FLINT HILLS resources®
Corpus Christi Refineries

**CERTIFIED MAIL**
**RETURN RECEIPT REQUEST**
**7012 3050 0000 9879 4546**

P.O. Box 2608
Corpus Christi, Texas 78403-2608

February 21, 2014

Ms. Kathleen Aisling
U.S. Environmental Protection Agency, Region 6
Air Permits Section (6PD-R)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Flint Hills Resources Corpus Christi, LLC - West Refinery
Greenhouse Gas PSD Permit Application
Domestic Crude Project
Response to Information Request

Dear Ms. Aisling:

On behalf of Flint Hills Resources Corpus Christi, LLC (FHR), I am submitting some of the information you requested in your January 30, 2014 information request (sent via email) regarding the greenhouse gas (GHG) prevention of significant deterioration (PSD) permit application FHR submitted to EPA Region 6 on December 12, 2012. The permit application seeks to authorize a project at FHR's West Refinery to allow the refinery to process a larger percentage of domestic crude oil (the Domestic Crude Project). Responses to your information request are provided on the following pages. Additional information is provided in Attachment A. The remaining information you requested in your January 30, 2014 information request regarding carbon capture and sequestration will be submitted at a later date.

In the event you have additional questions or would like to discuss further, please contact Daren Knowles at (361) 242-8301.

Sincerely,

Valerie Pompa
Vice President and Manufacturing Manager

VP/DK/syw
Air 14-083; W 3 N 22

Enclosure

cc: Air Section Manager, TCEQ, Region 14, Corpus Christi, w/enclosure
Mr. Kris L. Kirchner, P.E., Waid Environmental, Austin, w/enclosure
Mr. Jeff Robinson, EPA Region 6, w/enclosure (via email)
Ms. Melanie Magee, EPA Region 6, w/enclosure (via email)

# RESPONSES TO JANUARY 30, 2014 INFORMATION REQUEST

## Emitting Units

1. **For each unit (including each individual boiler) that will be debottlenecked or have increased utilization due to the project, please discuss the operating history of the unit (typical hours of operation, annual maintenance and other downtime, and firing rate in MMBtu on a monthly basis for the baseline years used in the permit). Has the unit ever been utilized at the maximum capacity? If so, how recently? How are you going to increase the utilization, for instance, is there any maintenance that will have to take place or is it solely an increase in firing or utilization?**

   **Can the facility, as currently configured, utilize the maximum capacity of the unit? If not, is the unit physically constrained by other process equipment?**

   FHR's Response

   Based on phone conversations with you, we understand that the scope of this question is limited to the four boilers affected by the project as a result of increased utilization. These four boilers are the Mid Crude Boiler (43BF1), Boiler No. 7 (06BF657), Boiler No. 8 (06BF658), and Boiler No. 9 (06BF659). Additional information regarding these four boilers was provided in our February 17, 2014 submittal.

   A table showing each boiler's average monthly firing rate for 2011 and 2012 is provided in Attachment A. Each boiler typically operates 8760 hours per year. Generally, there is a decrease in the firing rate when process units within the refinery are going through a turnaround because of the decrease in steam demand while these process units are not operating. Based on 2011 and 2012 monthly firing rates, the highest monthly firing rate for Boilers No. 7, No. 8, and No. 9 was about 70% of the maximum firing capacity and the average firing rate was about 60% of the maximum firing capacity. Based on 2011 and 2012 monthly firing rates, the highest monthly firing rate for the Mid Plant Boiler was about 60% of the maximum firing capacity and the average firing rate was about 40% of the maximum firing capacity. As discussed in our February 17, 2014 submittal, one or more of the four boilers will experience an increase in utilization in order to produce the additional steam required for the Domestic Crude Project. However, none of the affected boilers will operate above their maximum capacity because the boilers, as currently configured, can supply the additional steam demand (there are no physical or operational constraints that would prevent them from doing so). Additionally, no maintenance on the boilers will be required to increase the utilization to meet the additional steam demand associated with the Project.

