossary.
- The handling of bovine carcasses is therefore affected by federal SRM regulations. Rules related to the handling of SRM in landfills and by other disposal methods are prescribed by CFIA and may be viewed at:
- <http://www.inspection.gc.ca/english/anima/heasan/disemala/bseesb/enhren/art/wasdece.shtml>
- 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. This is true for both disease and non-disease related mass carcass disposal emergencies.
- 3.7 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, some on-site disposal methods, burial and burning, have potentially serious environmental consequences and on-site composting may be limited by space requirements and access to carbonaceous bulking agents (wood chips, straw, peat moss).
- While on-site disposal is still a preferred option, off-site methods may increasingly be used in emergencies, particularly for the carcasses of large animals. A decision to move the disposal activities off-site will be related to the scale of event (i.e., the volume of material), site capacity, potential human health concerns and environmental concerns.
- For off-site disposal, the primary issue will be to identify a suitable site for disposal and the transportation of carcasses in a safe, sanitary and timely fashion to avoid spreading the disease and/or endangering public health (see Appendix 3 to this section for transportation considerations).
- 3.8 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 24 inches of freeboard, 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, they should be lined and 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 disinfectant should be carried to deal with minor spills during transit.

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 animal disease material are under development by CFIA/MAL. Once issued, these protocols will guide decisions on applicable transportation issues.

3.9 Pre-emptive Slaughter of Animals

The pre-emptive slaughter of animals to support attempts to control and eradicate the disease is an integral part of a response to an animal health emergency. 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 contain and eradicate the disease. Pre-emptive slaughter 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. In some situations the animals slated for pre-emptive slaughter may be suitable for market. The market option is preferable where possible but the animals must be transported alive to approved commercial slaughter/processing facilities using approved

transportation and handling protocols.

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*.

3.10 Impact on Human Health

The presence of a zoonotic disease that has a potentially serious 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 an animal disease 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 JEOP will normally include a *Human Health Branch*, which will be activated whenever the identified disease presents public risks associated with a zoonotic disease.

3.11 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

3.12 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 is minimized.

Proper environmental monitoring before and after carcass disposal is also necessary. 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, permits and ensure that current guidelines and best practices are being applied.

3.13 First Nations

Should a carcass disposal emergency affect First Nations lands, prior authorization for entry must be obtained.

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 situations may be done directly with INAC and the First Nations entity involved if this is practicable.

3.14 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 local 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 there will be a high demand for information throughout disposal operations. The effective integration of information is particularly important as there are likely to be several levels of responders involved. A clear, timely and consistent message is paramount.

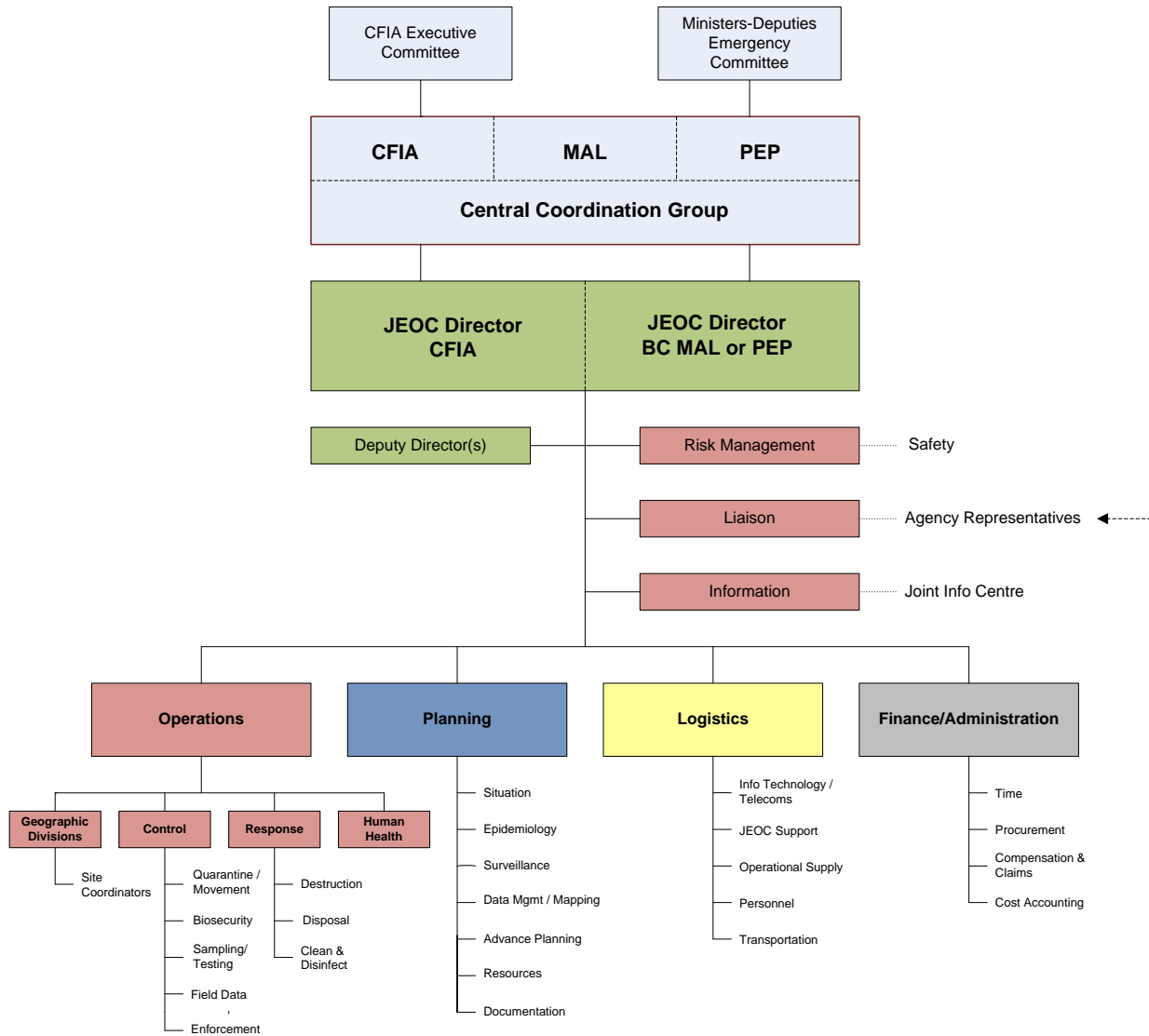
The key is to have designated public information officers and/or spokespersons from the outset, including industry representatives, who cooperate closely with each other. Press releases must be distributed in a timely manner to all RDCK directors, staff, local media and PEP.

Emergency information should be posted on the regional district web site and consideration should be given to establishing an emergency-specific web site. Facebook and Twitter and other social networking services may be utilized as additions/alternatives to traditional communications systems.

Carcass disposal operations will inevitably and unavoidably involve unpleasant scenes of dead or dying animals. Care should be taken to limit media access to certain areas and to restrict, to the extent possible and reasonable, the release of potentially disturbing images.

All organizations involved should 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 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
FADES Plan Response – JEOC Structure

