Anhydrous Ammonia Code of Practice
Summary of Protocol Changes
2017 to 2022 Edition

Overall Comments:

As part of Fertilizer Canada's commitment to continuous improvement, Codes of Practice are reviewed and updated on a five-year cycle. A revised Anhydrous Ammonia Code will come into force on January 1, 2022. The changes proposed from the 2017 Protocols fall into 4 categories:

1. Incorporation of Technical Bulletins issued since implementation of the 2017 Code. These changes are identified in Column 3 of the matrix below.
2. All previously "scored" items are now mandatory meaning all protocols in the Code must be satisfied for certification/recertification. These protocols are identified in Column 3 of the matrix below with an indication of "This protocol is now mandatory".
3. Other Substantive changes include regulatory changes, evolution of industry best practices etc. Details are provided in the matrix in Column 3.
4. Language throughout the code was updated to provide clarity and consistency and some sections required re-numbering. Many of these changes are considered minor and the associated Protocols are noted as "No substantive changes made" in the matrix.

As indicated above the following matrix summarizes the changes to individual protocols and identifies substantive changes.

#	2022 Proposed Code	Change from 2017 Edition
A	**SITING AND EXTERIOR REQUIREMENTS**	
A.1	A.1 Siting Requirements – Distance from People	
A.1.1	A.1.1 New and Expanded anhydrous Ammonia Storage and Handling Operations	
	A1.1.1 New Sites The minimum distances from occupancies for siting an anhydrous ammonia storage and handling operation certified under the Ammonia Code of Practice on or after January 1, 2011 are:	No substantive changes made

	(a) 1.5 kilometers from the border of a City, Town, Village or Hamlet, or from Evacuation-Sensitive facilities such as hospitals, schools, residential developments or senior citizens homes; and (b) 500 meters from any occupancy (e.g. a rural residence or a small business. Occupancy is defined in Section A1 of the User Guide); and (c) 50 meters from an environmentally sensitive area (lake, stream, wetland etc.); and Approval from the local authority having jurisdiction is also required.	
A1.1.2	Expansion at Existing Sites Capacity expansion at existing certified ammonia sites that are within the setback distances outlined in A.1.1.1 (grandfathered or municipally encroached sites) are required to meet additional protocols as defined in SECTION J – Expanded storage Capacity at Encroached Sites SITES. These requirements include: a) Preapproval by Fertilizer Canada b) Equipment and measures as outlined in the Anhydrous Ammonia Code of Practice Renovation Policy 3.6.2 Expanded Storage Capacity at Encroached Sites c) Approval from the local authority having jurisdiction d) Compliance with SECTION J – Expanded storage Capacity at Encroached Sites	New addition to reflect revised Renovation Policy which allows expansion at encroached sites with conditions.
A.1.2	All Operations Less Than 500 Metres from Population Concentrations or Less Than 100 Metres from any Occupancy. All anhydrous ammonia storage and handling operations located less than 500 metres from the boundary of a city, town, village, hamlet or from an evacuation-sensitive facility (e.g. hospital, school or senior citizens home), or less than 100 metres from any occupancy (e.g. rural residence). In order to minimize the risk to people from an accidental release of anhydrous ammonia, the following measures are required: (a) Where loading and unloading is conducted at the operation, pull-away protection shall be installed on liquid hose connections (both in load and out load).	Section (b) is removed from the 2022 Edition ~~(b) Additional security precautions shall be installed at the operation including:~~ ~~• If fencing is in place, all fencing must be topped by three strands of barbed wire.;~~ ~~AND~~

	All sites are required to have pull-away protection installed on <u>both</u> liquid and vapour hose connections (both in load and out load).	• ~~Some form of security lighting~~ With the change in Protocol A4.1 where fencing at all sites is mandatory, Section (b) is Redundant.
A.1.3	Communication with Local People	No substantive changes made
A2	Distance from Anhydrous Ammonia Storage and Handling Operation to Roadway or Railway	No substantive changes made
A3	Distance from Anhydrous Ammonia Storage and Handling Operations to Environmentally Sensitive Areas	No substantive changes made
A4	**Security for Anhydrous Ammonia Storage and Handling Operations**	
A.4.1	Anhydrous Ammonia Storage and Handling Security Fencing**:** The anhydrous ammonia storage and handling operation must incorporate measures to prevent unauthorized access to the product. All ammonia pressure vessels (stationary and/or mobile) and piping systems are secured within a security fence with lockable security gates. The minimum requirements for fencing of new sites, commissioned after January 1, 2019, is 6' chain link with a barbed wire top. Existing ammonia Code-compliant sites using fencing, as the primary means of site security / compliance with this Protocol, can continue to use either a 5-foot wire fence topped with three-strand barb wire or 6-foot chain link, with or without three strands of barbed wire. All sites must be fully secured when unattended.	Protocol A4.1 has been updated to reflect Bulletin # 04-2018 issued on October 4, 2018. The only means of acceptable site security is fencing.
A4.2	Unattended Storage Site Inspections Unattended sites must be inspected every two weeks while unattended.	This protocol is now mandatory.

