**Vendor Emissions 7HA.01 Combustion Turbine & Duct Burner**
**CPV Towantic Energy, LLC**

| **AMBIENT CONDITIONS:** | **-14.2°F** | | | | | | **59°F** | | | | | **90°F** | | **100°F** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **GE CASE #:** | **#1** | **#2** | **#3** | **#4** | **#28** | **#29** | **#35** | **#9** | **#31** | **#32** | **#11** | **#36** | **#13** | **#14** | **#16** | **#17** | **#23** | **#24** | **#22** |
| Fuel | Natural Gas | | | | | | | | | | | | | | | | | | |
| Number of GTs Operating | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| GT Operating Load | BASE | BASE | BASE | BASE | 75% | 50% | BASE | BASE | 75% | 50% | 30% | BASE | BASE | BASE | BASE | BASE | 75% | 50% | 41% |
| Fuel Heating Value, Btu/lb (HHV) | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 | 22,809 |
| Evaporative Cooler Status | Off | Off | Off | Off | Off | Off | Off | Off | Off | Off | Off | Off | On | On | On | On | Off | Off | Off |
| Duct Burner Status | Fired | Fired | Fired | Unfired | Unfired | Unfired | Fired | Unfired | Unfired | Unfired | Unfired | Fired | Unfired | Fired | Fired | Unfired | Unfired | Unfired | Unfired |
| Chiller Status | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| Ambient Relative Humidity, % | 20 | 20 | 20 | 20 | 20 | 20 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 40 | 40 | 40 | 40 | 40 | 40 |
| BAROMETRIC PRESSURE, psia | 14.30 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 |
| GT Heat Input (MMBtu/hr/unit, HHV) | 2,523 | 2,523 | 2,523 | 2,523 | 2,045 | 1,580 | 2,423 | 2,423 | 2,017 | 1,538 | 555 | 2,211 | 2,301 | 2,294 | 2,294 | 2,294 | 1,684 | 1,306 | 1,169 |
| DB Heat Input (MMBtu/hr/unit, HHV) | 198 | 97 | 962 | 0 | 0 | 0 | 110 | 0 | 0 | 0 | 0 | 209 | 0 | 190 | 766 | 0 | 0 | 0 | 0 |
| Gross Power (kW) | N/A | N/A | N/A | N/A | N/A | N/A | 804,949 | 777,538 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Heat Rate (Btu/kW-hr, gross) | N/A | N/A | N/A | N/A | N/A | N/A | 6,295 | 6,234 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **HRSG STACK EXHAUST GAS** | | | | | | | | | | | | | | | | | | | |
| Exhaust Flow, lb/hr | 5,021,800 | 5,017,200 | 5,057,000 | 5,012,700 | 4,031,000 | 3,234,000 | 4,655,900 | 4,647,300 | 3,828,300 | 3,155,300 | 2,460,200 | 4,262,100 | 4,386,900 | 4,385,100 | 4,411,700 | 4,376,400 | 3,552,200 | 2,909,600 | 2,585,100 |
| Stack Temperature, °F | 181.9 | 188.9 | 170.0 | 196.4 | 189.6 | 180.4 | 174.2 | 183.2 | 180.2 | 179.0 | 170.0 | 186.7 | 196.2 | 197.2 | 170.0 | 202.8 | 197.1 | 190.0 | 182.9 |
