Petition For A Declaratory Ruling That No Certificate Of Environmental Compatibility And Public Need Is Required For The Installation Of Two (2) Customer-Side 460 kW Fuel Cells To Be Located At Zygo Corp., Laurel Brook Road, Middlefield, CT 06455.

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 two (2) 460 kW fuel cells in support of a customer-side distributed resources project in Middlefield, 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 cell is a customer-side installation distributed generation resource with grid interconnection and is to be located on site at Zygo Corp. in Middlefield, CT (see project site – Attachment A). The installation consists of placing (2) natural-gas fueled 460 kW PureCell® 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 each Fuel Cell are eight feet four inches wide by twenty-seven feet four inches long by nine feet eleven inches tall. The units are totally enclosed and factory-assembled and tested prior to shipment.

The Fuel Cell is intended for a distributed generation and combined heat and power application. The systems for Zygo will be capable of producing a total of 920 kW of continuous, reliable electric power while generating heat that will be used for a building heating loop. It will operate in parallel with the utility grid and provide a portion of the electrical requirements of the facility. When all of the heat is used, the overall efficiency of the system will be 62%, including both electric and thermal output. As long as natural gas is available, electric power and heat can be generated.

The PureCell® 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 Cells for Zygo are estimated to reduce the facility's annual carbon emissions by over 260 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

Cells are 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 DEP's Middlefield natural diversity data base areas map. The installation of the two (2) PureCell Model 400 fuel cells will be outside of identified locations of endangered species populations.

The Fuel Cells will not emit noise in excess of limitations set forth in CT regulations. The Fuel Cells are located in the Zygo lot. CT regulations require a noise level of no greater than 62dBA from a Class B emitter to a Class B receptor and this installation will comply due to the nature of the site. The fuel cells are expected to operate at full power (920 kW), with a noise level in free field of well below 62dBA at 100 feet, at all times. Therefore, the fuel cells are 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 units at Zygo.

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:

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

Attachment A: Project Site. The fuel cells will be sited as shown below.

Attachment B: PureCell® Model 400 Datasheet

DOOSAN

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[1]	kW/kVA	460/532	440/518
Electrical Efficiency	%, LHV	43%	45%
Peak Overall Efficiency	%, LHV	90%	90%
Gas Consumption[1]	MMBtu/h, HHV (kW)	4.09 (1,200)	3.77 (1,104)
Gas Consumption[1,2]	SCFH (Nm^3/h)	3,995 (107)	3,674 (98.4)
High Grade Heat Output @ up to 250°F[1]	MMBtu/h (kW)	0.72 (212)	0.55 (162)
Low Grade Heat Output @ up to 140°F[1]	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[3,4]

NOx ..... 0.01 lbs/MWh (0.006 kg/MWh)
CO ..... 0.02 lbs/MWh (0.009 kg/MWh)
VOC ..... 0.02 lbs/MWh (0.009 kg/MWh)
SO_2 ..... Negligible
Particulate Matter ..... Negligible
CO_2[1] (electric only) ..... 998 lbs/MWh (454 kg/MWh)
(with High-Grade heat recovery) ..... 815 lbs/MWh[5] (371 kg/MWh)
(with full heat recovery) ..... 485 lbs/MWh[5] (220 kg/MWh)

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/Nm3)
3. Emissions based on 440 kW operation.
4. Fuel cells are exempt from air permitting in many U.S. states.
5. Includes CO_2 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
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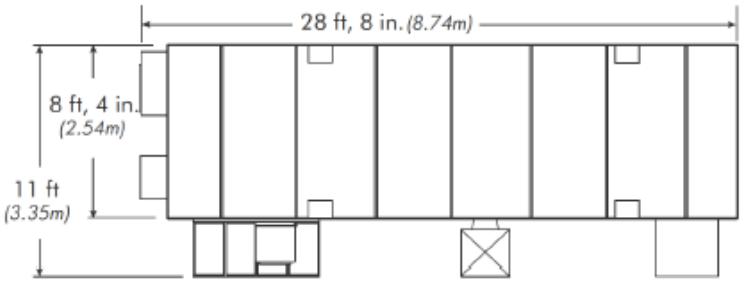
DOOSAN

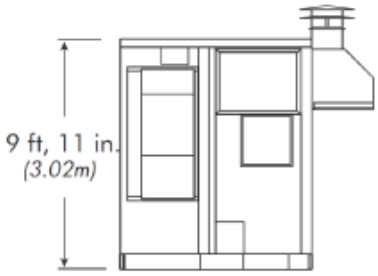
PureCell® Model 400

SYSTEM DIMENSIONS

Power Module

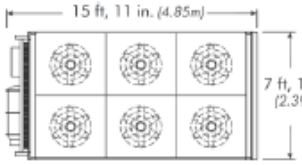


Top View



Side View

Cooling Module



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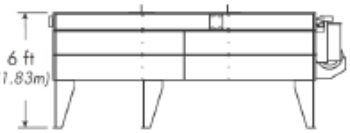


Side View

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)	3,190lb (1,447 kg)

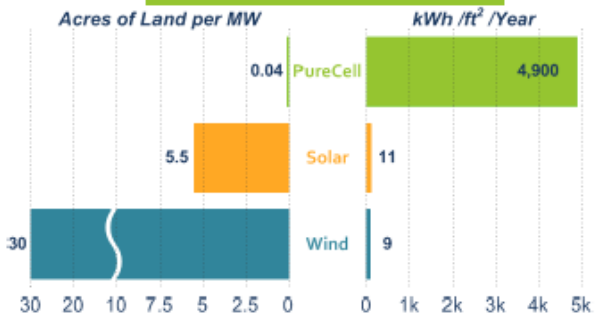
PURECELL ADVANTAGE

OFFSET 3x MORE CO_2

CAPACITY FACTOR

CO_2 OFFSET

USE LESS LAND



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195 Governor's Highway
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www.doosanfuelcell.com

Attachment C: California Air Resources Board Emissions Certification

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Matthew Rodriquez
Secretary for
Environmental Protection

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

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.

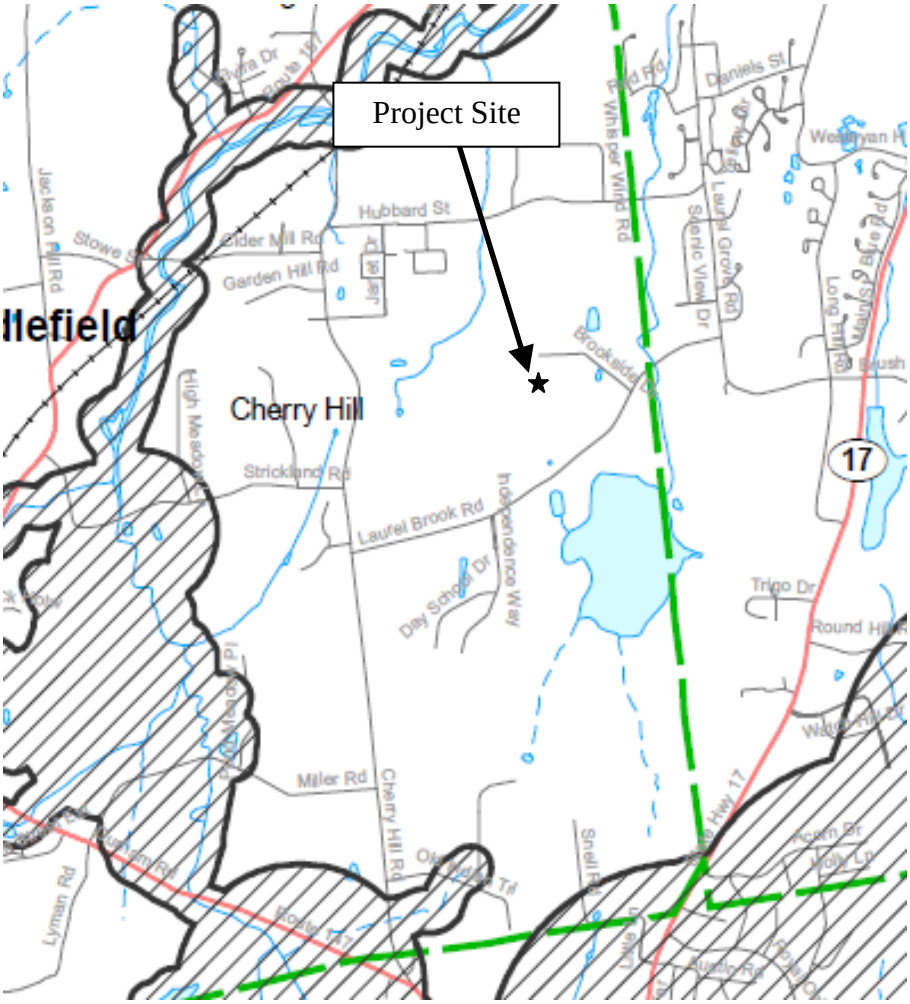
3) Shall expire on the 26th day of December, 2017.

