

***Petition For A Declaratory Ruling That No Certificate Of Environmental Compatibility And Public Need Is Required For The Installation Of A Customer-Side 1380 kW Fuel Cell Project To Be Located At Waterbury Water Pollution Control Plant 210 Municipal Rd., Waterbury, CT 06708***

**I. INTRODUCTION**

Pursuant to Connecticut General Statutes Section 16-50k, Doosan Fuel Cell America, Inc.(Doosan) hereby petitions the Connecticut Siting Council (the “Council”) for a declaratory ruling (“Petition”) that a Certificate of Environmental Compatibility and Public Need (“Certificate”) is not required for the installation of four (4) 460 kW fuel cells in support of a customer-side distributed resources project in Waterbury, Connecticut (the “Project”) as described below. Doosan submits that no Certificate is required because the proposed installation would not have a substantial adverse environmental effect.

**II. DESCRIPTION AND LOCATION OF THE PROJECT**

The fuel cells are a customer-side installation distributed generation resource with grid interconnection and is to be located at 210 Municipal Drive, Waterbury, CT 06708 directly adjacent to the generator Building.(see project site – Attachment A). The installation consists of installing four (4) natural-gas fueled 460 kW PureCell<sup>®</sup> Model 400 phosphoric acid fuel cell system (“Fuel Cell”) manufactured by Doosan in South Windsor, Connecticut (see Attachment B for Model 400 datasheet). The overall dimensions of the Fuel Cell are eight feet four inches wide by twenty-seven feet four inches long by nine feet eleven inches tall. The unit is totally enclosed and factory-assembled and tested prior to shipment.

The Fuel Cell is intended for a distributed generation and power application. The system for Waterbury Water Pollution Control Plant will be capable of producing a total of 1840 kW of continuous, reliable electric power. It will operate in parallel with the utility grid and provide a portion of the electrical requirements of the facility. The installation will have an overall annual efficiency of 44.4%. As long as natural gas is available, electric power and heat can be generated.

The PureCell<sup>®</sup> Model 400 fuel cell system has been certified to meet the strict ANSI/CSA FC-1 fuel cell safety standard to protect against risks from electrical, mechanical, chemical, and combustion safety hazards. Numerous safety features have been incorporated into the design. A combustible gas sensor and thermal fuses located throughout the power module cabinet detect any over-temperature. The detection of a potential combustible gas mixture, over-temperature, or the failure of this detection circuit will result in a power plant shutdown and a subsequent inert gas (nitrogen) purge of the fuel cell stack and fuel processing system. This event will also result in a system alarm notification to the power plant operator (Doosan)

The power plant is designed with an integral emergency-stop button on the outside of the enclosure to enable immediate shutdown in the event of an emergency. There is also a gas shut-off valve and electrical disconnect switch easily accessible to emergency personnel.

The fuel cell stack is wrapped in a fire retardant blanket. There are no materials inside the unit that would sustain a flame. There is no large volume of gas or any ignition that occurs within the cell stack. The power plant does not store hydrogen; it consumes hydrogen-rich gas equal to what it requires to produce power.

Phosphoric acid is an integral part of the fuel cell system, acting as the electrolyte within the fuel cell stack. Phosphoric acid is a surprisingly common substance that is contained in common cola drinks. There is no reservoir of liquid; phosphoric acid is contained in the porous

structure of the fuel cell stack material by capillary action, similar to how ink is absorbed into a blotter.

The only fluid in the power plant is water. All pressurized water vessels are designed to ASME boiler codes and inspected annually. All piping, welds, etc. meet pressurized piping standards. Water produced through the electrochemical process is “pure” water and is reclaimed and reused by the process. The other source of water is water used in the external cooling module, which is mixed with a polypropylene glycol and a rust inhibitor to prevent rust and freezing in colder climates.

The fuel cell does not produce any hazardous waste during normal operation. Standard Material Safety Data Sheets (MSDS) are available in the product service manual.

### **III. PROJECT BENEFITS**

Fuel cell technology represents an important step in advancing Connecticut’s goal of diversifying its energy supply through the use of renewable energy, as expressed in Connecticut General Statutes Section 16-244 et seq. The Project will serve as a cost-effective clean energy source while also reducing the demand for grid electricity from this location. Further, this fuel cell installation will support the efforts of the State of Connecticut to be a leader in the utilization of fuel cell technology.