2. **For the modified sources, please use the actual to projected actual test for the emissions calculation.**

   FHR's Response

   Per the definition of "Projected Actual Emissions" in 40 CFR 52.21(b)(41)(ii)(d), an emission unit's potential to emit may be used in lieu of the projected actual emissions. The CCR Hot Oil Heater is the only existing source that will be modified as part of the project. Therefore, while FHR is using the actual to project actual test for the CCR Hot Oil Heater, we are choosing to use the potential to emit for the CCR Hot Oil Heater in

lieu of the projected actual emissions as allowed by the above-cited definition.

3. **For all emissions baseline calculations and averaging calculations (for instance, obtaining the average fuel gas composition), please provide all spreadsheets and supporting documentation.**

   FHR's Response

   Baseline emissions were only calculated for the CCR Hot Oil Heater (39BA3901) and the DHT Stripper Reboiler (37BA2). The 2011 and 2012 baseline emission rate calculations and supporting documentation for these two emission units are provided in Attachment A.

**General**

4. **Page 55, last paragraph: Please modify the sentence and the table on the following page using CO2 emission factors for the fuel gas and natural gas that are facility specific.**

   FHR's Response

   The last paragraph on Page 55 was revised and included in Attachment A of the February 17, 2014 submittal.

5. **Page 27: Please add more detail about the stream from the Merox Treating Unit and the percentage that it contributes to the GHG emissions.**

   FHR's Response

   The maximum firing capacity of the Sat Gas No. 3 Hot Oil Heater is 450 MMBtu/hr. This is the total combined firing capacity from the combustion of natural gas and the stream from the Merox Treating Unit. The heat duty provided by the stream from Merox Treating Unit is less than 0.5% of the heat duty provided by the natural gas. The stream from the Merox Unit is approximately 60 mol% nitrogen, 10 mol% oxygen, 6 mol% hydrogen, 5 mol% water, 14 mol% methane, and less than 5 mol% of mostly heavier hydrocarbons. The $CO_2$ factor for the stream estimated based on Tier III calculation methodology is similar (within 5%) to the $CO_2$ factor calculated for natural gas using the same methodology (see calculations for Sat Gas Hot Oil Heater on page 28 in the February 17, 2014 submittal). GHG emissions from the combustion of this stream are less than 0.5% of the total GHG emissions estimated from the Sat Gas Hot Oil Heater for natural gas. Because the stream from the Merox Treating Unit is so small and the $CO_2$ from Tier III methodology are similar for the stream and natural gas, FHR has estimated GHG emissions from the Sat Gas Oil Heater assuming that all of the maximum firing capacity of 450 MMBtu/hr is from the combustion of natural gas and the Tier III $CO_2$ factor for natural gas is used.

# ATTACHMENT A

## 2011-2012 MONTHLY FIRING RATES AND BASELINE CALCULATIONS


Kris L. Kirchner

2-21-2014

# 2011-2012 FIRING RATE SUMMARY

| Month | Boiler No. 8 Average Firing Rate (MMBtu/hr) | Boiler No. 9 Average Firing Rate (MMBtu/hr) | Boiler No. 10 Average Firing Rate (MMBtu/hr) | Mid Crude Boiler Average Firing Rate (MMBtu/hr) |
|---|---|---|---|---|
| January-11 | 133.0 | 108.3 | 106.6 | 106.8 |
| February-11 | 116.4 | 113.9 | 112.6 | 102.1 |
| March-11 | 128.3 | 126.9 | 125.1 | 101.9 |
| April-11 | 124.1 | 122.7 | 121.1 | 104.5 |
| May-11 | 137.7 | 142.8 | 141.2 | 115.6 |
| June-11 | 105.2 | 103.8 | 102.8 | 75.9 |
| July-11 | 100.5 | 85.0 | 87.3 | 83.7 |
| August-11 | 93.6 | 92.4 | 90.9 | 75.6 |
| September-11 | 115.6 | 114.3 | 112.5 | 80.7 |
| October-11 | 93.2 | 92.3 | 90.8 | 81.3 |
| November-11 | 109.8 | 108.7 | 106.8 | 88.1 |
| December-11 | 123.9 | 122.7 | 120.7 | 113.3 |
| January-12 | 122.6 | 120.9 | 119.5 | 125.3 |
| February-12 | 132.5 | 131.1 | 129.3 | 124.8 |
| March-12 | 133.2 | 132.2 | 131.0 | 124.2 |
| April-12 | 129.3 | 117.0 | 125.7 | 106.8 |
| May-12 | 106.2 | 121.2 | 120.1 | 109.7 |
| June-12 | 117.0 | 114.4 | 113.3 | 101.6 |
| July-12 | 117.3 | 93.6 | 83.4 | 100.0 |
| August-12 | 115.1 | 113.2 | 112.3 | 87.8 |
| September-12 | 110.8 | 109.1 | 108.1 | 81.6 |
| October-12 | 116.7 | 115.0 | 114.4 | 85.9 |
| November-12 | 111.2 | 109.8 | 109.4 | 78.1 |
| December-12 | 112.1 | 110.7 | 110.4 | 76.4 |

## 2011 Baseline Greenhouse Gas Emission Rate Calculations

**INPUT DATA**

| | |
|---|---|
| Combustion Unit Description: | 37BA2 DHT Stripper Reboiler |
| Facility Identification Number (FIN): | 37BA2 |
| Emission Point Number (EPN): | KK-3 |

**COMBUSTION UNIT DATA**

| | | |
|---|---|---|
| Fuel Gas Firing Capacity, HHV: | 191537 | MMBtu/yr, HHV |
| Heating Value of the Fuel Gas, HHV: | 991.72 | Btu/scf |
| Volume of Gaeous Fuel Combusted: | 193 | MMscf/yr @ 60 F |
| Carbon Content: | 0.73 | kg C/kg Fuel |
| Molecular Weight of the Gaseous Fuel: | 15.79 | kg/kg-mole |

**EMISSION FACTORS**

| Pollutant | Emission Factor (kg/MMBtu) * | Emission Factor (lb/MMBtu) | Global Warming Potentials ** |
|---|---|---|---|
| Carbon Dioxide ($CO_2$) | N/A - Tier III | N/A - Tier III | 1 |
| Methane ($CH_4$) | 0.003 | 0.0022 | 25 |
| Nitrous Oxide ($N_2O$) | 0.0006 | 0.00022 | 298 |

* The heater fires refinery fuel gas. The CH4 and N2O factors are from 40 CFR 98, Table C-2 for petroleum.

** Global warming potentials are from Table A-1 in 40 CFR 98, Subpart A.

**EMISSION RATES**

| Pollutant | GHG Annual Emissions (short tons/yr) | $CO_2e$ Annual Emissions (short tons/yr) |
|---|---|---|
| Carbon Dioxide ($CO_2$) | 10749 | 10749 |
| Methane ($CH_4$) | 0.21 | 5.28 |
| Nitrous Oxide ($N_2O$) | 0.02 | 6.29 |
| Total | 10749 | 10761 |

Emission rates are calculated using equations C-5 and C-8b and converting from metric tons/yr.

**Equation C-5 from 40 CFR 98, Subpart C**

$$CO_2 = \frac{44}{12} * Fuel * CC * \frac{MW}{MVC} * 0.001 \qquad \text{(Eq. C-5)}$$

$CO_2$ = Annual $CO_2$ mass emissions from combustion of the specific gaseous fuel (metric tons).

Fuel = Annual volume of the gaseous fuel combusted (scf). The volume of fuel combusted must be measured directly, using fuel flow meters calibrated according to §98.3(i). Fuel billing meters may be used for this purpose.

CC = Annual average carbon content of the gaseous fuel (kg C per kg of fuel). The annual average carbon content shall be determined using the same procedures as specified for HHV in paragraph (a)(2)(ii) of this section.

MW = Annual average molecular weight of the gaseous fuel (kg/kg-mole). The annual average molecular weight shall be determined using the same procedures as specified for HHV in paragraph (a)(2)(ii) of this section.

MVC = Molar volume conversion factor at standard conditions, as defined in §98.6. Use 849.5 scf per kg mole if you select 68 °F as standard temperature and 836.6 scf per kg mole if you select 60 °F as standard temperature.

44/12 = Ratio of molecular weights, $CO_2$ to carbon.

0.001 = Conversion factor from kg to metric tons.

**Equation C-8b from 40 CFR 98, Subpart C**

$CH_4$ or $N_2O$ (metric tons/yr) = 0.001 x Gas x EF

where

Gas = Annual natural gas usage (MMBtu)

EF = Fuel specific default $CH_4$ or $N_2O$ emission factor for natural gas from Table C-2 (kg/MMBtu)

1 metric ton = 1.1023 short tons

## 2012 Baseline Greenhouse Gas Emission Rate Calculations

**INPUT DATA**

| | |
|---|---|
| Combustion Unit Description: | 37BA2 DHT Stripper Reboiler |
| Facility Identification Number (FIN): | 37BA2 |
| Emission Point Number (EPN): | KK-3 |

**COMBUSTION UNIT DATA**

| | | |
|---|---|---|
| Fuel Gas Firing Capacity, HHV: | 226155 | MMBtu/hr, HHV |
| Heating Value of the Fuel Gas, HHV: | 919.18 | Btu/scf |
| Volume of Gaeous Fuel Combusted: | 246 | MMscf/yr @ 60 F |
| Carbon Content: | 0.72 | kg C/kg Fuel |
| Molecular Weight of the Gaseous Fuel: | 14.20 | kg/kg-mole |

**EMISSION FACTORS**

| Pollutant | Emission Factor (kg/MMBtu) * | Emission Factor (lb/MMBtu) | Global Warming Potentials ** |
|---|---|---|---|
| Carbon Dioxide ($CO_2$) | N/A - Tier III | N/A - Tier III | 1 |
| Methane ($CH_4$) | 0.003 | 0.0022 | 25 |
| Nitrous Oxide ($N_2O$) | 0.0006 | 0.00022 | 298 |

* The heater fires refinery fuel gas. The CH4 and N2O factors are from 40 CFR 98, Table C-2 for petroleum.

** Global warming potentials are from Table A-1 in 40 CFR 98, Subpart A.

**EMISSION RATES**

| Pollutant | GHG Annual Emissions (short tons/yr) | $CO_2e$ Annual Emissions (short tons/yr) |
|---|---|---|
| Carbon Dioxide ($CO_2$) | 12180 | 12180 |
| Methane ($CH_4$) | 0.25 | 6.23 |
| Nitrous Oxide ($N_2O$) | 0.02 | 7.43 |
| Total | 12180 | 12194 |

Emission rates are calculated using equations C-5 and C-8b and converting from metric tons/yr.

**Equation C-5 from 40 CFR 98, Subpart C**

$$CO_2 = \frac{44}{12} * Fuel * CC * \frac{MW}{MVC} * 0.001 \qquad \text{(Eq. C-5)}$$

$CO_2$ = Annual $CO_2$ mass emissions from combustion of the specific gaseous fuel (metric tons).

Fuel = Annual volume of the gaseous fuel combusted (scf). The volume of fuel combusted must be measured directly, using fuel flow meters calibrated according to §98.3(i). Fuel billing meters may be used for this purpose.

CC = Annual average carbon content of the gaseous fuel (kg C per kg of fuel). The annual average carbon content shall be determined using the same procedures as specified for HHV in paragraph (a)(2)(ii) of this section.

MW = Annual average molecular weight of the gaseous fuel (kg/kg-mole). The annual average molecular weight shall be determined using the same procedures as specified for HHV in paragraph (a)(2)(ii) of this section.

MVC = Molar volume conversion factor at standard conditions, as defined in §98.6. Use 849.5 scf per kg mole if you select 68 °F as standard temperature and 836.6 scf per kg mole if you select 60 °F as standard temperature.

44/12 = Ratio of molecular weights, $CO_2$ to carbon.

0.001 = Conversion factor from kg to metric tons.

**Equation C-8b from 40 CFR 98, Subpart C**

$CH_4$ or $N_2O$ (metric tons/yr) = 0.001 x Gas x EF

where

Gas = Annual natural gas usage (MMBtu)

EF = Fuel specific default $CH_4$ or $N_2O$ emission factor for natural gas from Table C-2 (kg/MMBtu)

1 metric ton = 1.1023 short tons

## 2011 Baseline Greenhouse Gas Emission Rate Calculations

**INPUT DATA**

| | |
|---|---|
| Combustion Unit Description: | 39BA3901 CCR Hot Oil Heater |
| Facility Identification Number (FIN): | 39BA3901 |
| Emission Point Number (EPN): | JJ-4 |

**COMBUSTION UNIT DATA**

| | | |
|---|---|---|
| Fuel Gas Firing Capacity, HHV: | 390191 | MMBtu/yr, HHV |
| Heating Value of the Fuel Gas, HHV: | 765.55 | Btu/scf |
| Volume of Gaeous Fuel Combusted: | 510 | MMscf/yr @ 60 F |
| Carbon Content: | 0.61 | kg C/kg Fuel |
| Molecular Weight of the Gaseous Fuel: | 12.94 | kg/kg-mole |

**EMISSION FACTORS**

| Pollutant | Emission Factor (kg/MMBtu) * | Emission Factor (lb/MMBtu) | Global Warming Potentials ** |
|---|---|---|---|
| Carbon Dioxide ($CO_2$) | N/A - Tier III | N/A - Tier III | 1 |
| Methane ($CH_4$) | 0.003 | 0.0022 | 25 |
| Nitrous Oxide ($N_2O$) | 0.0006 | 0.00022 | 298 |

* The heater fires refinery fuel gas. The CH4 and N2O factors are from 40 CFR 98, Table C-2 for petroleum.

** Global warming potentials are from Table A-1 in 40 CFR 98, Subpart A.

**EMISSION RATES**

| Pollutant | GHG Annual Emissions (short tons/yr) | $CO_2e$ Annual Emissions (short tons/yr) |
|---|---|---|
| Carbon Dioxide ($CO_2$) | 19459 | 19459 |
| Methane ($CH_4$) | 0.43 | 10.75 |
| Nitrous Oxide ($N_2O$) | 0.04 | 12.82 |
| Total | 19460 | 19483 |

Emission rates are calculated using equations C-5 and C-8b and converting from metric tons/yr.

**Equation C-5 from 40 CFR 98, Subpart C**

$$CO_2 = \frac{44}{12} * Fuel * CC * \frac{MW}{MVC} * 0.001 \qquad \text{(Eq. C-5)}$$

$CO_2$ = Annual $CO_2$ mass emissions from combustion of the specific gaseous fuel (metric tons).

Fuel = Annual volume of the gaseous fuel combusted (scf). The volume of fuel combusted must be measured directly, using fuel flow meters calibrated according to §98.3(i). Fuel billing meters may be used for this purpose.

CC = Annual average carbon content of the gaseous fuel (kg C per kg of fuel). The annual average carbon content shall be determined using the same procedures as specified for HHV in paragraph (a)(2)(ii) of this section.

MW = Annual average molecular weight of the gaseous fuel (kg/kg-mole). The annual average molecular weight shall be determined using the same procedures as specified for HHV in paragraph (a)(2)(ii) of this section.

MVC = Molar volume conversion factor at standard conditions, as defined in §98.6. Use 849.5 scf per kg mole if you select 68 °F as standard temperature and 836.6 scf per kg mole if you select 60 °F as standard temperature.

44/12 = Ratio of molecular weights, $CO_2$ to carbon.

0.001 = Conversion factor from kg to metric tons.

**Equation C-8b from 40 CFR 98, Subpart C**
$CH_4$ or $N_2O$ (metric tons/yr) = 0.001 x Gas x EF
where
Gas = Annual natural gas usage (MMBtu)
EF = Fuel specific default $CH_4$ or $N_2O$ emission factor for natural gas from Table C-2 (kg/MMBtu)

1 metric ton = 1.1023 short tons

## 2012 Baseline Greenhouse Gas Emission Rate Calculations

**INPUT DATA**

| | |
|---|---|
| Combustion Unit Description: | 39BA3901 CCR Hot Oil Heater |
| Facility Identification Number (FIN): | 39BA3901 |
| Emission Point Number (EPN): | JJ-4 |

**COMBUSTION UNIT DATA**

| | | |
|---|---|---|
| Fuel Gas Firing Capacity, HHV: | 406735 | MMBtu/yr, HHV |
| Heating Value of the Fuel Gas, HHV: | 843.18 | Btu/scf |
| Volume of Gaeous Fuel Combusted: | 482 | MMscf/yr @ 60 F |
| Carbon Content: | 0.68 | kg C/kg Fuel |
| Molecular Weight of the Gaseous Fuel: | 13.44 | kg/kg-mole |

**EMISSION FACTORS**

| Pollutant | Emission Factor (kg/MMBtu) * | Emission Factor (lb/MMBtu) | Global Warming Potentials ** |
|---|---|---|---|
| Carbon Dioxide ($CO_2$) | N/A - Tier III | N/A - Tier III | 1 |
| Methane ($CH_4$) | 0.003 | 0.0022 | 25 |
| Nitrous Oxide ($N_2O$) | 0.0006 | 0.00022 | 298 |

* The heater fires refinery fuel gas. The CH4 and N2O factors are from 40 CFR 98, Table C-2 for petroleum.

** Global warming potentials are from Table A-1 in 40 CFR 98, Subpart A.

**EMISSION RATES**

| Pollutant | GHG Annual Emissions (short tons/yr) | $CO_2e$ Annual Emissions (short tons/yr) |
|---|---|---|
| Carbon Dioxide ($CO_2$) | 21286 | 21286 |
| Methane ($CH_4$) | 0.45 | 11.21 |
| Nitrous Oxide ($N_2O$) | 0.04 | 13.36 |
| Total | 21286 | 21310 |

Emission rates are calculated using equations C-5 and C-8b and converting from metric tons/yr.

**Equation C-5 from 40 CFR 98, Subpart C**

$$CO_2 = \frac{44}{12} * Fuel * CC * \frac{MW}{MVC} * 0.001 \qquad \text{(Eq. C-5)}$$

$CO_2$ = Annual $CO_2$ mass emissions from combustion of the specific gaseous fuel (metric tons).

Fuel = Annual volume of the gaseous fuel combusted (scf). The volume of fuel combusted must be measured directly, using fuel flow meters calibrated according to §98.3(i). Fuel billing meters may be used for this purpose.

CC = Annual average carbon content of the gaseous fuel (kg C per kg of fuel). The annual average carbon content shall be determined using the same procedures as specified for HHV in paragraph (a)(2)(ii) of this section.

MW = Annual average molecular weight of the gaseous fuel (kg/kg-mole). The annual average molecular weight shall be determined using the same procedures as specified for HHV in paragraph (a)(2)(ii) of this section.

MVC = Molar volume conversion factor at standard conditions, as defined in §98.6. Use 849.5 scf per kg mole if you select 68 °F as standard temperature and 836.6 scf per kg mole if you select 60 °F as standard temperature.

44/12 = Ratio of molecular weights, $CO_2$ to carbon.

0.001 = Conversion factor from kg to metric tons.

**Equation C-8b from 40 CFR 98, Subpart C**
$CH_4$ or $N_2O$ (metric tons/yr) = 0.001 x Gas x EF
where
Gas = Annual natural gas usage (MMBtu)
EF = Fuel specific default $CH_4$ or $N_2O$ emission factor for natural gas from Table C-2 (kg/MMBtu)

1 metric ton = 1.1023 short tons

# 40 CFR Part 98 GHG Reporting Information

| | Mid-Plant Fuel Gas | | | CCR Loop 1 | | |
|---|---|---|---|---|---|---|
| | Molecular Weight | HHV | Carbon Content | Molecular Weight | HHV | Carbon Content |
| January-12 | 16.18 | 1023.52 | 0.74 | 14.12 | 884.45 | 0.69 |
| February-12 | 13.77 | 899.86 | 0.72 | 13.12 | 834.18 | 0.68 |
| March-12 | 13.48 | 883.84 | 0.72 | 12.83 | 806.81 | 0.66 |
| April-12 | 13.19 | 873.90 | 0.72 | 13.56 | 820.77 | 0.65 |
| May-12 | 13.72 | 894.65 | 0.72 | 13.24 | 823.87 | 0.67 |
| June-12 | 14.31 | 923.18 | 0.72 | 14.41 | 796.87 | 0.60 |
| July-12 | 13.92 | 903.23 | 0.71 | 12.55 | 821.29 | 0.69 |
| August-12 | 14.02 | 913.06 | 0.72 | 12.88 | 839.35 | 0.70 |
| September-12 | 14.23 | 916.17 | 0.72 | 13.59 | 878.23 | 0.70 |
| October-12 | 14.58 | 934.55 | 0.73 | 14.82 | 888.84 | 0.69 |
| November-12 | 14.83 | 946.17 | 0.73 | 13.83 | 891.07 | 0.71 |
| December-12 | 14.09 | 912.94 | 0.72 | 12.50 | 838.16 | 0.70 |
| **Fuel-Weighted Avg.** | **14.20** | **919.18** | **0.72** | **13.44** | **843.18** | **0.68** |

| | Mid-Plant Fuel Gas | | | CCR Loop 1 | | |
|---|---|---|---|---|---|---|
| | Molecular Weight | HHV | Carbon Content | Molecular Weight | HHV | Carbon Content |
| January-11 | 14.26 | 908.87 | 0.72 | 12.72 | 626.10 | 0.46 |
| February-11 | 13.38 | 885.70 | 0.71 | 13.96 | 629.14 | 0.44 |
| March-11 | 14.13 | 916.74 | 0.72 | 11.75 | 712.06 | 0.59 |
| April-11 | 14.12 | 916.03 | 0.72 | 11.73 | 707.83 | 0.59 |
| May-11 | 15.91 | 1005.81 | 0.74 | 11.91 | 773.13 | 0.66 |
| June-11 | 16.28 | 1023.37 | 0.74 | 13.15 | 834.87 | 0.68 |
| July-11 | 15.67 | 1003.61 | 0.74 | 13.27 | 846.48 | 0.68 |
| August-11 | 16.37 | 1022.00 | 0.74 | 12.66 | 766.23 | 0.62 |
| September-11 | 17.15 | 1053.97 | 0.73 | 14.42 | 876.60 | 0.67 |
| October-11 | 18.73 | 1159.00 | 0.75 | 12.68 | 750.58 | 0.61 |
| November-11 | 18.12 | 1033.67 | 0.71 | 13.93 | 839.63 | 0.66 |
| December-11 | 17.42 | 1079.29 | 0.74 | 13.94 | 865.19 | 0.68 |
| **Fuel-Weighted Avg.** | **15.79** | **991.72** | **0.73** | **12.94** | **765.55** | **0.61** |