

Hantavirus Hazards and Control Practice

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1.0 Purpose

Hantavirus is a virus that exists in a variety of rodents although it is primarily limited to the deer mouse in North America.

The purpose of the Hantavirus Hazards and Controls Practice is to:

- a) Describe the risks of hantavirus and specify control measures,
- b) Comply with legislation, and
- c) Provide the operational framework for the identification, assessment, and control of hantavirus exposure on Cenovus facilities and worksites.

This practice in part responds to Cenovus's Environment, Health, and Safety Management System (EH&SMS) Element 2 – *Managing Risk and Change*. The Alberta and Saskatchewan regulatory requirements are found in [Appendix A](#).

2.0 Scope/Application

The Hantavirus Hazards and Controls Practice applies to all Cenovus worksites and encompasses contracted work activities where Hantavirus hazards may be present. This practice sets the minimum standards and expectations regarding protecting worker's health and safety from hantavirus hazards.

3.0 Hantavirus Hazards and Controls Process

3.1 What is Hantavirus Infection?

Hantavirus exists in a rodent's body (i.e., deer mouse), saliva, urine and faeces. Hantavirus infection (the virus) can occur via contact with live or dead rodents, rodent bites, contact with eyes, and contact with broken skin or open wounds, eating or drinking contaminated food, and inhalation or ingestion of contaminated materials or dust from dried mouse droppings, urine, and saliva from infected rodents. The most predominant hazard is inhalation where aerosols containing the virus are deposited into an individual's lungs.

There is no evidence that household pets or infected humans can transmit the disease.

3.2 Exposure

Exposure to hantavirus should be maintained as low as reasonably possible. Exposure may occur anywhere where workers could have contact with rodents, their saliva, urine, faeces, or materials that have become contaminated with the above. Certain areas are more likely to harbour rodents than others such as attics, crawlspaces, field buildings, insulated pipe, etc. As a result, some workers may be more likely to encounter hantavirus than others. Those who may be exposed include:

- a) Anyone working or living (workers, farmers, hikers, and campers) in rodent-contaminated sites or buildings (e.g., control rooms and camps);
- b) Personnel who enter field site buildings (outbuildings);
- c) Personnel involved in mouse cleanup;
- d) Personnel who are required to access ceiling, wall, floor, or subfloor spaces such as electricians and insulators; and
- e) Personnel handling and receiving records and files stored or once stored at a field site (outbuildings).

3.3 Health Effects

A number of cases of hantavirus infection have been reported in Alberta in the last few years. Deer mice are the main carriers of hantavirus, although it is possible that other rodent species such as field mice, voles, and rats may also carry the disease. Hantavirus can cause a serious lung infection, called Hantavirus Pulmonary Syndrome (HPS) with an average fatality rate of 40 to 50%.

It is important to know the symptoms of Hantavirus Pulmonary Syndrome (HPS), since early treatment can significantly improve the chance of survival. Initial symptoms typically occur 4 to 42 days after first exposure (usually between 10 and 14 days) and consist of the following:

- a) Fevers of up to 40° C
- b) Headache, nausea, and vomiting
- c) Fatigue, weakness, and chills
- d) Diarrhoea
- e) Muscle aches
- f) Cough
- g) Severe abdominal pain

Although the above symptoms can all be caused by the flu; with HPS, the muscle aches affect mainly the lower back, buttocks, thighs, and other large muscle groups. The abdominal pain in HPS may be so severe that it is sometimes confused with acute abdominal disease, such as appendicitis. The patient usually feels much worse than a medical assessment would suggest. These facts may be useful in differentiating between flu and hantavirus infection.

The second stage starts with shortness of breath. This is due to collection of fluid in the lungs (pulmonary oedema) and is the primary symptom of HPS. Later on, a cough may develop. The HPS disease, however, can be confirmed through specific medical tests.

Subsequent symptoms consist of shortness of breath because of pulmonary edema and subsequent death.

3.3.1 Health Monitoring and Treatment

- a) Health monitoring is not required for hantavirus exposure unless it's a requirement of a Hantavirus Exposure Plan; however, if you feel ill and suspect hantavirus may be the cause, seek medical attention immediately.
- b) Do not delay if you experience the above symptoms and have had recent contact with rodents or their droppings; make sure the doctor is aware of exposure history.
- c) There is no specific cure for HPS. However, treatment aimed at combating the damage caused to the body by the infection (supportive therapy) can be effective in saving lives.

3.4 Hantavirus Hazards and Control Procedures

3.4.1 Hazard Assessment and Control Measures

All reasonable efforts must be made to eliminate the hantavirus hazard where possible. Working in an area or with materials that may be contaminated would require a hazard

assessment. If and when rodents or rodent contamination is identified, the hazards need to be controlled by means of engineering controls and/or administrative controls.

Note: Depending on the severity of infestation, a Rodent Management and Control Plan may be required; see the following section for details.

1. **Engineering controls** should consist of the use of dust suppression methods such as the use of disinfectant sprays such as 1/5 dilution of household bleach to minimize dust generation. Disinfectant sprays should be applied in manner that does not create dust.
2. **Administrative controls** should consist of procedures and training on controlling hantavirus hazards.
3. Where these controls cannot be used or are not effective, **personal protective equipment** is the next line of defence.
 - a) Respiratory protection shall be used when conducting inspections or other work in areas known to be or likely to be contaminated or when conducting mouse cleanups. Respiratory protection shall consist of, at a minimum, a half-mask respirator (NIOSH-approved) equipped with P100 filters. For additional information, refer to the Cenovus **Respiratory Protection** Code of Practice.
 - b) Disposable impervious gloves must be used. If significant body contact is expected or for larger areas of contamination cleanup where more dust may be generated, workers should use full body disposable suites equipped with hoods.

Important Note: All affected workers (i.e., the work crew) **must** be included in the pre-job hazard assessment and in the control or elimination of those identified hazards. Further, all other workers at the worksite must be informed of the hazards and of the methods used to control or eliminate the hazards.

3.4.2 Pre-Job Safety Meeting

Prior to starting the cleanup, the Permit Issuer will hold a pre-job safety meeting with all workers or contractors involved in the work where all aspects of the cleanup, additional PPE, and respiratory protective equipment use (RPE) will be discussed.

3.4.3 Safe Work Permit

A Safe Work Permit will be issued for all cleanup operations requiring the use of RPE.

However, the Worksite Supervisor will decide if a SWP is required for small localized cleanup of droppings, the removal of dead rodents, or the setting of traps and bait according to agreed-to guidelines of the business unit (BU).

Note: All exposure incidents and cleanups regardless of their size will be reported in the Incident Management System which may also include an advisory being released.

3.5 Rodent Management/Control Program

The best control against hantavirus is preventing the presence of rodents on the worksite by implementing a Rodent Management/Control Program. This is the single most important step in reducing the risk of infection.

In Saskatchewan, the BU will ensure the program complies with Section 85 of the OHS Regulations which requires an Exposure Control Plan.

1. A Rodent Management/Control Program generally consists of a variety of elements to be effective and the specific elements for your worksite are dependent on a number of variables such as cost, efficacy, health and safety, environment, etc. Elements to be considered include the following:

- a) **Inspection** - regular inspection of facilities for the presence of rodents, rodent faeces, nesting materials, or other signs of their presence such as holes.
- b) **Communications** - informing workers of the disease risk, how it is transmitted, and the signs and symptoms of the disease.
- c) **Sanitation** - properly secure and dispose of all potential food sources.
- d) **Exclusion** - limit rodent entry into buildings by sealing holes ¼ inch or larger with metal wool or concrete mixtures and by limiting foliage growth around buildings; see following for additional precautionary measures.
- e) **Trapping** - the use of traps to catch and kill rodents.
- f) **Baiting** - the use of rodenticides to poison the rodents. Encouraging natural predators, such as cats, to eliminate rodents is not recommended because it runs contrary to other Cenovus policies and practices.

Note: Depending on the severity of infestation, the BU should consider hiring a pest control company for professional extermination services.

2. A Rodent Management/Control Program includes the following precautionary measures:

- a) Do not occupy rodent-infected buildings until they are cleaned.
- b) Do not drink untreated surface water.
- c) Do not disturb mouse nests. Do not dry sweep or use an air hose to clean in areas where signs of mice exist, especially where droppings are present. Ensure decontamination procedures (including PPE) are followed.
- d) Follow Cenovus's **Well site and Facility (Process Building) Entry Practice** and ventilate closed buildings before working in them.
- e) Do not handle live wild rodents.

3. A Rodent Management/Control Program implements the following measures to control rodent populations:

- a) Mouse-proof buildings to prevent entry of rodents. Seal holes larger and ¼" diameter with steel wool, steel mesh screens, sheet metal or mortar. Mice can get through very small holes.
- b) Look for signs of rodents in daily inspection routines or building entry procedures.
- c) Store food and water in secure cabinets or in containers with sealing lids.
- d) Clear brush and grass away from buildings.
- e) Mouse-proof garbage cans by using tight fitting lids or elevating them.

3.6 Trapping and Removing Dead Rodents

3.6.1 Trapping Rodents

- a) In buildings use spring-loaded mouse traps. Bait the traps with dried fruit or peanut butter mixed with oats or cheese. Be sure the bait is securely attached to the trip pedal, or the trap may not spring when the food is removed.
- b) Set traps at right angles to the walls where the rodents are known to travel, with the bait side of the trap towards the wall. Bait the traps without setting them for the first few nights.

3.6.2 Removing Dead Rodents

- a) Spray the trap with a disinfectant prior to removing the rodent. Disinfectants (such as a 1:10 dilution of Javex or other household bleach, 70% alcohol, or most general purpose household disinfectants) are effective in killing the hantavirus. Make sure the label indicates the product is a disinfectant.
- b) Wearing gloves transfer the dead rodent to a disinfectant solution and soak before transferring it to a plastic bag. Close the bag with a twist tie, then place it in a second bag and seal it with a twist tie.
- c) Dispose of the bagged rodent by placing it in the regular garbage. Disinfect the area (do not reuse the disinfectant solution used to soak the rodent). Wash your hands and exposed skin surfaces thoroughly with soap and water.

3.7 Decontamination Procedures

Workers can become contaminated with hantavirus-contaminated materials by having the dust on their clothes, hands, or hair. Workers must be provided with adequate PPE to limit body contamination and must have adequate facilities and procedures in place to safely remove any contamination.

To clean up small areas of contamination; for example, where small amounts of droppings are present, do the following:

1. Prevent entry of unprotected personnel.
 2. Wear a respirator with high-efficiency particulate filter (N-100, R-100 or P-100); goggles; and nitrile, rubber, or other impervious disposable gloves (not leather).
 3. Spray with 1/5 dilution of household bleach (70% ethyl alcohol, rubbing alcohol, and most household disinfectants probably also work). Soak the material thoroughly. In doing this, avoid using a stream of water which may stir up dust (use a fine mist).
- Cautionary Note:** In areas contaminated with oil, there could be a hazardous reaction with the chlorine in bleach resulting in possible inhalation and/or explosion hazards as well.
4. Scoop up material; seal in double plastic bags and label bags. If material is soaked through with disinfectant, the bags can be disposed of in the regular garbage. If not, incineration is required.
 5. Wash down area with disinfectant and detergent.
 6. Leave work area and dispose of gloves. Remove respirator.
 7. Use the same precautions for picking up dead mice (e.g., from traps). Put on disposable impervious gloves and spray the carcass with bleach solution. Disinfect all traps with bleach solution.
 8. For larger areas of contamination, where dust will be produced during the cleanup, wear disposable coveralls with hood.
 9. After the work has been completed, remove coveralls and gloves.
 10. While eye protection and respirator are still in place, carefully wipe them over with a paper towel or cloth soaked in disinfectant, avoiding contact with the skin and eyes. Also, disinfect boots, if contaminated.
 11. Remove eyewear and respirator.
 12. Disinfect eyewear and outside surfaces of respirator.

4.0 Training

All employees who may be required to work in areas where rodent contamination may be present must be trained in hantavirus awareness. Training will at a minimum include:

- a) Alberta and Saskatchewan regulatory requirements.
- b) Communication and monitoring for the control of hantavirus
- c) Application of hazard identification and control tools including applicable permits, procedures, worksheets, etc.

Note: It is a legal requirement that workers must use the procedures appropriately and apply the training.

5.0 Roles and Responsibilities

Roles and responsibilities for safety documents are described in the link below:

Cenovus CEN-EHS234, Roles and Responsibilities Standard

Roles and responsibilities specific to Hantavirus Hazard and Control are described below:

5.1 Business Unit/Asset Team and all Workers

All Cenovus employees and contractors are responsible for reporting signs of rodent infestations to their Supervisor and depending on the severity of the infestation, stopping the work if necessary according to agreed-to guidelines.

6.0 Principles

Hazard assessment and control practices and procedures are fundamental to the effective management of EH&S and are a part of the EH&SMS Element 2 – Managing Risk and Change.

7.0 References

7.1 Internal References

1. Cenovus CEN-EHS022, Risk, Risk Assessment and Risk Management Description
2. Cenovus CEN-EHS131, *Well site and Facility (Process Building) Entry Practice*
3. Cenovus CEN-EHS010, *Respiratory Protection*
4. Cenovus CEN-EHS108, *Personal Protective Equipment*
5. Cenovus CEN-EHS234, *Safety Responsibilities Standard*

7.2 External References

1. Work Safe Alberta, *Hantavirus: Information for Employers and Workers (1998)*
2. Saskatchewan OHS, *Hantavirus Disease Guideline for Protecting Workers and the Public (2006)*
3. CAPP, *Hantavirus Health Effects and Protection Guideline (2000)*

8.0 Change Management

Proposed changes to this practice can be directed to EH&S Development and MOC; email EH&S Document Management

9.0

Definitions and Acronyms

Definitions and acronyms for safety documents are described in the link below:

[Cenovus CEN-EHS243, Definitions and Acronyms](#)

The following definitions and acronyms are specific to Hantavirus Hazard and Control.

Bio hazardous Material means a pathogenic organism, including a blood borne pathogen, that, because of its known or reasonably believed ability to cause disease in humans, would be classified as Risk Group 2, 3, or 4 as defined by the Public Health Agency of Canada or any material contaminated with such an organism.

Expose means to come in harmful contact with an infectious material or organism from inhalation, ingestion, skin or mucous membrane contact, or percutaneous (i.e., needle/sharp-puncture) injury.

Hantavirus Pulmonary Syndrome (HPS) is a serious illness caused by a virus that is often fatal.

Harmful Substance means a substance that, because of its properties, application or presence, creates or could create a danger, including a chemical or biological hazard, to the health and safety of a worker exposed to it.

Hazardous Substance means a controlled product and a chemical, biological, or physical agent that, by reason of a property that the agent possesses, is hazardous to the health or safety of a person exposed to it.

Infectious Material or Organism means an infectious material or organism that has been identified in an approved manner as an infectious disease hazard that poses a significantly increased exposure risk to a worker or self-employed person.

Occupational Exposure means reasonably anticipated, harmful contact with blood or other potentially infectious bio hazardous materials that may result from the performance of a staff member's duties.

Other Potentially Infectious Materials means human body fluids, (e.g., semen, vaginal secretions, amniotic fluid), any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.

Rodent is a mammal belonging to the order Rodentia characterized by continuously growing incisor teeth. Common rodents include mice, rats, prairie dogs, beavers, etc.

Virus is a microscopic infectious agent that requires a host in order to replicate.

Appendix A

– Applicable Legislation

The Hantavirus Hazards and Controls Practice encompasses requirements of the following legislation.

1. Alberta OHS Code (2009)

- a) Part 2 – Hazard Assessment, Elimination and Control
 - Section 7 – *Hazard Assessment*
 - Section 8 – *Worker Participation*
 - Section 9 – *Hazard Elimination and Control*
 - Section 10 – *Emergency Control of Hazard*
- b) Part 4 – Chemical Hazards, Biological Hazards, and Harmful Substances
 - Section 16(3) – *Maintaining Exposure as Low as Reasonably Achievable*
- c) Part 35 – Health Care and Industries with Biological Hazards
 - Section 525.1 – *Exposure Control*
 - Section 528 – *Policies and Procedures*
 - Section 529 – *Limited Exposure*
 - Section 530 – *Post-Exposure Management*

2. Saskatchewan OH&S Regulations (to 2009)

- a) Part III – General Duties
 - Section 12 a) *General Duties of Employers*
 - Section 22 b) *OH&S Program – identification of existing and potential risks to the health and safety of workers.... and measures.....that will be taken to reduce, eliminate, or control those risks.*
- b) Part VI – General Health Requirements
 - Section 85 – *Exposure Control Plan*
- c) Part XXI – Chemical and Biological Substances
 - Part XXXI – *Additional Protection for Health Care Workers*