| Exhaust Flow, acfm | 1,378,879 | 1,391,719 | 1,369,559 | 1,405,650 | 1,118,607 | 884,171 | 1,268,318 | 1,282,265 | 1,050,690 | 863,237 | 663,327 | 1,192,417 | 1,245,356 | 1,248,598 | 1,209,184 | 1,255,005 | 1,005,696 | 814,190 | 715,554 |
| $O_2$, Vol. % | 11.55% | 11.88% | 9.07% | 12.20% | 12.25% | 12.56% | 11.18% | 11.84% | 12.17% | 12.80% | 13.02% | 10.74% | 11.40% | 10.69% | 8.58% | 11.40% | 12.35% | 12.77% | 12.72% |
| $CO_2$, Vol. % | 4.36% | 4.21% | 5.50% | 4.06% | 4.03% | 3.89% | 4.43% | 4.13% | 3.98% | 3.69% | 3.58% | 4.46% | 4.12% | 4.45% | 5.42% | 4.12% | 3.74% | 3.55% | 3.57% |
| $H_2O$, Vol. % | 8.45% | 8.15% | 10.68% | 7.86% | 7.82% | 7.54% | 9.58% | 8.99% | 8.70% | 8.13% | 7.93% | 11.45% | 11.16% | 11.81% | 13.68% | 11.19% | 9.80% | 9.43% | 9.47% |
| $N_2$, Vol. % | 74.76% | 74.87% | 73.88% | 74.99% | 75.01% | 75.12% | 73.93% | 74.16% | 74.27% | 74.49% | 74.58% | 72.49% | 72.46% | 72.19% | 71.47% | 72.43% | 73.24% | 73.38% | 73.37% |
| Ar, Vol. % | 0.89% | 0.89% | 0.88% | 0.89% | 0.89% | 0.89% | 0.88% | 0.88% | 0.88% | 0.89% | 0.89% | 0.87% | 0.86% | 0.86% | 0.85% | 0.86% | 0.87% | 0.87% | 0.87% |
| MW, lb/lb-mole | 28.43 | 28.45 | 28.29 | 28.47 | 28.47 | 28.49 | 28.31 | 28.35 | 28.37 | 28.41 | 28.42 | 28.11 | 28.11 | 28.07 | 27.96 | 28.11 | 28.23 | 28.25 | 28.25 |
| **HRSG EXHAUST STACK EMISSIONS (PER STACK):** | | | | | | | | | | | | | | | | | | | |
| NOX, ppmvd @ 15% O2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2 |
| NOX, lb/MMBtu as NO2 (EPA Method 19) | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 | 0.0074 |
| NOX, lb/hr as NO2 | 20.90 | 20.10 | 26.80 | 19.40 | 15.50 | 12.00 | 19.80 | 18.40 | 14.50 | 11.10 | 8.40 | 18.40 | 17.40 | 18.80 | 23.30 | 17.40 | 12.80 | 9.89 | 8.85 |
| VOC, ppmvd @ 15% O2 as CH4 | 1.5 | 1.5 | 2.0 | 1.0 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 | 1.0 | 1.0 | 1.5 | 1.0 | 1.5 | 2.0 | 1.0 | 1.0 | 1.0 | 1 |
| VOC, lb/MMBtu as CH4 (EPA Method 19) | 0.0019 | 0.0019 | 0.0026 | 0.0013 | 0.0013 | 0.0013 | 0.0019 | 0.0013 | 0.0013 | 0.0013 | 0.0013 | 0.0019 | 0.0013 | 0.0019 | 0.0026 | 0.0013 | 0.0013 | 0.0013 | 0.0013 |
| VOC, lb/hr as CH4 | 5.13 | 4.94 | 8.82 | 3.37 | 2.69 | 2.08 | 4.72 | 3.19 | 2.53 | 1.93 | 1.46 | 4.51 | 3.03 | 4.63 | 7.24 | 3.02 | 2.22 | 1.72 | 1.54 |
| CO, ppmvd @ 15% O2 | 1.7 | 1.7 | 1.7 | 0.9 | 0.9 | 0.9 | 1.7 | 0.9 | 0.9 | 0.9 | 0.9 | 1.7 | 0.9 | 1.7 | 1.7 | 0.9 | 0.9 | 0.9 | 0.9 |
| CO, lb/MMBtu (EPA Method 19) | 0.0038 | 0.0038 | 0.0038 | 0.0020 | 0.0020 | 0.0020 | 0.0038 | 0.0020 | 0.0020 | 0.0020 | 0.0020 | 0.0038 | 0.0020 | 0.0038 | 0.0038 | 0.0020 | 0.0020 | 0.0020 | 0.0020 |
| CO, lb/hr | 10.80 | 10.40 | 13.80 | 5.31 | 4.24 | 3.28 | 9.93 | 5.03 | 3.98 | 3.04 | 2.30 | 9.50 | 4.78 | 9.75 | 12.00 | 4.76 | 3.49 | 2.71 | 2.42 |