A5	Operational Lighting The anhydrous ammonia storage and handling operation is equipped with sufficient lighting to allow for the safe transfer of anhydrous ammonia during night-time operations. All points around the storage vessels where anhydrous ammonia is transferred require dedicated lighting sufficient for work to be done safely.	This protocol is now mandatory.
A6	Emergency Exits	No substantive changes made
A7	Facility Signage The anhydrous ammonia storage and handling operation is equipped with required warnings and emergency response signage. The following information must be located at the entrance to the site: A7.1 Caution/Danger Anhydrous Ammonia A7.2 Authorized Personnel Only A7.3 No Smoking or Open Flames (both statements, or both pictograms are required) A7.4 After hours and daytime emergency contact numbers including company and emergency services A7.5 Signs must be equipped with letters on a contrasting background that makes the sign legible to approaching emergency services.	Previous A7.4 – *Nearest location of publically accessible phone* has been removed. Prior A7.5 is now A7.4. Prior A7.6 is now A7.5. Addition of pictograms to A7.3 A7 is now mandatory.
A8	Housekeeping	No substantive changes made
B	**FIXED STORAGE VESSEL AND EQUIPMENT**	
B1	Storage Vessel Design and Construction	
B1.1	Storage Vessel Construction	No substantive changes made
B1.2	Storage Vessel Supports	No substantive changes made
B1.3	Storage Vessel Maintenance & Testing	No substantive changes made
B2	Storage Vessel Valves, Piping and Gauges	

B2.1	Storage Vessel Emergency Shut-off Valves All storage vessels must be equipped with a positive emergency shut-off valve to stop the flow of product from the vessel in an emergency on all liquid lines except inlet lines equipped with check valves. – The emergency shut off must be able to be operated from both opposing ends of the storage vessel – Mechanical activating levers or devices for the emergency shut-off must be colour-coded blue – Electronic/Wireless Emergency Shut-off system activation devices shall be a red button with either a blue or yellow background labeled Emergency Stop	Protocol clarified: - Location of emergency shut off clarified - Electronic/wireless emergency shut-off, if used have been clarified.
B2.2	Storage Vessel Excess Flow Valves	No substantive changes made
B2.3	Storage Vessel Piping Systems, Valves & Fittings	No substantive changes made
B2.4	Storage Vessel Hose-end Valves	No substantive changes made
B2.5	Storage Vessel Safety Relief Valves	No substantive changes made
B2.6	Storage Vessel Safety Valve Rain Caps Safety relief valves shall be equipped with rain caps.	Changed to reflect Bulletin # 02-2019. Prior version required standpipes and rain caps. This protocol is now mandatory
B2.7	Storage Vessel Safety Relief Valve Certification	No substantive changes made
B2.8	Storage Vessel Hydrostatic Relief Valves	No substantive changes made
B2.9	Storage Vessel Piping	No substantive changes made
B2.10	Storage Vessel Fittings	No substantive changes made
B2.11	Storage Vessel Colour Coding	This protocol is now mandatory
B2.12	Storage Vessel Liquid Piping System Emergency positive shut-off valves	This protocol is now mandatory
B2.13	Storage Vessel Non-Stainless-Steel Flex Connectors	No substantive changes made

B2.14	Storage Vessel Gauges	No substantive changes made
B2.15	Storage Vessel Level Gauge	No substantive changes made
B2.16	Storage Vessel Pressure Gauge	No substantive changes made
B3	**Storage Vessel Hoses**	
B3.1	Hose markings for Anhydrous use	No substantive changes made
B3.2	MAWP Storage Vessel Hose Marking	No substantive changes made
B3.3	Storage Vessel Hose Expiry	No substantive changes made
B3.4	Storage Vessel Hose Couplings	No substantive changes made
B3.5	Storage Vessel Hose Testing	No substantive changes made
B3.6	~~When the site is unattended, the hose-end valves are secured against unauthorized access~~	Protocol Removed. With the change in Protocol A4.1 where fencing at all sites is mandatory, B3.6 is Redundant.
B4	**Storage Vessel Transfer Pumps and Compressors**	
B4.1	Storage Vessel Transfer Pump / Compressor	Clarify that documentation is required.
B4.2	Storage Vessel Transfer Pump and Compressor Guards	No substantive changes made
B4.3	Storage Vessel Transfer Pump and Compressor Mounting	No substantive changes made
B5	**Storage Vessel Labels and Markings**	
B5.1	Storage Vessel Labels The anhydrous ammonia storage vessel has been clearly labelled with “ANHYDROUS AMMONIA INHALATION HAZARD” in a colour contrasting from the white background of the pressure vessel. Letters must be a minimum of two (2) inches (50 mm) inches in height. Labelling must appear on the two long sides of the vessel.	Merged with Protocol B5.2 to incorporate “INHALATION HAZARD”. Minimum lettering size changed to aligned with code requirements. INHALATION HAZARD statement is now mandatory.
B5.2	Storage Vessel Placards	Former B5.3. Protocol is now mandatory.

B5.3	Storage Vessel WHMIS Labels	Former B5.4. No substantive changes made
B5.4	Storage Vessel Safe Handling	Former B5.5. Protocol is now mandatory.
B5.5	Storage Vessel Emergency First Aid Signage	Former B5.6. Protocol is now mandatory.
B6	**Bleed Off Containment**	
B6.1	Storage Vessel Bleed-off Containment:	No substantive changes made
B6.2	Storage Vessel Bleed-off Containment Tank Label	Protocol is now mandatory
B6.3	Storage Vessel Bleed-off Disposal	Protocol is now mandatory
B6.4	Storage Vessel Bleed-off Containment Tank Venting	Protocol is now mandatory
B7	**Personal Protective Equipment**	
B7.1 – B7.5	The anhydrous ammonia storage and handling operation is equipped with the required personal protective equipment. When handling, transferring and or repairing equipment that has potential for release that could cause injury from anhydrous ammonia, all required Personal Protective Equipment (PPE) must be worn. Examples where PPE is required to be worn include: • While connecting and disconnecting hoses for transfer (Note: when transfer operations are being completed (i.e. pumping is taking place) the operator can remove the PPE when in a safe area). • While bleeding equipment for transfer and after transfer operations are completed. • While personnel are performing maintenance, until all anhydrous ammonia has been evacuated from the equipment that is being maintained. Each employee working with ammonia at an anhydrous ammonia operation must have the following: B7.1 Full-face cartridge style respirator complete with extra cartridges. B7.2 One- or two-piece anhydrous ammonia resistant suit (neoprene). B7.3 Gauntlet style anhydrous ammonia resistant gloves (neoprene).	PPE requirements are the same. Addition of description to clarify when PPE is to be worn.

	B7.4 CSA approved safety boot with a minimum six inch upper. B7.5 Individual emergency water bottle filled with clean, fresh water.	
B8	**Emergency Equipment**	
B8.1 – B8.8	The anhydrous ammonia storage and handling operation is equipped with the required emergency equipment that is accessible and identifiable by all personnel. In addition to all personal protective equipment, specified in Section B7, the following designated emergency equipment is required: B8.1 Two anhydrous ammonia full-face respirators complete with spare canisters/cartridges. B8.2 If required by provincial regulations, two self-contained breathing apparatuses (SCBA). B8.3 Two one- or two-piece anhydrous ammonia resistant suits. B8.4 First Aid kit of a size appropriate for the number of employees at the site. B8.5 At minimum, a 10-pound charged ABC fire extinguisher (one located near each anhydrous ammonia transfer point). B8.6 Two water supplies are required for emergency requirements. Water supplies may be either safety showers or 200-gallon water troughs filled with clean, fresh water and labelled with a white cross on a green background to designate emergency response water. Troughs must be located within 10 metres of anhydrous ammonia transfer points. Water troughs must be located opposite to each other on either side of the storage vessel, considering the prevailing wind direction. Water must be heated to prevent freezing when transfer operations are occurring. B8.7 Emergency eyewash capability. B8.8 Two wind indicators must be located at the anhydrous ammonia storage operation in order to determine the wind direction for emergency response purposes	Emergency equipment requirements are the same. B8.5 is now mandatory B8.6 was updated to reflect Bulletin # 02-2018, the requirement for a white cross on a green background.

B9	**Electrical Code Compliance**	
B9.1	Storage Vessel Grounding	No substantive changes made
B9.2	Electric Motors	No substantive changes made
B9.3	Electrical Enclosures	No substantive changes made
B9.4	Emergency Heaters GFI	No substantive changes made
C	**TRANSPORT AND APPLICATION EQUIPMENT PART 1 – DELIVERY UNITS**	
C1	**Transport Vessel Design and Construction**	
C1.1	Transport Vessel Design, Construction, Operation and Maintenance	No substantive changes made
C1.2	Transport Vessel Canadian Registration Number (CRN)	No substantive changes made
C1.3	Transport Vessel Maintenance and Testing	No substantive changes made
C2	Transport Vessel Valves, Piping and Gauges	No substantive changes made
C2.1	Valves on Transport Vessel Liquid and Vapour Lines	No substantive changes made
C2.2	Transport Vessel Excess Flow Valves	No substantive changes made
C2.3	Transport Vessel Valves	No substantive changes made
C2.4	Transport Vessel Hose-end Valves	No substantive changes made
C2.5	Transport Vessel Safety Relief Valves	No substantive changes made
C2.6	Transport Vessel Hydrostatic Relief Valves	No substantive changes made
~~C2.7~~	Former C2.7 from 2017 Code was: T~~he transport vessel must have a means of securing discharge valves when left unattended.~~	Protocol Removed. With the change in Protocol A4.1 where fencing at all sites is mandatory, Former C2.7 is Redundant.

C2.7	Transport Vessel Piping	Former C2.8. No substantive changes made
C2.8	Transport Vessel Fittings	Former C2.9. No substantive changes made
C2.9	Transport Vessel Colour Coding	Former C2.10. Protocol is now mandatory
C2.10	Transport Vessel Flex Connector	Former C2.11. Protocol is now mandatory
C2.11	Gauges on Transport Vessel	Former C2.12. No substantive changes made
C2.12	Transport Vessel Level Gauge	Former C2.13. No substantive changes made
C2.13	Transport Vessel Pressure Gauge	Former C2.14. No substantive changes made
C3	**Transport Vessel Hoses**	
C3.1	Transport Vessel Hoses	No substantive changes made
C3.2	MAWP Transport Vessel Hose Marking	No substantive changes made
C3.3	Transport Vessel Hose Expiry	No substantive changes made
C3.4	Transport Vessel Hose Couplings	No substantive changes made
C3.5	Transport Vessel Hose Testing	No substantive changes made
C4	**Transfer Vessel Transfer Pumps**	
C4.1	Transport Vessel Transfer Pump for Anhydrous Ammonia The transfer pump must be approved by the manufacturer for anhydrous ammonia service. *Compliance will be based on documentation of the transfer pump type.*	Clarify that documentation is required.
C4.2	Transport Vessel Transfer Pump Guards	No substantive changes made
C4.3	Transport Vessel Transfer Pump Mounting	No substantive changes made
C5	**Transport Vessel Labels and Markings**	

C5.1	Transport Vessel Labels The anhydrous ammonia storage vessel has been clearly labelled with "ANHYDROUS AMMONIA INHALATION HAZARD" in a colour contrasting from the white background of the pressure vessel. Letters must be a minimum of two (2) inches (50 mm) inches in height. Labelling must appear on the two long sides of the vessel.	Merged with Protocol C5.2 to incorporate "INHALATION HAZARD". Minimum lettering size changed to aligned with code requirements. INHALATION HAZARD statement is now mandatory
C5.2	Transport Vessel Placards	Former C5.3. No substantive changes made
C5.3	Transport Vessel Pressure Test Labels	Former C5.4. No substantive changes made
C5.4	Transport Vessel Safe Handling Procedures	Former C5.5. Protocol is now mandatory
C5.5	Transport Vessel Emergency First Aid Procedures	Former C5.6. Protocol is now mandatory
C5.6	Transport Vessel Emergency Contact	Former C5.7. No substantive changes made
C6	**Transport Vehicle Emergency and Personal Protective Equipment**	
C6.1-C6.10	The anhydrous ammonia transport vessel is equipped with the required emergency and personal protective equipment. (a) Each transport vehicle must have the following: C6.1 First Aid kit C6.2 At minimum, 3A 10BC (5 lb) fire extinguisher with nozzle C6.3 Minimum of 20 liters (5 gallons) of clean, fresh emergency water C6.4 Roadside emergency kit C6.5 Communication device (e.g. cell phone or two-way radio) (b) Each transport operator must be supplied their own Personal Protective Equipment (PPE) as follows and be instructed on its use, limitations, inspection, and maintenance. C6.6 Full-face cartridge style respirator complete with extra cartridges	Emergency equipment requirements are the same. PPE requirements are the same.

	C6.7 One- or two-piece anhydrous ammonia resistant suit (neoprene) C6.8 Gauntlet style anhydrous ammonia resistant gloves (neoprene) C6.9 CSA approved safety boot with a minimum six inch upper C.6.10 Individual emergency water bottle filled with clean, fresh water (c) Transport Operators are required to wear PPE when handling, transferring and or repairing equipment that has potential for ammonia release that could cause injury from anhydrous ammonia. PPE is required to be worn • Any time a valve is being actuated (being turned on or off) • When a hose is being handled • When performing a connection or disconnection and/or performing any bleed down of connections • When troubleshooting or conducting maintenance operations on pressurized or potentially pressurized equipment such as meters or flow meters on application equipment. (Note: After connection and while filling there is no requirement for the operator to be fully dressed, for example while monitoring the transferring process, completing an inspection of the unit being filled, or updating documentation.)	Addition of description to clarify when PPE is to be worn.
C7	Transport Vehicle Certification	No substantive changes made
C8	**Security for Transport Vessels**	
C8.1	Securing While in Transport	No substantive changes made
C8.2	Parking Near Evacuation-Sensitive Occupancies	No substantive changes made
C8.3	Off-site storage of Transport Vessels	No substantive changes made
C8.4	Mobile Ammonia Vessels Delivery units must be stored at a certified site within a locked, fenced area that complies with the Code fencing requirements (see Section **Error! Reference source not found.**) or they have	Clarified that transport equipment must be stored within the fenced area (as per Protocol A4.1.

	been emptied and de-pressurized. Storing vessels inside a roofed structure is prohibited unless the vessel has been emptied and depressurized.	Clarified that pressurized vessels cannot be stored within a roofed structure. Referenced requirements for storage for farm sites certified under the Ammonia Code of Practice.
C	**TRANSPORT AND APPLICATION EQUIPMENT PART 2 – NURSE OR APPLICATOR TANKS**	
C9	**Nurse and Applicator Tank Design and Construction**	
C9.1	Nurse and Applicator Tank Design, Construction, Operation and Maintenance	No substantive changes made
C9.2	Nurse and Applicator Tank Specification	No substantive changes made
C9.3	Nurse and Applicator Tank Maintenance and Testing	No substantive changes made
C10	**Nurse and Applicator Tank Valves, Piping and Gauges**	
C10.1	Valves on Nurse and Applicator Tank Excess Flow Valve	No substantive changes made
C10.2	Nurse and Applicator Tank Valves Suitability	No substantive changes made
C10.3	Nurse and Applicator Tank Safety Relief Valve	No substantive changes made
C10.4	Nurse and Applicator Tank Hydrostatic Relief Valves	No substantive changes made
C10.5	Nurse and Applicator Tank Emergency Discharge Control a) All single nurse tanks with a capacity of 10,000 litres (2,642 USWG) or more, and b) all multiple nurse tank configurations, and c) all tanks manufactured on or after January 1, 2017, must be equipped with emergency discharge control as per CSA B620.	Clarified language in protocol. Previous version stated: Effective January 1, 2022, all existing nurse tanks (single with capacity of 10, 000 litres (2, 642 USWG) or more, or any multiple nurse tank configurations purchased before January 1, 2017, must be equipped with

	Compliance will be indicated by inspection of the equipment and demonstration of functionality. Documentation Certificate of Compliance must be referenced for compliance.	pull-away protection; unless regulations require them sooner.
C10.6	Nurse and Applicator Tank Piping	No substantive changes made
C10.7	Nurse and Applicator Tank Fittings	No substantive changes made
C10.8	Nurse and Applicator Tank Colour Coding	Protocol is now mandatory
C10.9	Nurse and Applicator Tank Hose Used for Piping	No substantive changes made
C10.10	Nurse and Applicator Tank Gauges	No substantive changes made
C10.11	Nurse and Applicator Tank Liquid Level	No substantive changes made
C10.12	Nurse and Applicator Tank Pressure Gauge	No substantive changes made
C11	**Nurse and Applicator Tank Hoses**	
C11.1	Nurse and Applicator Tank Approved Hoses	No substantive changes made
C11.2	MAWP Nurse and Applicator Tank Hose Marking	No substantive changes made
C11.3	Nurse and Applicator Tank Hose Expiry	No substantive changes made
C11.4	Nurse and Applicator Tank Hose-end Valve	No substantive changes made
C11.5	Nurse and Applicator Tank Hose Couplings	No substantive changes made
C11.6	Nurse and Applicator Tank Hose Testing	No substantive changes made
C11.7	Nurse and Applicator Tank Breakaway Coupler	No substantive changes made
C12	**Nurse and Applicator Tank Vessel Labels and Markings**	
C12.1	Nurse and Applicator Tank Labels The anhydrous ammonia storage vessel has been clearly labelled with “ANHYDROUS AMMONIA INHALATION HAZARD” in a colour contrasting from the white background of the pressure vessel. Letters must be a minimum of two (2) inches (50 mm) inches in height. Labelling must appear on the two long sides of the vessel.	Merged with Protocol C12.2 to incorporate “INHALATION HAZARD”. Minimum lettering size changed to aligned with code requirements.

		INHALATION HAZARD statement is now mandatory
C12.2	Nurse and Applicator Tank Placards	Former C12.3. No substantive changes made
C12.3	Nurse and Applicator Tank Pressure Test Labels	Former C12.4. No substantive changes made
C12.4	Nurse and Applicator Tank Safe Handling Procedures	Former C12.5. Protocol is now mandatory
C12.5	Nurse and Applicator Tank Emergency First Aid Procedures	Former C12.6. Protocol is now mandatory
C12.6	Nurse and Applicator Tank Emergency Contact	Former C12.7. Protocol is now mandatory
C13	**Nurse and Applicator Tank Personal Protective Equipment**	
C13.1 – C13.4	Nurse and Applicator Tank Personal Protective Equipment	No substantive changes made
C14	Nurse and Applicator Tank Tow Vehicle Requirements All vehicles used for towing anhydrous ammonia nurse wagons to and from the point of application of the product must meet minimum capacity requirements in accordance with the size of nurse tank they are towing. In addition to regulatory requirements, tow vehicles used for transporting anhydrous ammonia nurse wagons must be rated for the size and weight of the nurse tank they are towing. Refer to requirements specified in the applicable Highway Traffic Act. Commercial licenced vehicles transporting anhydrous ammonia requiring Commercial Vehicle Safety Alliance (CVSA) inspection must have current certification. Other vehicles must pass an annual safety inspection.	Protocol is now mandatory Clarified that Commercial licenced vehicles must have CVSA certification.
C15	Lighting Requirements for Towing Nurse and Applicator Tanks All anhydrous ammonia tanks or applicators being towed by licenced vehicles on roads must be equipped with lighting in accordance with the applicable Highway Traffic Act or Transport Regulation.	Protocol is now mandatory Addition of (d) Reflectors.

