

TECHNICAL REVIEW AND EVALUATION

OF APPLICATION FOR

AIR QUALITY PERMIT NO. 63224

I. INTRODUCTION

This Class II operating permit No. 63224 is issued to Concord Blue Eagar, LLC, the Permittee, for the construction of a biomass powered electrical power generating station and biochar production facility. The facility is located in Eagar, Apache County, Arizona.

Apache County is an attainment or unclassified area for the National Ambient Air Quality Standards (NAAQS).

Company Information

Company Name:	Concord Blue Eagar, LLC
Facility Name:	Concord Blue Eagar
Facility Location:	152 #4 County Road 4128 Eagar, AZ 85925
Mailing Address:	12424 Wilshire Blvd., Suite 660 Los Angeles, CA 90025

II. PROCESS DESCRIPTION

A. Biomass System

The woody biomass feedstocks include waste wood from area mills (ranging in size from small pieces of wood to sawdust), small diameter whole logs, and woody debris from community slash piles. Large items will be screened out and intermittently chipped or ground in a mobile diesel-fired horizontal chipper, as needed. Tractor trailers will deliver wood chips and whole logs for storage and processing at the Project site. The processing includes an air density separator for removal of rocks and heavy items and a dust collector to treat the exhaust air from a cyclone situated on top of a 24-hour storage silo.

B. Biomass Thermolysis

Undried biomass chips are conveyed from the 24-hour storage silo to a multi-stage indirect thermal dryer using circulating thermal oil heated by reciprocating engine waste heat. Dried chips are conveyed into a static mixing column where the ceramic heat carrier balls and chips are mixed together and fed into the Pyrolyzer where the wood waste is converted through oxygen-free thermolysis to a raw producer gas and char. The raw producer gas rises to the Higher Temperature Reformer where increased heat and chemical reactions convert the low grade producer gas into a high quality raw syngas. A portion of the reformed and cleaned syngas is used in a multi-fuel process burner to reheat the ceramic beads to the proper operating temperature, making the facility self-sustaining. The electrical generating equipment consists of

two lean burn reciprocating engines fired by the synthesized gaseous fuel (“syngas”) produced by the thermolysis of the biomass. Cleaned syngas is flared for two to three hours during startup until it reaches the specified quality to combust in the two reciprocating engines.

C. Biochar System

The thermolysis of the biomass results in syngas and biochar. The biochar and ceramic heat carrier balls exit the Pyrolyzer and are separated through screening. The heat carrier balls are mechanically lifted to the Carrier Ball Heater and the biochar is conveyed via a cooling auger to a short-term holding bin. Biochar is transferred to a cross auger and then is deposited into the 2.5 day storage silo. The silo will be kept under negative pressure by the dust collector discharge fan and connected by a dust discharge pipe. The bagging operation also occurs under negative pressure, controlled by a high static pressure/low load system.

III. EMISSIONS

Table 1 below shows the facility-wide potential to emit (PTE) for this facility.

Table 1: Facility Emissions

Pollutant	Facility Potential to Emit (tons/year)
PM ₁₀	0.91
PM _{2.5}	0.88
NO _x	40.53
CO	89.98
SO ₂	3.32
VOC	26.20
HAPs	7.34

IV. APPLICABLE REGULATIONS

A. Minor New Source Review (NSR)

Concord Blue Eagar, LLC is subject to the requirements of Minor NSR in accordance with R18-2-334. The requirements of Minor NSR are applicable to pollutants for which the corresponding PTE is equal to or greater than the permitting exemption threshold as defined in R18-2-101.99. The applicable pollutants subject to Minor NSR for this facility are CO and NO_x. Facilities can satisfy the requirements of Minor NSR by either demonstrating compliance with the National Ambient Air Quality Standards (NAAQS) through air dispersion modeling or by implementing reasonable available control technology (RACT) on the applicable emissions unit. Concord Blue Eagar, LLC met the requirements of Minor NSR by conducting a refined air dispersion modeling analysis and the results of this analysis demonstrate compliance with the NAAQS.

B. Other Applicable Regulations

Applicable regulations were identified by the company as part of the application packet. If necessary, the source is required to list any additional regulations that may be applicable. Table 2 displays the applicable requirements for each piece of equipment under this proposed permit.

Table 2: Verification of Applicable Regulations

Unit	Control Device	Rule	Verification
Multi-Fuel Burner	Baghouse/Cartridge Filter	A.A.C. R18-2-724	This standard applies to all fossil fuel fired industrial equipment greater than 0.5 MMBtu/hr but less than 250 MMBtu/hr.
Internal Combustion Engines: Diesel fire Pump Engine and Horizontal Chipper Engine	None	40 CFR 60 Subpart IIII	This standard applies for CI engines manufactured after April 6, 2006.
Internal Combustion Engines: Dresser Rand Engines	None	40 CFR Subpart JJJJ	This standard applies for SI engines manufactured after July 1, 2008. These engines fire syngas and as such follow the requirements in the Subpart applicable to landfill/digester gas engines.
Flare, Thermal Biomass Dryer,	None	A.A.C. R18-2-730	This standard applies to unclassified sources.
Biomass and Biochar Material Handling Operations	Baghouse	A.A.C. R18-2-730	This standard applies to unclassified sources.
Fugitive dust sources	Water and other reasonable precautions.	A.A.C. R18-2, Article 6	These standards are applicable to all fugitive dust sources.
Mobile sources	Water Sprays/Water Truck for dust control	A.A.C. R18-2, Article 8	Opacity requirements for smoke and dust for mobile sources (construction equipment, etc.).

