

# **Mountain State Clean Energy LLC**

## **Maidsville Facility**

**Permit R14-0038**

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**West Virginia Division of Air Quality**

Edward Andrews, P.E.

October 19, 2021

# Overview

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- Acronyms
- What is being permitted?
- Summary of emissions
- Monitoring
- Testing
- Recordkeeping
- Reporting
- Public comment period
- Summary

# Acronyms

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BACT (Best Available Control Technology)

CO<sub>2</sub> (Carbon Dioxide)

CT (Combustion Turbine)

DB (Duct Burner)

EGUs (Electric Generating Units)

MACT (Maximum Achievable Control Technology)

NAAQS (National Ambient Air Quality Standards)

NSPS (New Source Performance Standards)

NSR (New Source Review)

PSD (Prevention of Significant Deterioration)

SCR (Selective Catalytic Reduction) Control Device

Ox Cat (Oxidation Catalyst)

# What is being permitted?

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- Natural gas-fired combined cycle power plant
- 2x1 configuration: 2 gas turbines x 1 steam turbine, 1,200 MW:
  - Heat Recovery Steam Generators with supplementary natural gas-fired duct burners
- Best Available Control Technology
  - Dry Low NOx (DLN) for NOx control
  - Selective Catalytic Reduction (SCR) for NOx control
  - Oxidation Catalyst for CO, VOC and Formaldehyde control
- PJM Electrical Grid Interconnection
- Proposed combustion turbines will use air-cooled evaporators
- Gas supply via existing interstate pipeline, which will require a connection line to be constructed to the site



