Part B, Section III: Other Technologies

(These are emerging technologies which have been in operation with an air quality permit, however do not yet qualify as LAER)

Source Type: **Major/LAER**

Application No.: **567735**

Equipment Category: **I.C. Engine, Stationary, Emergency, Electrical Generators**

Equipment Subcategory:

Date: **December 11, 2016**

1. EQUIPMENT INFORMATION

A. MANUFACTURER: Cummins	B. MODEL: QST30-G5
C. DESCRIPTION: EPA-certified Compression Ignition, diesel engine, 12 cylinders, turbocharged and aftercooled, Engine Family CCEXL030.AAD.	
D. FUNCTION: On-site emergency electrical power generation.	
E. SIZE/DIMENSIONS/CAPACITY: 1490 BHP, driving 1000 kW generator	
COMBUSTION SOURCES	
F. MAXIMUM HEAT INPUT: ---	
G. BURNER INFORMATION	

TYPE	INDIVIDUAL HEAT INPUT	NUMBER
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H. PRIMARY FUEL: DIESEL	I. OTHER FUEL: ---
J. OPERATING SCHEDULE: <1 HRS/DAY 1 DAYS/WEEK 52 WKS/YR	
K. EQUIPMENT COST: Not Available	
L. EQUIPMENT INFORMATION COMMENTS: Engine is equipped with an aftertreatment system consisting of Selective Catalytic Reduction and Diesel Particulate Filter.	

2. COMPANY INFORMATION

A. COMPANY: Praxair, Inc.	B. FAC ID: 007416
C. ADDRESS: 2300 E. Pacific Coast Highway CITY: Wilmington STATE: CA ZIP: 90744	D. NAICS CODE:
E. CONTACT PERSON: Laura Cremer	F. TITLE: Environmental Specialist
G. PHONE NO.: 925-866-6851	H. EMAIL: laura_cremer@praxair.com

3. PERMIT INFORMATION

A. AGENCY: SCAQMD	B. APPLICATION TYPE: NEW CONSTRUCTION PERMIT TO OPERATE
C. SCAQMD ENGINEER: Tracy Nguyen	
D. PERMIT INFORMATION: PC ISSUANCE DATE: 6/16/15 P/O NO.: G43499 PO ISSUANCE DATE: 10/27/2016	
E. START-UP DATE: 10/1/2015	
F. OPERATIONAL TIME: Intermittent--for engine readiness test. Limited to 200 hrs/year which includes no more than 50 hours/year and 4.2 hour/month for maintenance and testing.	

4. EMISSION INFORMATION

A. BACT EMISSION LIMITS AND AVERAGING TIMES:

	VOC	NOx	SOx	CO	PM OR PM_{10}	INORGANIC
BACT Limit	0.19 G/KW-HR 0.14 G/BHP-HR)	0.67 G/KW-HR (0.5 G/BHP-HR)		3.5 G/KW-HR (2.61 G/BHP-HR)	0.03 G/KW-HR (0.022 G/BHP-HR)	
Averaging Time						
Correction						

B. OTHER BACT REQUIREMENTS: Compliance with rules 404, 431.2 and 1470.

C. BASIS OF THE BACT/LAER DETERMINATION: Achieved in Practice/New Technology

D. EMISSION INFORMATION COMMENTS: Engine was certified to comply with EPA Tier 4 requirements.

5. CONTROL TECHNOLOGY

A. MANUFACTURER: Cummins	B. MODEL: S4F-H-T4F

C. DESCRIPTION: Selective Catalytic Reduction and Diesel Particulate Filter with an electric heater.

D. SIZE/DIMENSIONS/CAPACITY: 85% DPF efficiency.

E. CONTROL EQUIPMENT PERMIT INFORMATION:

APPLICATION NO. 567735 PC ISSUANCE DATE: 6/16/15
PO NO.: G43499 PO ISSUANCE DATE: 10/27/2016

F. REQUIRED CONTROL EFFICIENCIES:

CONTAMINANT	OVERALL CONTROL EFFICIENCY	CONTROL DEVICE EFFICIENCY	COLLECTION EFFICIENCY
VOC	%	%	%
NOx	%	%	%
SOx	%	%	%
CO	%	%	%
PM	85%	%	%
PM_{10}	%	%	%
INORGANIC	%	%	%

G. CONTROL TECHNOLOGY COMMENTS Engine is certified to comply with EPA Tier 4 requirements: NMHC=0.14 g/bhp-hr, NOx=0.5 g/bhp-hr, CO=2.61 g/bhp-hr and PM=0.022 g/bhp-hr.