Executed at Sacramento, California, this 26th day of December 2012.

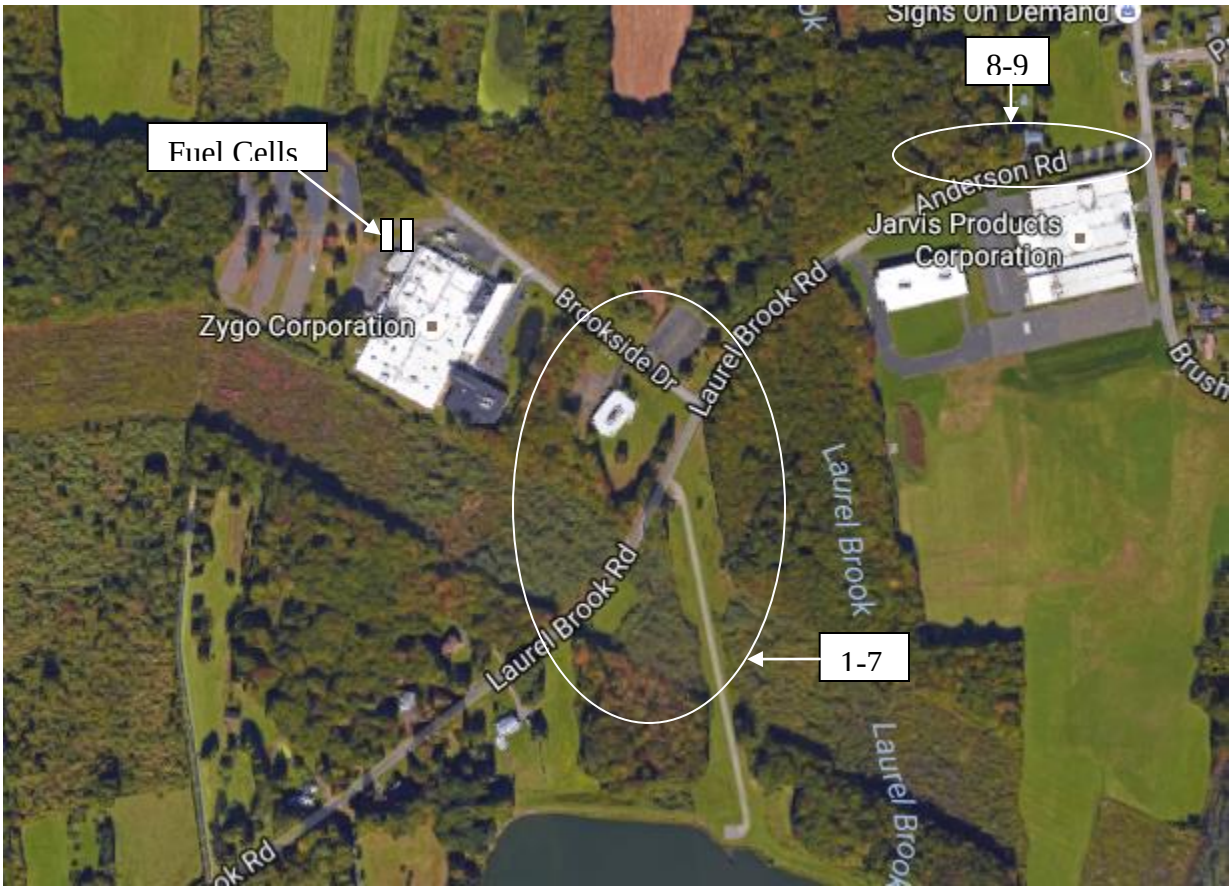
James N. Goldstene
Executive Officer
by

Cynthia Marvin, Chief
Stationary Source Division

Attachment D: Connecticut DEP Middlefield Natural Diverse Database areas Map (shaded areas denote known locations of State and Federal listed species).



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



Middlefield Abutters B – List of Abutters

ID Number	Property Address	Owner Name	Co Owner Name	Owner State	Owner City	Owner Zip
1	139 Laurel Brook Road	Stanley Slomkowski		CT	Middlefield	06455
2	140 Laurel Brook Road	Meghan E Burgers		CT	Middlefield	06455
3	141 Laurel Brook Road	Gary & Mimi Didato		CT	Middlefield	06455
4	104 Laurel Brook Road	Robert C. Birdsey		CT	Middlefield	06455
5	64 Laurel Brook Road	Scott M. McBride		CT	Middlefield	06455
6	54 Laurel Brook Road	Alan J. Cotrona	Karyn M. Pasani	CT	Middlefield	06455
7	75 Laurel Brook Road	Paula S. Mansfield		CT	Middlefield	06455
8	30 Anderson Road	John & Hope Kasper		CT	Middletown	06457
9	33 Anderson Road	Jarvis Products Corporation		CT	Middletown	06457

Attachment F – State Officials Notification List

This is to certify that on the 27th day of October 2016, the foregoing notice was sent via first class mail to the following:

AGENCY	NAME/ADDRESS
Mayor/First Selectman of Middlefield, CT	**Edward P. Bailey** 393 Jackson Hill Road Middlefield, CT 06455
Zoning Department	**Allan Johanson** Middlefield Town Hall 393 Jackson Hill Road Middlefield, CT 06455
Building Department	**Robert Meyers** Middlefield Town Hall 393 Jackson Hill Road Middlefield, CT 06455
State Senator	**Dante Bartolomeo** Senate District 13 167 Reynolds Drive Meriden, CT 06450-2568
State House	**Emil Altobello** House District 82 555 Preston Ave Meriden, CT 06450-4883
United Congressman	**Rosa DeLauro** 59 Elm Street New Haven, CT 06510
United State Senator	**Christopher S. Murphy** One Constitution Plaza, 7th Floor Hartford, CT 06103
United State Senator	**Richard Blumenthal** 90 State House Square Hartford, CT 06103
State Department of Energy and Environmental Protection	**Robert Klee, Commissioner** 79 Elm Street Hartford, CT 06106
State Department of Public Health	**Dr. Jewel Mullen Commissioner** 410 Capitol Avenue Hartford, CT 06134
State Council on Environmental Quality	**Susan Merrow, Chair** 79 Elm Street Hartford, CT 06106
State Department of Agriculture	**Steven K. Reviczky Commissioner** 165 Capitol Avenue Hartford, CT 06106
Office of Policy and Management	**Benjamin Barnes, Secretary** 450 Capitol Avenue Hartford, CT 06106-1379
State Department of Economic and Community Development	**Catherine Smith, Commissioner** 505 Hudson Street Hartford, CT 06106-7106
River COG	**Samuel S. Gold** RiverCOG 145 Dennison Road Essex, CT 06426
Attorney General	**George Jepsen, Attorney General** Office of the Attorney General 55 Elm Street Hartford, CT 06106
Public Utilities Regularity Authority	**Arthur House, Chairman** Public Utilities Regularity Authority Ten Franklin Square, New Britain, CT 06051
Department of Transportation	**James P. Redeker, Commissioner** Department of Transportation 2800 Berlin Turnpike, Newington, CT 06111
Department of Emmegency Services and Public Protection	**Dora B. schriro Commissioner** 1111 country club road Middletown, CT 06457
Department of Consumer Protection	**Jonathan A Harris Commissioner** 165 Capitol Avenue Hartford, CT 06106-6300
Department of Administrative Services	**Melody A. Currey Commssioner** 165 Capitol Avenue Hartford, CT 06106
Department of Labor	**Scott D. Jackson Commissioner** 200 Folly Brook Boulevard Wethersfirld, CT 06109