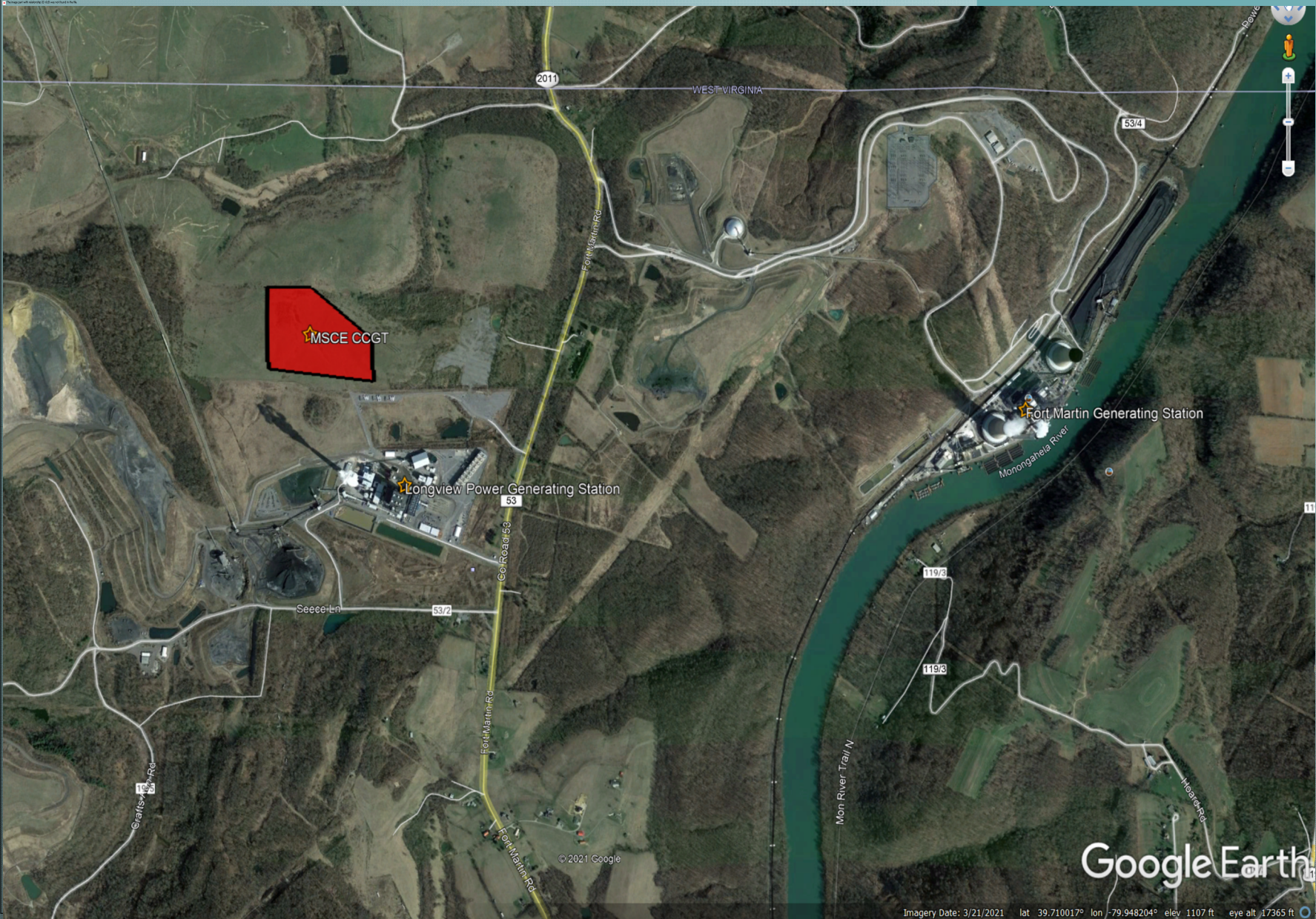
# Other Associated Equipment

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- Cooling tower
- Two fuel gas heaters
  - 7 MMBtu/hr, natural gas-fired
- Emergency generator
  - 2,100 hp, diesel-fired
- Fire water pump
  - 240 hp, diesel-fired
- Two natural gas compressors
  - Electric motor-driven units
- Ammonia and diesel fuel tanks

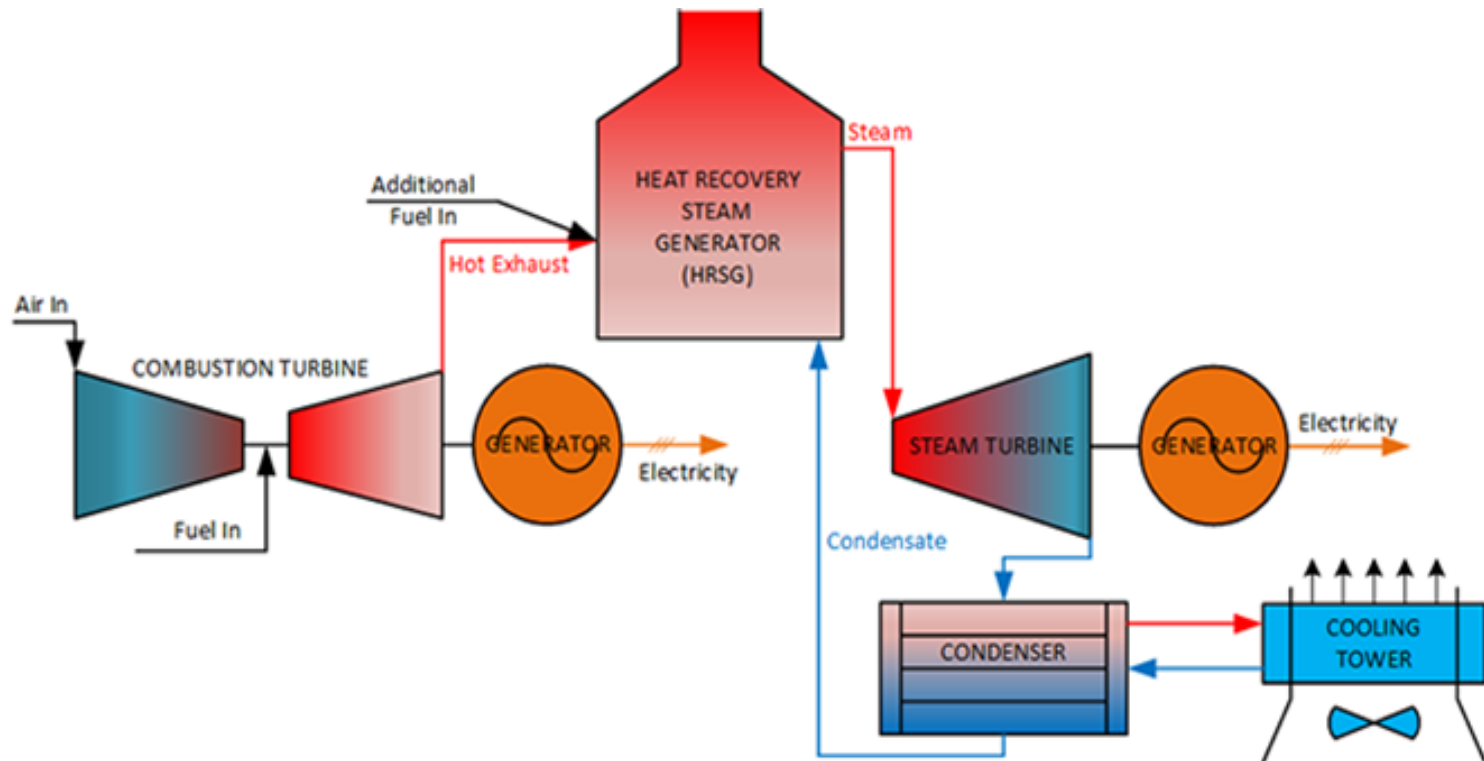


# MSCE Proposed Site





# What is a Combined-Cycle Power Plant?



# BACT for Combustion Turbines

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- $\text{NO}_x$  – 2 ppm @ 15%  $\text{O}_2$
- CO – 2 ppm @ 15%  $\text{O}_2$
- VOC -1 ppm @ 15%  $\text{O}_2$  w/o DF & 2 ppm w/DF
- PM – 0.0058 lb/MMBtu
- $\text{H}_2\text{SO}_4$  - Total Sulfur Content of 0.4 grains/100 scf
- GHG – 824 lb/MW –M501JAC and 852 lb/MW – 7HA.03

# Effects on Dolly Sods and Otter Creek

## MSCE Impacts at 50 km (micrograms/cubic meter)

Avg Period	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
24-hr		0.12	0.096
Annual	0.01	0.015	0.013

## Significant Impact Levels (SIL) for Class I Areas

Short-term		0.3	0.27
Long-term	0.1	0.2	0.05

MSCE's Screening test for the Air Quality Related Values (AQRVs) was Q/d, which was <10 (Q/d for MSCE was 8.1).

# Effects on Local Area

	NO <sub>x</sub>		PM <sub>2.5</sub>		PM <sub>10</sub>
<b>National Ambient Air Quality Standard (NAAQS)</b>	1-hr avg H8H 5-yr avg	Annual Avg	24-hr avg H8H 5-yr avg	Annual Avg	24-hr avg H6H 5-yr avg
<b>Total (µg/m<sup>3</sup>)</b>	<b>226.7</b>	18.1	<b>163.8</b>	<b>50.4</b>	<b>220.0</b>
<b>NAAQS (µg/m<sup>3</sup>)</b>	188	100	35	12	150
<b>Max Contribution from MSCE to any exceedance (µg/m<sup>3</sup>)</b>	1.92	NA	0.248	0.038	0.486
<b>SIL (µg/m<sup>3</sup>)</b>	7.5	1	1.2	0.2	5

# Increment Consumed

	<b>NO<sub>x</sub></b>	<b>PM<sub>2.5</sub></b>		<b>PM<sub>10</sub></b>	
<b>PSD Increment</b>	Annual Avg	24-hr avg H2H 5-yr avg	Annual Avg	24-hr avg H2H 5-yr avg	Annual Avg
<b>Total (µg/m<sup>3</sup>)</b>	4.93	6.32	1.32	180.2	43.8
<b>Increment (µg/m<sup>3</sup>)</b>	25	9	4	<b>30</b>	<b>17</b>
<b>MSCE Max Increment Consumed (µg/m<sup>3</sup>)</b>	0.0037	6.32	1.28	0.54	0.05
<b>Max MSCE Project Contribution to any exceedance (µg/m<sup>3</sup>)</b>	NA	NA	NA	0.47	0.05
<b>Significant Impact Level (SIL) (µg/m<sup>3</sup>)</b>	7.5	1	0.2	5	1