6. DEMONSTRATION OF COMPLIANCE

A. COMPLIANCE DEMONSTRATED BY: Compliance with EPA Tier 4 standards is based on EPA nonroad engine test methods and duty cycles. Tests conducted under other duty cycles or using different test methods may produce different results and are not indicative of noncompliance with the BACT levels.

B. DATE(S) OF SOURCE TEST:

C. COLLECTION EFFICIENCY METHOD:

D. COLLECTION EFFICIENCY PARAMETERS:

E. SOURCE TEST/PERFORMANCE DATA:

F. TEST OPERATING PARAMETERS AND CONDITIONS:

G. TEST METHODS (SPECIFY AGENCY):

H. MONITORING AND TESTING REQUIREMENTS:
I. DEMONSTRATION OF COMPLIANCE COMMENTS:

7. PENDING CONSIDERATIONS

A. SCR GETTING UP TO TEMPERATURE AND RUN TIME: Equipped with exhaust heater/load bank and control to regulate temperatures and assure quick (<10 minute) full SCR efficiency.
B. TIER 4 ENGINES WITH INDUCEMENT THAT MAY BE BYPASSED: In July 2016 EPA amended 40 CFR Part 60, Subpart IIII to allow manufacturers to design engines so that operators can temporarily override performance inducements related to emission control system during emergency situations to protect human life and require Tier 1 compliance during such emergencies. EPA is confident that Tier 4 engines will function properly in emergency situations and expects that auxiliary emission control devices allowed under this provision will rarely be activated.
C. CERTIFICATION OF EMERGENCY ENGINE AT DIFFERENT DUTY CYCLE THAT MAY NOT ACHIEVE CLAIMED EMISSION LEVELS: Emissions testing was done on the ISO 8178 D2 Cycle consistent with constant speed stationary engines. (5% @ 100% Torque, 25%@75%, 30%@50%, 30%@25% and 10%@10%).
D. COST EFFECTIVENESS ANALYSIS: TBD

8. ADDITIONAL SCAQMD REFERENCE DATA

A. BCAT:	B. CCAT:	C. APPLICATION TYPE CODE:
D. RECLAIM FAC? YES ☐ NO ☐	E. TITLE V FAC: YES ☐ NO ☐	F. SOURCE TEST ID(S):
G. SCAQMD SOURCE SPECIFIC RULES:		
H. HEALTH RISK FOR PERMIT UNIT		

H1. MICR:	H2. MICR DATE:	H3. CANCER BURDEN:	H4. CB DATE:
H5: HIA:	H6. HIA DATE:	H7. HIC:	H8. HIC DATE:

Part B, Section III: Other Technologies

(These are emerging technologies which have been in operation with an air quality permit, however do not yet qualify as LAER)

Source Type: **Minor**

Application No.: **591787**

Equipment Category: **Fuel Cell Electricity Generator – Digester Gas fueled**

Equipment Subcategory:

Date: **March 1, 2017**

1. EQUIPMENT INFORMATION

A. MANUFACTURER: Fuel Cell Energy	B. MODEL: DFC 1500
C. DESCRIPTION: Fuel Cell, digester gas fueled with biogas clean-up system and start-up air heater with natural gas burner (Rule 222 Registration per Rule 219(b)(5)).	
D. FUNCTION: On-site electrical power generation and heat recovery.	
E. SIZE/DIMENSIONS/CAPACITY: 1.4 MW, 355 scfm Digester gas flow	
COMBUSTION SOURCES	
F. MAXIMUM HEAT INPUT: ---	
G. BURNER INFORMATION	

TYPE	INDIVIDUAL HEAT INPUT	NUMBER
---	---	---

H. PRIMARY FUEL: DIGESTER GAS	I. OTHER FUEL: NATURAL GAS
J. OPERATING SCHEDULE: 24 HRS/DAY 7 DAYS/WEEK 52 WKS/YR	
K. EQUIPMENT COST: Not Available	
L. EQUIPMENT INFORMATION COMMENTS: Biogas clean-up system consists of condensate drain tank, hydrogen sulfide removal vessel, siloxane removal vessels, polishing vessel and refrigerant chiller.	