	If the size or configuration of the tanks or applicators being towed prevents following drivers from seeing the signal and/or brake lights of the towing vehicle, the tank or applicator must have the following equipment to provide warning to following drivers (either permanently or temporarily mounted): (a) Stop lights (b) Turn signal lights (c) Tail lights (d) Reflectors *Compliance will be indicated through visual inspection and functional demonstration of the equipment by the current Owner / Operator or person responsible indicating that all tow vehicles have been equipped with lighting (stop lights, turn signal lights, taillights) if following drivers cannot see tow vehicle signal and brake lights.*	Compliance requirement includes functional demonstration of equipment.
C16	**Security for Nurse and Applicator Tanks**	
C16.1	Security for Nurse and Applicator Tanks While in Transport	No substantive changes made
C16.2	Nurse and Applicator Tank Parking near Evacuation-Sensitive Occupancies	No substantive changes made
C16.3	Storage of Nurse and Applicator Tanks	No substantive changes made
C16.4	Securing of nurse and applicator tanks at farm locations Farmers must be instructed on the proper measures to take to secure nurse and applicator tanks at farm locations. These instructions must include: a) Nurse or applicator tanks must have their main access valves secured while they are being stored overnight at a farm location or in the field. Storing the vessels inside a roofed structure is prohibited unless the vessel has been emptied and de-pressurized. b) Nurse or applicator tanks that remain in the field overnight should be positioned to discourage tampering.	Protocol is now mandatory Clarified that pressurized vessels cannot be stored within a roofed structure. Referenced requirements for storage for farm sites certified under the Ammonia Code of Practice.

C17	**Nurse and Applicator Tanks Running Gear Inspection and Maintenance Protocol**	
C17.1	All nurse and applicator running gear shall be inspected and maintained to prevent running gear failures.	Protocol is now mandatory Clarified running gear inspections
C17.2	Nurse and Applicator Running Gear Preventative Maintenance Program A preventive maintenance program shall be in place for nurse and applicator running gear. Preventive maintenance programs shall include detailed visual inspection of tires, wheel bearings, frames, reaches, hitches and tank mountings. Inspections shall be completed seasonally, and records kept.	Clarified that the seasonal inspections do not include kingpins and piping assemblies
C17.3	Physical Inspection of Undercarriage A preventive maintenance program shall include a physical inspection including disassembly of wheel bearings, kingpins, frames, reaches, hitches and tank mountings. Inspections shall be completed every five (5) years and records kept.	No substantive changes made
C18	**MOBILE Tank Database** All sites are required to submit data electronically to Fertilizer Canada on all nurse tanks and applicator tanks owned by the operator and for all producer nurse tanks and applicator tanks that the site fills with anhydrous ammonia. Data is to be submitted every two years in advance of being audited/re-audited for certification under the Ammonia Code of Practice.	
C18.1	Data has been submitted to Fertilizer Canada for all retail-owned nurse tanks/applicator tanks within the current calendar year. *Compliance will be verified by checking the online reporting system for a submission by the site within the current calendar year.*	This is a new protocol and a mandatory requirement. Reference Bulletin 02-2021
C18.2	Data has been submitted to Fertilizer Canada for all producer owned nurse tanks/applicator tanks within the current calendar year. *Compliance will be verified by checking the online reporting system for a submission by the site within the current calendar year.*	This is a new protocol and a mandatory requirement. Reference Bulletin 02-2021
C18.3	Data has been submitted to Fertilizer Canada for all retail-owned Transport Delivery tanks within the current calendar year.	This is a new protocol and a mandatory requirement.

	Compliance will be verified by checking the online reporting system for a submission by the site within the current calendar year.	Reference Bulletin 02-2021
D	**TRAINING**	
D1	Facility General Safety Rules	Protocol is now mandatory
D2	Safe Operating Procedures	No substantive changes made
D3	TDG Training	No substantive changes made
D4.1	Driver Certification Driver licensing in accordance with applicable Provincial regulations is mandatory. *Compliance will be indicated through an examination of driver licences to indicate that staff required to operate transport vehicles have a current and appropriate license as required by provincial authorities*	Clarified compliance to include examination of driver licences
D4.2	Driver Abstracts	Protocol is now mandatory
D5	WHMIS Training	No substantive changes made
D6	**Occupational Health and Safety Training Programs**	
D6.1 – D6.3	Occupational Health and Safety Training Programs	Protocols are now mandatory
D7	**Emergency Training**	
D7.1	First Aid	No substantive changes made
D7.2	Cardiopulmonary Resuscitation (CPR)	No substantive changes made
D7.3	Fire Extinguisher Training	Protocol is now mandatory
D7.4	Respiratory Protection	Protocol is now mandatory
D7.5	Annual Respirator Fit Test	New protocol. Separated this requirement from D7.4 for greater clarity and emphasis.
D8	**Emergency Response Training**	
D8.1	Employee Emergency Response Training	No substantive changes made

D8.2	Emergency Responder Training	No substantive changes made
D8.3	Transportation Emergency	No substantive changes made
D9	Security	Protocol is now mandatory
D10	Contractor Safety	Protocol is now mandatory
D11	End User Education End users transporting and using anhydrous ammonia have been instructed on the proper safety and emergency response procedures every three years at minimum. *Compliance will be indicated through inspection of documentation demonstrating end users transporting and using anhydrous ammonia have been instructed on the proper safety and emergency response procedures at least every three years.*	Clarified compliance verification. A signed and dated letter is insufficient.
E	**DOCUMENTATION**	
E1	Employee Training Records	Protocol is now mandatory
E2	**Safe Operating Procedures**	
E2.1	Transfer operations	No substantive changes made
E2.2	Confined Workspace Entry, Lockouts and Elevated Work	Protocol is now mandatory
E2.3	Use and Maintenance of PPE	Protocol is now mandatory
E3	**Maintenance Records**	
E3.1	Annual Safety Inspection Records	No substantive changes made
E3.2	Hydrostatic Pressure Test	Protocol is now mandatory
E3.3	Running Gear Maintenance	No substantive changes made
E3.4	Pressure Vessel	Protocol is now mandatory
E4	Transfer of Product to Certified Sites	No substantive changes made
F	**EMPLOYEE KNOWLEDGE**	
F1.1-1.3	Safe Operating Procedures Knowledge	Protocols are now mandatory
F2.1 - F2.3	TDG Knowledge	Protocols are now mandatory

F3.1-3.5	Site Emergency Response Plan Knowledge	Protocols are now mandatory
F4	Care of Emergency Equipment Knowledge	Protocol is now mandatory
F5	WHMIS Knowledge	Protocol is now mandatory
F6.1-F6.2	Security Procedures Knowledge	Protocols are now mandatory
F7	Inspection of Equipment Knowledge	Protocol is now mandatory
G	**EMERGENCY RESPONSE**	
G1	Written Emergency Response Plan	Collapsed G1.1-G1.13 into 1 protocol G1. Moved former G1.7 ERAP to G10
G2	Communication of Emergency Response Plan	No substantive changes made
G3	Risk Assessment	Protocol is now mandatory
G4	**Copies of the Emergency Response Plan**	
G4.1	A copy of the emergency response plan is kept at the anhydrous ammonia operation.	No substantive changes made
G4.2	A copy of the emergency response plan is kept at a secure off-site location.	Protocol is now mandatory
G4.3	A current hard copy of the emergency response plan must be in a blue weather-proof container near the entrance to the ammonia operation	No substantive changes made
G5	The emergency response plan for the anhydrous ammonia operation has been reviewed, had its contents verified and updated within the past 12 months	No substantive changes made
G6.1-G6.3	Emergency Contact List	Collapsed G6.1-G6.3 into 1 protocol G6. Protocols are now mandatory

G7	**Emergency Response Drill**	
G7	An exercise has been conducted on the emergency response plan in order to enhance the plan, familiarize participants with their duties and identify any gaps in the plan within the past 12 months.	No substantive changes made
G7.2	Emergency Response Simulation If applicable, a full-scale Emergency Response simulation exercise has been conducted within the past five (5) years.	Removed and combined with G10.1
G8.1-G8.4	Contaminated Run Off Water	Protocols are now mandatory
G9	Incident Reporting Program	Collapsed 91.1 and G9.2 into 1 protocol G9. Protocols are now mandatory
G10	Environmental Emergency Requirements All Retail Anhydrous Ammonia sites with fixed storage facilities in quantities of 4.5 tonnes or more must have a process to comply with the Environmental Emergency (E2) Regulations of the Canadian Environmental Protection Act	
G10.1	E2 plans and procedures will be written and current with documentation maintained for a minimum of 7 years. Plan preparations, registrations and schedule submissions must be completed by required deadlines. Annual E2 Plan practice is required (could be a table-top exercise). A full E2 Plan practice simulation exercise is required every 5 years.	Moved from G7.2 Added as per Bulletin # 04-2019 incorporating 2019 Environmental Emergency Regulations.
G10.2	Emergency Response Assistance Plan (ERAP) All Anhydrous Ammonia Sites/Locations that have Delivery Units must apply for and have a valid Transport Canada Approved Emergency Response Assistance Plan (ERAP). All Anhydrous Ammonia Sites/Locations that have Nurse Wagons that exceed 10,000 litres in capacity must apply for and have a valid Transport Canada Approved Emergency Response Assistance Plan (ERAP). (Note: ERAP number will be the same for locations with Delivery Units and Nurse Wagons.)	Added as per Bulletin # 04-2019 incorporating 2019 Environmental Emergency Regulations.

H	RAILCARS AND EQUIPMENT	
H1	Railcar Design and Construction	
H2	**Railcar Loading and Unloading Operations**	
H2.1	Railcar Loading / Unloading	No substantive changes made
H2.2	Hose Valves	No substantive changes made
H2.3	Hose-end Valves	Protocol is now mandatory
H2.4	Fall Protection System	No substantive changes made
H3	**Railcar Vessel Hoses**	
H3.1	Hoses marked for NH3	No substantive changes made
H3.2	Hose Maximum Allowable Working Pressure	No substantive changes made
H3.3	Hose Expiration	No substantive changes made
H3.4	Hose Couplings	No substantive changes made
H3.5	Hose Testing	No substantive changes made
H4	**Transfer Pumps or Compressors**	
H4.1	Transfer Pump Suitable for NH3	Clarify that documentation is required.
H4.2	Transfer Pump Guards	No substantive changes made
H4.3	Transfer Pump Securely Mounted	No substantive changes made
H5	**Railcar Labels and Markings**	
H5.1	Railcar Marking – Anhydrous Ammonia	No substantive changes made
H5.2	Railcar Marking – Inhalation Hazard	No substantive changes made
H5.3	TGD Placards	No substantive changes made
H5.4	Pressure Test and Retest Dates	No substantive changes made
H6	The anhydrous ammonia storage and handling operation is equipped with the required personal protective equipment.	PPE requirements are the same. Addition of description to clarify when PPE is to be worn.

	When handling, transferring and or repairing equipment that has potential for release that could cause injury from anhydrous ammonia, all required Personal Protective Equipment (PPE) must be worn. Examples where PPE is required to be worn include: • While connecting and disconnecting hoses for transfer (Note: when transfer operations are being completed (i.e. pumping is taking place) the operator can remove the PPE when in a safe area). • While bleeding equipment for transfer and after transfer operations are completed. • While personnel are performing maintenance, until all anhydrous ammonia has been evacuated from the equipment that is being maintained. Each employee working with ammonia at an anhydrous ammonia operation must have the following: • Full-face cartridge style respirator complete with extra cartridges. • One- or two-piece anhydrous ammonia resistant suit (neoprene). • Gauntlet style anhydrous ammonia resistant gloves (neoprene). • CSA approved safety boot with a minimum six inch upper. • Individual emergency water bottle filled with clean, fresh water.	Collapsed H6.1-H6.5 into one protocol H6.
H7.1 – H7.8	Emergency Equipment	No substantive changes made. H7.5 – Fire extinguisher is now mandatory.
H8	**Railcar Security**	
H8.1	Railcar Seals	No substantive changes made
H8.2	Pre-Release Inspection	No substantive changes made
I	**INSURANCE**	
I1	Insurance Requirements	No substantive changes made

J	EXPANDED STORAGE CAPACITY AT ENCROACHED SITES	
J	This section contains audit protocols that are only required for grandfathered or encroached sites that undergo renovations to expand storage capacity. This section does not apply to renovations on sites that meet the minimum setback requirements as set out in Section A.1.1. See 3.6.2 Expanded Storage Capacity at Encroached Sites (page 23 of Protocol guide.	
J.1 to J4	These are new protocols are specific to encroached sites seeking to expand fixed storage capacity.	New protocols

POLICY ADDITIONS/AMENDMENTS:

In addition to specific protocol amendments the following policies have been amended/added to the introductory section of the 2022 Ammonia Code of Practice:

Bulletin #	Title	Comments
02-2020	Updates to Strengthen the Ammonia Code of Practice Enforcement Policy: Introducing Fines for Incidences of Chronic Non-Compliance.	Update to the Compliance and Enforcement Policy (3.1). Revisions also reflected in the Appeals Process Policy.
04-2020	Interpretation of Protocols A4.1, C8.4 and C16.4 for Producers Certified Ammonia Sites	Clarification made in the Code preface to clarify the new requirements for security at farm sites certified under the Ammonia Code of Practice.
01-2021	Updates to the Renovation Policy for Protocol A.1 – Expansion of Fixed Ammonia Storage Capacity at Operations Certified Under the Ammonia Code of Practice.	Addition to the Renovation Policy, Section 3.6 which now permits the addition of fixed storage capacity at encroached sites with conditions.