

STATEMENT OF BASIS

Tenaska Alabama Partners, L.P.
Tenaska Lindsay Hill Generating Station
Billingsley, Alabama
Autauga County
201-0008

This proposed renewal Title V Major Source Operating Permit is issued under the provisions of ADEM Admin. Code r. 335-3-16. The above-referenced applicant has applied to renew the existing Title V Permit, which was originally issued on May 18, 2006. The above named applicant has requested authorization to perform the work or operate the facility shown on the application and drawings, plans and other documents submitted on September 24, 2020 attached hereto or on file with the Air Division of the Alabama Department of Environmental Management, in accordance with the terms and conditions of this permit. This permit would not allow the emission of additional air pollutants.

Tenaska Alabama Partners, L.P. was issued its existing Major Source Operating Permit (MSOP) on June 1, 2016, with an effective date of June 15, 2016, and with an expiration date of June 14, 2021. Per ADEM Rule 335-3-16-.12(2), an application for permit renewal shall be submitted at least six (6) months, but not more than eighteen (18) months, before the date of expiration of the permit. Based on this rule, the application for renewal was due to the Department no later than December 14, 2020. No additional information was deemed necessary for processing of this MSOP.

The Lindsay Hill Generating Station is owned and operated by Tenaska Alabama Partners, L.P. and is located in Billingsley, Alabama. This facility operates three (3) combined-cycle combustion turbine (CT) units each with a heat recovery steam generator (HRSG) with supplementary firing from a duct burner and steam turbine. This facility generates approximately 844 MW of electric power when firing natural gas during summer design conditions and 924 MW of electric power when firing natural gas during winter design conditions. These figures include approximately 120 MW from supplemental firing in the HRSG. The significant sources of air pollutants at this facility are:

- Three (3) 163/164 MW Natural Gas/Distillate Oil Fired Combustion Turbines (CT-1, CT-2, CT-3) each with 550 MMBtu/hr Natural Gas Fired Duct and Heat Recovery Steam Generator with Selective Catalytic Reduction (SCR) NO_x Control.
- 412 HP Existing Emergency Firewater Pump

Additionally, the applicable requirements of Cross-State Air Pollution Rule (CSAPR) will be included in this renewal.

Significant Changes to Permit

Under this renewal, Tenaska has requested that the opacity standard for the duct burner be removed as the unit will only combust pipeline quality natural gas and is exempt from the opacity standard specified in 40 CFR Subpart Da. However, a more stringent BACT opacity standard still applies. In addition, Tenaska has requested that the particulate matter (PM) standard for the duct burner be removed as the unit, utilizing pipeline quality natural gas, has potential SO₂ emissions

of 0.060 lb/MMBtu or less and uses no post-combustion technology to reduce emissions of SO₂ or PM which allows the facility to be exempt from the PM standard per 40 CFR Subpart Da.

Three (3) 163/164 MW Combined Cycle Units (CT-1, CT-2, CT-3)

The combined cycle units (combustion turbine and duct burner) fire pipeline natural gas. Fuel Oil is in place as a backup fuel for the combustion turbines. Each combustion turbine and each steam generator has the capability to generate electric power of approximately 163/164 MW and 120 MW, respectively. Each unit's duct burner has a heat input rating of 550 MMBtu/hr and provides the capability to produce additional steam from each heat recovery steam generator (HRSG). The NO_x emissions from the combined cycle combustion turbines are controlled by the use of Selective Catalytic Reduction (SCR).

The combined cycle units were subject to a Prevention of Significant Deterioration (PSD) Review in which BACT was established for NO_x, CO, VOC, SO₂, PM₁₀, and sulfuric acid mist. Air Permit Number 201-0008-X001, which originally included the BACT requirements, was issued on July 6, 2000. The combustion turbines are subject to the Federal New Source Performance Standards (NSPS) contained in 40 CFR Part 60, Subpart GG, and the duct burners are subject to NSPS, Subpart Da. The combined cycle units are also subject to the Acid Rain Program and the Cross-State Air Pollution Rule (CSAPR). The combined cycle units' expected emissions and the associated standards are listed below.

Initially the CT's were permitted as 170 MW units; after further verification during the 2016 renewal and an email dated May 13, 2016 sent by Trevor Tobias of Tenaska, it was determined that the nameplate capacity of these CTs are 163/164 MW (natural gas/distillate).

Emission Standards

Opacity:

- Visible Emissions from each of the combined cycle/duct burner stacks shall not exceed 10%.