| SO2, lb/hr | 4.85 | 4.67 | 6.20 | 4.49 | 3.64 | 2.81 | 4.64 | 4.31 | 3.42 | 2.60 | 1.98 | 4.31 | 4.09 | 4.42 | 5.45 | 4.08 | 3.00 | 2.33 | 2.08 |
| H2SO4, lb/hr | 2.28 | 2.19 | 2.70 | 2.11 | 1.71 | 1.32 | 2.12 | 2.03 | 1.61 | 1.22 | 0.93 | 2.02 | 1.92 | 2.08 | 2.56 | 1.92 | 1.41 | 1.09 | 0.98 |
| H2SO4, lb/MMBtu | 0.00084 | 0.00084 | 0.00077 | 0.00084 | 0.00084 | 0.00084 | 0.00084 | 0.00084 | 0.00080 | 0.00079 | 0.00167 | 0.00083 | 0.00083 | 0.00084 | 0.00084 | 0.00084 | 0.00084 | 0.00083 | 0.00084 |
| $PM/PM_{10}/PM_{2.5}$, lb/hr | 20.00 | 19.50 | 20.10 | 9.73 | 9.19 | 8.76 | 20.30 | 9.64 | 9.08 | 8.65 | 8.33 | 19.10 | 9.53 | 20.10 | 18.00 | 9.52 | 8.86 | 8.51 | 8.38 |
| $PM/PM_{10}/PM_{2.5}$, lb/MMBtu | 0.0073 | 0.0074 | 0.0058 | 0.0039 | 0.0045 | 0.0055 | 0.0080 | 0.0040 | 0.0045 | 0.0056 | 0.0150 | 0.0079 | 0.0041 | 0.0081 | 0.0059 | 0.0041 | 0.0053 | 0.0065 | 0.0072 |
| $NH_3$, ppmvd @ 15% O2 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5 |
| NH3, lb/MMBtu (EPA Method 19) | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 | 0.0068 |
| $NH_3$, lb/hr | 19.30 | 18.60 | 24.70 | 17.90 | 14.30 | 11.10 | 18.30 | 17.00 | 13.40 | 10.20 | 7.76 | 17.00 | 16.10 | 17.40 | 21.50 | 16.10 | 11.80 | 9.14 | 8.17 |
| $CO_2$, lb/hr (40 CFR 75, App. G, Eq. G-4) | 323,458 | 311,440 | 414,288 | 299,936 | 243,033 | 187,810 | 301,123 | 288,038 | 239,687 | 182,755 | 65,920 | 287,550 | 273,466 | 295,223 | 363,715 | 272,666 | 200,109 | 155,280 | 138,917 |
| $CH_4$, lb/hr (40 CFR 98, Subpart C, Table 2) | 6.00 | 5.78 | 7.69 | 5.56 | 4.51 | 3.48 | 5.59 | 5.34 | 4.45 | 3.39 | 1.22 | 5.33 | 5.07 | 5.48 | 6.75 | 5.06 | 3.71 | 2.88 | 2.58 |
| $N_2O$, lb/hr (40 CFR 98, Subpart C, Table 2) | 0.60 | 0.58 | 0.77 | 0.56 | 0.45 | 0.35 | 0.56 | 0.53 | 0.44 | 0.34 | 0.12 | 0.53 | 0.51 | 0.55 | 0.67 | 0.51 | 0.37 | 0.29 | 0.26 |
| $CO_2e$, lb/hr (CH4 GWP = 25, N2O GWP = 298) | 323,787 | 311,756 | 414,710 | 300,241 | 243,280 | 188,001 | 301,429 | 288,331 | 239,931 | 182,941 | 65,988 | 287,843 | 273,744 | 295,523 | 364,085 | 272,943 | 200,312 | 155,438 | 139,058 |
| $CO_2e$, lb/MW-hr (gross) | N/A | N/A | N/A | N/A | N/A | N/A | 748.9 | 741.7 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

**Vendor Emissions 7HA.01 Combu**
**CPV Towantic Energy, LLC**

| **AMBIENT CONDITIONS:** | **-14.2F** | | | | **59°F** | | | **90°F** | **100°F** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **GE CASE #:** | **#37** | **#46** | **#47** | **#38** | **#41** | **#52** | **#53** | **#42** | **#43** | **#44** | **#51** | **#45** |