# Summary of Emissions

## MSCE

Pollutant	Combustion Turbines		Facility
	Normal Operations (tons per year)	Start up/ shutdown (tons per year)	Emissions (tons per year)
Particulate Matter (PM)	198.1	2.24	210.0
Nitrogen Oxides (NO <sub>x</sub> )	284.7	32.2	321.0
Sulfur Oxides (SO <sub>2</sub> )	39.8		39.9
Carbon Monoxide (CO)	173.3	100.5	276.0
Volatile Organic Compounds (VOCs)	99.3	41.2	141.0
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	35.8		35.8
Total HAPs	23.3		23.3



# Applicable Regulations

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The following Federal and State air quality standards have been incorporated into the permit:

- Rule 14 PSD Requirements - Best Available Control Technology (BACT)
- Rule 13 for non-PSD pollutants (mainly HAPs)
- Rule 2 for PM Standard for Boilers and Heaters
- NSPS for Stationary Combustion Turbines
- NSPS for Greenhouse Gas Emissions for Electric Generating Units
- NSPS for Stationary Compression Ignition Internal Combustion Engines
- MACT for Stationary Combustion Turbines
- MACT for Stationary Reciprocating Internal Combustion Engines
- MACT for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

# Monitoring

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- Continuous Emission Monitoring of  $\text{NO}_x$ , CO and ammonia slip.
- Separate Fuel Metering of CT and DB.
- Sulfur content and heating value of the natural gas.
- Monitoring of the SCR and Ox Cat.
- Startup and shutdown times.
- Operating hours of the engines.
- Fuel usage and operating hours of the FGHS.
- Flow rate and total dissolved solids or conductivity of the cooling water.
- Annual leak detection and repair (LDAR) survey of the fuel supply lines.

# Testing

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- Initial Testing
  - CO, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, VOC, H<sub>2</sub>SO<sub>4</sub>, formaldehyde, and ammonia slip.
- Annual Testing
  - CO, NO<sub>x</sub> and ammonia slip for the CEMs.
- Subsequent Testing
  - PM<sub>10</sub>, PM<sub>2.5</sub>, VOC, and H<sub>2</sub>SO<sub>4</sub> based on indicators.

# Recordkeeping

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- **For the Combustion Turbines, recordkeeping includes:**
  - Records of operation, maintenance of control devices, inspections, fuel usage, steam load, generator outputs and startups/shutdowns.
- **For the Fuel Gas Heaters:**
  - Records of operation, fuel usage and tune-ups.
- **For the Emergency Generator and Fire Water Pump:**
  - Records of hours of operation and purpose of the operation.
  - Records of maintenance performed and tune-ups.

# Recordkeeping *(cont'd.)*

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- **For the Cooling Tower:**

- Drift test.

- **For fugitive emissions:**

- Records of surreys, repairs, and sulfur hexafluoride circuit breaker alarms.

# Reporting

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- **6-month reports for:**
  - NO<sub>x</sub> CEMs records.
- **Annual reports on:**
  - Annual fugitive emissions surreys.
- **Biennial Annual (every two years) reports on:**
  - Results of the tune-ups for the fuel gas heaters.

# Public Comment Period

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- Class I legal advertisement published in Dominion Post on Friday, October 1.
- Comment period ends at 5:00 p.m. on Tuesday, November 1.

# Where Can I Find the Draft Permit?

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- Copies of the Preliminary Determination, Draft Permit, Application and supporting documents can be found on the DEP website:

<https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx>

- Documents are also available on DEP's electronic document management system – ApplicationXtender.

<https://documents.dep.wv.gov/appxtender>

User Name: DEP

Password: DEP

- Call (304) 926-0499 ext. 41244 to request a copy



# Summary

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- DAQ will continue to accept public comments until 5:00 p.m., Monday, November 1, 2021.
- DAQ will evaluate and respond to all timely air quality-related public comments.
- After November 1, DAQ will take final action on this application taking into consideration all comments received during the public comment period relative to the proposed project.

# Contact Information

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