STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

IN RE:	:	
	:	
PETITION OF BROAD STREET FUEL CELL, LLC FOR A DECLARATORY RULING THAT A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED IS NOT REQUIRED FOR THE INSTALLATION OF A FUEL CELL AT THE TRINITY COLLEGE CAMPUS	:	PETITION NO. _____
	:	AUGUST 2, 2017

PETITION FOR DECLARATORY RULING:
INSTALLATION HAVING NO SUBSTANTIAL ENVIRONMENTAL EFFECT

I. INTRODUCTION

Pursuant to Connecticut General Statutes ("Conn. Gen. Stat.") § 16-50k, Broad Street Fuel Cell, LLC ("BSFC"), a wholly owned subsidiary of FuelCell Energy, Inc. ("FCE"), 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 a 1.4 megawatt ("MW") fuel cell combined heat and power generating facility, including all associated equipment and related site improvements at the Trinity College Campus, as described herein (collectively, the "Project").

Conn. Gen. Stat. § 16-50k(a) provides, in pertinent part:

> Notwithstanding the provisions of this chapter or title 16a, the council shall, in the exercise of its jurisdictions over the siting of generating facilities, approve by declaratory ruling . . . the construction or location of any fuel cell unless the council finds a substantial adverse environmental effect . . . .

BSFC respectfully submits that the construction and operation of the proposed Project satisfies the criteria of Conn. Gen. Stat. § 16-50k(a) and, as described in more detail below, will not have a substantial adverse environmental effect.

II. THE PETITIONER

BSFC is a wholly owned special purpose subsidiary of FCE created for financing purposes for this Project. FCE is a Delaware corporation with a principal place of business at 3 Great Pasture Road, Danbury, Connecticut. Trustees of Trinity College, Inc. is a Connecticut non-profit educational institution ("Trinity College") with a campus located at 300 Summit Street, Hartford, Connecticut (the "Campus"). Trinity College and BSFC have entered into a power purchase agreement (the "PPA") whereby BSFC will design, install, own and operate one of FCE's SureSource 1500 fuel cell power plants nominally rated at 1.4 MW. FCE will be responsible for the construction and long-term service of the Project under a contract with BSFC for the term of the PPA, which is fifteen (15) years.

Correspondence and/or communications regarding this Petition should be addressed to:

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Project Manager
FuelCell Energy, Inc.
3 Great Pasture Road
Danbury, CT 06810
(203) 825-6142 (office)
(203) 825-6100 (fax)
dkamenetskiy@fce.com

A copy of all such correspondence or communications should also be sent to the Petitioner's attorneys:

Jennifer D. Arasimowicz, Esq.
Henry Sire, Esq.
FuelCell Energy, Inc.

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(203) 825-6069 (fax)
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hsire@fce.com

III. FACTUAL BACKGROUND

A. Public Benefit

A public benefit exists if a project "is necessary for the reliability of the electric power supply of the state or for a competitive market for electricity." Conn. Gen. Stat. § 16-50p(c)(1). The State of Connecticut has further articulated its energy goals in the Comprehensive Energy Strategy as encouraging the provision of cheap, clean, reliable electricity, fostering the development of microgrids and promoting economic development and job growth. The Project is located at the Trinity College Campus in Hartford, Connecticut and will be used to satisfy a substantial portion of the electrical and thermal needs of the Campus. As a result, the electric load that Trinity College will need to obtain from the electric grid will be reduced, including the summertime peak demand; thereby, reducing the stress on the system and reducing load on overloaded transmission lines. The Project will provide Trinity College with savings as compared to grid purchased electricity and thermal energy. The fuel cell power plant will be manufactured in Connecticut, and installed and operated by FCE. Thus, the Project satisfies the articulated goals of the Comprehensive Energy Strategy.

B. Project

FCE will build and operate the Project to be located at the Trinity College Campus in Hartford, Connecticut. The Project will be installed on an approximately 40 foot x 60 foot area surrounded by an approximately thirteen (13) foot-high fence and gated wall within the secure Trinity College Campus (the "Site"). *See* Exhibit A for a preliminary project drawing and Site photographs.

The Project will include one natural gas-fired SureSource 1500 power plant manufactured by FCE.[1] The Project will cogenerate a nominal 1.4 MW of Connecticut Class I renewable energy for use at the Campus. Thermal energy produced by the Project will be provided for use in Trinity College's existing thermal distribution system.

The Project consists of multiple skids classified into three major subsystems. The mechanical balance of plant ("MBOP") is comprised of three separate components; the desulfurization system, the main process skid, and the water treatment system skid. The MBOP supplies fresh air, cleans and heats fuel and water, and includes the power plant control system. The electrical balance of plant ("EBOP") is comprised of four sections: one power conditioning unit, two transformers and one switchgear for grid connection. The EBOP converts the fuel cell DC power into utility grade AC power. The SureSource 1500 power plant includes one SureSource module. The SureSource module performs the electrochemical conversion of the continuous fuel supply into DC electric power. The SureSource module contains four fuel cell stacks. Each stack contains the assembly of electrochemical cells that produce DC power. Resembling a large battery, each of the four stacks is constructed of approximately 400

[1] FCE has rebranded its DFC fuel cells as "SureSource." The underlying technology has not changed.

individual fuel cells clamped together with manifolds inside an insulated container.

The SureSource 1500 will have one Cain Industries heat recovery steam generator ("HRSG"), model ESG1. The HRSG will be housed in a separate building next to the fuel cell and provide the Campus with 2,000-2,700 lbs/hour of 65 psig saturated steam.

The SureSource 1500 will include FCE's standard load leveler and black start product option to support up to 1.2 MW of micro-grid operations. This option allows the unit to provide load following duty during stand-alone or micro-grid operations. It includes a computer controlled resistive load bank.

C. Local Input

On Wednesday, June 21, 2017, representatives of FCE met with officials from the City of Hartford's Department of Development Services to discuss the Project. To date, the City of Hartford has expressed no concerns regarding the Project.

D. Notice of Petition

A copy of this Petition has been sent to each person appearing of record as an owner of property that abuts the Campus and to relevant Connecticut state agencies, the Attorney General, regional planning agencies, legislators representing Hartford and representatives of the City of Hartford, all as set forth on Exhibit B attached hereto.

IV. THE INSTALLATION WILL NOT HAVE A SUBSTANTIAL ADVERSE ENVIRONMENTAL EFFECT

The Project will provide 1.4 MW of clean electrical energy without the environmental impacts normally associated with the use of natural gas as a fuel.

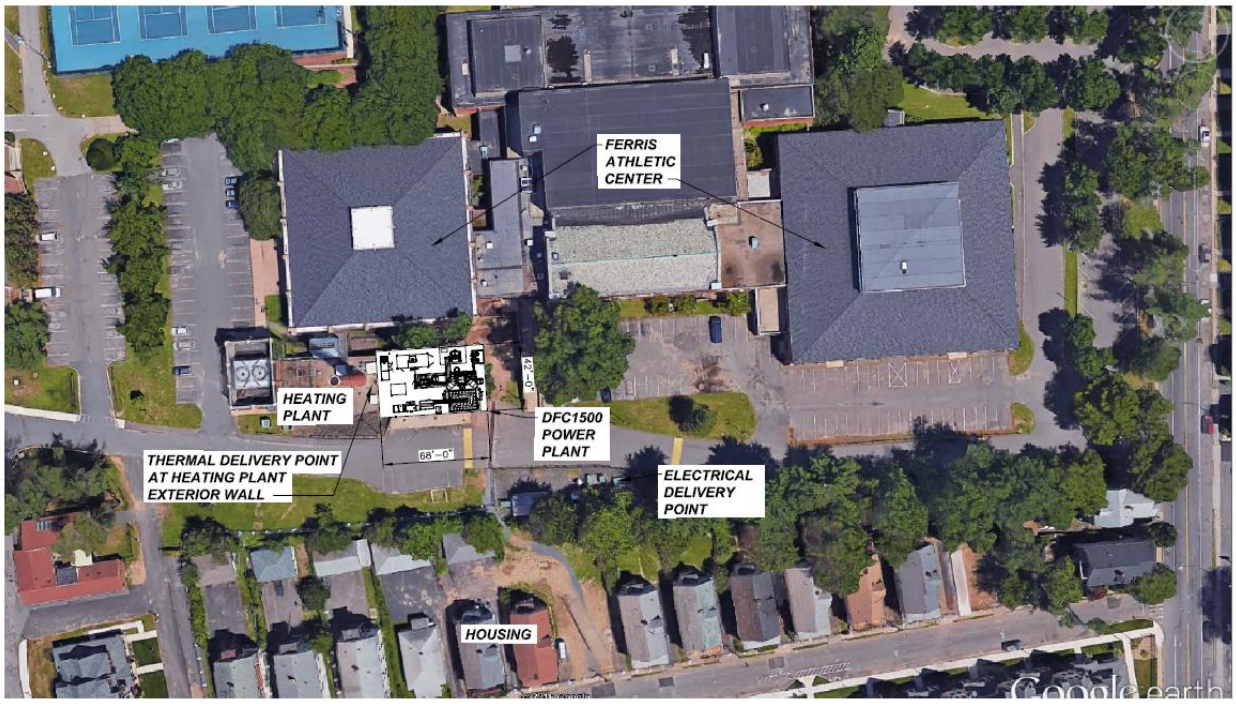
A. Materials Storage

Approximately 1,000 litres of liquid nitrogen will be stored on-Site to be used in the Project. Nitrogen is non-toxic; however, it is a Department of Transportation Division 2.2 (non-flammable gas) hazardous material. There are no U.S. Environmental Protection Agency ("EPA") reporting requirements for nitrogen.

B. Public Health and Safety

The Project will be located at the Site as depicted in Figure 1 below. The roadways in the area are adequate for all deliveries to support the construction and operation of the Project. The limited number of truck trips necessary to support installation will not have any adverse impacts on local roadways or traffic conditions. Operational personnel trips will be insignificant, as the Site will be unmanned and only visited periodically by technicians.

Figure 1



The Project has been designed with significant attention to protecting the community sound environment. The core of the fuel cell technology (*i.e.*, the SureSource module) will produce no significant sound. Ancillary equipment associated with the Project includes a blower that will pump fresh air through a silencer into the main process skid. An air conditioning unit, which is similar to many used in residential applications, will be located above the water treatment cabinet to support equipment inside the cabinet and will produce sound only when the fan is actively providing cooling for the system. Relatively small transformers and electrical buses and inverters, as well as fans providing ventilation to some of the equipment, will produce modest sound. Under normal conditions, these few acoustic sources would produce consistent sound throughout the day and night.

The acoustic levels associated with the Project were estimated at community receptors per the Regulations of Connecticut State Agencies ("R.C.S.A.") § 22a-69-1 *et seq.* The Site is categorized as a Class C (or Industrial) Noise Zone; existing sound levels in or around the Site are typically dominated by the sound of mechanical equipment for the central heating plant and boiler of the Campus. As a Class C Noise Zone, the sound level is limited to 70 dBA at Class C receptors, 66 dBA at Class B receptors, and 61 dBA at Class A receptors during the daytime and 51 dBA at Class A receptors during the nighttime. Since on-campus properties are residential, they were evaluated as a Class A Noise Zone. The results of the modeling indicate that the Project can be operated at the Site within the applicable noise performance criteria. *See* Facility Sound Assessment attached as Exhibit C.

Since the Project also includes a load leveler and an emergency generator, the acoustic profile of the Project was modeled with this equipment as well. The load leveler will only be

activated in the rare condition when utility power is lost and it will remain active until utility power is restored. The emergency generator will only be used for weekly maintenance checks during daytime hours only and in the rare instance when both utility power and fuel cell power are lost (*i.e.*, major storms with local damage). In such instances, the emergency generator will be operated only long enough to start the fuel cell when the fuel cell is tripped off at the time of utility power loss. The results of the modeling indicate that even with operation of the load leveler or the generator, the Project can be operated within the applicable noise performance criteria. *See* Facility Sound Assessment attached as Exhibit C.

Prior to operation, FCE will discuss the Project with the Hartford Fire Department and the Trinity College Campus safety department. In addition, in accordance with the Council's Final Decision in Docket NT-2010, FCE is attaching an Emergency Response Plan ("ERP") for the Council's review. *See* ERP attached as Exhibit D. The ERP includes the following information:

- A description of any simulated emergency response activities with any state and/or local emergency response officials;
- Details of any facility Site access system; and
- Establishment of an emergency responder/local community notification system for on-Site emergencies and planned construction-related activities that could cause community alarm.

All other requirements of the NT-2010 Decision will be adhered to.

Project design has begun, and the drawing attached as Exhibit A represents a preliminary drawing depicting the site installation.

C. Scenic Values

The proposed Project will have little impact on the visual character of the community. Generally, the potential visual impact is inherently small due to the low profile of the Project in the context of the existing buildings at the Campus. Views to the South will be obstructed by the Ferris Athletic Center, the existing Campus gymnasium. Views to the West will be obstructed by the central heating plant and boiler of the Campus. Views to the North and East will be obstructed by the fencing and wall surrounding the Project.

D. Historical Values

On June 21, 2017, a request was made with the Connecticut State Historic Preservation Office ("SHPO") regarding the Project's effect on historic, architectural or archaeological resources listed on or eligible for the National Register of Historic Places. *See* Correspondence attached as Exhibit E. As of the date of filing of this Petition, the SHPO has not responded. However, given the adjacency of the Project to the central heating plant and boiler of the Campus, the Petitioner is confident that there will be no impact to the State's historic, architectural or archaeological resources.

E. Air Quality

Air emissions from the fuel cell associated with the Project, assuming continuous year-round full power operation, are conservatively expected to be as follows:

Pollutant	**Total Potential Emissions (tpy)**
Oxides of Nitrogen ("NO_x")	0.06
Oxides of Sulfur ("SO_x")	0.0006
Particulate Matter ("PM")	0.0001
Carbon Monoxide ("CO")	0.61
Volatile Organic Compounds ("VOC")	0.12
Carbon Dioxide ("CO_2")	4,691

In addition to the emissions from the fuel cell itself, there will also be minor emissions associated with a 5 MMBtu/hr gas-fired startup burner that will be included with the fuel cell power plant. The burner is used at start-up only to heat the plant to its required operating temperature. The criteria pollutant potential emissions (assuming 8,760 hours of operation) associated with the gas-fired burner along with the fuel cell are less than 15 tpy using conservative EPA AP-42 emission factors.

Total emissions from the proposed Project will be below levels that would render the Project a "major stationary source" as defined at R.C.S.A. § 22a-174-1(57). The Project's maximum emissions will operate well below the serious non-attainment area thresholds for VOC and NO_x. Thus, the Project will be a minor source and is not subject to Federal Non-Attainment New Source Review ("NSR"). Also, there is no requirement for emission offsets for this Project as it will be below the non-attainment NSR major source thresholds.

A Permit to Construct and Operate Stationary Sources is not required for the Project because the potential emissions of any individual criteria air pollutant are less than 15 tpy; the source is not a new major stationary source; and, the source is not a new major source of hazardous air pollutants. The Project is also not subject to DEEP's "permit by rules" because the potential emissions from each of the fuel cell are less than 15 tpy. Thus, there are no registrations or applications required to be submitted to the DEEP; nor are there anticipated to be any approvals from the DEEP Air Bureau required prior to the construction and operation of the Project.

On May 13, 2010, EPA issued the final greenhouse gas ("GHG") Tailoring Rule. This rule effectively raised the thresholds for GHG emissions that define when permits under the

Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. However, since the potential GHG emissions from the Project will be well below the 75,000 tpy trigger established by the Tailoring Rule, those emissions will not trigger the requirement for an air permit.

On average, the Project will offset power from the utility grid, which has an average CO_2 footprint of 1,066 lbs CO_2 per MWh (EPA EGRID 2014v2 (February 2017) NEWE New England subregion, non-baseload). As a result, operation of the Project will result in the following net reduction of CO_2 GHG:

- CO_2 produced from power generation: 980 lbs/MWh
- CO_2 produced from combined heat and power generation: 765 lbs/MWh
- CO_2 avoided by not using grid power: 1,066 lbs/MWh

Net CO_2 impact: 301 lbs/MWh or approximately 1845 tpy **reduction**

F. Water Quality

The Site is not located within either 100- or 500-year floodplains or the coastal zone. There are also no surface water bodies, wetlands or hydric soils at or near the Site.

The Site occupies less than one acre and, as such, a DEEP general permit construction stormwater pollution prevention plan is not required. Groundwater in the Site vicinity will not be impacted by the installation and operation of the Project. Limited excavation of soils will be required for installation of the Project and no wastewaters will be discharged on-Site. To the extent necessary, the small number of personnel periodically operating and/or maintaining the Project will use existing sanitary facilities at the Campus.

The fuel cell to be installed as part of this Project (*i.e.*, SureSource 1500) will require approximately 6,500 gallons per day ("gpd") of raw water and will discharge approximately

3,200 gpd of wastewater. Most of the makeup water will be released as water vapor with the fuel cell exhaust gas. Water will be obtained from the existing Trinity College water system and the wastewater will be discharged to the existing Trinity College wastewater system. The Project will register under DEEP's Miscellaneous Sewer Compatible Discharges general permit. Thus, adequate water supply and infrastructure are available to supply the Project. Therefore, no substantial adverse environmental effect will occur from the Project's water use and wastewater disposal.

G. Fish and Wildlife

A request was made with the Connecticut DEEP for a review of the Natural Diversity Data Base Map. In response, the DEEP indicated that the Project will not impact any extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur in the vicinity of this property. *See* Correspondence attached as Exhibit F.

H. Summary

Overall, the proposed installation will have an incremental visual impact and will not cause any significant change or alteration in the physical or environmental characteristics of the Campus or the surrounding area. In fact, as discussed in Section IV.E above, the Project will actually provide an environmental benefit to the State of Connecticut by reducing CO_2 emissions by approximately 1845 tpy.

V. CONCLUSION

For all the foregoing reasons, BSFC respectfully requests that the Council issue a determination, in the form of a declaratory ruling, that the proposed installation as described above is not one that would have a substantial adverse environmental effect and, therefore, that a Certificate is not required.

Respectfully submitted,

BROAD STREET FUEL CELL, LLC

By _____

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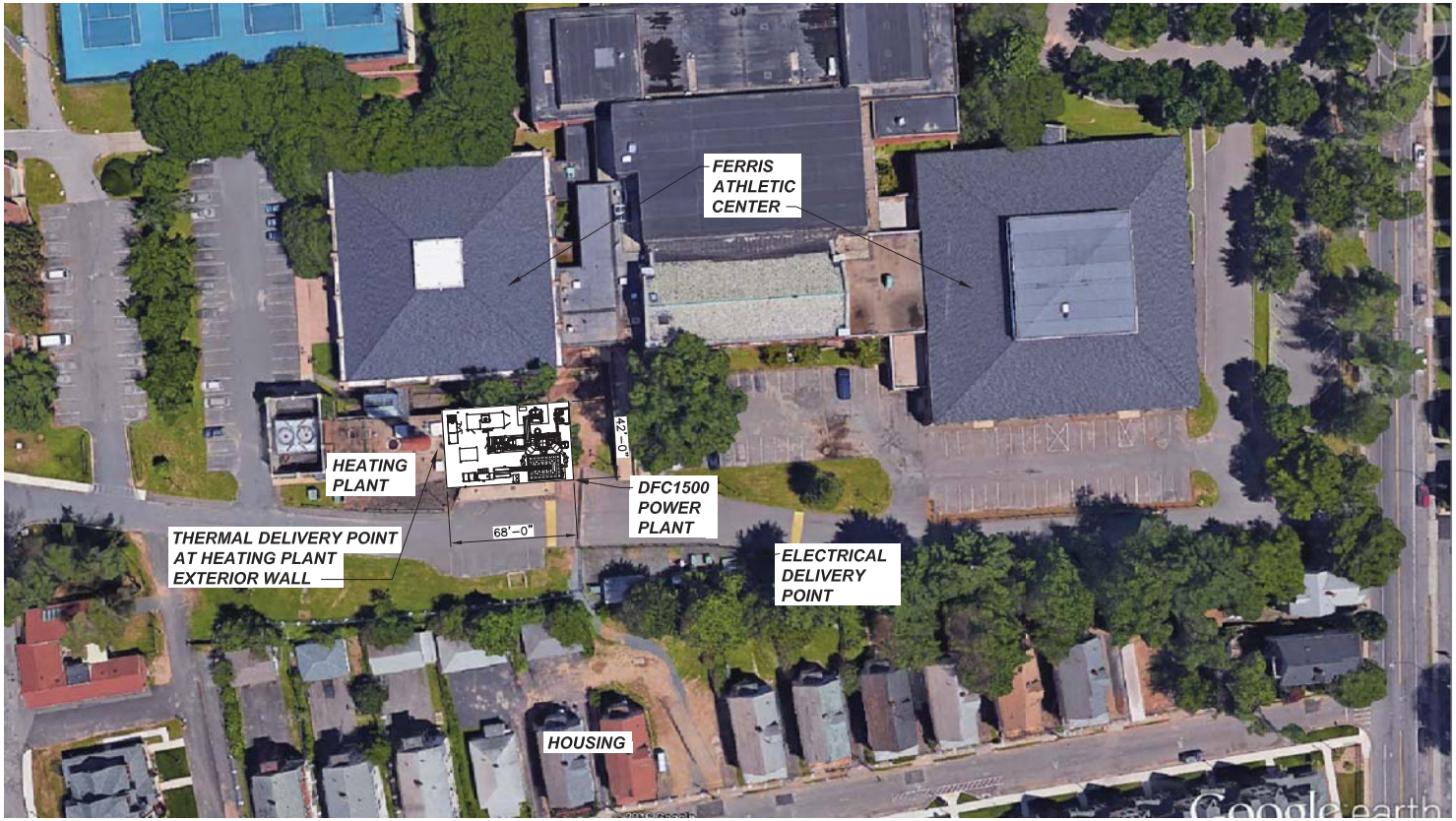
Its Attorneys



PLOT PLAN

25' 0 25' 50' 100'

GRAPHIC SCALE

PRELIMINARY

FUELCELL ENERGY, INC. PROPRIETARY

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION AND MAY NOT BE DISCLOSED, COPIED OR REPRODUCED EXCEPT BY WRITTEN PERMISSION FROM FUELCELL ENERGY, INC.

