

Underground Storage Tank Regulations

Under the authority of Chapter 111, Section 31 of the Massachusetts General Laws, the Board of Health has adopted the following regulations to prevent and detect leakage of underground storage tank contents into the surrounding soil and thus protect against possible contamination of water supplies in the Town of North Reading. These regulations are intended as an aid to the Board of Health in enforcing Article 13 of the North Reading General By-Laws (Hazardous Materials Storage By-Law). Nothing in these regulations should be construed as inconsistent with Fire Protection Regulations 527 CMR 9:00.

Section 1 – Definitions:

1.1 The words, terms or phrases listed below for the purpose of these regulations shall be defined as follows:

Underground Storage Tanks: Shall mean any storage containment system including piping in connection therewith, which meets at least one of the following criteria:

- a) The top of which is located below ground
- b) Any portion of which is four feet or more below ground.

“Underground storage tank” shall not include the storage of fuel oil for heating purposes in a freestanding container within a building.

Qualified Person: A representative certified by the tank’s manufacturer or the manufacturer of the product being installed or tested.

Cathodic Protection System: A system which inhibits the corrosion of a tank or its components either through the sacrificial anode or the impressed current method of creating a corrosion-inhibiting electrical current. (reference: API publication 1632-First Edition 1983).

Leak Detection System: A full time approved system installed for the purpose of early detection of leaks. Minimum standards of in-tank monitoring systems shall consist of in-tank equipment which provides continuous monitoring of any liquid from the tank at a minimum rate of .05 gallons per hour or equivalent leakage over a period of time.

Also see 527 CMR 9.02 and Chapter 13 of the Town of North Reading General By-Laws (Hazardous Materials Storage By-Law).

SECTIONS 2 THROUGH 4 APPLY TO ALL UNDERGROUND STORAGE TANKS IN THE TOWN OF NORTH READING.

Section 2 – Identification:

2.1 All owners of underground storage tanks registered with the North Reading Board of Health must affix a metal tag to the fill pipe of the tank. Such tags will be provided by the Board of Health. Tags must be placed in such a location on the fill pipe of the tank as to be visible to any inspector authorized by the Town.

UST Regulations

-2-

Section 3. – Testing For Tightness:

3.1 All owners of underground storage tanks must notify the Board of Health and the Fire Chief 48 hours in advance of an underground storage tank test.

3.2 All tests shall be administered by a qualified person approved by the Board of Health and the Fire Chief.

3.3 All non-residential steel or fiberglass reinforced plastic (FRP) subsurface tanks and their piping shall be subject to mandatory testing at the owners expense, on the 10th, 13th, and 15th years following the date of installation and annually thereafter in accordance with the National Fire Protection Pamphlet No. 329, Ch 4-3.11. If evidence of the date of installation is not available and the Board of Health or the Fire Chief so determine, the tank and its components must be tested at the owners expense.

- 3.4 In the event that a particular tank and its piping indicate a leak rate of .050 gallons per hour or greater the Board of Health and the Fire Chief must be notified of such within 12 hours of the time the owner or operator is informed of the leak rate.
- 3.5 All owners of underground storage tanks shall supply the Board of Health and the Fire Chief with a certified copy of all test results for a tank and its piping within one week of receipt of such results. Test results must state whether the tank passed or failed the test and the leak rate of the tank.
- 3.6 In the event that a particular tank and its piping indicate a leak rate of .050 gallons per hour or greater the tank shall be isolated from its piping and retested. Underground Storage Tanks in the Town's Water Supply Recharge areas (aquifer protection zones) must be retested within one week of the time the owner is notified of the original test results.
- 3.7 In the event that retesting confirms that the source of the leak is the piping for a particular tank, the owner or operator shall take that tank out of service immediately as per 527 CMR 9:19:1(c).
- 3.8 In the event that retesting confirms that the source of the leak is a particular tank, the owner shall within 24 hours cause that tank to be emptied of all its product as per 527 CMR 9:19:1 (d). Tanks in the Town's water supply recharge areas (aquifer protection zones) must be emptied within 12 hours of the time that retesting confirms that the source of the leak is that tank.
- 3.9 The Fire Chief shall determine whether any tank or its piping which has been identified as the source of a leak shall be removed and replaced or may be repaired and shall notify the owner of the decision as per the North Reading General By-Laws Chapter 13, Section 7.3.10 No underground storage tank which has leaked as a result of corrosion shall be relined as per 527 CMR 9.20:1.

Section 4. – New and Replacement Installations:

- 4.1 New installations of underground storage tanks are NOT permitted in the Town's water supply recharge areas (aquifer protection zones) as per the North Reading General By-Laws Article 20, Section 8.7.4.
- 4.2 . A Special Permit must be obtained from the Board of Appeals to replace an existing

UST Regulations

-3-

Underground storage tank in the Town's water supply recharge areas (aquifer protection zones) as per the North Reading General By-Laws Article 20, Section 8.4.7.

- 4..3 An application for a permit to install or replace underground storage tanks must be submitted to the Board of Health. The Board of Health must act on an application for a permit to install underground storage tanks within thirty (30) days of receipt of plans.
- 4.4 A permit to install a new underground storage tank or replace an existing underground storage tank must be obtained from the Board of Health before any installation construction may begin.
- 4.5 A Hazardous Materials Storage Permit must be obtained from the Fire Chief for all new and replacement underground storage tanks prior to installation.

Section 5 through 20 of this regulation applies to ALL non-residential underground storage tanks and to those residential underground storage tanks located in the Town's water supply recharge areas (aquifer protection zones).

Section 5 – Construction Plans and Specifications:

- 5.1 Four (4) copies of the proposed underground storage tank plans and specifications, drawn up

by a registered professional engineer containing the following information must be submitted to the Board of Health accompanied by a permit application and a fee of \$50.00, before a permit to replace or install an underground storage tank is approved.

- a. Location, size and type of all proposed tanks and related piping.
- b. Type of material to be stored in all tanks as per 527 CMR 9:00.
- c. Specifications and location of an approved leak detection system and overfill protection.
- d. A locus plan showing the distance of the tank to the nearest Town and/or private wells, as well as the seasonal high groundwater elevation within 500 feet of the proposed underground storage tank(s).
- e. Location of property lines, public ways, existing and proposed buildings and structures, individual sewage disposal systems and reserve areas, facilities for surface water drainage and any other subsurface utilities.
- f. Detailed specifications and locations of observation wells, monitoring wells and monitoring devices (ie. size, depth to groundwater, cross sectional profile, crowning etc.).
- g. Detailed tank and piping specifications showing tank elevation, cross sectional profile, depth of tank etc.
- h. Copy of Installer Certification Certificate.
- i. Installation and testing schedule for tank(s) and its components.
- j. All plans must bear the stamp and seal of a registered professional engineer on each page (licensed by the Commonwealth of Massachusetts). The plans shall also include the name of the engineer and the company contact person who will be on site. The engineer is to inspect and certify all phases of the installation and submit a written letter of certification along with as-built plans to the Fire Chief and the Board of Health.

Section 6. Installation Requirements:

- 6.1 No underground storage tank shall be installed unless the owner of the tank has given at least a one (1) week notice of its installation to the Board of Health and the Fire Chief.
- 6.2 No new or replacement underground storage tank shall be buried or concealed until it has been inspected, tested for tightness and approved by the Fire Chief or his designee as per 527 CMR 0.15.1.
- 6.3 No underground storage tank shall be installed except by a contractor who has been licensed by the Commonwealth of Massachusetts for that purpose or certified in writing by the manufacturer as qualified for that purpose.
- 6.4 All underground storage tanks shall be installed in accordance with the manufacturers' instructions and in compliance with the Massachusetts General Laws Chapter 21C and with the provisions of 527 CMR 9.00, et seq., as amended; provided that the backfill material for any fiberglass reinforced plastic (FRP) underground storage tank shall be pea gravel or crushed stone and that the backfill material under all underground storage tanks shall be clean non-corrosive sand, free of stones, cinders and any other foreign material.

Section 7 – Design and Construction:

- 7.1 All new and replacement underground storage tanks shall be designed and constructed to provide maximum protection against corrosion and leakage. Only the following systems shall be permitted:

- A. UL listed fiberglass reinforced plastic (FRP) double walled tanks that:
 - 1. Use materials compatible with the product stored therein.
 - 2. Are corrosive resistant
 - 3. Contain a vacuum or air pressure, in the interstitial space for continuous monitoring.
 - B. Double walled steel tanks that:
 - 1. Are compatible with the product stored therein
 - 2. Meet the Steel Tank Institute 3-way protection (STI-P3) for external corrosion
 - 3. Have cathodic protection, a bonded di-electric coating on the outside (coal tar epoxy or urethane) and electrical isolation from other components.
 - 4. Contain a vacuum or air pressure, in the interstitial space for continuous monitoring
 - C. Any other double walled containment type of tank construction approved by the Board of Health and the Fire Chief.
- 7.2 All new or replacement underground storage tanks shall be equipped with a metallic or non-metallic striker plate at least 12x12 inches in area and at least ¼ inch thick, attached to the bottom of the tank under each fill and gauge opening.
- 7.3 All remote pumping systems for underground storage tanks shall be equipped with delivery line leak detectors.
- 7.4 All underground storage tanks must be properly anchored with a concrete pad or deadman anchors or any other equivalent or superior method approved by the Board of Health and the Fire Chief.

UST Regulations

-5-

Section 8 – Piping:

- 8.1 Piping may be double walled stainless steel, fiberglass reinforced plastic (FRP) or steel. All new or replacement steel pipes shall be protected against corrosion by the use of cathodic protection and electrical isolation.
- 8.2 All piping for new and replacement underground storage tank systems shall be designed, constructed and installed so as to allow testing for tightness without the need for disturbing elements of the storage system.
- 8.3 Product, fill and delivery lines shall each be installed in a single trench between the fill or delivery point. The trench shall be constructed so that there is a continuous heat sealed polymer lining extending from the pipe island to the tank, laid in a bed 3/8" diameter pea gravel with the same material surrounding the liner or as required by the tanks manufacturer.
- 8.4 After the fill and product lines have been tested, a liner shall be wrapped over the lines forming a secondary containment shield.
- 8.5 All vent lines shall be installed in a single trench.
- 8.6 Filler pipes shall extend down to within four (4) inches of the bottom of the tank.
- 8.7 Exposed threads of metallic pipe shall be coated with a coal tar product.
- 8.8 All pipes connected to underground storage tanks shall lead from the tops of such tanks as per 527 CMR 9.11:4.

Section 9. – Tank Liners/Vaults:

- 9.1 All underground storage tanks must contain an impervious geotex liner which lines the entire excavation, the liner shall be attached to manholes to contain releases from leaks in components and piping. Installation of the liner must be in accordance with the manufacturers' instructions and must be done by personnel trained and certified by the manufacturer. All liners must be guaranteed by the manufacturer to function properly for ten

- (10) years or other suitable time period approved by the Board of Health and the Fire Chief.
- 9.2 At the discretion of the Board of Health a concrete vault with an epoxy coating may be used in place of an impervious liner. In such a case the same standards and guarantees shall apply as those required for liners.
- 9.3 Concrete vaults must be tested for density, yield, air slump and compression by a qualified person approved by the Board of Health and the Fire Chief.