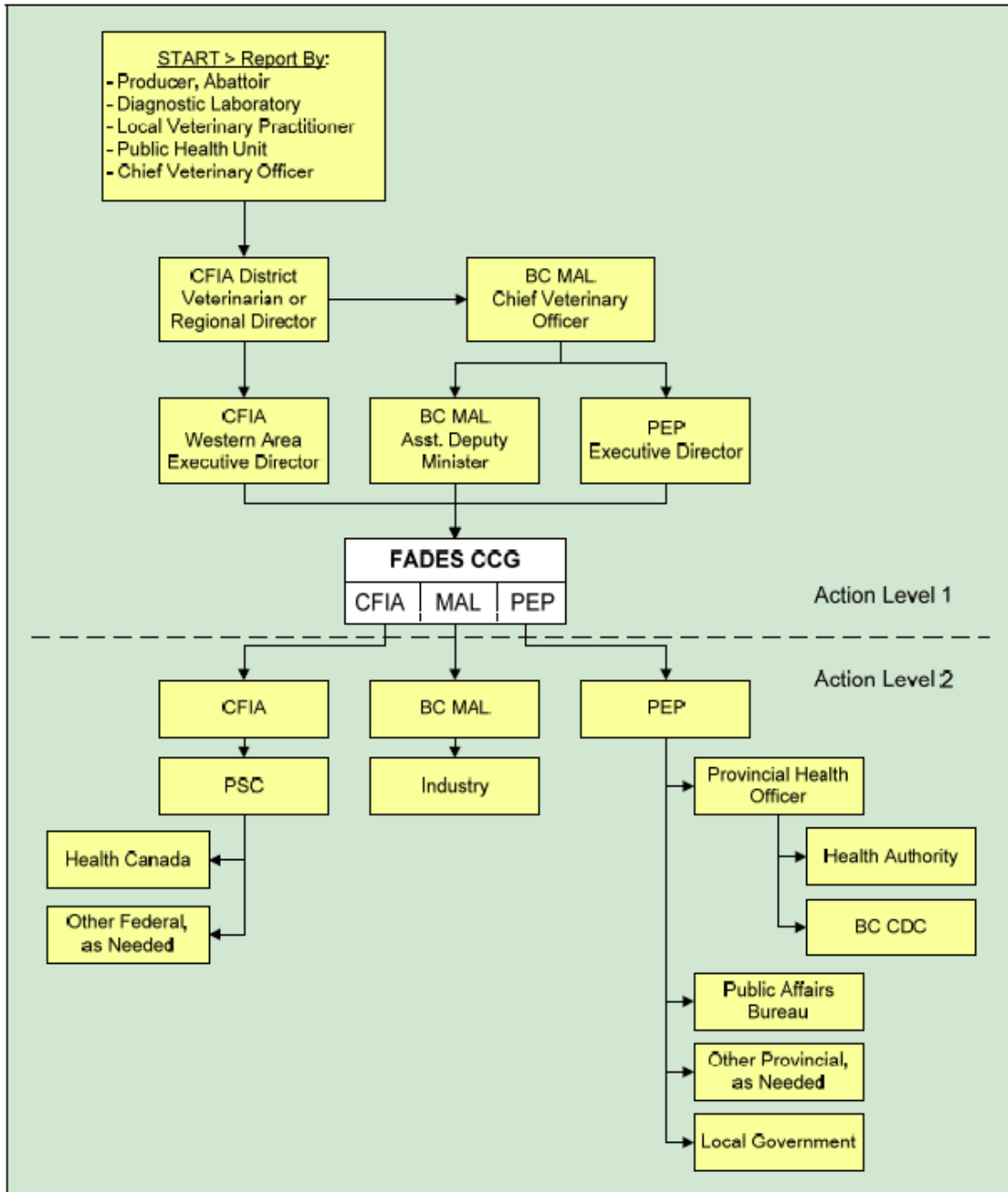


Function Chart for a Fully-Activated Federal-Provincial Joint Emergency Operations Centre (JEOC)
(Source: FADES Plan 2009)

This chart illustrates the organization of a federal-provincial JEOC during an expanded carcass disposal event, and how RDCK representatives would fit into the JEOC. Under these circumstances it is likely that the RDCK EOC would also be activated.

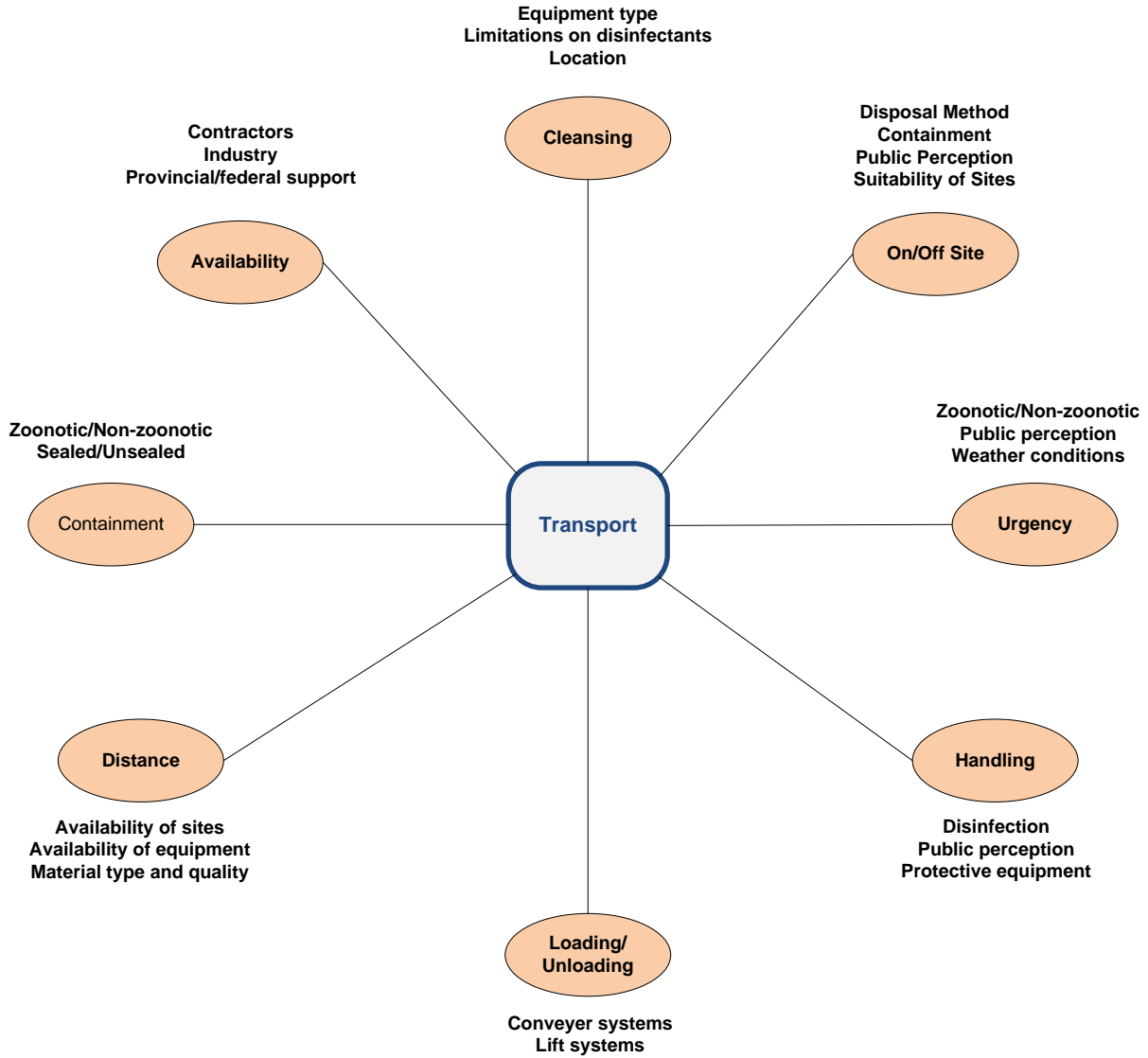
In principle, local government interaction with the federal-provincial JEOC would be through the Liaison Group. However, the JEOC Director may wish to have local government representation directly within the Operations, Planning or Logistics sections. Local government officials will always have direct access to the JEOC Directors on matters which affect the local jurisdiction.

Appendix 2 to Section 3
CFIA Expanded Response Notification Flow



(Source: FADES Plan 2009)

Appendix 3 to Section 3
Transport Considerations



Issues to be considered in deciding options for transport.

4. Disposal Operations – RDCK

4.1 General

Effective disposal operations in the RDCK will be those that are planned in advance. 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.

In a non-disease event the RDCK will work together with the local livestock industry, PEP, MAL and MOE to conduct disposal operations.



In an animal disease event the RDCK will provide local support to federal/provincial authorities.

4.2 Initiating Local Disposal Operations

The first indication of a carcass disposal event is likely to come from a local producer. If the mortalities resulted from a disease, the local jurisdiction may not be involved in, or even aware of, the initial reporting of the disease and initial inspection/testing activities by CFIA.

The local government will become involved when the scale of carcass disposal requirements exceeds the producer's capacity to handle. For a non-disease event, the responsible local jurisdiction will activate its carcass disposal emergency plan and work with applicable provincial agencies to respond to the emergency.

For an animal disease event in the RDCK, the CFIA Regional Office in Cranbrook will coordinate the first response. The CFIA Regional Office has the capability to open a small EOC on-site, and will determine the initial steps to be taken until the arrival of additional CFIA personnel and resources. The responsible local jurisdiction will provide appropriate support as required by the situation.

Critical paths and master checklists for both non-disease and animal disease events are at Appendices 1-4 to this section.

4.3 Disposal Operations: Non-Disease Event

The natural events considered most likely to affect the RDCK area are identified in sub-section 2.2, *Risk Profile*. For a non-disease event, the responsibility for selecting the disposal methodology will rest with RDCK, in consultation with PEP, MAL, and MOE.

The selection of suitable disposal methods for a non-disease event requires due regard to environmental concerns, safety and public

opinion. The disposal methodology selected will depend on a number of variables, including the animal species, cause of mortality, location and condition of carcasses and environmental conditions.