(ADEM Admin. Code r. 335-3-14-.04(9)(b)) BACT

The opacity standard applies at all times except during startup, shutdown, and load change.

- An owner or operator of an affected facility that combusts only natural gas and/or synthetic natural gas that chemically meets the definition of natural gas is exempt from the opacity standard specified in paragraph §60.42Da(b).

(40 CFR 60 Subpart Da, §60.42 Da(b)(2))

Particulate Matter (PM):

- Particulate emissions from each of the combined cycle/duct burner stacks shall not exceed 0.020 lb/MMBtu & 31.9 lb/hr when firing natural gas and 0.042 lb/MMBtu & 66.1 lb/hr when firing fuel oil.

(ADEM Admin. Code r. 335-3-14-.04(9)(b)) BACT

- An owner or operator of an affected facility that combusts only gaseous or liquid fuels (excluding residual oil) with potential SO₂ emissions rates of 26 ng/J (0.060 lb/MMBtu) or less, and that does not use a post-combustion technology to reduce emissions of SO₂ or PM is exempt from the PM emissions limits in this section.

(40 CFR 60 Subpart Da), §60.42Da(f)(1)

The PM emission standards apply at all times except during startup, shutdown, and load change.

Sulfur Dioxide (SO₂):

- Sulfur Dioxide emissions from each unit's duct burners shall not exceed 0.20 lb/MMBtu.

(ADEM Admin. Code r. 335-3-10-.02(2)(a), 40 CFR 60 Subpart Da, §60.43Da(b)(2))

- Sulfur Dioxide emissions from each of the combined cycle/duct burner stacks shall not exceed 150 ppmv or sulfur content of fuels burned in the combustion turbines shall not exceed 0.8% by weight.

(ADEM Admin. Code r. 335-3-10-.02(33), 40 CFR 60 Subpart GG, §60.333)

- Sulfur Dioxide emissions from each of the combined cycle/duct burner stacks shall not exceed 0.014 lb/MMBtu & 33.2 lb/hr when firing natural gas and 0.052 lb/MMBtu & 110.4 lb/hr when firing fuel oil.

This SO₂ emission standard applies at all times except during startup, shutdown, and load change.

(ADEM Admin. Code r. 335-3-14-.04(9)(b)) BACT

- Sulfur content of fuel oil burned in the combustion turbines shall not exceed 0.05% by weight. The duct burners shall only fire natural gas.

(ADEM Admin. Code r. 335-3-14-.04(9)(b)) BACT

- The combined cycle units are subject to the Acid Rain Regulations. These units are not allocated SO₂ allowances under Phase II of the Acid Rain Program. These units shall hold sufficient allowances in the unit account to cover annual SO₂ emissions.

(ADEM Admin. Code r. 335-3-18-.01 and 40 CFR Part 73)

Nitrogen Oxides (NO_x):

- Nitrogen Oxides emissions from each of the combined cycle/duct burner stacks shall not exceed 0.0145 lb/MMBtu and 34.9 lbs/hr when firing natural gas and

0.050 lb/MMBtu and 113.4 lb/hr when firing distillate oil (each limit based on 3-hr rolling average).

(ADEM Admin. Code r. 335-3-14-.04(9)(b)) BACT

The NO_x emission standards apply at all times except during startup, shutdown, and load change.

- Nitrogen Oxides emissions from each of the combined cycle/duct burner stacks shall not exceed 109 ppmv (75 ppmv adjusted for heat rate) while firing natural gas and 102 ppmv (75 ppmv adjusted for heat rate) while firing fuel oil (4-hr rolling average).

(ADEM Admin. Code r. 335-3-10-.02(33), 40 CFR 60 Subpart GG, §60.332(a)(1), §60.334(j)(1)(iii)(A)

- Nitrogen Oxides emissions from each of the duct burners shall not exceed 1.6 lb/MWh (30-day rolling average).

(ADEM Admin. Code r. 335-3-10-.02(2)(a), 40 CFR 60 Subpart Da, §60.44Da(d)(1))

Carbon Monoxide (CO):

- Carbon Monoxide emissions from each of the combined cycle/duct burner stack shall not exceed 0.045 lb/MMBtu and 106.0 lbs/hr when firing natural gas and 0.062 lb/MMBtu & 150.5 lbs/hr when firing fuel oil.

(ADEM Admin. Code r. 335-3-14-04(9)(b)) BACT

The CO emission standards apply at all times except during startup, shutdown, and load change.

Volatile Organic Compounds (VOC):

- Volatile Organic Compounds emissions from each of the combined cycle/duct burner stack shall not exceed 0.007 lb/MMBtu and 16.2 lbs/hr when firing natural gas and 0.012 lb/MMBtu & 27.3 lbs/hr when firing fuel oil.

(ADEM Admin. Code r. 335-3-14-04(9)(b)) BACT

The VOC emission standards apply at all times except during startup, shutdown, and load change.

Sulfuric Acid Mist:

- Sulfuric acid mist emissions from each of the combined cycle/duct burner stack shall not exceed 0.0011 lb/MMBtu and 2.55 lbs/hr when firing natural gas and 0.004 lb/MMBtu & 8.6 lbs/hr when firing fuel oil.

(ADEM Admin. Code r. 335-3-14-04(9)(b)) BACT

The H₂SO₄ emission standards apply at all times except during startup, shutdown, and load change.

Operational:

- The three (3) combustion turbines shall burn no more than a total of 31,500,000 gallons of distillate oil in any consecutive 12-month period.

(ADEM Admin. Code r. 335-3-14-.04(9)) BACT

- The three (3) heat recovery steam generator duct burners shall combust no more than a total of 10,512,000 MMBtu of natural gas in any consecutive 12-month period.

(ADEM Admin. Code r. 335-3-14-.04(9)) BACT

Potential Emissions

Tenaska was designed with the capacity to fire natural gas in both the combustion turbines and duct burner with the combustion turbines having a secondary/back-up fuel capacity to burn distillate fuel oil. Tenaska is under permit restrictions to burn 31.5 MMgals/yr or less of distillate fuel oil in the combustion turbines and 10,512,000 MMBtu/yr or less of natural gas in the duct burners. The potential emissions for the worst-case scenario are shown below:

Pollutant	PTE (tons/year)
PM/PM10/PM2.5	415
NO _x	486
CO	1,183
SO ₂	466
VOC	173
Total HAP	10.4
CO ₂ e	3,407,397

Potential to Emit – 3 CCCT w/Duct Burner

The listed emission rates below were established during initial compliance testing.

Particulate Matter (PM) and Opacity:

- During initial compliance testing, the PM emission rates from the units were ≤0.002 lb/MMBtu. The testing was conducted while firing the duct burners and while burning both natural gas and fuel oil in the combustion turbines. Visible emissions would not be expected while burning natural gas or low sulfur fuel oil.

Sulfur Dioxide (SO₂) and Sulfuric Acid Mist:

- Initial compliance testing indicated a maximum emission rate of 0.007 lb/MMBtu while the combustion turbines were firing natural gas and 0.03 lb/MMBtu while the combustion turbines were firing fuel oil. Initial performance testing for sulfuric acid mist was not required since the units demonstrated compliance with the sulfur dioxide emission limits (i.e., it was estimated that the units were complying with the sulfuric acid mist emissions limits if the sulfur

dioxide emission limits were being met).

Nitrogen Oxides (NO_x):

- During initial compliance testing, the NO_x emission rates from the units were below the permitted allowable limits. While combusting natural gas, the maximum NO_x emission rate from the units was 0.012 lb/MMBtu. While firing fuel oil, the maximum NO_x emission rate from the units was 0.043 lb/MMBtu.
- The unit is required to monitor NO_x with a Continuous Emissions Monitoring System (CEMS). CEMS data indicates that NO_x emissions from the combined cycle/duct burner are below the permitted emission limits.

Carbon Monoxide (CO):

- During initial compliance testing, the CO emission rates from the units were below the permitted allowable emission limits. The maximum CO emission rate while firing natural gas was 0.031 lb/MMBtu and while firing fuel oil was 0.06 lb/MMBtu.

Volatile Organic Compounds (VOC):

- During initial compliance testing, the VOC emission rates from the units were below the permitted allowable limits. The maximum VOC emission rate while firing natural gas was 0.005 lb/MMBtu and while firing fuel oil was 0.006 lb/MMBtu.

Green House Gases (GHG):

- The facility reported an annual total of 3,407,397 Tons. This is an estimate of the potential emissions.

Periodic monitoring and Compliance Assurance Monitoring (CAM)

Particulate Matter (PM)/Opacity:

- Based on the low expected levels of emissions as compared to the regulatory allowable emission limits, periodic monitoring of opacity and particulate matter emissions is not considered necessary. Additionally, the only control device for the CT is an SCR that is only used to control NO_x emissions; therefore, CAM is not applicable to PM and Opacity.

Sulfur Dioxide (SO₂)/Sulfuric Acid Mist:

- Monitoring the sulfur content (≤ 0.05%) of the fuel oil burned in these units should provide reasonable assurance that the units are meeting the SO₂ and sulfuric acid mist emission limits. Oil sampling and analysis are required to be performed in accordance with 40 CFR Part 75, Appendix D. Additionally, the only control device for the CT is an SCR that is only used to control NO_x emissions; therefore, CAM is not applicable to SO₂ or Sulfuric Acid Mist.

Nitrogen Oxides (NO_x):

- The combined-cycle combustion turbine units are required to operate continuously on each exhaust stack a NO_x continuous emission monitoring system (CEMS). The CEMS is used to demonstrate compliance with the best available control technology (BACT) emission limits, the Acid Rain Program,

and CSAPR.

- These units are required by 40 CFR Part 75 to maintain and operate NO_x Continuous Emissions Monitoring Systems (CEMS). Based on 40 CFR §64.2, the only pollutant potentially subject to CAM would be NO_x since it is the only pollutant which is controlled by an active control device and the potential uncontrolled emission rate is greater than 100 tons per year. 40 CFR §64.2(b)(vi) provides exemptions for the CAM regulations including using CEMS as a continuous compliance determination method (CCDM). Tenaska has requested that the NO_x CEMS also be used as CCDM. 40 CFR §64.2(b)(vi) states that the requirements of CAM shall not apply to any of the emission limitations or standards for which a part 70 or 71 permit specifies a CCDM. On May 24, 2005, EPA Region IV approved Tenaska Partners' request to utilize the CEMS as a CCDM, therefore exempting the units from CAM as indicated in §64.2(b)(1)(iv). The CEMS would therefore be a compliance determiner for each of the applicable NO_x limits based upon the associated averaging times.

Volatile Organic Compounds (VOC) and Carbon Monoxide (CO):

- These units are required by ADEM Admin. Code r. 335-3-16-.05(c) to maintain and operate CO CEMS. The CEMS shall be utilized as an indicator of compliance with the CO and VOC emission limitations. Since VOC or CO is not controlled by an active control device, these units would not be subject to CAM requirements for VOC or CO.

Record Keeping and Reporting

- An excess emissions report for the combined turbine/duct burner stack as defined by 40 CFR Part 60, Subpart A, §60.7(c) and (d), shall be submitted semi-annually to the Department within 30 days of the end of each reporting period.

ADEM Admin. Code r. 335-3-16-.05(c) and 40 CFR §60.7(c) and (d)

- Records of the following shall be maintained in a form suitable for inspection for a period of at least five years following the said recording:
 1. The sulfur content, by weight, of the fuel burned in the combustion turbines.
 2. The monthly and rolling 12 month totals of the quantity of fuel oil fired in each combustion turbine and the rolling 12 month totals of the quantity of fuel oil fired in all combustion turbines.
 3. The monthly and rolling 12 month totals of the quantity of natural gas fired in each duct burner and the rolling 12 month totals of the quantity of natural gas fired in all duct burners.

ADEM Admin. Code r. 335-3-16-.05(c)

- The facility shall comply with the recordkeeping and reporting requirements of Rules 335-3-5-.31, 335-3-5-.35, 335-3-8-.33, 335-3-8-.37, 335-3-8-.65 and 335-3-8-.69.

ADEM Admin. Code r. 335-3-5-.31, 335-3-5-.35, 335-3-8-.33, 335-3-8-.37, 335-3-8-.65 and 335-3-8-.69.

Cross-State Air Pollution Rule

- These units are subject to the applicable provisions of Cross-State Air Pollution Rule (CSAPR) to include all applicable provisions of the SO₂ Group 2 Trading Program requirements.

(ADEM Admin. Code r. 335-3-5-.06 through 335-3-5-.36)

- These units are subject to the applicable provisions of Cross-State Air Pollution Rule (CSAPR) to include all applicable provisions of the NO_x Annual Trading Program requirements.

(ADEM Admin. Code r. 335-3-8-.07 through 335-3-8-.70)

MACT Subpart ZZZZ – Existing Emergency Firewater Pump

This emergency firewater pump is subject to 40 CFR 63, Subpart ZZZZ, because it was manufactured before the applicability date of April 1, 2006 in 40 CFR Part 60 Subpart IIII. This emergency firewater pump is subject to the applicable requirements in 40 CFR Part 63 Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (RICE)). The following emergency firewater pump is considered Subpart ZZZZ:

<u>Source #</u>	<u>HP</u>	<u>Fuel</u>
002	412	Diesel

NSPS Subpart IIII

Subpart IIII applies to owners and operators of engines that commence construction after July 11, 2005, where the engines are manufactured on or after July 1, 2006. This compression ignition firewater pump was manufactured before April 1, 2006. Therefore, Subpart IIII does not apply.

(40 CFR Part 60 Subpart IIII, §60.4200(a)(3))

MACT Subpart ZZZZ

Emission Standards

- This unit is subject to the applicable requirements listed in Table 2d of 40 CFR 63 Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

(40 CFR Part 63 Subpart ZZZZ, §63.6603(a))

- The Permittee must operate and maintain this unit according to the manufacturer's emission-related written instructions or develop a maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.

(40 CFR Part 63 Subpart ZZZZ, §63.6625(e)(3))

- The Permittee must install a non-resettable hour meter for each unit if one is not already installed.

(40 CFR Part 63 Subpart ZZZZ, §63.6625(f))

- This unit may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of this unit is limited to 100 hours per year. There is no time limit on the use of this unit in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. This unit may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. Any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in 40 CFR 63 Subpart ZZZZ, is prohibited.

(40 CFR Part 63 Subpart ZZZZ, §63.6640(f))

Expected Emissions

The expected emissions are based on AP-42 emission factors, manufacturer's certifications, and a maximum operation of 500 hours per year. The expected emissions of the firewater pump engine subject to Subpart ZZZZ – Existing Firewater Pump Emergency Engines are shown below:

Pollutant	412 HP Firewater Pump	
	lb/hr	TPY
PM ₁₀ / PM _{2.5}	0.97	0.24

SO₂	0.91	0.23
NO_x	13.81	3.45
CO	2.97	0.74
VOC	0.22	0.055
CO_{2e}	--	119.68

MACT Monitoring

The Permittee shall perform the following activities:

- (a) Change oil and filter every 500 hours of operation or annually, whichever comes first;
- (b) Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first;
- (c) Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

Or utilize an oil analysis program as describe in §63.6625(i) or §636625(j).

(40 CFR Part 63 Subpart ZZZZ, Table 2d & §63.6625(i))

If an oil analysis program is utilized for a stationary compression ignition engine, the Permittee must perform the oil analysis at the same frequency specified above for changing the oil. The Permittee must at a minimum analyze the following parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new, viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new, or percent water content (by volume) is greater than 0.5. If any of the limits are exceed, the Permittee must change the oil within 2 business days of receiving the results of the analysis or before commencing operation, whichever is later.

(40 CFR Part 63 Subpart ZZZZ, §63.6625(i))

CAM

This source is uncontrolled; therefore, CAM does not apply.

Recordkeeping and Reporting

The Permittee must keep records of the parameters that are analyzed as part of the oil analysis program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for

the engine. These records shall be maintained in a manner suitable for inspection for a period of 5 years from record generation.

(40 CFR Part 63 Subpart ZZZZ, §63.6625(i))

The Permittee must keep records of the maintenance conducted on these units in order to demonstrate that you operated and maintained these units and after-treatment control device (if any) according to your own maintenance plan or according to manufacturer's written instructions. These records shall be maintained in a manner suitable for inspection for a period of 5 years from record generation.

(40 CFR Part 63 Subpart ZZZZ, §63.6655(e))

The Permittee must keep records of the hours of operation of each engine that is recorded through the non-resettable hour meter. The facility must document how many hours are spent for emergency operation; including what classified the operation as emergency and how many hours are spent for non-emergency operation. These records shall be maintained in a manner suitable for inspection for a period of 5 years from record generation.

(40 CFR Part 63 Subpart ZZZZ, §63.6655(f))

Plant – Wide Potential to Emit

Pollutant	PTE (tons/year)
PM/PM10/PM2.5	415.24
NO _x	489.45
CO	1,183.74
SO ₂	466.23
VOC	173.06
Sulfuric Acid Mist	35.70
Total HAP	10.40
CO ₂ e	3,407,516

Potential to Emit – Plant - Wide

Pollutant	PTE (tons/year)
PM/PM10/PM2.5	40.87
NO _x	50.76
CO	98.13
SO ₂	3.86
VOC	19.01
Sulfuric Acid Mist	7.05
Total HAP	2.84
CO ₂ e	762,553.88

Plant – Wide Actual Emissions (2019)

Recommendation:

I recommend that the Department issue this third renewal of Major Source Operating Permit NO. 201-0008 to Tenaska Alabama Partners, L. P., Tenaska Lindsay Hill Generating Station. The facility should be able to meet the applicable state and federal regulations associated with their emission sources.



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Date

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