CAGE CODE 63131

FuelCell Energy 3 Great Pasture Rd., Danbury, CT 06813

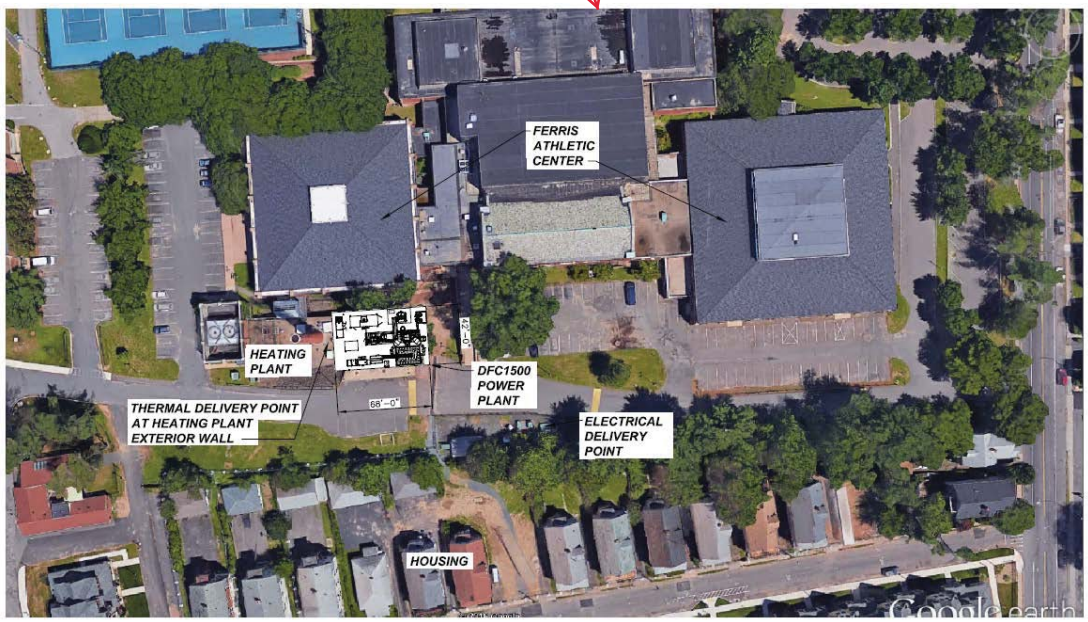
TITLE: DFC POWER PLANTS
TRINITY COLLEGE - SATELLITE IMAGE
MICROGRID - PLOT PLAN

SIZE	Location	DWG NO	REV
D	---	16-0024	4
SCALE	AS SHOWN	SHEET	8 OF 8

Project Map

Google Earth

feet 1000
meters 400



Petition of Broad Street Fuel Cell, LLC
August 2, 2017
Exhibit A

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Exhibit B

CERTIFICATION

PARCEL #	LOCATION	OWNER OF RECORD
185574229	0002 FAIRFIELD AV	PARK DEPT CITY OF HARTFORD 550 MAIN ST HARTFORD, CT 06103-2913
207533005 207533006	0210- 0212 NEW BRITAIN AV 0206-0208 NEW BRITAIN AV	TRINITY COLLEGE TRUSTEES OF 300 SUMMIT ST HARTFORD, CT 06106-3100
205532042	0183-0189 ALLEN PL	TRINITY COLLEGE TRUSTEES OF 300 SUMMIT ST HARTFORD, CT 06106-3100
205532041 205532020 205532018 205532013 205532012 205532011 205532010 205532006 206532004 206532003	0108 VERNON ST 0058-0060 VERNON ST 0066 VERNON ST 0078 VERNON ST 0084 VERNON ST 0086- 0088 VERNON ST 0090- 0092 VERNON ST 0104- 0106 VERNON ST 0114 VERNON ST 0118 VERNON ST	TRINITY COLLEGE TRUSTEES OF 300 SUMMIT ST HARTFORD, CT 06106-3100
205532017	0070 VERNON ST	TRINITY COLLEGE TRUSTEES OF 70 VERNON ST HARTFORD, CT 06106-3121
205532016	0072 VERNON ST	TRINITY COLLEGE TRUSTEES OF 72 VERNON ST HARTFORD, CT 06106-3121
205532015	0074 VERNON ST	TRINITY COLLEGE TRUSTEES OF 74 VERNON ST HARTFORD, CT 06106-3121
205532014	0076 VERNON ST	TRINITY COLLEGE TRUSTEES OF 76 VERNON ST HARTFORD, CT 06106-3121
205532009	0094 VERNON ST	TAU ALPHA HOUSE CORP C/O HARRY COHEN 22 CANOE RIVER RD SHARON, MA 02067-2977
205532008	0098 VERNON ST	ASSOCIATION THE ALPHA CHI ALUMNI 98 VERNON ST HARTFORD, CT 06106
205532007	0100- 0102 VERNON ST	TRUSTEES OF TRINITY COLLEGE 300 SUMMIT ST HARTFORD, CT 06106-3100

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205532005	0110- 0112 VERNON ST	TRINITY COLLEGE TRUSTEES OF 110 VERNON ST HARTFORD, CT 06106
206532002	0122 VERNON ST	DELTA PHI FRATERNITY OF PHI KAPPA CHAPTER OF THE ALPHA 1275 WELSH RD HUNTINGTON VALLEY, PA 19006
206532001	0134 VERNON ST	TRINITY COLLEGE TRUSTEES OF 134 VERNON ST HARTFORD, CT 06106-3114
206533005	0260 SUMMIT ST	TRINITY COLLEGE TRUSTEES OF 300 SUMMIT ST HARTFORD, CT 06106-3100
208533001	0240 NEW BRITAIN AV	COLLEGE THE TRUSTEES OF TRINITY 300 SUMMIT ST HARTFORD, CT 06106-3100
206533007	0081 VERNON ST	COLT TRUST INC (THE) 100 PEARL ST, 3RD FLR WEST TOWER C/O ACCOUNTING HARTFORD, CT 06103
206533006	0079 VERNON ST	TRINITY COLLEGE TRUSTEES OF 79 VERNON ST HARTFORD, CT 06106-3141
208632015	0010- 0012 FAIRFIELD AV	FAIRFIELD AVENUE REALTY LLC 37 COUNTRY CLUB RD WETHERSFIELD, CT 06109
208632014	0008 FAIRFIELD AV	FIRE DEPT CITY OF HARTFORD ENGINE CO 9 550 MAIN ST HARTFORD, CT 06103-2913
208632013	0283- 0287 NEW BRITAIN AV	RICHARD STARON JADWIGA STARON 24 TEE LA WETHERSFIELD, CT 06109-4067
208631012	0275- 0277 NEW BRITAIN AV	ROCIO MOTA 275-277 NEW BRITAIN AV HARTFORD, CT 06106
208631011 208631010 208631009	0265- 0269 NEW BRITAIN AV 0261- 0263 NEW BRITAIN AV 0255- 0257 NEW BRITAIN AV	GEORGE PETRYKEVYCH 210 MOHEGAN DR WEST HARTFORD, CT 06117-1426
208631008	0249 NEW BRITAIN AV	MATAR REALTY LLC 619 EASTERN PARKWAY BROOKLYN, NY 11213

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208631007	0241- 0243 NEW BRITAIN AV	WALTER SR WINIARZ KRYSTYNA WINIARZ 607 RIDGE RD WETHERSFIELD, CT 06109-2617
208631006	0235- 0237 NEW BRITAIN AV	MARY OPOKU BOAKYE 235 NEW BRITAIN AV HARTFORD, CT 06106-3127
208631005	0229- 0231 NEW BRITAIN AV	ZOE PROPERTIES LLC 80C MORRIS ST HARTFORD, CT 06106
208631004	0223- 0225 NEW BRITAIN AV	FLOR BRICENO 145 CRESCENT DR EAST HARTFORD, CT 06118
207575026	0194- 0198 NEW BRITAIN AV	TRINITY COLLEGE TRUSTEES OF 300 SUMMIT ST HARTFORD, CT 06106 3100
207575063	0130 NEW BRITAIN AV	TRUSTEES OF TRINITY COLLEGE 300 SUMMIT ST HARTFORD, CT 06106-3100
207575062 207575061	0140- 0142 NEW BRITAIN AV 0144- 0146 NEW BRITAIN AV	MARK J PIANKA 94 MCBRIDE RD MONSON, MA 01057-9685
207575060	0150- 0152 NEW BRITAIN AV	MARIA W LU SAVVAS CHARLEY W. SAVVAS TSAMPIKA KITSA SAVVIS 9 ANCIENT HWY WETHERSFIELD, CT 06109
207575032 207575033 207575034 207575035 207575036 207575037 207575038 207575041 207575042 207575043 207575044 207575047 207575049 207575050 207575051 207575052 207575053 207575054	0160- 0162 NEW BRITAIN AV #201-#207, 301-304, 307, 309 401-405, 407-409	160 NEW BRITAIN LLC 563 FRANKLIN AV HARTFORD, CT 06114

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207575056 207575057 207575058		
207575039	0160- 0162 NEW BRITAIN AV #208	HECTOR MANGUAL 160 NEW BRITAIN AV APT 208 HARTFORD, CT 06106-3130
207575040	0160- 0162 NEW BRITAIN AV #209	ANGEL VALLE 160 NEW BRITAIN AV APT 209 HARTFORD, CT 06106-3130
207575045	0160- 0162 NEW BRITAIN AV #305	LUIS A VELEZ PO BOX 261141 HARTFORD, CT 06126-1141
207575046	0160- 0162 NEW BRITAIN AV #306	GLDNSPR LLC 45 MEADOW RIDGE DR EASTON, CT 06612
207575048 207575055	0160- 0162 NEW BRITAIN AV #308, 406	LUIS R FLORES 481 PROSPECT AV WEST HARTFORD, CT 06105
207533091	1705- 1707 BROAD ST	COLLEGE THE TRUSTEES OF TRINITY 300 SUMMIT ST HARTFORD, CT 06106-3100
207533090	1713- 1715 BROAD ST	TRUSTEES OF TRINITY COLLEGE 300 SUMMIT ST HARTFORD, CT 06106-3100
207533014 207533008 207533007	076B CRESCENT ST 0114 CRESCENT ST 0122 CRESCENT ST	TRINITY COLLEGE TRUSTEES OF 300 SUMMIT ST HARTFORD, CT 06106-3100
207533004	0216 NEW BRITAIN AV	TRINITY COLLEGE TRUSTEES OF 216 NEW BRITAIN AV HARTFORD, CT 06106-3126
207533003 207533001	0220- 0222 NEW BRITAIN AV 0228- 0230 NEW BRITAIN AV	TRINITY COLLEGE TRUSTEES OF 300 SUMMIT ST HARTFORD, CT 06106-3100
207533002	0224 NEW BRITAIN AV	TRUSTEES OF TRINITY COLLEGE 300 SUMMIT ST HARTFORD, CT 06106-3100
208533002	0234 NEW BRITAIN AV	TRINITY COLLEGE TRUSTEES OF 111 DEKOVEN DR APT 1103 MIDDLETOWN, CT 06457-3465
207548103	0116 NEW BRITAIN AV	RASHA A AYOUB 689 DEMING ST SOUTH WINDSOR, CT 06074-3803
207548102	1710 BROAD ST	JOHN GIARENAKIS BORDONARO SERVICE CENTER 1710 BROAD ST

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		HARTFORD, CT 06106-3116
207548101	1694- 1696 BROAD ST	TREVOR MORRISON 1694 BROAD ST HARTFORD, CT 06106-3116
207548100	1686- 1688 BROAD ST	VERA F ANDERSON 1187 WINDSOR AV WINDSOR, CT 06095-3475
207548099 207548098	1678- 1680 BROAD ST 1668 BROAD ST	ADK ASSOCIATES LLC PO BOX 330487 WEST HARTFORD, CT 06133
207548097 207548096	1660- 1662 BROAD ST 1650- 1652 BROAD ST	JAC PROPERTIES MANAGEMENT INC 473 FRANKLIN AV HARTFORD, CT 06114
207548095	1642- 1644 BROAD ST	LP URBAN PRESERVATION ASSOC 400 WASHINGTON ST HARTFORD, CT 06106
229548015	0104 NEW BRITAIN AV	JOHN GIARENAKIS 104 NEW BRITAIN AV HARTFORD, CT 06106
229548014	0108- 0110 NEW BRITAIN AV	JULIAN MOHABIR 93-32 208TH QUEENS VILLAGE, NY 11428
207548104	0112- 0114 NEW BRITAIN AV	LAMAROS PROPERTY LLC 867 PARK ST HARTFORD, CT 06106
207548094	1630- 1632 BROAD ST	ANA SANTIAGO 1630 BROAD ST 1632 HARTFORD, CT 06106-3116
207548093	1620- 1622 BROAD ST	HECTOR L ORTIZ FLOR ANGELA ORTIZ 1620-1622 BROAD ST HARTFORD, CT 06106-3116
207548092	1608- 1612 BROAD ST	POPE PARK ZION LLC 207 WASHINGTON ST HARTFORD, CT 06106-2470
206547012	1580 BROAD ST	COLLEGE THE TRUSTEES OF TRINITY 300 SUMMIT ST HARTFORD, CT 06106-3100
206547011	0073 COLONIAL ST	73 COLONIAL PROPERTY LLC 64 ANDOVER DR MILFORD, CT 06460-6943
206546010	1536- 1538 BROAD ST	SONY AUGUSTIN GERTRUDE AUGUSTIN 1536 BROAD ST 1538 HARTFORD, CT 06106-3113

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206546009	1526- 1528 BROAD ST	TRINITY GATEWAY APARTMENTS LLC 1034 PROSPECT AV HARTFORD, CT 06105
228546056	0071 BROWNELL AV	TRUSTEES OF TRINITY COLLEGE 300 SUMMIT ST HARTFORD, CT 06106-3100
206546008 205544127	1500- 1502 BROAD ST 1300 BROAD ST	TRUSTEES OF TRINITY COLLEGE 300 SUMMIT ST HARTFORD, CT 06106-3100
228545068	0053 VERNON ST	LEARNING CORRIDOR CITY OF HARTFORD 550 MAIN ST HARTFORD, CT 06103-2913
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Exhibit B

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Exhibit B

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U. S. Congressman, 1st District	Congressman John B. Larson 221 Main Street, 2nd Floor Hartford, CT 06106

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Henry Sire

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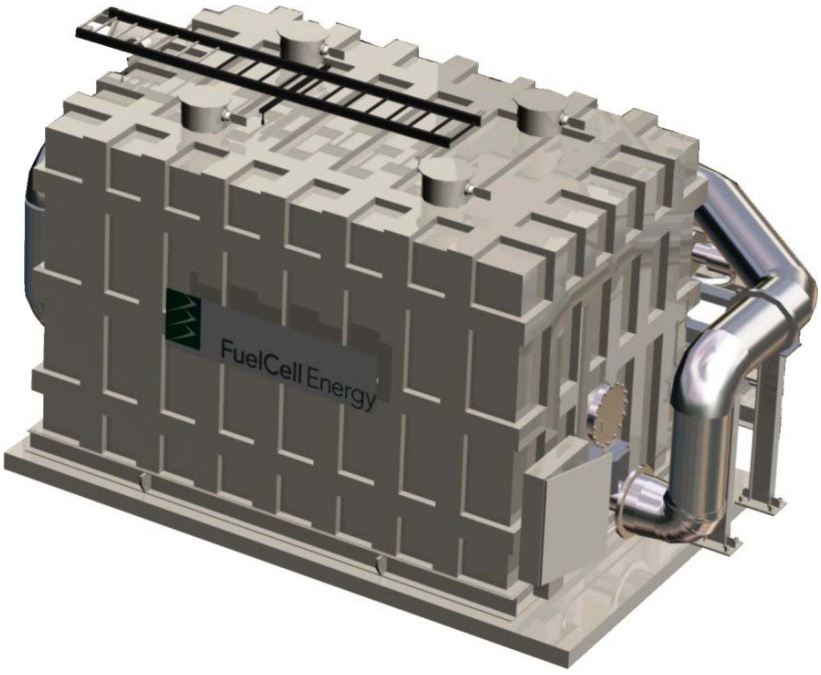
Exhibit C

Facility Sound Assessment



Fuel Cell Project

Trinity College

Hartford, Connecticut

January 17, 2017

Prepared For:

FuelCell Energy, Inc.
3 Great Pasture Road
Danbury, CT 06813

Prepared By:

Modeling Specialties
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Environmental Sound Assessment
Trinity College Project

Background

A DFC1500 Fuel Cell Project is proposed at Trinity College in Hartford, Connecticut. The Fuel Cell process combines Connecticut Class I Renewable Energy resources, uses proven commercial technologies, is ultra-clean, and is more efficient than any other electricity generating technology in its size range. The proposed facility exports to the host additional energy from the Fuel Cell waste gases making this process even more energy efficient than a simple cycle Fuel Cell project. The equipment configuration is designed and provided by FuelCell Energy, Inc. ("FuelCell Energy"). The following assessment is based on the criteria provided by Hartford and the Connecticut Department of Energy & Environmental Protection (CDEEP). Since the proposed location adjacent to the existing heat plant is significantly distant and shielded from offsite locations, the study will address sound levels at the nearest residences on and off campus. Sound levels from the proposed equipment were estimated based on vendor design and measured sound from similar equipment configurations. Sound level modeling techniques were used to estimate the potential impacts at receiving locations. What follows is a complete analysis of the facility sound using measured ambient data, detailed proposed equipment configuration and using 3 dimensional noise modeling software package CadnaA by Datakustic.

Overview of Project and Site Vicinity

The Project is located off Ferris Roadway at the Trinity College campus in Hartford. The proposed site is less than one mile from Interstate 84 to the north-northwest. It is just over 1.5 miles from Interstate 91 to the east. However, the existing sound levels in the area are usually dominated by the sound of mechanical equipment as this is the heart of the campus support infrastructure. The proposed equipment layout is adjacent to the existing heat plant. Additional mechanical support equipment is in the lower level of the Ferris Athletic Center (including the gymnasium, Fitness Center, Squash Center, Field House and Swimming Pool). The substation supporting the campus is located directly across Ferris Roadway to the south of the equipment. In addition to the mechanical sources, the existing sound field includes traffic on campus as well as Broad Street and New Britain Avenue. Since the potential equipment impacts are greatest when ambient levels are lowest, significant effort was made to measure sounds during periods of relative quiet for the area.

The nearest residences to the proposed equipment are the Crescent Street Townhouses to the south. There are additional off-campus residences to the east, but they are significantly more distant. Both will be used as sensitive receptors in this study. The equipment is expected to be installed at the heat plant equipment elevation, making the Ferris Roadway serve as a berm between the equipment and the residences. Figure 1 shows a Google Earth view of the existing campus utility area, proposed equipment and the modeled receptor areas annotated with distances.