Because a fuel cell does not burn fuel, the system will significantly reduce air emissions associated with acid rain and smog, and dramatically reduce those emissions associated with global warming. The application of the Fuel Cell for Waterbury Waste Water Treatment Plant is estimated to reduce the facility’s annual carbon emissions by over 169 metric tons when compared to the U.S. EPA eGrid emissions factor for non-baseload generation in the New England ISO utility system. The Fuel Cell is designed to operate in total water balance – no

make-up water is normally required after start-up and no water discharges to the environment will occur under normal operating circumstances. Furthermore, unlike many traditional power generation systems, fuel cells produce very little sound and typically do not require sound proofing or cause the need for hearing protection.

#### **IV. NO SUBSTANTIAL ADVERSE ENVIRONMENTAL EFFECT**

The proposed installation will have no substantial adverse environmental effect. The installation and operation of the Fuel Cell will meet all air and water quality standards of the Connecticut Department of Environmental Protection (“DEP”).

Section 22a-174-42 of the Regulations of Connecticut State Agencies (RCSA) governing air emissions from new distributed generators exempts fuel cells from air permitting requirements. Notwithstanding this exemption, the Fuel Cell system meets the CT emissions standards for a new distributed generator as shown in Table 1 below, and no permits, registrations or applications are required under rules based on the actual emissions of the fuel cell. Furthermore, the Fuel Cell system is certified by the California Air Resources Board to meet the Distributed Generation Certification Regulation 2007 Fossil Fuel Emissions Standards (see Attachment C).

**Table 1: CT Emissions Standards for a New Distributed Generator**

Air Pollutant	CT Emissions Standard (lbs/MWh)	PureCell Model 400 Fuel Cell System at Rated Power (lbs/MWh)
Oxides of Nitrogen	0.3	.01
Carbon Monoxide	2	.02
Carbon Dioxide	1900	998

With respect to water discharges, the Model 400 Fuel Cell is designed to operate without water discharge under normal operating conditions. To the extent that minimal water overflow may occasionally occur, such discharges will consist of de-ionized water and will be directed to a site sanitary drain or dry well. This discharge will be incorporated into the overall site design, and will be covered by the site's water discharge permit, if necessary.

Further, the Fuel Cell installation and operation will have no substantial adverse effect on either listed endangered species or listed Connecticut historical places. Attachment D contains the relevant portion of the CT. DEEP Waterbury Natural Diverse Database areas Map. The installation of the PureCell Model 400 fuel cell will be outside of identified locations of endangered species populations.

The Fuel Cell will not emit noise in excess of limitations set forth in CT regulations. The Fuel Cell location is on the west side of the site adjacent to the Generator/substation building. CT regulations require a noise level of no greater than 62dBA from a Class B emitter to a Class B receptor. The fuel cell is expected to operate at full power (1840kw), with a noise level in free field of well below 62dBA at 100 feet, at all times. Therefore, the fuel cell is not expected to emit "excessive noise" to the neighboring buildings.

## **V. LOCAL INPUT AND STATE FUNDING**

Doosan will complete all necessary permitting before installing the unit at Waterbury Waste Water Treatment Plant.

## **VI. CONCLUSION**

As set forth above, Doosan requests that the Council issue a determination, in the form of a declaratory ruling, that the proposed installation above is not one that would have a substantial adverse effect, and, therefore, that a Certificate is not needed.

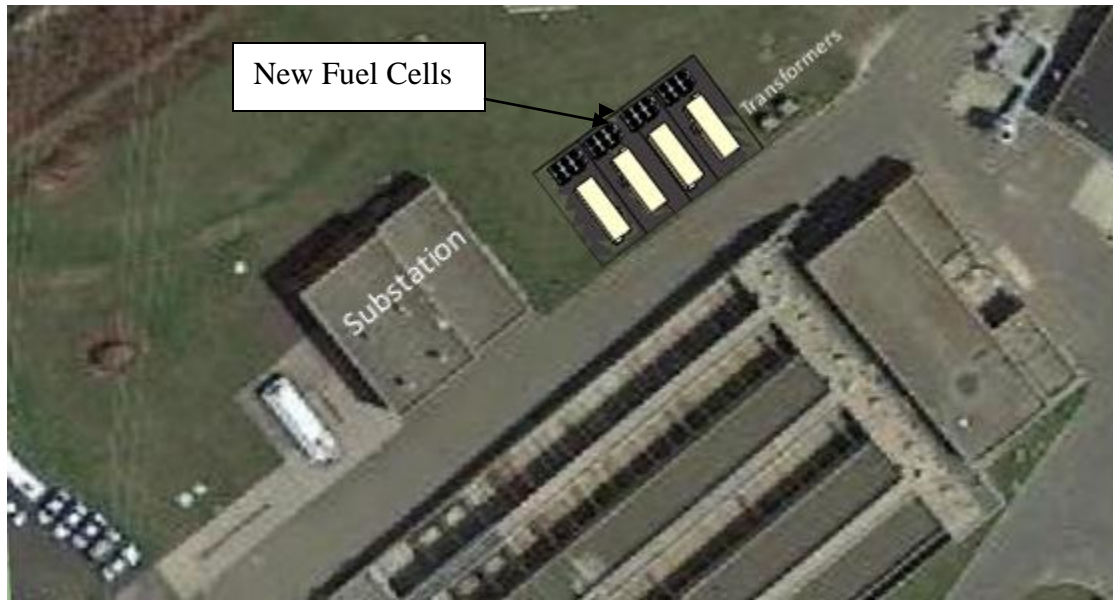
Respectfully submitted,

By:

A handwritten signature in black ink, appearing to read "Dawn Mahoney". The signature is fluid and cursive, with the first name "Dawn" and last name "Mahoney" clearly distinguishable.

Dawn Mahoney, Esq.  
General Counsel  
Doosan Fuel Cell America Inc.

Attachment A: Project Site.



## Attachment B: PureCell® Model 400 Datasheet



## PureCell® Model 400

### PURECELL SYSTEM BENEFITS

#### Energy Security

Proven PAFC fuel cell technology that is setting durability records

#### Energy Productivity

Increased efficiency and continuous on-site generation reduces energy costs

#### Energy Responsibility

Ultra-low emissions equals sustainability

### PURECELL SYSTEM COMPETITIVE ADVANTAGES

#### Long Life

Industry leading 10-year cell stack life assures high availability and low service cost

#### Modular & Scalable

Solutions for multi-megawatt applications to meet growing energy demand

#### Experience

Most knowledgeable and experienced team in the industry

#### High Efficiency

Up to 90% total CHP Efficiency

#### Grid-Independence

Proven performance delivering power when the utility grid fails

#### Load Following

Capable of dispatching power to match building needs

#### Small Footprint

Highest power density among clean generation technologies

#### Flexible Siting

Indoor, outdoor, rooftop, multi-unit

### RATED POWER OUTPUT: 460KW, 480VAC, 50/60HZ

Characteristic	Units	Operating Mode	
		Power 460kW	Eco 440kW
Electric Power Output <sup>1</sup>	kW/kVA	460/532	440/518
Electrical Efficiency	%, LHV	43%	45%
Peak Overall Efficiency	%, LHV	90%	90%
Gas Consumption <sup>1</sup>	MMBtu/h, HHV (kW)	4.09 (1,200)	3.77 (1,104)
Gas Consumption <sup>1,2</sup>	SCFH (Nm <sup>3</sup> /h)	3,995 (107)	3,674 (98.4)
High Grade Heat Output @ up to 250°F	MMBtu/h (kW)	0.72 (212)	0.55 (162)
Low Grade Heat Output @ up to 140°F	MMBtu/h (kW)	1.03 (301)	1.00 (292)

### FUEL

Supply..... Natural Gas  
Inlet Pressure ..... 10 to 14 in. water (2.5 - 3.5 mbar)

### EMISSIONS<sup>3,4</sup>

NOx ..... 0.01 lbs/MMWh (0.006 kg/MMWh)  
CO ..... 0.02 lbs/MMWh (0.009 kg/MMWh)  
VOC ..... 0.02 lbs/MMWh (0.009 kg/MMWh)  
SO<sub>x</sub> ..... Negligible  
Particulate Matter ..... Negligible  
CO<sub>2</sub><sup>1</sup> (electric only) ..... 998 lbs/MMWh (454 kg/MMWh)  
(with high-grade heat recovery) ..... 815 lbs/MMWh (371 kg/MMWh)  
(with full heat recovery) ..... 485 lbs/MMWh (220 kg/MMWh)

### OTHER

Ambient Operating Temp ..... -20°F to 104°F (-29°C to 40°C)  
Sound Level ..... <65 dBA @ 33 ft. (10m)  
Water Consumption ..... None (up to 86°F (30°C) Ambient Temp.)  
Water Discharge ..... None (Normal Operating Conditions)

### CODES AND STANDARDS

ANSI/CSA FC1-2014: Stationary Fuel Cell Power Systems  
UL1741-2010: Inverters for Use With Distributed Energy Resources

### NOTES

1. Average performance during 1st year of operation.
2. Based on natural gas higher heating value of 1025 Btu/SCF (40.4 MJ/Nm<sup>3</sup>)
3. Emissions based on 440 kW operation.
4. Fuel cells are exempt from air permitting in many U.S. states.
5. Includes CO<sub>2</sub> emissions savings due to reduced on-site boiler gas consumption



Doosan Fuel Cell America, Inc.  
Corporate Headquarters  
195 Governor's Highway  
South Windsor, CT 06074  
860.727.2253  
www.doosanfuelcell.com

The manufacturer reserves the right to change or modify, without notice, the design or equipment specifications without incurring any obligation either with respect to equipment previously sold or in the process of construction. The manufacturer does not warrant the data on this document. Warranted specifications are documented separately.

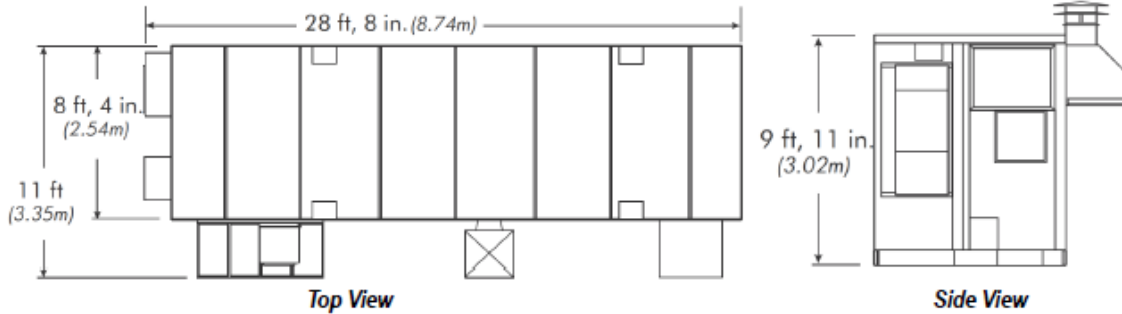
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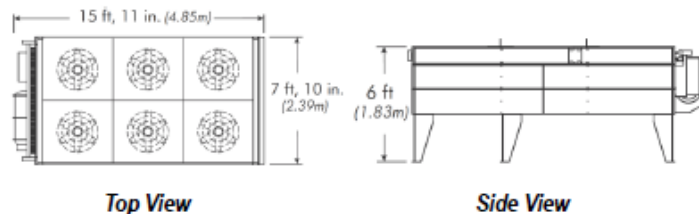
# PureCell® Model 400

## SYSTEM DIMENSIONS

### Power Module



### Cooling Module



### PHYSICAL SPECIFICATIONS

	Power Module	Cooling Module
Length	28' 11" (8.74m)	15' 11" (4.85m)
Width	8' 4" (2.54m)	7' 10" (2.39m)
Height	9' 11" (3.02m)	6' 0" (1.83m)
Weight	57,000 lb (27,216 kg)	3,190 lb (1,447 kg)

## PURECELL ADVANTAGE

### OFFSET 3x MORE CO<sub>2</sub>



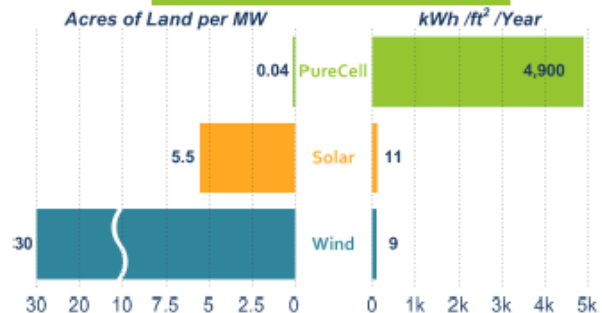
### CAPACITY FACTOR



### CO<sub>2</sub> OFFSET



### USE LESS LAND



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Attachment C: California Air Resources Board Emissions Certification



**Matthew Rodriguez**  
Secretary for  
Environmental Protection

## Air Resources Board

**Mary D. Nichols, Chairman**  
1001 I Street • P.O. Box 2815  
Sacramento, California 95812 • [www.arb.ca.gov](http://www.arb.ca.gov)



**Edmund G. Brown Jr.**  
Governor

December 26, 2012

Steve Goyette  
UTC Power  
195 Governors Highway  
South Windsor, Connecticut 06074

Dear Mr. Goyette:

We have reviewed the Distributed Generation (DG) Certification application, submitted on September 20, 2012, for the UTC Power 440 kW PureCell® System Model 400 fuel cell and have determined that the fuel cell meets the requirements of article 3, title 17, California Code of Regulations, sections 94200 – 94214 (Air Resources Board's DG Certification Program). We are pleased to provide you with the enclosed Executive Order DG-040 for the Certification of the 440 kW PureCell® System Model 400.

If you have questions about the enclosed Executive Order or the DG Certification Program, please do not hesitate to contact me at (916) 323-1491, or Jonathan Foster of my staff at (916) 327-1512.

Sincerely,

David Mehl, Manager  
Energy Section

Enclosure:

Executive Order DG-040

cc: Jonathan Foster

*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption.  
For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.*

California Environmental Protection Agency

*Printed on Recycled Paper*

**State of California  
AIR RESOURCES BOARD**

**Executive Order DG-040**

**Distributed Generation Certification of  
UTC Power Corporation  
440kW PureCell® System Model 400**

WHEREAS, the Air Resources Board (ARB) was given the authority under California Health and Safety Code section 41514.9 to establish a statewide Distributed Generation (DG) Certification Program to certify electrical generation technologies that are exempt from the permit requirements of air pollution control or air quality management districts;

WHEREAS, this DG Certification does not constitute an air pollution permit or eliminate the responsibility of the end user to comply with all federal, state, and local laws, rules and regulations;

WHEREAS, on September 24, 2012, UTC Power Corporation applied for a DG Certification of its 440 kW PureCell® System Model 400 fuel cell and whose application was deemed complete on December 10, 2012;

WHEREAS, UTC Power Corporation has demonstrated, according to test methods specified in California Code of Regulations (CCR), title 17, section 94207, that its natural-gas-fueled 440kW PureCell® System Model 400 fuel cell has complied with the following emission standards:

1. Emissions of oxides of nitrogen no greater than 0.07 pounds per megawatt-hour.
2. Emissions of carbon monoxide no greater than 0.10 pounds per megawatt-hour.
3. Emissions of volatile organic compounds no greater than 0.02 pounds per megawatt-hour.

WHEREAS, UTC Power Corporation has demonstrated that its 440kW PureCell® System Model 400 fuel cell complies with the emissions durability requirements in CCR, title 17, section 94207(d); and

WHEREAS, I find that the applicant, UTC Power Corporation, has met the requirements specified in CCR, title 17, article 3, Distributed Generation Certification Program, and has satisfactorily demonstrated that the 440kW PureCell® System Model 400 fuel cell meets the DG Certification Regulation 2007 Fossil Fuel Emission Standards.

NOW THEREFORE, IT IS HEREBY ORDERED, that a DG Certification, Executive Order DG-040 is granted.

This DG Certification:

- 1) Is subject to all conditions and requirements of CCR, title 17, article 3, Distributed Generation Certification Program, including the provisions relating to inspection, denial, suspension, and revocation.
- 2) Shall be void if any manufacturer's modification results in an increase in emissions or changes the efficiency or operating conditions of a model, such that the model no longer meets the 2007 DG Certification emission standards.
- 3) Shall expire on the 26<sup>th</sup> day of December, 2017.

Executed at Sacramento, California, this 26<sup>th</sup> day of December 2012.

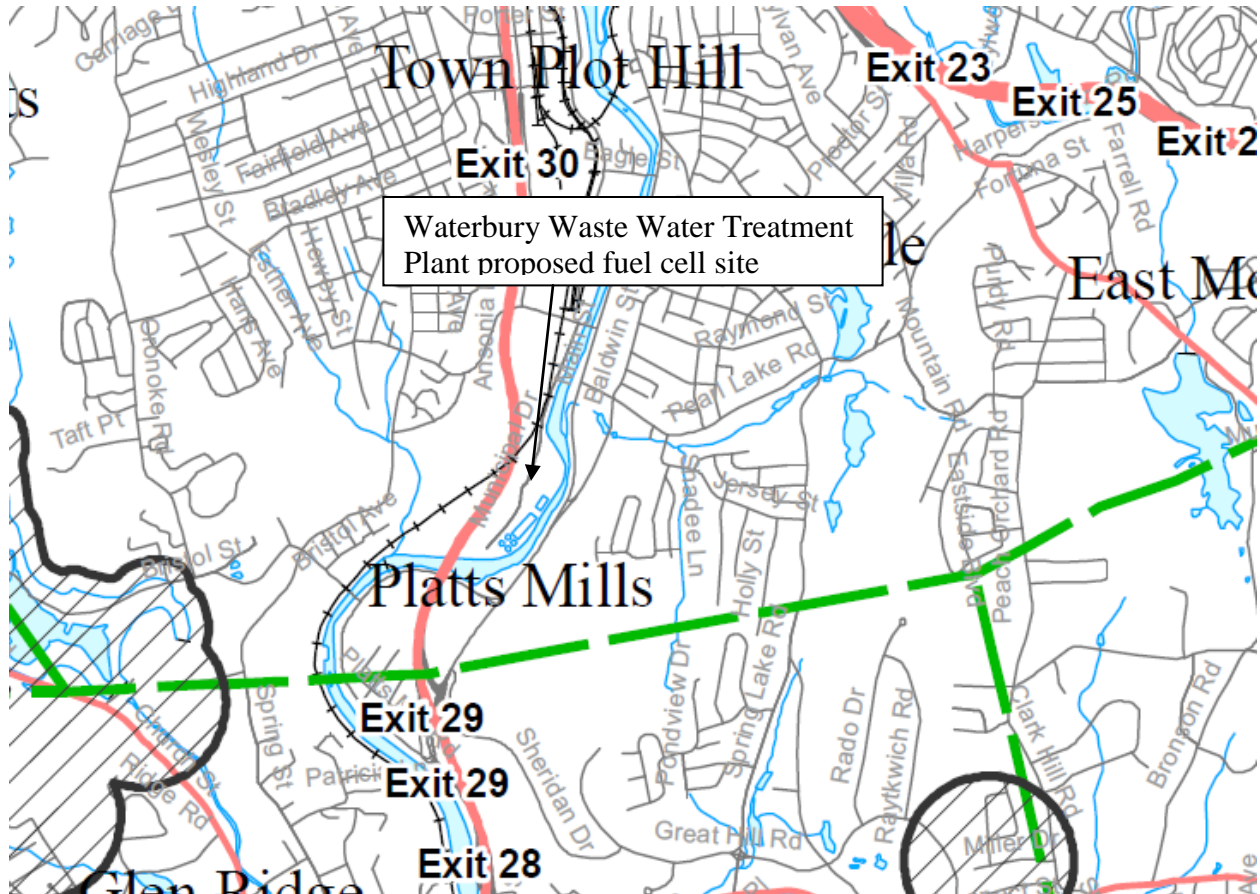
James N. Goldstene  
Executive Officer

by

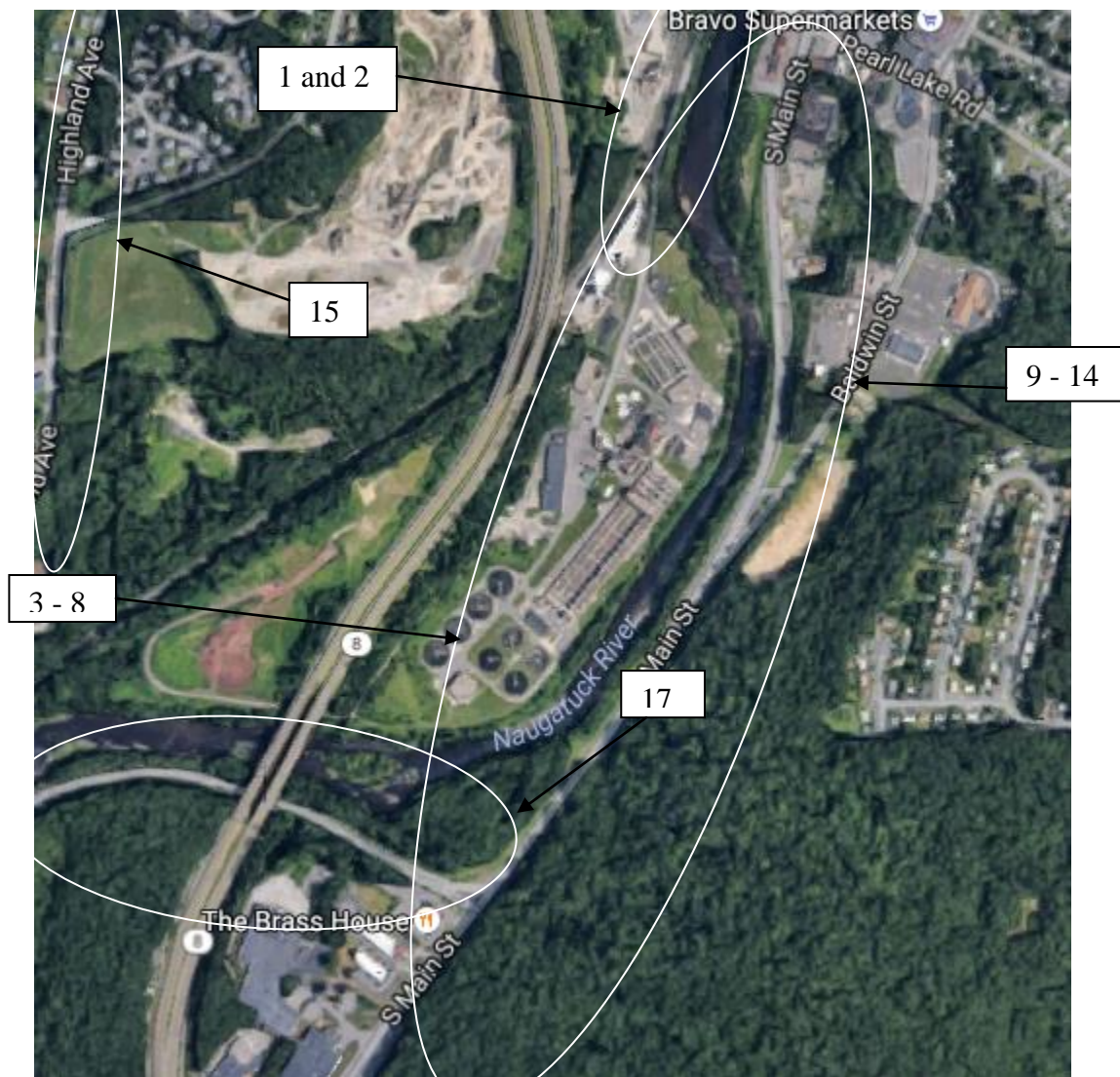


Cynthia Marvin, Chief  
Stationary Source Division

Attachment D: Connecticut DEP Naugatuck Natural Diverse Database areas Map (shaded areas denote known locations of state and federal listed species)



Attachment E – Waterbury Abutters A – Location Map  
(please see Waterbury Abutters B for list of Abutters)



### Waterbury Abutters B – List of Abutters

ID	Site Address	Owner Name	Mailing Address	Mailing City	Mailing State	Mailing Zip
1	184 Municipal Road	Municipal Road LLC	15 Mullen Road	Enfield	CT	06082
2	Municipal Road	Joan Benedetto	37 Spart Hill Parkway	Easton	CT	06612
3	2100 South Main Street	City of Waterbury	235 Grand Street	Waterbury	CT	06702
4	2391 South Main Street	771 Properties LLC	1625 Straits Turnpike, Suite 200	Middlebury	CT	06762
5	2636 South Main St.	C P N Motel LLC	2636 South Main Street	Waterbury	CT	06706
6	2620 South Main St.	Platt Brothers Co	2670 South Main Sreet	Waterbury	CT	06706
7	South Main St.	Canyon Signs & Graphics Inc	355 Washington Ave	North Haven	CT	06475
8	South Main St.	Francisco & Associates	2180 South Main Street	Waterbury	CT	06706
9	2070 Baldwin Street	Mark Wilkowski & Michael Surv	173 Southwind Road	Waterbury	CT	06708
10	Baldwin St.	Conn Railway & Light Co	PO Box 270	Hartford	CT	
11	2139 Baldwin St.	Vieira Sergio & George Vincent	10 Hopkins Hill Road	Naugatuck	CT	06770
12	2113 Baldwin St.	Our Lady of Fatima Roman Catholic	PO Box 1787	Waterbury	CT	
13	2073 Baldwin St.	Church of Our Lady Fatima Corp	PO Box 1878	Waterbury	CT	06720
14	2205 Baldwin St.	Wheeler-Young Post 201 V F W	1338 Baldwin Street	Waterbury	CT	06706
15	Highland Ave.	Materials Innovation & Recycling	100 Constitution Plaza	Hartford	CT	06103
16	Highview St.	Vincent Lorusso & Batholomew Jr.	42 Rena Lane	Waterbury	CT	06705
17	Thomaston Ave.	Boston & Maine Corporation	799 Main Street	Hartford	CT	06103



## Attachment F – State Officials Notification List

This is to certify that on the <b>27th day</b> of October 2016, the foregoing notice was sent via first class mail to the following:	
AGENCY	NAME/ADDRESS
Office of the Mayor	<b>Neil M. O'Leary</b> City Hall Building 235 Grand Street, 2nd Floor Waterbury, CT 06702
City Planning Department	<b>Charles Morrison</b> Land Use Officer 185 South Main Street, 5th Floor Waterbury, CT 06702
Building Inspections Department	<b>E. Gil Graveline</b> Building Official 185 South Main Street, 5th Floor Waterbury, CT 06702
State House	<b>Jeffrey Berger</b> House District 73 134 Gaylord Drive Waterbury, CT 06708
State House	<b>Larry Butler</b> House District 72 70 Blackman Road Waterbury, CT 06704
State House	<b>Anothony D'Amelio</b> House District 71 64 Wellington Ave Waterbury, CT 06708
State House	<b>Selim Noujaim</b> House District 74 104 Dinatali Drive Waterbury, CT 06705
State House	<b>Geraldo Reyes Jr.</b> House District 75 30 Madison St. Waterbury, CT 06706
State Senate	<b>Joan Hartley</b> Senate District 15 206 Columbia Blvd. Waterbury, CT 06710
State Senate	<b>Joe Markley</b> Senate District 16 47 Elm Street Plantsville, CT 06479
United State Congressman	<b>Rosa L. DeLauro</b> 59 Elm Street New Haven, CT 06510
United State Senator	<b>Christopher S. Murphy</b> One Constitution Plaza, 7th Floor Hartford, CT 06103
United State Senator	<b>Richard Blumenthal</b> 90 State House Square Hartford, CT 06103
State Department of Energy and Environmental Protection	<b>Robert Klee, Commissioner</b> 79 Elm Street Hartford, CT 06106
State Department of Public Health	<b>Dr. Jewel Mullen Commissioner</b> 410 Capitol Avenue Hartford, CT 06134
State Council on Environmental Quality	<b>Susan Merrow, Chair</b> 79 Elm Street Hartford, CT 06106
State Department of Agriculture	<b>Steven K. Reviczky Commissioner</b> 165 Capitol Avenue Hartford, CT 06106
Office of Policy and Management	<b>Benjamin Barnes, Secretary</b> 450 Capitol Avenue Hartford, CT 06106-1379
State Department of Economic and Community Development	<b>Catherine Smith, Commissioner</b> 505 Hudson Street Hartford, CT 06106-7106
Naugatuck Valley Council of Governments	<b>Rick Dunn</b> Executive Director 49 Leavenworth St., 3rd Floor Waterbury, CT 06702
Attorney General	<b>George Jepsen, Attorney General</b> Office of the Attorney General 55 Elm Street Hartford, CT 06106
Public Utilities Regularity Authority	<b>Arthur House, Chairman</b> Public Utilities Regularity Authority Ten Franklin Square, New Britain, CT 06051
Department of Transportation	<b>James P. Redeker, Commissioner</b> Department of Transportation 2800 Berlin Turnpike, Newington, CT 06111
Department of Emergency Services and Public Protection	<b>Dora B. Schifro Commissioner</b> 1111 Country Club Road Middletown, CT 06457
Department of Consumer Protection	<b>Jonathan A Harris Commissioner</b> 165 Capitol Avenue Hartford, CT 06106-6300
Department of Administrative Services	<b>Melody A. Currey Commisioner</b> 165 Capitol Avenue Hartford, CT 06106
Department of Labor	<b>Scott D. Jackson Commissioner</b> 200 Folly Brook Boulevard Wethersfield, CT 06109

Waterbury WWTP.  
210 Municipal Drive, Waterbury, CT  
Fuel Cell Petition

October 25, 2016