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Canada

Animal Biosecurity

National Farm-Level Mink Biosecurity Standard

Producers' Guide

Growing Forward
A federal-provincial-territorial initiative

FFCMA

CMB
Canada Mink Breeders

Dedication

The Standard is dedicated to the late Dr. Bruce Hunter, professor emeritus of the Ontario Veterinary College, who laid the foundation for this document. Dr. Hunter's dedication and significant contributions to the field of veterinary medicine and the fur-bearing industry improved the health and welfare of farmed mink.

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Introduction

Designed to be read with the National Farm-Level Mink Biosecurity Standard (the Standard), the content of this Guide closely follows that of the Standard in that it can be easily cross-referenced. The Standard provides a series of target outcomes that, if achieved, should provide a foundation for an effective biosecurity program. This guide provides additional information, including suggestions and examples of what farm infrastructure, such as farm layout, biosecure zones, and required equipment, is recommended and the type of work procedures, training, and routine documentation that should be implemented to achieve the desired target outcomes in the Biosecurity Standard. (Appendix A provides a glossary of terms, and Appendix B highlights additional suggested references for producers.)

What Is Biosecurity For Mink Farms?

On-farm biosecurity encompasses a set of organized, well-planned procedures that are applied at the farm level. The primary objective is to reduce the exposure of mink to infectious disease-causing agents including their introduction, spread within the farmed mink population and release from the farm. (Appendix A provides a glossary of terms used in this document.)

Biosecurity is only successful if the producer commits to learning and implementing the basic principles of biosecurity. Biosecurity is not a new concept, nor are most biosecurity measures difficult or expensive for producers to implement. Many daily activities that producers perform involve biosecurity measures. To ensure maximum benefit, without wasting human and capital resources, committing to and implementing a structured biosecurity program is advised. Producers can protect their animals and ensure the success and sustainability of their industry by implementing biosecurity.

Disease can result in devastating losses. Operations with poor disease control may become a significant risk to the rest of the industry; if an infectious disease occurs on the premises, all mink farms are at risk. **Every operation needs a biosecurity program, regardless of the number of mink that are raised.**

Common sources of infectious agents:

- Escaped / feral mink, neighbours' mink, cats and wildlife: particularly wild mink, raccoon, skunk, fox, wild birds, rodents and other pests including other domestic animals.
- People: can transmit diseases on contaminated hands, footwear, clothing and even hair.
- Manure and Carcasses: manure and the carcasses of diseased mink can be an important source of infection.
- Newly Purchased Mink: from other farms.
- Feed and Water Sources: including feed ingredient and feed delivery trucks.
- Equipment: such as transportation crates, catching and vaccination equipment, feeders, nipples / water cups and farm tools.
- Vehicles and Farm Equipment: such as tractors, manure spreaders, including the equipment of neighbours and contractors, are exposed to various sources of infection both inside and outside the farm.

Biosecurity Principles

Disease control and prevention is complex. To be effective, prevention and intervention methods must be done in a logical sequence. Adopting one principle or recommendation without first doing another may render the action unsuccessful; for example, isolating newly purchased mink for two to three weeks to ensure freedom of disease would have reduced benefit if the producer fails to first establish the health of the herd / mink being purchased and the pathogens and pests present that must be tested for, treated or monitored.

Biosecurity programs are effective at mitigating infectious diseases caused by many microbial pathogens (bacteria [including mycoplasma], viruses, fungi, and protozoa) transmitted by different routes; therefore, biosecurity programs should not be based on a single disease or method of transmission.

Aleutian disease, mink virus enteritis, mink distemper, and hemorrhagic pneumonia (*Pseudomonas*) are the most common and serious diseases that mink producers in Canada should consider when developing a biosecurity program.

Who Should Use This Document And How?

All mink producers are encouraged to read this Producer Guide with the Standard. Both this Guide and the Standard are in three sections, representing the foundations of an operating biosecurity system, which are access management, animal management, and operational management.

Each section is further divided into subsections and **Target Outcomes. Each Target Outcome represents a biosecurity-related goal that all mink producers should implement to protect their herds from the introduction and spread of microbial pathogens.**

With such a broad target industry audience, some of the biosecurity principles may be difficult for all producers to implement immediately. Producers should consider the ongoing implementation of additional biosecurity measures as mink operations are improved over time; for example, when facilities or equipment are replaced or refurbished.

How Was The Guide Developed?

The Guide, while industry-driven, was a collaborative project that included producers, subject matter experts, advisory groups, and leaders in industry and government. This work was facilitated by contractors and guided by three committees: 1) a mink biosecurity management committee, 2) a biosecurity advisory committee, and 3) a biosecurity technical advisory committee, all of which contributed ideas and comments. (Appendix D provides a list of the committees and committee members.)

Section 1: Access Management

The disease literature documents that the movement of people, wildlife, pets, and other disease vectors, in addition to equipment and vehicles, are important routes for bringing microbial pathogens onto a premises or into a shed. Many diseases, including Aleutian disease, mink virus enteritis, mink distemper, ringworm, and others are carried onto farms by disease-carrying vectors. Controlling access to the site and to the areas where the mink are housed is an important biosecurity principle.

1.1 Biosecure Zones – Keep Disease Out

1.1.1 Target Outcome

Biosecure zones and controlled access points are established to control access to the premises, mink sheds, and other critical production areas.

Biosecure zones allow the separation and protection of farm areas from people, materials, animals, products, and equipment that may pose a risk to mink health due to contamination from or infection with disease pathogens.

Identifying and implementing biosecurity measures that are specific to outer and inner zones ensures that multiple protective measures must be breached before microbial pathogens gain access to the most critical area of the site – where mink are housed. It also minimizes the risk of disease pathogens spreading from the mink housing and the mortality/manure storage areas to the rest of the site and off the farm.

Employ a three-zone concept for the farm site/premises:

1. Determine Boundaries of the Site – The Premises

The "premises" refers to the entire property on which the mink are raised and is interchangeable with the term "farm site."

2. Establish a Controlled Access Zone

The "controlled access zone" (CAZ) refers to the area of land and buildings constituting the mink production area of the premises that is surrounded by a security fence and only accessible through a securable controlled access point. A CAZ restricts the access of visitors, vehicles, equipment, and animals (including wildlife) at the perimeter of the mink production area. The CAZ may include mink sheds/housing areas, the feed kitchen, feed storage areas, supply storage, and waste storage (manure,

compost, and carcass storage). The CAZ should exclude personal residences to minimize unnecessary access by family and visitors. Gates, fences, and barriers must be properly designed and maintained. For enclosed sheds that do not have a security fence, there is the potential that disease-carrying animals could get into close proximity of housed mink and transmit air-borne pathogens.

3. Fence the Controlled Access Zone

A security fence surrounding the CAZ provides greater control over all areas that can affect mink health, and thus is preferred to fencing the restricted access zone (RAZ). If only one fence exists on the premises, then it is preferred that it exists around the CAZ.

4. Establish Controlled Access Points

A controlled access point (CAP) regulates access to the CAZ and RAZ. It is a single point, or a designated entrance, to a specific area that enables traffic control and ensures that equipment and procedures are available to effect biosecurity measures. The access point to the RAZ may be a single door, gate, or barrier that can be locked or secured to prevent access.

5. Establish a Restricted Access Zone

A RAZ controls access to the mink sheds, or areas where mink are housed, and should include the feed kitchen. For practical purposes, it may also contain the pelting area. Including the feed kitchen in the RAZ minimizes access to, and possible contamination of, feed ingredients and feed. It is practical in that it allows free movement within the zone when feeding; if the feed kitchen is located outside the RAZ, additional biosecurity measures are required to move between the mink and feed kitchen.

Consider this area a fortress where only essential personnel may enter wearing clean, biosecure clothing. A fence that surrounds the mink housing area prevents mink from escaping and wild animals, livestock, or people coming into contact with the mink.

A single RAZ may be suitable for sites where all mink are of the same health status. If possible, use security fencing to isolate the RAZ, further protecting the health and security of mink. Separate fencing around the RAZ is beneficial, as many farm premises have considerable activity in the CAZ; for instance, the delivery of feed or feed ingredients, and of mink carcasses for pelting.

Fences help to mitigate the risk of mink escaping from the farm and of introducing disease and genetic traits into the wild population. Fences also mitigate the risk of disease introduction into farmed mink from pests and contaminants. Using a 1.25 inch fence (i.e. mesh size) is now common and is effective at controlling mink but ineffective at preventing rodent access. Solid fencing is best, as it keeps out rodents and does not provide a climbing surface for pests such as raccoons. The cost/benefit ratio of solid fencing should be assessed; for those producers who wish to maintain an Aleutian disease-free herd, it may be a reasonable option.

Multiple RAZs may be necessary if mink are housed in different areas on the site; for example, to maintain the health of valuable breeding males and females after the kits are weaned or when establishing a disease-free herd.

Since pelting areas may also be located in the RAZ, it must be remembered that these activities can result in the contamination of staff, equipment and the environment with infectious pathogens; the implementation of appropriate biosecurity measures contributes to preventing disease carriage to breeding animals and housing areas. Pelting is a high-risk activity, especially custom pelting operations, so the pelting operation must be kept away from the feed kitchen and feed ingredients.

Mink from other farms that are brought onto your farm for custom processing in the pelting area RAZ pose a high risk for disease spread. For vehicle entry and exit from the farm and the handling of these mink, there must be strict biosecurity procedures in place for staff. In addition, movement on-farm and sanitation must be followed to avoid the introduction of microbial pathogens into the farm's mink population.

To prevent the transmission of microbial pathogens, caution and strict adherence to biosecurity procedures when transporting mink is also required when transporting mink to off-premises custom pelting or processing plants, which are also considered a RAZ.

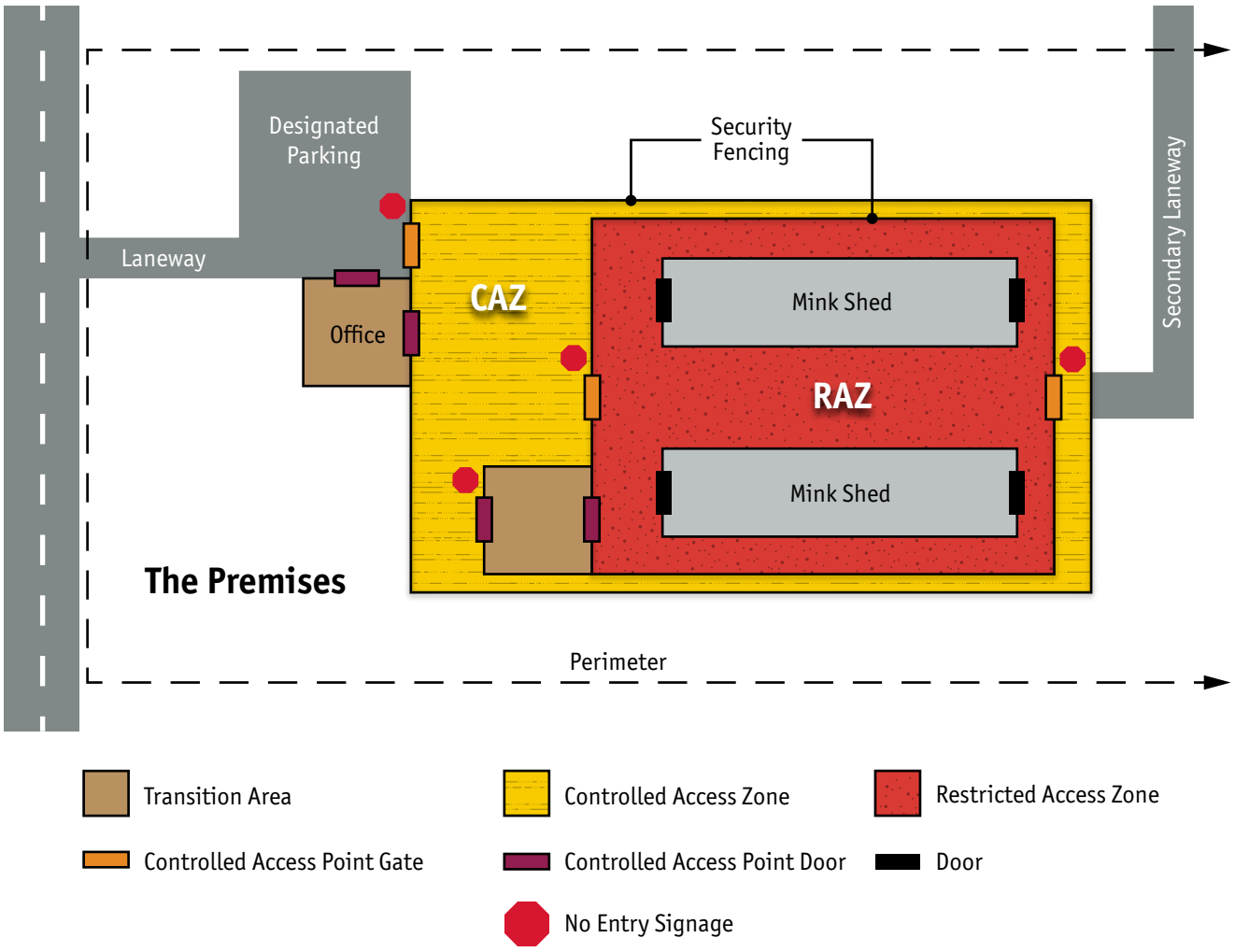
Feed kitchen areas are also considered part of the RAZ, as many feed ingredients pose biological or chemical risks to the mink population. Strict adherence to biosecurity protocols concerning RAZs is required when entering or leaving this area.

Exclude on-farm visitors where appropriate. Allow visitor entry with special permission only; supervise visitors, provide clean biosecure outer clothing for visitors, and ensure visitors sanitize their hands.

Most biosecurity programs recommend a single entrance to the main shed, which is equipped with a locked door and a doorbell, to protect against risks posed by uninvited visitors.

Figure 1 presents an example that highlights the concepts in implementing premises, CAZ, and RAZ biosecurity zones. (Appendix C provides additional site plan examples and potential approaches to implementing biosecurity zones for more complex operations.)

FIGURE 1—Biosecurity zones for mink premises, CAZ, and RAZ



The sample site plan (Figure 1) identifies three biosecurity zones for the premises (i.e.: outside the CAZ), the CAZ and the RAZ. Key features include:

a. primary and secondary access points where the secondary access point / laneway is used for waste removal and mink shipments, while the primary access point is used for everything else;
b. parking for staff and visitors, which is located outside the CAZ;
c. an office where visitors sign in for possible entry to the transition area and the CAZ;
d. security fencing of the CAZ and the RAZ;
e. controlled access points and transition areas that meet biosecurity protocols to enter the CAZ and/or the RAZ; and
f. doors, with signage, used as barriers to the CAZ and the RAZ, for managing access at the controlled access points by staff and visitors.

1.1.2 Target Outcome

Biosecure zones and controlled access points are easily identified.

Compliance with biosecurity measures is enhanced by ensuring staff and visitors can easily identify what areas of the premises they can and cannot access and what measures are required to enter biosecure areas.

Suggested best practices:

1. Visually identify biosecure zones and the CAPs; this may be accomplished with signage, fencing, boundary markers, doors, and gates.
2. Post signage that is clearly visible to warn visitors to stay away and to direct essential visitors to the appropriate location for entry.
3. Use physical barriers (chains, gates, fences), in addition to signage, to identify the zones. Signage alone is often insufficient to deter visitors that fail to notice or intentionally disregard signs. Signage tends to be more effective when there is an informative message such as the biosecurity protocol and when there are questions related to visitor compliance.
4. Ensure vehicles and equipment entering or leaving the CAZ and RAZ meet sanitation requirements to prevent the introduction of disease pathogens and their spread. Restricting access to one entry point will lessen potential problems.
5. Review the barriers in place to prevent the introduction, release, and/or escape of mink by considering doors in addition to fences – specifically, how many doors must a mink go through to get onto and off the premises?
6. Be aware that, without a CAP, there is no ability to prevent the introduction of microbial pathogens.
7. Provide a designated parking area for visitors and staff. Locate the designated parking area outside the CAZ. Only dedicated farm vehicles should be in the CAZ. Inspect vehicles before they enter the CAZ to ensure they are visually clean.
8. Define a designated area for conducting sanitation procedures when entering the CAZ. Develop cleaning and disinfection (C&D) protocols, providing at the sanitation station.
9. Thoroughly clean and disinfect equipment for entry and exit to the RAZ. The minimum C&D process is to wash and disinfect the undercarriage of vehicles (e.g. tires, wheels, wheel wells, and underbody). Clean and disinfect the entire vehicle when the vehicle has organic material present. During a disease situation, C&D is required for equipment and vehicles moving onto and off the premises, and in cold weather, a wash bay may be necessary.

1.2 Entry, Movement, and Exit Protocols – Control

1.2.1 Target Outcome

Staff and visitors understand and respect site biosecure zones and comply with procedures for movement.

Biosecure zones are used to create areas where the spread of microbial pathogens can be reduced by employing biosecurity measures. The zones are only effective at minimizing the transmission of infectious pathogens if measures to prevent this transmission are applied when moving between and within zones.

Suggested best practices:

For staff:

1. Instruct staff on the importance and purpose of the CAZ and RAZ; the use of a single CAP to the CAZ and RAZ areas will reduce disease risks.
2. Train staff in protocols for entering the premises, the CAZ, and the RAZ (mink housing areas); include procedures for movements within and between these areas and exit protocols.
3. Define an area outside the CAZ for staff to park their vehicles, and indicate the area, using markings or signage. Staff vehicles should never enter the CAZ or RAZ. Only allow dedicated farm vehicles in the CAZ.

For visitors:

1. Ideally, do not allow visitors onto the premises and when visitor access is necessary, only allow access by appointment.
2. Require all visitors to enter and exit through a single CAP to the CAZ and RAZ.
3. Train staff and essential visitors (such as veterinarians and fur graders) in protocols for entering the premises, CAZ, and RAZ; include procedures for movements within and between these areas and exit protocols. A staff member should escort non-essential visitors.
4. Prevent access of the CAZ and RAZ by other non-essential visitors – particularly those with previous mink exposure, such as other mink producers.
5. Know the history of visitors. Visitors should sign the Visitor Log prior to entering the CAZ to keep a record of all visitors to the farm. Visitor information collected includes visitor name and company, and when, where, and purpose of their last mink contact.
6. Apart from staff, only veterinarians or fur graders should be allowed to handle mink.
7. Define an area outside the CAZ for visitors to park their vehicles, and indicate the area using markings or signage. Visitor vehicles should never enter the CAZ or RAZ. Delivery vehicles should follow C&D protocols if they enter the CAZ.

1.2.2 Target Outcome

Biosecurity procedures are required for (and complied to by) staff and visitors entering and exiting the CAZ and RAZ.

Procedures are necessary to reduce the transmission of microbial pathogens by staff and visitors into and out of the mink production and housing areas on clothing, footwear, and the person.

Suggested best practices:

For staff:

1. Employees should arrive at work in clean clothing, which allows a break in microbial pathogen transmission.
2. Farm employees should wear farm-dedicated outer clothing and footwear (boots). It is important that the footwear be adequately cleaned and disinfected – ideally, rubber boots. (Most footwear made of other materials does not allow for adequate C&D.)
3. Staff should wear dedicated protective clothing (cover-ups) and boots, and should sanitize their hands when entering the CAZ and RAZ. This clothing should remain in these areas while in use. Dedicated clothing should be removed before leaving (even temporarily) the CAZ and RAZ and put back on when returning.
4. The potential entry or spread of microbial pathogens can be reduced by a ready supply of farm clothing available for staff, either supplied by the individuals or by the farm owner, and that remains on the farm.
5. Biosecurity clothing should be kept in a clean and dry location (clean storage room or clean container) to ensure clothing remains clean. Use separate lockers or totes for clean and dirty clothing; it is important to maintain separation of clothing to break disease transmission. If this clothing is removed from the CAZ or RAZ for washing or disposal, ensure that it is handled or disposed of in a biosecure manner.

For Visitors:

1. Ensure visitors follow biosecurity protocols and put on disposable outer clothing (either supplied by the visitor or by the farm) or don farm-designated coveralls that are routinely laundered at a sufficiently hot temperature to kill microbial pathogens.
2. Use overboots or treaders versus plastic boot covers for visitors. The former are much more durable and can be re-used, whereas the latter rip and can be slick in snow and wet weather and can fall off. Clean footwear prior to entering the RAZ, performing a boot change or using a boot wash station.
3. Store soiled laundry and soiled footwear (boots) in a sealed container until laundered and cleaned and disinfected, respectively.
4. Ensure visitors sanitize or wash their hands prior to entering and exiting the CAZ and RAZ. The biosecurity protocols posted at the CAP and in the transition area (TA) need to be available to visitors.

1.2.3 Target Outcome

Staff and visitors wear appropriate personal protective biosecurity clothing/equipment and practise strict biosecurity procedures when performing duties which either cross multiple biosecure zones and/or involve significant exposure to microbial pathogens.

Developing and implementing appropriate biosecurity standard operating procedures (SOPs) is critical when performing tasks that involve direct contact with materials with an increased risk of exposure to microbial pathogens such as the following:

- manure
- mink that are found dead
- mink carcasses and fat from pelting

The protocols to follow and the protective biosecurity equipment to use must prevent contamination of the individual and the production area, and avoid direct or indirect transmission of microbial pathogens to live animals.

Suggested best practices:

1. Pay strict attention to biosecurity for any animal-handling activity such as pelting, vaccinating, and carcass, fat, and manure disposal, because of their significant potential to spread microbial pathogens.
2. Have staff and essential visitors use dedicated mink handling and treatment equipment (e.g. catching mitts, vaccination equipment, and transportation pens) for different tasks to minimize the spread of microbial pathogens.
3. Clean and disinfect personal protective biosecurity clothing and equipment between uses.

1.2.4 Target Outcome

Controlled access points (CAPs) have the necessary equipment and materials to implement biosecurity procedures.

The requirements established for entry and exit at each zone dictate the equipment and materials that must be provided for staff and visitors to comply. This may include, but is not limited to, clean boots and coveralls, boot cleaning, and disinfecting materials, hand sanitizers, and paper towels.

Producers are encouraged to advise suppliers and essential visitors to bring their own biosecure clothing but producers should retain a supply of biosecure clothing in case suppliers or visitors forget or do not comply with this request.

Suggested best practices:

1. Provide staff with clean dedicated farm clothes (cover-ups and boots) and visitors with new disposable or clean dedicated farm clothing and boots. Keep biosecurity clothing in a clean and

dry container to ensure it remains clean. Consider lockers or totes for clean and dirty clothing; it is important to maintain separation of clothing to break disease transmission.

2. Provide handwashing facilities or hand sanitizer at the CAP. Hand sanitation facilities should be located in the transition areas. Hand sanitizers should be available and used at the entrance of the RAZs.
3. Provide and properly maintain a station for boot changes or boot cleaning at the entry to the CAZ and RAZ. Ensure boot sanitation is carried out when entering or leaving the CAZ and RAZ:
    a. Clean boots can be more effectively disinfected than dirty ones. Research demonstrates that, for the removal of bacteria, scrubbing visible manure off boots using water is as effective as scrubbing visible manure off boots using disinfectants. It is recommended that there be facilities provided to pre-clean footwear.
    b. Ensure that surfaces (footwear) are clean prior to disinfection. To be effective, the disinfectant must contact the clean surface, and disinfectant activity is reduced in the presence of organic material. Therefore, boot washes are preferred to boot baths.
    c. Be aware that simply walking through a boot bath will not disinfect boots. Every disinfectant requires a different exposure time. Read the label carefully to understand the amount of time that long boots must be in contact with the disinfectant for effective use.
    d. Use boot baths that are long, wide, and a minimum of 10 cm (4 in) in depth.
    e. Ensure that the design of the boot bath facilitates easy drainage and are protected from the weather.
    f. Replace disinfectant regularly, following the manufacturer's directions. Dirty boot baths are ineffective and can be a medium for pathogen growth.
    g. On a multi-commodity farm, be aware that boots might be worn in different areas around the farm and in transit, but that boots can act as a vector for disease organisms. Boots worn on-farm should not be worn off-farm.
    h. Rather than using a boot bath, consider using different boots for different areas of the production unit. Systems for changing boots range from simply limiting the use of boots to the shed to using different boots in each room and hallway. Consider having an area to wash boots.
4. Provide a clean dry location (i.e. transition area) to store the necessary clothing and materials, and perform the required biosecurity procedures.

Access Management Key Points: Biosecure Zones and Movement Protocols

Keep mink secure from strangers, visitors, and wildlife by controlling access to the sheds and farm and by establishing protective zones and implementing movement controls:

a. Control entry to the mink housing and other production facilities on the farm site.
b. Use barriers and signage or other readily visible indicators to alert visitors that they require the producer's permission to enter.
c. Use dedicated on-farm clothes (i.e. not worn off the farm) to improve biosecurity.
d. Provide visitors with protective clothing; at a minimum, supply boot covers and clean outerwear for visitors to put on before entering the RAZ and to take off when leaving the RAZ.
e. Provide and require the use of equipment and supplies to wash or sanitize hands at the entrance of sheds.
f. Provide and maintain an area at the entry of the CAZ and RAZ with the necessary equipment and supplies to clean and disinfect boots (i.e. a transition area with a boot wash).
g. Ensure the entrance to the farm site and / or CAZ can be closed in the event the farm needs to be locked down.
h. Locate designated parking for staff and visitors outside the CAZ.
i. Install and maintain a properly constructed security fence that is designed to prevent the escape of mink and access by wildlife, feral animals, and escaped farmed mink.

Section 2: Animal Health Management

Animal Introduction, Movement and Removal

2.1 New Animals – Buy Clean

Many diseases, including ringworm, Aleutian disease, and even genetic diseases such as hereditary tyrosinemia can be brought onto a farm. The purchase of diseased and subclinically infected mink is one of the most significant methods of disease introduction.

Purchase breeding replacements or new genetic stock only from reputable breeders who disclose all potential health problems and who follow and document current science-based Aleutian disease control/eradication programs. Ideally, these programs would be developed collaboratively by industry and veterinary specialists (private practitioners and academia) and implemented at an industry level.

2.1.1 Target Outcome

Obtain new breeding stock from reputable breeders with healthy herds; verify herd health and, when warranted, treat new breeding stock with booster vaccinations and for other health issues such as injury during transport and parasites.

It should always be an objective to obtain healthy breeding stock from reputable breeders to minimize the possibility of introducing disease pathogens to farms from outside sources.

Diseases that should be of concern include, but are not limited to, Aleutian disease, mink virus enteritis, footpad disease, and hemorrhagic pneumonia (*Pseudomonas*) infections.

Producers should consider all new mink that are purchased potentially infected, and treating as such, regardless of the reputation and credentials of the seller. The suggested best practices for obtaining new breeding stock are as follows:

1. Ensure that mink purchases comply with appropriate federal, provincial, state, and other regulations.
2. Require documentation of health status, such as a veterinary health certification and/or test results, of animals for infectious and genetic diseases prior to purchase.
3. Test mink for Aleutian disease as appropriate; for example, to prevent Aleutian disease introductions to clean farms.
4. Ensure vaccinations, and parasite and medical treatment protocols are performed.

2.2 Scheduling Animal Movements

Every time new mink are introduced or resident mink are moved, there is the opportunity to introduce and transmit microbial pathogens by people, animals, birds, equipment, and supplies.

2.2.1 Target Outcome

Limit the frequency of new mink introductions and movements of all mink to reduce opportunities for the transmission of microbial pathogens.

Newly acquired mink pose a significant opportunity for disease introduction, affecting the health of the herd and the microbial pathogen load on the premises. Infected mink can shed microbial pathogens; however, not all infected mink may appear clinically ill, and this can occur

- early in the course of an illness before clinical signs appear;
- when the microbial pathogen only causes mild illness; and/or
- after a mink appears to have clinically recovered from an illness, but may still be shedding pathogens.

Suggested best practices:

1. Limit the frequency of introductions (purchases) of new animals.
2. Limit the frequency of on-farm animal movements.
3. Avoid using the same vehicles for transporting mink and other commodities:
    a. If the same vehicles must be used for transporting mink and other commodities, trucks should be swept clean, and where necessary and weather permitting, washed and disinfected between transporting different commodities. An additional safeguard is to schedule high-risk activities as the last activities, prior to a complete C&D of the vehicles.
    b. Weather permitting, it is recommended that trucks and transportation pens be washed between shipments of live mink and completely cleaned and disinfected, if the delivery of mink has been to other farms or locations. Manure and mink body fluids are a source of microbiological contamination (e.g. Aleutian disease and *Salmonella*).

2.2.2 Target Outcome

Maximize downtime between mink groups on the premises and in the housing area.

The microbial pathogen load can be reduced in the absence of a host to maintain it. Downtime, leaving pens and sheds empty, allows for the natural reduction in numbers of disease-causing pathogens within the herd/housing area and for appropriate removal of organic material and a thorough cleaning and disinfection process.

The longer a housing area is empty, the less likely it is that disease organisms will remain a threat. Pathogen load can be minimized with the removal of organic material and a thorough cleaning and disinfection process.

To maximize microbial pathogen reduction in pens/sheds, the area that has been emptied should be clearly separated from other housing areas that contain live mink to avoid cross contamination and re-contamination. Although the full turnover of mink on a premises (all in – all out) is unlikely to occur, mink sheds or areas within the shed should be cleaned, disinfected, and left empty for two to three weeks whenever mink are moved.

Suggested best practices:

1. Schedule an effective downtime period for all sheds to occur at least once a year. Use the longest period of downtime possible; however, a period of two weeks should be considered the minimum.
2. When determining an appropriate period of downtime, consider the current health status of the mink and other effects, such as the health status of surrounding farms.
3. Be aware that pelting sheds may be emptied when breeding sheds may not be emptied, and thus cleaning and disinfection may have to occur at different times of the year.
4. Plan the breeding, pelting, and introduction of new mink to allow parts of the facility to be emptied of animals.
5. Clean and disinfect the mink sheds whenever the sheds are empty.

2.2.3 Target Outcome

Practise strict biosecurity measures when handling mink.

Mink pens provide a secure environment that can mitigate the contact by mink with infected animals and contaminated people, equipment, and materials. Handling exposes mink to a much broader array of risks – the contamination and microbial pathogens encountered by these people, equipment, materials, and other animals. The pelting process poses a risk for shedding microbial pathogens, and thus care must be taken to ensure breeding animals are not exposed.

Suggested best practices:

1. During pelting, strict biosecurity practices, including wearing protective clothing, along with cleaning and disinfection, are used to ensure that breeding stock remain disease free and that disease is not spread throughout the premises during the following activities:
   - mink catching
   - pelt processing
   - moving
   - carcass disposal
   - euthanasia
2. Ideally, all equipment and materials are dedicated to on-farm use, and designed or constructed of materials that allow for easy cleaning and disinfection.

3. Ensure that the movement of animals, carcasses, fat, pelts, and humans minimizes the opportunity for disease transmission when pelting activities occur off-site.

2.3 Isolation Procedures – Stay Clean

Separating activities by time, carefully planning the procedures, having designated equipment and areas, along with effective biosecurity procedures, are critical to ensuring that isolation procedures are effective.

2.3.1 Target Outcome

Each premises has a sufficient number of pens to physically isolate new mink arrivals from the main herd, and has isolation procedures to minimize the transmission of microbial pathogens.

Many mink diseases can be introduced by the introduction of new animals. Isolation areas are critical to ensuring the health of the mink herd. The isolation period provides an opportunity to determine animal health by observing mink for clinical signs of illness, conducting tests, and administering treatments if warranted. Monitoring the herd from which the animals were acquired during this isolation period provides additional information on potential health risks to which the new mink may have been exposed. Upon completion of the isolation period, the newly purchased animals may enter the main herd when they meet the established herd health criteria.

Suggested best practices:

1. Isolate all new mink arrivals for a period of at least three weeks, observing for signs of illness or other health issues.
2. Perform multiple Aleutian disease tests for all new mink prior to introduction to the main herd.
3. Practise strict isolation procedures, including boot and clothing changes and hand sanitation, to ensure potential diseases are not transferred from the isolated animals to the main herd.
4. Dedicate separate equipment, which is specific to the isolation facilities.
5. Feed and handle mink in isolation facilities at the end of the day (separating activities in time).
6. Near the end of the isolation period, contact the producer from whom the new animals were acquired to determine whether an infectious disease has occurred in that herd.

Animal Health Management Key Points: Animal Introduction, Movements, and Removal

BUY CLEAN and STAY CLEAN

a. Ensure new mink are healthy by sourcing from reputable suppliers that apply and document sound medical and biosecurity practices in their herds.
b. Reduce the opportunity for disease introduction by limiting the frequency of mink introductions and movements.
c. Maximize downtime on the site and between mink groups.
d. Practise strict biosecurity when handling, catching, and moving mink.
e. Ensure all sites have a sufficient number of pens to isolate new mink.
f. Apply isolation procedures for all new mink arrivals, whether newly purchased or moved between producer-owned farms.

Monitoring and Maintaining Animal Health and Disease Response

Knowing the disease status of the herd is critical to recognizing whether an important disease condition is present on the farm and in initiating a prompt and effective response. Early diagnosis and disease surveillance help to contain the microbial pathogen in the event of an infectious or reportable animal disease (Reportable disease).

Suggested best practices for monitoring herd health:

- Observe animals regularly.
- Maintain a record of losses and illnesses.
- Recognize suspicious clinical signs that might suggest a contagious disease problem.
- Recognize unacceptable mortality rates or an abnormal pattern of mortalities.

Once these indicators of contagious disease are recognized, undertake immediate action to diagnose the disease and activate a response.

2.4 Animal Health Monitoring and Maintenance

2.4.1 Target Outcome

Individuals who monitor animal health are knowledgeable in mink health, in recognizing disease symptoms, and in response protocols.

Essential for effective disease monitoring and response protocols is having the knowledge and experience in identifying ill health in mink, including changes in appearance, behaviour, and activity. Staff members are not expected to diagnose the disease – this is the responsibility of the herd veterinarian and veterinary diagnostic laboratories. Staff, however, should know when something is wrong and what response protocols to follow.

Suggested best practices:

1. Train staff to detect ill health in the mink herd, and implement response protocols.
2. Ensure written disease response materials are readily available to staff.

2.4.2 Target Outcome

Daily procedures for animal health monitoring are followed and records of vaccination, illness, treatments, and mortalities are maintained.

Many factors may negatively affect animal health. These include, but are not limited to, infectious diseases, genetic diseases, management practices, and climatic conditions. To protect mink health and welfare, early detection of infectious disease is critical in preventing the spread of microbial pathogens. It allows for an appropriate response, reduces the extent and severity of a disease outbreak, and minimizes contamination of the premises.

Daily animal health monitoring provides the ability to promptly identify, investigate, and resolve health and management problems. Animal health records provide more accurate data than relying on memory and enhance the ability to identify disease trends, review previous health issues, and determine the success/failure of treatments and herd health programs.

Suggested best practices:

1. Examine mink at least daily for any evidence of poor health; signs may include reduced feed and/or water intake, lethargy, eye condition (e.g. discharge, inflammation), stool (e.g. colour, form)
2. Isolate sheds for mink that are showing signs of disease.
3. Have separate staff, where feasible, to examine mink in isolation AFTER the examination of the main herd; staff examining mink in isolation should wear outerwear, boots, and gloves that are dedicated to the isolation area.
4. Ensure that staff wash their hands when leaving the isolation area.
5. Maintain records of illnesses, behaviour changes, daily mortalities, and treatments.

Sample: Mortality Record				
Shed # / Date	Pen or Mink ID	Samples Taken for Determination of Cause of Death (Y/N)	Cause of Death	Action Taken

Sample: Pen or Individual Treatment Record								
Shed # / Date	Pen or Mink ID	Number of Mink	Product Name	Reason the Product was Used	Dosage and Route Used	The Person Who Administered Treatment	Weight of Treated Mink	Treatment Result

6. Carry out and record birth counts, and monitor regularly to assess and respond to disease or management issues that affect kits.

2.4.3 Target Outcome

Animal health monitoring increases following the addition of new mink, illness in the herd, or industry disease alerts.

The frequency of animal health monitoring must be increased when there is a heightened risk of disease transmission. Stressed animals are often more susceptible to disease and frequently shed higher levels of microbial pathogens.

Suggested best practices:

1. Increase the frequency of disease monitoring after higher-risk activities, following any activities which stress animals, when sick mink have been identified, or when industry has reported a disease alert.

2.4.4 Target Outcome

The detection of ill health in the herd results in an appropriate response.

Suggested best practices:

1. Appropriate responses to evidence of disease may include animal isolation until the resolution of illness and infectivity, treatment, culling, euthanasia, or other interventions.
2. Ideally, avoid using sheds and pens where sick or dead mink have been located until the cause of illness or death is known.
3. Avoid using sheds and pens for other mink that previously housed sick or dead mink until careful cleaning and disinfection has been carried out.
4. Never spread unconsumed feed from the pens of sick or dead mink to other pens.
5. Postpone using transportation pens for moving sick mink until cleaning and disinfection is performed.
6. Contact your veterinary advisor, and arrange to have sick or dead mink sent to a laboratory for autopsy and analysis.

2.4.5 Target Outcome

Each farm establishes and implements a herd health program, in consultation with a veterinarian.

Determining the cause of disease facilitates control and treatment plans, increasing their effectiveness and reducing expenses.

Veterinarians receive extensive training in many disciplines, including, but not limited to, disease identification, the appropriate methods of sample collection, and submission to a veterinary diagnostic laboratory.

With veterinary input, establish and follow a comprehensive mink herd health program. The program should include the following:

1. periodic visits (4 times a year) by the veterinarian to view the herd and provide an opinion on health status;
2. information on mink herd health that should be kept and made available to the veterinarian during visits or when disease is suspected or identified;
3. inspection and review of biosecurity protocols, systems, and activities during the veterinarian visit;
4. vaccination and treatment program; and
5. breeding and weaning strategies.

Vaccines are available to protect mink against some important diseases, though they do not provide complete protection to the herd. Some vaccines are capable of preventing clinical disease, whereas others reduce the severity or extent of a disease, but none provide full herd protection against a disease outbreak.

Vaccination of ill or compromised animals can reduce the efficacy of the response to vaccination.

Depending on the animal health status, vaccinated animals require at least three weeks to develop protective immunity. Vaccinating new mink just prior to their addition to the herd is ineffective. Mink farmers should carefully review their vaccination policies with their veterinarian to optimize protection for the herd.

Suggested best practices:

1. Develop the vaccination program with your veterinarian at least a year in advance to ensure that adequate vaccine is ordered to protect mink the following year.
2. Customize the vaccination program for your farm, based on management practices, disease history of the farm, and the surrounding area.
3. Ensure that staff members are familiar and follow the manufacturer's directions for the proper storage, handling, and administration of vaccines.

Establishing a Medication Usage Plan

The purchase of healthy stock and the implementation of biosecurity and vaccination programs will reduce the need for antibiotics, as well as the cost of production. Producers, with their veterinarians, should review the protocols they have in place at least once per year. Establishing protocols and keeping records takes time; however, the process establishes a means of ensuring their effectiveness and is a necessary part of the production program.

Mink production is full of change – new employees, new disease diagnosis by the veterinarian, and new products. Protocols inform a new employee on the rationale for using a medication, the type of mink on which it is used, the dosage to be used, and the way it is administered. Records should show when the veterinarian reached the diagnosis and when the protocol was changed. Written procedures allow other staff to take over during the absence of those who normally carry out the task.

Establish a Medication and Vaccine Usage Plan with your veterinarian. Review the plan annually. Obtain a prescription from a veterinarian for the use of medications or vaccines for the mink herd, and keep the prescription on file. Also, annually, or as warranted, review the Medication and Vaccine Usage Plan with your staff, ensuring that it is being followed.

Create a plan that identifies what actions to take if an error were to occur in medication use, including feed medications. This plan provides:

- a description of how to identify affected animals,
- what records to keep concerning the incident and the actions taken to correct the problem, and
- who to contact regarding the incident.

The improper use of antimicrobials, whether administered by injection, in the water or in the feed, could lead to antimicrobial resistance; to minimize the impact of this, review your Medication and Vaccine Usage Plan to ensure that all antimicrobials are used appropriately.

All prescription medications are marked with a Pr symbol on the label. These products may be purchased only from veterinarians with whom you have a veterinary-client relationship. Over-the-counter (OTC) medications do not have the Pr symbol but will be marked "For Veterinary Use Only" and can only be administered to animals. These medications may be purchased from veterinary clinics or other livestock medicine outlets.

Repackaged product (repackaged by your veterinarian) must be labelled appropriately and must only be provided under a valid veterinary prescription. Be aware that when materials are repackaged, there is a risk of contamination, and they must be handled with care.

If your veterinarian supplies you with a generalized drug use plan that has been developed for other clients, highlight the products that you use, or transfer the information on the products you use to your own personalized drug use plan.

Read and follow the information contained on medication labels and inserts. Pharmaceutical companies periodically make changes to dosage rates or withdrawal times. Checking labels allows you to identify when changes are made.

Establish identification procedures for animals that receive treatment by all administration routes (e.g. in the feed, in the water, by injection and topical application). Identifying individual animals and pens is important, as many drugs require treatment to be repeated over several days.

Sample: Medication and Vaccine Usage Plan

Date	Shed #	Product Name	Manufacturer	Medication/ Vaccine Used For	Dosage	Administration Route Used	Product Warnings	Storage Location On-Farm

2.4.6 Target Outcome

Escaped and released farmed mink and wild mink that are captured are not permitted entry into the farm site.

Mink that have either escaped or been released from the farm site can be directly exposed to microbial pathogens through contact with wild mink, mink from other farms and wildlife, and/or indirectly exposed through contact with a contaminated environment. These mink, if caught, should not be brought back onto the farm due to the risk of transmitting microbial pathogens to the remaining herd.

Wild mink that are inadvertently caught and returned to a mink farm pose a similar health risk. They should be dispatched according to applicable federal, provincial, and municipal government regulations.

When there is a substantial escape or release of mink from a farm, capture and re-entry to the herd may be considered. The herd health status will be compromised, and a plan will be needed to establish the health of the mink, returning the farm to a biosecure status.

Suggested best practices:

1. Ensure that staff members are familiar with protocols for dealing with escaped mink.
2. Do not return any mink that escape from the shed to the herd.
3. Euthanize escaped mink and dispose of the carcass in a biosecure manner, according to applicable federal, provincial, and municipal government regulations.
4. If mink are not euthanized but are held until pelt harvest, isolate from the herd, and manage following protocols for sick and/or contagious mink.
5. For a substantial escape or release of mink where the animals are returned to the farm, follow a program of testing that is developed in cooperation with the consulting veterinarian to ensure that herd health status has not been compromised. Where herd health status has been compromised through the introduction of disease, institute a program to return the herd to a biosecure status that may include
   a. regular testing for Aleutian disease and increased monitoring for signs of illness,
   b. booster vaccinations, and
   c. replacement of the complete herd with new mink breeders.

2.5 Animal Health Response

2.5.1 Target Outcome

The recognition of unusual clinical signs, clinical signs consistent with serious infectious diseases, and/or high mortality rates trigger a response that includes farm lockdown and seeking a diagnosis.

