

# What Powers You

September 30, 2022

Melanie Bachman, Esq.  
Executive Director  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

**RE: PETITION NO. 1479 – Bloom Energy Corporation** notification to the Connecticut Siting Council of fuel pipe cleaning procedures in association with the operation of the 1.5-megawatt fuel cell facility located at the NBC Sports Group building, 1 Blachley Road, Stamford, Connecticut.

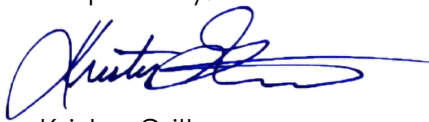
Dear Ms. Bachman:

Per condition #4 outlined in the Siting Council's declaratory ruling letter received on March 14, 2022, we are respectfully submitting the attached report to notify the Council of the means and methods that will be used to perform fuel pipe cleaning procedures, to be completed in accordance with Public Act 11-101.

In compliance with condition #4.h., copies of this correspondence and accompanying report are being sent via USPS Certified Mail to the state agencies on the attached list.

If you have any questions, concerns or require additional information, please contact me at (917) 803-4511.

Respectfully,



Kristen Grillo  
Bloom Energy Corporation  
**Senior Permitting Specialist | East Coast Field Office**  
Customer Installations Group | North America  
(917) 803-4511  
[Kristen.Grillo@bloomenergy.com](mailto:Kristen.Grillo@bloomenergy.com)



Bloom Energy Corporation  
4353 North First Street, San Jose, CA 95134  
**408 543 1500**  
[www.bloomenergy.com](http://www.bloomenergy.com)

<b>Name</b>	<b>Title</b>	<b>Mailing Address</b>	<b>Town</b>	<b>State</b>	<b>Zip</b>
Katie Dykes	Commissioner, Dept. of Energy and Environmental Protection	79 Elm St.	Hartford	CT	06106-5127
Marissa Paslick Gillett	Chairman, Public Utilities Regulatory Authority	10 Franklin Square	New Britain	CT	06051
Dr. Manisha Juthani	Commissioner, Dept. of Public Health	410 Capitol Ave.	Hartford	CT	06134
Paul Aresta	Executive Director, Council on Environmental Quality	79 Elm St.	Hartford	CT	06106
Bryan P. Hurlburt	Commissioner, Dept. of Agriculture	450 Columbus Blvd., Suite 701	Hartford	CT	06103
Jeffrey R. Beckham	Secretary, Office of Policy and Management	450 Capitol Ave.	Hartford	CT	06106
Joseph Giuliatti	Commissioner, Dept. of Transportation	2800 Berlin Turnpike	Newington	CT	06111
David Lehman	Commissioner, Dept. of Economic and Community Development	450 Columbus Blvd.	Hartford	CT	06103
Brenda Bergeron	Deputy Commissioner, Dept. of Emergency Management and Homeland Security	1111 Country Club Rd.	Middletown	CT	06457
Michelle H. Seagull	Commissioner, Dept. of Consumer Protection	450 Columbus Blvd., Suite 901	Hartford	CT	06103
Michelle Halloran Gilman	Commissioner, Dept. of Administrative Services*	450 Columbus Blvd.	Hartford	CT	06103
Danté Bartolomeo	Commissioner, Dept. of Labor	200 Folly Brook Blvd.	Wethersfield	CT	06109

*\*The Department of Public Works was eliminated and is now under the Department of Administrative Services.*

## Submittal #220000-008.0 - Gas Line Purge MOP 220000 - Plumbing

<b>Revision</b>	0	<b>Submittal Manager</b>	Bill Burgon (A/Z Corporation)
<b>Status</b>	Open	<b>Date Created</b>	Sep 22, 2022
<b>Issue Date</b>	Sep 22, 2022	<b>Spec Section</b>	220000 - Plumbing
<b>Responsible Contractor</b>	A/Z Mechanical	<b>Received From</b>	Daniel Cruz (A/Z Mechanical)
<b>Received Date</b>		<b>Submit By</b>	
<b>Final Due Date</b>	Sep 26, 2022	<b>Lead Time</b>	
		<b>Cost Code</b>	
<b>Location</b>		<b>Type</b>	Document
<b>Sub Section</b>			
<b>Approvers</b>	Sung Lee (SK ecoplant)		
<b>Ball in Court</b>	Sung Lee (SK ecoplant)		
<b>Distribution</b>	Tyler Thorpe (A/Z Electrical), Matthew Devitto (A/Z Corporation), Daniel Cruz (A/Z Mechanical)		
<b>Description</b>			

### Submittal Workflow

Name	Sent Date	Due Date	Returned Date	Response	Attachments
General Information Attachments					
Sung Lee		Sep 26, 2022		Pending	



Our review is for the general conformance with the design concept and contract documents. Any marking or comments must not be construed as relieving the subcontractor/supplier from compliance with the project plans and specifications nor departures there from. The subcontractor / supplier remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes for the techniques of assembly, and for performing this work in a safe manner and in accordance with all applicable codes.

Date: September 22, 2022

Reviewed by: William Burgon

**METHOD OF PROCEDURE**

<b>WHERE</b>	Building Name	NBC Sports / SKE&C Betek BLOOM ENERGY - FUEL CELLS
	Work Site Address	1 Blachley Rd Stamford, CT 06902

<b>WHEN</b>	Work Start Date	5-Oct	Shift Start Time	6:00:00 AM
	Work Complete Date	5-Oct	Shift Complete Time	2:30:00 PM

<b>WHAT</b>	Site ID	S10883	Description of Work	FUEL CELL
	Project Title	NBC003	MOP Type	Sequence of Operation for Nitrogen Purge

<b>WHO</b>	Name	Company	Title	Function/Department	Date	Approved or Approval Not Req
		Tyler Thorpe	A-Z Corp	Project Manager	Electrical	
	Matt DeVitto	A-Z Corp	Site Superitendant	CM		
	Daniel Cruz	A-Z Corp	Project Manager	Mechanical		
	Zach Benevides	A-Z Corp	Project Foreman	Mechanical		
	Ken Weaverling	BloomEnergy	Site Superitendant	Oversight		
	Sung Lee	SKE&C	Project Controls Manag	Remote Oversight		
	Robert Andel	Complete Connectic	Engineer	3rd Party Inspection Agency		
	Stamford Fire Departmen	City of Stamford	Dispatch	Remote Oversight - In Case of Emergency		

DOC-  
1010418  
Rev A

## NBC Sports / SKE&C Betek BLOOM ENERGY - FUEL CELLS

C-8-1388

NBC003 (1 Blachley Rd Stamford, CT 06902)

SECT.				
1	<b>Planning Tasks</b>			
2	<b>Shutdown Tasks</b>			

Critical Step? (*)	Step No	Procedure / Task	Responsible Parties	Planned Start Date	Time	Initial Here
		<b>PLANNING TASKS</b>				
	1	Review the Bloom Energy N2 Commissioning requirements and the CSC Letter Dated 3/14/22 and make provisions to complete all required work needed to safely purge and energize the new gas piping installation.	A/Z Corp/Bloom Energy/SKE&C	9/20/2022	N/A	
	2	Verify fuel plumbing has been pressure tested for leaks by the final inspections complete prior to executing this MOP	A/Z Corp	9/26/2022	N/A	
	3	Per CSC Letter Item#4a Compressed Nitrogen will be the identified cleaning media for the fuel cell new piping installation.	A/Z Corp	9/20/2022	N/A	
	4	Verify Tools are available: Gas Meter Detector RKI-GX2012, Adjustable Pipe Wrenches, Caution Tape, Fire Extinguisher (2A or better), Nitrogen Bottle with Pressure Regulator and Certified Gauges, YFP Purge Hose	A/Z Corp	10/5/2022	7am	
	5	Required PPE: Safety Glasses, Gloves Lvl4 cut resistant, Hard Hat, High Visibility Clothing, Steel Toe or Composite Work Boots with safety toe protection	A/Z Corp	10/5/2022	N/A	
	6	Per CSC Letter Item#4b Identify Known Hazards of Compressed Nitrogen are as follows: Contains Gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation	A/Z Corp	9/20/2022	N/A	
	7	Per CSC Letter Item#4c Description of how known hazards will be mitigated: A/Z will perform operation in outdoor area away from mechanical intakes or building openings. Compressed Nitrogen tanks will be stored out of direct sunlight, upright and secured to prevent tank from being susceptible to extreme temperatures above 52 deg C/ 125deg F.	A/Z Corp	9/20/2022	N/A	
	8	Per CSC Letter Item#4d A/Z jobsite foreman and any other affected employees conducting work shall conduct a site specific safety meeting with the Compressed Nitrogen material SDS sheet regards to safe working methods. All work to conform to the requirements set forth in the NFPA 54 1213.0 Pressure Testing, Inspection, and Purging.	A/Z Corp	10/5/2022	7am	
	9	Per CSC Letter Item#4f A/Z Corporation will be performing the Nitrogen Media Purge as the project Plumbing Contractor approved by the City of Stamford.	A/Z Corp/SKE&C	10/5/2022	N/A	
	10	Per CSC Letter Item#4g - Notify 3rd Party Inspection Agency to schedule witness inspection for Fuel Pipe Cleaning. Agency will be Complete Connection, LLC Consulting Engineers - 227 Merwin Ave. Milford, CT 06460	A/Z Corp/Bloom Energy/SKE&C	10/5/2022	N/A	