A range of disposal options **for a non-disease event** is listed below in preferred order of priority (see Annex B for amplification of disposal methodologies):

Priority	Methodology	Notes
1	On-Farm Burial	<p>On-farm burial is a suitable option for a limited numbers of carcasses where geological and hydrological conditions permit.</p> <p>Burial sites must be a reasonable distance from residences, screened from view and easily secured. Soils should have low to medium permeability, sufficient distance to ground water from trench bottom and sufficient cover depth. A bottom clay layer is highly desirable to prevent leaching.</p> <p>Burial confines the carcasses but can produce large volumes of leachate. Also, the residue within a burial site will persist for many years and ultimate elimination of the carcass material represents a long-term process. Burial must therefore be used cautiously for mass disposal. See Annex B for more detailed guidance on burial site selection.</p> <p>Suitability: Cattle and other large animals in limited numbers, sheep, hogs.</p> <p>Note: MOE advises against on-farm burial if the area receives more than 600 mm (23.6 inches) of annual precipitation, the seasonal high water table depth is less than 2m (6.6 feet), the site is above an unconfined aquifer or the site has coarse textured soil.</p>
2	On-Farm Composting	<p>Composting is currently practiced by some producers for routine mortality. Bin or windrow type composting is the norm.</p>

			<p>The bin method utilizes a walled containment structure where carcass material is placed in layers with a bulking agent (carbonaceous material such as bedding material or wood chips) and periodically turned or aerated. Windrow composting is similar but the layering is in extended linear piles allowing for considerably more capacity depending on the available space.</p> <p>In-vessel composting has also been proven effective in emergency situations. This method of composting utilizes plastic pods 3m in diameter and 66m long. Carcasses are ground and mixed with bulking agent, and pipes are used for forced aeration within the pods. This actively ventilated, pod-type composting is a good wet-weather alternative to windrow composting.</p> <p>The most important limiting factor for composting on a larger scale is access to carbonaceous bulking agent such as wood chips, straw or peat moss.</p> <p>Companies with experience and composting equipment are listed at Appendix 3 to Section 5.</p> <p>Suitability: Poultry (in-barn when possible), cattle and other larger animals in limited numbers when required equipment is available.</p> <p>Notes:</p> <p>1) The end product from composting cattle carcasses from which SRM has not been removed must be disposed of in accordance with SRM regulations.</p> <p>2) On-farm composting is not subject to federal regulations concerning the handling and disposal of SRM. However, compost from cattle carcasses should only be spread on areas where cattle will not graze for a minimum of five years.</p>
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	3	Rendering	<p>There is one rendering plant in BC, West Coast Reductions (WCR) Ltd., located in Vancouver. WCR renders smaller animal carcasses on site and ships bovine and horse carcasses to a subsidiary WCR plant in Calgary for processing. WCR is not currently permitted to render infected carcasses and will not render goats, sheep, ratites (ostriches/emus), llamas or alpacas.</p> <p>West Coast Reduction Ltd. 105 North Commercial Drive Vancouver, BC V5L 4V7 604-255-9301 www.wcrl.com/index.htm</p> <p>Rendering is a practical option for a limited numbers of carcasses. Cattle carcasses which would be transported to Calgary.</p> <p>Suitability: Cattle, poultry, hogs.</p> <p>Note: Dead animals have to be at the gate of the rendering facility within 24-36 hours after death. Coordination of transport resources is therefore critical.</p>
	4	Incineration	<p>High-temperature incineration is an effective disposal option. However, there are no large-scale, fixed-facility incinerators in the RDCK. There is a limited-capacity incinerator in Burnaby, but it currently does not accept carcass material for disposal.</p> <p>A large incinerator exists at the Swan Hills facility in Alberta, however technical limitations, costs and bio-security risks of long-distance transport would have to be considered. Portable incinerators are not currently available in BC.</p> <p>Suitability: All animals.</p> <p>Note: Incineration of cattle carcasses must meet specified critical temperatures in accordance with SRM regulations. CFIA approval is required.</p>

	5	Central Composting	<p>Off-farm composting is acceptable if suitable sites are available.</p> <p>Sites should be on high ground with good drainage. A preferred base is a concrete pad, asphalt or packed gravel, however a field with vegetative cover is acceptable if leachate can be contained.</p> <p>The composting site must be at least one meter above the high water table level and 3m from any water source used for domestic purposes. Minimum recommended site size is 20 acres.</p> <p>Suitability: Poultry, sheep, hogs. Limited suitability for cattle and other large animals.</p> <p>Notes:</p> <p>1) Potential sites should be identified in advance or early in the emergency (see Appendix 6).</p> <p>2) The end product from central composting of cattle carcasses from which the SRM has not been removed must be disposed of in accordance with SRM regulations.</p>
	6	Central (Trench) Burial	<p>Off-farm burial is suitable for large numbers of carcasses, but is likely to meet with public opposition. Sites remote from populated areas with limited access such as in logged or burned over areas may be acceptable if the terrain, geological and hydrological conditions are suitable.</p> <p>Suitability: Cattle and other large animals, sheep, hogs.</p> <p>Note: Suitable sites in should be identified in advance or early in the emergency response (see Appendix 6).</p>
	5	Landfill	<p>The four landfills in RDCK are not lined and the disposal of farmed animal carcasses is not currently permitted. A limited number of animal carcasses</p>

		<p>could be disposed of in an emergency, however CFIA approval would be required if SRM was present (see Note below and Appendix 5).</p> <p>Suitability: Only as permitted by CFIA.</p> <p>Note: Special CFIA permitting is required for the disposal of SRM in landfills.</p>
8	Air-Curtain Burning	<p>Air curtain burning utilizes a trench or contained system with a forced air supply. It produces lower temperatures than incinerators and is a less desirable option.</p> <p>A list of suppliers of air curtain burners is at Appendix 3 to Section 5.</p> <p>Suitability: Poultry, sheep, hogs. Limited cattle carcasses.</p> <p>Note: No air curtain burning of SRM is allowed due to the risk presented by fly ash.</p>

Guidelines for the selection of potential disposal sites within the RDCK are at Appendix 6.

The choice of disposal options and sites must always be made in close consultation with MAL, MOE and/or PEP. SRM regulations apply to bovine carcasses in all cases.

In a large scale emergency the volume of carcasses created will influence the method of carcass disposal. Public opinion will always be a factor.

MAL disposal protocols provide detailed information concerning disposal choices:

MINISTRY OF AGRICULTURE AND LANDS
Resource Management Branch Waste Management Engineer 604-556-3001

MAL must be contacted for current information prior to any final decisions about disposal methods being made.

4.5 Disposal Operations: Animal Disease Event

For an animal disease event, the responsibility for disposal rests with CFIA, in consultation with provincial and local officials:

CANADIAN FOOD INSPECTION AGENCY
<p>BC Mainland/Interior Regional Office 4321 Still Creek Drive Burnaby, BC V5C 6S7 604-666-1261</p>
<p>Cranbrook District Office 108-1525 Cranbrook Street North Cranbrook, BC V1C 3S7 250-417-2293</p>
<p>District Veterinarian (Cranbrook) 250-417-2293</p>

The disposal options listed for a non-disease event in sub-section 4.4 above will apply generally to an animal disease event, however the decision on disposal methodology will be made by federal/provincial authorities in consultation with the RDCK.

There are special considerations for the disposal of infected carcasses which could affect the priority order of disposal options. Rendering is not currently permitted for infected carcasses, although animals pre-emptively slaughtered could still be shipped to WCR. Burial and incineration may be favoured in an animal disease event.

4.5 Probable Roles and Tasks: Animal Disease Event

During an animal disease event, federal and provincial staffs will move into the affected area and, if the event is a serious one, will establish a JEOC for the coordination of emergency operations.

The role of the RDCK will be to provide support and assistance to the federal/provincial response. The most likely scenario is that the RDCK emergency staff would be located in the JEOC to provide support, in which case roles and tasks could include:

a) Assisting Federal/Provincial Agencies

Provide advice on local conditions and facilities to federal and provincial organizations as required. Early support may include assistance with locating and obtaining a suitable JEOC facility. ^{Note 1}

b) Assessment of Local Requirements

Liaise with local producers and provide advice to the JEOC on the scope and scale of the carcass disposal emergency in the local area.

c) Enforcement

Utilize local police and other first responders to provide assistance to CFIA, through the JEOC, in enforcing movement restrictions including barricading roads to assist with movement controls.

d) Assist with Identification of Disposal Methods

Provide advice to JEOC staff on local conditions (meteorological, transportation routes, hazards, etc) which will assist in selecting appropriate disposal methodologies.

e) Disposal Site Selection

Identify potential disposal sites within the local area.

f) Coordinating Support

Identify resources available for carcass disposal and assist in coordination of local support throughout the emergency.

g) Public Information

Local communications staff should work with federal and provincial public relations representatives to ensure consistency in messaging (see sub-section 3.14).

Note 1: In a major animal disease event, federal and provincial officials will normally deploy with all of the personnel and resources necessary to establish a JEOC and conduct operations. They may require assistance in finding a suitable local facility in which to locate the JEOC.

4.6 Threats to Human Health

The RDCK should maintain close communication with Interior Health and local medical facilities throughout carcass disposal operations to ensure that potential threats to human health, and mitigating strategies, are identified and communicated.

INTERIOR HEALTH AUTHORITY**Interior Health Corporate Office**

Risk Management / Emergency Planning
220-1815 Kirschner Road
Kelowna, BC, V1Y 4N7
250-862-4200

Central Kootenay Health Service Area

813 10th Street
Castlegar, BC V1N 2H7
250-365-4301

4.7 Cross-Border Cooperation

As the southern border of the RDCK is also an international border, carcass disposal operations may require cross-border liaison and cooperation, particularly if the mass mortality resulted from an

animal disease event.

