

# NYC Fleet

## New York City's B20 Compatibility Program for its Fleet Diesel Fuel Storage Facilities

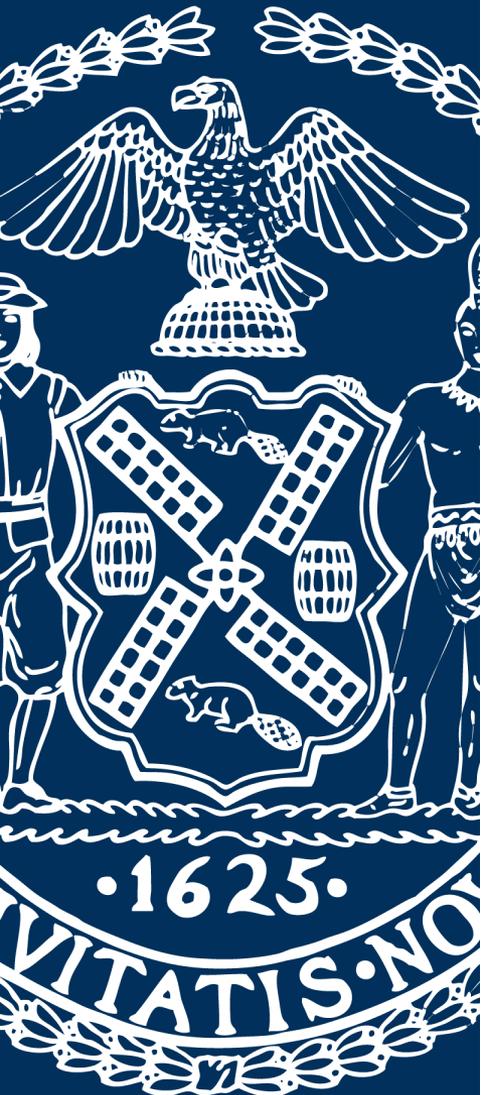
Presented by:

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Presented at the 25th National Tanks Conference & Exposition held  
on September 14-16, 2015 in Phoenix, Arizona



## Agenda:

- Introduction to NYC Fleet
- Biodiesel Benefits and Storage Considerations
- Overview of the New York City's Program to Verify Compatibility of UST Sites to Store B20 Using EPA's Guidance for Storing Biodiesel Blends over B20
- B20 Fleet Compatibility Program for its Fleet Diesel Storage Facilities. FDNY in NYC required fleet to implement the EPA process for B21 to B100 to permit our legally required B20 program. NYC is one of few organizations to have implemented the B21 to B100 type process.
  - ✓ Fire Department of New York City's B20 Storage Permission Requirements
  - ✓ NYC Fleet Diesel Storage Facilities- B20 Variance Applications Approval Process
  - ✓ EPA Biodiesel Underground Storage Guidance
- Variance Application Examples
- NYC B20 Implementation Strategy
  - ✓ Challenges and Achievements
- Lessons Learned / Future Work



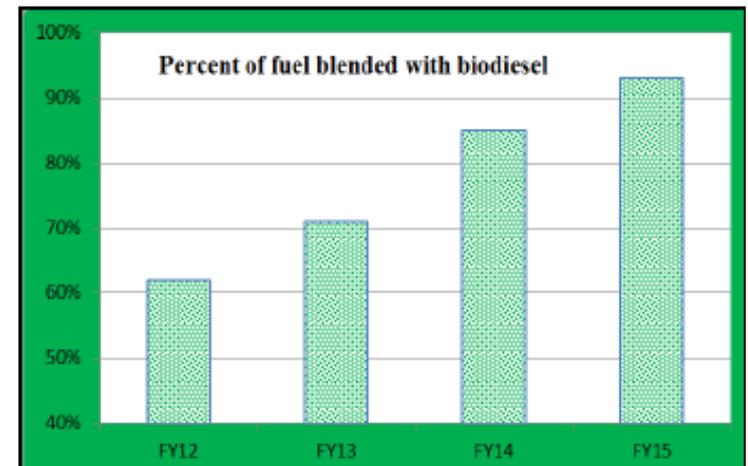
## Biodiesel in the NYC Fleet

- New York City Fleet is a national leader in Biodiesel Use and has used Biodiesel for over a decade. NYC received the National Biodiesel Board's Influence Award in 2011.
- New York City mandates the **use** of **B20** by the City's non-emergency diesel fleet in the warm months and B5 for the rest of the year.
- Our emergency services also voluntarily use B5.
- B20 Fleet Compatibility Program for its Fleet Diesel Storage Facilities.
- FDNY in NYC required fleet to implement the EPA process for B21 to B100 to permit our legally required B20 program.
- NYC is one of few organizations to have implemented the B21 to B100 type process.
  - ✓ Fire Department of New York City's B20 Storage Permission Requirements
  - ✓ NYC Fleet Diesel Storage Facilities- B20 Variance Applications Approval Process
  - ✓ EPA Biodiesel Underground Storage Tank Guidance for demonstrating the compatibility of the USTs with B20.



## New York City Fleet – Biodiesel Use

- ❑ Over 27,000 owned and leased vehicles.
- ❑ Over 400 in-house fueling stations.
- ❑ Used 15.6 million gallons of diesel/biodiesel blends in FY 2015.
- ❑ Used 6.4 million gallons of B20 (20% biodiesel/80% petrodiesel by volume) in FY 2015.
- ❑ About 9,700 vehicles, or 93% of its diesel vehicle municipal fleet, are currently fueled with biodiesel blends.
- ❑ Major fleet agencies, such as Sanitation, Parks, DEP, DOT, and FDNY increased use of biodiesel.
- ❑ NYC Local Law 73 of 2013 requires that non-emergency diesel vehicles owned/leased by the City to use B20 during the warm weather months.
- ❑ NYC emergency services also voluntarily use B5.





## Biodiesel Benefits

- The National Renewable Energy Laboratory (NREL)<sup>(3)</sup> lists the following Biodiesel’s advantages in its *Biodiesel Handling and Use Guide*:
  - ❖ It is renewable.
  - ❖ It displaces petroleum-derived diesel fuel.
  - ❖ It can reduce global warming gas emissions.
  - ❖ It can reduce tailpipe emissions, including air toxics.

From the NREL’s *Biodiesel Handling and Use Guide, Fourth Edition*:

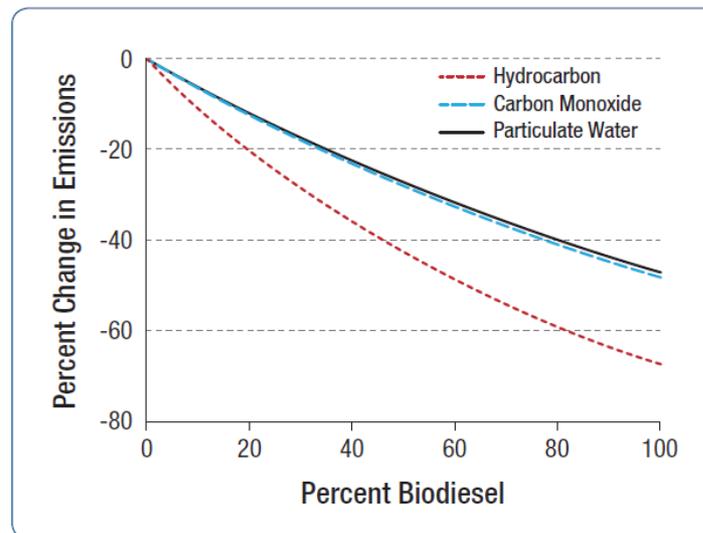


Figure 2. Average Emission Impacts of Biodiesel Fuels in CI Engines<sup>12</sup>

## Overview of the New York City's B20 Fleet Compatibility Program for its Fleet Diesel Storage Facilities

- ❑ NYC Local Law 73 of 2013 requires non-emergency diesel fuel-powered vehicles owned/leased by the City to use B20 during the warm weather months (April-November) starting July 1, 2016.
- ❑ With the increase in the use of biodiesel, there followed a need to store and dispense B20 using existing diesel underground storage tank (UST) and aboveground storage tank (AST) systems.
- ❑ Fire Department (FDNY) to certify and permit existing diesel USTs and ASTs systems for storage and dispensing of biodiesel blends.
- ❑ The NYC Fleet team at Department of Citywide Administrative Services (DCAS) worked with major fleet agencies, such as Parks, DEP, and DOT, to achieve the B20 certification of diesel USTs and ASTs by the FDNY.
- ❑ FDNY required that a variance application for the use of B20 be submitted for each diesel storage tank.



# Overview of the New York City's B20 Fleet Compatibility Program for its Fleet Diesel Storage Facilities (cont.)

- ❑ FDNY was to assure compliance with the UST compatibility requirements stated in 40 CFR 280.32
- ❑ FDNY required conservative approach
  - ❑ the B20 variance applications to adhere to the 2011 EPA guidance for UST systems storing *greater than* 20% biodiesel.
  - ❑ Even though they were not covered by guidance since not storing *greater than* B20
- ❑ **Guidance On Compatibility Of UST Systems With Ethanol Blends Greater Than 10 Percent And Biodiesel Blends Greater Than 20 Percent-** Published by the EPA in June 2011
- ❑ Owners and Operators were/are to demonstrate the compatibility of critical equipment & components used to store and dispense B20.<sup>12</sup>



# NYC Fleet B20 Compatibility Program - What components of the USTs did we have to certify compatible?

## ❑ Critical Components<sup>12</sup>

- ❖ Storage tank system
- ❖ Piping system
- ❖ Dispenser system
  - Dispenser
  - Pump hose
  - Nozzle
  - Breakaway
  - Swivel
- ❖ Flexible connector
- ❖ Tank sump
- ❖ Under-dispenser containment
- ❖ Submersible pumps\*
- ❖ Emergency shut-off valve\*

\*If applicable



- ❖ Leak detection system
  - Automatic tank gauge
  - Leak sensor
  - Magnetostrictive probe
- ❖ Spill and overflow prevention equipment

# NYC Fleet B20 Compatibility Program - What did we require on a certification?

❑ Materials - Compatibility Certifications:

- ❖ Formally written by an official/recognized source
- ❖ States the explicit equipment/component (make, model, year)
- ❖ Specifies the fuel type
- ❖ States blending concentration range (if applicable)





# NYC Fleet B20 Compatibility Program - Who could certify compatibility?

- ❑ Sources of certification to demonstrate materials compatibility:
  - ❖ Manufacturer certification
    - Officially written certification
    - The specific equipment/component (make, model, year)
    - Specifying the fuel type and blending concentration range (if applicable)
  
  - ❖ Manufacturer warranty and/or Product datasheet/specifications
  
  - ❖ Independent test lab
    - Underwriters Laboratories (UL)
  
  - ❖ Recognized organizations
    - National Biodiesel Board (NBB)
    - Petroleum Equipment Institute (PEI)
    - Steel Tank Institute (STI)
  
  - ❖ Government organizations
    - US Environmental Protection Agency (EPA)
    - U.S. Department of Energy's Office: National Renewable Energy Laboratory (NREL)
    - New York Department of Environmental Conservation (DEC)



# NYC Fleet B20 Compatibility Program – What did we need to get FDNY approval?

- ❑ FDNY variance application and supporting documents:
  - ❖ Application for Modification (Variance) of Provisions of the New York City Fire Code or Fire Department Rules (Form BFP-MOD (10/09))
  - ❖ BFP-MOD (10/09) attachments:
    - Department of Buildings Certificate of Occupancy.
    - Fire Department Permit.
    - Explanation of modification sought.
    - Petroleum bulk storage (PBS) certificate.
  - ❖ Engineer's certification.
  - ❖ List of equipment/components and Engineer's notes:
    - DEC Facility Information
    - DEC Tank Information
    - List of equipment/components
    - Engineer's notes
  - ❖ Equipment/components datasheets
  - ❖ Compatibility certifications
  - ❖ Site Pictures and Maps





# NYC Fleet B20 Compatibility Program – How did we do it?

- ❖ Identification of the diesel fueling sites that would carry B20.
- ❖ Gathering of preliminary information for each fueling station:
  - As-built drawings.
  - PBS.
  - DEC – Bulk Storage Database information.
  - Contractor’s built package.
- ❖ Site Visit to the fueling station to collect on-site information.
- ❖ Review of collected data and B20 compatibility site assessment.
- ❖ Generation of variance application.
- ❖ Submission of the variance application to the FDNY.
- ❖ Review and Approval of the variance application by the FDNY.
- ❖ Fire permit update to include B20 for the approved sites.





# Variance Application Example: BFP-MOD (10/09) Form

FOR FDNY USE ONLY  
 APPLICATION REC'D: DATE: \_\_\_\_\_  
 BY: \_\_\_\_\_  
 APPLICATION NO.: \_\_\_\_\_

## NEW YORK CITY FIRE DEPARTMENT

### APPLICATION FOR MODIFICATION (VARIANCE) OF PROVISIONS OF THE NEW YORK CITY FIRE CODE OR FIRE DEPARTMENT RULES

**INSTRUCTIONS:**

- A. This form shall be used to apply to the Fire Department, pursuant to FC104.8 and 3 RCNY §104-01, for a modification (variance) of any Fire Code or Fire Department Rule provision. This application shall not be used for modifications of any provision of the New York City Building Code, including design requirements for fire alarm systems.
- B. This application must be typewritten or legibly printed in ink, accompanied by all necessary supporting documents, including as applicable design and installation documents.
- C. A non-refundable application fee of \$200.00 is required at the time of filing, in accordance with FC A04(5).
- D. Complete all 18 sections of this application. Do not leave any sections blank. If a particular section is not applicable, mark the section "N/A". Sections 9, 10, 11, 14, 15 and 16 may require that additional documentation be filed with the application.
- E. Modification applications shall be filed in triplicate to:

Chief of Fire Prevention  
 New York City Fire Department  
 9 MetroTech Center, 3<sup>rd</sup> Floor  
 Brooklyn, NY 11201-3857

Any questions regarding this application or application filing procedures should be directed to the Technology Management Unit, Bureau of Fire Prevention, at (718) 999-2377.

