FuelCell Energy
3 Great Pasture Road
Danbury, CT 06810
www.fuelcellenergy.com

June 28, 2019

VIA EMAIL AND OVERNIGHT MAIL

Ms. Melanie A. Bachman
Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, Connecticut 06051

RE: **Petition No. 1372** – Derby Fuel Cell, LLC petition for declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 14.0-megawatt fuel cell facility and associated equipment to be located at 200 Roosevelt Drive, Derby, Connecticut.

Dear Ms. Bachman:

Pursuant to the Council's request dated June 11, 2019, enclosed on behalf of Derby Fuel Cell, LLC (the "Company") are an original and 15 copies of the Company's responses to the Council's questions 1-36 in the above-referenced matter. The Company is submitting its confidential response to Interrogatory CSC-36 under seal, along with a Motion for Protective Order, which is being filed simultaneously herewith.

If you have any questions regarding the enclosed, please feel free to contact me.

Respectfully submitted,

Jennifer D. Arasimowicz
Interim President, General Counsel, Chief Commercial Officer and Corporate Secretary

Encls.

c: Service List

Q-CSC-1 Would the proposed facility be a "customer-side distributed resources" facility or a "grid-site distributed resources" facility pursuant to Connecticut General Statutes §16-1?

A-CSC-1: **The proposed facility would be a "grid-site distributed resources" facility pursuant to Connecticut General Statutes § 16-1.**

Q-CSC-2 Referencing page 2 of the Petition, provide the date on which FuelCell Energy, Inc. (FCE) submitted its proposal in response to a Connecticut Department of Energy and Environmental Protection (DEEP) Request for Proposals (RFP). On what date did DEEP select this fuel cell project in its RFP? What percentage of the electrical energy and/or renewable energy credits (RECs) would be sold to The Connecticut Light and Power Company d/b/a Eversource Energy and The United Illuminating Company (UI) per the power purchase agreements?

A-CSC-2: **FuelCell Energy, Inc. submitted its proposal in response to the DEEP RFP on April 02, 2018. The project was selected by DEEP on or around June 13, 2018.**

The United Illuminating Company (UI) would purchase 19.62% of the facility electrical output. The remaining 80.38% would be sold to The Connecticut Light and Power Company d/b/a Eversource Energy. RECs are sold with the electrical energy and therefore are transferred to the utilities in the same percentages.

Q-CSC-3 Was the project selected for the LREC/ZREC Program?

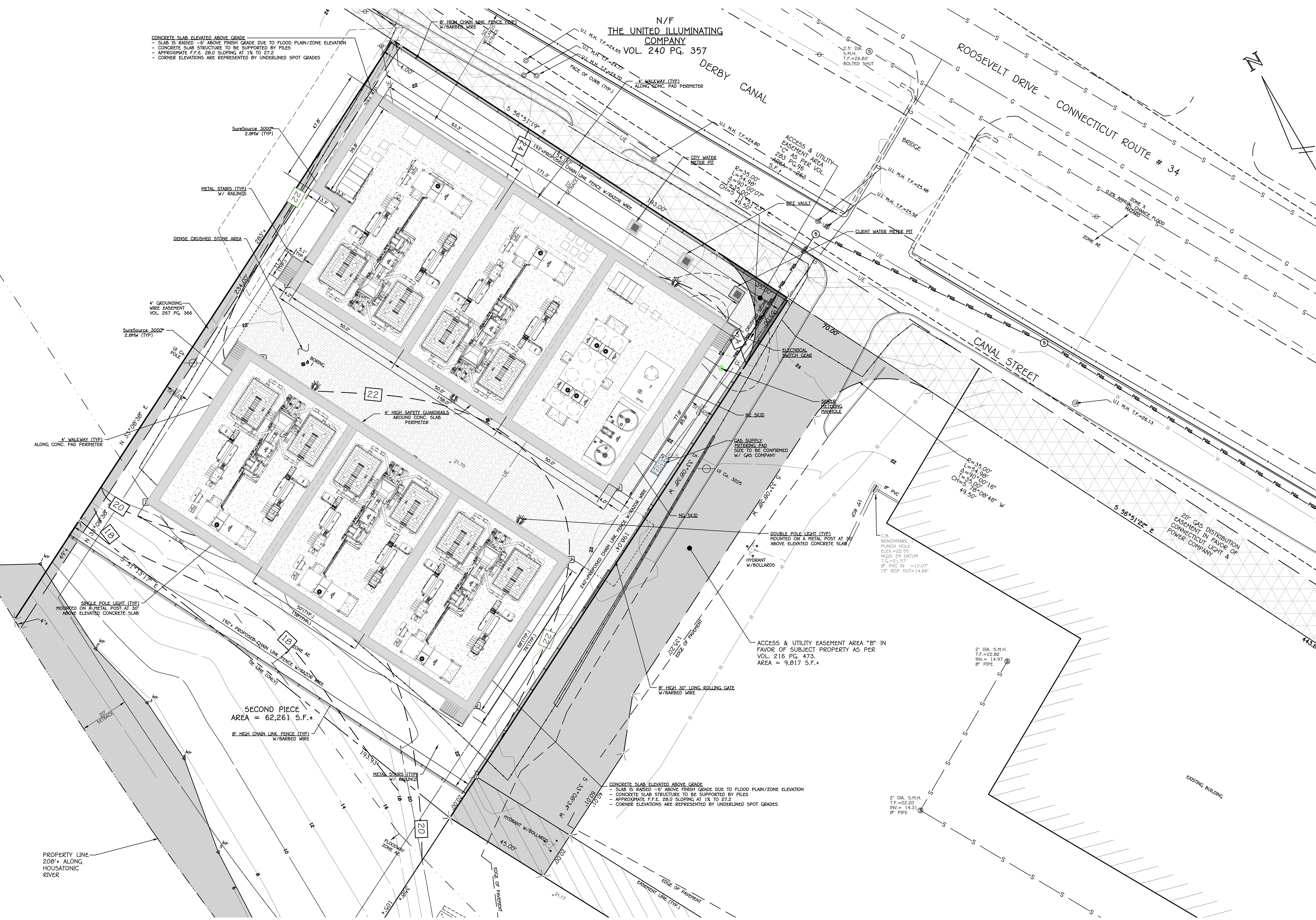
A-CSC-3: **The project was not eligible to be bid into the LREC/ZREC program. Pursuant to Section 2.2.2 of the DEEP RFP, "Eligible Projects cannot receive Connecticut ratepayer-funded incentives or subsidies or any other contract to sell products produced by the project to a Connecticut EDC, including but not limited to net metering, pursuant to C.G.S. § 16-243h, virtual net metering, pursuant to C.G.S. § 16-244u, or LREC/ZREC pursuant to C.G.S. §§ 16-244r and 16-244t or any successor programs."**