To mitigate the risk of transmitting disease pathogens from a potentially infected premises to other mink farms in the area, immediately implement a farm lockdown.

Trigger points to consider:

- the recognition of unusual clinical signs in the mink;
- illness in the mink herd beyond normal levels and normal variance – good health records allow producers to determine average values (and the degree to which it varies) for illness in the herd at different stages of production; and
- increased mortality in the mink herd beyond normal levels and normal variance – as per illness, when mortality varies beyond normal levels and normal variance.

Some of the trigger points will be consistent across all mink farms (certain clinical signs of illness in mink), whereas others (the average number of sick or dead mink) will vary slightly, based on a producer's production practices. Therefore, it is best for producers, in consultation with their veterinarian, to set trigger points for percent mortality and illness for their own herds.

When trigger points are reached, implement immediate steps to minimize the risk of spreading microbial pathogens within the farm or to other farms.

The elements of a farm lockdown include the following:

- preventing entry to the farm of all non-essential personnel;
- notifying industry members, neighbours, organizations, and authorities about the issue;
- instituting enhanced biosecurity measures for feed and other necessary input deliveries;
- restricting the movement of people, animals, equipment, vehicles, and other materials off the farm; and
- seeking a diagnosis.

Suggested best practice disease response activities:

1. Contact your veterinarian.
2. Implement a self-imposed premises lockdown to prevent disease spread beyond the farm.
3. Self declaration and immediate notification of:
    a. neighbours, so they are aware of the disease outbreak and can take steps to protect their farms;
    b. feed kitchens and/or feed input suppliers, so they can take precautionary steps, such as delivering feed to the infected farm at the end of the day;
    c. provincial and national industry organizations; and
    d. provincial and/or federal governments where regulations are in place regarding reportable diseases.
4. Identify the biosecurity procedures that are necessary to avoid spreading microbial pathogen infection beyond the farm when delivering feed ingredients, feed, and other inputs to the infected premises.
5. Submit samples for analysis and disease diagnosis.

Animal Health Management Key Points: Animal Health Monitoring and Response

a. Know the clinical signs of poor health in mink and the appropriate disease response measures.
b. Monitor animal health, and maintain records at least daily.
c. Maintain a daily mortality log, and perform regular monitoring of all mink.
d. Increase animal health monitoring during periods of increased disease risk.
e. Obtain the advice of veterinarians on implementing a herd health program.
f. Do not allow escaped mink to re-enter the farm premises.
g. Implement enhanced biosecurity to prevent the spread of a disease when unusual clinical signs or high mortality is observed.
h. Lockdown the premises by restricting deliveries, shipments, and the movements of animals, equipment, vehicles and people; and by notifying industry suppliers and neighbours.

Section 3: Operational Management

Mortality, Manure, Garbage, and Waste Management

3.1 Mortality Management

Producers should assume all dead mink are contaminated with microbial pathogens and require handling in a manner that ensures disease pathogens are not spread to other mink on the premises or to other farms.

The proper handling of dead mink is an important biosecurity principle; recommended practices include:

- providing appropriately designed storage and disposal facilities for dead mink to ensure physical isolation from the herd and to prevent access by scavengers and pests;
- following an accepted method of dead mink disposal; and
- following a standard operating procedure (SOP) for the daily collection, handling, and recording of dead mink found on-farm.

Most infectious pathogens survive for considerable amounts of time in the carcasses of dead mink. Bacterial, fungal, and some parasitic agents will actually replicate and increase in numbers. Rodents, flies, and other scavengers with access to these carcasses can spread disease pathogens across the farm, to neighbouring farms and to wildlife.

Farms that pelt their own mink should ensure that proper biosecurity protocols are in place to safely handle the significant volumes of carcasses and fat that must be stored, transported and disposed of during the harvest season.

3.1.1 Target Outcome

When dead mink are stored temporarily prior to disposal, storage should be in a dedicated storage facility and in a manner that prevents unintended access and the transmission of microbial pathogens.

The temporary storage and final disposal of dead mink must comply with federal, provincial, and municipal government regulations. The process to dispose of dead mink includes prompt collection, removal to a contained temporary storage if used, and final disposal by an approved method such as composting, deadstock collection/rendering, incineration, burial, or by another approved method.

Suggested best practices:

1. Locate the temporary storage facility away from the mink production areas (sheds, feed kitchen, and pelting areas).
2. Design the temporary storage facility in a way that prevents access by pests and scavengers, and that avoids contamination of the environment.
3. Use deep freezers for temporary storage of occasional, low-volume mortality.

3.1.2 Target Outcome

Daily procedures are established and implemented for the collection and removal of dead mink from the production area.

While collecting dead mink, it is important to ensure that microbial pathogens that may be present in the animal are not transmitted directly or indirectly to other mink. Ideally, the collection of dead mink should be conducted independently of other animal management tasks, such as feeding or live animal examinations, to protect the health of the herd.

Suggested best practices:

1. Establish a written mortality management plan on each premises.
2. Keep a record of daily mink mortalities; collect dead mink at least daily.
3. Collect and move dead mink, preferably in a sealed container, from the production area to the mortality storage facility.
4. Collect mink mortalities independently of performing other mink management activities.
5. Ensure that staff members wear appropriate clothing, boots, and gloves when handling dead mink, and wash their hands and footwear following dead mink collection and disposal.
6. Dedicate specific equipment to high-risk activities, including dead-mink collection, storage, and disposal. When this is not feasible, clean and disinfect equipment prior to use for other tasks.

3.1.3 Target Outcome

Dead mink are disposed of in a manner that minimizes the transmission of microbial pathogens and in accordance with applicable government regulations.

Suggested best practices:

1. Ensure that the disposal of dead mink complies with federal, provincial, and municipal government regulations.
2. Be aware that disposal methods may include incineration, composting, burial, deadstock collection, rendering, and other acceptable disposal methods that are consistent with applicable municipal, provincial, and federal guidelines.

3. Properly dispose of dead mink on site, where feasible and permitted. On-farm disposal should be conducted in a manner that ensures disease pathogens are contained or destroyed. It is important to make a distinction between "composting" and "weathering" as it pertains to dead mink disposal. Composting is an active process while weathering is simply a passive process where dead mink are piled with waste material.
    a. Composting materials properly requires active monitoring of the compost pile to manage, among other elements, airflow, moisture, temperature and product ratios.
    b. In the composting process, it is primarily the generation of heat that inactivates pathogens; reductions in the moisture content (desiccation), changes in pH, oxygen, and carbon dioxide also affect the survival of pathogens during this process.
    c. Weathering is a passive process; pathogen inactivation results primarily from the desiccation of the microbial pathogen and the effects of sunlight and natural temperature variation. Weathering is not a recommended practice for pathogen inactivation.
    d. On-farm composting should be based on recommendations from accredited sources, such as universities, consultants, and/or governments.
4. Where outside disposal companies are used, restrict their access to the premises and arrange to transfer mortalities to their containers or vehicles at the edge of the CAZ.

3.2 Manure Management

Manure is a source of pathogens and must be properly handled, stored, and disposed of to minimize pathogen transmission. Some microbial pathogens can remain infectious in the environment for years.

3.2.1 Target Outcome

Manure is handled, stored, and disposed of in a manner that minimizes the transmission of microbial pathogens.

Locate manure storage and disposal away from the production area or off-site. Any equipment – for example, tractors, wagons, shovels, and wheelbarrows – used in this process should either be dedicated equipment or be cleaned and disinfected before their use for other tasks. Immediately clean up manure spills during handling and removal and, when necessary, clean and disinfect tools, equipment, and the area to prevent the spread of microbial pathogens.

Suggested best practices:

1. Remove manure from beneath mink pens at frequent intervals, at the end of a production cycle, and after illness in the herd. During warm weather, this should be done more frequently to reduce potential fly problems.
2. Transport manure to storage and disposal locations in a manner that minimizes potential disease transmission; for example, by covered wagons or manure spreaders which prevent spillage.
3. Store manure away from animal housing areas and in a manner that minimizes access by pests and pets.

4. Apply manure to the land according to applicable federal, provincial, and municipal regulations.
5. When composting manure, follow recommended composting practices, and keep the compost covered to reduce access by pests and pets.
6. Control shed and site run-off to prevent or minimize the spread of microbial pathogens.
7. Have staff members who are handling manure change their outer clothing and boots, and wash their hands before starting other activities.

3.3 Garbage and Waste Management

3.3.1 Target Outcome

Garbage is handled, stored and disposed of on each premises in a manner that minimizes the transmission of microbial pathogens.

Contain garbage, and store in sealed containers prior to disposal to prevent pest access and possible microbial pathogen spread.

Suggested best practices:

1. Store garbage in covered containers that minimize access by pets and pests.
2. Store and dispose of garbage away from mink housing areas and in accordance with applicable federal, provincial, and municipal regulations.
3. Have staff wash their hands, and ensure that clothing is clean prior to returning to work after disposing of garbage.

3.3.2 Target Outcome

Pelting and processing waste is handled, stored, and disposed of in a manner that minimizes the transmission of microbial pathogens.

The pelting process generates a considerable amount of waste that the farm must handle and dispose of. This waste includes the mink carcass after the pelt is removed, fat from the pelt, and sawdust or similar material that is used during this process, and other packaging and handling garbage. The disposal of pelting and processing waste must comply with federal, provincial, and municipal government regulations; examples of approved methods may include composting, rendering, incineration, or burial.

Suggested best practices:

1. Once the pelt is removed, place the remaining mink carcass in a covered container. Remove carcasses from the pelting area daily to a storage waste container that minimizes access by pests until disposal. Disposal may include biofuel generation, composting, rendering, burial, and other methods that meet with government regulations.

2. Place, in a sealable container, fat that is removed from the leather side of the pelt through scraping, suctioning, or other methods in the pelt preparation process. This is an oil or fat by-product of the pelting process, and the container, when full, should be stored in the waste or garbage storage area until shipped or disposed of.
3. Clean the pelting area daily. Collect the sawdust, or like material, used during the pelting process, place in a covered container, and remove to the manure or organic material storage area. Collect and send with this material any other mink waste material from the pelting utensils and equipment.
4. Place paper or other waste in the regular garbage container for storage and disposal.

Operational Management Key Points: Mortalities, Manure, Garbage, and Waste

a. Properly handle, store, and dispose of mortalities, garbage, and pelting waste to effectively reduce the risk of transmitting microbial pathogens on and off the premises.
b. Comply with federal, provincial, and municipal government regulations regarding mortality, carcass and manure storage, and disposal.
c. Establish a mortality collection and disposal system on each premises.
d. Promptly collect dead mink in leak-proof containers for subsequent removal to a temporary storage area or disposal location.
e. Ensure mortality, garbage, and pelting waste storage and disposal areas are designed to prevent scavenging by wildlife or pets.
f. Ensure mortality, garbage, and pelting waste storage prevents exposure of mink and other animals to microbial pathogens.
g. Ensure staff wear appropriate biosecurity clothing and follow biosecurity protocols during the pelting process and when handling manure, mortalities, and garbage.
h. Collect, store, and dispose of manure, garbage, and pelting waste in a biosecure manner.

3.4 Water Management

Water is the single most important nutrient for mink. Mink require access to potable water at all times.

Water is involved in virtually every physiological process in mink production. Water helps transport food through the intestinal tract, transports digested nutrients, and functions as a carrier in waste elimination. For drinking water, both quality and quantity are important.

Contaminated surface water or shallow wells are known sources of infectious agents, including *Campylobacter*, *Salmonella*, *Escherichia coli* (E. coli), and *Pseudomonas* bacteria. Some viruses can survive in water for over 40 days. *Pseudomonas* is a water-loving bacterium and a significant pathogen to mink. Recent investigations of *E. coli* outbreaks in mink in the United States have established links with contaminated well water.

Water quality is determined from laboratory analysis. Bacterial analysis can provide measures such as coliform counts. Water treatment will effectively reduce coliform counts, but finding an elevated coliform count or high nitrate level in a water source indicates a problem with surface drainage, which may, in turn, require a change in management practices.

A chemical analysis is used to determine the levels of various minerals that are present in a water sample. The Canadian Task Force on Water Quality established the water quality guidelines that are shown in Table 1. Total dissolved solids (TDS), or the filterable residue, is a main indicator of water quality. Levels over 10,000 mg/L are unfit for animal consumption.

Canadian Water Quality Guidelines for Livestock Item Maximum Recommended Limit (mg/L)		
Major Ions		
– Calcium 1000.0	– Sulphate 1000.0	
– Nitrate and Nitrite 100.0	– Total Dissolved Solids 3000.0	
– Nitrite alone 10.0		
Heavy Metals and Trace Ions		
– Aluminum 5.0	– Cobalt 1.0	– Nickel 1.0
– Arsenic 0.5*	– Copper 5.0	– Selenium 0.05
– Beryllium 0.1**	– Fluoride 2.0***	– Uranium 0.01
– Boron 5.0	– Lead 0.1	– Zinc 50.0
– Cadmium 0.02	– Mercury 0.003	
– Chromium 1.0	– Molybdenum 0.5	

Source:
Task Force on Water Quality Guidelines 1987: *5.0 if not added to feed; **Tentative Guidelines; and ***1.0 if fluoride present in feed.

3.4.1 Target Outcome

Water, to meet the physiologic needs of mink (drinking and misting), is tested at least annually and treated as necessary to ensure it meets water quality standards for livestock consumption.

Water quality is affected by many things including pH, mineral content and contaminants such as microbial pathogens chemicals and may cause illness in mink. Surface water – such as in ponds, creeks, and rivers – which is used for drinking and/or misting should be treated so that it meets water quality standards for livestock consumption.

Suggested best practices:

1. Document and implement a water management program to ensure water meets quality standards. The water system is comprised of the water source, water treatment equipment, water pump, supply lines, and drinkers.
2. Be aware that surface water sources are often contaminated with coliform bacteria and possibly pathogenic diseases. When surface water is used for drinking and misting, water treatment is necessary to meet quality standards for mink and may include some of the following processes:
   - filtration
   - ozone
   - chlorination
   - combinations of treatments
   - ultraviolet irradiation
   - other technologies
3. Regardless of the method used, monitor water treatment equipment frequently, and test water to alert the producer when the treatment process has failed.
4. Perform water testing at the source and at the delivery end of the water lines at least annually to ensure that drinking water standards for mink are met.
5. Increase the frequency of water testing when there is an increased risk of contamination of the water system; for example, recirculating water systems, heavy rains, spring run-off, flooding and spreading of manure.
6. Know that standard testing will not identify waterborne viruses of particular concern. Polymerase chain reaction (PCR) testing, by qualified laboratories, may be an option in determining whether the water source is contaminated with virus in disease-infected areas; this should be performed in consultation with a veterinarian. The detection of viruses in water samples may serve as a tool to evaluate the risks associated with water uses, disease risks posed by neighbouring mink farms, the efficacy of water treatment, or other health risks to mink.