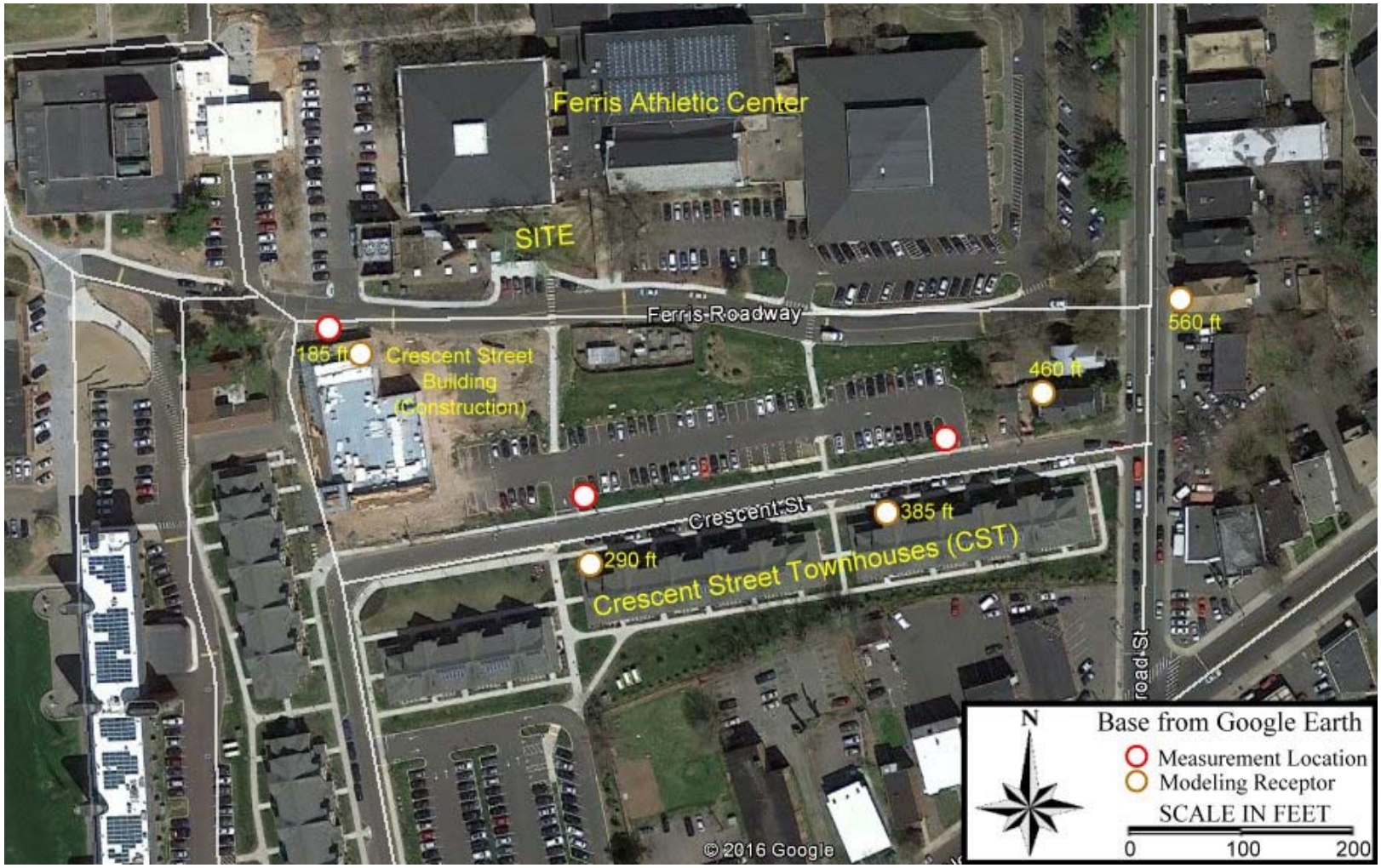

Figure 1: **Aerial Overview of the Site, Measurement Locations, Receptors and Surrounding Area**

Noise Analysis: Discussion of Analysis Methods

There are a number of ways in which sound (noise) levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. Following is a brief introduction to the noise measurement terminology used in this assessment.

Noise Metrics

The Sound Level Meter used to measure noise is a standardized instrument.[1] It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various circumstances. One of these is the *A-weighting* network. A-weighted sound levels emphasize the middle frequency sounds and de-emphasize lower and higher frequency sounds; they are reported in decibels designated as "dBA." Figure 2 illustrates typical sound levels produced by sources that are familiar from everyday experience.

The sounds in our environment usually vary with time so they cannot simply be described with a single number. Two methods are used for describing variable sounds. These are *exceedance levels* and *equivalent levels.* Both are derived from a large number of moment-to-moment A-weighted sound level measurements. Exceedance levels are designated L_n, where "n" can have any value from 0 to 100 percent. For example:

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the *residual* sound level, which is the sound level observed when there are no loud, transient noises.
- L_{50} is the median sound level; the sound level in dBA exceeded 50 percent of the time during the measurement period.
- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the *intrusive* sound level because it is caused by occasional louder noises like those from passing motor vehicles. By using exceedance levels, it is possible to separate prevailing, steady noises (L_{90}) from occasional, louder noises (L_{10}) in the environment.

[1] *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983, published by the Standards Secretariat of the Acoustical Society of America, Melville, NY.

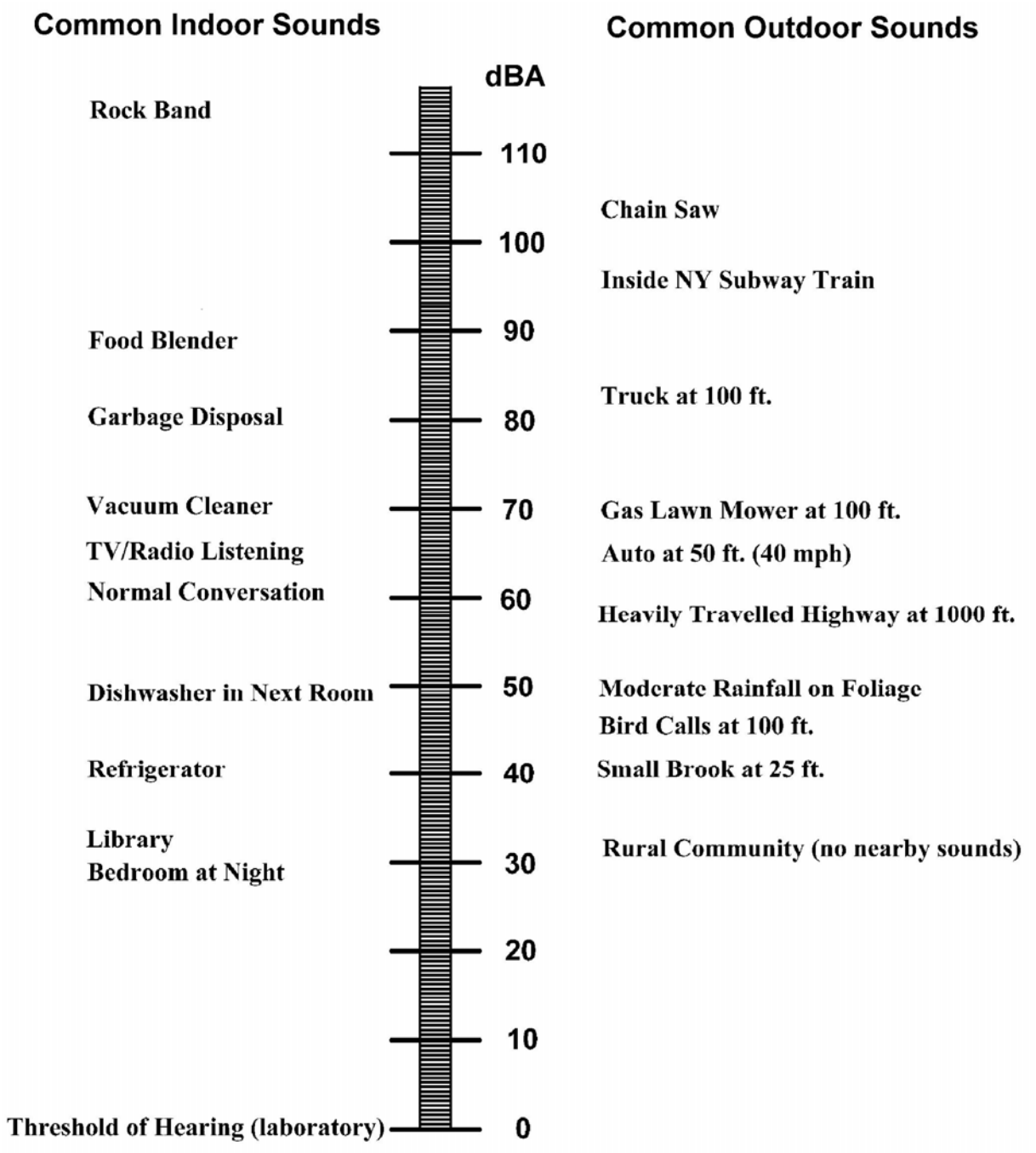

Figure 2: **Typical Sound Levels from Everyday Experience**

- The *equivalent level* is the level of a hypothetical steady sound that has the same energy as the actual fluctuating sound observed. The equivalent level is designated L_{eq}, and is also A-weighted. The equivalent level is strongly influenced by occasional loud, intrusive noises.

When a steady sound is observed, all of the L_n and L_{eq} are equal. This analysis is based on the background or L_{90} metric. All broadband levels represented in this study are weighted using the A-weighting scale.

In the design of noise control treatments, it is essential to know something about the frequency spectrum of the sound of interest. Noise control treatments do not function like the human ear, so simple A-weighted levels are not useful for noise-control design or the identification of tones. The frequency spectra of sounds are usually stated in terms of *octave band sound pressure levels*, in dB, with the octave frequency bands being those established by standard.[2] The sounds in the community were measured in 1/3 octave band levels. The sounds expected as a result of this project have been evaluated with respect to the octave band sound pressure levels as well as the A-weighted equivalent sound level. For simplicity (and by Connecticut standard) they are summarized in this report in terms of the combined A-weighted background level.

Noise Regulations and Criteria

Sound compliance is judged on two bases: the extent to which Federal and State regulations or guidelines are met, and the extent to which it is estimated that the community is protected from excessive sound levels. The governmental regulations that may be applicable to sound produced by activities at the Site are summarized below.

- ***Federal***

Occupational noise exposure standards: 29 CFR 1910.95. This regulation restricts the noise exposure of employees at the workplace as referred to in Occupational Safety and Health Administration requirements. The facility will emit only occasional sounds of modest levels, as demonstrated by this study.

- ***State***

The state of Connecticut (Connecticut Department of Energy & Environmental Protection or CDEEP) regulates noise at Regulation Title 22a, Sections 69-1 through 69-7.4, Control of Noise. The project is a Class C (Industrial) emitter. The corresponding CDEEP performance criteria are shown in Table 1 based on the land use of the emitter and the potentially affected receptors.

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[2] *American National Standard Specification for Octave, Half-octave and Third-octave Band Filter Sets*, ANSI S1.11-1966 (R1975).

Table 1: Connecticut DEEP Noise Standards by Noise Zone
Based on SLUCONN (Standard Land Use Classification Manual of Connecticut)

	Receptor's Land Use			
Emitter Class	Industrial	Commercial	Residential/Day	Residential/Night
Class A (Res)	62 dBA	55 dBA	55 dBA	45 dBA
Class B (Com)	62 dBA	62 dBA	55 dBA	45 dBA
Class C (Ind)	70 dBA	66 dBA	61 dBA	51 dBA

Adjustments for high background noise levels or impulse noises.

1. In those individual cases where the background noise levels caused by sources not subject to these regulations exceed the standards contained in this chapter, a source shall be considered to cause excessive noise if the noise emitted by such source exceeds the background noise levels by five dBA, provided that no source subject to the provisions of this chapter shall emit noise in excess of eighty (80) dBA at any time, and provided that this section does not decrease the permissible levels of other sections of this chapter.

2. No person shall cause or allow the emission of impulse noise in excess of eighty (80) dB peak sound pressure level during the nighttime to any residential noise zone.

3. No person shall cause or allow the emission of impulse noise in excess of one hundred (100) dB peak sound pressure level at any time to any zone.

- ***Local Hartford Requirements***

The City of Hartford, Connecticut regulates noise in their zoning ordinance at ***23 - Noise***. Electrical generation is an industrial use. The area of the campus immediately surrounding the proposed equipment is also industrial (mechanical utilities). The corresponding Hartford criteria are shown in Table 2 based on the zoning of the emitter and the potentially affected receptors. While regulated separately, the requirements are identical to the CDEEP standards including measurement requirements and the handling of existing high ambient environments.

Table 2: City of Hartford, Connecticut, by Zoning District

	Receptor's Zone			
Emitter's Zone	Industrial	Commercial	Residential/Day	Residential/Night
Residential	62 dBA	55 dBA	55 dBA	45 dBA
Commercial	62 dBA	62 dBA	55 dBA	45 dBA
Industrial	70 dBA	66 dBA	61 dBA	51 dBA

Since the noise standards are based on the land use of both the emitter and the receiver, the current land uses in the area is important to the study. The campus is zoned institutional, so the school has some latitude of sound emissions that remain on campus. Off-campus receptors are distant and shielded from the sources, so are not expected to be affected by the proposal. This study focuses on the levels expected at on-campus residences and several nearest off-campus locations.

Existing Community Sound Levels

A site survey and noise measurement study was conducted for the facility on January 13 and 14, 2017. While the ambient sound fluctuates through the day and night, the sound from the proposed facility is expected to be very steady. For this reason, several surveys were scheduled at various parts of the day and night. It is noted that ambient surveys are usually scheduled to represent weekday conditions. Since there is an active construction project (Crescent Street Building) in the project area, the daytime survey was scheduled on Saturday morning to avoid the sound from construction activities.

Attended sound level measurements were made using a Rion NA-28 sound level meter. The measurements create a baseline community sound level and captured the frequency-specific character of the sound. The meter was mounted on a tripod approximately 5 feet above the ground. The microphone was fitted with a factory recommended foam windscreen. The meter was programmed to take measurements for 20 minutes and then to store processed statistical levels. The meter meets the requirements of ANSI S1.4 Type 1 – Precision specification for sound level meters. The meter was calibrated in the field using a Larsen Davis Cal-250 acoustical calibrator before and after the measurement sessions. The field calibrations indicated that the meter did not drift during the study. The meter's spectrum analyzer complies with the requirements of the ANSI S1-11 for octave band filter sets.

The statistical L_{90} referenced in the CDEEP standard characterizes the background sound level. Using this metric, the sound from short term or infrequent sources is statistically excluded from the sample. Some of the sound measured is from passing vehicles which momentarily elevates the levels, but such sources are statistically screened from the results. Because much of the existing sound is from campus mechanical equipment, those sources were fully characterized in the nighttime survey (minimizing other local sound sources). These levels are not reported in the ambient survey, but are used in the modeling of the combined future sound estimates.

Existing Sources of Sound

During all surveys, the fluctuating sound field was dominated by occasional vehicle pass-bys. However, the background sound was dominated by the sound from existing campus mechanical equipment. Each source tends to dominate the sound field near the source. The background sound as defined by the CDEEP was determined using the L_{90} statistical level. There were widespread "occasional" sources seen in the area such as HVAC condensers and at least 7 backup generators in the project area. None of these were operated during the surveyed period. The FuelCell package will also be equipped with a "black-start" generator in case of trip during a utility outage. This is considered an upset condition and is covered separately in Appendix A.

The proposed FuelCell equipment will be added to the existing campus support infrastructure in this area so the existing sound is an important backdrop for the proposed facility. Figures 3 shows an overview of the source locations. Figure 4 through 6 illustrate the primary sources of existing mechanical sound in the area. This study addresses the mechanical sound from the FuelCell equipment in the context of these existing mechanical sources.

Figure 3: **Overview of Existing Sources of Background Sound.**

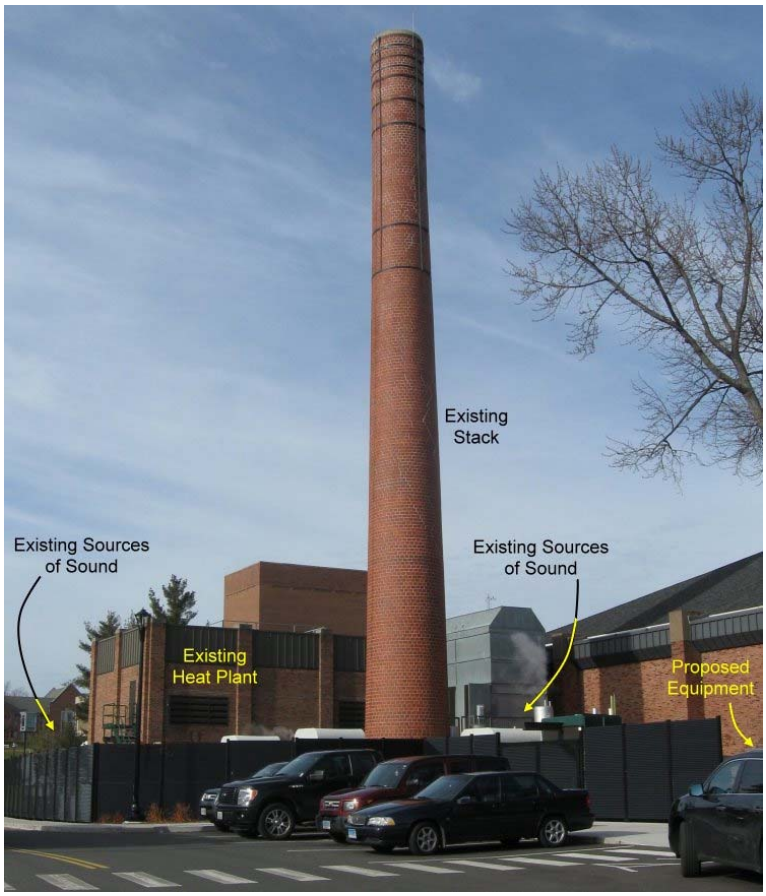


Figure 4: **Field Image Showing the Heat Plant Adjacent to the Site**

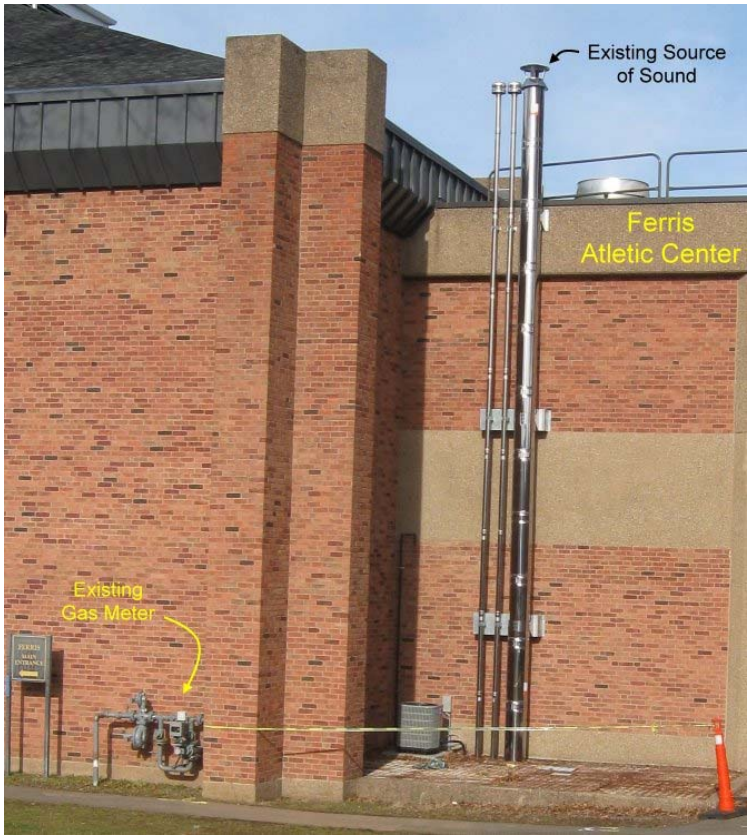


Figure 5: **Field Image Showing the Elevated Vent on the Ferris Center**

Figure 6: **Field Image Showing the Intake Louver Near the Rear Ferris Center Exit**

Results of the Ambient Survey

Based on a survey of this portion of campus, the sound from the FuelCell equipment has the potential to affect the same receivers as the existing sources. The Crescent Street Building is the nearest receiver, but does not appear to be residential in use. The new Crescent Street Townhouses are the nearest residential land use and are evaluated as sensitive receptors. There is what appears to be a single off-campus residence at the east end of Crescent Street. While it is distant from the sources, it was selected for evaluation. There is one residence on the far side of Broad Street that has unobstructed but distant exposure to the modeled sources. While its sound field is expected to be dominated by traffic on Broad Street, it is also included in the study. The nearest off-campus residences to the south are not only distant, but are shielded by the new Crescent Street Townhouses. For these reasons, they were not included in this study.

Three measurement locations were identified to represent the modeled receivers. Their orientation is shown in Figure 1. The results of the ambient sound level measurements are summarized in Table 3. The community sensitivity is usually based on the lower background levels. Comparing the Leq levels (including all sounds) to the L90 levels (quietest 10% of samples) offers a baseline of the sound in the existing area. Baseline levels are affected by community conditions, meteorology, seasons, insects and traffic patterns. Because the measured levels are dominated by area traffic, they can be expected to be relatively consistent. They show that the existing community meets the target levels in the Connecticut DEEP standards.

Table 3: Ambient Sound Levels Measured on January 13 & 14, 2017

Location	Time	Period	Background Level dBA (L_{90})
Residences CST South	5:20 PM	Evening	48 dBA
Residences East	5:45 PM	Evening	49 dBA
Commercial West	6:12 PM	Evening	50 dBA
Residences CST South	4:05 AM	Night	45 dBA
Residences East	3:42 AM	Night	43 dBA
Commercial West	3:20 AM	Night	52 dBA
Residences CST South	11:08 AM	Daytime	46 dBA
Residences East	11:30 AM	Daytime	49 dBA
Commercial West	12:15 PM	Daytime	50 dBA

Consistent with most residential communities, the daytime is affected by elevated traffic volumes on the roadways. While the individual vehicle pass-byes are statistically excluded from the results, the din of area traffic contributes to the daytime background levels. Nighttime levels tend to be lower because of lower traffic volumes and less neighborhood activities.

Existing On-Campus Sources of Sound

While the regulatory levels do not apply to existing sound levels on the host property, the on-campus sound levels are very relevant to the siting of this equipment. As analyzed in the previous section, it is typical to evaluate the project sounds against the applicable regulatory standards. But the FuelCell equipment will not operate in isolation. For on-campus evaluation, it is appropriate to evaluate the proposed equipment sound within the context of the existing steady state campus sources. For this reason, the existing sources were measured during the nighttime survey when other ambient sources were at a minimum. The existing campus sources were introduced into the digital model (described in the next section) so they can be easily combined with the sound from the proposed facility. Modeling of existing sources is graphically summarized in Figure 8.

Expected Sounds from the Proposed Installation

The proposed installation has been designed with significant attention to protecting the community sound environment. Most of the equipment associated with the Fuel Cell facility produces no significant sound. The fuel cell technology does not require many of the mechanical sources of noise that are typical of power generation facilities. This analysis represents the most likely sound levels to be expected as a result of the normal operation of the facility using manufacturer's data and measurements of similar equipment at other fuel cell installations.

A computer model was developed for the facility's sound levels based on conservative sound propagation principles prescribed in the acoustics literature. Most of the equipment sources will produce gentle sound of a continuous nature. Each of the potential sources during routine operation of the facility was identified. The sound from each facility-related source is estimated at the source and at the community receptors. The sum of the contributing sources is used to represent the predicted sound level at the modeled location. Identifying specific receiving locations is a key element of the noise modeling, since sound levels decrease exponentially with increasing distance. The distances used in this study represent the distance between the sources and the nearest representative sensitive property. The results of the modeling at off-campus locations show that the steady sound from the proposed equipment will meet the Hartford and CDEEP standards during the daytime and at night with a large margin.

Sources of Project Sound

There are several sources of modest sound at the proposed facility. Under normal conditions, the few noise sources will produce consistent sound through the day and night. At least one source, the A/C unit on the Water Processing Skid, will cycle on and off based on the cooling requirement. The dry cooler is equipped with multiple fan pairs which will be activated as needed to provide necessary cooling. Since it is designed for operation under all feasible conditions, it will almost never operate with all fans together. The sound from the utility metering inlet piping and regulator fuel train varies from installation to installation, depending on variables outside the control of the project. For that reason, a conservative (worst-case) condition was modeled. The meter was modeled at street level on the south side entrance steps to the fuel cell power plant. Field measurements from existing (larger) installations were included in this analysis.

In this way, foreseeable changes to the Trinity College installation will only reduce the gas metering sound. For example, scaling the sound based on fuel use of this DFC1500 installation would reduce the metering sound by 3 dBA. Lowering the installed elevation to the FuelCell ground elevation will reduce the metering sound by 10 dBA or more at most receptors. Finishing the utility installation with lagging would also reduce its sound. Even with the conservative modeling assumptions, the metering sound is not expected to dominate the field at any modeling receiver. Furthermore, in this conservative study, all part-time sources are analyzed as continuous full time sources. The modeling of the facility is based on the proposed equipment layout as shown in Figure 7. This equipment layout base is about 6 feet below sidewalk level.

The DFC-1500 fuel cell equipment is manufactured in Connecticut by FuelCell Energy, Inc. The primary source of equipment sound is from the fresh air blower and piping to deliver air to the modules. The electronics cabinets (electrical balance of plant), along with supporting transformer and chiller will also contribute some sound. The blower has been installed with carefully designed acoustical treatment. Air is drawn into the blower through overhead filters. The blower output pipe is treated with lagging to prevent the blower sound from being transmitted from the piping. Some gas flow sources are also lagged. This configuration was developed for Fuel Cell installations to reduce the potential to affect sensitive community receptors. However, the mitigated process will still emit some sound energy, which is quantified and modeled at sensitive areas.

The analysis of sound is based on the contributions of individual sources and propagation losses to the analyzed receptors in general directions from the facility. The modeling accounts for the worst-case equipment sound under quiet ambient conditions consistent with the regulatory criteria. The Hartford and CDEEP criteria would apply at all off-campus receptors. Modeled levels are provided at the two most exposed off-site residential properties. This analysis of sound is based on the contributions of individual project sources and propagation losses to the analyzed receptors in various directions from the facility. Modeling is not provided in some directions because the existing buildings provide shielding in those directions. Those existing buildings, however, can reflect sound in sensitive directions, which is included in the model. Like the heat plant equipment, the FuelCell layout will be at about 6 feet lower than the sidewalk level. The elevation difference will significantly shield the sound from ground level sources at the nearest receptors. Results of the modeling are shown in Table 4 for the FuelCell only. Graphical summaries are provided in Figure 8 through 10 for various cases for comparison.

Table 4: Summary of Noise Modeling Results for the FuelCell Only

Receptor	Distance (ft)	Project Sound (dBA)	Criterion (dBA)
Commercial, West	185	37	N/A
Residence, CST South	290	37	N/A
Residence, CST SE	385	33	N/A
Residence, SE	460	34	51
Residence East	560	29	51

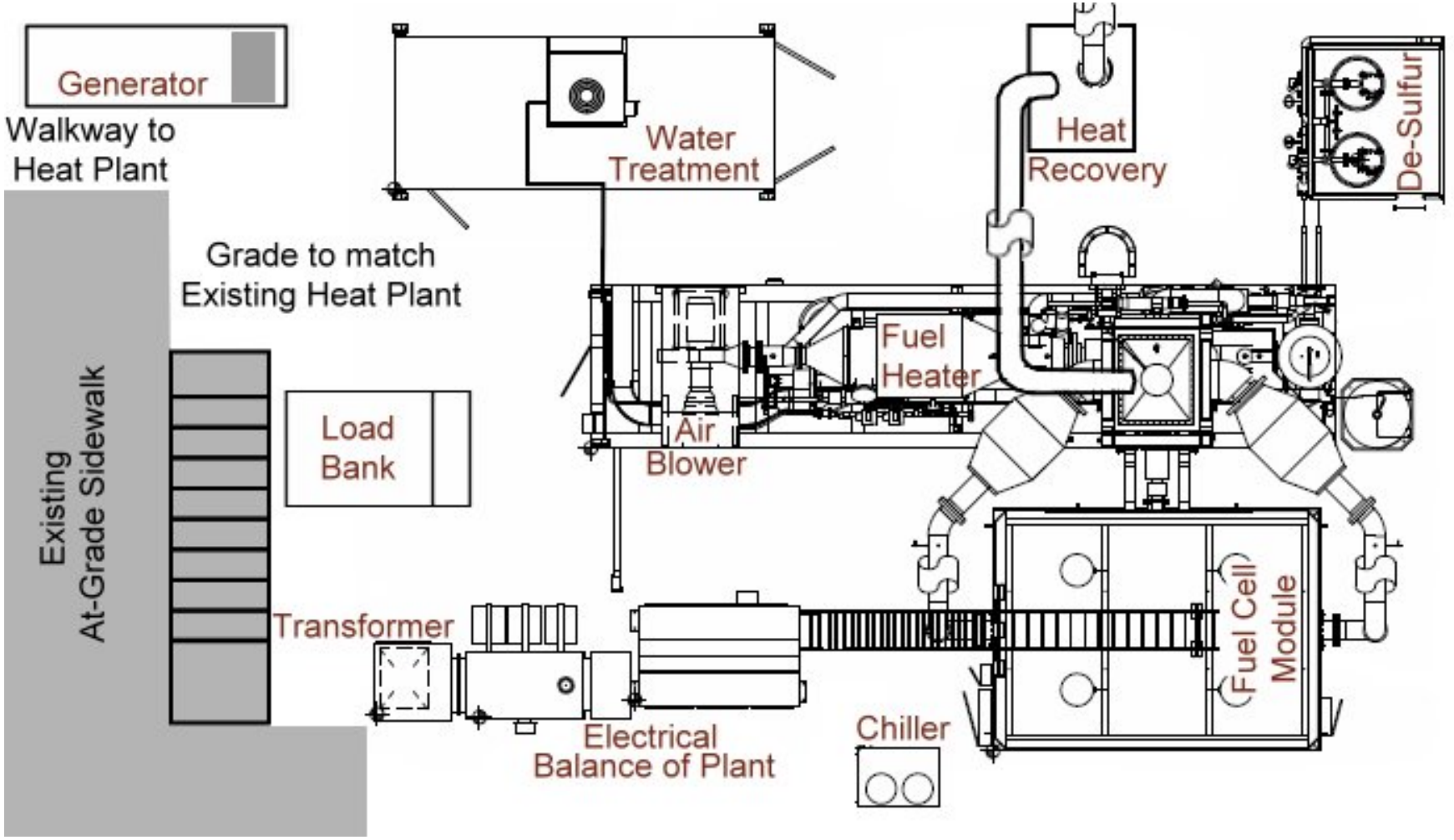


Figure 7: **Layout of the DFC-1500 facility Showing Major Groups of Equipment**

Figure 8: **Graphical Summary of the Modeled Sound from Existing Sources (No Fuel Cell)**

Figure 9: **Graphical Summary of the FuelCell Facility Predicted Sound Levels (FuelCell Only)**

Figure 10: **Graphical Summary of the Cumulative Sound from Existing and FuelCell Sources**

As noted, the project sound levels are far below the regulated levels at the most exposed off-site locations. This indicates that the project has no potential to significantly affect sound levels at any off-campus location.

Since the proposed equipment will be operated in conjunction with the existing campus infrastructure sources, the sound levels were modeled for the combined existing and proposed equipment. Figure 10 shows a graphical summary of the cumulative levels with all current noise sources along with the proposed FuelCell equipment also operating.

A comparison of Figures 8 and 10 shows the expected effect of the proposed equipment. These levels represent the expected "before and after" sound levels. The comparison is tabulated in Table 5. Additional receptors were added for the purposes of evaluating campus pedestrian sound levels. Like any sidewalk receptor, these locations represent fleeting exposure as students and staff move from one building to another. Existing sources are still expected to dominate locations nearest to those sources. The proposed equipment will only dominate the sound field as pedestrians pass by the site. Planned visual screens will shield the view from some locations, but like the existing screen for the substation and heat plant, the louvered visual screen is not expected to block sound.

Table 5: Summary of Noise Modeling Results – Before and After

Receptor	Existing Sound (Modeled dBA)	Cumulative Sound (dBA)	Change (dB)
Commercial, West	45	45	0
Residence, CST South	40	42	+2
Residence, CST SE	38	39	+1
Residence, SE	35	37	+2
Residence East	30	32	+2
Curb Near Ramp	52	53	+1
Highest level on Ramp	59	62	+3

Conclusions

The proposed fuel cell equipment package inherently lacks the heavy mechanical equipment that is commonly associated with electrical generation. There will be several sources of modest sound such as blowers, pumps, condenser and fans. The size of the equipment and character of the sound is more typical of commercial building mechanical equipment than of typical electrical generating sources. Mitigation measures are engineered into the equipment configuration to keep the cumulative sound from the Fuel Cell facility at or near the ambient level.

The existing sound levels were established by direct measurements that do not include short term ambient sounds such as passing cars. In this way, the study represents quiet conditions for the area. Existing sources in the area were quantified to allow them to be modeled. The proposed new sources of sound were also identified and quantified. Sound level modeling techniques were employed to estimate the sound levels at the nearest receptor locations. Since sound decreases with

distance, the sound will decrease significantly at more distant locations. The results of the modeling indicate that the facility levels will meet the Hartford and CDEEP noise criteria at all nearby receptors with a large margin.

An analysis was also provided to compare on-campus sound levels before and after the installation. The analysis shows that the proposed project represents an increase of 1 to 3 dB in the sound level at various receivers. An increase of 3 dB or less is not noticed in a typical community. In this way, the equipment is expected to fit nicely into the existing mechanical infrastructure at Trinity College with a barely noticeable increase in sound at on-campus residences and to pedestrians.

Attachment A: Sound from Facility Upset Conditions

The Load Leveler

The fuel cell is connected to a high pressure natural gas fuel source that is not dependent on the availability of local utility electrical power. The residual power to operate the equipment is self-generated. In this way, the Fuel Cell production will not usually be affected by the lack of utility power. But there are two sources that are associated with that specific condition. Neither of these sources are a routine contribution to facility sound, so they were not included in the steady state modeling analysis.

Any network of power supply must have an active balance between the power supply and the power consumption. In contrast, the Fuel Cell technology is ideally suited for long term steady-state electric power production. As a steady base-load source, the fuel cell is not designed for tracking a fluctuating load. This is usually not a problem, as the electricity is exported into the grid, providing the necessary stabilization of the moment-to-moment production and utilization. In the absence of the grid, this facility is designed to instantly support an electrical "island" by incorporating a load leveler. This unit provides instant adjustment of the unit net output to match the moment-to-moment demand. It does this by simply consuming the excess energy using a resistive heater (load bank). To reject the heat from this unit, the load bank has a fan driven airflow past the multiple layers of heating elements.

Because of the need for immediate load leveling in the absence of the grid, the load leveler will be instantly activated whenever the grid power is lost and will remain active until utility power is restored. While this is a rare upset condition, it is fundamental to the designed operation of the facility separate from the grid. For that reason, the sound associated with the load leveler fan is designed to operate within the applicable performance criteria.

Table A1: Summary of Comparison - Base Load to "Load Leveler Operation"

Receptor	Cumulative Level (dBA)	With Load Leveler Sound (dBA)	Increase (dBA)
Commercial, West	45	46	+1
Residence CST South	42	46	+4
Residence CST SE	39	42	+3
Residence SE	37	40	+3
Residence East	32	36	+4
Curb	53	55	+2
Ramp	62	63	+1

The Emergency Generator

As stated, the fuel cell equipment is powered by natural gas and operates on self-generated electrical power. It is designed to be instantly disconnected from the grid when utility power is lost. However, instability at the time of the power outage could translate into a tripped unit. If the unit trips as the utility power is lost, then it requires electrical energy to re-start the FuelCell and to restore the power island. An electrical generator is incorporated into the facility design to accommodate that need.

The generator specified for the facility is a 200 kW Generac unit that is fired by natural gas. The generator will be installed on a separate pad in the DFC 1500 footprint. The generator will be a standalone unit configured for quiet operation. There are several upgrades that are available for the unit. The most effective is the Level 2 Noise Mitigation Enclosure that is proposed for this unit.

There are only two occasions when the generator will be used. The first is for weekly routine maintenance checks during daytime hours only. The second is during that rare event when the utility power is lost ***-and-*** the fuel cell facility power is also lost. This is only likely to take place during major storms with local damage. Unlike most emergency generators which will operate for the duration of the power outage, this unit will only need to operate long enough to perform a hot start the FuelCell unit during the special case when the unit tripped at the time of power loss.

While this is also a rare upset condition, it is fundamental to the reliability of the facility. For that reason, the sound associated with the generator will also be designed to operate within the applicable performance criteria.

Table A2: Summary of Comparison - Base Load to "Generator Operation"

Receptor	Cumulative Level (dBA)	With Generator Sound (dBA)	Increase (dBA)
Commercial, West	45	46	+1
Residence CST South	42	44	+2
Residence CST SE	39	40	+2
Residence SE	37	38	+1
Residence East	32	34	+2
Curb	53	55	+2
Ramp	62	63	+1

EMERGENCY RESPONSE/SAFETY PLAN

Prepared for:

Trinity College Fuel Cell Project

Located at:

Trinity College

300 Summit Street, Hartford, CT 06106

Campus Installation Location: Ferris Roadway

Owned by:

Broad Street Fuel Cell, LLC

Plan Prepared by:

FuelCell Energy, Inc.

3 Great Pasture Road

Danbury, CT 06810

Plan Submitted to:

Connecticut Siting Council

10 Franklin Square

New Britain, CT 06051

August 2017

A current copy of this Plan is to remain in an accessible location on-site at all times

Document Number: SHE_Eng-114

Revision: 1

Plan Contents

Appendices

1 INTRODUCTION

The Trinity College Fuel Cell Project consists of one fuel cell power plant whose equipment is owned by Broad Street Fuel Cell, LLC, a wholly owned subsidiary of FuelCell Energy, Inc. (FCE). The fuel cell plant will be operated under a long term service agreement by FCE. The property is owned by Trustees of Trinity College, Inc. and the generated power from the facility will be sold to Trinity College pursuant to a power purchase agreement and the power and waste heat will be used by Trinity College to supply its campus. The net generating capacity of the power plant is 1.4 MW, nominal.

This Emergency Response / Safety Plan has been prepared for submission to the Connecticut Siting Council in fulfillment of the requirements of the Decision and Order pursuant to Docket NT-2010. The NT-2010 order requirements for the preparation of an Emergency Response / Safety Plan are similar to the requirements imposed by other regulatory programs, namely, the Emergency Action Plan required by the Occupational Safety and Health Administration (OHSA) general industry standard, the Fire Prevention & Emergency Plan requirement of the National Fire Protection Agency Standard 853 and the development of safety programs required by OSHA. Accordingly, these plans, in addition to other information, are incorporated into this Plan in fulfillment of the NT-2010 requirements.

1.1 General

FCE SureSource fuel cell plants are designed and operated as unmanned power generation facilities. The control system for the plant is designed for the system to “fail safe” in the event of a process upset. For any event or upset condition that has a potential safety consequence, the plant control system initiates an emergency shutdown (“ESD”) sequence that isolates the external fuel source from the plant and trips the fuel cell inverters off the grid.

A fuel cell plant Emergency Shut Down event isolates the natural gas fuel supply from the plant through the use of dual fast-acting, spring-loaded block valves located at the plant fuel gas supply connection. An ESD event also triggers automatic isolation of the fuel desulfurizer vessels and initiates the purging of the downstream fuel train components through the module using the onsite supply of inert nitrogen gas. Purging the residual fuel train contents out through the module results in the fuel being oxidized to innocuous end products. An ESD event also results in the fuel cell module(s) and inverter(s) being disconnected from the electric utility grid. Process upset or equipment operation malfunctions that can only cause equipment damage but no possible safety consequences can result in the fuel cell plant switching off the electric grid while remaining operational (islanding) so as to allow time for the electric grid or the fuel cell plant to stabilize, prior to resynchronizing with the grid. During any of these types of events, operators at FCE’s 24/7/365-manned Global Monitoring and Control Center (“GMCC”), will immediately assess the operational condition of the plant and take appropriate actions to stabilize or recover the plant to operational status, whichever is appropriate for the situation. If any on-site response is appropriate for the situation, the GMCC operator will contact appropriate personnel, be they an FCE field service

technician, or in the very unlikely event of a developing emergency response situation, local emergency response personnel.

Following, in Table 1, is an outline description of the fuel cell plant and other site equipment included in this project.

Table 1: Plant Descriptions

Plant Model: SureSource 1500

Each SureSource 1500 plant consists of one (1) C1400 SureSource fuel cell module, a Mechanical Balance-of-Plant (MBOP – skids 1-3), and an Electrical Balance of Plant (EBOP – power conditioning unit (PCU)/inverter w/ chiller, transformer & utility interconnection switchgear).

Number of Fuel Cell Plants:1

Fuel Cell Power Output: **1.4 MW, nominal**

Installation Location: **Outdoors**

Fuel type: **Pipeline Natural Gas**
Regulated utility supply pressure: 20 psig to fuel cell plant
Plant reduced operating pressure: <15psig

Plant Output Voltage: **480 VAC/3 Phase/60 Hz**

EBOP Manufacturer: **Rockwell**

EBOP Transformer Type / Dielectric Fluid: Dry Type

Nitrogen Supply: **Liquid microbulk tank (~250 gal. liquid capacity)**

<u>Additional / Appurtenant Equipment</u>

Supplemental Fuel Cleanup Equipment: None

Heat Recovery: Heat Recovery Steam Generator (65 psig saturated steam)

Black Start Capability: 200 KW natural gas fueled generator

Load Following / Islanding Capability: Load Leveler (1.4 MW, air cooled)

Step-up Transformer: 480V / 4.8KV (Oil filled)

Equipment not described above is not covered by this plan.

2 EMERGENCY RESPONSE / SAFETY – PLANS

Employers are required by the Occupational Safety and Health Administration ("OSHA") Standard at 29 CFR 1910.38 to have a written Emergency Action Plan ("EAP") for workplaces. The EAP can serve to fulfill the requirements of an Emergency Response Plan when the plan for emergency response activities is to evacuate the premises and to allow professional emergency responders to perform the required emergency response activities. Due to the nature of FCE SureSource fuel cell power plants being unmanned, remotely operated, and fail-safe in operational philosophy and control, it is the practice and policy of FCE to instruct workers, through a workplace EAP, to evacuate the premises in emergency situations and to summon professional emergency responders to perform required emergency response activities.

NFPA 853 is the national standard for the installation of Stationary Fuel Cell Power Systems and requires the preparation of a written Fire Prevention and Emergency Plan for fuel cell installations. The Fire Prevention and Emergency Plan is to be prepared in accordance with the requirements of Section 8.2 of NFPA 853 and is to include descriptions of fire prevention procedures, inspections, housekeeping practices, flammable material storage, control of ignition sources, procedures for fire protection equipment impairment, fire emergency plans and other information.

The OSHA standards for General Industry (Part 1910) and Construction (Part 1926) at Title 29 of the Code of Federal Regulations require that employers comply with a host of health and safety standards. Such requirements are outlined in employer safety programs and policies. Summary statements of corporate health and safety policies are often prepared for employee quick reference on an individual plant or project-specific basis.

Copies of the Emergency Action Plan, Fire Prevention & Emergency Plan and Plant/Project Safety Plan for the Trinity College Fuel Cell Project follow.

2.1 Emergency Action Plan

Following is the Emergency Action Plan (EAP) for the subject plant. As the new plant is at the point of the start of construction, the installation of which will add 1.4 MW of on-site power generation capacity to the site, this EAP will serve as both a construction phase and an operation phase document. If required, it will be updated again as necessary to appropriately reflect specific site conditions and limitations, at final project completion.

Emergency Action Plan

Site Name: **Trinity College Fuel Cell Project**

Site Address: **300 Summit Street**
Hartford, CT 06106

Plant Operator: FuelCell Energy, Inc.
3 Great Pasture Road
Danbury, CT 06810

Plant Owner: Broad Street Fuel Cell, LLC
c/o FuelCell Energy, Inc.
3 Great Pasture Road
Danbury, CT 06810

A. *Emergency Plan Coordinator & Other Contacts*

Emergency Plan Coordinator –

Name: **Global Monitoring and Control Center (GMCC)**
Company: FuelCell Energy, Inc. **(FCE)**
Description: 24 hour / 365 day Plant Monitoring
Telephone No: **(800) 326-3052**

Additional Contact information –

Site Operator Contacts: *(NOTE: private telephone numbers redacted from public report to protect privacy)*

Name: Vallerie Hoffman
Co./Dept./Title: FCE / Field Service / Eastern Region Manager
Telephone No: (203) 825-6071 (FCE)
Redacted (work cell)
Redacted (personal cell)

Name: Steve Brown
Co./Dept./Title: FCE / Field Service / Director of Field Operations
Telephone No: (203) 205-2449 (FCE)
Redacted (Home)
Redacted (Cell)

Name: Mark Benedict
Co./Dept./Title: FCE / Process Engineering /Principal Engineer, Product EHS
Telephone No: (203) 830-7429 (FCE)
Redacted (Home & Cell)

Name: Gordon Brookes
Co./Dept. /Title: FCE / FuelCell Energy Corporate EHS Director
Telephone No: (860) 496-2207 (FCE)
Redacted (Cell)

Additional Site Contacts:

Name: Ray D'Addeo
Co./Dept.: Trinity College / Facilities / Maintenance Manager
Telephone No: (860) 297-2718
Redacted (Cell)

Site Utility Contacts:

Company: **Connecticut Natural Gas**
Name/Dept /Title: Gas Leaks or Emergency 24-hr contact
Telephone No: (866) 924-5325 (24-hour)

Company: **Eversource (electricity)**
Name/Dept /Title: Eversource Customer Care Phone Support Number - Emergency
Telephone No: (800) 286-2000 (24 hour)

Company: **Metropolitan District Commission (water, sewer, storm drain)**
Name/Dept /Title: MDC Service Center (answering service during non-business hours)
Telephone No: (860) 278-7850

Company: **Airgas (Nitrogen)**
Name/Dept /Title: Mike Gieralt / Bulk Gas Manager/Southern New England
Telephone No: (203) 258-2616 (cell)
(800) 242-0105 (24/7 Technical Service and Bulk Deliveries)

Government Official Contacts:

(Note: Government officials are only to be contacted by designated FCE personnel, per established FCE policy/procedure, described later in this Plan)

City of Hartford –
Mayor's Office; Luke Bronin (chief of staff Thea Montañez) – (860) 757-9500
Hartford Police Department (non-emergencies) – (860) 757-4000
Hartford Fire Department, 253 High Street (non-emergencies) – (860) 757-4500 (main)
nearest Fire Station - Engine 15 / Ladder 2, 8 Fairfield Avenue; ~ 1/2 mile driving

State Legislators –
State House Representative – Angel Arce (District 4); (860) 240-8585; (800) 842-8267
State Senator – John W. Fonfara (Senate District 1); (860) 240-0043; (800) 842-1420

Private Residences/Establishments requesting notification of emergency response incidents (per formal request):

Neighboring Resident or Establishment Name	Neighbor Street Address	Contact Information – Phone and/or email
none		

B. *Preferred Means of Reporting Emergencies*

GMCC is to contact local Emergency Responders in accordance with this Plan, if required, or when requested to do so by on-site personnel.

Emergency	Make Initial Notification to:
Fire / Explosion	**(860) 757- 4000** (verified 06/02/17 - mab) **(for calls originating from other than on-site)** **9-1-1 (for calls originating on-site only)**
Flammable / Hazardous Material Release	
Medical Emergency	
Threat / Violence / Police Matter	
Severe Weather	Coordinate with FuelCell Energy GMCC (800) 326-3052

GMCC is to then contact a FCE Field Service Management representative and then make any additional utility / owner / community resident contacts as directed to by FCE F.S. Management representative.

C. Emergency Action Plan Elements

- **Emergency Escape Procedures and Routes**

  Emergency escape routes, exits and rally areas are depicted in the Plant Layout drawing provided in Appendix A.

  Upon discovery of the need for an evacuation (either self-initiated or in response to an evacuation call), all personnel on site shall immediately proceed to the nearest safe site exit and then proceed immediately to the designated rally area. Non-FCE contractors and guests shall be escorted by their host FCE employee to the nearest safe exit. The FCE standard lock combination is known by operating /maintenance personnel for any exits that may be secured at times when the plant is occupied.

  In the course of evacuation, ***a call shall immediately be placed to GMCC with a request/instruction for the second GMCC operator to immediately call local Emergency Responders*** *(See Emergency Action Plan, Section B)* to initiate action by the local emergency response organization(s). The caller is to stay on the line and provide all information requested, including name, location and nature of emergency and additional contact information, as may be requested.

  With the exception of small 'incidental' spills (as defined by OSHA and per FCE employee training), FCE employees are not to perform chemical spill response activities. Emergency or private spill response contractors are to be retained for the cleanup of non-incidental spills.

  All releases of ANY material are to be reported to the FCE Product EHS Principal Engineer and to the FCE EHS department as soon as practical.

- **Procedures for Employees who Remain to Operate Critical Operations Before Escape**

  All employees are expected to proceed immediately to the designated primary or backup rally location during any call for site evacuation.

- **Employee Accountability Procedures after Evacuation**

  The Trinity College Fuel Cell Project is a normally unmanned site; however, one or several FCE, owner or visiting personnel may be present on site at any time to perform operating, maintenance or other tasks. Per established site work/visitation procedure, all FCE and other personnel present on-site will be known by both the senior FCE Field Service employee present at the site as well as by the off-site GMCC operator. Upon the implementation of an evacuation, cell phone contact is to be established immediately with GMCC to update or confirm the list of on-site personnel. Accounting of all on-site

personnel is to then be made at the rally area, or backup rally area, wherever the situation dictates that assembly occur.

- **Rescue and Medical Duties**

  FCE employees are not routinely provided with rescue or in-depth medical training, and as such are not required or expected to perform rescue or medical duties. FCE employees are NOT to reenter the site following an evacuation prior to an 'all-clear' call being made from the professional first responder person in charge.

- **Alarm System**

  FCE plants are normally unmanned sites, with only a small number of workers present on site at any given time. Typically one, sometimes two, and on rare occasions more than two workers are present on site when work is being performed. When multiple workers are on site, they will typically be working together.

  The employee alarm system to be used at the Trinity College Fuel Cell Project site is direct voice communication. *The OSHA standard for employee alarm systems at 29 CFR 1910.165 allows the use of direct voice communication as an acceptable procedure for sounding an alarm system for workplaces of 10 or fewer employees, provided all employees can hear the alarm.*

  Upon discovery of a situation requiring evacuation, the discovering employee shall directly communicate the evacuation requirement to his/her fellow employees. Any non-employee guests on-site will be escorted by their host employee to the nearest clear exit at that time. It is envisioned that all employees present on site at any time will be capable of hearing a call for evacuation under foreseeable circumstances.

- **Training**

  All employees and contractors working at, and visitors to, FCE fuel cell power plants are to be trained in the elements, policies and procedures of this Emergency Action Plan prior to, or at the time of their first visit. All persons present at FCE plant sites are expected to comply with all elements of this plan in emergency situations.

D. ***Emergency ShutDown (ESD) Procedures***

ESD Pushbuttons located throughout the site can be used to shut down the operation of site equipment.

1. **Site Electrical Disconnect pushbutton:** The following ESD pushbutton will ***both disconnect the SureSource plant and open the plant utility grid Tie-Breaker:***

    - 1 on the EBOP Tie Breaker Switchgear *(HS-300E)*

Note that some Mechanical Balance of Plant electrical devices are also UPS (uninterruptable power supply) fed, so some low voltage equipment may temporarily remain energized even after engaging an ESD pushbutton. Note also that a hot SureSource module may contain hazardous voltage, even when not operating.

2. **SureSource ESD pushbuttons:** The following ESD pushbuttons will stop the operation of the SureSource equipment :

    - 1 pushbutton on the main control panel inside of Skid 1 (*HS-300A)*
    - 1 pushbutton on the south outside of Skid 1 (*HS-300B)*
    - 1 pushbutton on the control panel on the west end of Skid 2 *(HS-300C)*
    - 1 pushbutton on the southeast corner of Skid 2 *(HS-300D)*
    - 1 pushbutton on the north side of the EBOP PCU *(HS-300F)*

NOTE: Fuel Cell Plant Electrical Balance of Plant switchgear, PCU and transformer equipment will remain energized even after depressing one of these ESD pushbuttons. Note also that some Mechanical Balance of Plant electrical devices are also UPS (uninterruptable power supply) fed, so some low voltage equipment may temporarily remain energized even after engaging an ESD pushbutton. Note also that a hot SureSource module may contain hazardous voltage, even when not operating.

The locations of the plant ESD pushbuttons are depicted in the drawings in Appendix B.

E. ***Special Training***

FCE personnel who work at fuel cell plants receive Hazcomm training in the chemical hazards that are present on site. Operating personnel also receive training in other occupational safety and health (OSHA) standards, as appropriate for the tasks to which they are assigned.

F. ***Personnel Accounting Following Evacuation***

In order to be accounted for, all personnel present on site at the time of an evacuation are to proceed to the designated rally area, depicted on the drawing in Appendix A. Contact will be made with GMCC and the ranking supervisor on site will determine if all personnel are

accounted for or if any personnel are missing. The results of the accounting determination will be reported to the professional first responder in charge of the emergency response.

G. ***Rescue and Medical Duties***

All rescue and medical duties required at any FCE fuel cell plant will be performed by professional emergency response personnel.

2.2 Fire Prevention & Emergency Plan

Following is the Fire Prevention & Emergency Plan for the subject plant. As only the first phase of the plant has been constructed to date, this Fire Prevention & Emergency Plan will be updated as necessary to appropriately reflect specific site conditions and limitations, as FCE becomes aware and construction is completed.

Fire Emergency Plan

Purpose:

This document provides information specific to FCE's SureSource power plant, as described in the Plant Description section earlier in this Plan (Table 1). The document has been prepared in accordance with the requirements of Section 8.2 of NFPA 853-2015.

A. Response to Fire or Other Emergency Condition

- **Overview of fire hazards present**

  Natural gas (odorized) at a nominal pressure of 20 psig is supplied to the fuel cell power plant connection point via an underground pipe from a connection in the street. The aboveground gas meter and manual shutoff valves that supply the fuel are located inside the locked fence enclosure surrounding the fuel call plant in the back next to the building. The piping runs underground from the shutoff valve/metering stations to the interior of the plant where it emerges above grade and connects to the plant. The fuel cell plant immediately reduces the fuel gas pressure to less than 15 psig and directs the gas flow to the plant desulfurization equipment.

  Natural gas is de-odorized by flowing through the two desulfurizer vessels of the fuel cell power plant. The desulfurizer vessels are each equipped with a safety pressure relief valve (PRV), sized for both a failed pressure reducing valve and a fire exposure condition. The PRVs discharge to a vent termination above the roof line of the Ferris Athletic Center. Any unintended flow discharged to atmosphere through a PRV is immediately detected by an in-line flow sensor, which in turn immediately initiates a plant ESD. De-odorized fuel from the desulfurizers flows through the fuel cell power plant equipment, including the fuel humidifier and preconverter, and then into the fuel cell modules. The air heater also operates on an intermittent basis on de-odorized fuel. All fuel gas is confined within code complying process piping and vessels. All fuel sample valve taps are small bore and "double blocked" by virtue of tethered caps.

  The fuel cell power plant operates at high internal temperatures. Temperatures inside the insulated fuel cell module are approximately 1200^{o}F and the fuel fired air heater also operates at temperatures of up to 1200^{o}F. The fuel humidifier and connecting pipes also operate at high temperature. Insulation or guards are provided to maintain external skin surfaces at safe temperatures.

  Ancillary pieces of electrical equipment are provided with or are appurtenant to the fuel cell power plant. Some electrical equipment may operate at high current and/or medium voltage (>500V) and therefore generate appreciable heat. All electrical equipment are designed to applicable codes, including provisions for adequate heat dissipation.

- **Notifications and coordination**

  Upon discovery of a fire or other emergency condition, or acknowledgement of a fire alarm associated with the fuel cell power plant, the discovering or acknowledging person shall make notifications to the appropriate persons as outlined in the site Emergency Action Plan.

  An on-site discovering person who is trained in the operation and maintenance of the fuel cell power plant and who has evacuated the site for an emergency situation shall remain stationed in proximity to the site and accessible to emergency responders through the emergency response time frame in order to assist and support responders with technical expertise as they may request or require.

  An on-site discovering person who is a representative of the plant/facility owner shall remain on-site through the emergency response time frame to assist and support responders with plant/facility owner information and resources, including access to required resources and traffic control as emergency responders may request or require.

- **Plant security**

  Security is maintained by a locked, eight foot high chain link fence enclosure surrounding the plant. The enclosure is equipped with personnel and equipment doors or gates for necessary access. All doors/gates are kept locked when facility or operating personnel are not present. Emergency Fire Department access to the site in the absence of attending personnel would be obtained by removing the lock with a bolt cutter.

- **Evacuation and restriction of non-response personnel**

  Upon discovery of a fire or other emergency condition associated with the fuel cell power plant, the plant area shall be immediately evacuated of all non-response personnel to a minimum distance of 100 feet. Plant host facility representatives and qualified plant operating personnel shall identify themselves to Emergency Response personnel and remain nearby and available to assist in response activity support, as necessary. Notifications of nearby residents as required by the Emergency Response Person in Charge, shall be undertaken as directed, per the EAP.

- **Operator activities**

  On-site personnel:

  - Upon discovery of a fire or other plant emergency condition with the plant still running, while immediately evacuating the area of self and others, depress any Emergency ShutDown (ESD) pushbutton, if it is safe to do so. ESD buttons are situated at several locations around the plant as indicated in Appendix B, and as can be identified by their red mushroom caps and labeling, as depicted in photos later in this plan.
  - Upon discovery of a fire or other emergency condition with a plant that has experienced an Emergency ShutDown (ESD), immediately evacuate others and self.
  - Contact GMCC and instruct GMCC to in turn contact local Emergency Responders. As an emergency situation, advise GMCC to make other required notifications to management personnel, owner, and others, per Emergency Action Plan.
  - Remain on-site at a safe distance to assist and support responding personnel, including providing plant access, restricting access of non-responding personnel, or controlling traffic.

  Remote GMCC (Global Monitoring and Control Center) operators:

  - Upon advisement or acknowledgement of a *fire-related* Emergency Shutdown or knowledge of other emergency condition, make Emergency Responder and all other required notifications as described in Emergency Action Plan.
  - If not already present, dispatch field service personnel to the site to assist and support response personnel with fuel cell technical expertise.

B. Fire Extinguishment / Emergency Plant Shutdown

- **Fire water application concerns**

  FIRE WATER SHALL NOT BE APPLIED TO COMPONENTS OF THE FUEL CELL POWER PLANT AT ANY TIME. Certain fuel cell components may remain electrically energized with either alternating current or direct current voltage even after a system shutdown via one of the Emergency ShutDown (ESD) pushbutton switches.

- **Appropriate extinguishing media**

  Only fire extinguishing medias appropriate for live electrical equipment shall be applied to fuel cell power plant components. Only listed fire extinguishers for Class A:B:C type fires are provided inside the plant enclosed area.

Upon Emergency ShutDown (ESD) of the fuel cell power plant, all fuel supplies to the plant are automatically shut off via two in-line fast-acting spring-loaded isolation valves.

Following an ESD, **ELECTRICAL ISOLATION IS NOT ASSURED**. Substantial AC and/or DC voltages may still remain for significant durations following an Emergency ShutDown event.

FOLLOWING AN ESD SOME NATURAL GAS WILL REMAIN ISOLATED WITHIN THE FUEL DESULFURIZER VESSELS, however, these vessels are protected from overpressurization by pressure safety valves sized for fire exposure conditions. Following an ESD, nitrogen gas supplied from an on-site liquid source will flow through the fuel cell plant equipment. As with the desulfurizers, the nitrogen source supply is protected against overpressurization by a safety relief valve provided by the gas supplier.

A Plant Layout drawing is provided in Appendix A. The locations of key utility shutoffs (fuel gas, electricity) are indicated on the layout drawing.

- **Other Emergencies**

  Hazardous material spills – Hazardous materials that may be temporarily present on-site other than natural gas are typically solids, and usually only in small quantities. Trained hazardous material operations and response personnel are on-site for any operations or maintenance activities that involve the handling of bulk or containerized hazardous materials. Small quantities of water treatment chemicals are contained in the water treatment (Skid 1) enclosure.

  Transformer dielectric oil – There is a transformer on site that contains dielectric oil. The transformer uses FR3 dielectric fluid – a natural, seed-based, biodegradable, 'less-flammable fluid' transformer oil.

  Personnel injuries – For injuries requiring medical attention, the injured party or his/her companion shall seek appropriate medical attention for the injured. For serious injuries, call GMCC to summon local Emergency Responders per the Emergency Action Plan. For less serious injuries that require medical attention the injured shall obtain medical treatment at the nearest emergency medical care facility. All accidents and injuries (and near misses) shall be reported to FCE EHS.

C. Plan Validation

The executable elements of this Fire Emergency Plan consist of the manual activation of an Emergency ShutDown upon discovery, evacuation of the power plant area and notifications.

ESD buttons are all hard-wired in a fail-safe circuit. All fuel cell operating personnel are trained and regularly re-trained in a complete suite of safety programs.

Fire Prevention Plan

A. *Egress*

A Plant Layout drawing is provided in Appendix A. The plant emergency egress paths are depicted on the drawing.

B. *Emergency alarms and ShutDowns*

The fuel cell power plant is provided with Emergency ShutDown (ESD) pushbuttons. ESD pushbuttons have red mushroom caps and are clearly labeled. ESD pushbutton locations are indicated on the drawings in Appendix B. Photos of typical ESD pushbuttons are shown in Figure 1. Depressing an ESD pushbutton will immediately shut down fuel flow to the power plant as well as shut down all of the mechanical balance of plant equipment. **HOWEVER, THE ESD DOES NOT OPEN THE ELECTRICAL GRID TIE BREAKER, SO ELECTRICAL BALANCE OF PLANT COMPONENTS WILL REMAIN ENERGIZED. ADDITIONALLY, UNINTERRUPTABLE POWER SUPPLIES (UPS) WILL PROVIDE POWER TO A NUMBER OF MECHANICAL BALANCE OF PLANT COMPONENTS AND THE FUEL CELL MODULE WILL RETAIN SIGNIFICANT DC VOLTAGE POTENTIAL ENERGY IF OPERATING OR HOT PRIOR TO THE ESD.** (exception – the EBOP switchgear ESD button *does* open the electric grid tie-breaker; however, hazardous voltage may still remain.)

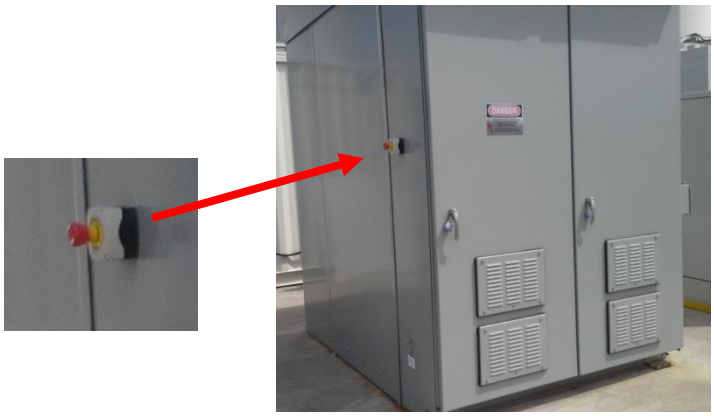
The following types of automatic acting emergency sensors are provided with the fuel cell power plant:

- Combustible gas detectors
- UV/IR Flame detectors
- Smoke detectors

In addition process flows, temperatures, pressures and voltages are continuously monitored for deviations from expected values. Process sensors are used to verify proper operation of the process and will quickly sense and shutdown the process upon severe deviations, such as would occur in the case of excessive seismic activity. Emergency sensors have either supervisory signals or are wired to alarm on sensor failure such that the plant will ESD on the loss of any one of these devices. Emergency sensors are calibrated in accordance with an established schedule as described in the maintenance manual. Sensor locations, as well as classified hazardous areas, are depicted in the drawings provided in Appendix B.

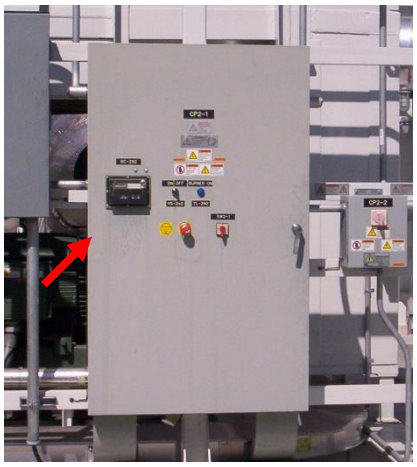
Sensor detection of flame, MBOP smoke, or presence of excessive combustible gas concentration (45% of Lower Explosive Limit [LEL]) will result in an Emergency ShutDown

(ESD) of the fuel cell plant. In the case of combustible gases, detection of a concentration of approximately 25% LEL will result in a high LEL warning alarm. EBOP smoke detectors provide an alarm function only as other performance shutdowns protect the equipment in case of actual fire.



Tie Breaker Switchgear
(Site Electrical Disconnect)

Electrical Balance of Plant



Skid 2, Main Process Skid Control Panel

Figure 1: Typical Emergency ShutDown (ESD) Pushbuttons

Fuel cell plant operating personnel are provided with portable gas detectors for use in operating and maintenance tasks including surveillance for gas leaks should such be necessary.

C. Fire prevention

The fire prevention strategy for the fuel cell power plant consists of the following Plan elements:

- **Housekeeping**

  The area around the fuel cell power plant shall be kept orderly and free of combustible and flammable materials, including combustible and flammable liquids, flammable gases and combustible and flammable solid materials. Trash shall not be allowed to accumulate. The water treatment system container shall not be used for general material storage.

- **Storage and Handling of flammables/combustibles**

  STORAGE OF FLAMMABLE AND COMBUSTIBLE MATERIALS IS PROHIBITED WITHIN THE PLANT ENCLOSURE WITHOUT PRIOR WRITTEN PERMISSION FROM THE LOCAL AUTHORITY HAVING JURISTICTION. Transient flammables and combustibles may include gases, small containers of flammable liquids such as solvents, trash and virgin and spent consumables used in the fuel cell process. These materials are to always be stored in packaging appropriate for their material properties and retained on site for as short of a duration as feasible. Flammable and combustible materials are to be kept separated from sources of ignition, fuel piping and processing equipment and electrical equipment and shall be protected from weather. Appropriate packaging materials for consumable materials are as follows:

  - Catalysts, virgin or spent – closed/sealed steel drums
  - Desulfurizer media, virgin – manufacturer's original packaging
  - Desulfurizer media, spent – closed/sealed steel drums

- **Flammable/combustible materials and potential ignition sources**

  The following are flammable/combustible materials *potentially* present at the fuel cell power plant:

  - Natural gas (present in piping and desulfurizer vessels only - no on-site storage)
  - Electrical equipment
  - Plastics
  - Insulation jacketing
  - Desulfurizer media (activated carbon)
  - 50% aqueous solution Propylene Glycol EBOP chiller coolant and heat transfer medium (hot water heat recovery installations)
  - Misc. new and used filter elements, PPE, packaging, etc.
  - Granular nickel based catalyst (DOT Div. 4.2, PG II/III; transient storage only, never long-term)

  Natural gas piping within the plant security fencing is identified with yellow "Natural Gas" pipe markers, complying with ANSI A13.1 requirements.

The following are potential ignition sources present at the fuel cell power plant:

- Heat from process
- Electrical equipment
- Catalysts
- Hot work
- Unauthorized Smoking or open flame
- Internal combustion equipment/vehicles

The fuel cell power plant design and procedures established to operate and maintain the plant have been formalized to minimize any potential for fire.

- The entire plant has been designed to and complies with the provisions of the ANSI/CSA safety code FC-1 (2004).
- The plant is equipped with automatic safety sensors to safely shut down the process in cases of leaking fuel or fire (Section B.)
- All fuel is pipeline supplied with minimal fuel holdup within the process.
- Desulfurizer vessels have been provided with pressure safety relief valves sized for fire emergencies.
- All of the plant piping has been designed in accordance with ASME B31.3 standard for process piping code. Piping is marked in accordance with ANSI A13.1.
- Areas of potential hazardous (classified) atmospheres have been identified and sources of potential ignition have been removed and any electrical equipment within complies with the area classification designation.
- Electrical equipment is designed to and complies with the provisions of UL1741.
- Smoking is NOT allowed within the fuel cell plant area.
- Hot Work within the fuel cell plant area is by Permit only, with potential sources of flammable materials removed from the area of potential ignition when hot work is conducted. Hot Work Permits are to be issued by the plant owner/operator. Additionally, any hot work conducted under the supervision of FCE will also be permitted under the FCE Hot Work Permit program.

- **Portable Fire Extinguisher**

  Sufficient type A:B:C portable fire extinguishers (20 lb. minimum), depicted in the drawing in Appendix A, are installed at the plant such that the travel distance to nearest extinguisher does not exceed 50 feet. Portable fire extinguishers required for specific maintenance procedures are brought to site by service personnel as special equipment for that procedure.

- **Inspections of plant area and fire prevention equipment**

  All inspections and maintenance of fuel cell components and systems are to be performed in accordance with the latest revision of the plant maintenance manual.

Operating personnel also conduct an informal "walk around" inspection every time they visit the plant site. As the plant operates remotely without the presence of operators, the walk around inspection is simply to check for any out of the ordinary situations or accumulated materials. FCE operators log any negative findings into a Computerized Maintenance Management System (CMMS) database. Sensors are calibrated or replaced in accordance with an established maintenance schedule based on equipment manufacturer's instructions; with work orders scheduled and records maintained by the database.

If, during an operator site visit or walkaround inspection a fuel leak is discovered, an immediate evaluation and disposition shall be undertaken. For sizeable leaks, an immediate plant shutdown may be necessary, while leaks of a very minor nature may be able to be addressed by such remedies as flange bolt retorquing or other measures. FCE operators are equipped with portable fuel gas (LEL) meters to assist in the evaluation of leak severity. Any discovered leak and its corrective measures shall be recorded in the CMMS database.

UV/IR flame detectors, combustible gas (LEL) sensors and smoke detector automatic sensors shall be tested, calibrated, maintained and/or replaced at the frequency provided in the SureSource 1500B/B5 plant maintenance manual. A summary of these requirements is provided below:

Automatic Sensor	Frequency	Maintenance Action
Skid 1 Smoke Detectors	18 mos.	Test & replace if required
EBOP Smoke Detectors	18 mos.	Test & replace if required
Combustible Gas Detectors	6 mos.	Clean, test & calibrate, if req'd.
UV/IR Flame Detector	18 mos.	Clean & Test

- **Fire protection system/equipment impairment**

  Unintended impairment of any fire protection sensor system will automatically ESD the plant. Manual short-term sensor impairment for the purpose of on-site maintenance occurs only at times when maintenance personnel are on-site and vigilant for signs of fire or potential fire. As a policy, extended system impairment is not permitted with rare exceptions and only when alternative monitoring methods can be implemented by remote monitoring and for as short of a duration as possible.

- **Incident investigation and reporting**

  Any fire-related incident shall be immediately reported to the Local Fire Department as "lead investigator." Plant owner representatives as well as FCE qualified personnel will be called upon to assist the Department in the site and technical aspects of the investigation. Such incidents will also be investigated by the fuel cell

operator/manufacturer (FCE) as required by the manufacturer's Certifying Agency. Results/conclusions of the investigation will be reported to the plant owner. External reporting to other agencies will be as directed by the responding Department commanders and as required by regulation, as established at the time of incident.

2.3 Plant/Project Safety Plan

Following is the Safety Plan for the subject plant. This Safety Plan will be updated as necessary to appropriately reflect specific site conditions and limitations, as FCE becomes aware and as construction progresses.

Safety Plan

FCE will address site security and personnel safety as the highest priority to ensure a safe and healthy work environment. Minimum safety requirements and policies have been identified and will be provided and enforced on all levels and for all organizations performing work at the facility during both the construction and operation phases of the project.

In addition, all contractors and subcontractors will be required to provide, adhere to, enforce, and report on their own safety policies and practices. Such policies, procedures and/or handbook will be provided to FCE prior to contract execution for FCE's review and consideration.

A. Site Supervision

FCE, or their prime construction subcontractor, will provide a construction/safety manager to be present while any work is being performed on site at any time. FCE Project Management representatives and EHS professionals will perform additional on-site review and inspections to further enforce all safety policies and practices.

Further, contractors and subcontractors will be required to have their own safety supervisor on site at all times when work is being performed. The safety supervisor is responsible for their personnel's adherence to all required and prudent safety policies and practices. The supervisor is to be responsible for:

- Enforcing safety policies and practices,
- Providing safety orientation for any new personnel onsite,
- Daily safety “toolbox” meetings covering daily activities and associated risks, by trade,
- Recording the daily safety meetings,
- Weekly safety status meetings and discussion topics,
- Performing and reporting on weekly safety audits,
- Maintaining a daily personnel attendance log (for personnel accounting),
- Site walks with FCE’s safety and construction managers on request, and
- Monthly formal reports including labor hours worked, incidents (including near misses, recordable events, and reportable events) along with a detailed description of corrective actions, audit results, and a summary of any site walks that occurred during that period.

At any time, FCE or subcontractor’s safety or construction management personnel can enforce a stop work directive to correct any safety infractions.

B. FCE Safety Program Policies

Construction contractor and plant operator shall plan and conduct all work to safeguard persons and property from injury and will direct performance of work in compliance with reasonable safety and work practices and with applicable federal, state and local laws, rules, and regulations including but not limited to "Occupational Safety and Health Standards" promulgated by the U.S. Department of Labor. Work in areas adjacent to electrically energized equipment and/or operating natural gas equipment shall be performed in accordance with said practices, laws, rules, and regulations.

As part of FCE’s continuing efforts to provide a safe and healthy workplace, it is required that all work activities be performed in accordance with all applicable regulatory requirements. While impossible to foresee all potential circumstances, the below list of Environmental, Health and Safety requirements constitutes the minimum basic elements to be followed during both the construction and operation phases of the fuel cell power plant project. All personnel are also required to abide by Trinity College’s Contractor Environment Health and Safety Manual.

- SIGN IN: All individuals must sign in/out at the office each day that they are on site.
- ACCIDENT, ILLNESS & INJURY: All accidents and injuries occurring on the premises shall be reported immediately to the Construction Manager in charge of

the work being performed, or during operation phase of plant, to the FCE EHS department as soon as possible.

- CHEMICAL RELEASE OR SPILL: Any release of chemicals on site, regardless of volume, must be immediately reported to the Construction Manager, or during operation phase of plant, to the FCE EHS department as soon as possible.
- COMPRESSED GAS MANAGEMENT: The management and use of compressed gas is to be performed in accordance with OSHA standard 29 CFR 1910.101 "Compressed Gasses, General Requirements."
- CONFINED SPACES: All work in "confined spaces" is to be managed in accordance with OSHA standard 29 CFR 1910.146.
- CRANE HOIST & SLING SAFETY: The operation of cranes and hoists is to be performed in accordance with OSHA standard 29 CFR 1910.179; and the use of slings is to be in accordance with OSHA standard 29 CFR 1910.184.
- ELECTRICAL SAFETY: All work involving electricity is to be performed in accordance with OSHA standards 29 CFR 1910 Subpart S, "Electrical Safety"; 1910.269 "Electric Power Generation, Transmission & Distribution; and NFPA 70E-2004 "Electrical Safety In The Workplace" as applicable.
- EYE PROTECTION: During all times that ANY work is being performed anywhere on the facility, all personnel at the facility must be wearing eye protection.
- FALL PROTECTION: All work performed at heights of six feet or greater must be provided with at least one form of fall protection that will either prevent a fall from occurring, or properly arrest a person's fall once the event has occurred. However, platforms, or other surfaces designed primarily for walking, shall be provided with an approved guardrail system when they are either; >4' above the adjacent floor or ground level, or, above dangerous equipment (conveyor belts, chemical baths, exposed rebar, etc…) regardless of height. In all cases, work at height must be performed in accordance with OSHA standards 29 CFR 1910.23, 132, and 503.
- HAND & PORTABLE POWER TOOL SAFETY: Hand and portable power tools are to be used in accordance with OSHA standard 29 CFR 1910 Subpart P.
- HAZARD COMMUNICATION; RIGHT to KNOW: 29 CFR OSHA standard 29 CFR 1910.1200: Employees shall not be exposed to Hazardous Chemicals without first

receiving training on the associated physical and health hazards and the measures needed to protect the employee from these hazards.

- FCE utilizes green on white Target Organ Labels identifying the Name and the Physical & Health hazards of a material; these labels shall be used for all containers not otherwise adequately labeled by the manufacturer.
- Hazardous materials brought on site shall be labeled and a Material Safety Data Sheet (MSDS) supplied to the Environmental Health and Safety (EHS) Department prior to working with the chemical.
- An MSDS station detailing all chemicals currently onsite is available for review.

- HAZARDOUS MATERIALS: FCE EHS is to be notified in advance of all hazardous materials to be brought on site. Storage, use and off-site transportation of these materials shall be performed in accordance with applicable requirements of the Connecticut General Statutes, the Regulations of Connecticut State Agencies and Titles 29 (OSHA), 40 (EPA), 49 (DOT) of the Code of Federal Regulations.
- HOT WORK PERMIT SYSTEM: A formal “Hot Work Permit” program is used as part of FCE’s overall Fire Prevention Program. Hot work is any operation that introduces a potential ignition source, which in the presence of combustible or flammable materials can result in a fire. HOT WORK includes, but is not limited to, operations such as brazing, cutting, grinding, soldering, torching, and welding. The use of a Hot Work Permit is required for all hot work operations outside of designated hot work areas. Hot work can be performed without a permit only in areas specifically designated and posted as a "Hot Work" area.
- LADDER SAFETY: The use of ladders is to be done in compliance with the following OSHA standards:
  - 29 CFR 1910.25 - PORTABLE WOOD LADDERS
  - 29 CFR 1910.26 - PORTABLE METAL LADDERS
  - 29 CFR 1910.27 - FIXED LADDERS
  - 29 CFR 1910.29 - MANUALLY PROPELLED MOBILE LADDER STANDS & SCAFFOLDS
- LOCKOUT TAGOUT PROGRAM: All servicing and maintenance of equipment is to be performed in accordance with the requirements of OSHA standard 29 CFR 1910.147 or 269 as applicable. These standards require locking out all potential energy sources prior to the performance of work.
- PERSONAL PROTECTIVE EQUIPMENT: In accordance with OSHA standard 29 CFR 1910.132-138 and Subpart I, work is to be performed using all necessary PPE. Hazard Assessments and Training in the use of required PPE are to be performed and documented prior to performance of work. PPE shall be removed before leaving the work area and disposed of according to waste management procedures to

ensure that contaminants are not spread to personnel, through the facility(s), and/or to the environment.

- POWERED INDUSTRIAL TRUCKS: Forklifts and other industrial lift trucks are to be operated only by personnel trained in accordance with OSHA standard 29 CFR 1910.178.
- POWERED PERSONAL LIFT TRUCKS: Powered personal lift trucks are to be operated only by personnel trained in accordance with OSHA standard 29 CFR 1910.67 and 29 CFR 1926.453.
- SAFETY DEVICES: Equipment safety devices are not to be removed, bypassed or otherwise modified without review and approval by FCE EHS Dept.
- SCAFFOLDING: All use of scaffolding shall be in accordance with the following OSHA standards:
    - 29 CFR 1910.28 – "Safety Requirements for Scaffolding"
    - 29 CFR 1910.29 – "Manually Propelled Mobile Ladder Stands & Scaffolds"
- STORMWATER POLLUTION PREVENTION: In accordance with the Connecticut Department of Environmental Protection (CTDEP) "General Permit for the Discharge of Stormwater Associated with Industrial Activity"; activities which will directly or indirectly release hazardous or non-hazardous materials into the storm water system are not permitted. All site practices will be to prevent or minimize pollution of stormwater. Operation of the fuel cell plant in and of itself does not invoke stormwater permitting requirements, however, the fuel cell is installed at a larger institutional facility that may have its own stormwater compliance obligations. Stormwater permitting and compliance for the greater campus site will remain the responsibility of the campus owner.
- WASTE MANAGEMENT: FCE is to be notified in advance of all waste to be generated. Under state and federal rules, FCE, as the site operator, is the "Generator" of all waste generated/created on site(s). As such, FCE is responsible for the proper Management, Storage, Transportation and Disposal of all wastes generated at site. This is to be done in accordance with all applicable requirements of the Connecticut General Statutes, the Regulations of Connecticut State Agencies and Titles 29 (OSHA), 40 (EPA) and 49 (DOT) of the Code of Federal Regulations.
- WORKING ALONE: Working alone can introduce additional hazards not necessarily present during the course of performing work with other personnel. The biggest risk in working alone is during the occurrence of an incapacitating injury to the lone employee; a lack of timely medical attention could exacerbate the injury leading to greater harm. To prevent this, tasks must be assessed for hazards before assigning the employee(s) to perform them alone. If hazards do exist, either periodic monitoring, assignment of additional personnel, or re-scheduling of the work must

be done. Further, it is important that task limitations be clear in order that new hazards are not introduced during any work performed alone. Employees performing work alone shall always contact GMCC by cell phone upon entering the facility site and upon leaving.

- GENERAL DUTY CLAUSE: The General Duty Clause of the Occupational Safety and Health Act requires that employers provide a place of employment that is free of recognized health or safety hazards to employees. It is FCE policy to provide such a workplace. Employees are encouraged to discuss any known or perceived health or safety issues or concerns with FCE management or EHS associates.

3 SITE SECURITY & ACCESS

Public access to the fuel cell equipment is first restricted by its location at a private facility equipped with its own security staff. Additional security is maintained by the limited access installation location, equipped with a locked eight foot high chain link fence enclosure surrounding the plant. The enclosure is equipped with personnel and equipment doors or gates for necessary operator access. All doors/gates are kept locked when facility personnel are not present. Emergency Fire Department access to the site would be obtained by removing the lock with a bolt cutter.

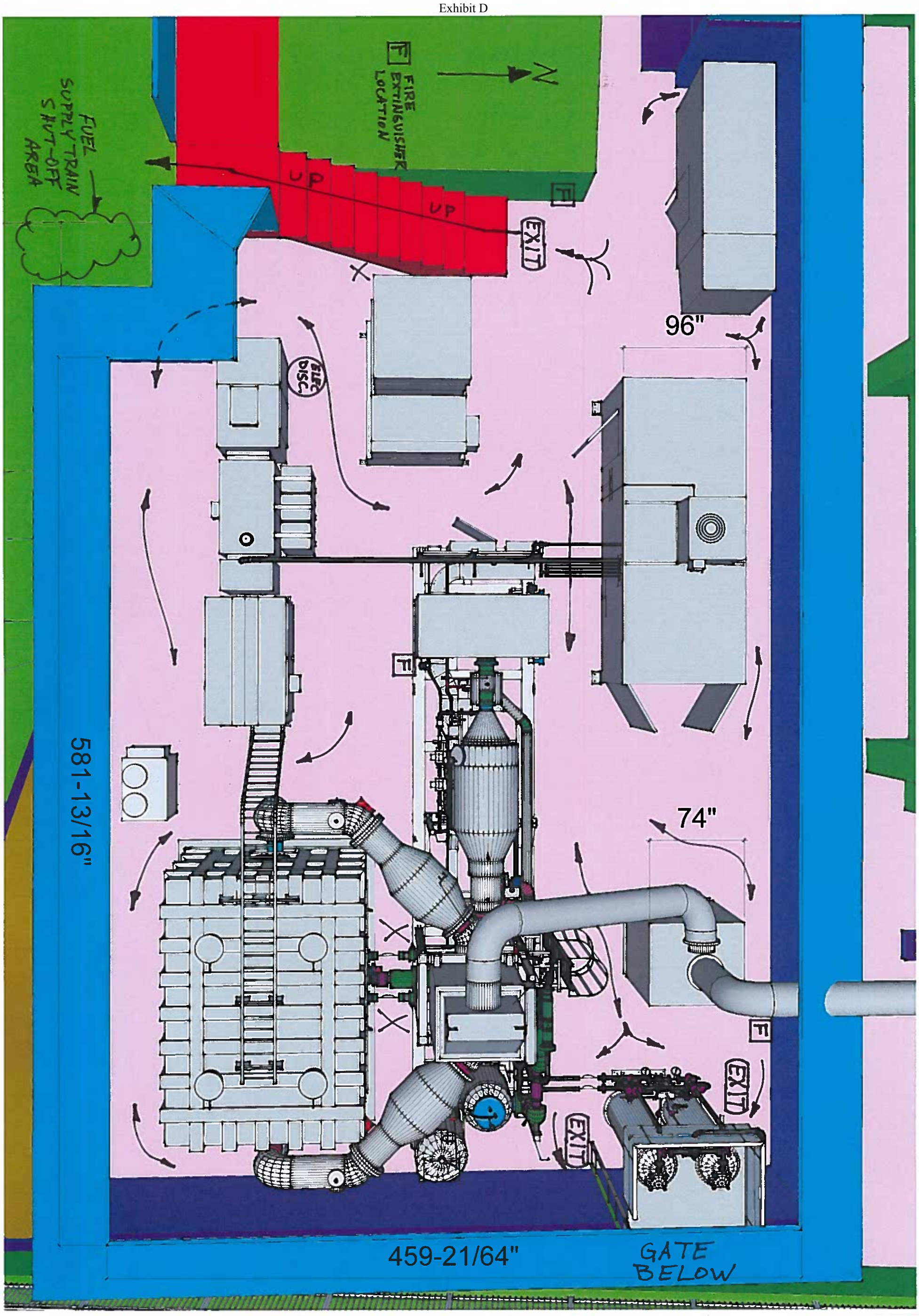
All FCE power plants are remotely monitored 24 hours per day, 7 days per week, year round by FCE's GMCC operations center. Any tampering or unauthorized manipulation of fuel cell components that would result in any significant performance change for the plant will be immediately detected by the GMCC operator and/or result in an Emergency ShutDown of the plant, restoring the plant to a safe condition. All FCE fuel cell power plants are designed for "fail-safe" operation, where all foreseeable process deviations have been considered and the consequences minimized, through a hazard and operability (hazop) analysis.

4 EMERGENCY RESPONDER / LOCAL COMMUNITY COORDINATION & NOTIFICATION SYSTEM

FCE will coordinate with local emergency response departments to familiarize personnel with the operations and equipment installed at the site. At a point prior to plant mechanical completion, FCE will contact the Local Fire Department to schedule a walk around tour and training event for the near-completed installation. Either prior to or at this time, a compilation of Safety Data Sheets for chemicals used on the site can be provided to the Fire Department. It is not anticipated that any chemical quantities on-site will exceed Emergency Planning and Community Right-to-know Act (EPCRA) notification or reporting thresholds at any time, so therefore Tier II notifications and reporting will not be required.

During the construction phase, prior to a scheduled delivery of any piece of major equipment, the police department and campus security will be notified and contracted to manage and, as required, control local traffic. Prior to connecting or making natural gas available at the facility, FCE will coordinate with the local fire department, provide training regarding the facility equipment and facility safety features, tour Department personnel and provide description of how the plant facility will respond should a fire, smoke, or volatile gas release occur.

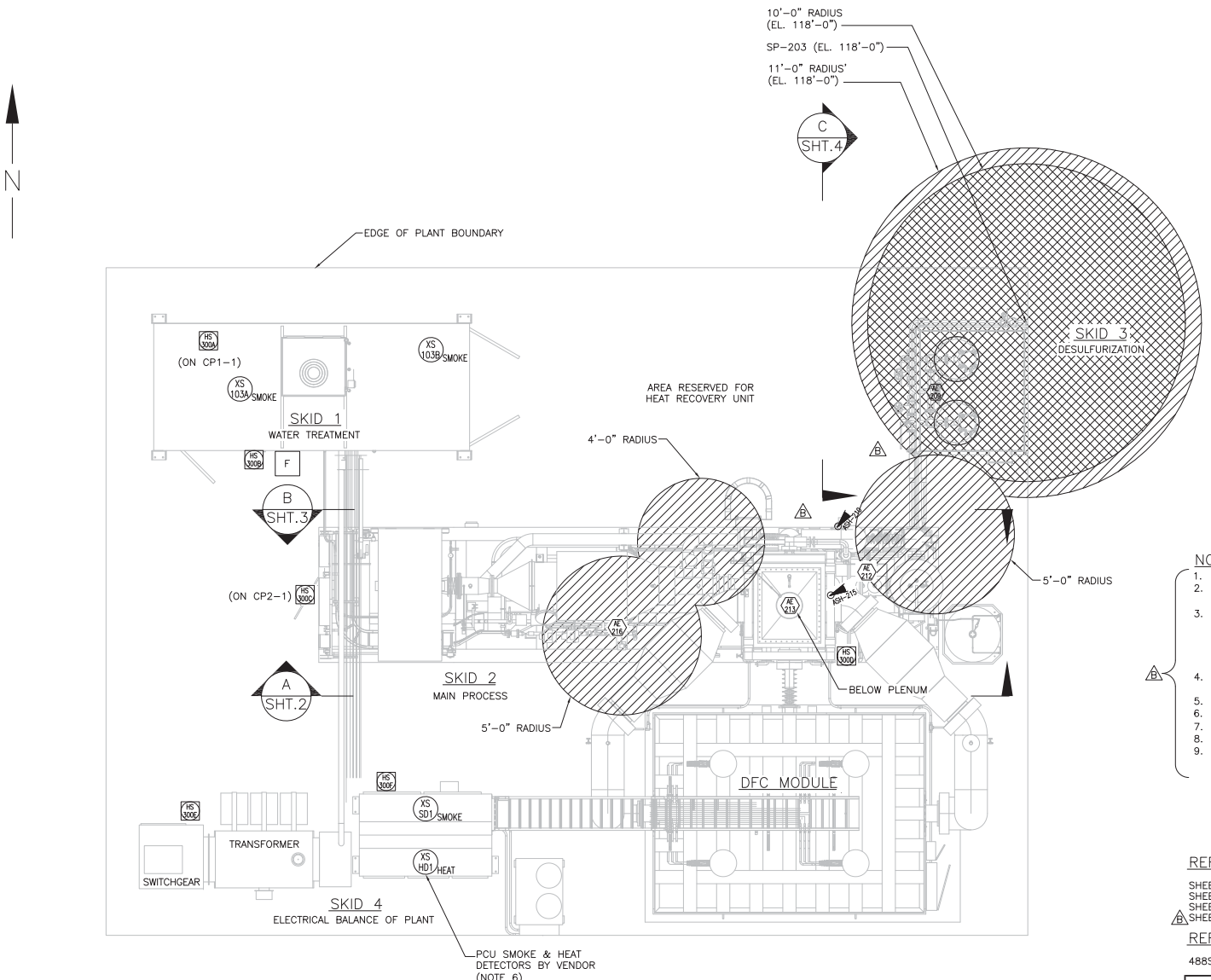
FCE will record the names and contact information of those local residents that request to be informed of any actual emergency response situation that may develop at the subject power plant which may affect them. The names and contact information of the local residents will be incorporated into the Emergency Action Plan in the table provided for notification in an emergency response situation that could potentially affect these residents. Responsibility for making such notifications will be the on-site manager during the construction phase of the project, and GMCC during the operation phase of the project.



Appendix A **Trinity College Fuel Cell Project** **Egress Plan**

Rev. 1; June, 2017

REVISION HISTORY				
REV	DESCRIPTION	BY	APPROVED	DATE
A	INITIAL RELEASE PER ECN #4199	HEB II	M.A.B.	6/24/09
B	REVISION PER ECN #6307	KGG	S.MAURER	04/23/14



SITE OVERALL AREA CLASSIFICATION PLAN

B SCALE: 0 4' 8' 12'

LEGEND:

- CLASS 1, DIVISION 1
- CLASS 1, DIVISION 2
- ASH-YYY — UV/IR FLAME DETECTOR (2)
- AE YYY — COMBUSTIBLE GAS DETECTOR (LEL) (4)
- HS YYY — E-STOP (6)
- XS YYY — HEAT OR SMOKE DETECTOR (4)
- B F — FIRE EXTINGUISHER RECOMMENDED LOCATION TYPE A,B,C 20LB MIN (SEE DETAIL, SHT 4. SEE NOTE 7) (1)

NOTES:

1. GRADE ELEVATION = 100'-0" (DATUM).
2. ROCKWELL EBOP SHOWN. DIVISION DETERMINATIONS ARE IDENTICAL FOR OTHER EBOPS.
3. DIVISION DETERMINATIONS ARE FOR NATURAL GAS (GROUP D) AND ANAEROBIC DIGESTER GAS (ADG, GROUP D) FUELED PLANTS. NATURAL GAS AND ADG (55% METHANE, MIN.) HAVE AUTO IGNITION TEMPERATURES > 1000°F. ELECTRICAL EQUIPMENT PRESENT IN DIVISION 1 AND DIVISION 2 LOCATIONS MUST BE RATED FOR CLASS 1 USE AND APPROPRIATE DIVISION.
4. CLASSIFICATION DRAWING DOES NOT ASSESS LEAK SOURCES FROM CUSTOMER SUPPLIED NG OR ADG FUEL UTILITY TIE-INS IN THE VICINITY OF PLANT.
5. NOTE DELTED
6. PCU HEAT & SMOKE DETECTORS ARE ALARMS ONLY.
7. FIRE EXTINGUISHER(S) SUPPLIED BY CUSTOMER.
8. THIS DRAWING APPLIES TO OUTDOOR INSTALLATION.
9. SP-203 SHALL NOT BE DIRECTED TOWARDS, OR LOCATED WITHIN 15 FT OF ANY HEATING, VENTILATION OR AIR-CONDITIONING AIR INTAKE, WINDOWS, DOORS OR OTHER OPENINGS INTO BUILDINGS.

REFERENCE SHEETS - THIS DRAWING

SHEET 2 - YARD - AREA CLASSIFICATION SECTION
SHEET 3 - YARD - AREA CLASSIFICATION SECTION
SHEET 4 - YARD - AREA CLASSIFICATION SECTIONS & DETAIL
B SHEET 5 - YARD - BLACKSTART OPTION, PLAN & SECTION

REFERENCE DRAWINGS

488S-01-01 - LIST OF DRAWINGS

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CAGE CODE 63131

SIGNATURES
DRAWN: H.E.BOYKIN II 3/20/09
ENGINEER: C.THOMAS 05/29/09
APPROVED: S. MAURER 05/29/09
RELEASED: A.HADJIST 05/29/09

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE ±1/16"

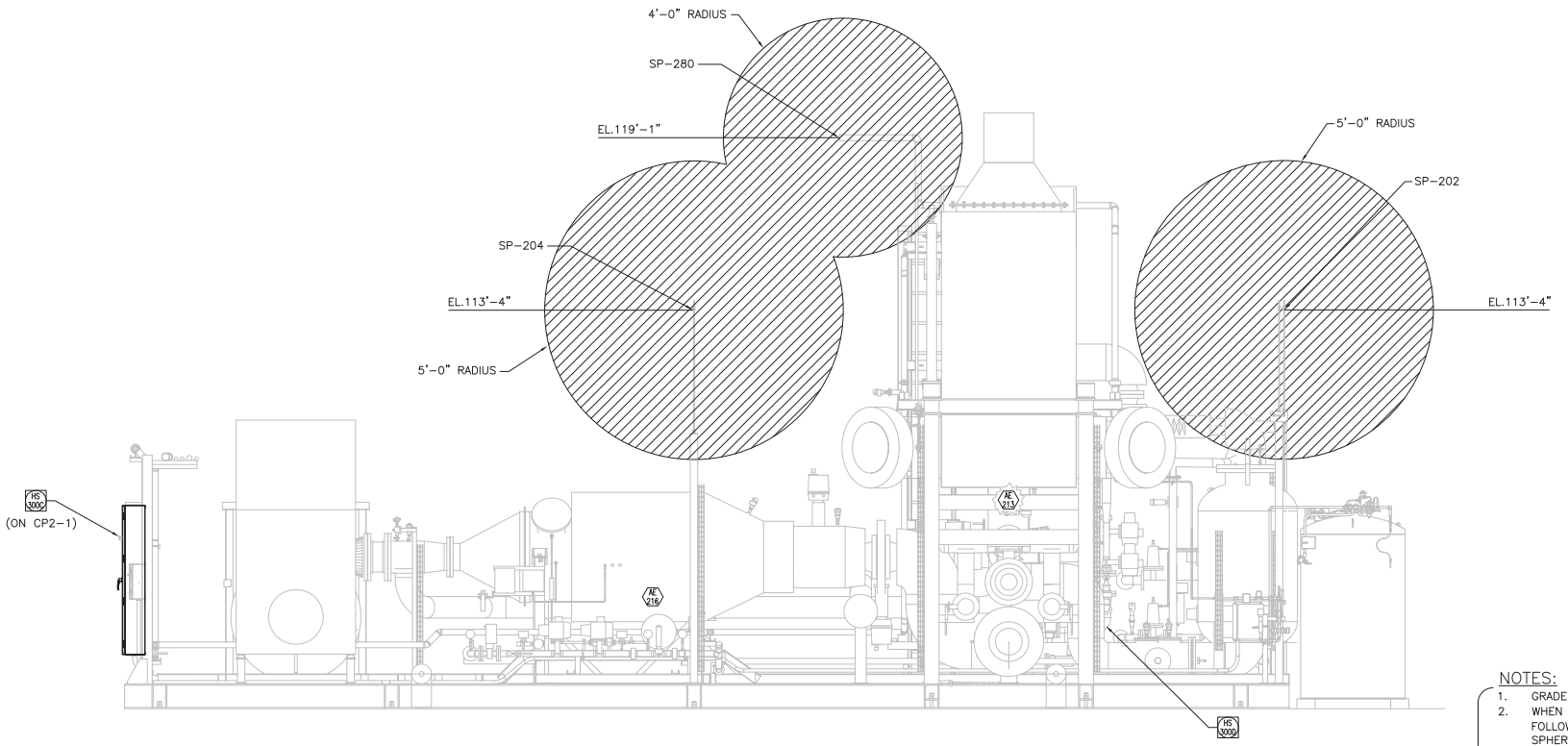
A REVISION INDICATOR
B FLAG NOTE

FuelCell Energy 3 Great Pasture Rd., Danbury, CT 06813

TITLE: DFC 1500BL5 POWER PLANT
YARD - AREA CLASSIFICATION
OVERALL PLAN

SIZE	Location	DWG NO	REV
D	SITE	488S-51-00	B

SCALE AS SHOWN SHEET 1 OF 5



SECTION-A SKID 2 SOUTH SIDE

A
SHT. 1

SCALE: 0 2' 4' 6'

NOTES:

1. GRADE ELEVATION = 100'-0"
2. WHEN OPENED AND DISCHARGING (EXHAUST PURGING), THE FOLLOWING SAMPLE VALVES HAVE 18" RADIUS DIVISION 2 SPHERES ABOUT THEIR FINAL DISCHARGE LOCATIONS: HV-228, HV-237, HV-243, HV-249A, HV-250, HV-274, HV-321, (AND HV-1237 AND HV-1243, IF PRESENT). OPERATORS TO ROUTE VENT TUBING FROM VALVES TO A SAFE LOCATION DURING VENTING PROCEDURES.
3. WHEN EXISTING, SP-1201 SHALL BE LOCATED WITHIN 2" OF SP-204.

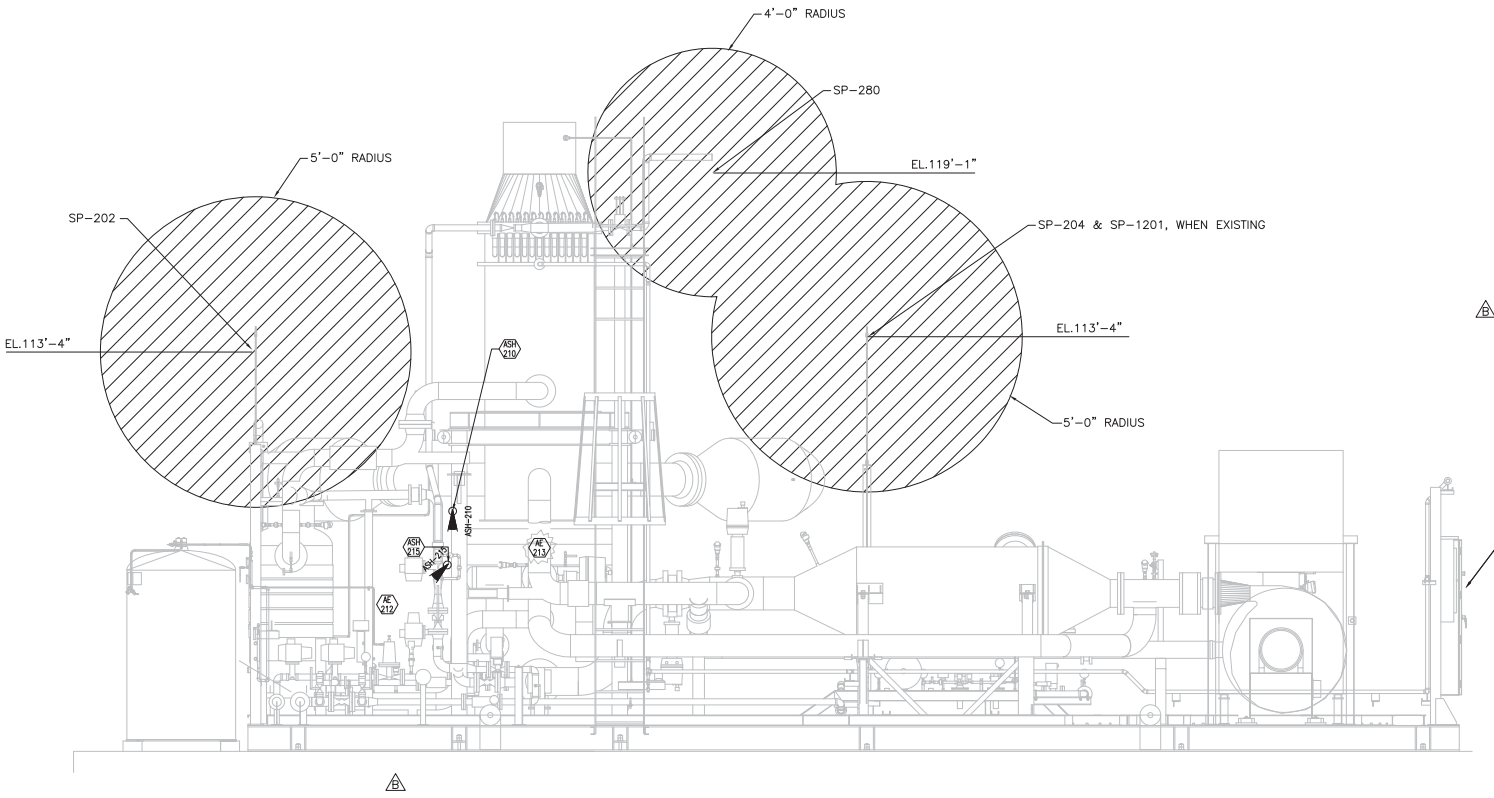
CAGE CODE 63131

FuelCell Energy 3 Great Pasture Rd., Danbury, CT 06813

TITLE
DFC 1500BL5 POWER PLANT
YARD - AREA CLASSIFICATION
SECTION

SIZE	Location	DWG NO	REV
D	SKID 2	488S-51-00	B

SCALE AS NOTED SHEET 2 OF 5



NOTES:

1. GRADE ELEVATION = 100'-0"
2. ASH-210 SHALL BE ORIENTATED TO PROTECT SKID 3.
3. ASH-215 SHALL BE ORIENTATED TO PROTECT SKID 2 DFC FUEL TRAIN.
4. WHEN OPENED AND DISCHARGING (EXHAUST PURGING), THE FOLLOWING SAMPLE VALVES HAVE 18" RADIUS DIVISION 2 SPHERES ABOUT THEIR FINAL DISCHARGE LOCATIONS: HV-228, HV-237, HV-243, HV-249A, HV-250, HV-274, HV-321, (AND HV-1237 & HV-1243, IF PRESENT). OPERATORS TO ROUTE VENT TUBING FROM VALVE(S) TO A SAFE LOCATION DURING VENTING PROCEDURES.
5. FOR SKID 3 LOCATED DIFFERENTLY THAN DEPICTED ON SHEET 1, OWNER SHALL INSTALL AE/ASH-210 IN A LOCATION APPROVED BY FCE.
6. WHEN EXISTING, SP-1201 SHALL BE LOCATED WITHIN 2" OF SP-204.

SECTION-B SKID 2 NORTH SIDE

B SHT. 1

SCALE: 0 2' 4' 6'

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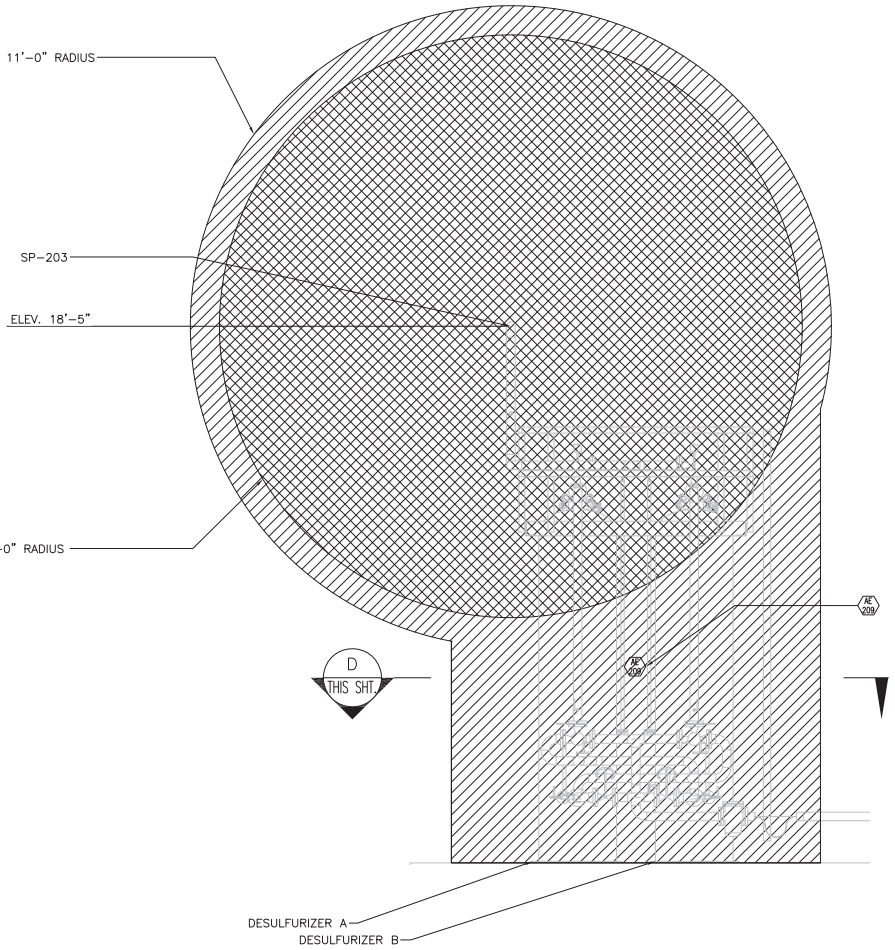
FuelCell Energy 3 Great Pasture Rd., Danbury, CT 06813

TITLE: DFC 1500BL5 POWER PLANT YARD - AREA CLASSIFICATION SECTION

SIZE	Location	DWG NO	REV
D	SKID 2	488S-51-00	B

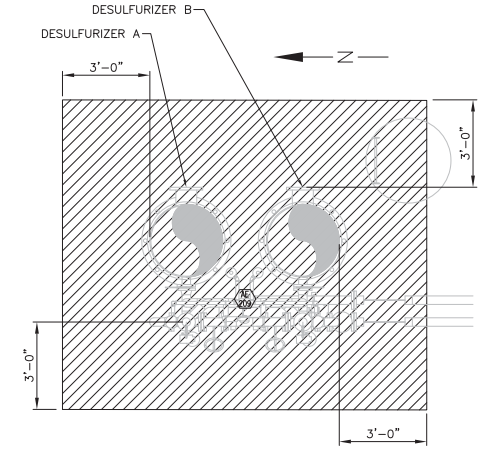
SCALE AS NOTED SHEET 3 OF 5



SECTION–C SKID 3 WEST SIDE

SCALE: 0 2' 4' 6'

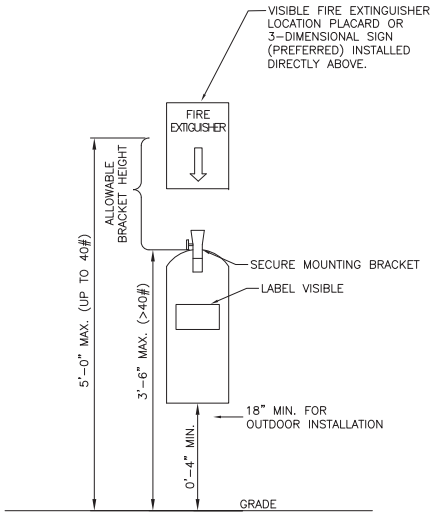
C SHT. 1



SECTION–D SKID 3 PLAN

SCALE: 0 2' 4' 6'

D THIS SHT



FIRE EXTINGUISHER MOUNTING DETAIL

SCALE: N.T.S.

NOTES:

- OUTDOOR MOUNTED EXTINGUISHERS TO BE PROVIDED WITH WEATHERPROOF COVER WITH CLEAR INSPECTION WINDOW.
- EXTINGUISHERS TO BE PROVIDED WITH TAMPER SEALS AND INSPECTION TAGS.

NOTES:

1. GRADE ELEVATION = 100'-0"
2. FOR SKID 3 LOCATED DIFFERENTLY THAN DEPICTED ON SHEET 1, OWNER SHALL INSTALL AE/ASH-210 IN A LOCATION APPROVED BY FCE.
3. SP-203 SHALL NOT BE DIRECTED TOWARDS, OR LOCATED WITHIN 15'-0" OF ANY HEATING, VENTILATION OR AIR-CONDITIONING AIR INTAKE, WINDOWS, DOORS OR OTHER OPENINGS INTO BUILDINGS.

CAGE CODE 63131

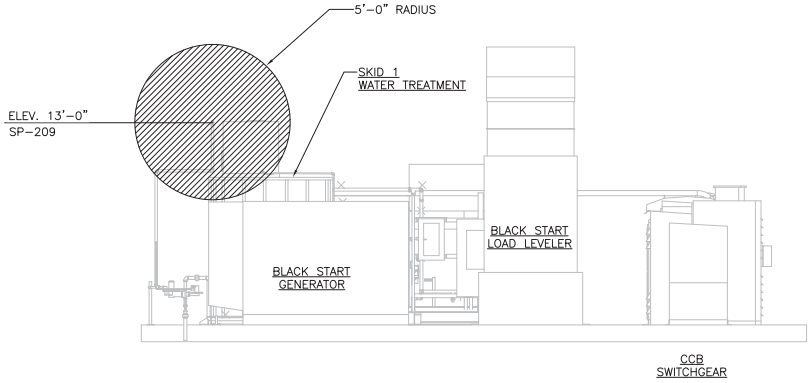
FuelCell Energy 3 Great Pasture Rd., Danbury, CT 06813

TITLE

DFC 1500BL5 POWER PLANT
YARD - AREA CLASSIFICATION
SECTIONS & DETAILS

SIZE	Location	DWG NO	REV
D	SKID 3	488S-51-00	B

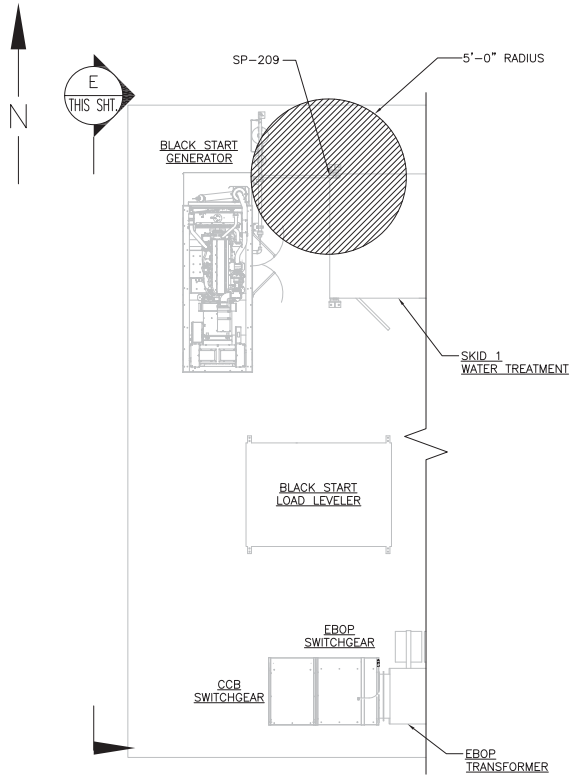
SCALE AS NOTED SHEET 4 OF 5



SECTION–E – BLACKSTART OPTION

E
THIS SHT

SCALE: 0 4' 8' 12'



PARTIAL PLAN

SCALE: 0 4' 8' 12'

B

FUELCELL ENERGY, INC.
PROPRIETARY

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION AND MAY NOT BE DISCLOSED, COPIED OR REPRODUCED EXCEPT BY WRITTEN PERMISSION FROM FUELCELL ENERGY INC.

CAGE CODE
63131

FuelCell Energy 3 Great Pasture Rd., Danbury, CT 06813

TITLE
DFC 1500BL5 POWER PLANT
YARD - AREA CLASSIFICATION
BLACKSTART OPTION - PLAN & SECTION

SIZE	Location	DWG NO	REV
D	SITE	488S-51-00	B

SCALE AS SHOWN SHEET 5 OF 5

Department of Economic and Community Development
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State Historic Preservation Office

One Constitution Plaza | Hartford, CT 06103 | 860.256.2800 | Cultureandtourism.org

PROJECT REVIEW COVER FORM

1. This information relates to a previously submitted project. ☐ You do not need to complete the rest of the form if you have been previously issued a SHPO Project Number. Please attach information to this form and submit.

SHPO Project Number _____
(Not all previously submitted projects will have project numbers)

Project Address _____
(Street Address and City or Town)

2. This is a new Project. [X] If you have checked this box, it is necessary to complete ALL entries on this form .

Project Name Trinity Fuel Cell Project

Project Location The Trinity College campus address is 300 Summit Street. The planned facility is to be located on campus in front of the Ferris Athletic Center, adjacent to the campus's central heating plant and facing Ferris Roadway to the south.
Include street number, street name, and or Route Number. If no street address exists give closest intersection.

City or Town Hartford
In addition to the village or hamlet name (if appropriate), the municipality must be included here.

County Hartford
If the undertaking includes multiple addresses, please attach a list to this form.

Date of Construction (for existing structures) N/A

PROJECT DESCRIPTION SUMMARY (include full description in attachment):

Installation of a 1.4 MW fuel cell combined heat and power generating facility, including all associated equipment and site improvements at Trinity College Campus in Hartford.

TYPE OF REVIEW REQUESTED

a. Does this undertaking involve funding or permit approval from a State or Federal Agency?

[X] Yes [ ] No

Agency Name/Contact	Type of Permit/Approval	State	Federal
Connecticut Siting Council	Petition of Broad Street Fuel Cell, LLC for a Declaratory Ruling that a Certificate of Environmental Compatibility and Public Need is Not Required for the the Installation of a Fuel Cell at Trinity College Campus in Hartford	[X]	[ ]
		[ ]	[ ]
		[ ]	[ ]

	Yes	No
b. Have you consulted the SHPO and UCONN Dodd Center files to determine the presence or absence of previously identified cultural resources within or adjacent to the project area?	[ ]	[X]
If yes: Was the project site wholly or partially located within an identified archeologically sensitive area?	[ ]	[ ]
Does the project site involve or is it substantially contiguous to a property listed or recommended for listing in the CT State or National Registers of Historic Places?	[ ]	[X]
Does the project involve the rehabilitation, renovation, relocation, demolition or addition to any building or structure that is 50 years old or older?	[ ]	[X]

Department of Economic and Community Development
Connecticut still revolutionary

State Historic Preservation Office

One Constitution Plaza | Hartford, CT 06103 | 860.256.2800 | Cultureandtourism.org

PROJECT REVIEW COVER FORM

The Historic Preservation Review Process in Connecticut Cultural Resource Review under the National Historic Preservation Act – Section 106 http://www.achp.gov/106summary.html involves providing technical guidance and professional advice on the potential impact of publicly funded, assisted, licensed or permitted projects on the state's historic, architectural and archaeological resources. This responsibility of the State Historic Preservation Office (SHPO) is discharged in two steps: (1) identification of significant historic, architectural and archaeological resources; and (2) advisory assistance to promote compatibility between new development and preservation of the state's cultural heritage.

Project review is conducted in two stages. First, the SHPO assesses affected properties to determine whether or not they are listed or eligible for listing in the Connecticut State or National Registers of Historic Places. If so, it is deemed "historic" and worthy of protection and the second stage of review is undertaken. The project is reviewed to evaluate its impact on the properties significant materials and character. Where adverse effects are identified, alternatives are explored to avoid, or reduce project impacts; where this is unsuccessful, mitigation measures are developed and formal agreement documents are prepared stipulating these measures. For more information and guidance, please see our website at: http://www.cultureandtourism.org/cct/cwp/view.asp?a=3933&q=293820

ALL PROJECTS SUBMITTED FOR REVIEW MUST INCLUDE THE FOLLOWING MATERIALS*:

[X] **PROJECT DESCRIPTION** Please attach a full description of the work that will be undertaken as a result of this project. Portions of environmental statements or project applications may be included. The project boundary of the project should be clearly defined**

[X] **PROJECT MAP** This should include the precise location of the project – preferably a clear color image showing the nearest streets or roadways as well as all portions of the project. Tax maps, Sanborn maps and USGS quadrangle maps are all acceptable, but Bing and Google Earth are also accepted if the information provided is clear and well labeled. The project boundary should be clearly defined on the map and affected legal parcels should be identified.

[X] **PHOTOGRAPHS** Clear, current images of the property should be submitted. Black and white photocopies will not be accepted. Include images of the areas where the proposed work will take place. May require: exterior elevations, detailed photos of elements to be repaired/replaced (windows, doors, porches, etc.) All photos should be clearly labeled.

For Existing Structures	Yes	N/A	Comments
Property Card	[ ]	[X]	
For New Construction	**Yes**	**N/A**	**Comments**
Project plans or limits of construction (if available)	[X]	[ ]	
If project is located in a Historic District include renderings or elevation drawings of the proposed structure	[ ]	[X]	
Soils Maps http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm	[ ]	[X]	
Historic Maps http://magic.lib.uconn.edu/	[ ]	[X]	
For non-building-related projects (dams, culverts, bridge repair, etc)	**Yes**	**N/S**	**Comments**
Property Card	[ ]	[X]	
Soils Map (see above)	[ ]	[X]	
Historic Maps (see above)	[ ]	[X]	

PROJECT CONTACT

Name Henry Sire, Esq. Title Associate Counsel
Firm/Agency Broad Street Fuel Cell, LLC c/o FuelCell Energy, Inc.
Address 3 Great Pasture Road
City Danbury State CT Zip 06810
Phone (203) 205-2481 Cell (203) 648-3655 Fax (203) 825-6069
Email hsire@fce.com

*Note that he SHPO's ability to complete a timely project review depends largely on the quality of the materials submitted.
** Please be sure to include the project name and location on *each page* of your submission.

Trinity Fuel Cell Project

Project Description

Broad Street Fuel Cell, LLC, a wholly owned subsidiary of FuelCell Energy, Inc. ("FCE"), shall install, own and operate a fuel cell generation facility comprised of one natural gas-fired SureSource 1500 power plant manufactured by FCE (the “Project”). The Project will cogenerate a nominal 1.4 MW of Connecticut Class I renewable energy for use at the Trinity College campus. Thermal energy produced by the Project will be provided for use in Trinity College's existing thermal distribution system.

The Project consists of multiple skids classified into three major subsystems. The mechanical balance of plant (“MBOP”) is comprised of three separate components; the desulfurization system, the main process skid, and the water treatment system skid. The MBOP supplies fresh air, cleans and heats fuel and water, and includes the power plant control system. The electrical balance of plant (“EBOP”) is comprised of four sections: one power conditioning unit, two transformers and one switchgear for grid connection. The EBOP converts the fuel cell DC power into utility grade AC power. The SureSource 1500 power plant includes one SureSource module. The SureSource module performs the electrochemical conversion of the continuous fuel supply into DC electric power. The SureSource module contains four fuel cell stacks.

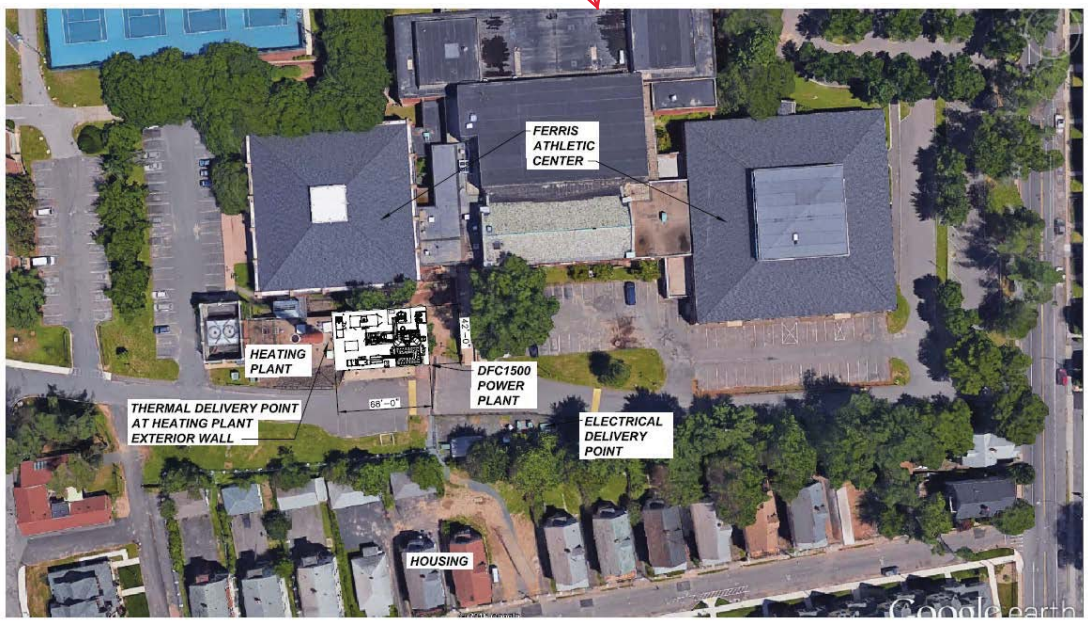
Each stack contains the assembly of electrochemical cells that produce DC power. Resembling a large battery, each of the four stacks is constructed of approximately 400 individual fuel cells clamped together with manifolds inside an insulated container.

The SureSource 1500 will have one Cain Industries heat recovery steam generator (“HRSG”), model ESG1. The HRSG will be housed in a separate building next to the fuel cell and provide the campus with 2,000-2,700 lbs/hour of 65 psig saturated steam.

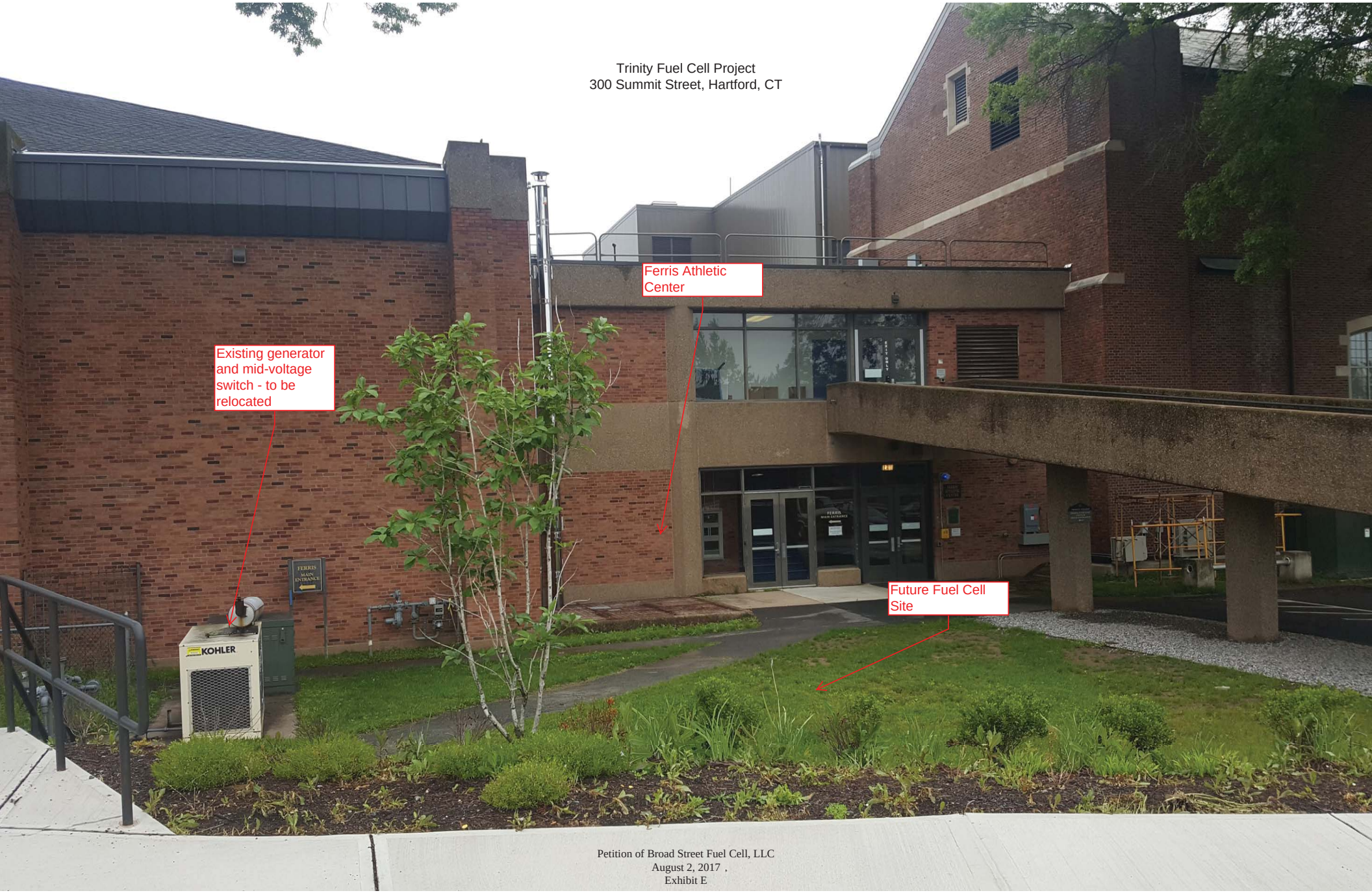
The SureSource 1500 will include FCE’s standard load leveler and black start product option to support up to 1.2 MW of micro-grid operations. This option allows the unit to provide load following duty during standalone, or micro-grid operations. It includes a computer controlled resistive load bank.

Google Earth

feet 1000
meters 400



Trinity Fuel Cell Project
300 Summit Street, Hartford, CT



Petition of Broad Street Fuel Cell, LLC
August 2, 2017
Exhibit E

Trinity Fuel Cell Project
300 Summit Street, Hartford, CT

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

June 27, 2017

Henry Sire
Fuelcell Energy, Inc.
3 Great Pasture Road
Danbury, CT 06810
hsire@fce.com

Project: Trinity Fuel Cell Project Located at Trinity College at 300 Summit Street in Hartford
NDDB Determination No.: 201705126

Dear Henry Sire,

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding the area delineated on the map provided for the proposed Trinity Fuel Cell Project Located at Trinity College at 300 Summit Street in Hartford, Connecticut. I do not anticipate negative impacts to State-listed species (RCSA Sec. 26-306) resulting from your proposed activity at the site based upon the information contained within the NDDB. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits. This determination is good for two years. Please re-submit a new NDDB Request for Review if the scope of work changes or if work has not begun on this project by June 27, 2019.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base.

Sincerely,

Dawn M. McKay

Dawn M. McKay
Environmental Analyst 3