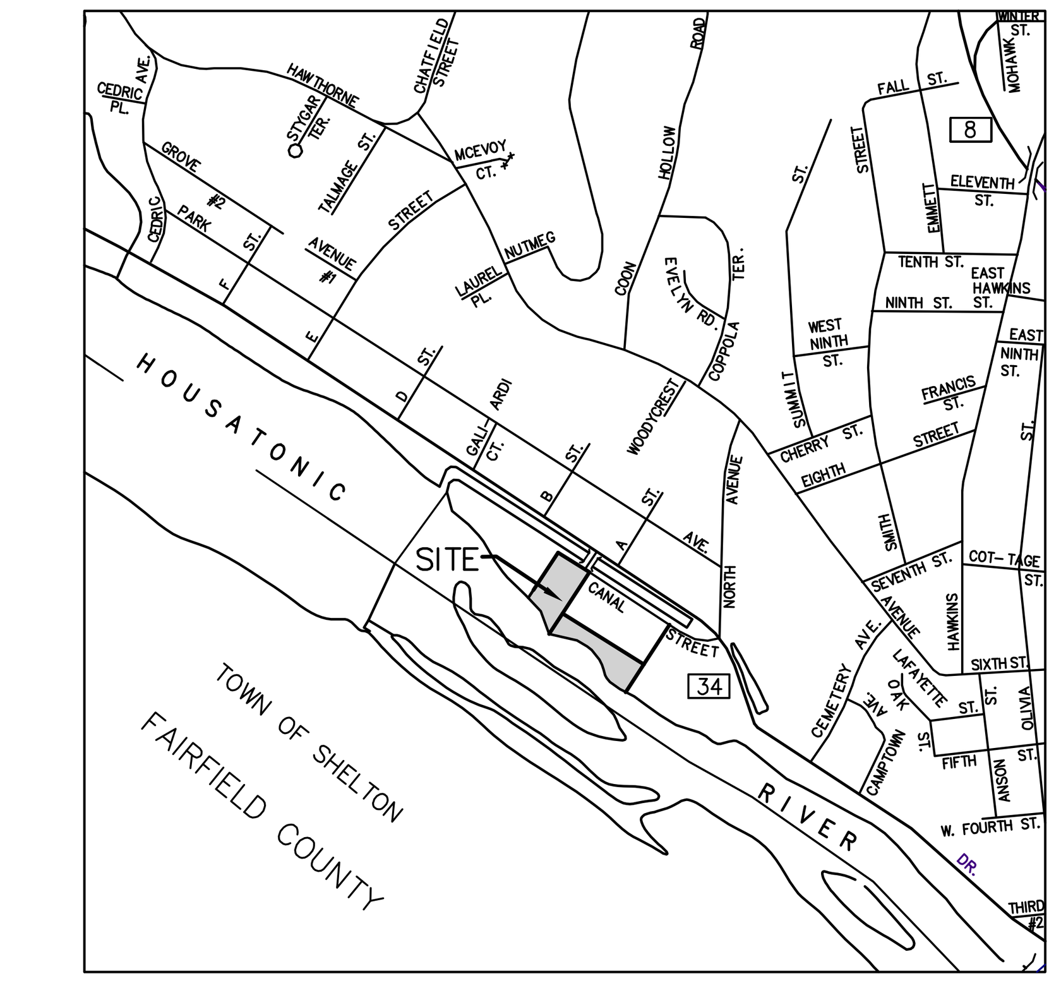
Construction Specifications Questions

Q-CSC-4 Provide a clear copy of Figure 1 and Drawing Nos. C-001 through C-004 from the Petition, and depict the wastewater connection on Drawing No. C-004. Either 8.5" x 11" or 11" x 17" could be used for the drawing sizes.

A-CSC-4: **A copy of Figure 1 (Site Development Plan) and Drawing Nos. C-001 through C-004 are attached hereto as Exhibit A.**

EXHIBIT A





LOCATION MAP

SCALE: 1" = 1000'±

NOTES:

1. REFERENCE IS MADE TO THE FOLLOWING MAPS:
   A. RIGHT OF WAY SURVEY, MAP SHOWING EASEMENT AQUIRED FROM, DERBY CELLULAR Z PRODUCTS, INC., BY THE CITY OF DERBY, FOR THE PLAN, FOR THE BRIDGE OVER DERBY CANAL, SCALE: 1:250 METERS, DATE: JULY 2003, BY: MILONE & MacBROOM.
   B. PROPERTY & TOPOGRAPHIC MAP OF, HOUSATONIC INDUSTRIAL PARK, LAND NOW OR FORMERLY, THE CONNECTICUT DEVELOPMENT AUTHORITY, ROOSEVELT DRIVE, DERBY, CONNECTICUT, SCALE: 1"=20', DATE: 6/8/83, BY: DECARLO & DOLL.
   C. SURVEY PREPARED FOR, VANIDA ASSOCIATES, INC., 200 ROOSEVELT DRIVE, DERBY, CONNECTICUT, SCALE: 1"=40', DATE: DECEMBER 19, 1990, BY: E.G. SHELOMIS & ASSOCIATES
   D. THE SHELTON CANAL COMPANY, BERLIN, CONN., PLAN SHOWING LAND AND EASEMENT TO BE CONVEYED TO THE CITY OF DERBY, AND EASEMENT AREA TO BE RESERVED, SCALE: 1"=50', DATE: APRIL 22, 1986, REVISED THRU: 3/19/87, BY: NORTHEAST UTILITIES SERVICE COMPANY, SYSTEM REAL ESTATE DEPARTMENT.
   E. MAP SHOWING LAND TO BE CONVEYED TO, THE UNITED ILLUMINATING COMPANY, BY THE SHELTON CANAL COMPANY, CANAL STREET, DERBY, CONNECTICUT, SCALE: 1"=20', DATE: JUNE 22, 1992, BY: GORDON BELIDES, P.E. & L.S.
   F. B.F. GOODRICH CO., DERBY, CONN., SCALE: 1"=40', DATE: JULY 14, 1975, REVISED THRU: OCT. 27, 1978, BY: NOWAKOWSKI & O'BYMACHOW
   G. THE VICTORY TEXTILE PRINTING CORPORATION, DERBY, CONN., SCALE: 1"=40', DATE: NOVEMBER 15, 1972, REVISED THRU: OCT. 25, 1974, BY: NOWAKOWSKI & O'BYMACHOW
2. FOR SUBJECT PROPERTY, REFERENCE IS MADE TO THE FOLLOWING DEED ON FILE IN THE TOWN OF DERBY LAND RECORDS AS VOL. 596 PG. 316 AND LISTED ON ASSESSOR'S MAP 9, BLOCK 4 AS LOTS 3B & 4B
3. FLOOD HAZARD ZONE BOUNDARIES SHOWN HEREON TAKEN FROM FEMA FLOOD INSURANCE RATE MAP, NEW HAVEN COUNTY, CONNECTICUT, MAP NUMBER 09001C0305F, EFFECTIVE DATE: JUNE 18, 2010
4. THE STONEWALLS AND/OR FENCES SHOWN AS BOUNDARIES MAY HAVE IRREGULARITIES OF COURSE BETWEEN PRINCIPAL POINTS OF COURSE INDICATED.
5. CONTOURS AND SPOT ELEVATIONS SHOWN HEREON TAKEN BY FIELD SURVEY AND BASED ON
6. CALL BEFORE YOU DIG (1-800-922-4455) SHALL BE CONTACTED PRIOR TO PROJECT INITIATION.
7. DESIGN ENGINEER/LAND SURVEYOR TO SET A STABLE BENCHMARK AND STAKE & OFFSET SEPTIC SYSTEM PRIOR TO INSTALLATION. INSTALLER TO NOTIFY ENGINEER (3) BUSINESS DAYS BEFORE INSTALLATION.
8. DESIGN ENGINEER/LAND SURVEYOR TO CONDUCT AN AS-BUILT SURVEY OF THE SEPTIC SYSTEM PRIOR TO BACKFILL. INSTALLER TO NOTIFY ENGINEER (3) BUSINESS DAYS BEFORE SYSTEM COMPLETION.

20 15 10 5 0 20 40 60

SCALE IN FEET

LEGEND

	UTILITY POLE
00	EXISTING CONTOURS
+0.00	EXISTING SPOT ELEVATION
+00.00	PROPOSED SPOT ELEVATION
(00)	PROPOSED CONTOUR
BCLC	BITUMINOUS CONCRETE LIP CURBING
W.S.O.	WATER SHUTOFF
W.G.	WATER GATE
PRS	PROPOSED SEWER LINE
S	EXISTING SEWER LINE
G	EXISTING GAS LINE
UE	EXISTING UNDERGROUND ELECTRIC
W	EXISTING WATER LINE

NOTE

ANY MODIFICATIONS TO THE LOCATION OR ELEVATION OF THE SEPTIC SYSTEM COMPONENTS SHOWN HEREON (INCLUDING CURTAIN DRAINS IF SHOWN) ARE SUBJECT TO THE WRITTEN APPROVAL OF THE DESIGN ENGINEER. THE DESIGN ENGINEER WILL NOT BE RESPONSIBLE FOR ANY CHANGES MADE WITHOUT SUCH WRITTEN APPROVAL.

STUART J. FAIRBANK
CONN. P.E. #20206

BOUNDARY LINES OF ADJOINING PROPERTIES ARE SHOWN FOR GENERAL INFORMATIONAL PURPOSES ONLY AND ARE NOT TO BE CONSTRUED AS BEING ACCURATELY LOCATED OR DEPICTED.

THE WORD "CERTIFY", AS USED IS UNDERSTOOD TO BE AN EXPRESSION OF PROFESSIONAL OPINION BY THE ENGINEER OR SURVEYOR. IT IS A DECLARATORY STATEMENT WHICH IS BASED ON HIS BEST KNOWLEDGE, INFORMATION AND BELIEF. AS SUCH IT CONSTITUTES NEITHER GUARANTEE NOR WARRANTY, EXPRESSED OR IMPLIED, OF ANY INFORMATION CONTAINED HEREON. NO CERTIFICATION IS EXPRESSED OR IMPLIED ON ANY ORIGINAL OR ANY DUPLICATE OF THIS PLAN UNLESS IT BEARS AN ORIGINAL STAMP OR SEAL AND ORIGINAL SIGNATURE OF THE INDIVIDUAL WHOSE REGISTRATION NUMBER APPEARS HEREON.

