

BIODIESEL STORAGE/DISPENSING WITH UST SYSTEMS

Another type of alternative fuel is Biodiesel. This type of fuel is a cleaner burning diesel fuel made from vegetable oil. Biodiesel is generally available in two forms. One form is 100% Biodiesel (Vegetable Oil) and the other form is a blend of Biodiesel and petroleum Diesel. The most common blend is 20% Biodiesel (B20) and 80% petroleum diesel.

CONCERNS WITH BIODIESEL BLEND FUELS

Biodiesel blends containing greater than 20% biodiesel have the same compatibility concerns as E-blend fuels. Prior to storing a biodiesel blend with greater than 20% biodiesel, owners and operators must demonstrate that their UST systems are compatible with this product. If you are planning to convert an UST system from storing a conventional motor fuel to storing a biodiesel blend with greater than 20% biodiesel, you must complete a UST-20 form, *Alternative Fuel/Hazardous Substance Compatibility Checklist* and submit it to the UST section at least 30 days before conversion takes place. This form is available on our website at <http://portal.ncdenr.org/web/wm/>

UST REGULATION APPLICABILITY

A UST system that stores a mixture of biodiesel blended with petroleum diesel, another petroleum product, or a hazardous substance is regulated pursuant to the state's UST rules (15A NCAC 2N). Owners and operators of regulated UST systems must comply with certain requirements including financial responsibility, corrosion protection, leak detection, and spill and overfill prevention. One hundred percent biodiesel contains no petroleum-based products or hazardous substances. Therefore, North Carolina's UST regulations do not apply to these UST systems unless a release is discovered. If a release from a 100% biodiesel UST system is discovered, an owner or operator must comply with the requirements for initial response and abatement, assessment and corrective action

pursuant to the state's groundwater quality rules (15A NCAC 2L).

STEPS REQUIRED TO CHANGE A REGULATED UST TO 100% BIODIESEL

To request a change in the status of a regulated UST system to a non-regulated 100% biodiesel UST system, owners or operators must complete the following steps: (1) submit a UST-3 form, *Notice of Intent: UST Permanent Closure or Change-in-Service*; (2) conduct a site assessment in accordance with requirements established in 15A NCAC 2N .0802 and .0803 and the UST Section's *Guidelines for Site Checks, Tank Closure and Initial Response*; and (3) submit a UST-2 form, *Site Investigation Report for Permanent Closure or Change-in-Service of UST* along with a tank closure report.

REQUIREMENTS FOR BIODIESEL RELEASES

Although 100 percent biodiesel is far less toxic to the environment than petroleum diesel, it can still be a problem if spilled or released. Spills or releases of 100% biodiesel or biodiesel mixtures must be reported to the UST Section within 24-hours of discovery by submitting a *24-Hour Release and UST Leak Reporting Form* (UST-61 Form) to one of the UST Section Regional Offices listed at <http://portal.ncdenr.org/web/guest/regional-offices>. The *24-Hour Release and UST Leak Reporting Form* can be downloaded from the UST Section's web site (<http://portal.ncdenr.org/web/wm/>) or by calling a UST Section Regional Office.



October 2013

Alternative Fuel Storage Guidelines for UST Systems



N.C. Department of
Environment and Natural
Resources

Division of Waste Management
UST Section

ETHANOL STORAGE/DISPENSING WITH UST SYSTEMS

Increased interest in alternative fuels has created a market for ethanol and motor fuel blends where ethanol concentrations are greater than 10%. These fuels are commonly known as E-blend fuels (e.g., E85 fuel).

If you are considering installing or converting an Underground Storage Tank (UST) system for storage of E-blend fuels, you must first check and make sure that your equipment is compatible with ethanol. What may have been compatible with E10 fuel (containing 10% or less ethanol) is probably not compatible with higher concentrations of ethanol (greater than 10% ethanol).

CONCERNS WITH E-BLEND FUELS

North Carolina Administrative Code, 15A NCAC 2N .0403, requires a UST system to be compatible with the substance stored. E-Blend fuels do not have the same compatibility characteristics with UST system components as conventional fuels. E-blend fuels will degrade many non-metallic materials such as natural rubber, polyurethane, older adhesives, certain elastomers and polymers used in flex piping, bushings, gaskets, meters, filters and materials made of cork. E-blend fuels also degrade soft metals such as zinc, brass and aluminum.

In order to store and dispense E-Blend fuel, your UST system and UST system components must be Underwriters Laboratory (UL) listed or certified by the manufacturer for use with E-Blend fuels. NC DENR will also accept a compatibility analysis and certification by a Professional Engineer.

Please note that the Fire Marshal must also be notified prior to dispensing E-Blend fuels.

The equipment/components that must be checked for compatibility include:

- Overfill – Automatic shutoff or ball-float valves.
- Tank material.
- Spill containment and sumps.
- Submersible pumps, O-rings and gaskets.
- Line leak detectors.

- Leak detection equipment (ATG probes, floats, interstitial and sump sensors).
- Piping material.
- Pipe sealant and adhesives.
- Flex connectors, grommets.
- Filters.
- Suction pumps.
- Check valves.
- Dispensers and hanging hardware.

At least 30 days before storing and E-Blend fuel, you must complete a UST-20 form, *Alternative Fuel/Hazardous Substance Compatibility Checklist* and submit it to the UST section. This form is available on our website at <http://portal.ncdenr.org/web/wm/>.

OTHER CONCERNS WITH E-BLEND FUELS

Phase separation – Ethanol blends well with gasoline. However, it mixes better with water. Therefore, if water gets into the tank, two layers of product could result – an ethanol layer on the bottom and a gasoline layer on top. This can be a problem for vehicle fuel lines as product is no longer a blend. It is very important to keep water out of the tank. So, water intrusion problems should be fixed and the USTs checked for water regularly as part of routine maintenance.

Tank cleaning – A tank that will be used to store E-blend fuels must be clean. Particles in gasoline accumulate at the bottom of a tank over time and form sludge. When E-blend fuel is introduced into a tank, these particles become suspended in the ethanol and can cause problems with filters and fuel lines. Therefore, before storing E-blend fuel you should have the tank thoroughly cleaned.

OTHER RECOMMENDED STEPS

- Inform the facility's UST insurance carrier of plans to convert to a gasoline-ethanol blend exceeding 10% ethanol. The UST insurance carrier may have additional requirements other than those required by NCDENR. Obtain an amended certificate of insurance indicating UST coverage for the E-Blend stored.
- Check for water in the tank. No level of water is acceptable for gasoline-ethanol blended fuels.
- Ensure all visible fittings and connections at the top of the tank are tight (no vapors escape and no water enters). Fix any water infiltration problems.

- Ensure sump and spill containment covers are secured to prevent water from entering.
- Clean the tank of all water and sediment.
- Label fill ports - Identify fill port and paint access cover according to American Petroleum Institute (API) RP 1637, *Using the API Color-Symbol system to Mark Equipment and Vehicles for Product Identification at Service Stations and Distribution Terminals*.
- Label dispenser with alternative fuel labels.

After First Delivery (recommended by Renewable Fuels Association)

- Fill tank to 80 percent capacity and keep as full as possible for 7 to 10 days.
- Test for water (use alcohol compatible paste if you stick your tanks) at the beginning of each shift for the first 48 hours after delivery. If there is water in the tank, remove it, find out how it got there and fix it so it doesn't occur again.
- Have dispenser calibrated prior to any retail sales.

ADDITIONAL INFORMATION

You can find additional information concerning ethanol and UST systems in *Frequently Asked Questions about Ethanol Blend Fuels in Underground Storage Tanks* located on our website at <http://portal.ncdenr.org/web/wm/>.

You can also find additional information at the following websites:

- American Coalition for Ethanol (ACE) - <http://www.ethanol.org>
- National Ethanol Vehicle Coalition (NEVC): <http://www.e85fuel.com>
- New England Interstate Water Pollution Control Commission (NEIWPCC) - <http://www.neiwpcc.org>
- Renewable Fuels Association - <http://www.ethanolrfa.org/>
- U.S. Department of Energy, Alternative Fuels Data Center <http://www.afdc.energy.gov/>