V. MONITORING AND RECORDKEEPING REQUIREMENTS

A. Opacity Requirements

1. Multi-Fuel Burner

The Permittee must conduct a monthly EPA Reference Method 9 observation of emissions emanating from the stack of the multi-fuel burner. The Permittee is required to keep a record of the name of the observer, date and time of observation, and the results of the observation. If the observation results in an exceedance of the opacity limit the Permittee must take corrective action and log all such actions.

2. Material Handling, Flare, Chipper, Biomass/Biochar System, and Biomass Dryer

The Permittee must conduct a monthly EPA Reference Method 9 observation of emissions emanating from material handling operations. The Permittee is required to keep a record of the name of the observer, date and time of observation, and the results of the observation. If the observation results in an exceedance of the opacity limit the Permittee must take corrective action and log all such actions.

3. Cooling Tower

The Permittee must conduct a monthly EPA Reference Method 9 observation of emissions emanating from the cooling tower. The Permittee is required to keep a record of the name of the observer, date and time of observation, and the results of the observation. If the observation results in an exceedance of the opacity limit the Permittee must take corrective action and log all such actions.

4. Fugitive Dust Sources

The Permittee is required to maintain records of the dates on which any reasonable precaution to prevent excessive amounts of particulate matter from becoming airborne is taken. In addition, a certified EPA Reference Method 9 observer is required to conduct a quarterly survey of visible emissions from fugitive dust sources. If the observer sees a plume that, on an instantaneous basis, appears to exceed the limit of 40% opacity from a non-point source or 20% opacity from a point source, then the observer is required to take a six minute Method 9 observation of the plume. If the six-minute opacity of the plume is less than required limit, then the observer is required to make a record of the location, date, time of the observation and the results of the Method 9 observation. If the six-minute opacity of the plume exceeds the required limit, then the Permittee is required to adjust or repair the controls or equipment to reduce opacity to below the required limit and report it as an excess emission.

B. Particulate Matter Requirements

The permit specifies particulate matter limits for the fuel-burning equipment, material handling activities, cooling tower, biomass dryer, and work practice standards for fugitive dust sources. The Permittee is required to keep records of all activities that may produce fugitive dust emissions of particulate matter.

C. Monitoring, and Recordkeeping Requirements

The Permittee is required to maintain daily records in the unit of tons, the amount of biomass fed into the pyrolysis system.

VI. Ambient Air Impact Analysis

A. Introduction

Concord Blue Eagar, LLC. conducted an Ambient Air Impact Analysis as part of this permit application to demonstrate protection of the National Ambient Air Quality Standards (NAAQS). Modeling was completed using AERMOD for dispersion modeling of criteria pollutants subject to a NAAQS. Emissions sources that were modeled were the generators, biomass/biochar processing and handling activities, multi-fuel burner, biomass dryer, horizontal chipper, and emergency fire water pump.

B. NAAQS Dispersion Modeling Results

Dispersion modeling for the NAAQS was done using AERMOD. The results demonstrate that the proposed facility is not expected to exceed the NAAQS. Table 4 on the following page presents the results of the modeling analysis, in addition to applicable background concentrations for comparison to the NAAQS.

**TABLE 4:
NAAQS DISPERSION MODELING RESULTS**

Pollutant	Averaging Period	Highest Modeled Cumulative Concentration (µg/m³)	Background Concentration (µg/m³)	Total Cumulative Concentration (µg/m³)	NAAQS (µg/m³)
SO ₂	1-Hour	31.9	79.4	111.3	196
	3-Hour	18.2	97	115.2	1300
NO ₂	1-Hour	119.4	57	176.4	188
	Annual	2.3	1.7	4	100
CO	1-Hour	560.2	582	1142.2	40,000
	8-Hour	173.8	582	755.8	10,000
PM _{2.5}	24-Hour	10.6	13	23.6	35
	Annual	3.2	5	8.2	12
PM ₁₀	24-Hour	24.7	43	67.7	150

X. LIST OF ABBREVIATIONS

A.A.C.	Arizona Administrative Code
CFR.	Code of Federal Regulations
CI.	Compression Ignition
CO.	Carbon Monoxide
EPA.	Environmental Protection Agency
HAPs	Hazardous Air Pollutants
Lb/hr	Pound per Hour
m	meters
mph.	Miles per Hour
mrem	Millirem
NAAQS	National Ambient Air Quality Standards
NO _x	Nitrogen Oxide
NSR.	New Source Review
PM ₁₀ .	Particulate Matter with an Aerodynamic Diameter less than 10 Microns
PM _{2.5} .	Particulate Matter with an Aerodynamic Diameter less than 2.5 Microns
PTE	Potential to Emit
RACT.	Reasonably Available Control Technology
SI.	Spark Ignition
SO ₂ .	Sulfur Dioxide
TPY	Tons per Year
µg/m ³	Microgram per Cubic Meter
VOC	Volatile Organic Compound