CERTIFICATION NOTES:

1. THIS SURVEY PLAN HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTION 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.
   A. TYPE OF SURVEY:
   B. BOUNDARY DETERMINATION:
   C. THIS SURVEY CONFORMS TO THE STANDARDS AND ACCURACY OF CLASS

ANGUS L. McDONALD JR.
CONN. L.S. #70173

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

LAND & MARINE — ENGINEERING — SURVEYING — PLANNING

ANGUS McDONALD
GARY SHARPE
& ASSOCIATES, INC.
SINCE 1966

P.O. BOX 608, 233 BOSTON POST ROAD
OLD SAYBROOK, CONNECTICUT 06475
TEL. (860) 388-4671 FAX (860) 388-3962

SITE DEVELOPMENT PLAN

PROPERTY OF

I D A PROPERTIES, LLC

CANAL STREET
DERBY, CONNECTICUT

DATE: MARCH 8, 2019	SCALE: 1"=20'
DR'N DO'D	CK'D / APP'D
SHEET 1 of 1	JOB NO. 186391
REVISIONS:	

SureSource 3000™ POWER PLANT

200 ROOSEVELT DRIVE DERBY, CT 06418
PRELIMINARY SITE DEVELOPMENT

DEVELOPED & DESIGNED BY

DEVELOPMENT & CONSTRUCTION, LLC

68 UNION STREET
WESTFIELD, MA 01085
P: (413) 485-4060
F: (413) 485-4090

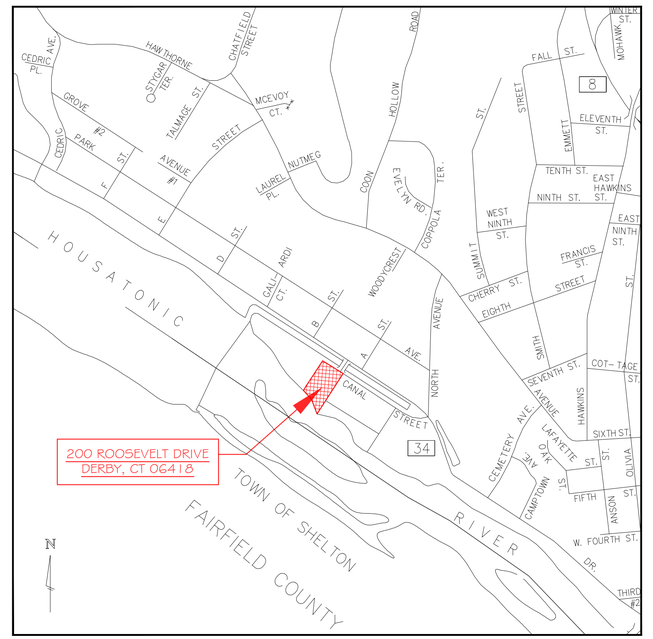
90 MAIN STREET
P.O. BOX 820
CENTERBROOK, CT 06426
P: (860) 982-0889

www.one-d-c.com

INDEX OF DRAWINGS

SureSource 3000™ SET UP

LOCUS MAP



PROJECT DESIGNER

one
DEVELOPMENT & CONSTRUCTION, LLC

68 UNION STREET
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F: (413) 485-4090

90 MAIN STREET
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CENTERBROOK, CT 06426
P: (860) 982-0889

www.one-d-c.com

PROJECT DEVELOPER

CONSULTING ENGINEER

PROFFESIONAL SEAL

DRAWING ORIENTATION

N NE E SE S SW W NW

NOTES/COMMENTS

NO.	DESCRIPTION	DATE

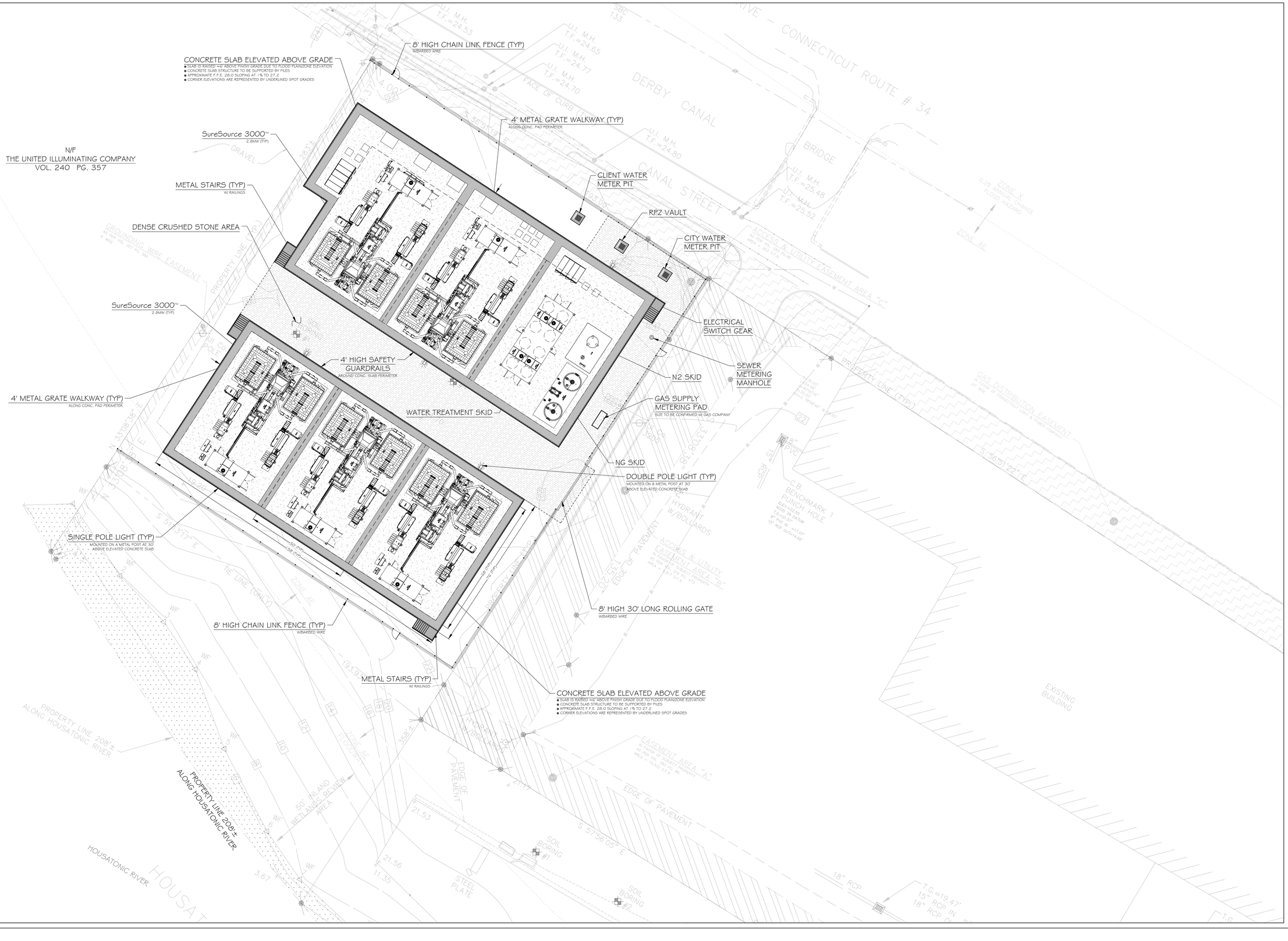
SURE SOURCE 3000™
POWER PLANT
200 ROOSEVELT DRIVE
DERBY CT

EXISTING CONDITIONS
PROPERTY BOUNDRY / SETBACKS

PROJECT NUMBER	
DATE	3/7/19
DESIGNED BY	YEVGENIY KARCHA
CHECKED BY	

C-001

SCALE 1"=20'-0"



PROJECT DESIGNER

DEVELOPMENT & CONSTRUCTION, LLC

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F: (413) 485-4090

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CENTERBROOK, CT 06426
P: (860) 982-0889

www.one-d-c.com

PROJECT DEVELOPER

CONSULTING ENGINEER

PROFFESIONAL SEAL

DRAWING ORIENTATION

N

NOTES/COMMENTS

NO.	DESCRIPTION	DATE

SURE SOURCE 3000™ POWER PLANT

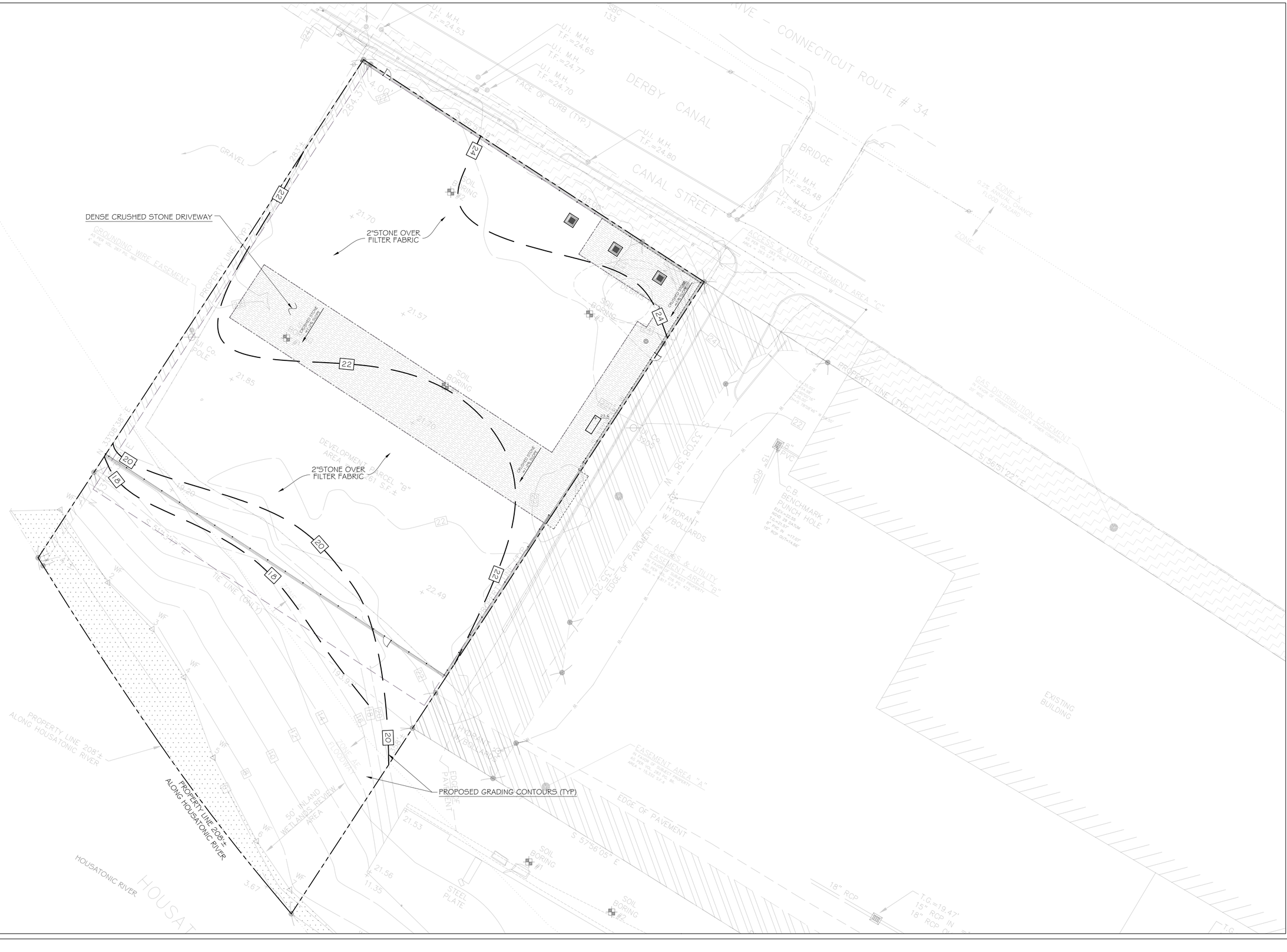
200 ROOSEVELT DRIVE
DERBY CT

SITE LAYOUT

PROJECT NUMBER	
DATE	3/7/19
DESIGNED BY	YEVGENIY KARCHA
CHECKED BY	

C-002

SCALE 1"=20'-0"



PROJECT DESIGNER

one
DEVELOPMENT & CONSTRUCTION, LLC

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www.one-d-c.com

PROJECT DEVELOPER

CONSULTING ENGINEER

PROFFESIONAL SEAL

DRAWING ORIENTATION

N NE E SE S SW W NW

NOTES/COMMENTS

NO.	DESCRIPTION	DATE

SURE SOURCE 3000™
POWER PLANT
200 ROOSEVELT DRIVE
DERBY CT

SITE GRADING PLAN

PROJECT NUMBER	
DATE	3/7/19
DESIGNED BY	YEVGENIY KARCHA
CHECKED BY	

C-003

SCALE 1"=20'-0"

PROJECT DESIGNER

ONE
DEVELOPMENT & CONSTRUCTION, LLC

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www.one-d-c.com

PROJECT DEVELOPER

CONSULTING ENGINEER

PROFFESIONAL SEAL

DRAWING ORIENTATION

NOTES/COMMENTS

NO.	DESCRIPTION	DATE

SURE SOURCE 3000™
POWER PLANT

200 ROOSEVELT DRIVE
DERBY CT

UTILITIES LAYOUT

PROJECT NUMBER
DATE 3/7/19
DESIGNED BY YEVGENIY KARCHA
CHECKED BY

C-004

SCALE 1"=20'-0"

Q-CSC-5 Referencing Drawing No. C-004, has the Petitioner determined how the natural gas connection would cross the existing bridge to reach the existing natural gas main on Route 34?

A-CSC-5: **Based on the preliminary design completed by Eversource there will be no need to cross the existing bridge for the natural gas connection. Eversource will tie-in into its gas main located on Route 34 and bring gas to the site by installing a new line extension along-side the IDA building.**

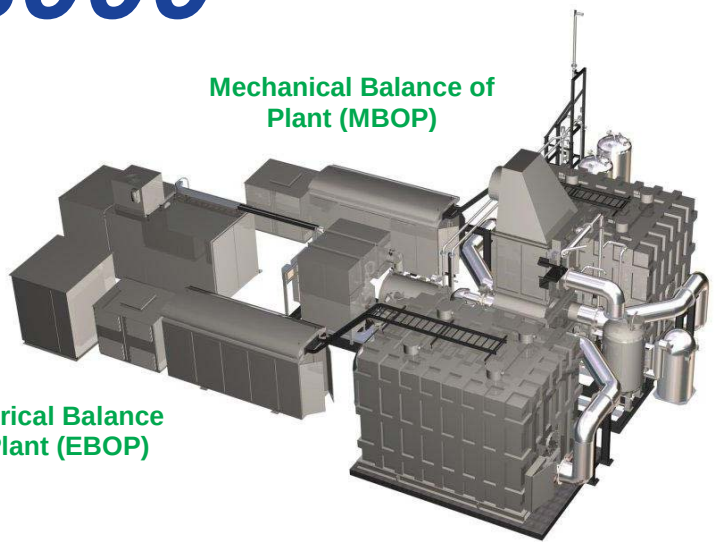
Q-CSC-6 Please provide a specifications sheet for the FCE SureSource 3000 fuel cell, or as applicable.

A-CSC-6: **The specification sheet for the SureSource 3000 fuel cell is attached hereto as Exhibit B.**

EXHIBIT B

SureSource 3000

2.8 MEGAWATTS



KEY FEATURES

- Predictable Power
- Highly Efficient
- Ultra-Clean
- Scalable
- Modest Footprint
- Quiet Operation
- Fuel Flexible

APPLICATIONS

Comprised of two 1.4 megawatt (MW) modules, the SureSource 3000 generates 2.8 MW of ultra-clean power. The system is ideal for on-site applications including large universities, manufacturing facilities, wastewater treatment plants, or multi-plant fuel cell parks to support the electric grid.

PERFORMANCE

Gross Power Output

Power @ Plant Rating	2,800 kW
Standard Output AC voltage	13,800 V
Standard Frequency	60 Hz
Optional Output AC Voltages	By Request
Optional Output Frequency	50 Hz

Efficiency

LHV	47 +/- 2 %

Available Heat

Exhaust Temperature	700 +/- 50 ºF
Exhaust Flow	36,600 lb/h
Allowable Backpressure	5 iwc

Heat Energy Available for Recovery

(to 250 ºF)	4,433,000 Btu/h
(to 120 ºF)	7,460,000 Btu/h

Fuel Consumption

Natural gas (at 930 Btu/ft3)	362 scfm
Heat rate, LHV	7,260 Btu/kWh

Water Consumption

Average	9 gpm
Peak during WTS backflush	30 gpm

Water Discharge

Average	4.5 gpm
Peak during WTS backflush	30 gpm

Pollutant Emissions

NOx	0.01 lb/MWh
SOx	0.0001 lb/MWh
PM10	0.00002 lb/MWh

Greenhouse Gas Emissions

CO2	980 lb/MWh
CO2 (with waste heat recovery)	520-680 lb/MWh

Sound Level

Standard	72 dB(A) at 10 feet

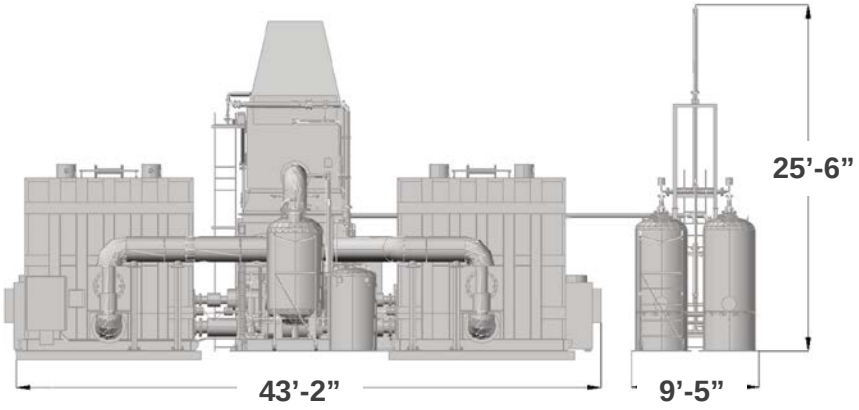
SPECIFICATIONS

SureSource 3000

WEIGHTS

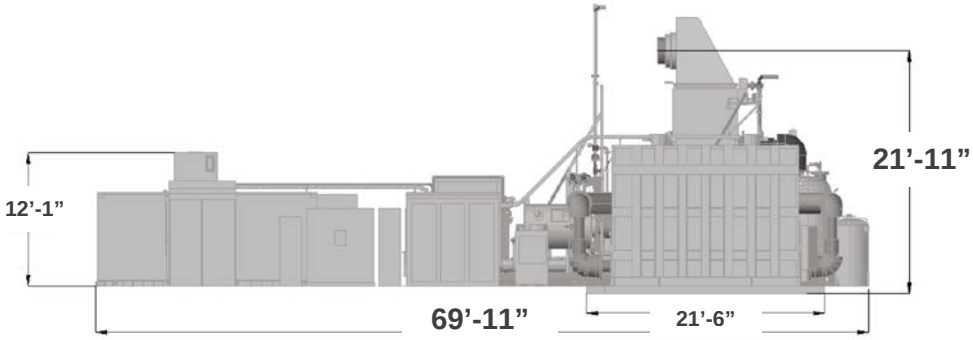
Water Treatment Skid
20,000 lb

Main Process Skid
50,000 lb



Desulfurization
15,000 lb

Electrical Balance of Plant
52,000 lb



Fuel Cell Module
107,000 lb *(each module)*

ABOUT FUELCELL ENERGY

FuelCell Energy (NASDAQ: FCEL) delivers efficient, affordable and clean solutions for the supply, recovery and storage of energy. We design, manufacture, undertake project development, install, operate and maintain megawatt-scale fuel cell systems, serving utilities, industrial and large municipal power users with solutions that include both utility-scale and on-site power generation, carbon capture, local hydrogen production for transportation and industry, and long duration energy storage. With SureSource installations on three continents and millions of megawatt hours of ultra-clean power produced, FuelCell Energy is a global leader with environmentally responsible power solutions.

Q-CSC-7

a) How tall would the exhaust stack of the SureSource 3000 fuel cell be in feet above the top of concrete (TOC) pad?

The individual exhaust stack of the SureSource 3000 fuel cell unit will be approximately 32'above the TOC.

b) Would there be a total of five stacks, i.e. one per fuel cell unit?

Yes, there will be a total of five stacks, *i.e.* one per fuel cell unit.

c) Would the exhaust stack be the tallest feature on each fuel cell unit?

Yes, the exhaust stack will be the tallest feature on each fuel cell unit.

d) If the exhaust stack is not the tallest feature for the proposed project, identify the tallest feature and provide its height in feet above the TOC.

N/A

e) Figure 4 of the Facility Sound Assessment depicts the SureSource 3000 fuel cell unit as having a vertical exhaust stack. Figure 5 appears to show a horizontal (side) stack exit/outlet. Which is correct? Does that materially affect the noise study?

Each SureSource 3000 unit will have a vertical exhaust stack. This design is depicted on Figure 4 and was considered/evaluated by the noise study. Figure 5 wrongly depicts horizontal stack exhausts, which are not applicable to this Project. This will have no impact to the completed noise study.

Q-CSC-8 Referencing Figure 1 of the Petition, the fuel cells would be located on concrete pads, and the center of the rectangular project footprint (between the fuel cell pads) would be paved. For the remaining areas of the fenced project footprint, would it also be paved, or would it have a different finish, e.g. gravel, traprock, concrete, etc.?

A-CSC-8: **The facility will have a stone driveway between the fuel cell pads. Areas underneath the pads will be 2" stone over fabric. All other areas will be seeded.**

Q-CSC-9 Page 4 of the Petition notes that, "The Project will be elevated approximately six feet above grade to account for the 100-year floodplain and zone elevation."

a) Please provide a FEMA flood map showing the proposed facility location and flood zone designation.

A FEMA flood map showing the proposed facility is attached hereto as Exhibit C.

b) Please estimate the existing ground elevation at the site.

The existing ground elevations are estimated between 19'-24'.

c) Please provide the 100-year flood elevation.

The 1% annual recurrence (100-year) flood elevation is 25'.

d) Please provide the 500-year flood elevation.

The 0.2% annual recurrence (500-year) flood elevation is 33.5'.

e) Please estimate the proposed elevation of the top of the concrete pads (i.e. TOC elevation).

The proposed elevation of the top of the concrete pads is 30'.

f) How many feet above the 100-year flood elevation would the TOC be?

TOC would be 5' above the 100-year flood elevation.

g) How many feet above the 500-year flood elevation would the TOC be (if any)?

TOC would be 3.5' below the 500-year flood elevation.

h) Could the proposed facility be installed to one-foot above the 500-foot flood elevation? If so, explain how this can be accomplished. If not, please indicate why not.

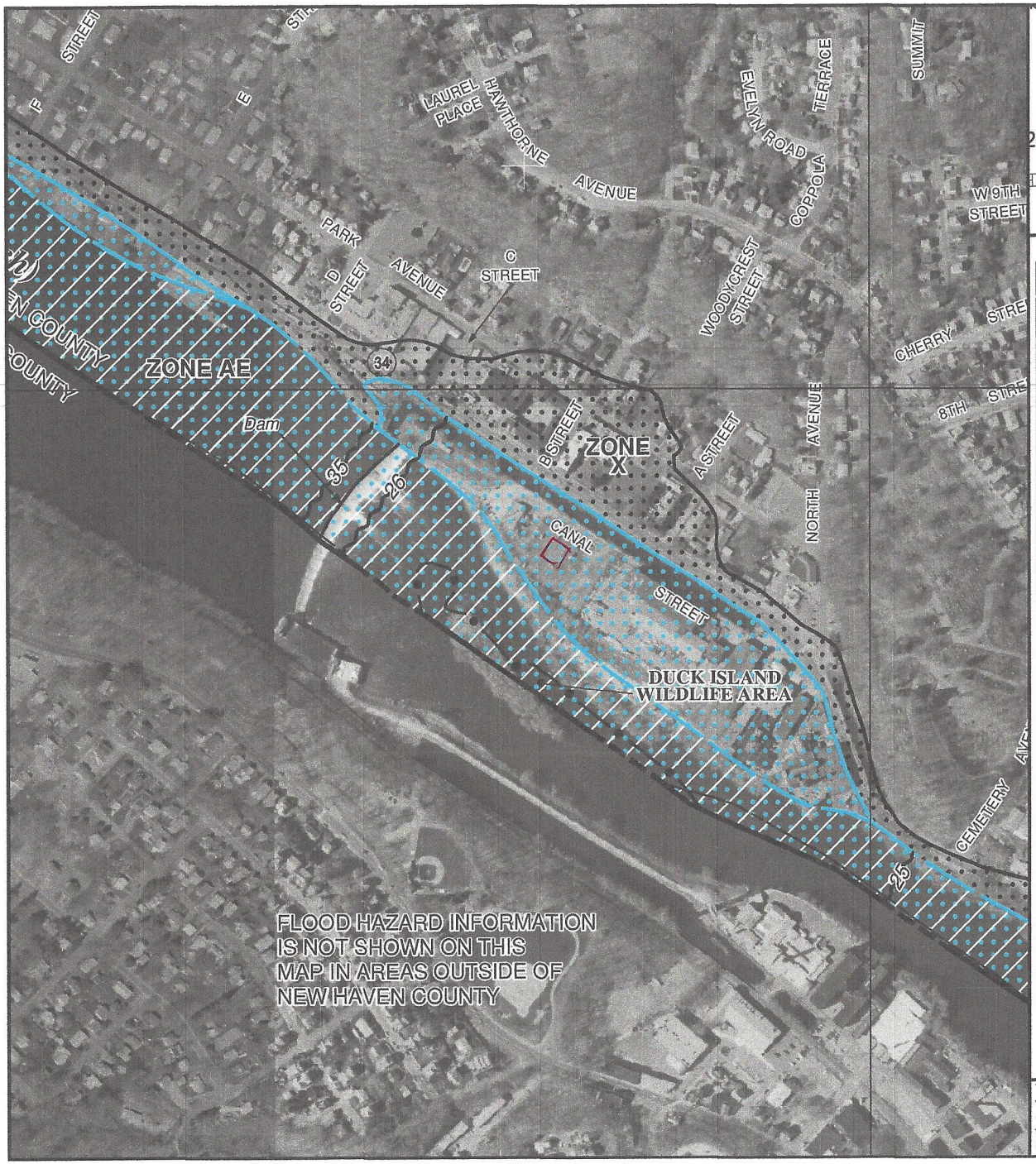
The proposed facility could be potentially installed to one-foot above 500-foot flood elevation by further elevating support platforms (by 4.5'). This would require redesign of piling system and structural steel for support platforms and would create additional technical and construction challenges. This would most likely also have a very significant cost impact to the Project.

i) What is the additional cost to install the facility one foot above the 500 year flood elevation?

In order to provide the additional installation cost for raising the facility above the 500-year flood elevation the structural design would have to be revised. We anticipate that this change would most likely have significant impact on pile and support structure sizing. Rough Order of Magnitude Estimate for such a change is between $1.1M and $2.2M.

We believe that raising the facility by 1' above Base Flood Elevation set-up by FEMA (at 25') as considered by our current facility design would provide sufficient level of flood protection compliant with FEMA requirements and consistent with prudent utility and industry practices.

EXHIBIT C



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0403H

FIRM

FLOOD INSURANCE RATE MAP

NEW HAVEN COUNTY, CONNECTICUT

(ALL JURISDICTIONS)

PANEL 403 OF 635

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

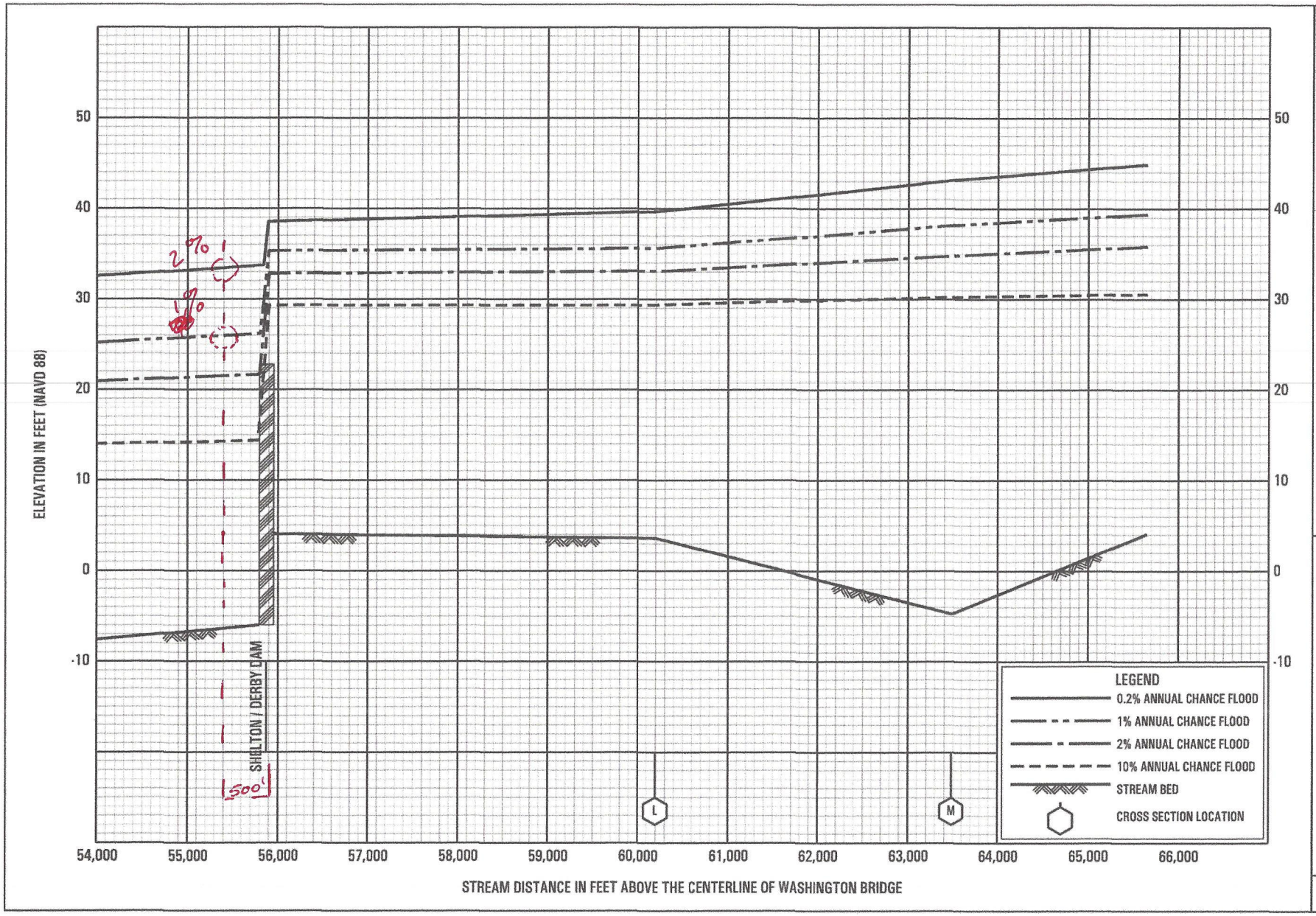
COMMUNITY	NUMBER	PANEL	SUFFIX
ANSONIA, CITY OF	090071	0403	H
DERBY, CITY OF	090075	0403	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
09009C0403H

EFFECTIVE DATE
DECEMBER 17, 2010

Federal Emergency Management Agency



FLOOD PROFILES

HOUSATONIC RIVER (LOWER REACH)

FEDERAL EMERGENCY MANAGEMENT AGENCY

NEW HAVEN COUNTY, CT

(ALL JURISDICTIONS)

175P

Q-CSC-10 Page 11 of the Petition note that, "Limited excavation of soils will be required for the installation of the project." Approximately how many cubic yards of cut (and fill if applicable) would be required to construct the project? Would any net cut material be reused on-site or removed from the site and hauled away?

A-CSC-10: **All Soils remain onsite. No cuts or fill will be required.**

Water Consumption/Wastewater Discharge Questions

Q-CSC-11 Referencing page 2 of the Emergency Response/Safety Plan, the water treatment system includes a 35-gallons per minute (gpm) reverse osmosis/electro-deionization system. However, page 11 of the Petition notes that the proposed project would have a water consumption rate of about 65,000 gallons per day (or roughly 45 gpm). Please reconcile these two numbers.

A-CSC-11: **Both values are correct. The 35 gpm water treatment system product flow rate is not continuous throughout the day because the purified water is directed into a product water storage tank for use by the process at a lower rate. The water treatment system cycles on and off as required to maintain required inventory in the storage tank. Additionally, the water treatment system has an overall product water recovery rate of about 63%. This means that for every 1 gallon of source water consumed, 0.63 gallons are recovered for product use and 0.37 gallons are discarded to sewer.**

Q-CSC-12 Referencing page 11 of the Petition, the total water consumption and discharge for the proposed project would be approximately 65,000 gallons per day (gpd) and 32,500 gpd, respectively. Would this increase during water treatment skid (WTS) backflush? By how much would it increase the consumption and discharge rates, and how often would WTS backflush typically occur?

A-CSC-12: **The water used and wastewater discharged during the periodic water treatment system backflushes are included in the above-referenced average daily water consumption and discharge flow volumes. It is anticipated that the water treatment systems will backflush approximately once every three days.**

Electrical Interconnection Questions

Q-CSC-13 How would the proposed facility interconnect to UI's Indian Well Substation? For example, would it be an all-underground connection to the substation? Would it be a distribution-level connection, e.g. 13.8-kilovolt?

A-CSC-13: **There will be an underground 13.8kV (distribution level) connection between the fuel cell plant and the substation.**

Q-CSC-14 Was a system impact study or interconnection study (as applicable) performed to see if substation could accommodate the proposed 14 MW? Would any modifications need to be performed by UI at the substation to accommodate this interconnection?

A-CSC-14: **A feasibility study was conducted by UI and confirmed that the Indian Well substation could accommodate the generation of the fuel cell plant with minor upgrades (a new 13.8kV circuit breaker and load tap changer).**

Facility Operation and Maintenance Questions

Q-CSC-15 Page 4 of the Petition notes that the facility "…will generate a nominal 14.0 MW of Connecticut Class I renewable energy that will be exported to the utility grid." Would any of the power be used to provide baseload or backup power (or both) for IDA Properties, Inc. (or another nearby customer), or would all 14.0 MW be exported to the grid? If used to serve a customer's building load, what percentage of the building's load would the proposed fuel cell facility provide?

A-CSC-15: **All power will be exported to the utility per the terms of the PPAs**.

Q-CSC-16 Would the proposed facility be part of a microgrid, or could it potentially be upgraded to be part of a microgrid in the future?

A-CSC-16: **The proposed facility would not be a part of a microgrid at this time. However, all FCE fuel cell plants are "microgrid capable," meaning they can be part of a microgrid if the surrounding microgrid infrastructure is established in the future.**

Q-CSC-17 Would the proposed fuel cell shut down in the event of a power outage, and would it automatically restart when power is restored?

A-CSC-17: **Per applicable utility interconnection rules, the fuel cell must disconnect itself from the utility grid within 2 seconds of an outage. The fuel cells are designed to disconnect and remain in a low-power "grid independent mode" where they power their own internal loads until the grid comes back. When the grid returns and is deemed stable, the plants will automatically reconnect to the grid and ramp back up in power.**

Q-CSC-18 Would any waste heat from the fuel cell be used for internal building use (e.g. for IDA Properties, Inc. or another customer) such as to provide or supplement domestic heating and/or hot water?

A-CSC-18: **Waste heat from the fuel cell will not be utilized for internal building use (*e.g.* for IDA Properties, Inc. or any other customer).**

Q-CSC-19 Explain how nitrogen would be used at the proposed facility. For example, would it be used for cooling purposes in a closed-loop system, or would it be used as an inert gas for emergency shutdown (ESD) purposes? If used for ESD purposes, how would the nitrogen be used? For example, would the nitrogen mix with the natural gas inside the fuel cell as a safety measure during ESD?

A-CSC-19: **Nitrogen is only used for storage of the fuel cells or during an upset condition. Normal operation of the fuel cells does not require nitrogen. The electro chemical process used by the fuel cells to convert hydrogen and oxygen to electricity, heat and water is sensitive to humidity. During normal operation, natural gas is humidified using purified potable water. At the elevated temperatures at which the fuel cells normally operate, such humidity is not a problem. However, during a shutdown, if the humid mixture begins to cool and condense, it could negatively impact the expected life and performance of the fuel cells. Similarly, natural humidity associated with the atmosphere could negatively impact the fuel cells. In an upset condition or during storage, nitrogen is used to purge the fuel cell modules of all humidified natural gas and prevent ambient air intrusion. The nitrogen is used in the gaseous form, but stored in the liquid form for ease of transport and to minimize storage space.**

Q-CSC-20 What is the operational life of the facility? Does the fuel cell media have to be changed? If so, at what intervals?

A-CSC-20: **The operational design life of the facility is 20 years.**

The fuel cell module itself has to be replaced every five (5) to seven (7) years. The service life of other media (*i.e.*, catalysts/chemicals) utilized by the fuel cell are as below:

Item	Service Life[(1)]
Fuel Preparation	
Sulfur Sorbent	6-24 months[(2)]
Pre-converter Catalyst	60 months
Water Treatment	
Anti Scalant	Dependent on water supply water quality
RO Membranes	18 months
Dechlorination Chemical	Replenished at 6 months
Electrical Balance of Plant	
Chiller Gylcol	18 months

Notes:

(1) Service life is based on typical site conditions. Actual service life will vary with site conditions and fuel, water and air quality.

(2) At 100% capacity; dependent on type of odorant in natural gas.

Q-CSC-21 If the proposed facility is approved, approximately when would construction commence, and when would it be expected to be completed and operational? What are the expected typical work hours and days of the week that construction would occur?

A-CSC-21: **If the proposed facility is approved, construction is expected to begin in October 2019 and commercial operation of the facility would be expected to commence by the end of May 2021. The typical construction work hours and days of the week would be 7:00 a.m. to 5:00 p.m., Monday through Friday.**

Q-CSC-22 Provide a decommissioning plan for the proposed facility.

A-CSC-22: **The decommissioning plan for the proposed facility, upon the expiration of the power purchase agreement (including any extension thereof) would be as follows: (a) all utility connections would be cut and capped; (b) all fuel cell equipment would be removed from the site; and (c) equipment pads and associated support structures would remain as-is.**

Facility Safety Questions

Q-CSC-23 Please identify media to be used for pipe cleaning procedures at the proposed facility in accordance with Public Act 11-101, An Act Adopting Certain Safety Recommendations of the Thomas Commission.

A-CSC-23: **A clean rag will be drawn through the pipe multiple times to ensure there is no construction debris or foreign matter remaining in the pipe. Compressed air will then be used to blow out any remaining dust. All fuel pipe-cleaning operations will be conducted in accordance with Public Act 11-101 and Connecticut Sitting Council Docket NT-2010.**

Q-CSC-24 In addition to National Fire Protection Association (NFPA) 853, are than any other NFPA or other codes and standards apply to fuel cell construction, installation and/or modifications?

A-CSC-24: **The basic product certification standard for fuel cells is ANSI/CSA FC 1-2014, Fuel cell technologies – Part 3-100: Stationary fuel cell power systems – Safety. The SureSource 3000 fuel cell plant is certified to the FC 1 standard. This standard incorporates dozens of normative references to other codes and standards, including from such standard issuing organizations as NEMA, ASME, ASTM, NFPA and UL. The SureSource 3000 plant complies with the applicable provisions of mechanical, piping, fire protection, safety and electric codes.**

Q-CSC-25 What is the distance and direction of the proposed facility to the nearest airport? Did the petitioner provide notification to the Federal Aviation Administration regarding the proposed fuel cell facility?

A-CSC-25: **The nearest airport to the proposed facility is Waterbury-Oxford Airport, approximately 11 miles to the northeast, and Sikorski Memorial Airport, approximately 11 miles to the southwest. The Company has not provided notification to the Federal Aviation Administration regarding the proposed facility**.

Environmental Questions

Q-CSC-26 Provide the number of trees six inches in diameter or greater that would be removed for installation of the proposed facility, if applicable.

A-CSC-26: **No trees six inches in diameter or greater would be removed for installation of the proposed facility. The site is open with no existing trees.**

Q-CSC-27 Provide the distance and direction to the nearest wetland. Provide the distance and direction to the nearest watercourse. Would erosion and sedimentation controls be installed per the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*, as necessary to protect such resources?

A-CSC-27: **The proposed facility will be at least 50' away from the flagged wetlands and approximately 75' from the Housatonic River (both are located to the west direction from the site). Erosion and sedimentation controls will be installed per the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.**

Q-CSC-28 Is the proposed facility within a Department of Energy and Environmental Protection-designated Aquifer Protection Area?

A-CSC-28: **The proposed facility is not within a Department of Energy and Environmental Protection-designated Aquifer Protection Area.**

Q-CSC-29 Referencing page 11 of the Petition, has the Petitioner submitted an application for a General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (General Permit) to the DEEP? If no, approximately when would such General Permit application be filed with DEEP? And would a Stormwater Pollution Control Plan be part of the General Permit application filing? Explain.

A-CSC-29: **Application for General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (General Permit) have not yet been submitted to CT DEEP. It is planned to be submitted on or around August-September 2019. A Stormwater Pollution Control plan will be part of the General application filing as outlined by CT DEEP requirements for this permit.**

Q-CSC-30 Figure 1 of the Petition depicts on-site lighting, e.g. single-pole light and double-pole light. Would such lighting be on at night and during inclement weather, or only when work is being performed? Would such lighting affect nearby properties?

A-CSC-30: **Site lighting will remain on at night for security purposes. Lighting design and lighting fixture selection will be completed per International Dark Sky Association guidelines to minimize any impact to nearby properties (minimum or no impact is anticipated since existing facilities including UI's sub-station already have lighting on during night time).**

Q-CSC-31 Provide a table showing state criteria thresholds and projected emissions from the proposed facility for all greenhouse gases listed in the Regulations of Connecticut State Agencies Section 22a-174-1(49) with and without the use of waste heat (as applicable), taking into account cumulative emissions associated with the five units.

A-CSC-31: **The below table lists the RCSA greenhouse gas permitting thresholds, as well as projected potential emissions, based on 8760 hours per year of full power operation from the five Derby plants. Although the Derby plants will not include waste heat recovery, the tpy of CO_{2-e} and GHG would not be affected if heat recovery was included.**

Greenhouse Gas	State of CT Criteria Thresholds for GHGs *(applicability requires **both** thresholds be exceeded)*		Facility Projected Emissions	(5 units with no waste heat recovery)
	(tpy, equivalent to 100,000 tpy CO_{2-e})	(tpy GHG)	(tpy CO_{2-e})	(tpy GHG)
Carbon Dioxide (CO_2) (GWP=1)	100,000	100	60,094	60,094
Methane (CH_4) (GWP=23)	4,348	100	1,154	50.2
Nitrous Oxide (N_2O) (GWP=296)	337	100	0	0
Sulfur Hexafluoride (SF_6) (GWP=22,200)	4.5	100	0	0
Any Hydrofluorocarbon (HFC) (GWP varies)	Varies (8 – 8,333)	100	0	0
Any Perfluorocarbon (PFC) (GWP varies)	Varies (4.5 – 18)	100	0	0
Total CO_{2-e} & GHG	**100,000**	**100**	**61,248**	**60,144**

Q-CSC-32 Provide information regarding available technologies and/or mitigation techniques to reduce greenhouse gas emissions from the proposed facility.

A-CSC-32: **The fuel cell itself is considered by many to be the best available control technology on a baseload, non-intermittent basis to reduce greenhouse gas emissions from distributed or grid-provided generation resources. The proposed fuel cell project is projected to reduce carbon dioxide emissions by 31,948 tons per year, which is a 34% reduction versus current carbon dioxide emissions associated with the grid. Carbon dioxide emissions are inversely related to fuel efficiency and the high efficiency of the fuel cell significantly reduces greenhouse gas emissions versus existing grid resources. Additional heat recovery for this project is not practical or required to achieve high generation efficiency**.

Q-CSC-33 Is methane (CH_4) broken down to zero in the reforming process? Is there some small amount of CH_4 emissions that would still occur?

A-CSC-33: **Methane is normally completely converted to hydrogen by the reforming reaction within the fuel cell stacks, but if any is left unconverted (for example at low power conditions) it is destroyed by a subsequent catalytic oxidation reactor in the fuel cell process. Between the reforming and oxidation processes virtually all of the methane is destroyed, with only trace amounts surviving to be present in the exhaust at very low levels (parts per million.)**

Q-CSC-34 Natural gas contains an odorant. Please submit a desulfurization plan narrative for the proposed fuel cell facility containing the following information:

a) Chemical reaction overview concerning what substances are produced from the desulfurization process, as well as plans for their containment and transport;
b) How much solid sulfur oxide would result from the desulfurization process, and methods and locations for containment, transport, and disposal;
c) Whether any of these desulfurization substances are considered hazardous, and if so, plans for the containment, transport, and disposal of hazardous substances;
d) Anticipated method of disposal for any other desulfurization substances; and
e) Whether any gaseous substances resulting from desulfurization can be expected to vent from the fuel cells, as well as the applicable DEEP limits regarding discharge of these gases.

A-CSC-34: **The fuel cell stacks that generate the electric power can be fouled by the sulfur odorant compounds (primarily mercaptans and/or sulfides) that the gas utility company injects into the natural gas. Accordingly, the fuel cell plant incorporates a desulfurization process that consists of two flow-through vessels configured in series filled with a specialized, proprietary desulfurization adsorption media. The sulfur removal mechanism is a physical adsorption or chemisorption process wherein the sulfur atoms are captured by the granular solid media without the release (production) of any other chemical species. In the process of removing the sulfur compounds from the gas, the capacity of the media for continued sulfur removal is diminished up until the point when it becomes exhausted and, if the media is not changed, sulfur break-through would occur. At this point, the media is deemed to be "spent." When the spent media in the lead desulfurizer vessel needs to be replaced, the fuel gas process flow is switched to the lag vessel only so that the spent media can then be removed from the off-line vessel and replaced with fresh media. Prior to accessing the spent media, the vessel is inerted with nitrogen to allow safe access into the vessel. During this inertion process, a small volume of natural gas is vented to atmosphere. After media replacement and once the vessel containing the fresh media has been inerted and purged into service, it then serves as the second (polishing) desulfurizer vessel in the process flow service.**

The spent solid waste media removed from the process has been characterized at similar locations to be RCRA hazardous by toxicity characteristic for benzene (D018). The benzene, present in the natural gas in very low parts per

million concentrations or less, is co-adsorbed onto the media along with the target sulfur compounds.

The total waste generation quantity (media plus adsorbed sulfur compounds) during any single desulfurizer media replacement event is less than 2000 pounds (900 kg) and previous operating experience throughout Connecticut suggests that desulfurizer maintenance events for any single fuel cell plant will be no more frequent than annually, and more likely less frequent than every two years (it varies, depending on the actual sulfur concentration in the gas locally.) The scheduling for media replacements for multiple fuel cell plants can be arranged such that no two plants are serviced in any single month, so the monthly waste generation rate is within the range for generators that operate under Small Quantity Generator rules. Derby Fuel Cell, LLC, as plant owner/operator, will comply with all rules for hazardous waste generators as promulgated through the regulations at RSCA §22a-449(c).

The waste generated when removing the spent desulfurizer media from the process is managed by immediately containerizing and transporting the waste off-site to a licensed disposal facility. Waste will not be treated, stored or disposed of at the site. The containerized waste is shipped off-site under a Uniform Hazardous Waste Manifest under the generator's EPA RCRA identification number. A licensed hazardous waste transporter under contract to FuelCell Energy, Inc., as service provider for the fuel cell project (*e.g.*, Clean Harbors, Triumvirate, Miller Environmental, etc.), will be contracted to pick up the waste and transport it to an approved designated disposal facility. The licensed waste destination facility will be determined at the time of contracting the waste contractor firm.

Agricultural Questions

Q-CSC-35 Is any portion of the project on prime farmland soils? If so, what is the area of prime farmland soils that would be impacted by the proposed project?

A-CSC-35: **No portion of the project is on prime farmland soils.**

Cost Questions

Q-CSC-36 Estimate the total cost of the proposed project. Break down the total cost into categories that the Petitioner deems appropriate.

A-CSC-36: **The Petitioner is providing a redacted version of a breakdown of the total cost of the proposed project and is filing an unredacted copy in a sealed envelope marked "CONFIDENTIAL," along with a Motion for Protective Order, filed simultaneously herewith.**

Capital Cost	***(000)s***
Power Plant Equipment	[redacted]
Installation	[redacted]
Interconnects	[redacted]
Construction Interest	[redacted]
Sales Taxes	[redacted]
Total Installed Cost	[redacted]