| Fuel | Distillate Oil | | | | | | | | | | | |
| Number of GTs Operating | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| GT Operating Load | BASE | BASE | 75% | 50% | BASE | 75% | 50% | BASE | BASE | BASE | 75% | 50% |
| Fuel Heating Value, Btu/lb (HHV) | 19,398 | 19,398 | 19,398 | 19,398 | 19,398 | 19,398 | 19,398 | 19,398 | 19,398 | 19,398 | 19,398 | 19,398 |
| Evaporative Cooler Status | Off | Off | Off | Off | Off | Off | Off | On | On | Off | Off | Off |
| Duct Burner Status | Unfired | Unfired | Unfired | Unfired | Unfired | Unfired | Unfired | Unfired | Unfired | Unfired | Unfired | Unfired |
| Chiller Status | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| Ambient Relative Humidity, % | 20 | 20 | 20 | 20 | 60 | 60 | 60 | 60 | 40 | 40 | 40 | 40 |
| BAROMETRIC PRESSURE, psia | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 | 14.3 |
| GT Heat Input (MMBtu/hr/unit, HHV) | 2,526 | 2,526 | 2,024 | 1,556 | 2,391 | 1,892 | 1,460 | 2,229 | 2,220 | 2,069 | 1,666 | 1,294 |
| DB Heat Input (MMBtu/hr/unit, HHV) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gross Power (kW) | N/A | N/A | N/A | N/A | 702,281 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Heat Rate (Btu/kW-hr, gross) | N/A | N/A | N/A | N/A | 6,809 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **HRSG STACK EXHAUST GAS** | | | | | | | | | | | | |
| Exhaust Flow, lb/hr | 4,989,600 | 4,989,600 | 4,000,500 | 3,223,500 | 4,838,400 | 3,810,500 | 2,937,900 | 4,546,500 | 4,529,700 | 4,249,400 | 3,398,900 | 2,703,800 |
| Stack Temperature, °F | 304.3 | 292.6 | 280.3 | 270.3 | 294.6 | 272.4 | 268.4 | 291.9 | 302.0 | 289.0 | 279.0 | 280.3 |
| Exhaust Flow, acfm | 1,633,130 | 1,602,532 | 1,266,208 | 1,003,297 | 1,570,533 | 1,197,696 | 916,428 | 1,479,289 | 1,493,673 | 1,375,012 | 1,082,755 | 860,409 |
| $O_2$, Vol. % | 11.09% | 12.17% | 11.17% | 11.72% | 11.10% | 11.16% | 11.25% | 10.90% | 10.90% | 11.03% | 11.07% | 11.40% |
| $CO_2$, Vol. % | 5.66% | 5.09% | 5.66% | 5.42% | 5.50% | 5.54% | 5.55% | 5.42% | 5.42% | 5.39% | 5.44% | 5.33% |
| $H_2O$, Vol. % | 10.62% | 9.17% | 10.20% | 9.14% | 11.62% | 11.06% | 10.52% | 13.08% | 13.09% | 12.63% | 12.11% | 11.28% |
| $N_2$, Vol. % | 71.78% | 72.70% | 72.11% | 72.85% | 70.94% | 71.39% | 71.82% | 69.77% | 69.76% | 70.11% | 70.54% | 71.14% |
| Ar, Vol. % | 0.85% | 0.87% | 0.86% | 0.87% | 0.84% | 0.85% | 0.86% | 0.83% | 0.83% | 0.84% | 0.84% | 0.85% |
| MW, lb/lb-mole | 28.40 | 28.50 | 28.45 | 28.54 | 28.27 | 28.34 | 28.40 | 28.11 | 28.10 | 28.15 | 28.21 | 28.29 |
| **HRSG EXHAUST STACK EMISSIONS (PER S** | | | | | | | | | | | | |
| NOX, ppmvd @ 15% O2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| NOX, lb/MMBtu as NO2 (EPA Method 19) | 0.0194 | 0.0194 | 0.0194 | 0.0194 | 0.0194 | 0.0194 | 0.0194 | 0.0194 | 0.0194 | 0.0194 | 0.0194 | 0.0194 |
| NOX, lb/hr as NO2 | 52.00 | 46.50 | 41.70 | 32.00 | 49.20 | 38.90 | 30.00 | 45.80 | 45.60 | 42.60 | 34.30 | 26.60 |
| VOC, ppmvd @ 15% O2 as CH4 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| VOC, lb/MMBtu as CH4 (EPA Method 19) | 0.0027 | 0.0027 | 0.0027 | 0.0027 | 0.0027 | 0.0027 | 0.0027 | 0.0027 | 0.0027 | 0.0027 | 0.0027 | 0.0027 |
| VOC, lb/hr as CH4 | 6.19 | 6.19 | 4.95 | 3.98 | 6.03 | 4.74 | 3.64 | 5.70 | 5.68 | 5.32 | 4.24 | 3.37 |
| CO, ppmvd @ 15% O2 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| CO, lb/MMBtu (EPA Method 19) | 0.0047 | 0.0047 | 0.0047 | 0.0047 | 0.0047 | 0.0047 | 0.0047 | 0.0047 | 0.0047 | 0.0047 | 0.0047 | 0.0047 |
| CO, lb/hr | 12.70 | 11.30 | 10.10 | 7.79 | 12.00 | 9.48 | 7.31 | 11.20 | 11.10 | 10.40 | 8.34 | 6.48 |
| SO2, lb/hr | 4.92 | 4.92 | 3.95 | 3.04 | 4.66 | 3.68 | 2.84 | 4.34 | 4.32 | 4.03 | 3.24 | 2.52 |
| H2SO4, lb/hr | 2.31 | 2.31 | 1.85 | 1.42 | 2.19 | 1.73 | 1.34 | 2.04 | 2.03 | 1.89 | 1.53 | 1.18 |
| H2SO4, lb/MMBtu | 0.00091 | 0.00091 | 0.00091 | 0.00091 | 0.00092 | 0.00091 | 0.00092 | 0.00092 | 0.00091 | 0.00091 | 0.00092 | 0.00091 |
| $PM/PM_{10}/PM_{2.5}$, lb/hr | 42.60 | 42.60 | 42.00 | 41.60 | 42.40 | 41.90 | 41.50 | 42.30 | 42.20 | 42.10 | 41.70 | 41.30 |
| $PM/PM_{10}/PM_{2.5}$, lb/MMBtu | 0.0169 | 0.0169 | 0.0208 | 0.0267 | 0.0177 | 0.0221 | 0.0284 | 0.0190 | 0.0190 | 0.0203 | 0.0250 | 0.0319 |
| $NH_3$, ppmvd @ 15% O2 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| NH3, lb/MMBtu (EPA Method 19) | 0.0072 | 0.0072 | 0.0072 | 0.0072 | 0.0072 | 0.0072 | 0.0072 | 0.0072 | 0.0072 | 0.0072 | 0.0072 | 0.0072 |
| $NH_3$, lb/hr | 19.20 | 17.20 | 15.40 | 11.80 | 18.20 | 14.40 | 11.10 | 16.90 | 16.90 | 15.70 | 12.70 | 9.83 |
| $CO_2$, lb/hr (40 CFR 75, App. G, Eq. G-4) | 410,005 | 410,005 | 328,427 | 252,513 | 388,030 | 307,101 | 236,953 | 361,746 | 360,200 | 335,845 | 270,323 | 209,995 |
| $CH_4$, lb/hr (40 CFR 98, Subpart C, Table 2) | 7.58 | 7.58 | 6.07 | 4.67 | 7.17 | 5.68 | 4.38 | 6.69 | 6.66 | 6.21 | 5.00 | 3.88 |
| $N_2O$, lb/hr (40 CFR 98, Subpart C, Table 2) | 1.52 | 1.52 | 1.21 | 0.93 | 1.43 | 1.14 | 0.88 | 1.34 | 1.33 | 1.24 | 1.00 | 0.78 |
| $CO_2e$, lb/hr (CH4 GWP = 25, N2O GWP = 298) | 410,646 | 410,646 | 328,941 | 252,908 | 388,637 | 307,581 | 237,324 | 362,312 | 360,763 | 336,370 | 270,745 | 210,323 |
| $CO_2e$, lb/MW-hr (gross) | N/A | N/A | N/A | N/A | 1,106.8 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |