

***NCDOT
B-20 BIODIESEL & E-85 FUELS
CASE STUDY***

By

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OVERVIEW

- *Fleet Size and Composition*
- *History of NCDOT's Alternative Fuels*
 - *B-20*
 - *E-10 & E-85*
- *Lessons Learned*
 - *Things to Do*
 - *Things to Avoid*
- *Questions?*

FLEET SIZE AND COMPOSITION

- *Approximately 23,000 Light & Heavy “Core”
Pieces of Construction Equipment*
- *11,625 “On & Off Road” Rolling Stock*
 - 7,075 Diesel/Bio-diesel Units*
 - 3,700 E-10 Ethanol/Unleaded Gasoline*
 - 850 E-85 Ethanol*

HISTORY OF B-20 USE

- *Began using B-20 in 1994 as a result of Clean Air and Energy Act mandates for public fleets.*
- *Initially limited use to 3 of 14 Highway Divisions. One Division from each region: Coastal, Piedmont, and Mountain areas.*
- *By 2003 the program was expanded to 6 of the 14 Highway Divisions. In 2006, expanded statewide.*
- *In normal years, NCDOT will purchase 11,000,000 gallons of B-20.*

HISTORY OF E-85 USE

- *Experimented with E-85 in Wilmington in 2004. Did not have enough flex fuel trucks to keep fuel rotated. Closed the site.*
- *Installed a new site in Greenville in November, 2009.*
- *Just awarded contract to install 4 E-85 sites in Marion, Charlotte, Asheboro, and Hillsboro.*

Lessons Learned

Things To Do

1. Tank & Dispenser

- Filter at dispensing units. Filter casing cost \$100 per pump. Use a 10 micron Viotech hydro glass filter designed to remove particulate matter and water. Changed every 4-6 weeks. Cost \$14.00 each.*
- 114 diesel and 114 gasoline tanks installed 25+ years ago. Recommend cleaning tanks prior to introduction of Biodiesel or E-85.*

Lessons Learned

Things To Do

2. Equipment

- Change the fuel filter following the first tank's use of B-20. Bio-diesel acts to clean fuel residue that accumulates over years of regular diesel use. Will clog filters. Once cleaned, filtration will be normal.*

Lessons Learned

Things To Do

3. Contracts

- Include BQ 9000 as a requirement. Insures the producer has a QA/QC program.*
- Include requirement for fuel provider to be responsible for all additives; ie, cold flow, algaecide, etc.*
- Include ASTM 6751 compliance.*

Lessons Learned

Things To Do

3. *Contracts (cont'd)*

- Include a guarantee requiring provider to replace contaminated fuel and clean tanks. We include a penalty of \$1,500 per occurrence.

- From March to September we allow several types of feedstock. From October to February we restrict feedstock to virgin soy.

Lessons Learned

Things To Do

4. *Education*

- *Prepare Management.* *We met with the Secretary and his Deputies to educate them on the precautions taken to insure the best chance for success.*
- *Prepare Technicians.* *We met with our Equipment Superintendents who are responsible for keeping the fleet operational.*
- *Prepare Users.* *We met with Division management to explain requirements and benefits. Became a topic of discussion at safety meetings.*

Lessons Learned

Things To Do

4. *Education (cont'd)*

- *Prepare Purchasing.* *Make sure they understand the reason for the specifications. Vendors may challenge the need for BQ9000 as well as other requirements.*

- *Prepare Fuel Vendors.* *Make sure they understand the requirements and the consequences for not adhering to those requirements.*

Lessons Learned

Things To Avoid

1. *Tanks and Dispensers*

- Allowing Biodiesel to sit for more than 120 days & E-85 to sit for more than 90 days in supply tanks.

2. *Equipment*

- Allowing fuel to sit in equipment for longer than recommended period of time. Examples: Standby generators, portable light plants, message boards.

3. *Contracts*

- Allowing the use of beef tallow and palm oil as feedstock for bio-diesel. The cold flow point for these are approximately 60 degrees Fahrenheit.

Questions

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