

***Subchapter 4: DESIGN, MANUFACTURING, AND INSTALLATION STANDARDS FOR UNDERGROUND STORAGE TANK SYSTEMS***

**§ 8-401 APPLICABILITY**

- (a) This subchapter applies to category one and category two underground storage tank systems.
- (b) In addition to the requirements of this subchapter, the Secretary may review category one underground storage tanks that store regulated substances other than motor fuel or heating fuel on a case-by-case basis to ensure that the design of the tanks meets the appropriate industry standards for the substance stored and the design, manufacture, and installation of the tanks protect public health and the environment.

**§ 8-402 PROHIBITIONS**

- (a) For all new facilities, no portion of any category one or category two underground storage tank system shall be located:
  - (1) Within the Source Protection Area of a public community water system or public non-transient, non-community (NTNC) water system using a groundwater source;
  - (2) Within Zone 1 or Zone 2 of a Source Protection Area of a public community water system or NTNC water system using a surface water source except that the Secretary may, on a case-by-case basis make a determination that an underground storage tank may be sited in the zone 2 of a source protection area of a water system using a surface water source;
  - (3) Within 200 feet of a public transient, non-community (TNC) water system source;
  - (4) Within 100 feet of any private drinking water supply source;
  - (5) Within 25 feet of any public water distribution line; or
  - (6) In any area designated as a Class I or Class II groundwater zone.
- (b) For all new facilities, and new underground storage tanks being installed at existing facilities, no portion of any category one or category two underground storage tank system shall be located less than five feet away from any wall, foundation or property line.
- (c) No person shall remove an underground storage tank from the ground and reinstall that tank for the purpose of storing a regulated substance unless the following conditions are met:
  - (1) The tank meets the requirements of **§ 8-404(a)**;

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- (2) The tank manufacturer or the manufacturer's representative inspects the tank and provides a written warranty to the Secretary verifying that the tank is structurally sound, and will meet its design standard for a period of at least 10 years; and
  - (3) The tank is reinstalled in accordance with the requirements of this subchapter before it is brought into service.
- (d) Any piping that is removed from the ground shall not be reinstalled as part of an underground storage tank system used to contain a regulated substance.

**Note:** Vermont's Fire Code, and standards adopted by the National Fire Protection Association (NFPA), prohibit using a tank designed for underground use in any above-ground application. More information is available from the Fire Prevention Division of the Vermont Department of Public Safety.

### § 8-403 GENERAL REQUIREMENTS

- (a) All category one and category two underground storage tank systems shall be made of or lined with materials that are compatible with the substance(s) stored in them.
- (b) Any component of an underground storage tank system that renders another component ineffective shall not be used.
- (c) Any installation or substantial alteration of a category one or category two underground storage tank system shall be conducted in accordance with Petroleum Equipment Institute Publication RP100– 2011 edition: "Recommended Practices for Installation of Underground Liquid Storage Systems."

### § 8-404 TANK STANDARDS

- (a) All new category one and category two tanks shall meet one of the following standards, as applicable:
  - (1) Any new steel tank shall meet:
    - (A) At least one of the following design and manufacturing standards:
      - (i) Underwriters Laboratories Standard 58: "Standard for Steel Underground Tanks for Flammable and Combustible Liquids;" or
      - (ii) Underwriters Laboratories of Canada ULC-S603-00 "Standard for Steel Underground Tanks for Flammable and Combustible Liquids;" and
    - (B) At least one of the following corrosion protection standards:

- (i) Steel Tank Institute “Specification for STI-P3-System of External Corrosion Protection of Underground Steel Storage Tanks;” or
  - (ii) Underwriters Laboratories Standard 1746: “Corrosion Protection Systems for Underground Storage Tanks;” or
  - (iii) Underwriters Laboratories of Canada CAN/ULC-S603.1-03: “External Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids” and CAN4-S631-M84 (R1998): “Standard for Isolating Bushings for Steel Underground Tanks Protected with Coatings and Galvanic Systems;” or
  - (iv) National Association of Corrosion Engineers Standard RP0285-2002: “Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems.”
- (2) Any new fiberglass-reinforced plastic tank shall meet at least one of the following design and manufacturing standards:
- (A) Underwriters Laboratories Standard 1316: “Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures”; or
  - (B) Underwriters Laboratories of Canada ULC-S1615-1998: “Standard for Reinforced-Plastic Underground Tanks for Flammable and Combustible Liquids.”
- (3) Any new steel and plastic composite tank shall meet Underwriters Laboratories Standard 58, “Standard for Steel Underground Tanks for Flammable and Combustible Liquids;” and at least one of the following corrosion protection standards:
- (A) Underwriters Laboratories Standard 1746: “Corrosion Protection Systems for Underground Storage Tanks;” or
  - (B) Steel Tank Institute ACT-100: “External Corrosion Protection of FRP Composite Steel Underground Storage Tanks;” or
  - (C) Steel Tank Institute ACT-100-U: “External Corrosion Protection of Composite Steel Underground Storage Tanks.”
- (b) Any category one or category two underground storage tank installed prior to July 1, 2007 (i.e., an existing tank) shall meet the following standards, as applicable:
- (1) Any existing steel tank shall meet:
    - (A) At least one of the following design and manufacturing standards:

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- (i) Underwriters Laboratories Standard 58: “Standard for Steel Underground Tanks for Flammable and Combustible Liquids;” or
    - (ii) Underwriters Laboratories of Canada CAN 4-5603-M85 “Standard for Steel Underground Tanks for Flammable and Combustible Liquids;” and
  - (B) At least one of the following corrosion protection standards:
    - (i) Steel Tank Institute “Specification for STI-P3-System of External Corrosion Protection of Underground Steel Storage Tanks;” or
    - (ii) Underwriters Laboratories Standard 1746: “Corrosion Protection Systems for Underground Storage Tanks;” or
    - (iii) Underwriters Laboratories of Canada CAN 4-603.1-M85: “Standard for Galvanic Corrosion Protection Systems for Underground Tanks for Flammable and Combustible Liquids” and CAN 4-5631-M84: “Isolating Bushings for Steel Underground Tanks Protected with Coatings and Galvanic Systems;” or
    - (iv) NACE International Standard RP-0285-2002: “Corrosion Control of Underground Storage Tank Systems by Cathodic Protection.”
  - (2) Any existing fiberglass-reinforced plastic tank shall meet at least one of the following design and manufacturing standards:
    - (A) Underwriters Laboratories Standard 1316: “Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products”; or
    - (B) Underwriters Laboratories of Canada 4-5615-M83: “Standard for Reinforced-Plastic Underground Tanks for Petroleum Products.”
  - (3) Any existing steel and plastic composite tank shall meet at least one of the following corrosion protection standards:
    - (A) Underwriters Laboratories Standard 1746: “Corrosion Protection Systems for Underground Storage Tanks;” or
    - (B) Association for Composite Tanks ACT-100: “External Corrosion Protection of FRP Composite Steel Underground Storage Tanks” (note – the Association for Composite Tanks is now part of the Steel Tank Institute.); or
    - (C) Steel Tank Institute ACT-100-U: “External Corrosion Protection of Composite Steel Underground Storage Tanks.”
- (c) Secondary containment for tanks

- (1) Any portion of a new category one or category two underground storage tank that is intended to contain regulated substance shall be equipped with secondary containment.
- (2) Except as provided in **subsection (c)(3) of this section**, new category one and category two double-wall tanks shall be designed to either:
  - (A) Contain an inert gas or liquid at a pressure greater than the maximum internal pressure of the primary tank, or
  - (B) Contain a vacuum for a period of one month.
- (3) All double-wall category one and category two tanks with an outer wall made of steel shall meet the design and manufacturing standards specified in Steel Tank Institute standard F841-91: "Standards for Dual-Wall Underground Storage Tanks."

**§ 8-405 PIPING STANDARDS**

- (a) Piping for category one and category two underground storage tank systems shall meet the following standards as specified:
  - (1) Steel piping
    - (A) Steel piping shall be at least schedule 40 factory-coated black steel pipe, with comparable malleable iron or steel screw-type fittings and extra-heavy couplings; and
    - (B) Steel piping, including flexible connectors attached to fiberglass piping, and any ancillary equipment containing a regulated substance, that is in contact with the ground shall be protected against corrosion by a cathodic protection system that uses either galvanic anodes or impressed current. All cathodic protection systems shall meet NACE International Standard RP0285-2002: "Corrosion Control of Underground Storage Tank Systems by Cathodic Protection."
  - (2) New piping made of fiberglass-reinforced plastic or flexible extruded thermoplastic shall meet Underwriters Laboratories Standard 971-2005: "Standard for Nonmetallic Underground Piping for Flammable Liquids."
- (b) Secondary containment for piping
  - (1) Except as provided for in **subsection (b)(3) of this section**, all piping, including remote fill pipes and manifolds, that is intended to contain regulated substance shall be equipped with secondary containment.
  - (2) Piping sumps shall be installed as follows:

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- (A) Except as allowed in **subsection (3) of this section**, containment sumps for all new piping shall be installed at the tank-top. Submersible pump heads shall be housed in containment sumps. All containment sumps shall be monitored for releases in accordance with the requirements of **§8-507(a)(1)**.
  - (B) All dispenser sumps shall be capable of containing a release of regulated substance from the internal workings of the dispenser and all exposed piping. All dispenser sumps shall be monitored for releases in accordance with the requirements of **§8-507(a)(1)**. A dispenser sump is not required if the dispenser operates under suction and the pipe connecting the tank to the dispenser rises directly vertically from the tank (e.g. a “Gasboy” system). For all other piping systems, dispenser sumps shall be installed for:
    - (i) Any dispenser connected to new piping, including any dispenser connected to new piping that is exempted from secondary containment in accordance with **subsection (3) of this section**; and
    - (ii) Any dispenser installed after July 1, 2007 and connected to existing piping, if installation of that dispenser requires excavation below the dispenser island.
  - (C) Any point where different types of new piping are joined underground, or any point between a tank and dispenser where liquid would likely accumulate first in the interstitial space of the piping system, shall be contained within an intermediary sump that is monitored for releases in accordance with the requirements of **§8-507(a)(1)** of these rules.
- (3) Secondary containment is not required for piping that operates at less than atmospheric pressure (i.e., a suction line), provided:
- (A) The piping is installed with a minimum continuous slope of one-eighth of an inch per foot such that any regulated substance contained in the piping drains into the tank if the suction is released; and
  - (B) Only one check valve is used per suction line; and
  - (C) The check valve in the suction line is located directly below, and as close as practical, to the pump; and
  - (D) The permittee or tank owner can readily demonstrate compliance with this subsection (e.g., by maintaining detailed records, installing a test plug at/in the check valve).

- (c) All fill pipes, pump out pipes, or other tank-top fittings shall be connected to the tank using vapor-proof fittings, and shall be equipped with vapor-proof caps that remain closed whenever the pipe or fitting is not in use.
- (d) All fill pipes, except for tank systems containing used oil or #4 or #6 fuel oil, shall be equipped with a drop tube that extends to within 4-6 inches of the tank bottom.
- (e) All pressurized piping shall be equipped with:
  - (1) An automatic line leak detector capable of alerting the underground storage tank system operator within one hour of regulated substance first leaking at a rate of, or equivalent to, at least three gallons per hour at an operating pressure of 10 pounds per square inch; and
  - (2) A shear valve in the supply line to the dispenser, that is located at the inlet to the dispenser, and is securely anchored to a structural member of the dispensing island. This valve shall be designed and installed to close automatically in the event that the dispenser is accidentally dislodged from the inlet pipe.
- (f) Any category one or category two underground storage tank located at an elevation that produces a gravity head on the dispenser shall be equipped with a device (e.g., a solenoid-operated anti-siphon valve) that prevents the flow of regulated substance by gravity from the tank when the dispenser is not in use, or in the event of a piping or hose failure.

**§ 8-406 SPILL CONTAINMENT & OVERFILL PREVENTION EQUIPMENT**

- (a) New and existing category one and category two underground storage tank systems shall be equipped with a liquid-tight device that will contain any regulated substance spilled from a carrier's transfer hose when the hose is detached from the tank system's fill pipe. Unless a variance is granted in accordance with **§ 8-109**, any spill containment device installed or replaced after July 1, 2007 shall:
  - (1) Have a minimum capacity of 15 gallons; and
  - (2) Not be equipped with a drain valve.
- (b) Overfill prevention
  - (1) Except for underground storage tank systems that meet the criteria of **subsection (b)(2) of this section**, all category one and category two underground storage tank systems shall be equipped with an overfill prevention device that, at the time of any delivery of regulated substance, either:
    - (A) Automatically shuts off the flow of regulated substance to the tank before the tank is 95 percent full; or

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- (B) Alerts the person making the delivery before the tank is 90 percent full by triggering a visible and/or audible alarm; or
- (C) Alerts the person making the delivery before the tank is 90 percent full by restricting the flow of air and vapors from the tank, thereby also restricting the flow of regulated substance into the tank. Vent restriction devices shall only be used in tank system designs that are consistent with vent restriction devices. Any vent restriction device shall be installed in such a manner as to allow access to the device and the ability to remove the device for inspection, maintenance, tightness testing, or another purpose.

**Note:** A listing of the tank system designs that are inconsistent with vent restriction devices can be found in **§8-503(d)(2)(A) through (E)**.

- (2) Any category one or category two underground storage tank system that never receives more than 25 gallons of regulated substance at one time is not required to be fitted with an overfill prevention device, provided the tank is:
  - (A) Never more than 90 percent full; and
  - (B) Operated in accordance with the manual overfill prevention requirements of **§ 8-503(e)**.

### **§ 8-407 SCHEDULING INSTALLATIONS AND SUBSTANTIAL ALTERATIONS OF UNDERGROUND STORAGE TANK SYSTEMS**

- (a) No person shall either install or substantially alter:
  - (1) A category one underground storage tank system without first obtaining a permit or a permit modification from the Secretary in accordance with **§8-304**; or
  - (2) A category two underground storage tank system without:
    - (A) Maintaining records documenting that the relevant general, design, construction, corrosion protection, spill containment, and overfill prevention standards specified under **§§ 8-403 through 8-406** have been met; and
    - (B) Registering the tank in accordance with **§ 8-302** within 30 days of the installation date.
- (b) Any person installing or substantially altering a category one underground storage tank (i.e., the permittee or permittee's agent) shall:

- (1) Schedule the installation with the Secretary at least five (5) business days prior to the commencement of construction.
- (2) If construction is not likely to commence on the scheduled date, notify the Secretary at least 24 hours prior to the originally scheduled date.
- (3) Following construction, but prior to backfilling, ensure that the installation or alteration has been:
  - (A) Inspected by either:
    - (i) The Secretary; or
    - (ii) A registered professional engineer with education and experience related to the installation of underground storage tanks, who certifies in writing to the Secretary that the installation or alteration meets the requirements of these rules; and
  - (B) Approved by the Secretary.
- (4) Within 14 days of completing an installation or substantial alteration, submit to the Secretary the completed and signed installation checklist(s) required under **§8-304(b)(5)**. An accurate drawing or as-built plan showing the size and location of all underground tanks and piping, property boundaries, building locations, and underground utilities, shall be submitted with the checklist(s).

**§ 8-408 UNDERGROUND STORAGE TANK SYSTEMS LOCATED AT MARINAS**

All new category one underground storage tank systems installed after the effective date of these rules, and located at marinas, shall be installed in accordance with the provisions contained within the Petroleum Equipment Institute's Publication PEI/RP 1000-09: "Recommended Practices for the Installation of Marina Fueling Systems." All existing category one underground storage tank systems located at marinas shall be retrofitted to meet the same standards no later than the marina's opening date in the spring of 2014.

**END OF SUBCHAPTER FOUR**