**1. Premises affected:**

Block No.: 319 Lot No.: 1  
 Address: NYC Department of Parks and Recreation - Clove Lake Garage  
21 Slosson Avenue, Staten Island, NY 10314  
 Affected floor(s) \_\_\_\_\_

**2. Applicant:**

Name: New York City Department of Parks and Recreation - 5 Boro Operations  
 Address: 10 Randall's Island  
New York, NY 10035  
 Telephone: (212) 410-8916  
 E-Mail: Gabriel.Ramos@parks.nyc.gov  
 Relationship to premises: Deputy Chief of Citywide Operations



# Variance Application Example: BFP-MOD (10/09) Form (cont.)

3. Premises Owner (if different from Applicant):

Name: NYC Department of Parks and Recreation  
 Address: 830 Fifth Avenue  
New York, NY 10021  
 E-Mail: Gabriel.Ramos@parks.nyc.gov  
 Telephone: (212) 410-8916

4. Filing representative:

Name: N/A  
 Company Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Telephone number: \_\_\_\_\_  
 E-Mail: \_\_\_\_\_  
 Expediter Registration No.: \_\_\_\_\_

5. Person to contact to make arrangements for Fire Department inspection:

Name: Gabriel Ramos Telephone number: (212) 410-8916

6. Nature of modification sought:

- Fire apparatus access roads
- Rooftop access and obstructions
- Other Variance of use fuel storage tank 009 & its dispensing equipment for biodiesel/diesel blends of up to 20 % biodiesel

7. Sections(s) of Fire Code (29 Administrative Code §FC \_\_) or Fire Department rules (3 RCNY \_\_) sought to be modified: FC 2206

8. Is this application being made in connection with a proposed or existing condition?  Proposed  Existing

9. Has the applicant or owner submitted any prior modification applications regarding this matter?  Yes  No. If yes, submit a copy of the prior application and response received.

10. Has any modification previously been granted for this premises or occupancy?  Yes  No. If yes, submit a copy of the modification determination.

11. Are there any outstanding Fire or Building code violation orders, notices of violation or summons outstanding against the applicant or the owner for the affected premises, whether related or unrelated to this matter?  Yes  No. If yes, describe the nature of the violation and submit a copy of the violation and the disposition. -- NOT APPLICABLE --

12. Building characteristics for affected premises:

Construction date: Unknown  
 Construction classification: Fireproof  
 Occupancy classification: Vehicle Fueling Station



# Variance Application Example: BFP-MOD (10/09) Form (cont.)

Height: N/A  
 Number of stories: N/A  
 Floor areas (square footage): N/A  
 Certificate of Occupancy No. (attach copy): - Please see attachment #1 in Section 2 -

**13. Fire protection features of affected premises: Station Fire Suppression System - See pictures in Section #6**

Is sprinkler system protection provided?  Yes  No. If yes, indicate the area protected: \_\_\_\_\_

Is standpipe system protection provided?  Yes  No.

Is a fire alarm system provided?  Yes  No. If yes, what type?  
 \_\_\_\_\_

**14. Submit copies of the most recent Fire Department permit(s), if any, issued to the owner or occupant relating to this application. - Please see attachment #2 in Section 2 -**

**15. Explain in detail the specific nature of the modification sought and describe the difficulty in complying with the requirements of the Fire Code or Fire Department rule. If you require more space, you may attach additional sheets(s). NOTE: Cost of compliance with code and rule requirements is not ordinarily sufficient grounds for granting of a modification. - Please see attachment #3 in Section 2 -**

**16. Explain in detail how you propose to mitigate the effect of modifying the code or rule requirement. Include all measures intended to ensure public safety. If you require more space, you may attach additional sheets(s).**  
 - Engineer Ledesma-Garrido, Ph.D., has inspected fuel storage tank 009 and its dispense system, one (1) underground tank and one (1) dispenser, at Clove Lakes Garage, examined all existing drawings and equipment documentation available from the manufacturers and established research organizations, and reviewed applicable certifications from independent laboratories and compatibility statements from the manufacturers. Based on the findings and expert assessment, Engineer Ledesma-Garrido, Ph.D., provided a certification for biodiesel/diesel blends of up to 20% biodiesel. As per the Federal Trade Commission 16 CFR Part 306.12, the dispenser will have attached a label for B5 to B20.

**17. Applicant Certification. Under penalty of perjury, I certify that the information contained in this application is true to the best of my knowledge.**

Applicant's name: Gabriel Ramos, Deputy Chief of Citywide Operations

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**18. Owner Statement (if different from applicant). I have authorized the applicant to file this modification with respect to the premises.**

Owner's name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



# Variance Application Example: Certificate of Occupancy

DEP\_Brooklyn Repairs\_FDNY BFP-MOD (10/09)\_Section 12\_Attachment 1\_C of O\_Page 3 of 4



## Certificate of Occupancy

Page 1 of 2

CO Number: 302377023F

This certifies that the premises described herein conforms substantially to the approved plans and specifications and to the requirements of all applicable laws, rules and regulations for the uses and occupancies specified. No change of use or occupancy shall be made unless a new Certificate of Occupancy is issued. *This document or a copy shall be available for inspection at the building at all reasonable times.*

A.	Borough: Brooklyn	Block Number: 08116	Certificate Type: Final
	Address: 855 REMSEN AVENUE	Lot Number(s): 1	Effective Date: 01/28/2014
	Building Identification Number (BIN): 3397904	Building Type: New	
<i>For zoning lot metes &amp; bounds, please see BISWeb.</i>			
B.	Construction classification: 1-E	(1968 Code)	
	Building Occupancy Group classification: B-2	(1968 Code)	
	Multiple Dwelling Law Classification: None		
	No. of stories: 2	Height in feet: 35	No. of dwelling units: 0
C.	Fire Protection Equipment: Standpipe system, Fire alarm system, Sprinkler system		
D.	Type and number of open spaces: None associated with this filing.		
E.	This Certificate is issued with the following legal limitations: None		
Borough Comments: None			

Borough Commissioner

Acting Commissioner

DOCUMENT CONTINUES ON NEXT PAGE

# Variance Application Example: Certificate of Occupancy (cont.)

DEP\_Brooklyn Repairs\_FDNY BFP-MOD (10/09)\_Section 12\_Attachment 1\_C of O\_Page 4 of 4



Page 2 of 2

## Certificate of Occupancy

CO Number: 302377023F

### Permissible Use and Occupancy

All Building Code occupancy group designations are 1968 designations, except RES, COM, or PUB which are 1938 Building Code occupancy group designations.

Floor From To	Maximum persons permitted	Live load lbs per sq. ft.	Building Code occupancy group	Dwelling or Rooming Units	Zoning use group	Description of use
CEL	30	OG	D-2 B-1		17	ACCESSORY USES
CEL	3	OG	B-1		17	STORAGE
CEL	32	OG	D-2		17	PLUMBING ROOM, METER ROOMS, ELECTRICAL ROOM, FIRE PUMP ROOM, TELEPHONE ROOM, MECHANICAL ROOM.
OSP		OG	B-1		17	(16) ACCESSORY OFF-STREET PARKING SPACES & (4) ACCESSORY LOADING BERTHS, FUELING STATION.
001	74	100	B-2 B-2		17	STORAGE, CONTRACTORS YARD, ACCESSORY USES
001	6	100	D-1		17	ACCESSORY MACHINE SHOP
002	359	100	E		17	ACCESSORY OFFICES & ACCESSORY USES
002	214	100	B-2		17	LOCKER ROOMS
002	142	100	E		17	LUNCHROOM, MAP ROOM, OFFICES, MENS AND WOMENS TOILETS
002	2	100	D-1		17	(2) ELECTRICAL ROOM

GENERAL NOTE: BUILDING MATERIALS OR CONTRACTORS YARD, OPEN & ENCLOSED, (16) ACCESSORY OFF-STREET PARKING SPACES & (4) ACCESSORY LOADING BERTHS