Section 10 – Leak Detection:

- 10.1 All leak detection equipment must be inspected and tested upon completion of the installation by a qualified person and annually thereafter.
- 10.2 All leak detection equipment shall be equipped with an audible alarm and warning lights which must be maintained in good working order by the owner of the tank.
- 10.3 All leak detection equipment shall contain a test button.

UST Regulations

-6-

Section 11 – Cathodic Protection:

- 11.1 All cathodic protection systems shall be tested annually by a qualified person and shall have negative voltage of at least 0.85 volts at all times as measured by a test box, between the structure being protected and saturated copper-sulfate reference electrode. This measurement shall be made with sacrificial anodes attached or, if impressed current be used, with the rectifier on.

Section 12 – Soil Testing:

- 12.1 A sample of soil from the tank excavation must be tested prior to tank installation.
- 12.2 A certified copy of the test results must be forwarded to the Board of Health and the Fire Chief to determine if soil characteristics meet DEQE regulations for soil quality before the tank is installed in the ground.

Section 13 – Monitoring:

- 13.1 All underground storage tanks must have a total of four (4) monitoring wells, located on each side of the liner or vault. Upon completion of the tank installation and at any future time at which the Board of Health or the Fire Chief may request, groundwater samples must be taken and tested by a certified laboratory for EPA method 624 or its performance equivalent. Copies of the test results must be forwarded to the Board of Health and the Fire Chief.
- 13.2 Monitoring wells shall be constructed of factory perforated or slotted PVC pipe, galvanized or coated metallic pipe with .020 inch openings. The wells shall be surrounded with permeable backfill material to permit water released product to flow freely into the well.
- 13.3 Wells must be capped and locked after the water samples have been obtained.

Section 14 – Tank Testing:

- 14.1 All new and replacement underground storage tanks must have an air pressure test performed at not less than 3 pounds per square inch and not more than 5 pounds per square inch. The test must be performed by a qualified person prior to the installation of the tank(s).

14.2 All new and replacement piping connected to underground storage tanks shall be tested hydrostatically (or by air pressure) to 150% of the maximum anticipated pressure of the system but not less than 50 pounds per square inch gauge at the highest point of the system as per 527 CMR 9.15:5.

14.3 All new underground storage tanks must have a precision test performed by a qualified person upon completion of installation and filling of the tank.

Section 15 – Inspection and Reporting

15.1 All owners or operators of underground storage tanks shall inspect all observation wells and leak detection equipment on a weekly basis.

UST Regulations

-7-

15.2 All owners or operators of underground storage tanks shall notify the Board of Health, the Fire Chief and DEQE if an inspection indicates a leak or malfunction.

15.3 The Board of Health or its agent and the Fire Chief or his designee may inspect observation wells and leak detection equipment at any time.

Section 16 – Permits

16.1 If the Board of Health determines that any proposed replacement, installation or modification of an underground storage tank constitutes a danger to a public or private well, aquifer recharge area or surface water or for any other reason, the Board of Health may deny applications or approve them subject to conditions that they may determine are necessary to protect any public or private water supply.

Section 17 – Variances

17.1 The Board of Health or the Fire Chief may vary their application of any provision of this regulation unless otherwise precluded by law, when in their opinion the applicant has demonstrated that an equivalent degree of environmental protection required under this regulation will still be achieved.

Section 18 – Severability

18.1 If any provision of this regulation is declared unlawful by a valid judgment or decree of any court of competent jurisdiction, such invalidity shall not affect any of the remaining provisions of this regulation.

Section 19 – Fines

19.1 Any person who violates this regulation shall be subject to a fine of not more than one hundred dollars (\$100.00). Each day or portion thereof during which a violation continues shall constitute a separate offense. The Board of Health shall take such legal action as is necessary to enforce this regulation and permits issued pursuant to it.

19.2 The Town of North Reading shall be the beneficiary of all fines imposed on account of the violation of this regulation in order to defray the expense of enforcing the same.

Section 20 – Costs

20.1 In every case, the owner shall be responsible for costs incurred to comply with this regulation.

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