2. COMPANY INFORMATION

A. COMPANY: Riverside Fuel Cell, LLC	B. FAC ID: 181483
C. ADDRESS: 5950 Acorn Street CITY: Riverside STATE: CA ZIP: 92504	D. NAICS CODE:
E. CONTACT PERSON: Don Bell	F. TITLE: Field Service Manager
G. PHONE NO.: 203-648-3658	H. EMAIL: dbell@fce.com

3. PERMIT INFORMATION

A. AGENCY: SCAQMD	B. APPLICATION TYPE: NEW CONSTRUCTION PERMIT TO OPERATE
C. SCAQMD ENGINEER: Gaurang Rawal	
D. PERMIT INFORMATION: PC ISSUANCE DATE: 2/25/17 P/O NO.: G45213 PO ISSUANCE DATE: 3/1/2017	
E. START-UP DATE: 10/1/2015	
F. OPERATIONAL TIME: Fuel cell is operational 24 hour/day, 365 days/year.	

4. EMISSION INFORMATION

A. BACT EMISSION LIMITS AND AVERAGING TIMES:

	VOC	NOx	SOx	CO	PM OR PM_{10}	INORGANIC
BACT Limit	0.10 LBS/MW-HR	0.07 LBS/MW-HR		0.10 LBS/MW-HR		
Averaging Time	Measured as Carbon	15 min		15 min		
Correction	15% O_2	15% O_2		15% O_2		

B. OTHER BACT REQUIREMENTS:

C. BASIS OF THE BACT/LAER DETERMINATION: Achieved in Practice/New Technology

D. EMISSION INFORMATION COMMENTS: Enter any additional comments regarding Emissions Information.

5. CONTROL TECHNOLOGY

A. MANUFACTURER: ---	B. MODEL: ---
C. DESCRIPTION: ---	
D. SIZE/DIMENSIONS/CAPACITY: ---.	
E. CONTROL EQUIPMENT PERMIT INFORMATION: APPLICATION NO. --- PC ISSUANCE DATE: --- PO NO.: --- PO ISSUANCE DATE: ---	
F. REQUIRED CONTROL EFFICIENCIES: ---	

CONTAMINANT	OVERALL CONTROL EFFICIENCY	CONTROL DEVICE EFFICIENCY	COLLECTION EFFICIENCY
VOC	%	%	%
NOx	%	%	%
SOx	%	%	%
CO	%	%	%
PM	%	%	%
PM_{10}	%	%	%
INORGANIC	%	%	%

G. CONTROL TECHNOLOGY COMMENTS ---

6. DEMONSTRATION OF COMPLIANCE

A. COMPLIANCE DEMONSTRATED BY: Source Test

B. DATE(S) OF SOURCE TEST: December 20, 2016

C. COLLECTION EFFICIENCY METHOD:

D. COLLECTION EFFICIENCY PARAMETERS:

E. SOURCE TEST/PERFORMANCE DATA: < 0.024 lb NOx/MW-hr; <0.012 lb CO/MW-hr; 0.045 lb VOC/MW-hr (as hexane)

F. TEST OPERATING PARAMETERS AND CONDITIONS: Testing performed under steady state conditions. Method 100.1 results for NOx and CO had to be corrected up to 20% full scale range of analyzer, but still demonstrated compliance with permit limits.

G. TEST METHODS (SPECIFY AGENCY): SCAQMD M. 100.1, 25.3

H. MONITORING AND TESTING REQUIREMENTS:
I. DEMONSTRATION OF COMPLIANCE COMMENTS:

7. PENDING CONSIDERATIONS

A. START-UP AIR HEATER WITH COMBUSTION BURNER EXHAUST EMISSIONS: Testing commended after the fuel cell reached stable steady state operation.
B. COST EFFECTIVENESS: TBD

8. ADDITIONAL SCAQMD REFERENCE DATA

A. BCAT:	B. CCAT:	C. APPLICATION TYPE CODE:
D. RECLAIM FAC? YES ☐ NO ☐	E. TITLE V FAC: YES ☐ NO ☐	F. SOURCE TEST ID(S):
G. SCAQMD SOURCE SPECIFIC RULES:		
H. HEALTH RISK FOR PERMIT UNIT		

H1. MICR:	H2. MICR DATE:	H3. CANCER BURDEN:	H4. CB DATE:
H5: HIA:	H6. HIA DATE:	H7. HIC:	H8. HIC DATE: