Table 1.1 provides a summary of the proposed BACT limits for the combustion turbines. Only the proposed BACT limit, expressed in lb/MW-hr are added as part of this addendum.

Table 1.1. Proposed GHG BACT Limits for the Montana Power Station

EPN	Description	Proposed BACT Limit[a,b] (CO_2e tpy)	Proposed BACT Limit (lb CO_2/MW-hr)
GT-1	Combustion Turbine 1	227,840	1,194
GT-2	Combustion Turbine 2	227,840	1,194
GT-3	Combustion Turbine 3	227,840	1,194
GT-4	Combustion Turbine 4	227,840	1,194

[a] The BACT limit for the Combustion Turbines includes MSS emissions

[b] The BACT limits are represented in metric tons

COMBUSTION TURBINES

GHG emissions from the proposed combustion turbines include CO_2, CH_4, and N_2O resulting from the combustion of natural gas. As stated in the Montana Power Station GHG PSD application, EPEC proposes the following design elements and work practices as BACT for the combustion turbines:

- Evaporative cooling design;
- Installation of four LMS100 SCCTs;
- Use of natural gas as fuel; and
- Implementation of good combustion, operating, and maintenance practices.

EPEC proposes a CO_2e emission limit of 227,840 tpy CO_2e and 1,194 lb CO_2/MWh for each of the four SCCTs which includes emissions from MSS activities. The proposed emission limits is based on a 365-day rolling average basis and includes CO_2, CH_4, and N_2O emissions, with CO_2 emissions being more than 99% of the total emissions.

Compliance with these emission limits will be demonstrated by monitoring fuel consumption with a fuel flow meter, installing a CO_2 CEMS on each turbine stack, and performing CH_4 and N_2O calculations consistent with the calculations included in Appendix B of this application. The lb/MWh emission limit will be calculated based on the measured net hourly energy output (MWh (net)) and the CO_2 emission CEMS data. These calculations will be performed on a monthly basis to ensure that the 12-month rolling average tons of CO_2e per year emission rates do not exceed these limits.

The BACT limit of 1,194 lb CO_2/MW-hr is calculated based on the following information

The BACT limit is calculated based on proposed equipment specifications as provided by the manufacturer and the default emission factors in the EPA's Mandatory Greenhouse Reporting Rule (MRR).

$$\text{lb } CO_2\text{/MW-hr} = EF * HHV / \text{Rated KW} * 1000 * 2.205$$

Where each parameter is defined and further discussed below.

Parameter	Description	Remarks
lb CO_2/MW-hr	Pounds of CO_2 per Megawatt-hr (lb CO_2/MW-hr)	

Rated KW *	Rated Kilowatts (KW)	50016 KW at 50% load at 105° F
HHV*	Heat input (MMBTU/hr) of the Combustion Turbine at 50% load	511 MMBtu/hr at 50% load at 105° F
EF	Fuel-specific default CO_2 emission factor, from Table C-1 of 40 CFR 98 Subpart C (kg CO_2/MMBtu)	53.02 kg CO_2/MMBtu
1000	Unit conversion from Kilowatt (KW) to Megawatt (MW)	1000 kW/1 MW
2.205	Unit Conversion from pound (lb) to kilogram (kg)	2.205 lb/kg

[1] Data obtained from the GE Performance Data provided by Mr. Steve Cooper (GE Power & Water) to Ms. Latha Kambham (Trinity Consultants) via email on April, 5, 2012.

Calculation:

$$\frac{53.02\ \text{kg}}{1\ \text{MMBtu}} \times \frac{2.205\ \text{lb}}{1\ \text{kg}} \times \frac{511\ \text{MMBtu/hr}}{50016\ \text{KW}} \times \frac{1000\ \text{KW}}{1\ \text{MW}} = 1{,}194\ \text{lb}\ CO_2\text{/MW-hr}$$