3.4.2 Target Outcome

Where feasible, closed water sources and closed drinking/delivery systems are used to supply water to meet the physiologic needs of the mink.

Suggested best practices:

1. Use water systems, such as municipal water sources, deep wells, or shallow wells to provide water for mink. Municipal water supplies and deep drilled wells provide the safest supply of water. Municipal water supplies are treated, tested, and pressurized, minimizing contaminants. Closed drinking systems, such as nipple drinkers, protect water supplies from external contamination.
2. Recirculating water systems require additional monitoring to prevent the transmission of pathogens to mink through water backflow and the contamination of water lines and holding tanks.

3.4.3 Target Outcome

Water lines, nipples, and cups are regularly maintained and sanitized.

Biofilm and scale contribute to poor water quality by:

- interfering with water flow;
- reducing consumption because of reduced palatability;
- decreasing the effectiveness of antibiotics and medications added through the drinking system; and
- harbouring microbial pathogens, resulting in elevated levels/counts of bacteria, and other pathogens in water.

Suggested best practices:

1. Remove biofilm and scale during cleaning to ensure disinfection is effective by adding a solution of acid – namely, citric or acetic acid – to the water lines and system, leaving it set for 48 hours. Follow this with a thorough flushing of the system.
2. Take extra care to keep water cups clean during the summer months when additional water is supplied in drinking cups for juvenile mink.
3. Clean and disinfect recirculating water systems frequently to ensure good water quality is maintained.

Operational Management Key Points: Water

Drinking water for mink should be free of contamination and meet water quality standards for livestock consumption:

a. Use drilled well or municipal water supplies, closed drinking systems, and nipple drinkers where feasible.
b. Treat surface water if used to supply water for drinking and/or misting.
c. Test water quality at least annually.
d. Treat the incoming water, and clean and disinfect the water system, if required.

3.5 Feed Management

Feed quality for mink should be maintained at the best possible standards to provide proper nutrient levels and to minimize microbial load. Managing the time, temperature, handling and storage of feed ingredients, and final feed product is a critical component of maintaining a healthy herd.

Mink feeds have the greatest variability of any livestock feed in terms of the variety of ingredients, nutrient content, and bacterial quality. Mink farmers may not know how feed or individual feed ingredients were obtained or handled prior to arrival at the farm. Due to the potential microbial pathogen load in many raw products of animal origin, the mink farmer should obtain feed ingredients or feed from known suppliers who operate under a food quality or food safety program.

Feed and feed ingredients may become contaminated by biological, physical, and chemical contaminants at their source during manufacturing, transport, storage, and feeding.

Feed ingredients and feed are often sourced from a wide geographic area with frozen poultry and fish offal often being shipped with commercial trucking companies or from dedicated mink feed ingredient suppliers that make multiple stops when they deliver feed. These deliveries, if biosecurity protocols are not followed, can be a source of disease transmission.

Farm-dedicated or non-dedicated feed containers that are returned to the feed kitchen, rather than being filled on-farm, can potentially carry back microbial pathogens to the feed kitchen in the containers. If feed is delivered to the farm in containers (e.g. fish boxes or totes), rather than pumped into containers on-farm, there is the possibility for transmission of microbial pathogens with the containers.

Feed that includes poultry and livestock offal are inherently contaminated with many types of bacteria and often a variety of viruses. Bacterial and toxin contamination of mink feeds, such as *Salmonella* and botulism, continues to be a concern and is often a result of contamination of source feed ingredient materials and their exposure to temperatures that promote bacterial growth.

Suggested best practices:

1. For easy access, keep records of feed ingredient or feed suppliers, including contact names and telephone numbers.
2. Be aware that poultry, fish, and livestock offal are inherently contaminated with many types of bacteria and often a variety of viruses. Methods to reduce the risks include:

    - careful selection of product (e.g. meat versus offal)
    - minimizing thawing and refreezing
    - purchase from reliable suppliers
    - storage under controlled conditions
    - proper handling of product
    - feeding soon after grinding or mixing
    - rapid cooling or freezing
    - a proper sanitation program

3.5.1 Target Outcome

Feed is of the highest nutritional quality available, which supports the health and development of mink.

The goal is to ensure that feed contains the appropriate nutrient levels for mink with negligible biological, chemical, and physical contaminants.

Suggested best practices:

1. When feed ingredients or complete feeds are received, routinely analyze for nutrient levels, using established protocols and standards.
2. Routinely analyze feed ingredients and complete feed samples for bacterial contamination, using established protocols and standards.

3.5.2 Target Outcome

Feed ingredients and feed are treated/processed to maintain quality and safety when necessary.

Raw animal products and by-products, if improperly handled, are susceptible to contamination and rapid bacterial growth.

Adding acids to feeds and using ensiled ingredients are examples of how feed can be treated to minimize bacterial growth.

Animal proteins and fats, even when held at low temperatures, can degrade. This process can negatively impact food quality and the health of mink. Some microbial pathogens can continue to grow at low temperatures. The storage and turnover of some raw product feed ingredients is time-sensitive.

Suggested best practices:

1. Use cooking, hydrolyzing, acidification, feed supplementation, and other treatments to reduce microbial pathogen activity and/or infectivity, and to increase available nutrients.
2. Pay strict attention to the storage and handling of feed ingredients and feed to minimize the risk of the growth of bacteria, particularly *Clostridium botulinum*.

3.5.3 Target Outcome

Feed and feed ingredients are stored at temperatures that maintain quality, safety, and that minimize the growth of microbial pathogens.

Delivered feed or feed ingredients that are not being used for the current day's feed production must be cooled and/or frozen as soon as possible to reduce potential bacterial/pathogen growth. Once mixed, stored feed should be kept cool to reduce pathogen growth until shipped or fed. If not being frozen for future delivery, wet feed should be fed out within 48 hours of mixing due to the rapid growth of pathogens when the temperature cannot be controlled. During warmer weather, all feed not stored under refrigeration should be used daily as pathogens multiply more quickly at higher ambient temperatures.

Suggested best practices:

1. Establish feed delivery procedures that minimize or prevent access to the CAZ and RAZ by feed delivery vehicles and drivers.
2. Be aware and implement biosecurity measures to minimize the risks of moving feed between farms or premises, because it poses an added potential risk for microbial pathogen movement.
3. Be aware that unconsumed feed poses a potential risk for microbial pathogen movement and should never be re-fed to other mink or animals. The unconsumed feed should be picked and scraped off the wire and placed in sealable containers and properly disposed of in accordance with federal, provincial, and municipal government regulations; this may include processes such as composting, burial or rendering.
4. Protect feed ingredients and feed from contamination by pets and pests through appropriate storage and handling practices.
5. Ensure feed storage coolers and freezers are well maintained, properly serviced, and routinely monitored to ensure that feed quality is not compromised.
6. Routinely clean and disinfect feed preparation areas, mixers, grinders, feed delivery areas, delivery systems (e.g. feed carts), and miscellaneous equipment.
7. Routinely clean and disinfect freezers and coolers.

3.5.4 Target Outcome

Feed ingredient and feed storage areas are designed, and procedures are implemented, to minimize disease introduction and spread. Feed preparation and storage areas, feed mixing, grinding and handling equipment are well maintained and personnel adhere to strict sanitation protocols to prevent contamination of feed ingredients and feed.

Contamination of feed ingredient and feed with microbial pathogens is a serious threat to the health of mink. Pathogens can spread through contact of clean feed with previously contaminated feed-handling equipment and storage containers, or by personnel who handle feed and do not observe strict hygiene procedures.

In the event of an emergency disease situation, feed delivery companies should initiate emergency/ heightened biosecurity protocols.

Suggested best practices:

1. Monitor cooler temperature to maintain a temperature below 4°C (39.2° F).
2. Monitor freezer temperature to maintain a temperature between -18°C (-0.4°F) to -23°C (-9.4°F).
3. Avoid using feed storage areas to store farm dead mink, carcasses, or pelts.
4. Ensure feed preparation and storage areas, and feed mixing and handling equipment are well maintained, cleaned, and disinfected routinely.
5. Have farm personnel adhere to sanitation protocols to prevent contamination of feed ingredients and feed.
6. Feed raw mixed feed that is to be refrigerated within 48 hours after mixing.

3.5.5 Target Outcome

On-farm feed kitchens, feed-ingredient delivery and storage areas, and the feed storage and shipping area are designed and managed as a controlled zone (i.e. RAZ or CAZ) to minimize the transmission of microbial pathogens and feed contamination.

On-farm feed kitchens, especially those supplying feed to multiple mink farms, pose a significant risk for the transmission of microbial pathogens and the chemical, biological, and physical contamination of feeds. The site where the feed kitchen is located is at high risk for potentially introducing microbial pathogens, which may be transmitted to the farm on contaminated clothing, equipment, and vehicles. In turn, microbial pathogens may be transmitted to other mink farms that receive contaminated feed products.

In addition, due to the nature of raw feed ingredients and their bacterial load, there is a potential of microbial pathogen contamination through the delivery, handling, and storage of feed ingredients, and the feed manufacturing process.

A properly designed feed kitchen significantly mitigates these risks; however, procedures must be relied upon to ensure feed quality when the location and design compromise biosecurity. Designating the feed kitchen as a RAZ and controlling its access (to select areas) by people, equipment, and vehicles limits potential pathogen introduction or spread. Following proper sanitation procedures reduces any potential introduction or spread of pathogens from this area.

Operational Management Key Points: Feed

Supplying mink with quality feed is the goal of every mink producer. Procedures are in place for feed kitchens and feed delivery personnel to minimize the risk of pathogen transmission between farms.

a. Good manufacturing practices are in place in all feed and feed ingredient storage and processing areas.
b. The feed production area is considered a RAZ, and all biosecurity precautions entering and leaving a RAZ are followed.
c. Feed ingredient and feed storage facilities are well-maintained and functional.
d. Proper feed ingredient and feed-handling practices are in place, which include maintaining and sanitizing feed equipment.
e. Proper timing of handling, storage, processing, and feeding of feed ingredients and mixed feed will reduce potential pathogen growth.
f. A program to monitor the bacterial levels of feed ingredients and finished feed is in place in all feed production areas.
g. Biosecurity procedures are developed for feed delivery to feed kitchens, which include flexible scheduling, use of personal protective equipment and truck sanitation, in the event of an infectious disease event.

3.6 Bedding

3.6.1 Target Outcome

Bedding material is obtained and stored in a manner that minimizes contamination by microbial pathogens and chemical contaminants.

Suggested best practices:

1. Source bedding from reputable suppliers. Bedding material should be clean, dry, and of a material that can readily absorb and release moisture. Some softwood shavings are a good bedding material for mink.
2. Ensure bedding material is free of contaminants, including terpenes and other resins that are present in some coniferous tree wood, and chemicals used in the drying and preservation process for some lumber.
3. Ensure straw or hay that is used as bedding is visibly free from mould and free of detectable odours.
4. Store bedding in a dry enclosed facility away from the mink production area to prevent contamination, and to ensure it remains clean and dry. Keep bedding storage facility doors closed.
5. Ensure that the bedding storage facility is pest proof. Pest control in bedding storage areas is necessary to prevent contamination with feces from rodents, raccoons, feral cats, and other wildlife.
6. Store bedding material in the bedding storage facility only.

3.6.2 Target Outcome

Bedding material in nest boxes is properly maintained; it is changed between cycles, after illness, and when soiled.

Soiled or contaminated bedding will support the growth of pathogens and attract pests, resulting in the exposure of all mink, but especially kits, to high levels of pathogens.

Suggested best practices:

1. Avoid using wet or contaminated bedding in the bedding storage facility for bedding mink.
2. Ensure that staff members who handle the clean bedding material do so in a biosecure manner.
3. Routinely, or as warranted, remove soiled or used bedding material from the nest boxes and replace with clean bedding.
4. Routinely collect and remove to the waste storage area any soiled or used bedding material from the nest boxes.

Operational Management Key Points: Bedding

a. Purchase bedding that is free from contaminants.
b. Store bedding to ensure that it is kept clean and dry.
c. Keep the bedding storage facility doors closed.
d. Include the bedding storage facility in the farm pest-control program.
e. Handle clean bedding material in a biosecure manner.
f. Provide a healthy environment for mink by monitoring bedding condition, and adding or changing bedding routinely, or as required.
g. Remove old or soiled bedding material from the production area to the waste storage area.

3.7 Premises, Building, Equipment, and Vehicle Sanitation

3.7.1 Target Outcome

Premises, building, equipment, and vehicle sanitation procedures are in place to minimize the introduction, harbouring and transmission of microbial pathogens.

Sanitation procedures that are applied to all areas of the farm and to vehicles and equipment that come onto, off of, or move around the premises can break the cycle of microbial pathogens. The purpose of the cleaning and disinfection process is to

- reduce the amount or degree of microbial pathogen contamination on-farm,
- inactivate the majority of pathogens that remain, and
- reduce the infectivity of those pathogens that are not inactivated to a level that is insufficient to cause illness in the mink.

The sanitation process consists of five steps:

1. dry cleaning – scraping, scrubbing, shovelling, and sweeping surfaces to remove accumulated organic material;
2. wet cleaning – applying hot water and a detergent at low pressure, and scrubbing surfaces as necessary;
3. drying – allowing the surfaces to dry before applying a disinfectant;

4. disinfecting – the application of a suitable registered disinfectant, at the proper concentration, to clean surfaces for the required contact time; and
5. weathering – rinsing disinfectant from surfaces (if required) and allowing surfaces to thoroughly dry before reusing equipment, pens, and sheds.

Suggested best practices for premises:

1. Clean and disinfect mink sheds, pens, and nest boxes on a routine schedule, including at the end of the production cycle and after illness.
2. Apply the five-step sanitation process when cleaning and disinfecting.
3. Focus on the dry cleaning and wet cleaning processes – these are critical steps to ensuring the disinfection process is effective.
4. Use detergents in the sanitation program to help remove biofilm. Biofilm is a thin layer of microbial pathogens containing organic material that adheres to pen floors, walls, nest boxes, and false bottoms, which helps protect bacteria and viruses from removal and disinfectant action.
5. Wet clean, using low pressure and hot water of 200°F (93°C), the sheds or areas that have no mink, as well as the equipment used for care and handling. Ideally, the surfaces of materials and equipment can be cleaned and disinfected using a pressure washer and hot water.
6. Use foaming applicators to permit a more visible application of cleaning agents. This application method helps to ensure that all surfaces are covered and may help increase contact time with surface materials. Foam action is usually short (10–30 minutes) and foam residue needs to be rinsed off before it dries.
7. Allow surfaces to dry sufficiently, usually for 24–48 hours; the shed is now considered clean.
8. Apply the disinfectant solution only to clean surfaces, as disinfectants are ineffective on organic material. Follow the manufacturer's recommendations on how to mix and apply the disinfectant solution.
9. As disinfectants are surface disinfectants, apply the disinfectant solution to the point of water run-off and let shed dry.

Suggested best practices for the selection of disinfectants:

1. Use a registered disinfectant that is appropriate for the microbial pathogens to be targeted. Registered disinfectants are products that have been evaluated by Health Canada and determined effective at inactivating the microbial pathogens listed on the manufacturer's label. Registered disinfectants can be identified by the drug identification number (DIN) on their label.
2. Thoroughly remove organic material from the area, as disinfectants do not work on organic material.
3. Ensure that disinfectant activity is compatible with soaps or detergents, harmless to building materials, and non-toxic to personnel and animals.
4. Read and follow the disinfectant manufacturer's recommendations to ensure proper dilution rates and exposure times.
5. Consult with your veterinarian to determine an appropriate disinfection program and disinfectant for your operation. There are various categories of disinfectants recommended: phenols, chlorine-based, iodine-based, quaternary ammoniums, aldehydes, peroxygen formulations, and alcohols.

Suggested best practices for buildings:

1. Maintain and keep buildings clean, organized, and free of debris and unnecessary materials.

Suggested best practices for vehicles:

1. Keep vehicles visibly clean, cleaning and disinfecting after handling high-risk materials and in the event of a disease risk.

3.7.2 Target Outcome

Ensure that new buildings and equipment are designed to allow appropriate cleaning and disinfection.

As important as cost and design, ease of cleaning and disinfection should be considered prior to purchasing equipment and building structures. Sanitation plays an important role in the health of mink and can require significant time and effort that can be reduced with proper facility and equipment design.

Suggested best practices:

1. Ensure that buildings (i.e. feed kitchen, pelting, and bedding storage facilities) can be closed to prevent pests from entering; specifically, doors close tightly, are kept closed, and buildings have no openings where pests can enter.
2. Direct rainwater, using rain gutters and a drainage system, away from the production units.
3. Incorporate site preparation for all buildings and mink sheds that allows rain and water to drain away from the facility and mink housing areas.
4. Ensure that there are no areas where water collects or puddles.
5. Design sheds in a way that allows manure removal equipment to easily access and collect manure droppings.
6. Maintain mink sheds, pens, security fences, and gates to prevent mink escaping from the shed or the farm.
7. Keep mink shed doors and security fence gates closed to prevent incoming pests or mink escaping.
8. Establish a designated sanitation area where vehicles and equipment can be efficiently cleaned and disinfected and where water, used in this area, can be contained or drained away from the production or traffic area.
9. Design and construct new sheds to facilitate cleaning and disinfection – sufficient space, accessibility and the use of impervious surfaces that can withstand pressure washing are important features.

Operational Management Key Points: Premises & Sanitation

a. Carry out cleaning and disinfection procedures when mink sheds and facilities are empty.
b. Clean facilities first by removing visible organic material, and then use a cleaning solution to wash or foam/rinse remaining organic material and biofilm.
c. Select a proper disinfectant for the problem pathogens that the farm has encountered, and use only on facilities that have been properly cleaned.
d. Follow the manufacturer's recommendations in mixing and applying the disinfectant solution.
e. Recognize that facility and site design should enhance the drainage of water away from the production area.
f. Inspect and maintain facilities, fences, gates, doors, and pens to prevent pest entry and mink escapes.

3.8 Pest/Pet Control

Pests are a potential source of microbial pathogens for mink. There are methods to control each class of pest.

Cats and other pets can carry and may spread microbial pathogens. If dogs and cats are allowed on-farm, they should be properly vaccinated and monitored for health.

Suggested best practices:

1. Feral cats should not be allowed on mink farms.

3.8.1 Target Outcome

An integrated pest control program is in place to control pests.

An integrated pest control program is designed to control multiple pests. It is important to be proactive with pest control as regaining control of an identified pest problem can be difficult.

Suggested pest control program best practices:

1. Pest exclusion methods – these are primarily management techniques and referred to as primary methods – which may include, but are not limited to, the following:
    - enclosed areas for feed delivery, feed preparation, feed ingredient storage, feed storage, and bedding storage;
    - covered bedding storage;
    - screened openings;
    - short grass and/or vegetation, or gravel strip outside building foundations to inhibit rodents;
    - proper disposal of unconsumed feed;
    - proper disposal methods for dead mink, mink carcasses, and other pelting waste; and
    - CAZ kept free of debris and long vegetation for potential use as pest habitat.
2. Consider pesticides, traps, bait, and other such pest control methods as secondary methods.
3. Always read pesticide labels carefully, using only as directed.
4. Install and maintain a well-designed and constructed security fence to prevent the entry of rodents, other mink, livestock, pets, and wild animals.

Suggested best practices for rodent control:

1. Monitor for signs of rodent activity (i.e. tracks, droppings, and holes) as part of the rodent control program. There is already a problem if rodents are visible.
2. Evaluate facilities to identify sources of entry and food for rodents. Rats can squeeze through holes as small as 1.5 cm (0.6 in) and mice through openings of 0.6 cm (0.24 in) or less. Close off openings around augers, pipes, and wires where they enter structures. Mortar, masonry, or metal collars are effective options for this purpose.
3. Use a gravel perimeter around enclosed sheds of at least 90 cm (35 in) wide.
4. Keep grass and weeds trimmed around the sheds; it is recommended that grass never be allowed to grow taller than 20 cm (8 in).
5. Clean up any spilled feed in feed preparation and shed areas as soon as possible.
6. Place traps or bait stations along walls and edges in areas of rodent activity.
7. Check traps and bait stations regularly, refill bait, and remove any dead rodents. Properly dispose of the rodents outside of your production area.
8. Require that a written rodent control program include all of the steps taken to help reduce or eliminate the rodent population. Include a map of trap and bait station locations, types of baits and poisons being used, and frequency of inspection.
9. If a pest control company is used, indicate the name and contact information, as well as the name(s) of the product(s) used. Pest control personnel should be licensed and provide evidence of such.

Suggested best practices for bird control:

1. Physically separate birds from production and feed storage areas with wire, plastic, or nylon netting, and hardware cloth or other building materials. Holes in these materials should be no larger than 2 cm (0.8 in).

2. Eliminate, or make less appealing, any roosting and nesting areas by cutting down trees near the shed areas, placing a wooden, plastic, or Plexiglas that covers over shed ledges at a 45° angle.
3. Ensure that open feeders, bins, and carts are covered; immediately clean up spilled feed.
4. Reduce access to water for birds.

Suggested best practices for fly control:

1. Keep the premises and facilities clean and debris free. Fly reproduction areas include wet areas, wet bedding, manure, old bedding, and areas where feed has been spilled.
2. Know that crusts on manure lagoons, if not agitated, provide breeding material for flies.
3. Cover solid manure piles with a black tarp to prevent flies from getting to breeding material and to raise temperatures high enough to kill any fly eggs and larvae.
4. Be aware that, even after death, female flies may still contain viable eggs, which may hatch.
5. Contact an Integrated Pest Management (IPM) specialist, a pest control company, or an entomologist for more pest control information.

Operational Management Key Points: Sanitation and Pest Control

a. Pests, dirty equipment, and vehicles can transmit disease and must be managed appropriately by sanitation and pest control programs.
b. Poorly constructed and maintained buildings can provide access and refuge for pests, resulting in the accumulation of microbial pathogens and pests on-site.
c. Use humane methods of pest exclusion by focusing first on making mink housing, feed, and bedding areas "pest proof."
d. If prevention measures fail, use lethal methods of pest control, in consultation with pest control experts, to ensure the safety of mink, people, pets, and non-target species.
e. A well-designed and constructed security fence is an important biosecurity measure in excluding many pests.

3.9 Biosecurity Program and Training

3.9.1 Target Outcome

All people who work on the premises know and understand the rationale and importance of biosecurity and biosecurity protocols.

It is important for all management and staff to receive biosecurity training and briefing before working with mink, ensuring they understand their own tasks and have general knowledge of all aspects of the process.

People who understand the purpose and importance of a biosecurity measure are more likely to adopt the practice as part of their daily routine. They are also more likely to ensure that visitors and service providers follow on-farm biosecurity practices.

Suggested best practices:

1. Make your biosecurity protocols available to farm staff and family.

3.9.2 Target Outcome

All people who work on the premises have reviewed the biosecurity-related instructions as needed, based on their assigned tasks.

The best way to ensure farm staff – including family members, if applicable – are clear on how to complete their assigned tasks in a biosecure manner is to have written procedures that are reviewed with them and updated when necessary.

A SOP must be easy to read while describing the steps followed to meet an objective; for example, an SOP that details feed and feed ingredient handling and feeding practices. SOPs should be readily available, reviewed regularly, and followed at all times.

In the event of a disease outbreak, provisions for additional or more rigorous biosecurity measures either on the premises or within the region are included.

Mink producers who do not employ staff and carry out all activities on the premises themselves still need to document their procedures. Written records will help to ensure the biosecurity measures are implemented and can serve as a guide to farming procedures when temporary staff are required or if a mink health problem occurs with the producer or staff.

Farm personnel should record any deviations from the biosecurity procedures that occur on a Corrective Action Record as follows:

Sample: Corrective Action Record					
Date	**Deviation**	**Corrective Action Taken**	**The Action Taken to Ensure That the Deviation Does Not Re-Occur**	**Staff Signature**	**Management Signature**

Suggested best practices:

1. Provide training on the biosecurity protocols for farm staff and family.
2. Review the farm's written standard operating procedures for biosecurity with farm personnel.
3. Monitor the implementation of biosecurity procedures, keep records, and note any deviations from the protocols.

Operational Management Key Points: Biosecurity Program and Training

a. Recognize that management and staff are more likely to implement biosecurity when they understand its importance.
b. Facilitate the learning and implementation of biosecurity for staff by developing written procedures for common tasks and ensuring the staff understands them.
c. Provide biosecurity training for farm staff, family, service providers, and visitors.
d. Keep a record of deviations that occur concerning the farm's biosecurity procedures.

Appendices

A: National Farm-Level Mink Biosecurity Standard Glossary

Access point: A visually defined entry point(s) through which traffic, such as farm staff, equipment, and delivery trucks will enter the premises, the CAZ, and/or the RAZ.

Additional biosecurity measures: A level of biosecurity required for mitigating situations wherein recommended practices cannot be followed (i.e. recommended may be an "all in/all out" system). Where this is impossible, as for a multi-age premises, implement extra biosecurity precautions.

Antimicrobial resistance (AMR): Refers to both natural and synthetic substances such as antibiotics and disinfectants that can kill or inhibit the growth of microorganisms. AMR occurs when an antimicrobial substance, or agent, is no longer effective in killing or inhibiting the growth of a particular microorganism. Antimicrobial substances are widely used in human and veterinary medicine for the treatment and prevention of microbial infections and are used for feed efficiency and to promote growth in animals in the agri-food industry.

The probability of an organism developing resistance increases with the length of exposure time to an antimicrobial agent. Bacterial strains can develop resistance to antimicrobial agents. Resistant bacterial strains survive and reproduce, transferring resistance to future generations and possibly to other microorganisms.

Approved: When used in reference to chemicals such as pesticides, the term means approved by the appropriate regulatory authority for the specific usage mentioned in the text.

Best practice: A management practice, technique, or technology that, when adopted, results in improvement and increased sustainability of the operation.

Biosecurity program: A set of preventive measures designed to reduce the risk of transmission of microbial pathogens or infectious diseases. Biosecurity programs are intended to minimize the introduction and spread of pathogens or diseases to, or from, farms by implementing on-farm practices for access, animal health, and operational management.

Carcass: The remains of mink harvested for pelts. (Refer also to "dead mink.")

Carrier: Mink or other animals that carry a pathogen without clinical signs with the ability to transmit the pathogen to other animals.

Clean: Free of any visible accumulation of organic matter and debris.

Controlled access point (CAP): A visually defined entry point with a restrictive barrier to control entry of traffic, such as farm staff, equipment, and feed trucks that will enter the premises, the controlled access zone (CAZ) and/or the restricted access zone (RAZ). It contains a transition area (TA) where procedures designed to minimize microbial pathogen spread can occur.

Controlled access zone (CAZ): The area of land and buildings constituting the mink production area of the premises that is accessible through a securable controlled access point.

Dead mink: Mink that are found dead or are euthanized for a medical condition. (Refer also to "carcass.")

Debris: Any material that may be capable of harbouring disease-causing organisms or pests such as discarded equipment, building material or machinery, manure, discarded bedding, dead mink, and soil.

DIN: – A drug identification number that is provided by Health Canada to products (drugs) following the successful registration process. Disinfectants are regulated by Health Canada and considered drugs – approved disinfectants in Canada will have a DIN on their label.

Disinfection: The application of a physical or chemical process to a surface for the purpose of destroying or inhibiting the activity of disease-causing micro-organisms.

Disposal (carcasses and dead mink): The final removal of mink carcasses and dead mink by means approved by the appropriate regulatory authorities; examples of approved methods may include rendering, composting, incineration, or burial.

Downtime: A period of time when a shed or area within a shed is empty, starting with a shed or area being emptied of mink and ending with the placement of mink into the shed or area. It allows for the natural reduction in numbers of disease-causing micro-organisms within the shed area. The effective period can be reduced by cleaning at the beginning of the period.

Essential visitors: Service personnel who enter the controlled access zone (CAZ) and/or restricted access zone (RAZ), other than personnel concerned with day-to-day mink production on the premises. Essential visitors include veterinarians, service and delivery people, suppliers, and regulators.

Feed kitchen: An on-farm facility that is used for producing mink feed and that may supply multiple mink producers.

Feral cats: Cats (*Felis catus* – domestic housecat) that have reverted to living in a wild state.

Feral mink: Escaped mink or mink descended from farmed mink that are now living in the wild.

Gate: A moveable barrier used to control access to an area such as a fence to close a gap or across a laneway to restrict entry.

Hand sanitation station: A sink, or hose or tap with water and hand soap for washing hands or a container provided for the dispensing of a hand sanitizer, such as alcohol-based hand-sanitation products.

Herd: A group of mink managed as a distinct population.

Infected mink: Mink that have acquired a pathogen.

Infection: Entry and development or multiplication of an infectious agent in the body of mink, humans, or other animals and birds.

Isolation: The practice of keeping mink physically separate from other mink – a practice that is usually performed for new, recaptured, or sick mink. The isolation period may be temporary or permanent.

Lockdown: Lockdown is established to prevent the escape of a disease from the farm or to limit a disease from entering the farm. In times of disease emergencies or disease outbreaks, a farm may restrict access to the farm premises by closing and locking gates, or by placing barricades to stop vehicles, locking doors to the CAZ and RAZ, and disallowing any visitors to the farm. Only necessary deliveries would be allowed onto the farm, with complete sanitation of delivery vehicles entering and exiting from the farm.

Microbial pathogens: Biological agents, such as a bacteria (including mycoplasmas), viruses, fungi, or protozoa that have the potential to cause disease.

Mink: All farmed mink reared or kept in captivity for breeding, the production of fur, or to supply breeding mink.

Mink shed: Any structure that encloses mink for fur-farming purposes.

Non-essential visitors: People and their equipment that do not require access to the CAZ and RAZ. These include, but are not limited to, guests, friends, and family.

Notifiable disease: A disease that is required by law to be reported to a federal or provincial regulatory authority.

On-farm: Pertaining to activities carried out on the farm.

Pathogen: An agent capable of causing disease.

Pest: Any insect, animal (excluding companion animals), or bird that may potentially come in contact with farmed mink that is undesirable, due to the risks of the transmission of microbial pathogens.

Potable: Water that is suitable for human consumption, meeting the requirements of the Canadian Drinking Water Standards.

Premises: A parcel of land with a continuous property boundary and defined by a legal land description or, in its absence, by geo-referenced coordinates, on which, or on any part of which, farmed mink are raised, kept, assembled, or disposed of. Interchangeable with the terms “farm” or “farm site.”

Producer guidance: Examples and best practices to facilitate achievement of the standard.

Protocols: Effectively a code of conduct, defined procedure to be followed.

Reportable disease: Animal diseases identified under federal and provincial Acts and Regulations, which are controlled or regulated to prevent their spread.

Reputable breeder and/or suppliers: The ability to substantiate the characteristics and quality of their production system (i.e. verifiable quality assurance). When purchasing live animals, consider the validation of health status, herd health history, and test results to support health status.

Restricted access zone (RAZ): An area inside the CAZ that is used, or intended for use, to house mink, including fenced shed areas or enclosed sheds, and where personnel and equipment access is more restricted than in the CAZ. The RAZ is sometimes referred to as the production area or restricted area (RA) in other mink production documents and guides.

Sanitation procedures: Procedures to reduce the number, infectivity, and survivability of microbial pathogens to promote health. This may be achieved by thoroughly cleaning and disinfecting surfaces such as equipment, pens, and boots, or by applying personal hygiene such as handwashing or hand sanitizers.

Sanitation station: A designated area outside the CAZ or RAZ where vehicles and equipment can be washed and disinfected. The station would be equipped to provide water for washing and to dispense detergent and disinfectant for the cleaning and disinfection (C&D) process.

Security fence: A permanent barrier that is used to enclose an area, such as a CAZ or RAZ, to control entry or exit. It is also known as a perimeter fence or guard fence.

Shed: Any structure that encloses mink.

Shed area: Fenced or unfenced area that mink sheds occupy.

Standard operating procedure (SOP): Documented procedure based on generally accepted good practices that describe in detail the steps followed to meet an objective; for example, a SOP that details the shed cleaning and disinfection procedure.

Target outcome: The goal that all keepers of mink aim for to protect their mink from the introduction and spread of disease.

Transition area (TA): An area where biosecurity procedures can occur for movement between the farm-site entry area (parking), CAZ, and RAZ.

Unconsumed feed: Leftover feed, or feed distributed to mink, that remains uneaten during the feeding period and is still of acceptable quality.

Vector: Any living carrier that has the potential to transport an infectious agent from an infected individual to a susceptible individual, its food, or immediate surroundings.

Verify: Refers to the confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.

Zone: A defined geographical area with boundaries and implemented biosecurity procedures that create a defined health status.

B: Additional Suggested References for Producers

General

1. Animal Biosecurity. General biosecurity measures for producers and veterinarians. Brochures, Video and other Publications – Animal Health Starts on the Farm. Canadian Food Inspection Agency. Available: http://www.inspection.gc.ca/animals/terrestrial-animals/biosecurity/eng/1299868055616/1320534707863.
2. Biosecurity for Mink Ranches. Fact Sheet. Perennia. Available: http://www.perennia.ca/livestock.php.
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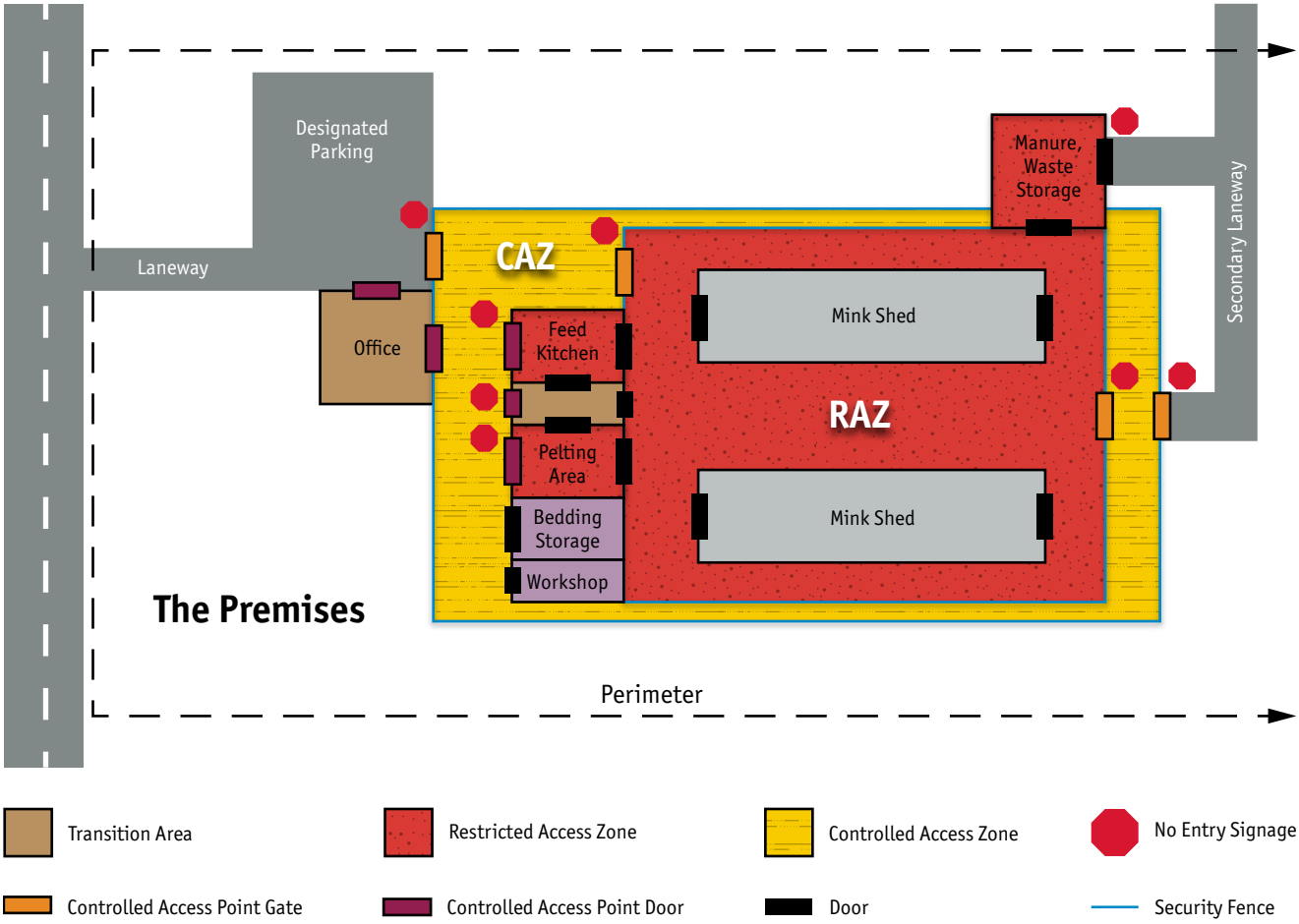
C: Additional Site Plan Examples and Potential Approaches to Implementing Biosecurity Zones for More Complex Operations

Figures 1–3 present additional site plan examples and potential approaches to implement premises, CAZ and RAZ biosecurity zones for more complex operations that integrate feed kitchen, pelting, bedding storage, and workshop areas.

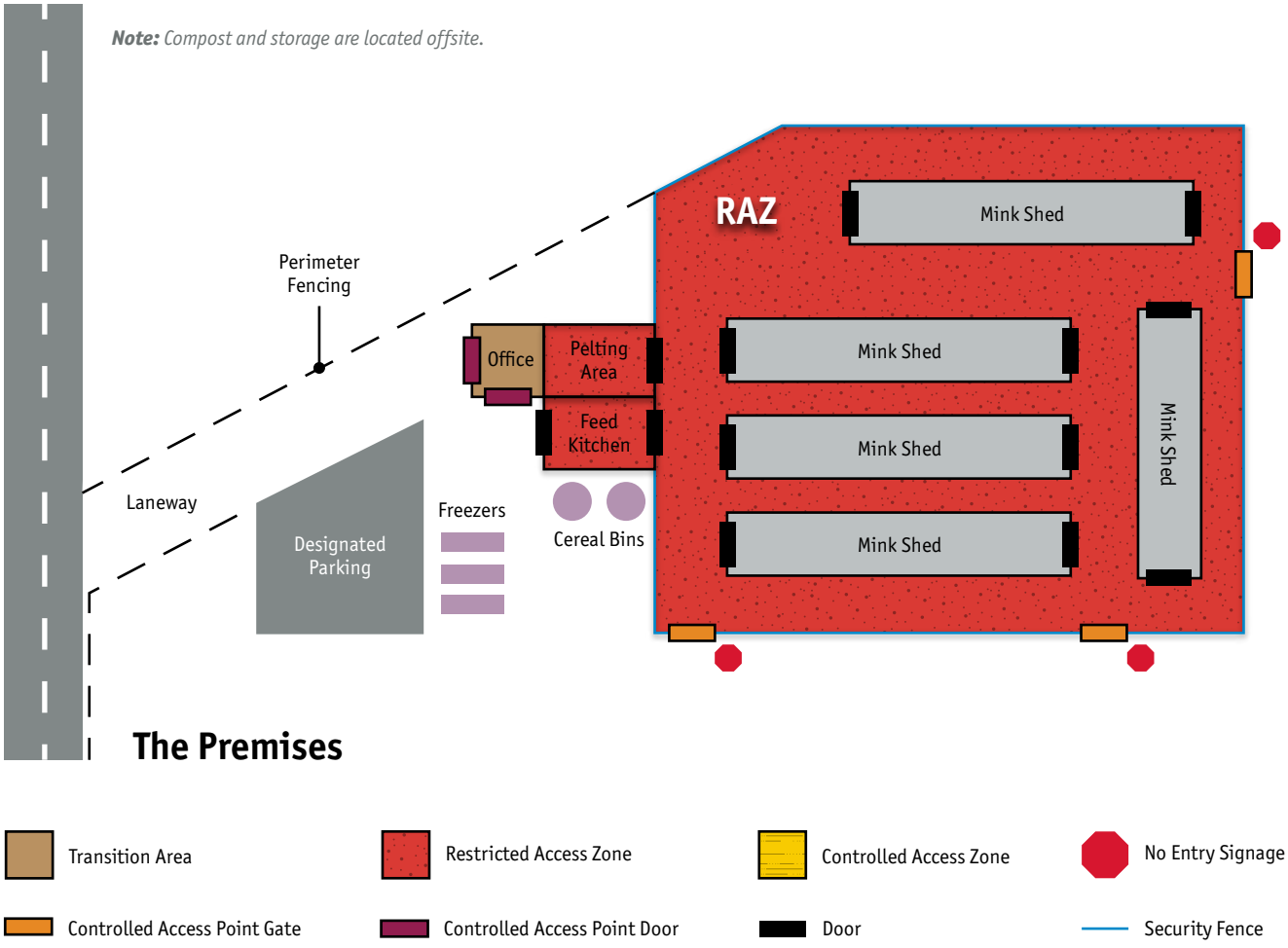
FIGURE 1—Biosecurity zones for mink premises, CAZ, and RAZ



Additional buildings and the production activities that occur are depicted in this diagram.

- Three zones/areas are represented: the Premises (which is the least biosecure), the CAZ (which is more biosecure) and the RAZ (which is the most biosecure) area.
- Entry/exit to the CAZ requires the application of biosecurity process.
- Once in the CAZ, no additional biosecurity measures are required to access the bedding storage and workshop buildings as they have an equivalent biosecurity status to the CAZ.
- The feed kitchen, pelting and manure/waste storage areas are included in the RAZ. Entry/exit to these areas from the CAZ is restricted by a CAP as additional biosecurity measures are required. Movement from the RAZ side requires no additional biosecurity measures.
- Including the kitchen, pelting and manure/waste storage areas in the RAZ allow movement between these areas and the mink sheds without the need to perform additional biosecurity measures. This minimizes the opportunity for transmitting disease pathogens between the CAZ and RAZ.

FIGURE 2a—Current, Actual Site Plan with Biosecurity Zones for Mink Premises and RAZ



A diagram of an actual mink ranch to demonstrate the biosecurity measures currently in place.

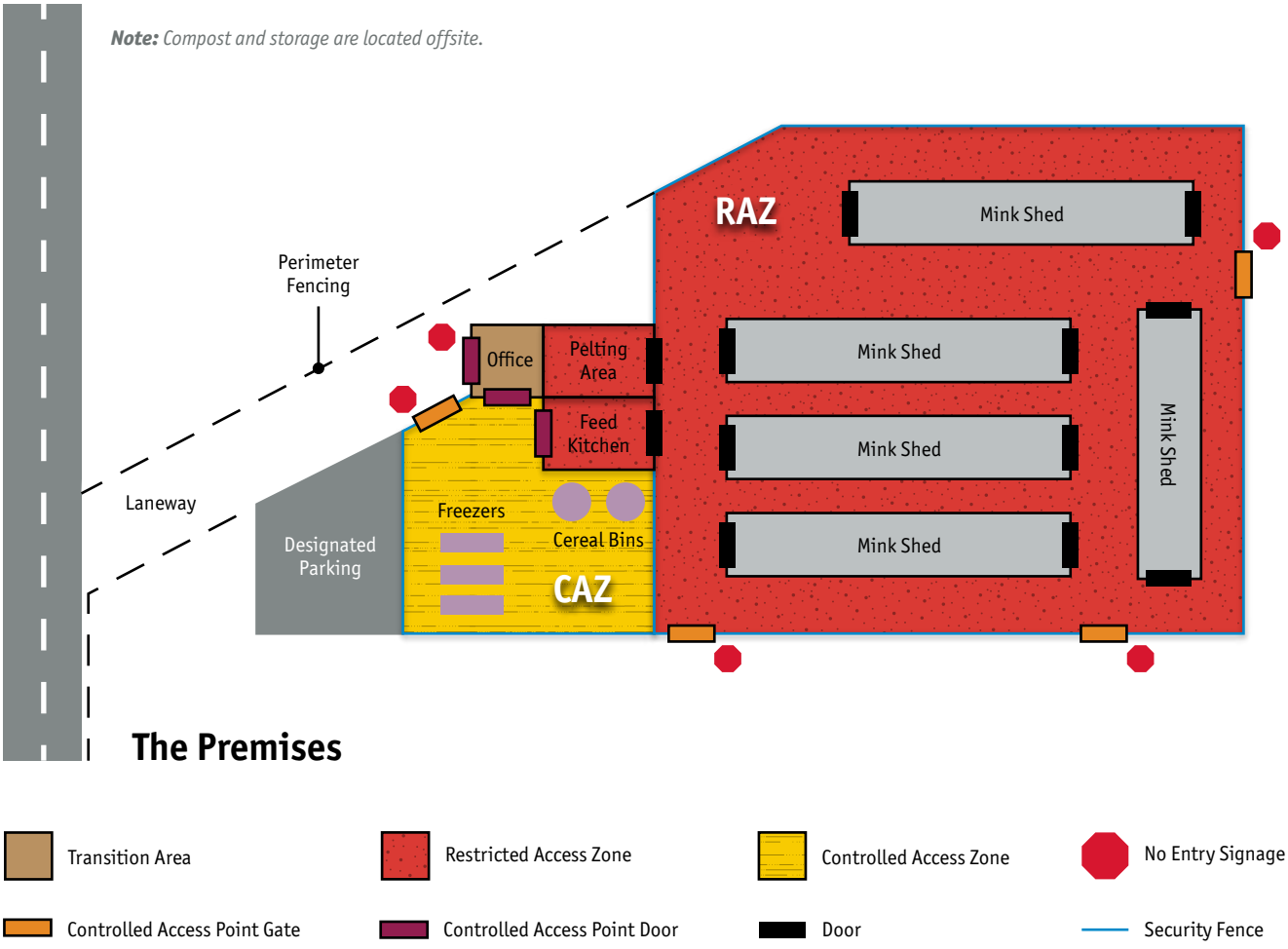
Pros:

- Designated parking has been established near the premises perimeter and biosecurity signage is present in some locations.
- CAPs control access to the office and thus the pelting area and RAZ.
- A RAZ has been established around the mink sheds, pelting and feed kitchen which helps to minimize the transmission of disease pathogens into and out of these critical areas.
- Security fencing is present around the RAZ that contains the mink sheds.

Cons:

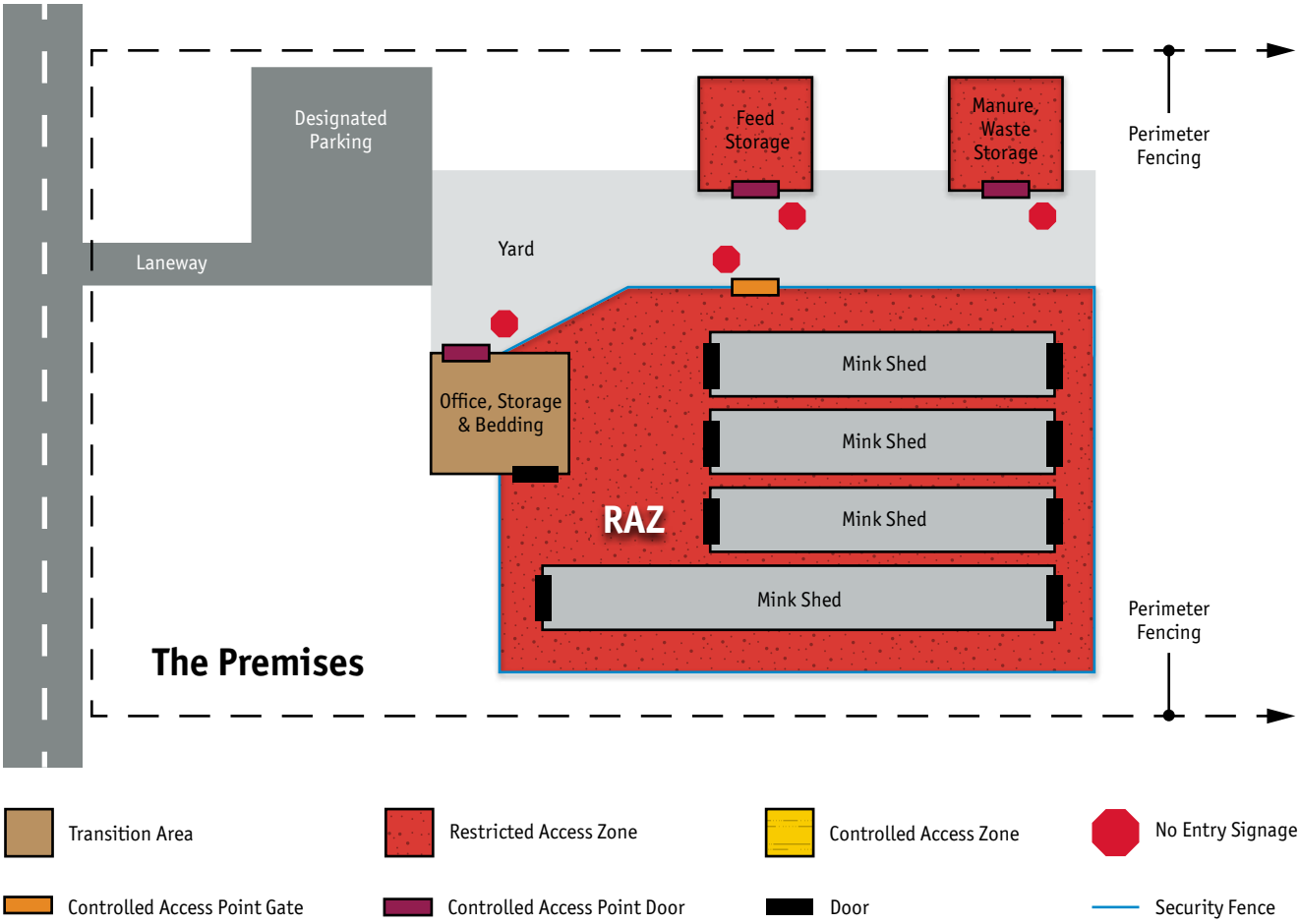
- There is no CAZ and CAPs to minimize the opportunity for entry by people/vehicles/equipment (which may transmit disease) into the freezers, coolers and the RAZ.
- Security fencing does not surround the feed kitchen or pelting area.
- Biosecurity signage is not present near the office and production area of the premises.

FIGURE 2b—Potential Future, Biosecurity Zones for Mink Premises, CAZ and RAZ



- Establishing a CAZ and fencing this area will improve security and minimize the opportunity for intentional and inadvertent access to the production areas.
- Establishing a CAP gate at the entry of the CAZ and a CAP door at the entry to the feed kitchen provides the ability to implement biosecurity procedures to reduce pathogen transmission.
- Additional biosecurity signage is an inexpensive and effective means to advise staff and visitors on requirements for entry and other important biosecurity details.

FIGURE 3a—Current, Actual Site Plan with Biosecurity Zones for Mink Premises and RAZ



A diagram of another mink ranch to demonstrate biosecurity measures currently in place.

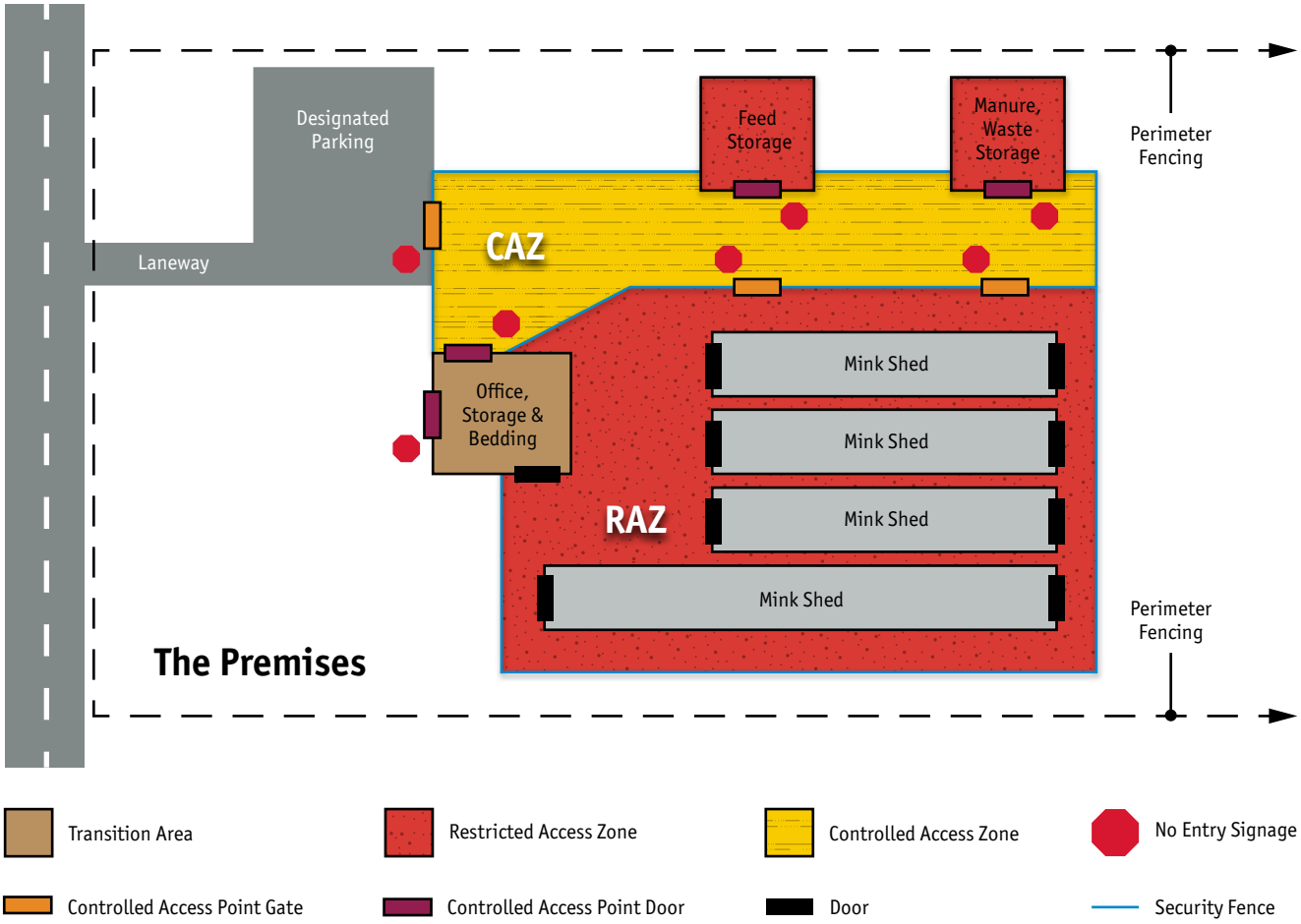
Pros:

- Designated parking has been established near the premises perimeter and biosecurity signage is present in critical locations.
- CAPs control access to the office and the RAZ.
- RAZs have been established around the mink sheds, feed storage and manure/waste stoage areas which helps to minimize the transmission of disease pathogens into and out of these critical areas.
- Security fencing is present around the RAZ that contains the mink sheds.
- Security fencing is present around the premises perimeter.

Cons:

- There is no CAZ and CAPs at the entry to the yard to minimize the opportunity for entry by people/vehicles/equipment (which may transmit disease).
- Equipment/personnel leaving the RAZ with manure/waste will be travelling across the area that feed carts will be using increasing the opportunity for disease pathogen transmission.
- Staff will have to implement biosecurity procedures to move between the RAZs which may interfere with daily work flow.

FIGURE 3b—Current, Actual Site Plan With Biosecurity Zones for Mink Premises and RAZ



- Establishing a CAZ and fencing this area will improve security and minimize the opportunity for intentional and inadvertent access to the production areas.
- Establishing a CAP gate at the entry of the CAZ provides the ability to implement biosecurity procedures to reduce pathogen transmission.
- The additional CAP gate between the CAZ/RAZ near the manure/waste storage areas will allow manure/waste removal to occur without moving across the area where feed is transported.
- Additional biosecurity signage is an inexpensive and effective means to advise staff and visitors on requirements for entry and other important biosecurity details.
- At a later date, creating RAZ corridors between the feed storage and RAZ of the mink shed and the manure/waste storage area and the RAZ of the mink shed would allow movement without the need to perform biosecurity procedures as they would be of equivalent biosecurity status. This would allow the removal of CAPs at those locations.

D: National Farm-Level Mink Biosecurity Standard: Advisory and Management Committees

The Standard's development benefited from comment and direction that were provided by the following members of the Advisory and Management Committees:

Mink Biosecurity Advisory Committee

- Dr. Arnost Cepica, Associate Professor, University of Prince Edward Island / Atlantic Veterinary College
- Nancy Daigenault, North American Fur Auctions (NAFA)
- Dr. Gord Finley, Veterinary Animal Health Consultant
- Jeff Gunn, Mink research – Nova Scotia Agricultural College
- Gary Hazlewood, Executive Director - Canadian Mink Breeders Association (CMBA)
- Dr. Bruce Hunter, Professor Emeritus, University of Guelph, Ontario Veterinary College (OVC)
- Paul Mauer, American Legend Cooperative (ALC)
- Tom McLellan, mink producer
- Jeff Mitchell, mink producer
- Marianne Patten, mink producer, CMBA provincial representative
- Brian Tapscott, Ontario Ministry of Agriculture and Food Rural Affairs (OMAFRA) – Alternative Livestock Specialist
- Richard Stern (alternate for Mr. Paul Mauer, ALC)

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