END OF SECTION

Borough Commissioner

Acting Commissioner

END OF DOCUMENT

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# Variance Application Example: Fire Permit

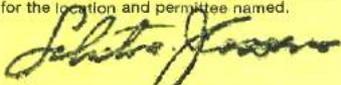
FIRE DEPARTMENT, CITY OF NEW YORK				PERMIT		BUREAU OF FIRE PREVENTION			
ACCOUNT NUMBER	TYPE	A.P.	D.O.	ADM. CO.	ISSUANCE DATE	PERMIT EXPIRES			
33030669	10	E	15	E323	03/26/14	01/15			
PREMISES ADDRESS				ACCOUNT NAME					
1875 RALPH AVE DEP 1887 RALPH AVE BROOKLYN, NY 11234				NYC DEP					
ITEM CODE	SUB CODE	QTY	DESCRIPTION	FLOOR NO.	FEE				
025	00	1	SITE INSPECTION-BURIED TANKS	1					
<table border="1"> <tr> <td>PERMIT TYPE</td> <td>1</td> </tr> </table>								PERMIT TYPE	1
PERMIT TYPE	1								
1=REGULAR	2=SUPPLEMENTAL	3=DUPLICATE	NYC DEP 1887 RALPH AVE BROOKLYN NY 11234-5301	** NO FEE **				0.00	
		1/2500 GALLONS GASOLINE 1/4000 GALLONS DIESEL C OF F P15#86161924X1/15		BY ORDER OF THE COMMISSIONER					
2014489634									



# Variance Application Example: Fire Permit (cont.)

D.O.	COMPANY	BORO	ACCOUNT NO.	TOTAL FEE	
26	E666	NY	30068720	\$ 0.00	BIODIESEL B20

Expiration Date <u>04/30/2014</u>  <b>F 13686</b>  Postal Address of Permit Holder or Agent: [ NEW YORK CITY PARKS DEPT C/O NYDCAS ]  Occupancy for which this Permit is issued and at which it must be displayed: [ A/K/A 79TH ST & TRANSVERSE RD 201 W 81 ST NEW YORK, NY 10024 ]  New York _____  Pursuant to the provisions of the administration Code and the regulations made thereunder, the above permittee is hereby authorized by the Fire Commissioner to store and use HAZARDOUS MATERIALS in the quantity specified.  This permit is revocable at the pleasure of the Commissioner, and is issued with the express understanding that the articles herein named are to be stored and kept in accordance with the provisions of the law; that the permittee will use all possible care to avoid accidents; that it is only available for the location and permittee named.   _____ Fire Commissioner	PERMIT COVERS  CODE NO. 025-01 SELF SERVICE SITE INSPECTION  025-42 FLEET AUTO LIQUID MOTOR FUEL  025-47 ALTERNATIVE FUEL  NOTE: TEMPORARY APPROVAL OF BIODIESEL (UP TO AND INCLUDING B20) STORAGE AND DISPENSING FOR FLEET VEHICLES AS PER FDNY LETTER OF 04/02/2013
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RF-101 (1/01) 93-111-R25-0470

**THIS PERMIT MUST BE PROMINENTLY DISPLAYED ON PREMISES**



# Variance Application Example: PBS Certificate

	<b>PBS Number</b> <b>2-602547</b>	<b>New York State Department of Environmental Conservation</b> <b>PETROLEUM BULK STORAGE CERTIFICATE</b> 625 Broadway, 11th Floor, Albany, NY 12233-7020 Phone: 518-402-9553	<b>Region 2 NYSDEC - PBS Unit</b> <b>One Hunters Point Plaza, 1st Floor</b> <b>47-40 21st Street, L.I. City, NY 11101-6454</b> <b>(718) 482-6454</b>				
<b>TANK NUMBER</b>	<b>TANK LOCATION</b>	<b>DATE INSTALLED</b>	<b>TANK TYPE</b>	<b>PRODUCT STORED</b>	<b>CAPACITY (GALLONS)</b>	<b>DATE LAST TESTED</b>	<b>TESTING DUE DATE</b>
004	Underground	07/01/1996	Fiberglass Reinforced Plastic (FRP)	Gasoline/Ethanol	4,000		
01	Underground	07/01/1996	Fiberglass Reinforced Plastic (FRP)	Biodiesel	1,000		
02	Underground	07/01/1996	Fiberglass Reinforced Plastic (FRP)	Biodiesel	1,000		
05	Underground	10/01/2004	Urethane Clad Steel	#2 Fuel Oil (On-Site Consumption)	1,500		
<p>* Aboveground tanks require monthly visual inspections and may need documented internal inspections as described in 6 NYCRR Part 613</p>							
<b>SITE:</b> QUEENS WATER MAINTENANCE 49-14 FRESH MEADOW LANE  FLUSHING, NY 11365		<b>OWNER:</b> NEW YORK CITY DEP 59-17 JUNCTION BLVD, CORONA, NY 11373		As an authorized representative of the above named facility, I affirm under penalty of perjury that the information displayed on this form is correct to the best of my knowledge. Additionally, I recognize that I am responsible for assuring that this facility is in compliance with all sections of 6 NYCRR Parts 612, 613 and 614, and applicable sections of 6 NYCRR Subpart 374-2 (used oil tanks only), not just those cited below: -- The facility must be re-registered if there is a transfer of ownership. -- The Department must be notified within 30 days prior to adding, replacing, reconditioning, or permanently closing a stationary tank. -- The facility must be operated in accordance with the code for storing petroleum, 6NYCRR Part 613. -- Any new facility or substantially modified facility must comply with 6NYCRR Part 614. -- This certificate must be signed and posted on the premises at all times. Posting must be at the tank, at the entrance of the facility, or the main office where the storage tanks are located. -- Any person with knowledge of a spill, leak or discharge must report the incident to DDC within two hours (1-800-457-7362).			
<b>Class B (Daily On-Site) Operator:</b> SUPERVISOR ON DUTY		<b>Tank Owner Name:</b> Same as Property Owner		-- The facility must be re-registered if there is a transfer of ownership. -- The Department must be notified within 30 days prior to adding, replacing, reconditioning, or permanently closing a stationary tank. -- The facility must be operated in accordance with the code for storing petroleum, 6NYCRR Part 613. -- Any new facility or substantially modified facility must comply with 6NYCRR Part 614. -- This certificate must be signed and posted on the premises at all times. Posting must be at the tank, at the entrance of the facility, or the main office where the storage tanks are located. -- Any person with knowledge of a spill, leak or discharge must report the incident to DDC within two hours (1-800-457-7362).			
<b>Emergency Contact Name:</b> THOMAS ANELLO <b>Emergency Contact Phone:</b> (347) 882-0080		<b>Facility Phone Number</b> (718) 359-0931		-- The facility must be re-registered if there is a transfer of ownership. -- The Department must be notified within 30 days prior to adding, replacing, reconditioning, or permanently closing a stationary tank. -- The facility must be operated in accordance with the code for storing petroleum, 6NYCRR Part 613. -- Any new facility or substantially modified facility must comply with 6NYCRR Part 614. -- This certificate must be signed and posted on the premises at all times. Posting must be at the tank, at the entrance of the facility, or the main office where the storage tanks are located. -- Any person with knowledge of a spill, leak or discharge must report the incident to DDC within two hours (1-800-457-7362).			
<b>ISSUED BY:</b> Commissioner Joe Martens <b>PBS NUMBER:</b> 2-602547 <b>DATE ISSUED:</b> 11/07/2013 <b>EXPIRATION DATE:</b> 12/21/2018 <b>FEE PAID:</b> \$500.00		<b>MAILING CORRESPONDENCE:</b> SHAY MCATAMNEY NYC DEPT OF ENVIRONMENTAL PROTECT 59-17 JUNCTION BOULEVARD 3RD FLOOR LOW RISE FLUSHING, NY 11373		Signature of Representative/ Owner: <i>Richard Nelson</i> Date: 11/20/13 Name and Title of Authorized Representative/Owner (Please Print): <b>RICHARD NELSON</b> Chief			
Print Date: 11/8/2013 <span style="float: right;">Page 1 of 1</span>							

**THIS REGISTRATION CERTIFICATE IS NON-TRANSFERABLE**

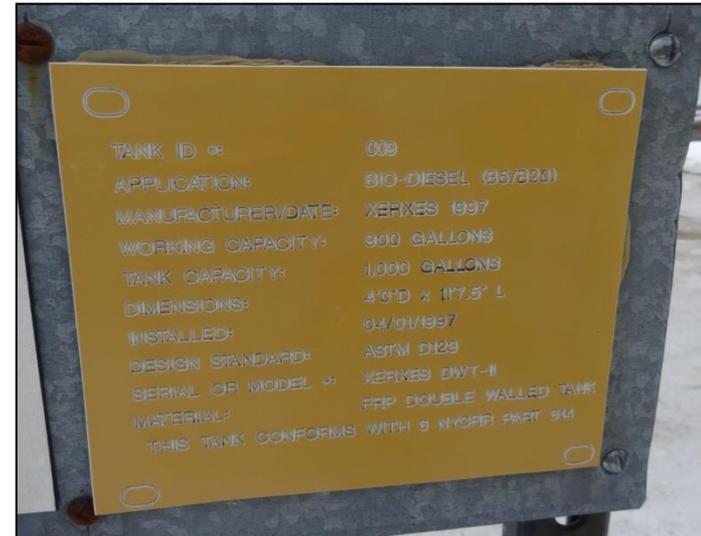


## Variance Application Example: Tank Metal Plates



TANK ID #: 008  
 APPLICATION: UNLEADED GASOLINE  
 MANUFACTURER/DATE: XERXES 1997  
 WORKING CAPACITY: 900 GALLONS  
 TANK CAPACITY: 1,000 GALLONS  
 DIMENSIONS: 4' D x 11'-7 1/2" L  
 INSTALLED: 04 / 1997  
 DESIGN STANDARD: ASTM D123  
 SERIAL OR MODEL #: XERXES DWT-1  
 MATERIAL: FRP DOUBLE WALLED TANK  
 THIS TANK CONFORMS WITH 6 NYCRR PART 614

TANK ID #: 008  
 APPLICATION: UNLEADED GASOLINE  
 MANUFACTURER/DATE: XERXES 1997  
 WORKING CAPACITY: 900 GALLONS  
 TANK CAPACITY: 1,000 GALLONS  
 DIMENSIONS: 4' D x 11'-7 1/2" L  
 INSTALLED: 04 / 1997  
 DESIGN STANDARD: ASTM D123  
 SERIAL OR MODEL #: XERXES DWT-1  
 MATERIAL: FRP DOUBLE WALLED TANK  
 THIS TANK CONFORMS WITH 6 NYCRR PART 614



TANK ID #: 009  
 APPLICATION: BIO-DIESEL (B5/B20)  
 MANUFACTURER/DATE: XERXES 1997  
 WORKING CAPACITY: 900 GALLONS  
 TANK CAPACITY: 1,000 GALLONS  
 DIMENSIONS: 4'0"D x 11'7.5" L  
 INSTALLED: 04/01/1997  
 DESIGN STANDARD: ASTM D123  
 SERIAL OR MODEL #: XERXES DWT-II  
 MATERIAL: FRP DOUBLE WALLED TANK  
 THIS TANK CONFORMS WITH 6 NYCRR PART 614



Manufactured to Underwriters Laboratories.  
 Design Standard UL1316, UL142 or UL58.  
 This tank is intended for the storage of petroleum  
 products & blends as outlined in the tank warranty.  
 New York State: This tank conforms with 6NYCRR Part 614

Tank Manufacturer:	CSI	Tank Number:	005
Tank Model:	DWT-6 Type II	PBS Number:	2-601796
Tank Dimensions:	72 ft x 21 ft	UL No:	A-125883
Date Installed:	9/29/2010	Date Manufactured:	8/20/2010
Product Stored:	Diesel		
Design Capacity:	3958 Gallons	Working Capacity:	3562 Gallons



# Variance Application Example: DEC Bulk Storage Database



## Bulk Storage Database Search Details

### Facility Information

**Site No.:** 2-602547  
**Status:** Active  
**Expiration Date:** 12/21/2018  
**Site Type:** PBS  
**Site Name:** QUEENS WATER MAINTENANCE  
**Address:** 49-14 FRESH MEADOW LANE  
**Locality:** FLUSHING  
**State:** NY  
**Zipcode:** 11365  
**County:** QUEENS

### Owner(s) Information

**Facility Owner:** NEW YORK CITY DEP  
 59-17 JUNCTION BLVD. . CORONA, NY. 11373  
**Mail Contact:** NYC DEPT OF ENVIRONMENTAL PROTECTION  
 59-17 JUNCTION BOULEVARD . FLUSHING, NY. 11373

### Tank Information

6 Tanks Found

Tank No	Tank Location	Status	Capacity (Gal.)
004	Underground	In Service	4000
01	Underground	In Service	1000
02	Underground	In Service	1000
03	Underground	Closed - Removed	1500
05	Underground	In Service	1500
06	Underground	Closed - In Place	3000

Refine This Search



# Variance Application Example: DEC Bulk Storage Database (cont.)



## Bulk Storage Database Search Details Tank Information

**Site No:** 2-602547

**Site Name:** QUEENS WATER MAINTENANCE

**Tank No:** 01

**Tank Location:** Underground

**Tank Status:** In Service

**Tank Install Date:** 07/01/1996

**Tank Closed Date:**

**Tank Capacity:** 1000 gal.

**Product Stored:** Biodiesel

**Percentage:** 5%

**Tank Type:** 06 - Fiberglass Reinforced Plastic (FRP)

**Tank Internal Protection:** Fiberglass Liner (FRP)

**Tank External Protection:** Fiberglass

**Tank Secondary Containment:** Double-Walled (Underground)

**Tank Leak Detection:** Interstitial - Electronic Monitoring

**Overfill:** High Level Alarm

**Spill Prevention:** Catch Basin

**Dispenser:** Suction Dispenser

**Pipe Location:** Underground/On-ground

**Pipe Type:** Fiberglass Reinforced Plastic (FRP)

**Pipe External Protection:** Fiberglass

**Piping Secondary Containment:** Double-Walled (Underground)

**Piping Leak Detection:** Tank Top Sump

**Tank Next Test Due:**

**Tank Last Test:**

**Tank Test Method:** Testing Not Required



# Variance Application Example: List of Equipment/Components and Compatibility with B20

The City of New York Department Environmental Protection  
 Tallman Island WPCP – Diesel Tank #CN-003-06 and Dispenser Information  
 Component Datasheet

Tallman Island WPCP – Tank CN-003-06				PBS No. 2-602868	
Component	Manufacturer	Product Number or Model	Description	Standard Certification	Compatibility Certification For Diesel/Biodiesel Blends of up to 20% Biodiesel (B20)
Tank	Highland Tank®	ACT-100-U®	Urethane clad steel, double-walled, underground tank, 550 gal	6 NYCRR Part 614, UL-58	Steel Tank Institute (Biodiesel Compatibility Statement #1)
Automatic Tank Gauge	Veeder-Root®	TLS-450®	Console	UL	Manufacturer's certification (Biodiesel Compatibility Statement #2)
Magnetostrictive Probe	Veeder-Root®	846390	MAG Plus	--	Manufacturer's certification (Biodiesel Compatibility Statement #2)
Leak Sensor	Veeder-Root®	794380	Solid-State discriminating containment sump sensor	--	Manufacturer's certification (Biodiesel Compatibility Statement #2)
Submersible pump	N/A (Suction System)	N/A	N/A	--	N/A
Overfill Prevention Valve	OPW®	61SO®	Single action, complete shut-off	New York City Fire Department (Approval 4902)	Engineer (See Note #1)
Piping System Underground & On-ground	unknown	unknown	Fiberglass reinforced plastic, double-walled	--	Engineer (See Note #2)
Dispensers	Gasboy®	9852	Twin (2) hoses, 1HP	UL	Manufacturer's certification (Biodiesel Compatibility Statement #3)
Dispenser Sump	Unknown	Unknown	One piece polyethylene	unknown	Engineer (See Note #3)
Spill Container	OPW®	1-3100	Double-walled	ULC	Manufacturer's certification (Biodiesel Compatibility Statement #4)



## Variance Application Example: List of Equipment/Components cont.)

The City of New York Department Environmental Protection  
 Tallman Island WPCP – Diesel Tank #CN-003-06 and Dispenser Information  
 Component Datasheet

Tallman Island WPCP – Tank CN-003-06					PBS No. 2-602868
Component	Manufacturer	Product Number or Model	Description	Standard Certification	Compatibility Certification For Diesel/Biodiesel Blends of up to 20% Biodiesel (B20)
Frames and Cover	Fibrelite®	FL90HD	36" dia. heavy duty flat sealed cover & composite frame	EN 124-C250	Manufacturer's certification (Biodiesel Compatibility Statement #5)
Dispensers Hoses	VST®	VSTa flex™	1" nitrile/PVC hose	cULus	Manufacturer's certification (Biodiesel Compatibility Letter #6)
Dispensers Nozzles	OPW®	7-HB®	Automatic Shut-off	UL and ULC	Engineer (See Note #4)
Hoses Swivels	OPW®	241 TPS®	Aluminum, zinc, Buna-N, Viton®	UL and ULC	Engineer (See Note #5)
Hose Breakaway	OPW®	66RB®	Viton®, aluminum, high-density polyethylene (HDPE)	UL	Engineer (See Note #6)
Emergency Shut-off Valve	N/A (Suction System)	N/A	--	N/A	N/A (Suction System)
Extractable Check Valve	Universal	515	Zinc plated cast iron body	--	Engineer (See Note #7)



## Variance Application Example: Engineer's Notes

New York City Department of Environmental Protection–Tallman Island WPCP  
Tank CN-003-06029

### Diesel tank and Fuel Dispenser- Component Datasheet Notes

#### Notes:

**Note #1: Overfill Prevention Valve – OPW®61SO®:** valve body - cast aluminum, Float – Nitrile rubber, Valve – aluminum, seals - Viton®, plastic parts – acetate, upper/lower drop tube – aluminum, hardware – stainless steel. (Manufacturer's datasheet attached).

**Note #2: Underground/On-ground piping system:** Pipe type has been identified/approved as "Fiberglass Reinforced Plastic (FRP)" by the New York State Department of Environmental Conservation (DEC). (DEC Tank Information attached).

**Note #3: Dispensers Sumps:** Upon inspection, the sump beneath dispenser appeared to be a one-piece polyethylene sump, which is adequate for biodiesel use. The make/model of the sumps could not be identified.

**Note #4: Dispensers Nozzles – OPW® 7-HB®;** Body – aluminum, lever & lever guard – Dura-Tuff® (Formulated with the Dura-Tuff® elastomer), packing - graphite with Teflon®, disc - Viton® fluorocarbon. (Manufacturer's datasheet attached).

**Note #5: Hoses Swivels – OPW® 241TPS®;** Body – aluminum, inlet adaptor – zinc, outlet adaptor – zinc, seals – Buna-N and Viton® fluorocarbon, bearing – nylon. (Manufacturer's datasheet attached).

**Note #6: Breakaway – OPW® 66RB®;** Body – aluminum, Sleeve – HDPE, Seals - Viton® fluorocarbon, Spring – Stainless steel, Poppet – Aluminum. (Manufacturer's datasheet attached).

**Note #7: Extractable Check Valve – Universal 515;** body – cast iron, seal – Buna-N. (Manufacturer's datasheet attached).

**Footnote:** The effects of biodiesel/diesel blends of up to 20% biodiesel (B20) on metals, such as brass, bronze and zinc, and on elastomers, such as Nitrile (Buna-N), are minimum and additional monitoring for leaks on the storage and dispensing equipment/components is not necessary.

#### References:

1. National Biodiesel Board website: [http://www.biodiesel.org/docs/ffs-performace\\_usage/materials-compatibility.pdf](http://www.biodiesel.org/docs/ffs-performace_usage/materials-compatibility.pdf): "Biodiesel blends of 20% or less have shown a much smaller effect on these materials. The effects are virtually non-existent in low-level blends, such as B2. When handling blends of B20 or less normal monitoring of hoses and gaskets for leaks is sufficient. Blends of B20 and lower reduce the impact of metal compatibility issues."
2. The National Renewable Energy Laboratory (NREL) - Biodiesel Handling and Use Guide Fourth Edition NREL/TP-540-43672 Revised January 2009 National Renewable Energy Laboratory <http://www.nrel.gov/vehiclesandfuels/pdfs/43672.pdf>: "Blends of B20 or lower are literally a "drop in" technology. No new equipment and no equipment modifications are necessary. B20 can be stored in diesel fuel tanks and pumped with diesel equipment." And "B20 or lower blends minimize most issues associated with materials compatibility. Experiences over the last 10 years indicate compatibility with all elastomers in diesel fuel systems, even those, such as nitrile rubber, that are sensitive to higher blends."

# Variance Application Example: OPW 61SO Overfill Valve Datasheet





www.opwglobal.com

## OPW 61SO Overfill Prevention Valves

The OPW 61SO Overfill Prevention Valve is designed to prevent the overfill of underground storage tanks by providing a positive shut-off of product delivery. The shut-off valve is an integral part of the drop tube used for gravity filling. The OPW 61SO allows easy installation (without breaking concrete) and requires no special manholes.

The OPW 61SO is a two-stage shut-off valve. When the liquid level rises to about 95% of tank capacity, the valve mechanism is released, closing automatically with the flow. This reduces the flow rate to approximately 5 gpm through a bypass valve. The operator may then stop the filling process and disconnect and drain the delivery hose. As long as the liquid exceeds the 95% level, the valve will close automatically each time delivery is attempted.

If the delivery is not stopped and the liquid rises to about 98% of tank capacity, the bypass valve closes completely. No additional liquid can flow into the tank until the level drops below a reset point.

The 61SO Overfill Prevention Valve can be adjusted to shutoff at any desired tank capacity. Please contact the Authority Having Jurisdiction (AHJ) and review local, state, and national codes to determine the regulatory requirements governing shut-off capacity in your region, as well as take into account other considerations such as extreme tank tilt. In all cases, the upper tube must protrude into the tank at least 6-1/2" to ensure that the valve can shut off flow into the tank completely before the top of the tank is wetted as per EPA requirements.

Models of the 61SO are available to meet virtually any UST application including two-point, coaxial, poppeted coaxial and remote fill. Methanol approved models are also available.

The OPW 61SO is approved by the New York City Fire Department. (Approval #4902).

### Materials

**Valve body:** Cast aluminum  
**Float:** Nitrile rubber, closed cell foam  
**Valve:** Aluminum  
**Seals:** Viton®  
**Upper & lower Drop Tube:** Aluminum  
**Plastic parts:** Acetal  
**Hardware:** Stainless steel

### Features

- ◆ **Simple, Easy and Quick Installation** – no excavation or special manholes required.
- ◆ **Economical** – costs a fraction of expensive, complicated and difficult-to-install valves.
- ◆ **Furnished Complete** – supplied with new upper and lower drop tubes, mounting hardware and thorough instructions for quick job site time.
- ◆ **Completely Automatic Operation** – no prechecks to perform, no resets, and no overrides to be broken or abused.
- ◆ **No Pressurization of the Tank** – operates directly from liquid level.
- ◆ **Will Accept a Dipstick for Gauging**

#### Advantages of Overfill Prevention Compared to Overfill Warning Systems:

- ◆ **Completely Automatic Operation** – does not rely on the alertness or speed of response of the delivery attendant for certainty of overfill prevention.
- ◆ **Keeps the Top of UST "Dry," per EPA Requirements** – eliminating possible leaks at loose bung fittings and the need for double containment on vent lines.
- ◆ **Does Not Rely on Pressure in the UST to Stop Flow** – allowing faster fill times and reducing spill risk.



### Important

In order to prevent product spillage from the Underground Storage Tank (UST), properly maintained delivery equipment and a proper connection at the tight-fill adaptor are essential. Delivery personnel should be managed and trained to inspect delivery elbows and hoses for damaged and missing parts. They should always make certain there is a positive connection between the adaptor and elbow. If delivery equipment is not properly maintained, or the elbow is not securely coupled to the adaptor, a serious spill may result when the OPW 61SO closes, causing a hazard and environmental contamination.

**NOTE:** The OPW 61SO is designed for use on tight-fill gravity drop applications only. Do not use for pressure fill applications.

- ◆ **Retrofits Directly** – for both new and existing tanks with 4" fill risers.
- ◆ **Quick Drain Feature** – automatically drains hose when head pressure is relieved.
- ◆ **Best Flow Rate in The Industry\***

\* Test-witnessed by Bowsor-Morner, Inc., an independent laboratory. Results available upon request.

### Listings and Certifications



Look for this label for authentic OPW EVR Approved products.

104

9393 Princeton-Glendale Road ♦ Hamilton, Ohio USA 45011 ♦ Phone: (800) 422-2525 ♦ Fax: (800) 421-3297

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# Variance Application Example: Veeder-Root Certification



**Veeder-Root**  
 125 Powder Forest Drive  
 P. O. Box 2003  
 Simsbury, CT 06070-7684  
 USA  
 Phone: (860) 651-2700  
 Fax: (860) 651-2719

To: Veeder-Root ATG customers  
 From: Jeff Kappler, ATG Product Manager  
 Date: October 7<sup>th</sup>, 2013  
 Re: Biodiesel compatibility

The products listed in the table below are compatible with the alternative fuels as shown. TLS-450/350/300/2 tank gauge systems can be combined with any of these products to monitor the alternative fuels listed.

Equipment Type	Series or P/N	ASTM D6751 Biodiesel	Ethanol	Methanol
Magnetostrictive Probes (Aluminum)	Series 8463x0, 8473x0	0-20%	0-15%	0-7%
Magnetostrictive Probes (Stainless Steel)	Series 8463x1, 8473x1	0-100%	0-100%	0-100%
Continuous Interstitial Tank System	P/N 857280-100, -200, -30x	0-20%	0-15%	0-5%
Electronic Line Leak Detector	Series 8475, 8484, 8494	0-20%	0-15%	0-5%
Groundwater Monitoring Interstitial Detectors	P/N 794380-621, -622, -624 P/N 794380-xxx P/N 794390-xxx P/N 847990-001, -002 P/N 857060-xxx P/N 857080-xxx	0-20%	0-15%	0-5%
Vapor Monitoring	P/N 394390-700	0-20%	0-15%	0-5%
Red Jacket Submersible Turbine Pump (non-AG)	P/N 41014x-xxx	0-20%	0-10%	0-10%
Red Jacket Submersible Turbine Pump (AG)	P/N 41014x-xxx	0-100%	0-100%	0-100%
Red Jacket FX Leak Detector	FXV series	0-20%	0-15%	0-20%

  
 Jeff Kappler  
 ATG Product Manager



# Variance Application Example: OPW Fuel Compatibility Matrix



## Above Ground Products Fuel Compatibility Matrix

Updated 1/2015

OPW Product Number	Description	Unleaded Fuels up to 10% Ethanol (≤E10)	Petroleum Diesel	Up to 25% Ethanol (≤E25)	Up to 85% Ethanol (≤E85)	Up to 100% Ethanol (≤E100)	Bio-Diesel Up to 5% (≤B5) Up to 20% (≤B20)	Av-Gas	Jet Fuel	Kerosene/ Fuel Oil
11A Series	Automatic Conventional Nozzles		UL/ULC				UL UL			X
11AP Series	Automatic Conventional Nozzles	UL/ULC		UL/ULC						
11AF Series	Farm Nozzles		UL/ULC				UL UL			X
11APF Series	Farm Nozzles	UL/ULC		UL/ULC						
11B Series	Pressure Sensing Automatic Conventional Nozzles		UL/ULC				UL UL			X
11BP Series	Pressure Sensing Automatic Conventional Nozzles	UL/ULC		UL/ULC						
21Ge Series	Pressure Sensing Automatic Nickel Plated Conventional Nozzles	UL		UL	UL	X				
7H Series	Automatic High Flow Conventional Nozzles		UL/ULC				UL UL			X
7HB Series	Pressure Sensing Automatic High Flow Conventional Nozzles		UL/ULC				UL UL			X
12WV Series	Vacuum Assist Nozzles	UL								
11VA Series	Vacuum Assist Nozzles	UL								
11VF Series	Balance Nozzles	UL								
311/811 Series	General Duty Manual Nozzles	UL	UL				X X			X
190/210/295SC Series	Manual Bulk Nozzles	X	X	X			X X			X
295SAJ	Manual Jet Fuel Nozzle							X X	X	X
295SA/SAC Series	Manual Av-Gas Nozzles	X		X				X X	X	X
1290 Series	Automatic Bulk Fueling Nozzles	X	X	X			X X			X
241 Swivels	Two Plane Hose Swivels	UL/ULC	UL/ULC	UL			UL UL			X
241TPS-0492	Nickel Plated Two Plane Hose Swivels	UL		UL	UL	X	UL UL			X
45 Swivels	Two Plane Hose Swivels	UL/ULC	UL/ULC	UL			UL UL			X
365 Swivels	Straight Swivels	UL	UL				X X			X
205 Swivels	Two Plane Hose Swivels - Cold Weather	UL/ULC	UL/ULC	X			X X			X
25 Swivels	Bulk Straight Swivel	X	X	X			X X	X X	X	X
66V Series Breakaways	Single Use Conventional Breakaways	UL/ULC	UL/ULC	X			X X			X
66V-0492	Nickel Plated Single Use Conventional Breakaways	UL		UL	UL	X	X X			X
66 Series Breakaways	Various Reconnectable and Single Use Vac Assist Breakaways	UL/ULC	UL/ULC	X			X X			X
68EZR Breakaway	Various Reconnectable and Single Use Vac Assist Breakaways	UL/ULC	UL/ULC	X			X X			X
38CS Adaptor	Balance Adaptor	X	X	X			X X			X
VaporSaver™ 1	Tank Pressure Management System	UL / ATEX								
CVS2™	Central Vacuum System	UL								