11	Per CSC Letter Item#4h - Review MOP with SKE&C and Bloom Energy. If approved, SKE&C to submit notice to CSC of purging clean new gas piping.	A/Z Corp/Bloom Energy/SKE&C	9/20/2022	N/A	
12	Field Coordination: Setup Barricades with caution tape and or cones within a 10ft radius around the point of discharge. Ensure no open flame within 50ft of equipment. Make sure Fire Extinguisher is within reach less than 50ft from discharge area. Confirm all Valves are in the closed position at all fuel stubups and meter.	A/Z Corp	10/5/2022	7:30am	
13	Notify Fire Department Dispatch	A/Z Corp	10/5/2022	7am	
<b>SHUTDOWN TASKS</b>					
1	Per CSC Letter Item# 4e - Gather A-Z Team Together for Stand-Down to Discuss MOP and Go Over Any Questions/Concerns. Persons not involved in the purging operations shall be evacuated from all areas within 10ft of point of discharge	All Teams	10/5/2022	7am	
2	Purge Open End of piping with Compressed Nitrogen using a pressure regulator with certified gauge rated for 100psi and controlled shutoff valve. The point of discharge shall be located at least 10ft away from sources of ignition, building openings, and 25ft from mechanical intake openings.	A/Z Corp/Bloom Energy	10/5/2022	8:00am	
3	Compressed Nitrogen will be purged at 60psi for 60 seconds approximately 5 times at each of the 3 outlet locations noted on the plan.	A/Z Corp/Bloom Energy/3rd Party Inspector	10/5/2022	8:00am	
4	Close System Open End shutoff valve for purging and connect to Bloom Fuel Cell Equipment	A/Z Corp/Bloom Energy	10/5/2022	9:00am	
5	Eversource Set Pressure Regulator and Release Meter Isolation Valve to flow Natural Gas through new piping at each of the (5) fuel stub ups using a calibrated Natural Gas Detector monitored by A/Z Corp at until 95% natural gas is detected. The point of discharge shall be located at least 10ft away from sources of ignition, building openings, and 25ft from mechanical intake openings.	Eversource/A/Z Corp/Bloom Energy	10/5/2022	9:30am	
6	Close ES Fuel Cell stub up Open End shutoff valve one at a time while purging and leave gas service energized for Bloom Energy to startup equipment	A/Z Corp/Bloom Energy/Eversource	10/5/2022	10:30am	
7					
8					
9					

## PROJECT CONTACTS LIST

Name	Company	Title	Function/Department	Email	Phone
Tyler Thorpe	A-Z Corp	Project Manager	Electrical	<a href="mailto:tthorpe@a-zcorp.com">tthorpe@a-zcorp.com</a>	860-204-6410
Matt DeVitto	A-Z Corp	Site Superitendant	CM	<a href="mailto:mdevitto@a-zcorp.com">mdevitto@a-zcorp.com</a>	860-912-2948
Daniel Cruz	A-Z Corp	Project Manager	Mechanical	<a href="mailto:dcruz@a-zcorp.com">dcruz@a-zcorp.com</a>	860-235-3945
Zach Benevides	A-Z Corp	Project Foreman	Mechanical	<a href="mailto:zbenevides@a-zcorp.com">zbenevides@a-zcorp.com</a>	860-912-3174
Ken Weaverling	BloomEnergy	Site Superitendant	Oversight	<a href="mailto:kenneth.weaverling@bloomenergy.com">kenneth.weaverling@bloomenergy.com</a>	302-332-1528
Sung Lee	SKE&C Betek	Project Controls Manager	Remote Oversight	<a href="mailto:sunglee@sk.com">sunglee@sk.com</a>	213-712-6094
Robert Andel	Complete Connection, LLC	Engineer	3rd Party Inspection Agency	<a href="mailto:robert.andel@sbcglobal.net">robert.andel@sbcglobal.net</a>	(203) 500-1743
Stamford Fire Department	City of Stamford	Dispatch	Oversight		203-977-5555





# Gas System Commissioning – N2

**DOC-1010208**

**Revision A**

**Estimated Evolution Time: 2 hrs**

**Number of Personnel: 2 Total**

**1 Inlet Attendant &**

**1 Discharge Attendant**

## Gas System Commissioning - Nitrogen



DOC-1010208 Rev A

### Purpose

- This procedure intends to provide a clear process for CIG field workers ensuring natural gas delivery to site within Bloom Energy Specifications. More specifically, the objective of this procedure is to:
  - Ensure Compliance with:
    - NFPA 54 National Fuel Gas Code
    - OSHA and CalOSHA construction safety standards
    - Title 49 of the Code of Federal Regulations (DOT) safety standards
    - Regional Air Quality Management Board Regulations
    - Bloom Energy's Critical to Quality Standards, especially regarding
      - Gas piping system blow-down and purging standards
    - Only valid in the state of CT

### Scope

- This procedure applies to all US BE construction sites in Connecticut.

### Audience

- 1 CDA Input attendant (general or sub-contractor)
- 1 Discharge Attendant (Bloom Qualified Gas Personnel)

### Applicable Documents

- NFPA 54
- DOC-1007152 SVC
- DOC-1009468 – Gas System Commissioning - CDA

## Gas System Commissioning - Nitrogen



DOC-1010208 Rev A

### Preliminary Requirements

#### **Required Safety Trainings**

- Bloom personnel on site must be documented as Bloom Energy (BE) Qualified Gas System Personnel, which includes:
  - Pipeline Safety
  - Compressed Gas Safety
  - LOTO
  - Valve Safety

#### **Required Personal Protection Equipment (PPE)**

- Safety glasses
- Gloves
- Hard hat
- High visibility clothing
- Work boots with safety toe protection

#### **Special Precautions and Potential Hazards**

- Verify fuel plumbing has been pressure tested for leaks by the utility and general contractor before executing this SOP (House Line Release).
- Oxygen monitoring is required for this operation.

#### **Required Tools, Materials, and Equipment**

- YFP Purge Hose (124422)
- House line installed
- Multi-Gas Monitor: minimum detection of Oxygen and Methane LEL
- Adjustable Wrench Set and/or two (2) Pipe Wrenches
- Gas Sampling Kit (BE# 131263)
- Caution tape and delineators
- Fire Extinguisher (2A or better).
  - This should already be on site.
- Filled Nitrogen Tank
  - QTY 1 approximately 75 Cu. Ft tank per 250 linear feet of 2" gas line (Praxair part NI-Q or equivalent)
  - QTY 1 approximately 140 Cu. Ft tank per 500 linear feet of 2" gas line (Praxair part NI-S or equivalent)

# Gas System Commissioning - Nitrogen

## Section A: Nitrogen Purge of Construction Plumbing

### 1. Site Setup

- 1.1. Ensure all customer protocols are met and scheduled accordingly
  - 1.1.1. Multiple RSA on the same site requires a dedicated MOP, using this procedure as a guide.
- 1.2. Put On PPE.
- 1.3. Turn on personal gas monitor(s) and attach to the person(s) at the discharge location.
- 1.4. Set up cones and caution tape to establish a discharge area around the fuel stub up farthest from the MSA with a 10 foot radius around the point of discharge. Remove all non-essential personnel.
  - 1.4.1. Ensure that there will be no open flame within 50 ft
- 1.5. Ensure a 2A or better fire extinguisher is located within 50 feet of the discharge area.
- 1.6. Verify Each Fuel stub up valve is in the closed position (at YFP, and Upstream facilities valve, where applicable and shut each fuel stub up valve. See Figure 1.

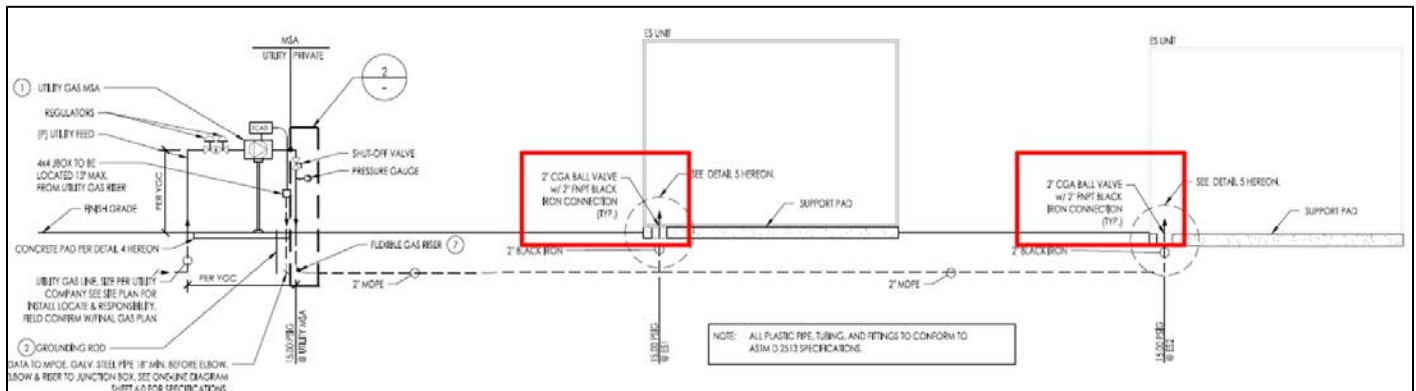


Figure 1

# Gas System Commissioning - Nitrogen

1.7. Identify Isolation valves on meter assembly.

1.8. Ensure all shut off valves are open between MSA and ESS and the stub-up valves are closed.

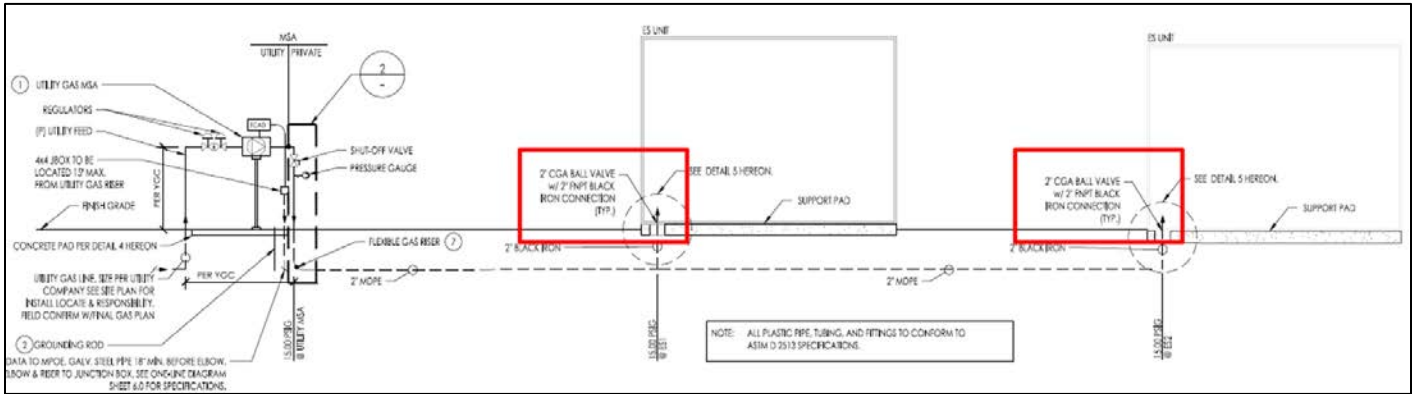


Figure 2

- a. If a YBB, reach out to the Construction Program Manager. Future instructions will go here. See Figure 3.

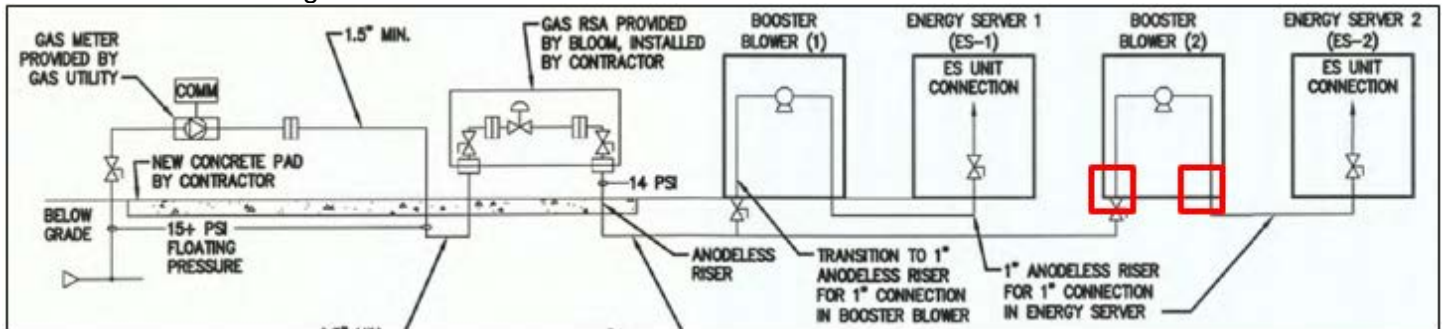


Figure 3

## Gas System Commissioning - Nitrogen

2. Follow the gas line from the MSA (or MSA gap) to the isolation valve on the stub up.
  - 2.1. Identify Isolation valve on meter assembly.
  - 2.2. Determine if gas pressure is available to the plumbing being purged, apply a LOTO to isolate gas if required.
  - 2.3. Perform a valve lineup to achieve the following:
    - 2.3.1. Meter Isolation valve is shut
    - 2.3.2. System gas stub up valve is shut
    - 2.3.3. All other valves between the meter isolation and system gas stub up are open
      - 2.3.3.1. If Parallel regulators, ensure only one set open, close isolations to the other set of regulators

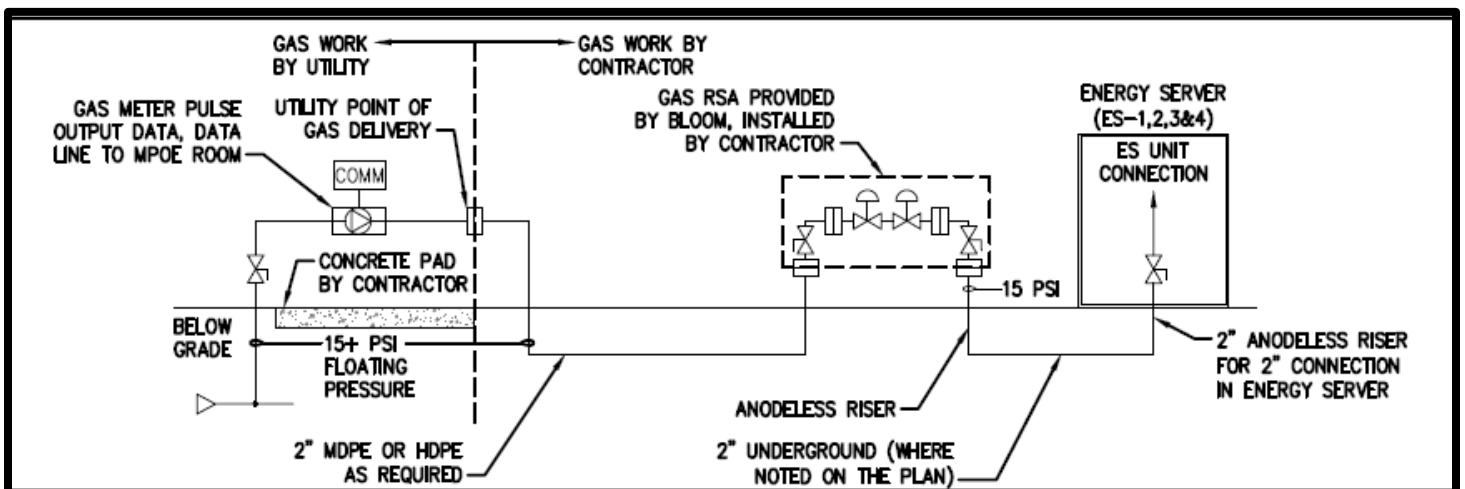


Figure 4

3. General/Subcontractor connects the supply of Nitrogen to the furthest point upstream without interfering with the Gas Utility scope of work.
4. Position Discharge Attendant with air monitor at the point of discharge.

## Gas System Commissioning - Nitrogen



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5. Connect YFP Purge Hose.
  - 5.1. Disconnect YFP from the fuel stub up, if connected
  - 5.2. Attach YFP purge hose to fuel stub up
  - 5.3. Attach YFP purge hose to overhead QDC
6. Inlet attendant supplies intended operational system pressure (min of 60 PSI) to plumbing and corrects any leaks.
7. Once pressure holds, the Discharge Attendant slowly opens all valves between the Nitrogen supply and the discharge assembly
8. Discharge attendant then opens the discharge assembly full open
  - 8.1. Continuously monitor the discharge area for the following and create an incident report if any are found:
    - 8.1.1. Debris
    - 8.1.2. Liquid water
    - 8.1.3. Gas other than compressed air
    - 8.1.4. Discharge attendant shall continuously monitor the discharge area and be prepared to secure the flow.
9. Let Nitrogen flow through the purge assembly for 60 seconds, then secure for 60 seconds.
  - 9.1. Perform at least 6 on/off cycles (6 cycles per 200 ft. of underground pipe)
10. Close the stub up isolation valve
11. If part of the assembly, remove the purge hose Y strainer
  - 11.1. If debris found, take pictures, clean and log an incident.
12. Reinstall "y" strainer.
13. If the Gas stick is provided by Bloom, perform Section B, if it is provided by the utility (fixed pressure) Move to Section C

## Section B: Setting the Bloom Gas Regulators

### 1. Possible Bloom Gas Stick Setups:

#### 1.1. Dual Regulator (two regulators on a single run of pipe)

1.1.1. Perform Section B as written

#### 1.2. Dual Parallel (four regulators on two runs of pipe)

1.2.1. Perform Section B once for each set

1.2.2. Ensure that the set not being used is isolated

#### 1.3. Single Regulator (one regulator on a single run of pipe)

1.3.1. Follow instructions for the upstream regulator only

2. Di Discharge Attendant throttles open the discharge valve as little as possible while still discharging air.

3. Contract Plumber will throttle the compressed gas regulator to achieve delivery pressure (min of 60PSI) on pressure gauge upstream of the regulator set.

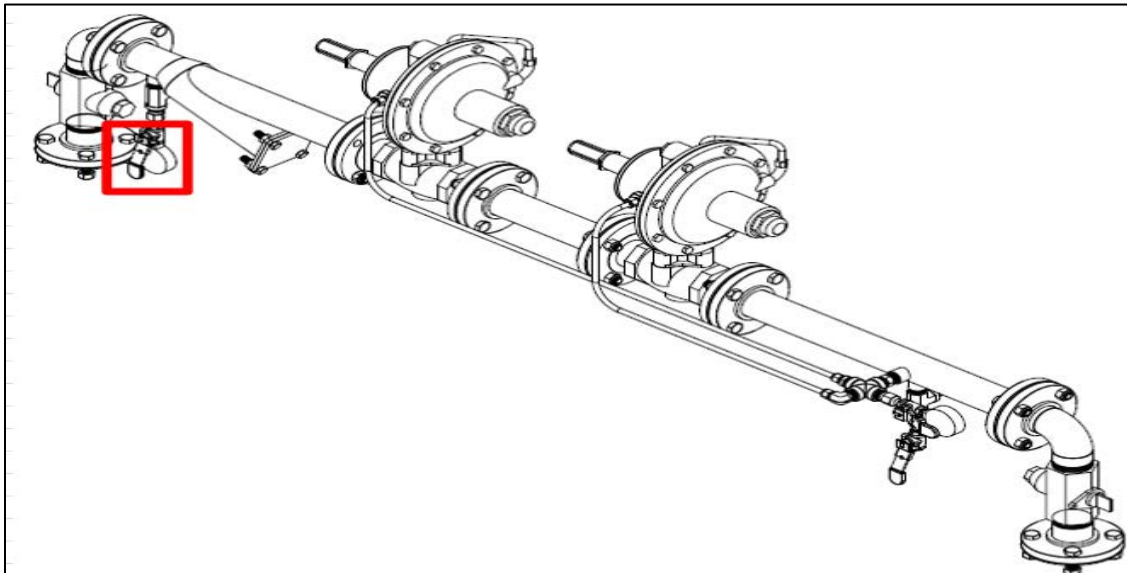


Figure 10



## Gas System Commissioning - Nitrogen

4. Discharge Attendant closes the valve on the vent assembly.
5. Remove the gray plastic covers from the Main Body Pilot adjustment screw from both regulators. Leave the cover on the small independent series 67 pilot assembly alone. See Figure 11.

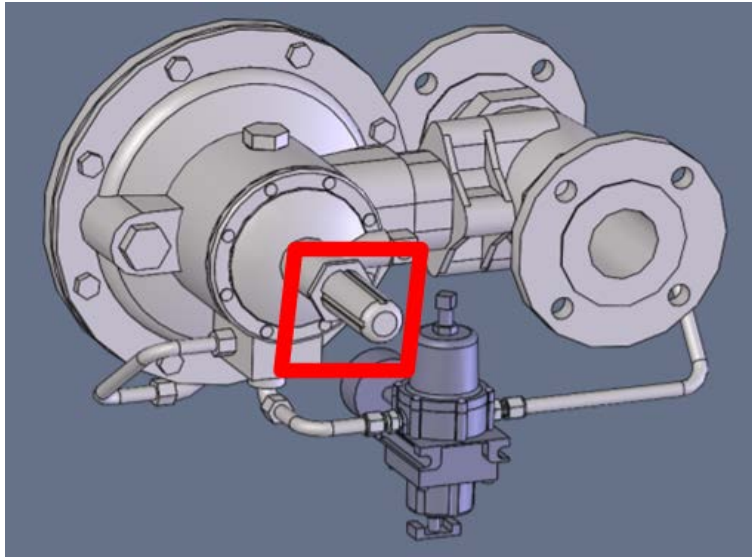


Figure 11

6. Turn the **Main Body Pilot** on the **upstream** regulator fully counter clockwise to stop any flow of gas.
  7. Turn the **Main Body Pilot** on the **downstream** regulator clockwise so the regulator is fully open.
- 7.1. If single regulator, ignore all **downstream** regulator instructions

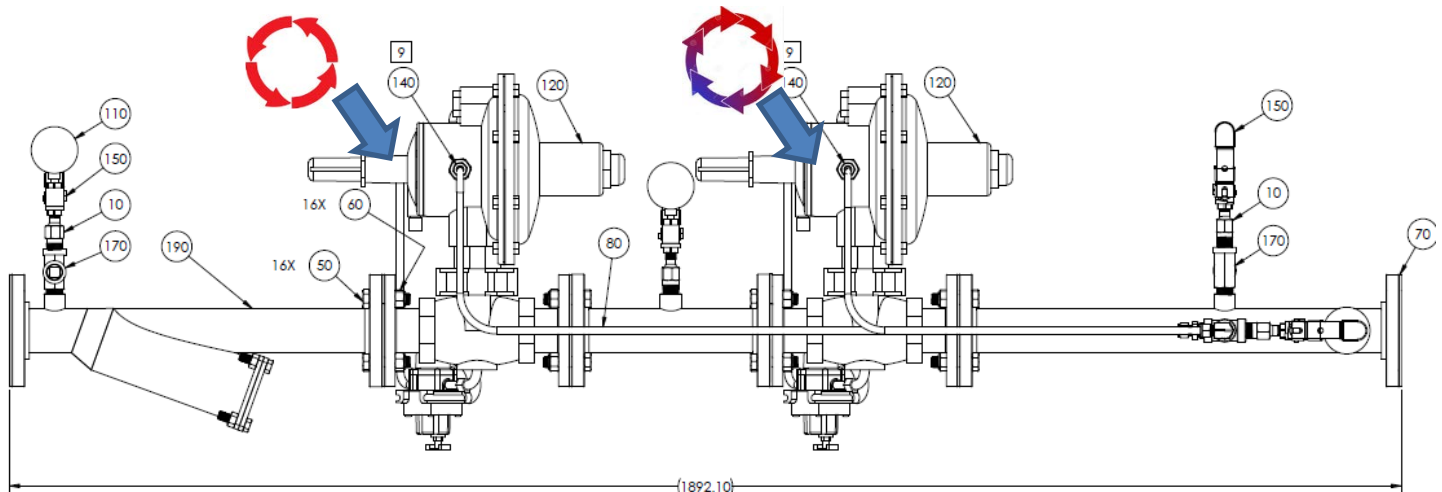


Figure 12

## Gas System Commissioning - Nitrogen

8. Crack open the discharge valve just enough so that the flow of air can be heard or felt.



Figure 13

9. Adjust the **Upstream** regulator first.

10. On the **Main Body Pilot** assembly, turn the adjusting screw clockwise to increase outlet pressure to achieve **18** psi as read on a gauge as far downstream as possible.

- 10.1. Be sure to adjust slowly to allow system pressure to stabilize after adjustment.

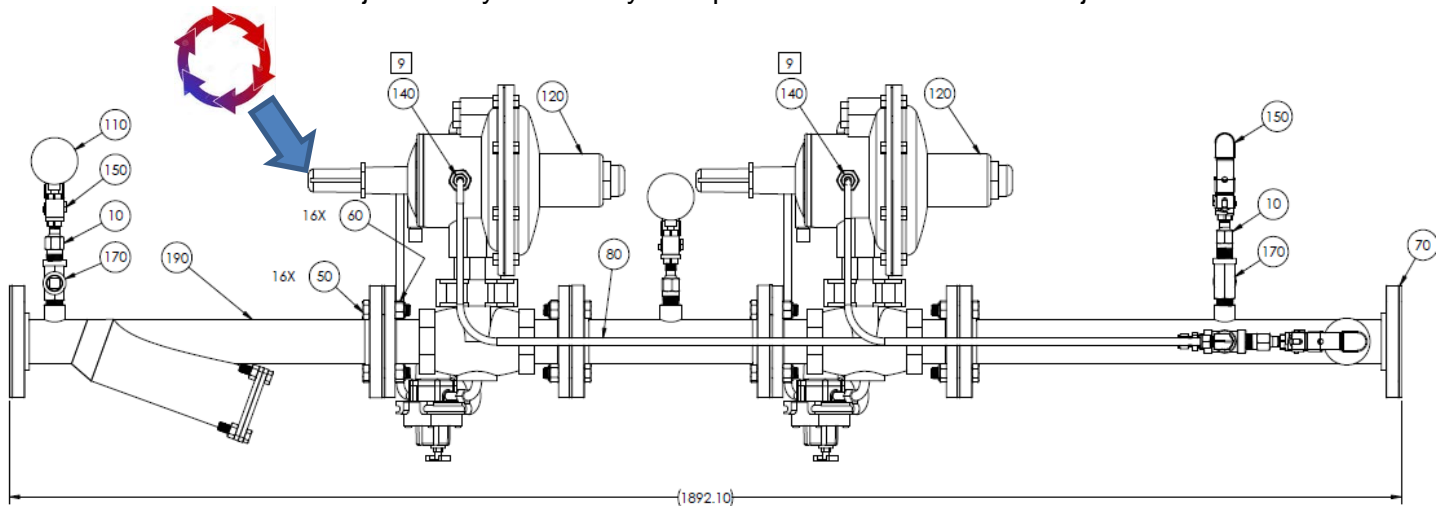


Figure 14

## Gas System Commissioning - Nitrogen

### 11. Adjust the **downstream** regulator second

11.1. On the **Main Body Pilot** assembly, turn the adjusting screw clockwise to increase outlet pressure or counterclockwise to decrease outlet pressure to achieve **15 psi** as read as far downstream as possible.

11.2. Be sure to wait for system pressure to change.

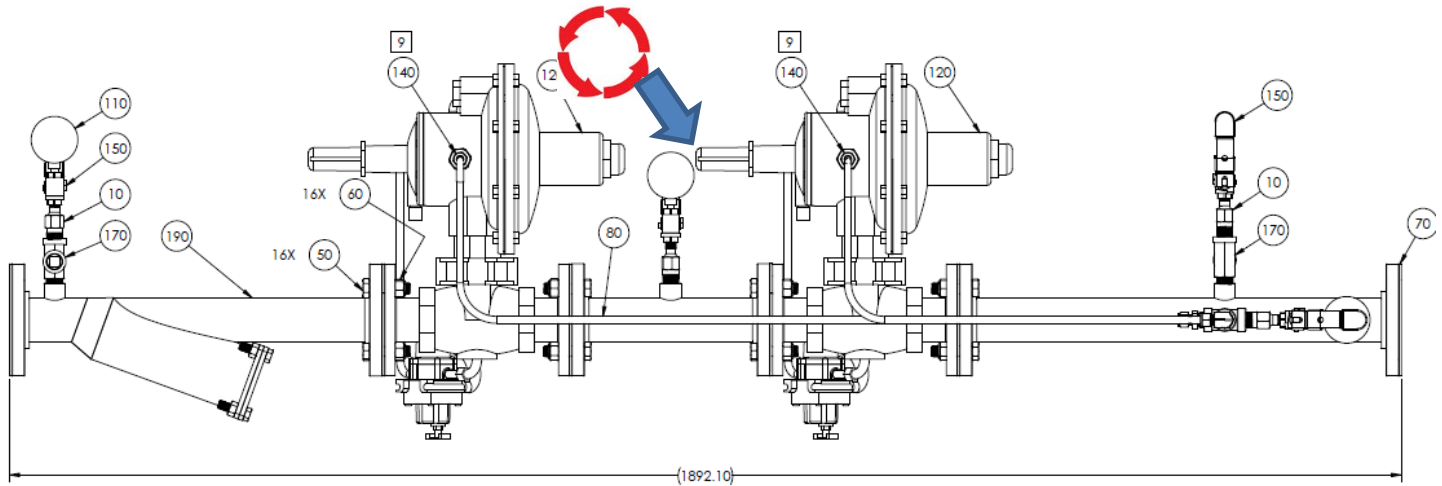


Figure 15

12. If the pressure on the upstream RSA riser gauge drops below expected delivery pressure at any time during the procedure, **STOP**, and re-pressurize the line and consider throttling down on the discharge valve.

13. Close the vent assembly valve.

## Gas System Commissioning - Nitrogen

14. If the gas stick is a dual parallel set and this is the first set dialed in, do the following (skip to next step if not):
- 14.1. Isolate the dialed in set with the valves provided on the turndown
  - 14.2. Open the isolation valves for the pair that has not yet been set
  - 14.3. Repeat Section B for the second set of regulators

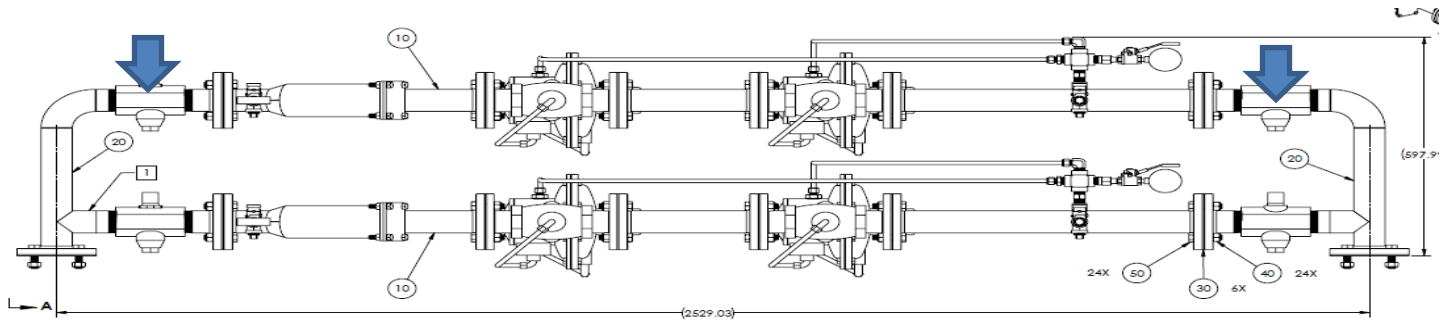


Figure 16

### Section C: Process closeout

#### 1. Restore system Conditions

- 1.1. Turn off the air compressor
- 1.2. Isolate the test equipment from the system
- 1.3. Remove all test equipment
  - 1.3.1. Air Compressor
  - 1.3.2. Purge Hose
- 1.4. Close all fuel stub up valves and reconnect YFP to fuel stub up
- 1.5. Leave meter isolation valves open
  - 1.5.1. If dual parallel, leave only one set open, isolate the second set

## Gas System Commissioning - Nitrogen



DOC-1010208 Rev A

## Version History

Revision	Date	Process Owner	Change Description	Training Required
A		Andy Blakeslee	Initial Release	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
A	4/27/17	Shane Peters	Reformatted into Standard Template, suggested edits	<input type="checkbox"/> Yes <input type="checkbox"/> No
A	6/8/17	Shane Peters	Thomas Sipe updates, with Shane's reformatting.	<input type="checkbox"/> Yes <input type="checkbox"/> No
A	2/20/18	Thomas Sipe	Split CDA, N2 and Moisture Sample	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No

Electronic Signature approvals are on file in Agile.



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

Web Site: [portal.ct.gov/csc](http://portal.ct.gov/csc)

### VIA ELECTRONIC & CERTIFIED MAIL RETURN RECEIPT REQUESTED

March 14, 2022

Kristen Grillo  
Bloom Energy Corporation  
4353 North First Street  
San Jose, CA 95134  
[Kristen.Grillo@bloomenergy.com](mailto:Kristen.Grillo@bloomenergy.com)

RE: **PETITION NO. 1479** – Bloom Energy Corporation petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a customer-side 1.5-megawatt fuel cell facility and associated equipment to be located at the NBC Sports Group building, 1 Blachley Road, Stamford, Connecticut.

Dear Ms. Grillo:

At a public meeting held on March 10, 2022, the Connecticut Siting Council (Council) considered and ruled that the above-referenced proposal meets air and water quality standards of the Department of Energy and Environmental Protection and would not have a substantial adverse environmental effect, and pursuant to Connecticut General Statutes § 16-50k would not require a Certificate of Environmental Compatibility and Public Need, with the following conditions:

1. Approval of any Project changes be delegated to Council staff;
2. Provide a copy of the Fuel Cell Emergency Response Plan to local emergency responders prior to facility operation, and provide emergency response training;
3. The use of natural gas as a fuel system cleaning medium during fuel cell construction, installation or modification shall be prohibited;
4. Submit the following information to the Council 15 days prior to any fuel pipe cleaning operations related to fuel cell construction, installation, or modification:
  - a. Identification of the cleaning media to be used;
  - b. Identification of any known hazards through use of the selected cleaning media;
  - c. Description of how known hazards will be mitigated, including identification of any applicable state or federal regulations concerning hazard mitigation measures for such media;
  - d. Identification and description of accepted industry practices or relevant regulations concerning the proper use of such media;
  - e. Provide detailed specifications (narratives/drawings) indicating the location and procedures to be used during the pipe cleaning process, including any necessary worker safety exclusion zones;
  - f. Identification of the contractor or personnel performing the work, including a description of past project experience and the level of training and qualifications necessary for performance of the work;

- g. Contact information for a special inspector hired by the project developer who is a Connecticut Registered Engineer with specific knowledge and experience regarding electric generating facilities or a National Board of Boiler and Pressure Vessel Inspector and written approval of such special inspector by the local fire marshal and building inspector; and
      - h. Certification of notice regarding pipe cleaning operations to all state agencies listed in General Statutes § 16-50j(h) and to the Department of Consumer Protection, Department of Labor, Department of Public Safety, Department of Public Works, and the Department of Emergency Management and Homeland Security;
5. Compliance with the following codes and standards during fuel cell construction, installation or modification, as applicable:
  - a. NFPA 54
  - b. NFPA 853; and
  - c. ASME B31;
6. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed within three years from the date of the mailing of the Council's decision, this decision shall be void, and the facility owner/operator shall dismantle the facility and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The facility owner/operator shall provide written notice to the Executive Director of any schedule changes as soon as is practicable;
7. Any request for extension of the time period to fully construct the facility shall be filed with the Council not later than 60 days prior to the expiration date of this decision and shall be served on all parties and intervenors, if applicable, and the City of Stamford;
8. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
9. The facility owner/operator shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v;
10. The facility owner/operator shall file an annual report on a forecast of loads and resources pursuant to Conn. Gen. Stat. §16-50r;
11. This Declaratory Ruling may be transferred, provided the facility owner/operator/transferor is current with payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v and the transferee provides written confirmation that the transferee agrees to comply with the terms, limitations and conditions contained in the Declaratory Ruling, including timely payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v; and
12. If the facility owner/operator is a wholly owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the facility within 30 days of the sale and/or transfer.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the petition, dated January 14,



2022, and additional information received February 22, 2022, and in compliance with Public Act 11-101, An Act Adopting Certain Safety Recommendations of the Thomas Commission.

Enclosed for your information is a copy of the staff report on this project.

Sincerely,



Melanie A. Bachman  
Executive Director

MAB/RDM/laf

Enclosure: Staff Report dated March 10, 2022

- c: Service List dated January 20, 2022  
The Honorable Caroline Simmons, Mayor, City of Stamford ([mayorsoffice@stamfordct.gov](mailto:mayorsoffice@stamfordct.gov))  
Walter F. Seely, Fire Marshal, City of Stamford ([FireMarshal@stamfordct.gov](mailto:FireMarshal@stamfordct.gov))



**STATE OF CONNECTICUT**  
**CONNECTICUT SITING COUNCIL**

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

Web Site: [portal.ct.gov/csc](http://portal.ct.gov/csc)

**Petition No. 1479**  
**Bloom Energy Corporation**  
**NBC Sports Group**  
**1 Blachley Road, Stamford, Connecticut**

**Staff Report**  
**March 10, 2022**

**Introduction**

On January 18, 2022, the Connecticut Siting Council (Council) received a petition from Bloom Energy Corporation (Bloom) for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the installation of a 1.5 megawatt (MW) fuel cell facility and associated equipment (Petition or Project) to be located at the NBC Sports Group building at 1 Blachley Road, Stamford, Connecticut.

On January 10, 2022, Bloom provided notice of the Project to abutting property owners, City of Stamford (City) officials, and required state agencies and officials. One abutter contacted Bloom requesting general Project information. No other comments were received.

Bloom consulted with and provided Project plans to the City's Land Use Bureau on December 10, 2021. The City did not comment on the Project.

On January 20, 2022, the Council sent correspondence to the City stating that the Council has received the Petition and invited the municipality to contact the Council with any questions or comments by February 17, 2022. No comments were received.

On February 8, 2022, pursuant to Regulations of Connecticut State Agencies (RCSA) §16-50j-40, the Council notified all state agencies listed therein, requesting comments regarding the proposed Project be submitted to the Council by February 17, 2022. No comments were received.

The Council issued interrogatories to Bloom on February 8, 2022. Bloom provided responses to the Council's interrogatories on February 22, 2022.

**Public Benefit**

The Project would be a "customer-side distributed resources" facility, as defined in Connecticut General Statutes (CGS) § 16-1(a)(49). CGS § 16a-35k establishes the State's energy policy, including the goal to "develop and utilize renewable energy resources...to the maximum practicable extent." The proposed facility is a distributed generation resource, and will contribute to fulfilling the State's Renewable Portfolio Standard as a low emission Class I renewable energy source. The Project was selected as part of the Low and Zero Emissions Renewable Energy Credit (LREC/ZREC) program. The Facility would be installed, maintained and operated by Bloom under a 15-year power purchase agreement with NBC Universal Media, LLC (NBC).

### **Project Site**

The proposed facility is located on a 32.68-acre parcel, zoned M-D, Designed Industrial, that is developed with several buildings, a parking garage and parking lots. Multiple tenants utilize the on-site buildings. The fuel cell would be installed adjacent to the NBC Sports Group building in the northwest portion of the host parcel.

The surrounding area consists of high-density residential. The Rogers International School, a City K-8 school, is to the northeast at 202 Blachley Road. The nearest residential property line from the proposed facility is approximately 179 feet to the northwest.

### **Proposed Project**

The facility would consist of five Bloom Energy 300-kW solid oxide fuel cell Energy Servers (model ES5-YASAAN) and associated equipment, including water deionizers, telemetry cabinets, disconnect switches, a transformer and utility cabinets. The fuel facility would consist of four energy servers measuring approximately 17.9 feet long by 8.6 feet wide by 6.7 feet tall and one energy server measuring 32.2 feet long by 4.3 feet wide by 7.1 feet tall. See Attached Site Plan for detail.

The fuel cell facility would be installed on concrete pads located in a paved area adjacent to the northwest corner of the building. A paved utility access way and a parking garage are located to the north of the proposed facility. A paved driveway and parking areas are located to the west, beyond which is a wooded area that buffers the host property from a residential area. A walled building compound that contains building fan units is to the east of the proposed facility.

To protect the fuel cell from potential vehicle damage, a guardrail would be installed along the north and west sides, facing the existing parking area and driveway.

The natural gas interconnection extends north from the proposed facility gas meter pad to existing service within the utility access way. Electric connections would extend east through the building to an existing building utility room. New meters and other electrical equipment would be installed within the room. A water connection would also occur within the building.

The proposed facility would be a customer-side, distributed resources project, designed only to provide electricity. The proposed facility would operate in parallel with the utility grid and provide a portion of the electrical needs of the NBC Sports Group building. The proposed facility is sized to provide at least 72% of the average annual baseload of the building. Any excess electricity created during periods of low energy usage, would be exported to the local electric grid under the net metering tariff. The interconnection application was submitted to Eversource in October 2021 for review. Final interconnection approval is anticipated in July 2022.

The proposed Bloom fuel cell units are designed to optimize the electrical efficiency alone rather than operate as combined heat and power units. Heat generated by the proposed facilities is used internally to increase the electrical efficiency of the fuel cells, and consequently there is no useful waste heat generated.

The fuel cell facility has an operational life of 15 years. The solid oxide fuel cell media would be changed at five-year intervals. At the end of the 15-year contract, NBC may renew the contract, return the facility at no cost, or buy the facility at fair market value. If the facility is to be removed at the end of the contract, the fuel cell units and associated equipment and components would be dismantled and removed.

Bloom anticipates construction to start in the third quarter of 2022 with approximately 12 - 18 weeks of total construction time, i.e. 4 to 6 weeks for site prep, 4 to 6 weeks for installation and 4 to 6 weeks for commissioning. Construction hours would be Monday-Friday, 7AM – 5 PM.

### Environmental Effects and Mitigation

The fuel cell facility would comply with all applicable Department of Energy and Environmental Protection (DEEP) water quality standards as no water would be consumed or discharged once the facility is operational. The proposed fuel cell facility would operate without water discharge under normal operating conditions. Water consumption would only occur at system fill and during restart operations.

Air emissions produced during fuel cell operation would not trigger any regulatory thresholds and are shown below.

Fuel Cell Facility	
Compound	lbs/MWh
NO <sub>x</sub>	0.01
CO <sub>2</sub> *	679-833

\*DEEP amended its regulations in 2016 to eliminate the CO<sub>2</sub> permit requirements from the New Source Review and Title V Programs as a result of a United States Supreme Court decision that overturned states' regulatory CO<sub>2</sub> permit requirements (*Utility Air Regulatory Group v. U.S. Environmental Protection Agency*, 573 U.S. 302 (2014))

The proposed facility would emit no methane (CH<sub>4</sub>), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs) or perfluorocarbons (PFCs), which are greenhouse gases defined in RCSA §22a-174-1(49), and would emit negligible amounts of sulfur oxides, volatile organic compounds and particulate matter.

The fuel cell desulfurization system would remove sulfur that is used as an odorant in natural gas because it is a fuel cell system contaminant. Sulfur compounds would be collected within a desulfurization unit (desulf unit) using a filter media – a composite copper catalyst. The U.S. Department of Transportation has certified the desulf unit as an acceptable form of transport for the desulfurization material that meets hazardous waste shipment standards. When a desulf unit is taken out of service, it is transported by a Bloom contractor to an out of state facility where the composite copper catalyst within the unit is removed, and the copper is used for other products. The empty desulf units are the refurbished for reuse at other Bloom fuel cell locations.

Visual impact from the proposed Project would be minimal as it is located among buildings that would block views from the north, south and east. Views from the west would be blocked by mature wooded vegetation along the host property boundary.

No wetlands, forest or prime farmland soils would be disturbed by the proposed Project as it is located entirely within paved areas on a developed commercial property. Erosion and sedimentation controls for the proposed facility would comply with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*.

The proposed Project is within a DEEP Natural Diversity Database (NDDDB) buffer area. DEEP provided a NDDDB Determination letter to Bloom on January 13, 2022 stating that it does not anticipate the proposed Project would have a negative impact on State-listed species. DEEP indicated the box turtle, a State Special Concern species, occurs in the general area and if a turtle is encountered during construction, that it be moved outside of the work zone.

The site is not within a Federal Emergency Management Agency- designated flood zone nor within an Aquifer Protection Area (APA). The nearest APA is 1.8 miles to the north. The site is not within the DEEP designated coastal boundary, defined under Connecticut's Coastal Management Act.

The site is previously disturbed and would not impact historic or cultural resources.

### **Public Safety**

Before commissioning the proposed facility, Bloom would use compressed air as pipe cleaning media in accordance with Public Act 11-101, An Act Adopting Certain Safety Recommendations of the Thomas Commission.

The fuel cell facility has internal and remote 24/7 operational monitoring. Abnormal operation would cause the facility to automatically shut down. The facility can also be shut down through a remote operations center as well as manually. The fuel cell facility is designed in accordance with American National Standards Institute and Canadian Standards Association (ANSI/CSA) America FC 1-2004 and the National Fire Protection Association, Inc. Standard 853 for stationary fuel cell power systems and includes extensive safety control systems, including both automatic and manual shutdown mechanisms that comply with pertinent engineering standards.

An emergency response plan (ERP) for the facility is included within the Petition. Bloom would submit the ERP to the Stamford Fire Marshal and would provide on-site training to local officials.

The fuel cell system is controlled electronically and has internal sensors that continuously measure system operation. If safety circuits detect a condition outside normal operating parameters, the fuel supply is stopped, and individual system components are automatically shut down. In addition, manual emergency shut down push buttons would be located at the site.

Noise associated with the construction of this Project would be temporary and exempt from DEEP Noise Control Regulations. Operational noise levels at the boundary of the nearest residential property (197 feet to the west) to the facility are predicted to be 43 dBA. DEEP's Noise Control Regulations thresholds for a Class B (commercial) emitter to a Class A (residential) receptor is 55 dBA (day) and 45 dBA (night). The residential property is classified as a Class A receptor. The fuel cell would have a noise dampening foam material at the doors and exhaust of the fuel cell to lower its noise emissions by up to 5 dBA. The noise calculation included the noise dampening material.

### **Conclusion**

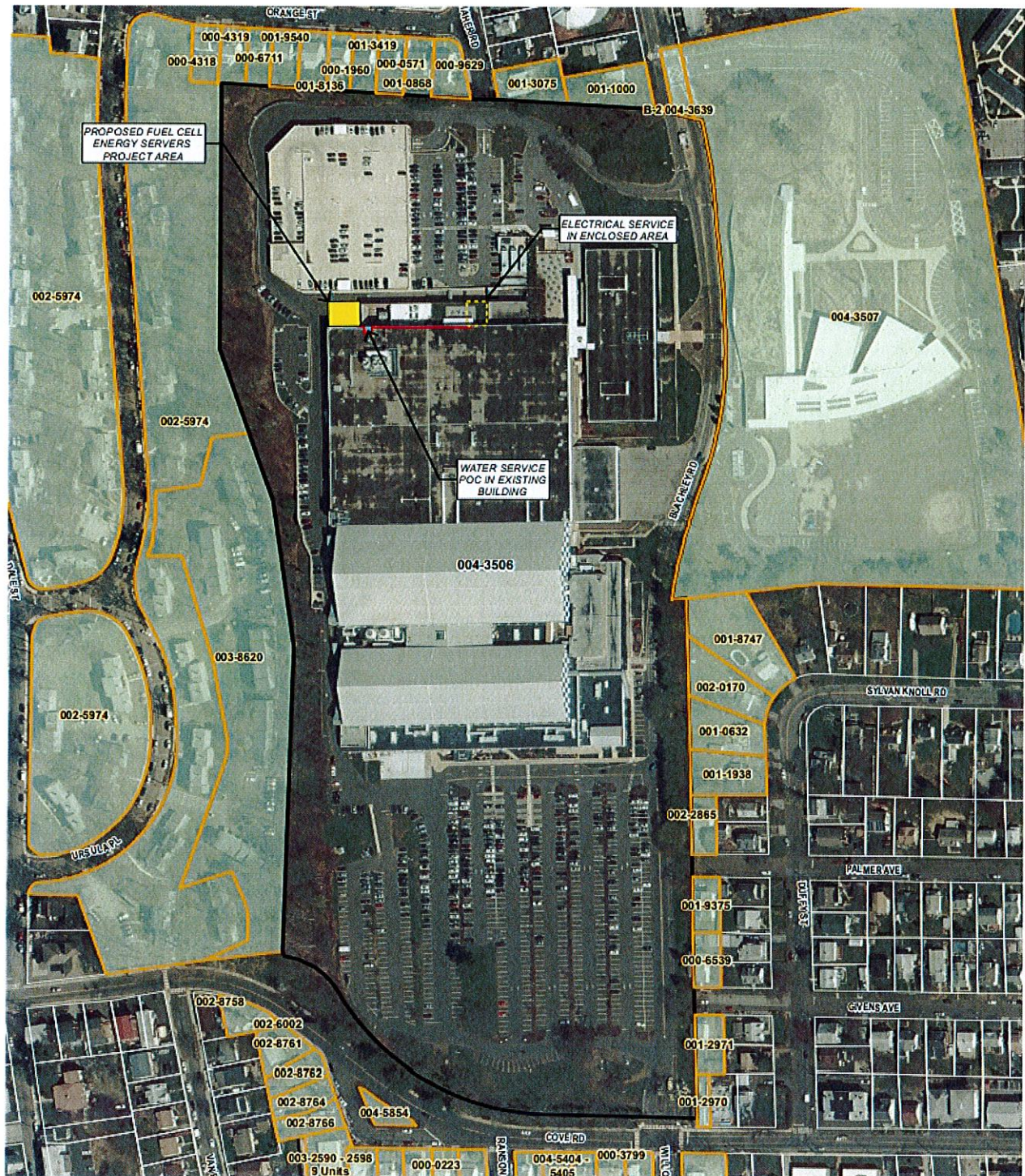
The Project is a distributed energy resource with a capacity of not more than sixty-five megawatts, meets air and water quality standards of the DEEP, and would not have a substantial adverse environmental effect. It would reduce the emission of air pollutants that contribute to smog and acid rain, and to a lesser extent, global climate change, and furthers the State's energy policy by developing and utilizing renewable energy resources and distributed energy resources. Furthermore, the Project was selected under the state's LREC/ZREC Program.

### **Recommendations**

If approved, staff recommends the following conditions:

1. Approval of any Project changes be delegated to Council staff; and
2. Provide a copy of the Fuel Cell Emergency Response Plan to local emergency responders prior to facility operation, and provide emergency response training.

### Fuel Cell Location



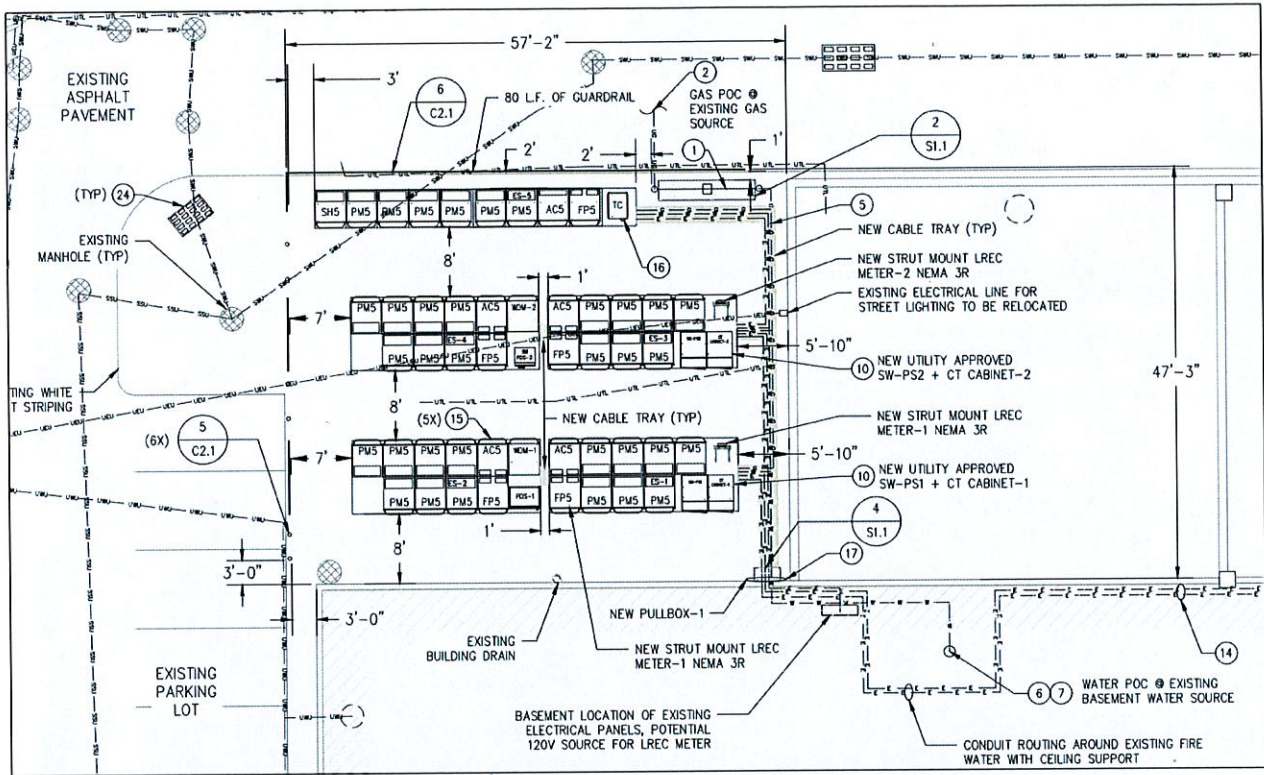
**Legend**

- Site
- Abutting Property
- Project Area
- Electrical Service
- Water Service
- Enclosed Electrical Area
- Approximate Assessor Parcel Boundary

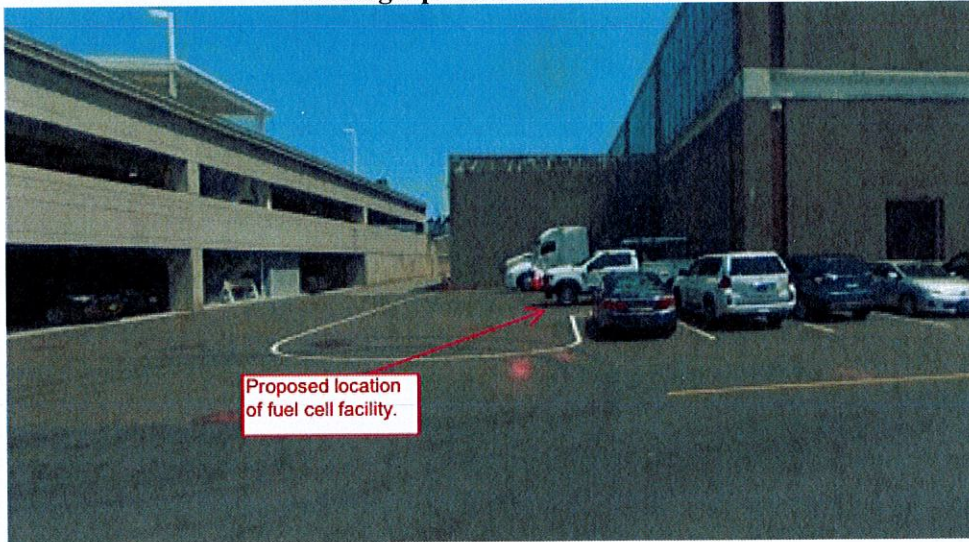
**Map Notes**  
 Base Map Source: CTECO 2019 Aerial Photograph

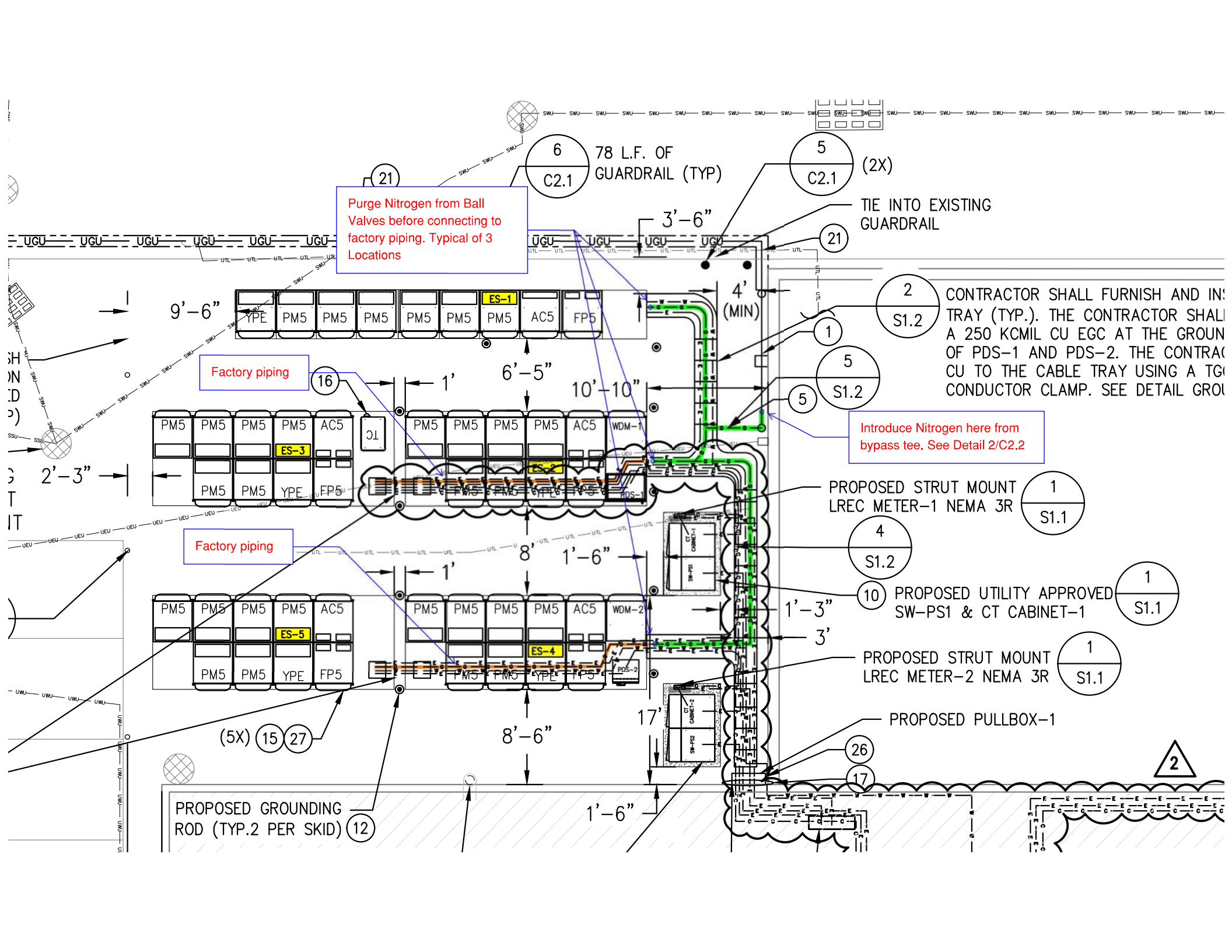


### Site Plan



### Photograph of Site Plan Area





Purge Nitrogen from Ball Valves before connecting to factory piping. Typical of 3 Locations

Introduce Nitrogen here from bypass tee. See Detail 2/C2.2

Factory piping

Factory piping

6 78 L.F. OF GUARDRAIL (TYP) C2.1

5 (2X) C2.1

TIE INTO EXISTING GUARDRAIL

2 CONTRACTOR SHALL FURNISH AND INSTALL TRAY (TYP.). THE CONTRACTOR SHALL INSTALL A 250 KCMIL CU EGC AT THE GROUND OF PDS-1 AND PDS-2. THE CONTRACTOR SHALL CONNECT THE EGC TO THE CABLE TRAY USING A TIGHT CONDUCTOR CLAMP. SEE DETAIL GROUNDING

PROPOSED STRUT MOUNT LREC METER-1 NEMA 3R

4 S1.2

10 PROPOSED UTILITY APPROVED SW-PS1 & CT CABINET-1

PROPOSED STRUT MOUNT LREC METER-2 NEMA 3R

PROPOSED PULLBOX-1

PROPOSED GROUNDING ROD (TYP. 2 PER SKID)

2

9'-6"

6'-5"

10'-10"

8'

8'-6"

1'-6"

3'-6"

4' (MIN)

10'-10"

1'-6"

17'

2'-3"

1

5

5

5

1

4

10

1

1

26

17

21

21

1

5

5

5

1

4

10

1

1

26

17

16

16

16

15

27

12

1

5

5

5

1

4

10

1

1

26

17

17

17

17

17

17

17



# NITROGEN, COMPRESSED

## Safety Data Sheet



### 1. IDENTIFICATION

**Product identifier**

**Product Name** NITROGEN, COMPRESSED

**Other means of identification**

**Safety data sheet number** LIND-P086

**UN/ID no.** UN1066

**Trade name** Lasline N2 4.8; Lasline N2 5.0; Gourmet N; Grade 6.0, VOC Free, Emission Grade, Zero 0.2

**Recommended use of the chemical and restrictions on use**

**Recommended Use** Industrial and professional use. Food and Beverage. Calibration/test gas.

**Uses advised against** Consumer use

**Details of the supplier of the safety data sheet**

Messer Canada Inc.

5860 Chedworth Way

Mississauga, Ontario L5R 0A2

Phone: 905-501-2500

Email: [service@messer-ca.com](mailto:service@messer-ca.com)

Website: [www.messer-ca.com](http://www.messer-ca.com)

Customer Service: 888-256-7359

**Emergency telephone number**

Company Phone Number +1 905-501-0802

FOR TRANSPORTATION EMERGENCIES ONLY: CANUTEC +1 613-996-6666 OR +1-888-226-8832

### 2. HAZARDS IDENTIFICATION

Gases under pressure	Compressed gas
Simple asphyxiants	Yes / Category 1

**Label elements**


**Signal word**

**Warning**

**Hazard Statements**

Contains gas under pressure; may explode if heated

May displace oxygen and cause rapid suffocation

**Precautionary Statements - Prevention**

Do not handle until all safety precautions have been read and understood  
 Use and store only outdoors or in a well ventilated place  
 Use a backflow preventive device in piping  
 Use only with equipment rated for cylinder pressure  
 Close valve after each use and when empty

**Precautionary Statements - Response**

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical attention/advice.

**Precautionary Statements - Storage**

Protect from sunlight when ambient temperature exceeds 52°C/125°F

**Hazards not otherwise classified (HNOC)**

Not applicable

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure Gas

Chemical Name	Common names/synonyms	CAS No.	Volume %	Chemical Formula
NITROGEN	Not available	7727-37-9	>99	N <sub>2</sub>

### 4. FIRST AID MEASURES

**Description of first aid measures**

<b>General advice</b>	Show this safety data sheet to the doctor in attendance.
<b>Inhalation</b>	Remove to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention immediately.
<b>Skin contact</b>	None under normal use. Get medical attention if symptoms occur.
<b>Eye contact</b>	None under normal use. Get medical attention if symptoms occur.
<b>Ingestion</b>	Not an expected route of exposure.
<b>Self-protection of the first aider</b>	RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

**Most important symptoms and effects, both acute and delayed**

<b>Symptoms</b>	Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.
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**Indication of any immediate medical attention and special treatment needed**

<b>Note to physicians</b>	Treat symptomatically.
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## 5. FIRE-FIGHTING MEASURES

### Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media None.

### Specific extinguishing methods

Continue to cool fire exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.

### Specific hazards arising from the chemical

Non-flammable gas. Cylinders may rupture under extreme heat.

### Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

#### **Personal precautions**

Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. Monitor oxygen level. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.

### Environmental precautions

#### **Environmental precautions**

Prevent spreading of vapors through sewers, ventilation systems and confined areas.

### Methods and material for containment and cleaning up

#### **Methods for containment**

Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest Messer location.

#### **Methods for cleaning up**

Return cylinder to Messer or an authorized distributor.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

#### **Advice on safe handling**

Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distance, use a cart designed to transport cylinders. Never attempt to lift a cylinder by its valve protection cap. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Use only with adequate ventilation. Use a backflow preventive device in piping. Close valve after each use and when empty. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Ensure the complete gas system has been checked for leaks before use.

Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner's written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

Only experienced and properly instructed persons should handle gases under pressure. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association publication CGA-P1, Safe Handling of Compressed Gases in Containers. Use only with equipment rated for cylinder pressure.

For additional recommendations consult CGA P-76 Hazards of Oxygen-Deficient Atmospheres.

### Conditions for safe storage, including any incompatibilities

**Storage Conditions** Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C / 125°F. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Stored containers should be periodically checked for general condition and leakage.

**Incompatible materials** None known.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters

#### Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
NITROGEN 7727-37-9	: See Appendix F: Minimal Oxygen Content	None	None

*ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health*

### Appropriate engineering controls

**Engineering Controls** Provide general ventilation, local exhaust ventilation, process enclosure or other engineering controls to maintain airborne levels below recommended exposure limits and to maintain oxygen levels above 19.5%. Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages.

### Individual protection measures, such as personal protective equipment

**Eye/face protection** Wear safety glasses with side shields (or goggles).

**Skin and body protection** Work gloves and safety shoes are recommended when handling cylinders.

**Respiratory protection** Use positive pressure airline respirator with escape cylinder or self contained breathing apparatus for oxygen-deficient atmospheres (<19.5%).

**General Hygiene Considerations** Handle in accordance with good industrial hygiene and safety practice.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

Physical state	Gas
Appearance	Colorless
Odor	Odorless
Odor threshold	Not applicable
pH	Not applicable
Melting/freezing point	Not applicable
Boiling point / boiling range	-196 °C / -321 °F
Evaporation rate	Not applicable
Flammability (solid, gas)	Non-flammable gas
Lower flammability limit:	Not applicable
Upper flammability limit:	Not applicable
Flash point	Not applicable
Autoignition temperature	Not available

Decomposition temperature	Not available
Water solubility	Slightly soluble
Partition coefficient	Not available
Kinematic viscosity	Not applicable

**Component Level Information:**

Chemical Name	Molecular weight	Boiling point/range	Vapor Pressure	Vapor density (air =1)	Gas Density kg/m <sup>3</sup> @20°C	Critical Temperature
NITROGEN	28.01	-196 °C	Above critical temperature	0.97	1.153	-146.9 °C

## 10. STABILITY AND REACTIVITY

**Reactivity**

Not reactive under normal conditions

**Chemical stability**

Stable under normal conditions.

**Explosion data**

**Sensitivity to Mechanical Impact** None.

**Sensitivity to Static Discharge** None.

**Possibility of Hazardous Reactions**

None under normal processing.

**Conditions to avoid**

None under recommended storage and handling conditions (see Section 7).

**Incompatible materials**

None known.

**Hazardous Decomposition Products**

None known.

## 11. TOXICOLOGICAL INFORMATION

**Information on likely routes of exposure**

<b>Inhalation</b>	Product is a simple asphyxiant.
<b>Skin contact</b>	Not available
<b>Eye contact</b>	Not available
<b>Ingestion</b>	Not an expected route of exposure.

**Information on toxicological effects****Symptoms**

Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<=19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

<b>Skin corrosion/irritation</b>	Not classified.
<b>Serious eye damage/eye irritation</b>	Not classified.
<b>Irritation</b>	Not classified.
<b>Sensitization</b>	Not classified.
<b>Germ cell mutagenicity</b>	Not classified.
<b>Carcinogenicity</b>	This product does not contain any carcinogens or potential carcinogens listed by OSHA, IARC or NTP.
<b>Reproductive toxicity</b>	Not classified.
<b>Developmental Toxicity</b>	Not classified.
<b>STOT - single exposure</b>	Not classified.
<b>STOT - repeated exposure</b>	Not classified.
<b>Chronic toxicity</b>	None known.
<b>Aspiration hazard</b>	Not applicable.

**Numerical measures of toxicity**

<b>Product Information</b>	
<b>Oral LD50</b>	Not available
<b>Dermal LD50</b>	Not available
<b>Inhalation LC50</b>	Not available

**12. ECOLOGICAL INFORMATION****Ecotoxicity**

No known effect.

**Persistence and degradability**

Not applicable.

**Bioaccumulation**

No known effect.

**13. DISPOSAL CONSIDERATIONS****Waste treatment methods**

**Disposal of wastes** Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to Messer for proper disposal.

**14. TRANSPORT INFORMATION****TDG**

<b>UN/ID no.</b>	UN1066
<b>Proper shipping name</b>	Nitrogen, compressed
<b>Hazard Class</b>	2.2
<b>Description</b>	UN1066, Nitrogen, compressed, 2.2

**IATA**

<b>UN/ID no.</b>	UN1066
<b>Proper shipping name</b>	Nitrogen, compressed
<b>Hazard Class</b>	2.2
<b>ERG Code</b>	2L
<b>Special Provisions</b>	A69

**IMDG**

UN/ID no.	UN1066
Proper shipping name	Nitrogen, compressed
Hazard Class	2.2
EmS-No.	F-C, S-V

**15. REGULATORY INFORMATION****INTERNATIONAL INVENTORIES**

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies

**Legend:**

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

**16. OTHER INFORMATION**

<b>NFPA</b>	<b>Health hazards</b> 0	<b>Flammability</b> 0	<b>Instability</b> 0	<b>Physical and Chemical Properties</b> Simple asphyxiant
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**Note:** Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2019, CGA Recommended Hazard Ratings for Compressed Gases, 4th Edition.

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**End of Safety Data Sheet**