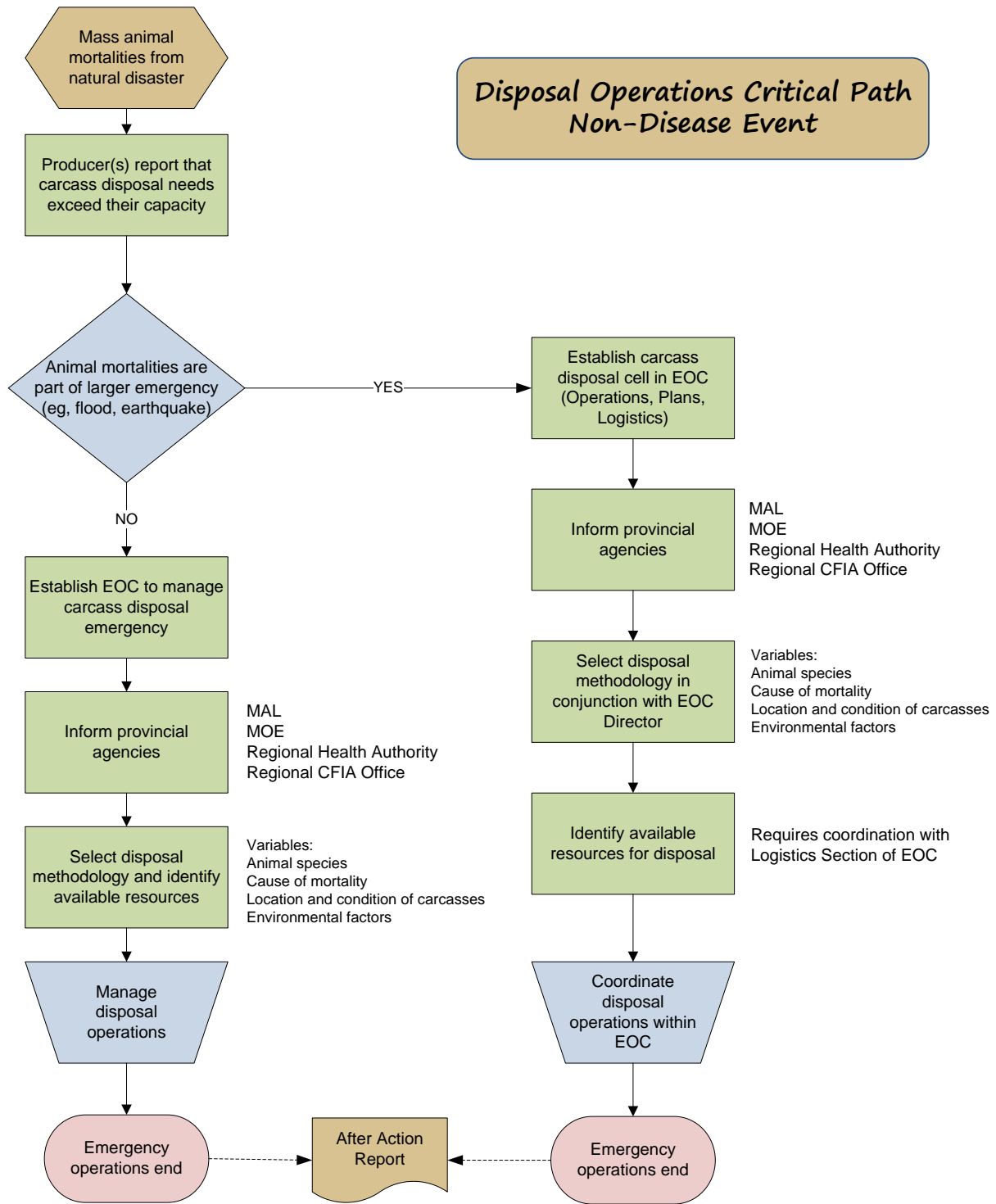
The [FADES Plan Annex D](#) identifies the CBSA as the agency responsible for notifying appropriate contacts needed to support a cross-border response, implementing movement control at international border points and providing support to the JEOC and/or other point of contact as required.

During the avian influenza emergency in the lower Fraser Valley in 2004, a US Department of Agriculture (USDA) liaison officer was stationed in the BCEOC under arrangements made between the USDA and CFIA, and an incident command post was established on the US side of the international border. A surveillance zone was also designated in the State of Washington which extended 10 kilometers southward from the Canada-US border, and designated truck washing stations were established in the border area. Similar arrangements may be expected in any future animal disease or carcass disposal emergency.

Arrangements for cross-border liaison in a carcass disposal emergency should be initiated by PEP for a non-disease event and by CFIA for an animal disease event:

Provincial Emergency Program
Provincial Emergency Coordination Centre (24 hours) 1-800-663-3456
Southeast Region PREOC 403 Vernon Street Nelson, BC, V1L 4E6 250-731-5245
Canadian Food Inspection Agency
BC Mainland/Interior Regional Office 4321 Still Creek Drive Burnaby, BC V5C 6S7 604-666-1261
Cranbrook District Office 108-1525 Cranbrook Street North Cranbrook, BC V1C 3S7 250-417-2293

Appendix 1 to Section 4
Critical Path – Non-Disease Event



Appendix 2 to Section 4 Checklist – Non-Disease Event

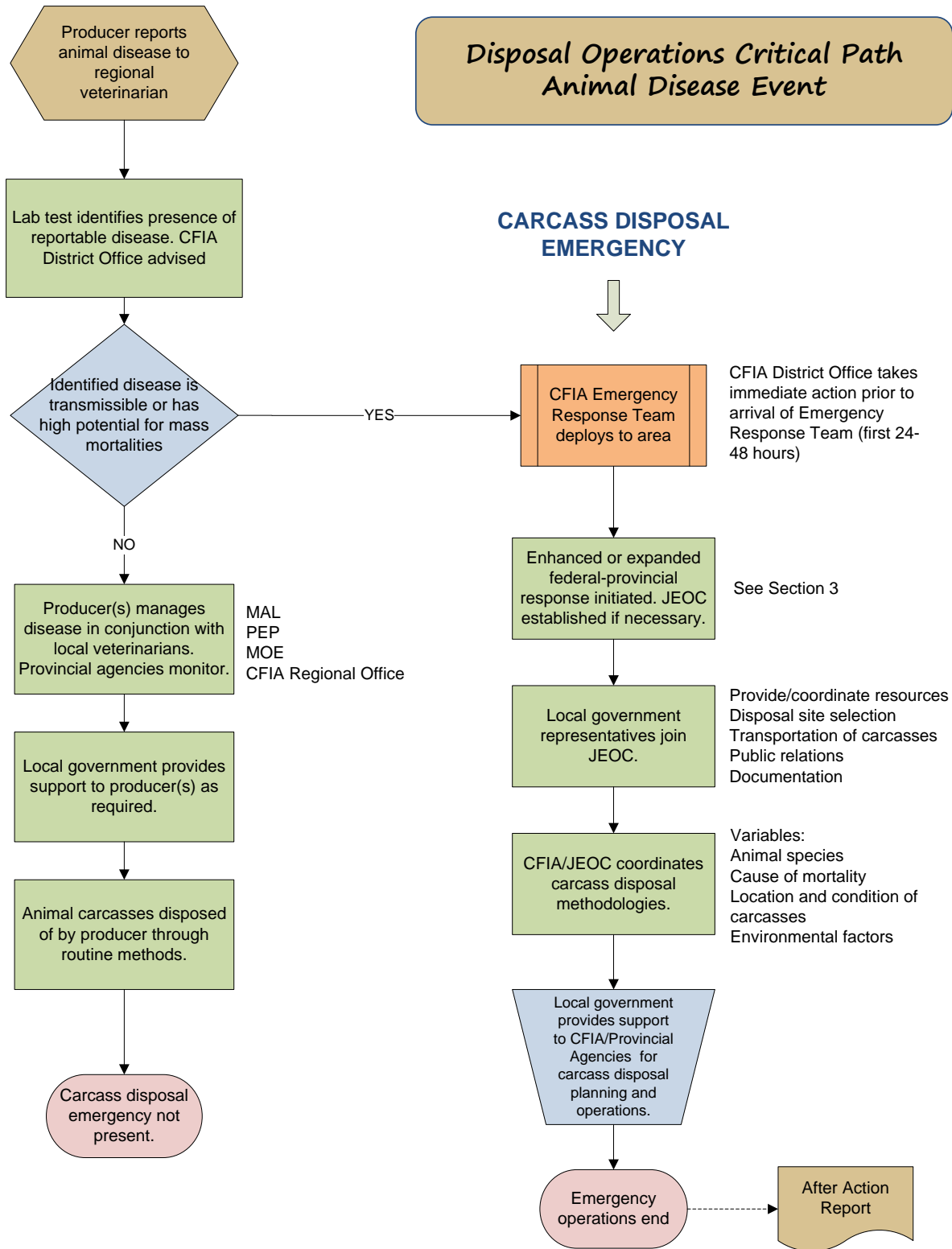
If the carcass disposal requirement is part of a larger emergency (e.g., flood, earthquake) for which the local authority EOC is already activated, a carcass disposal planning team should be formed within the EOC. If the carcass disposal emergency is independent from a larger emergency (e.g., caused by a localized fire, transportation accident, etc) the EOC should be activated to coordinate carcass disposal operations.

✓	Action Required
<input type="checkbox"/>	Establish carcass disposal team within EOC. Notify PEP and MAL of the nature of the emergency.
<input type="checkbox"/>	Obtain PEP Task Number if applicable.
<input type="checkbox"/>	Determine location and number of carcasses to the extent possible. This information will normally be obtained from the affected livestock producers. ^{Note 1}
<input type="checkbox"/>	Notify MOE of the carcass disposal emergency.
<input type="checkbox"/>	Notify applicable health authority if a threat to human health is suspected.
<input type="checkbox"/>	Identify and nominate industry representative(s) to EOC. This should include at least one representative from the applicable local livestock association.
<input type="checkbox"/>	In consultation with producers, determine if off-farm disposal is likely to be required. Review transportation requirements and availability if applicable.
<input type="checkbox"/>	Develop and implement a suitable communications strategy.
<input type="checkbox"/>	Identify disposal options in consultation with MAL and PEP.
<input type="checkbox"/>	Review potential disposal sites and, in conjunction with MAL and MOE arrange geotechnical or other assessments required.
<input type="checkbox"/>	Select disposal methodology(s) in concert with MAL.
<input type="checkbox"/>	Review resource lists and identify required equipment.
<input type="checkbox"/>	Brief affected producers on disposal operations.
<input type="checkbox"/>	Finalize plan and implement disposal operations.
<input type="checkbox"/>	Brief key stakeholders and keep public advised through local media, town hall meetings, etc.
<input type="checkbox"/>	Ensure appropriate documentation on carcass disposal is completed and retained.
<input type="checkbox"/>	Review compensation guidelines (anticipate and have solutions for local questions on compensation).
<input type="checkbox"/>	Record all decisions and actions for daily logs and After Action Report.
<input type="checkbox"/>	Identify recovery needs and implement recovery plan.

Note 1: For small carcass disposal events the responsibility remains with the producer(s). Local government assistance applies when the producer becomes overwhelmed or no suitable options exist on-farm.

Appendix 3 to Section 4
Critical Path – Animal Disease Event

*Disposal Operations Critical Path
Animal Disease Event*



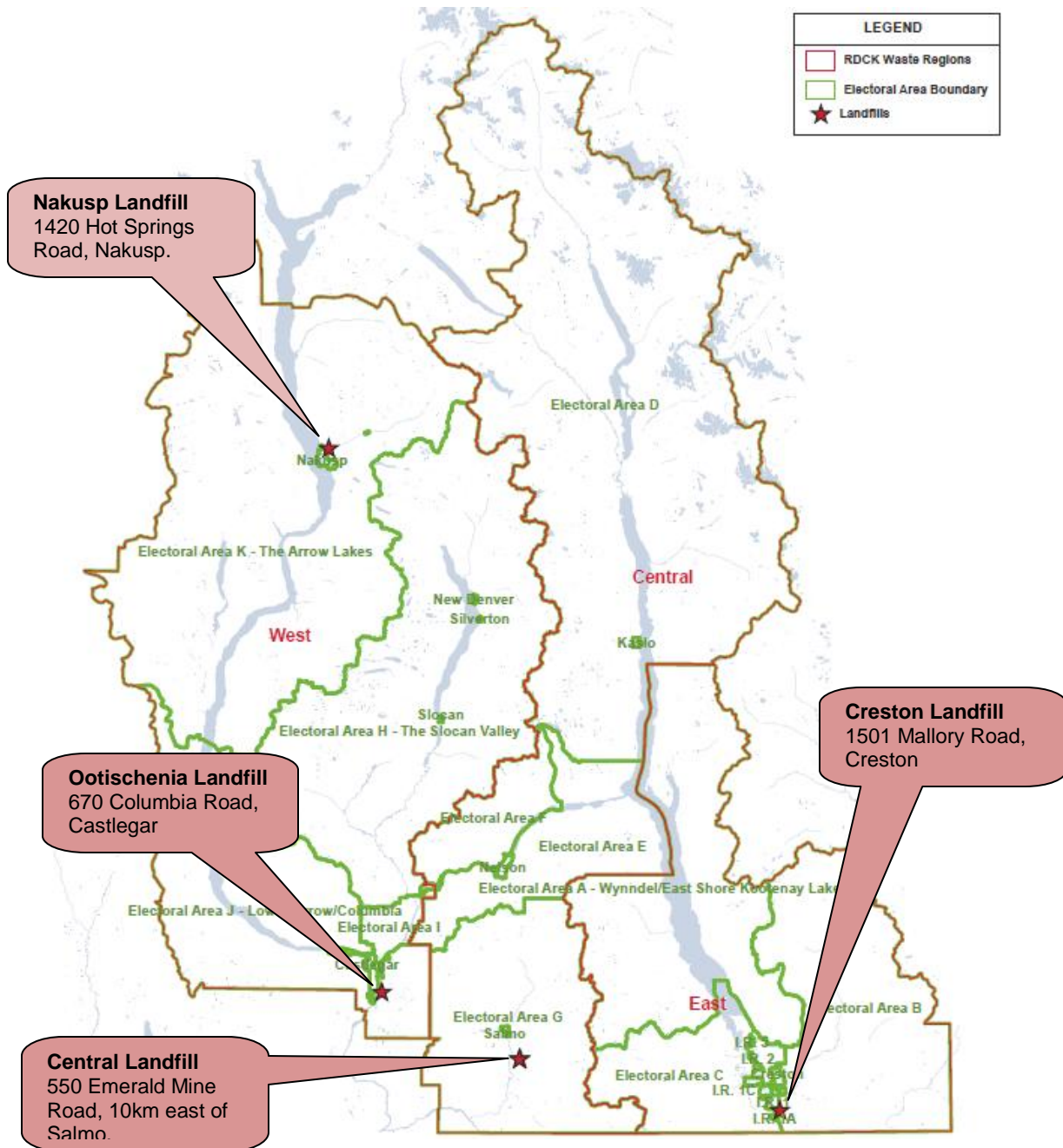
Appendix 4 to Section 4 Checklist – Animal Disease Event

A carcass disposal emergency which involves an animal disease as the cause of mortality will normally be part of a coordinated federal/provincial response to the underlying disease emergency. It is therefore likely that the Foreign Animal Disease Emergency Support (FADES) Plan will have been implemented and that a Joint Emergency Operations Centre (JEOC) will have been established in the Regional District.

✓	Required Action
<input type="checkbox"/>	On confirmation that carcass disposal emergency exists, liaise with JEOC staff to ensure that the local authority has input into the planning. If JEOC has not been established, liaise directly with PEP, MAL and CFIA.
<input type="checkbox"/>	Provide support to federal/provincial authorities as required for carcass disposal planning and response.
<input type="checkbox"/>	Obtain PEP Task Number if applicable.
<input type="checkbox"/>	Develop local public relations/communications plan. ^{Note 1}
<input type="checkbox"/>	Liaise with JEOC staff with respect to local environmental or other restrictions on carcass disposal.
<input type="checkbox"/>	Liaise with JEOC staff to ensure that local producers have been briefed and are kept advised on carcass disposal planning and operations.
<input type="checkbox"/>	Review resource lists and develop logistics/transportation plans in conjunction with JEOC.
<input type="checkbox"/>	Assist JEOC with preparation of disposal plans, providing advice on local conditions.
<input type="checkbox"/>	Review potential disposal sites in the local area and assist JEOC in arranging geotechnical and other surveys/assessments as required.
<input type="checkbox"/>	Ensure local first responders are briefed on carcass disposal requirements and are available to assist as required.
<input type="checkbox"/>	Determine from CFIA/JEOC any threats to human health from animal disease and liaise with Regional Health Authority on public health issues.
<input type="checkbox"/>	Participate as required in JEOC Action Planning Meetings to ensure that local interests are considered.
<input type="checkbox"/>	Keep local stakeholders and public advised of carcass disposal plans and activities through local media, town hall meetings and/or other means.
<input type="checkbox"/>	Maintain records/logs of all decisions and daily activities for After Action Report
<input type="checkbox"/>	Work with JEOC staff on recovery planning for the Regional District.
<input type="checkbox"/>	Review compensation guidelines (anticipate and have solutions for local questions on compensation).

Note 1: The local communications plan must be closely coordinated with regional/provincial/ federal communications strategies to ensure common messaging among all responding agencies.

Appendix 5 to Section 4 RDCK – Regional Landfills



None of the regional district landfills are currently permitted for animal carcass disposal. A limited number of animal carcasses could potentially be disposed of at these facilities in an emergency, however a temporary permit from CFIA would be required if SRM was present. Information on applying for a temporary permit and an application checklist is available online at:

<http://www.inspection.gc.ca/english/anima/heasan/disemala/bseesb/enhren/permie.shtml>

Appendix 6 to Section 4 RDCK – Disposal Site Selection

Minimum site size is 20 acres, but burial sites for large numbers of carcasses may have to be significantly larger.

The basic guidelines for site selection for burial and composting are shown below. It should be noted that sites are identified initially on the basis of size, location and availability only, and will require comprehensive geo-technical and environmental surveys before being approved for carcass disposal.

Burial	Composting
<p>Sites should be at least 10m above the high water table and 300m away from wells or watercourses used for domestic purposes. Locations above an aquifer are excluded due to the potential for contamination.</p> <p>Flood prone areas, steep slopes and bedrock should be avoided.</p> <p>Sites should be at least 400m from provincial highways, 100m from provincial roads or railroads and 300m from private residences.</p> <p>Access to the site must be suitable for heavy equipment and the delivery of livestock carcasses in transporter trucks.</p> <p>Sites must have soils with good stability capable of withstanding the weight of equipment used to construct and fill the pits.</p>	<p>Sites should be at least 1m above the high water table and 3m away from wells or watercourses used for domestic purposes. Flood prone areas, steep slopes and bedrock should be avoided.</p> <p>Sites should be on high ground with good drainage where pooling of water does not occur.</p> <p>The preferred base is a concrete pad, asphalt or packed gravel, however a field with vegetative cover can be used if it will support heavy equipment and leachate can be effectively contained.</p> <p>Access to the site must be suitable for the delivery of livestock carcasses in transporter trucks.</p> <p>The site should be shielded from public view and secure from animal predators.</p>

Potential sites should be identified in advance of a carcass disposal emergency. If this is not feasible then sites must be identified as early as possible within the emergency response.

More detailed information on site considerations and selection is at Annex B.

5. Disposal Resources – RDCK

5.1 General	<p>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.</p> <p>Each mass carcass disposal event will be unique, and therefore no complete list of required disposal resources can be developed. The resources will always need to be specifically tailored to the situation.</p>
5.2 Resource Requirements	<p>Disposal resources for carcass disposal will normally include transportation, heavy equipment, carbonaceous bulking agent such as wood chips or straw and protective/safety equipment for personnel.</p> <p>A generic equipment list for disposal operations is at Appendix 1.</p>
5.3 Specialized Disposal Resources	<p>Specialized disposal resources will 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:</p> <ul style="list-style-type: none">a) mobile incinerators / air-curtain burners;b) composting equipment;c) container equipment;d) generators; ande) decontamination equipment and chemicals. <p>A list of specialized equipment is at Appendix 2.</p>
5.4 Resource Availability	<p>The RDCK does not hold heavy equipment which could be used in a carcass disposal emergency except for some limited resources at the regional landfills. However, local suppliers and equipment hire contractors can provide a variety of resources on a commercial basis. Appendix 3 contains information on equipment suppliers.</p> <p>A list of provincially licensed slaughter facilities/ meat plants in BC is at Appendix 4.</p>
5.5 Resource Gap Analysis	<p>The RDCK does not possess all of the equipment or resources required to respond to a carcass disposal emergency. While many of the necessary resources can be obtained in the local area,</p>

shortfalls may continue to exist in the following areas:

- a) **Incinerating Capacity.** There is no large fixed-facility biological incinerator in the RDCK and only one in BC (Burnaby), which is not well set up to receive carcass material. There are no known sources of portable incinerators in BC.
- b) **Rendering Capacity.** The only facility available in BC is the WCR plant in Vancouver, which has little surge capacity and ships cattle and horse carcasses to Calgary for processing. WCR is not currently approved to handle infected carcasses.
- c) **Approved Landfills.** None of the landfills in the RDCK are currently approved for carcass disposal or permitted to receive SRM.
- d) **Composting Equipment and Supplies.** If composting is selected as a primary means of disposing of cattle or other large carcasses, the necessary supplies and equipment would have to be sourced from outside the district.
- e) **Personal Protective Equipment.** The RDCK does not hold stocks of personal protective clothing for individuals who may have to visit infected premises or handle carcasses in a disposal emergency. ^{Note 1}

Note 1: The type of personal protective clothing and equipment required depends on the nature and transmissibility of the animal disease. CFIA will provide guidance on the type of equipment required for the situation. Personal protective clothing will normally consist of N95 masks, gloves, impermeable coveralls, protective footwear and eye protection.

5.6 Disposal Challenges

Other challenges related to the ability of the RDCK to respond to a carcass disposal emergency are:

- a) **On-site burial** for large carcass volumes may be restricted for some farms due to high water tables, flood horizons, soil depth, gradients and spatial requirements.
- b) **Off-site burial** will require careful site selection to confirm suitability of topography, soils, drainage and security.
- c) **On or off-site composting** will require careful site screening to confirm water tables, drainage and availability of the necessary composting materials.

**Appendix 1 to Section 5
Generic Disposal Equipment List**

Equipment Type	Requirement
Transportation:	Trucks up to 1-ton for equipment transport. Vans/minibuses for personal transport. Heavy trucks, approved for transporting hazardous material (leak-proof hazardous material trucks, refrigerator trucks or trucks with liners and tarps to prevent leakage/wind loss).
Heavy Equipment:	Excavators (for burial operations). Graders (for burial operations). Tractors with front-end loader. Backhoes with front-end loader. Midsize skid-steer loaders. High-lift front-end loaders. Cranes. Loading ramps. Bulldozers. Water tanker (if no water source at sites).
Light Equipment:	Motorized pressure spray units (cleaning, washing and disinfection of vehicles and containers) Generators, various capacities. Pumps. Compressors. Fans (blowers)
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 antivirals (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.

	<ul style="list-style-type: none">Lime.Digging tools.Cleaning and disinfectant supplies.Hand tools (shovels, picks, rakes, etc).Pickets / portable fencing.Ag-Bags for in-vessel composting.Composting thermometers.Grinders with screens.Ag-Bag filling machine.Carbon source / bulk agent (litter, sawdust, straw, wood chips/shavings).Water hoses.Fuel for pyres / air curtain burners.Cell phones.Digital cameras or camcorders.
Documentation:	<ul style="list-style-type: none">Office equipment and supplies.Forms and templates.Printing facilities.

Appendix 2 to Section 5 Specialized Disposal 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. Carbon source (litter, sawdust, etc). Moisture meter.</p>

	<p>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>

Appendix 3 to Section 5 Disposal Resources and Equipment Suppliers

HEAVY EQUIPMENT AVAILABILITY – RDCK

RDCK equipment lists are maintained by Emergency Program Coordinators for each response service area. This includes lists of local suppliers/contractors.

The RDCK maintains a limited number of pieces of heavy equipment suitable for use in a carcass disposal emergency at the four landfills:

- a) **Central Landfill:** Dump truck; roll-off bin; two compactors; excavator.
- b) **Creston Landfill:** Dump truck; water truck; excavator.
- c) **Nakusp Landfill:** Dump truck; compactor; tractor loader.
- d) **Ootischenia Landfill:** Dump truck; loader; excavator; water truck.

EQUIPMENT AND SERVICE SUPPLIERS

GEO-TECHNICAL AND ENVIRONMENTAL SERVICES

(These companies provide testing and analysis of unprocessed soil, sediment and aggregate samples).

AMEC Earth and Environmental 913 Laval Crescent Kamloops, BC V2C 5P4 250-374-1347 http://www.amec.com/	An earth and environmental consulting business covering all aspects of environmental services, geotechnical engineering, infrastructure, materials testing and engineering and water resource services. Contaminated sites and groundwater testing and monitoring.
EBA Engineering Consultants Ltd. 150-1715 Dickson Avenue Kelowna, BC V1Y 9G6 250-862-4832 http://www.eba.ca/	Terrain evaluation and other geo-technical and environmental services.
Golder Associates Ltd. Unit B, 12330-88 th Avenue Surrey, BC V3W 3J6 604-591-6616 http://www.golder.com/	Ecological services, geo-technical surveys/testing, hydrogeological services, geotechnical engineering, risk assessment/toxicology, environmental management and remediation.
Levelton Consultants Ltd. 150-12791 Clarke Place Richmond, BC V6V 2H9 604-278-1411 http://www.levelton.com/	Specialist engineering and scientific services including materials engineering, quality assurance, environmental and geotechnical.

McElhanney Consulting Services Ltd. PO Box 787, 3907 4 th Avenue Smithers, BC V0J 2N0 250-847-4040 http://www.mcelhanney.com/mcsl/	Cadastral surveys, engineering and topographic surveys, environmental services.
Ward Engineering & Land Surveying 1014 Seventh Street Nelson, BC V1L 7C2 250-354-1660 www.wels.ca	Engineering services and consulting, water treatment, storm water management, topographical surveys.
Pennco Engineering Ltd. 204-625 Front Street Nelson, BC V1L 4B6 250-354-0112 www.pennco.ca	Transportation, municipal and water resources engineering.
SNT Engineering Ltd. 223 Fourth Street Nelson, BC V1L 2S1 250-509-1009 (no web site)	Geotechnical engineering.
Dr. Tony Salway, P.Geo 2954 Six Miles Lake Road Nelson, BC 250-825-4643 ihp@shaw.ca	Hydrology, soils, terrain, geohazard assessments.

ENVIRONMENTAL/ECOLOGICAL SERVICES (KOOTENAYS – OKANAGAN AREA)

Kala Groundwater Consulting 1314 McGill Road Kamloops, BC V2C 6N6 250-373-9194 www.kalagroundwater.com	An earth sciences consulting firm providing technical support in the development, protection and management of surface and groundwater resources.
PHH ARC Environmental PO Box 160, 107 Burton Main Road Burton, BC V0G 1E0 250-265-4232 www.phharcenv.com	An environmental services company which provides a wide range of environmental, engineering, geosciences and health & safety solutions.
Sumas Environmental Services Inc. 1374 Kootenay Way Kamloops, BC V2C 5L7 www.sumas.net	A waste management and environmental services company specializing in all phases of site remediation, industrial and hazardous waste management and pollution prevention.
Summit Environmental Consultants Inc. #200-2800 29 th Street Vernon, BC V1T 9P9 250-545-3672 www.summit-environmental.com	Offers consulting Services in environmental assessment and planning, contaminated sites, water quality, geosciences and soil science.

Delphinium Holdings Inc. 602 Tamarack Street, Castlegar, B.C. V1N 2J2 250-365-5656 www.delphiniumholdings.ca/index.html	A multidisciplinary resource management consulting firm specializing in environmental sampling and planning, policy and interactive studies with the use of mapping and GIS related decision aids.
Technology Resource Inc. 100-1444 Columbia Ave. Castlegar, BC V1N 3K3 250-365-5399 www.tri.bc.ca	An environmental and engineering consultant providing environmental engineering, contaminated sites remediation, site investigations, landfill design and closure, effluent and leachate treatment and hazardous waste management, (Main office in Vancouver).
SNC-Lavalin Environment Inc. 520 Lake Street Nelson, BC V1L 4H6 250-354-1664 www.snclavalin.com	Contaminated site assessment and remediation, regulatory liaison and certification.

COMPOSTING SERVICES AND EQUIPMENT

Pacific Forage Bag Supply Ltd. 4404-50 th Street Delta, BC 604-946-5026 http://www.pacbag.com/	Bags and other items for carcass composting.
Transform Compost Systems Ltd. 3911 Mt. Lehman Road Abbotsford, BC 604-856-2722 http://www.transformcompost.com/	Broad range of composting services including farm waste and mortalities. Provided composting services and advice during 2004 AI event.
Robertson Farms Ltd. P.O. Box 21 Grindrod, BC V0E 1Y0 250-838-2137	Transportation of non-SRM carcasses/waste tissue; contract hauler for West Coast Reduction Ltd. Composting services (has to contract/rent specialized equipment).

AIR-CURTAIN BURNERS

ABY-2 Environmental Prince George, BC 250-614-1483 Email: aby2enviornmental@gmail.com www.portableincinerators.net	Locally manufactured auxiliary fuel-fired (propane) portable air curtain burners with under-fire and over-fire air and continuous ash removal.
Air Burners, LLC 4390 Cargo Way Palm City, Florida 34990 772-220-7303 After hours: 561-248-9011 www.airburners.com/	Manufactures above-ground air curtain destructors and in-ground trench burner systems utilized for wood waste disposal and disaster recovery operations including carcass disposal.

Industrial Cleanburn 7795 Mays Road Duncan, BC V9L 6A8 250-746-1918 www.industrialcleanburn.com/	Sell, rent, lease and contract air curtain units manufactured in USA.
Mounce Construction Ltd. Box 814 Salmon Arm, BC V1E 4N9 250-832-9786 www.mounceconstruction.com/	Lease/contract ABC Air Curtain Destructor- Incinerators, a trailer-mounted portable air curtain destructor-incinerator.
Western Destructor Burn Box 1199 Salmon Arm, BC V1E 4P3 604-240-1111 (no web site)	Manufactures air curtain trench burners for sale/rental. System includes trench construction and over-fire air curtain with under-fire air if required.

RENDERING PLANTS AND DEAD STOCK OPERATORS

West Coast Reduction Ltd. (WCR) 105 North Commercial Drive Vancouver, BC V5L 4V7 604-255-9301 www.wcrl.com/index.htm	Only rendering plant in BC. Processes small animals (sheep, hogs) in Vancouver and ships cattle carcasses to Calgary for disposal. Not currently permitted by CFIA to process infected carcasses.
Robertson Farms Ltd. P.O. Box 21 Grindrod, BC V0E 1Y0 250-838-2137 (no web site)	Transportation of non-SRM carcasses/waste tissue; contract hauler for WCR Ltd.

HAZARDOUS WASTE TRANSPORT AND DISPOSAL

BC Environmental Industry Association (BCEIA) Suite 400 – 602 West Hastings Street Vancouver, BC V6B 1P2 604-683-2751 http://www.hazwastebc.com/index.html	A current list of hazardous waste transporters in BC is available from BCEIA. http://www.hazwastebc.com/Hazardous_Waste_Transporters.html
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GROUNDWATER CONSULTANTS

A list of groundwater consultants in BC is provided by the Ministry of Environment at:	http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/library/consultants.html
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EQUIPMENT HIRE AND TRANSPORTATION RESOURCES

<p>BC Road Builders & Heavy Construction Association Suite 307 – 8678 Greenall Avenue Burnaby, BC V5J 3M6 604-536-0220 www.roadbuilders.bc.ca</p>	<p>The association includes construction, service and supply and maintenance sectors and provides a unified voice for the industry. It represents privatized highway maintenance contractors, construction contractors, underground/utility contractors, paving contractors and various service & supply companies.</p>
<p>BC Ministry of Transportation and Infrastructure:</p> <p>Southern Interior Regional Office 447 Columbia Street Kamloops, BC V2C 2T3 250-828-4220</p> <p>West Kootenay District 310 Ward Street, 4th floor Nelson, BC V1L 5S4 250-354-6400 http://www.th.gov.bc.ca/contacts-regions.htm#SouthernInterior</p>	<p>MOT District Offices maintain extensive current listings of local and regional equipment-hire contractors, trucking services and other critical resources.</p>

LIVESTOCK HEALTH POLICY AND SERVICES

<p>BC Ministry of Agriculture and Lands Animal Health Centre 1767 Angus Campbell Road Abbotsford, BC V3G 2M3 604-556-3003 1-800-661-9903 http://www.al.gov.bc.ca/ahc/index.htm</p>	<p>The Animal Health Centre (AHC) is a full-service veterinary diagnostic laboratory, located in the Abbotsford Agriculture Centre in Abbotsford, British Columbia and funded by the Ministry of Agriculture and Lands.</p>
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Appendix 4 (cont'd)

**PROVINCIALY LICENSED MEAT PLANTS
(BC SOUTHERN INTERIOR)
As at May 26, 2009**

Kootenay Mobile Poultry Abattoir (Poultry) 2540 Godderis Road Cranbrook, BC V1C 7B8 250-489-5798	Gold Creek Custom Meats (Red meat) 3256 Gold Creek Road Cranbrook, BC V1C 6Z4 250-426-7770
Riverside Meats Ltd. (Red meat) 2945 Haines Road Salmon Arm, BC V1E 4M1 250-832-0012	Rainer Custom Cutting (Red meat) 7493 Darlington Creek Road General Delivery, Darfield, BC V0E 1R0 250-672-9407
Kam Lake View Meats (Red meat) 6453 Buckhorn Road Lot 20, Section 19 Kamloops, BC V1S 2A1 250-828-1015	Westholme Meat Packers Ltd. (Red meat and poultry) 7824 Westholme Road Westholme, BC V0R 1K0 250-246-9500
Van Diemen Turkey Farm Ltd. (Poultry) 3068 10th Ave (RR#1) Keremeos, BC V0X 1N0 250-499-5890	Pitt Meadows Meats Ltd. (Red meat) 18315 Ford Road Pitt Meadows, BC V3Y 1Z1 604-465-4752
Valley Wide Meats (Red meat) 40 Matthews Road Enderby, BC V0E 1V4 250-838-7980	Tarzwell Farms (Red meat) 534 Williams Road Creston, BC V0B 1G8 250-428-4316
Farmcrest Foods Ltd. (Poultry) 1880-30th Street SW Salmon Arm, BC V1E 4M1 250-832-0036	Rodear Meats Ltd. (Red meat) 3736 Beaver Valley Rd, Box 15 Big Lake, BC V0L 1G0 250-243-2340

Source: BC Centre for Disease Control. Complete listing at:

<http://www.bccdc.org/downloads/pdf/fps/reports/Meat%20Plant%20Establishment-WEB%20VERSION.pdf>

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*.

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-reportable disease/FAD emergency, and federal programs which apply when a reportable disease/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.gov.bc.ca/dfa_claims/PrivateSectorGuidelines.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 January 2008)*. This document may be reviewed at: http://www.pep.gov.bc.ca/dfa_claims/Financial_Assistance_Guide.pdf

6.3 Federal Programs

Owners of animals ordered destroyed during a reportable disease/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 an animal disease emergency. The *Regulations* are available online at:

http://laws.justice.gc.ca/en/showdoc/cr/sor-2000-233/bo-ga:s_2/en#anchorbo-ga:s_2

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 sub-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.

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.

An EOC form for this purpose is at Appendix 2.

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*. Permitted compensation amounts may be found in the *Regulations*. Examples of maximum compensation amounts (in Canadian dollars) for common farm stock are:

Cattle - registered	8,000
Cattle – non registered	2,500
Horse – ordered destroyed due to Equine Infectious Anemia	2,000
Horse – all others	8,000
Sheep - registered	1,200
Sheep – non registered	300
Swine – registered	5,000
Swine – non registered	2,000

Note 1: Amounts are as of February 23, 2010. Latest amounts can be obtained at <http://laws.justice.gc.ca/en/showdoc/cr/SOR-2000-233//en?page1>

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. 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?

A3. 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.

Q4. 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?

A4. In such events Disaster Financial Assistance is limited to farmers and ranchers whose livelihood is based on their farming and ranching activity.

**Appendix 2 to Section 6
Carcass Disposal Report Form**

CARCASS DISPOSAL REPORT**EOC ---**

Event:	EOC Function:	Name:
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RECORD DETAILS OF CARCASS DISPOSAL BELOW	
Reported by:	
Contact information of person reporting:	
Date(s) of disposal:	
Species and number of animals:	
Location of origin of animals:	
Method of disposal:	
Location of disposal:	
Follow-up required: (Obtain advice from MAL/MOE)	
Authority for disposal: (Provide names and contact numbers of any experts utilized in this disposal event).	

Page ____ of ____

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) Description of event – what happened?
- b) How the RDCK responded – who did what? and
- c) What 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.

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

SECTION 8 – ANNEXES

- A. Animal Diseases**
- B. Disposal Methodology Options**
- C. Training Requirements**

Annex A Animal Diseases

World Organization for Animal Health (OIE) - List A

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

CFIA Disease Strategies

Currently, the CFIA Foreign Animal Disease Manual of Procedures contains strategies for:

- African Swine Fever**
- Anaplasmosis**
- Avian Influenza**
- Bluetongue**
- Bovine Spongiform Encephalopathy**
- Classical Swine Fever (Hog Cholera)**
- Foot and Mouth Disease**
- Newcastle Disease**
- Pseudorabies**
- Swine Vesicular Disease**
- Vesicular Stomatitis**

Diseases with High Potential for Mass Mortality

Following is a list of diseases with high mass mortality potential. The diseases identified as zoonotic potentially present a risk to human health:

Disease	Likelihood	Risk to Animal Health	Zoonotic Status (Risk to Human Health) ⁽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) ⁽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 methods include bin, static windrow, and in-vessel (Ag Bag). Bin composting is commonly used on-farm for disposal of routine animal mortality. It involves layering of carcass material with a bulking agent (wood chips, bedding litter) within containment walls with periodic turning (aeration). Windrow composting also utilizes layering of carcasses and bulking agent in long windrows</p>

4.5 m wide, 2.1m high with 2.4m windrow spacing to allow machine access for turning. A 90m windrow would hold 55-60 cow carcasses. In-vessel composting utilizes plastic pods (Ag Bags) 3m in diameter and 66 m long. Carcasses are simultaneously ground and mixed with wood waste and loaded into the pods which are equipped with aeration pipes and ventilation ports. Each pod can hold up to 50 cow carcasses (~ 35 tonnes) and requires 325m² per pod.

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 outdoors.

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.

Site selection is of key importance for composting operations. Considerations include:

- flood prone areas, steep slopes and bedrock should be avoided;
- sites should be at least 1m above the high water table and 30 m away from wells or watercourses used for domestic purposes;
- sites should be on high ground with good drainage where pooling of water does not occur;
- a preferred base is a concrete pad, asphalt or packed gravel, however, a field with vegetative cover can be used if it will support equipment and leachate can be effectively contained;
- 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.

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. Ideally the bio-heat treatment would be performed in the barn. After disease inactivation the material can be brought out for safe composting in the open.

<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. Fixed facility incinerators require industrial sites and should be at least one hectare per facility.</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 high in particulate matter and produces offensive odours. Accordingly, it is normally suitable for only a small number of animals and is prohibited for cattle due to SRM fly-ash concerns unless it is performed on the farm where the cattle died. 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. Due to the risk of contamination from fuels, an impermeable sil (clay) is preferred and burn sites should be removed from the public by at least three kilometers.</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 burning sites require 2.5 hectares per installation and should be located a minimum of 100m from neighbouring residences and 500m from schools, hospitals and continuing care facilities. 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.</p> <p>Residues left over from burning must be buried, composted or transported to a landfill. However, open burning of significant</p>

	<p>volumes of carcasses has a negative psychological effect on the community and when used extensively during the Foot and Mouth disease epidemic in England in 2001, it had a significant impact on tourism and the economy.</p>
Landfill	<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>
Burial	<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>Burial confines the carcasses but can produce large volumes of leachate. Also, the residue within a burial site will persist for many years and ultimate elimination of the carcass material represents a long-term process. Burial must therefore be used cautiously for mass disposal.</p> <p>Maximum loading rate for non-emergency on-site carcass burial is 700kg 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 MOHS.</p> <p>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>

- 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.

Important considerations for burial site selection include:

- *Access to the site*: for both equipment to dig the burial pit and for the delivery of livestock, carcasses or other materials to be buried;
- *Environmental*: 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);
- *Construction considerations*: 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.
- *Back-filling*: it will likely be necessary to come back to the burial site several times during the course of carcass decomposition to back fill surface depression that result from the shrinking carcass mass. This is important for the purpose of avoiding water pooling right on top of the burial trench.

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.

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.

In cases of extreme emergency only, centralized, off-farm mass burial of large carcass volumes may become necessary. In such cases the following site selection criteria have been proposed:

Physical Setbacks and site Constraints

- Surface water bodies – 100m.

	<ul style="list-style-type: none"> - Domestic wells – 300m. - Provincial highways – 400m. - Provincial roads – 100m. - Railroads – 100m. - Residences – 300m. - Property line – 50m. - Unstable areas, steep banks, cliffs, ravines – 100m. - Hotels, restaurants, food processing facilities, schools churches and public parks – 300m. - National parks, cemeteries, flood prone areas, rock outcrops–excluded. - Underground and overhead utilities – avoid. - Difficult sites for excavation such as excessive trees, rocks, and other physical obstructions – avoid. - Steeply sloping land (greater than 5%) – avoid. - Crown land – preferred. - Reasonable truck access – required. <p><i>Geotechnical / Geological Criteria and Aquifer Protection</i></p> <ul style="list-style-type: none"> - Minimum 5 m of low permeability soil below the base of the proposed trench with a hydraulic conductivity of 1×10^{-6} cm/sec or less which equates to a total depth below ground surface of 10 m for a 5 m deep burial pit. - Minimum 5 m to location of the seasonally high water table below the base of the pit which equates to a total depth of 10 m below ground surface for a 5 m deep burial pit. - Any locations above an existing aquifer are excluded based on consideration of consequence of contamination. - Potential sites should be investigated by a professional geotechnical engineer to confirm suitability based on approved geotechnical and geological criteria.
<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 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</p>

within two days. Fermentation with *L. acidophilus* 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. Lactic acid fermentation creates a large volume of liquid waste product that is expensive to transport and for which it is difficult to find environmentally responsible uses.

Gasification and Incineration

A thermal process in which organic carbonaceous materials are partially combusted under limited oxygen conditions in a primary chamber. In most systems, the syngas and char will be oxidized through a secondary chamber at a higher temperature supplying heat for pre-drying of the feedstock or auxiliary heat sinks, leaving 1-3% ash. Surplus syngas from the primary chamber can be cleaned and utilized as a fuel. Gasification and incineration are two of the very few methods actually capable of and approved for cattle SRM destruction.

Alkaline Hydrolysis

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.

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. This method has potential for approval for cattle SRM destruction.

Thermal Hydrolysis

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. This method also has potential for approval for cattle SRM destruction.

Annex C Training Requirements

All personnel involved with carcass disposal operations need training, particularly with respect to safety, health and environmental requirements. This includes all RDCK 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, carcass disposal exercise should be conducted periodically. The frequency will be determined by the likelihood of a carcass disposal emergency as reflected in the HRVA. The exercises can take one of the following forms, working incrementally from the simplest (Level 1) to more complex 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 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.