UL - UL listed X - Compatible ULC - UL Canada \*Pending Investigation



## NYC B20 Implementation Strategy and Results

- ❑ FDNY granted a two-year grace period (4/2/2013 to 4/2/2015) for city agencies to generate/submit/obtain the required biodiesel variances.
- ❑ FDNY issued temporary fire permits that allowed city agencies to store and dispense biodiesel blends up to B20 at their diesel fueling stations.
- ❑ B20 variance applications for 98 fueling stations from Sanitation, Parks, DEP, and DOT.
  - Some of the fueling stations were installed over 30 years ago.
  - B20 variance applications to adhere to the EPA 2011 UST compatibility guidance.
  - Be generated by registered engineers/architects and/or other technical professionals approved by the FDNY Commissioner.
- ❑ **FDNY reviewed/granted 86 variances of use for B20.**
  - Permanent fire permit to store/dispense B20.
- ❑ FDNY extended grace period to April 2, 2017 for remaining 12 fueling stations.
- ❑ Fueling stations to store/dispense B20 April-November.



## NYC Fleet B20 Compatibility Program - Lessons Learned

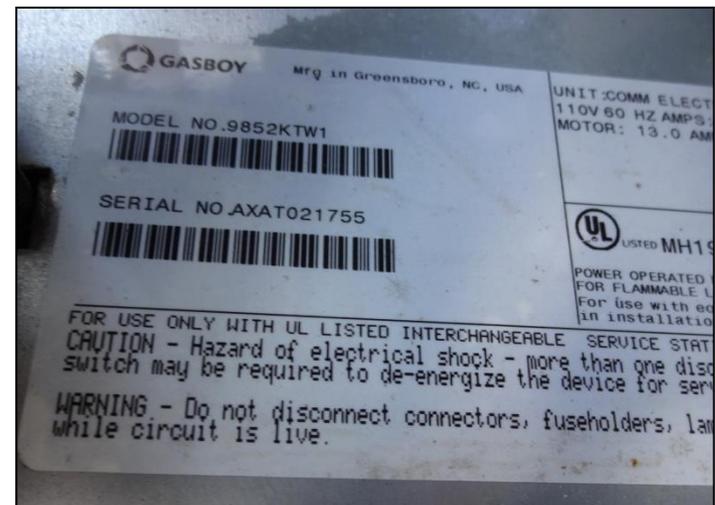
- ❑ Contractors to provide all equipment/component information.
- ❑ Central repository for permanent storage of the as-built drawings/information.
- ❑ New/rebuilt storage/dispensing systems to be compatible with biodiesel (B100).
- ❑ Site managers/operators to be familiar, and have access, to all parts of the fueling system.





## NYC Fleet B20 Compatibility Program - Lessons Learned - continued

- Verify using independent systems that all information gathered is correct.
- Take lots of pictures!
- Talk to manufacturer tech support.
- Check for updates on compatibility.
- Do not be an inspector!



## Future Work

- ❑ Complete variance applications for the remaining 12 sites.
  
- ❑ **Expand B20 program** to include exempted agencies, such as the NYC Department of Correction (DOC).
  
- ❑ **Run B50 Pilot during warmer months in 2016.**
  - Select sites.
  - Obtain FDNY waiver and temporary permit.
  - Identify information to be collected and time frame.
  - Expand B50 pilot based of favorable results.
  
- ❑ **Enhance B50 use.**
  - Variance Applications





## Reference Links

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1. U.S. Department of Energy's Office: National Renewable Energy Laboratory (NREL) Learning about Renewable Energy- Biofuel Basics  
([http://www.nrel.gov/learning/re\\_biofuels.html](http://www.nrel.gov/learning/re_biofuels.html))
2. National Biodiesel Board- Biodiesel...Revitalizing America's Future & Fuel Needs  
<http://puc.sd.gov/commission/Presentations/EnergyConference2009/DanFeigeSDSA-NBBBiodiesel051309.pdf>
3. U.S. Department of Energy's Office: National Renewable Energy Laboratory (NREL) Biodiesel Handling and User Guide (Fourth Edition)  
<http://www.nrel.gov/transportation/pdfs/43672.pdf>
4. American Society for Testing and Materials (ASTM) Standards and Specifications  
[www.astm.org](http://www.astm.org)
5. The National Biodiesel Accreditation Program BQ-9000® Quality Management Program  
<http://bq-9000.org/>



## Reference Links (cont.)

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6. U.S. Department of Energy's Office: National Renewable Energy Laboratory (NREL) Office of Energy Efficiency and Renewable Energy Presentation- E85 and Biodiesel Deployment  
<http://www.nrel.gov/docs/fy07osti/42312.pdf>
  
7. US Environmental Protection Agency (EPA) and the US Department of Energy Biodiesel Fuel Economy  
<http://www.fueleconomy.gov/feg/biodiesel.shtml>
  
8. National Biodiesel Board- Biodiesel Cold Flow Basics  
[https://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Fbiodiesel.org%2Fdocs%2Fdefault-source%2Fffs-performace\\_usage%2Fcold-flow-basics---ppt.ppt%3Fsfvrsn%3D6](https://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Fbiodiesel.org%2Fdocs%2Fdefault-source%2Fffs-performace_usage%2Fcold-flow-basics---ppt.ppt%3Fsfvrsn%3D6)
  
9. US Department of Energy Alternative Fuels Data Center  
[http://www.afdc.energy.gov/fuels/biodiesel\\_blends.html](http://www.afdc.energy.gov/fuels/biodiesel_blends.html)
  
10. National Biodiesel Board - Materials Compatibility  
[http://biodiesel.org/docs/ffs-performace\\_usage/materials-compatibility.pdf?sfvrsn=4](http://biodiesel.org/docs/ffs-performace_usage/materials-compatibility.pdf?sfvrsn=4)

## Reference Links (cont.)

11. US Environmental Protection Agency - Biodiesel Benefits and Concerns

<http://www.epa.gov/region9/waste/biodiesel/benefits.html>

12. US Environmental Protection Agency - Office of Underground Storage Tanks  
 “Guidance On Compatibility Of UST Systems With Ethanol Blends Greater Than 10 Percent And Biodiesel Blends Greater Than 20 Percent” (2011)

<http://www.epa.gov/oust/compend/biofuels-compat-guidance.pdf>





## Contact Information

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**New York, NY 10007**

**[rgarrido@dcas.nyc.gov](mailto:rgarrido@dcas.nyc.gov)**

## New York City's B20 Compatibility Program for its Fleet Diesel Fuel Storage Facilities

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**Thank you for your attention!**