Section I – South Coast AQMD BACT Determination

Source Type: **Major/LAER**

Application No.: **625886 - 625889**

Equipment Category: **Linear Generator**

Equipment Subcategory: **Non-Emergency Electrical Generator, Natural Gas Fired**

Date: **February 2, 2024**

1. EQUIPMENT INFORMATION

A. MANUFACTURER: Mainspring Energy	B. MODEL: MSE-230-NG
C. DESCRIPTION: Linear generator means any power generation technology that uses a thermochemical reaction to create linear motion that is directly converted into electricity. Each linear generator system consists of two identical cores. Each core is vented to an oxidation catalyst.	
D. FUNCTION: Mainspring linear generator uses a low-temperature reaction to produce electricity and is used as a stationary prime power source at this facility.	
E. SIZE/DIMENSIONS/CAPACITY: Each core is 120 kWe	
COMBUSTION SOURCES	
F. MAXIMUM HEAT INPUT:	
G. BURNER INFORMATION	

TYPE	INDIVIDUAL HEAT INPUT	NUMBER
N/A	N/A	N/A

H. PRIMARY FUEL: Natural gas	I. OTHER FUEL: N/A
J. OPERATING SCHEDULE: 24 HRS/DAY 7 DAYS/WEEK 52 WKS/YEAR	
K. EQUIPMENT COST: N/A	
L. EQUIPMENT INFORMATION COMMENTS: -	

2. COMPANY INFORMATION

A. COMPANY: Mainspring Energy, Incorporated	B. FAC ID: 193535
C. ADDRESS: 2063 Miguel Bustamante Pkwy CITY: Colton STATE: CA ZIP: 92324	D. NAICS CODE: 493120
E. CONTACT PERSON: Adam Simpson	F. TITLE: Co-Founder and CPO
G. PHONE NO.: (650) 330-1051	H. EMAIL: Adam.Simpson@mainspringenergy.com

3. PERMIT INFORMATION

A. AGENCY: South Coast AQMD	B. APPLICATION TYPE: NEW CONSTRUCTION
C. SCAQMD ENGINEER: Kate Kim	
D. PERMIT INFORMATION: PC ISSUANCE DATE: 6/15/21 P/O NO.: G68437- G68440 PO ISSUANCE DATE: 4/20/2022	
E. START-UP DATE: 2022	
F. OPERATIONAL TIME: + one year	

4. EMISSION INFORMATION

A. BACT EMISSION LIMITS AND AVERAGING TIMES: .

	VOC	NOx	SOx	CO	PM OR PM_{10}	INORGANIC
BACT Limit	25 PPMVD	2.5 PPMVD		12 PPMVD		
Averaging Time	*	*		*		
Correction	15% O_2	15% O_2		15% O_2		

B. OTHER BACT REQUIREMENTS: * averaged over 15 minutes.

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

D. EMISSION INFORMATION COMMENTS: N/A

5. CONTROL TECHNOLOGY

A. MANUFACTURER: Johnson Matthey	B. MODEL: MC6T-6F-2

C. DESCRIPTION: Oxidation catalyst

D. SIZE/DIMENSIONS/CAPACITY: N/A

E. CONTROL EQUIPMENT PERMIT INFORMATION: N/A

APPLICATION NO.: N/A PC ISSUANCE DATE: -

PO NO.: N/A PO ISSUANCE DATE: -

F. REQUIRED CONTROL EFFICIENCIES: N/A

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

G. CONTROL TECHNOLOGY COMMENTS:

Condition 9) After every six months of operation, the operator shall inspect the oxidation catalyst and determine if it needs to be cleaned or washed.

Condition 10) The operator shall wash the catalyst or replace the catalyst media at least after 12,000 hours of operation.

6. DEMONSTRATION OF COMPLIANCE

A. COMPLIANCE DEMONSTRATED BY: Source Test

B. DATE(S) OF SOURCE TEST: 1/18/2022

C. COLLECTION EFFICIENCY METHOD: N/A

D. COLLECTION EFFICIENCY PARAMETERS: N/A

E. SOURCE TEST/PERFORMANCE DATA:

Parameter	Core 1			Core 2			Permit Limit
	Normal Load	Max. Load	Min. Load	Normal Load	Max. Load	Min. Load	
CO, PPM @ 15% O_2	1.80	1.82	2.35	2.17	1.92	2.34	12.00
NO_X, PPM @ 15% O_2	1.66	1.76	1.07	1.91	1.82	0.90	2.50
VOC, PPM @ 15% O_2	4.35	-	-	4.03	-	-	25.00

Parameter	Core 3			Core 4			Permit Limit
	Normal Load	Max. Load	Min. Load	Normal Load	Max. Load	Min. Load	
CO, PPM @ 15% O_2	1.80	1.80	2.40	1.90	1.90	2.10	12.00
NO_X, PPM @ 15% O_2	1.94	1.70	1.19	1.13	1.12	1.12	2.50
VOC, PPM @ 15% O_2	2.64	-	-	4.01	-	-	25.00

F. TEST OPERATING PARAMETERS AND CONDITIONS:

Condition 15) the owner/operator shall conduct source test in accordance with the periodic source testing requirements of Rule 1110.2.

Condition 16.a) the test shall measure NOx, VOC, CO, oxygen content, moisture content, temperature, and exhaust flow rate at the exhaust of the equipment.

G. TEST METHODS (SPECIFY AGENCY):

South Coast AQMD Method 100.1 for NOx, O_2, CO_2, and CO (3 runs, 24-36 mins each)
South Coast AQMD Method 2.3 for velocity (3 runs, 24 mins each)
South Coast AQMD Method 4.1 for moisture (3 runs, 24 mins each)
South Coast AQMD Method 25.3 for VOC (1 run, 30 mins)

H. MONITORING AND TESTING REQUIREMENTS:

Condition 19) the operator shall conduct a source test annually on the equipment within 365 calendar days of previous source test.

I. DEMONSTRATION OF COMPLIANCE COMMENTS: -

7. ADDITIONAL SCAQMD REFERENCE DATA

A. BCAT: 040005	B. CCAT: -	C. APPLICATION TYPE CODE: -
D. RECLAIM FAC? YES ☐ NO ☒	E. TITLE V FAC: YES ☐ NO ☒	F. SOURCE TEST ID(S): PR22000 and PR22000A
G. SCAQMD SOURCE SPECIFIC RULES: Rule 1110.2. Rule 1110.3 as of 11/3/2023		
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: -