



Ammonia Utilization & Leak Art Hauser Centre

Prepared by: Carrie McCoshen, Recreation Coordinator

Approved by: Jody Boulet, Director of Community Services

Signature:  Practice No: 7.1.4

Effective: September 26, 2018 **Replaces:** June 13, 2018

Purpose:

To provide employees, contractors and emergency personnel a Safe Work Practice about the procedure to follow for entering the Ice Plant Room at the Art Hauser Centre in the case of an accidental leak of anhydrous ammonia. In reference to Section 307 of the Occupational Health and Safety Regulations, 1996, please note as follows:

Table 21 – Contamination Limits [Sections 307 & 309, clause 346(1)]

CAS Number	Substance	8 hour average contamination limit mg/m ³ * or ppm*	15 minute average contamination limit mg/m ³ or ppm	Notation ⁺
7664-41-7	Ammonia	25 ppm	35 ppm	

mg/m³ – milligrams of substance per cubic metre of air

ppm – parts (volume) of substance per million parts (volume) of air

Substances Listed in Table 21:

307(1) Subject to sections 306 and 308, where a chemical substance or biological substance listed in table 21 of the appendix is present at a place of employment, an employer shall:

- a) Provide adequate engineering controls, to the extent that is reasonably practicable to do so, to ensure that the contamination limit set out in Table 21 is not exceeded in any area where a worker is usually present; and
- b) Take all practicable steps to ensure that no worker’s personal exposure exceeds the contamination limit set out in table 21.

(2) An employer, in consultation with the committee, shall develop a written procedure that meets the requirements of subsection (3) where a chemical substance or biological substance listed in Table 21 of the Appendix is present at a place of employment in an airborne concentration that may be hazardous to a worker, and a worker:

- a) is regularly required or permitted to work more than 8 hours in a day or 40 hours in a week; or

- b) may be exposed to a combination or association of substances listed in Table 21 of the Appendix that have similar toxicological effects when acting on the same organ or body system.
- (3) a written procedure required by subsection (2) must identify:
- a) the substances to which a worker may be exposed;
 - b) the conditions under which a worker will be required or permitted to work, including the frequency, quantity and duration of exposure to the substances; and
 - c) the steps that the employer will take to ensure, to the extent that is practicable, that no worker's personal exposure exceeds the equivalent of the contamination limit set out in table 21 of the Appendix.
- (4) An employer shall implement a procedure developed pursuant to subsection (2).

Hazards: From Tanner Industries Anhydrous Ammonia Safety Data Sheet

Hazards: Acute Toxicity, Corrosive, Gases Under Pressure, Flammable Gas, Acute Aquatic Toxicity

Classification: Note: (1 – Most Severe – 4 – Least Severe)

Acute Toxicity, Inhalation (Category 4)

Skin Corrosion/Irritation (Category 1B)

Serious Eye Damage/Irritation (Category 1)

Gases Under Pressure (Liquefied gas)

Flammable Gases (Category 2)

Acute Aquatic Toxicity (Category 1)

Hazard Statements:

Harmful if inhaled

Causes severe skin burns and serious eye damage

Flammable gas

Contains gas under pressure: may explode if heated

Very toxic to aquatic life

PPE:

Eye/Face Protection: Chemical splash goggles should be worn when handling anhydrous ammonia. A face shield can be worn over chemical splash goggles as additional protection. Do not wear contact lenses when handling anhydrous ammonia.

Skin Protection: Ammonia impervious gloves and clothing (such as neoprene, butyl and Teflon) should be worn to prevent contact during normal operations, such as loading/unloading and transfers. Chemical boots can be worn as additional protection

Respiratory Protection: Respiratory protection approved by NIOSH (National Institute for Occupational Safety & Health) for ammonia must be used when applicable safety and health exposure limits are exceeded. For escape in emergencies, NIOSH approved respiratory protection should be used, such as a full-face respirator and canisters/cartridges approved for ammonia or SCBA (self-contained breathing apparatus). A SCBA is required for entry into ammonia atmospheres at or above 300 ppm (IDLH – immediately dangerous to life or health)

Procedure:

1. Facility Alarms: The Ice Plant room and entranceway into Ice Plant Room are equipped with 2 alarms – the Armstrong, located to the left of the door into the plant room from inside the facility and the Chillgard, located in the Ice Plant room on the South wall.



Armstrong – Normal Mode green light on Chillgard – Normal Mode – green light on

2. If an ammonia leak has occurred, the Ammonia Alarm system will activate, as follows dependant on the levels released:

Armstrong Alarm - will go into low alarm at 10 ppm. A yellow warning light on the controller will notify employees prior to entering the room. This low alarm starts the exhaust fan on a low speed.



Chillgard Detector will go into alarm at 25 ppm. Two strobe lights and sirens will be activated, one located above the entrance to the Ice Plant Room and the other located on the exterior of the building above the exit doors from the Ice Plant Room – Door 5



At 35 ppm, the Armstrong detector goes into high alarm with yellow and red warning lights on the controller along with a siren. The exhaust fans activate to high speed and then an alarm call out to the Alarm Service provider is activated. The Alarm Service Provider **will not** contact the Fire Department, but will contact the Art Hauser Centre Arena Alarm Call List, as the alarm could be a result of mechanical failure and not an ammonia leak.



NOTE: the Red Emergency Shut Off button will only shut down the equipment and will NOT isolate the leak. If the Red Emergency Shut Off button is pushed it will still have exhaust while the alarm is on. If there is no power, then the exhaust fan will not operate.

Note: the alarm key pad located by the small exterior door in foyer area will continuously show System Armed – All Zones Secure on the display. The alarm system will call out to the Alarm Monitoring Company who will contact the City of Prince Albert Arena Call List.



3. If the ammonia leak alarm system is in High alarm mode, the following process will be implemented:
 - a. Qualified staff (Arena Engineer or Maintenance II (if holds Engineer certification) or Refrigeration Mechanic) to investigate the status of the problem. Qualified staff will have a 15 minute average contamination limit at 35 ppm.
 - b. Qualified staff to isolate the problem for repair, if unable to isolate or repair, then proceeds to pull fire alarm and evacuate facility. If time to call Fire Department to inform them if staff have evacuated or public in facility and where the Muster point is. Give Fire Department an advance update so they may know what to expect upon arrival by calling 9-1-1, who will relay all information to Fire Department.
 - c. If staff is on site during alarm, wait outside to meet Fire Department arrival and provide update on status of the situation. A wind flag will be on the East rooftop for Fire Department to note the wind direction. Always stay out of the direction of the exhaust. It is also noted that the east side of the Art Hauser Centre has the exhaust and intake between the Ice Plant area Door 5



- d. If there is chance that employees are in the facility, then Fire Department will perform search and rescue. There is a key box located to the top right of Exterior East door 4 with a key to the Back Shop for access into the facility. There is also an Interior and Exterior master key



- e. In the event the alarm sounds after working or occupancy hours, then the qualified alarm Call-out Staff are enroute to investigate the alarm, then the employee will check in with 911 City Employees or Security Company (Refrigeration Mechanic) for compliance with Working Alone Safe Work Practice.
4. Upon safely resolving the problem, an OH&S Investigation Report will need to be completed and submitted to the Facility Manager within 48 hours of the leak/hazard.

References:

Art Hauser Centre Ice Plant Alarm Call-out List
Anhydrous Ammonia Safety Data Sheet
Art Hauser Centre Emergency Response Protocol & Plan