

**Coal Gas Transportation, LLC**  
**Case No. 14-1515-EL-REN**  
**Response to Initial Set of Staff Interrogatories**

- 1. In response to Question H, the application indicates the “facility” has a placed in-service date of January 1, 1992. How does the applicant define “facility” in the context of this response?**

Coal Gas Transportation, LLC (CGT) hereby amends its response to Question H of the application as follows:

The Renewable Energy Facility:

**Yes** has a placed-in-service date before January 1, 1998; Date: **1/1/1992**

No has a placed-in-service date on or after January 1, 1998; Date:

**Yes** has been modified or retrofitted on or after January 1, 1998; Date: **11/1/1998**

Before the initial passage of SB 221, methane gas emitted from an abandoned coal mine did not qualify as a renewable energy generating resource under Ohio law. Pursuant to statutory changes enacted through SB 315 and SB 310, facilities that gathered such methane gas became eligible to seek certification as renewable energy generating facilities. It is primarily the foregoing legislative changes that render the CGT facility eligible for consideration as a renewable energy generating facility.

CGT defines its “facility” as the entire methane gas production and transportation system it operates and oversees, as diagramed on the map (**Attachment A**) and schematic (**Attachment B**) attached hereto. Since January 1, 1998, the facility currently operated by CGT has gone through a number of significant modifications.

In January 1992, the prior owner of the facility, Northwest Fuels Development, Inc. (NFD), began producing methane from five (5) well heads drilled into the Nelms #1 mine and the Hopedale Mining Nelms #2 mine. Following an acquisition by LAHD Energy, Inc. (LAHD) in October of 1995, the facility expanded and was greatly modified. In November 1998, LAHD completed the installation of nine (9) miles of sales line, allowing for the facility’s methane gas to be delivered directly into Dominion East Ohio (DEO) lines. In total, between 1998 and 2005, twenty-nine (29) wells were drilled, thirty (30) miles of new gathering pipeline was laid, and twenty-nine (29) new pipeline connections were made within the facility.

In March 2005, an affiliate of CGT, CBM Ohio LLC (CBM), began working in partnership with LAHD, and in October 2009, CGT became the operator of the entire facility. Between 2005 and the present day, CGT and its affiliates have invested heavily in making even further modifications to the facility:

- In 2007 and 2008, ten (10) new wells were drilled and placed into production at an approximate cost of one million dollars (\$1,000,000).
- In 2009, fifty thousand dollars (\$50,000), was invested to upgrade fifteen (15) compression facilities in order to increase methane gas production.
- In 2010, the facility was expanded to include the Hopedale Mining Cadiz Portal mine, where four (4) new methane extraction wells were drilled at an approximate cost of seven hundred and twenty thousand dollars (\$720,000). Likewise in 2010, approximately one hundred and fifty five thousand dollars (\$155,000) was spent to upgrade compression in existing well heads and to modify gathering lines so as to eliminate bottlenecks in the flow of the methane gas through the facility.
- In 2012, approximately one hundred and fifty thousand dollars (\$150,000) was invested to upgrade the facility's main compressor station and to install twenty (20) additional gas flow measuring meters (Barton and SilverSmith).
- In 2013, approximately sixty-five thousand dollars (\$65,000) was spent on the installation of automated valves in order to upgrade the facility's capability to blend the methane gas with natural gas.

**2. If the facility has a placed in-service date of January 1992, describe how the applicant believes that the facility satisfies the statutory in-service date requirement for eligible facilities?**

See above response to question #1.

**3. The proposed formula provided in response to Question G.2 of the application appears to contain an error. Please either confirm or correct the proposed formula for quantifying REC equivalence.**

The formula provided in response to Question G.2 was in error. The correct formula is as follows:

Per the language of the recently adopted S.B. 310, O.R.C. Section 4928.645 (B)(1) has been amended to reflect that "for purposes of converting the quantity of energy derived from biologically derived methane gas to an electricity equivalent, one megawatt hour equals 3,412, 142 British thermal units." Given that 1,000 cubic feet (MCF) of the facility's methane has an energy equivalent of 700,000 british thermal units (BTU), it is CGT's understanding that, per the language of the Ohio Revised Code, each MCF of methane generated by its facility should equal .205 megawatts. Therefore, approximately 4,874.49 MCF of the facility's methane would be equivalent to 1 megawatt hour of electricity.

**4. To quantify the total coal mine methane gas output, the applicant is proposing to measure the total blended gas prior to its entry into the Dominion East Ohio (DEO) pipeline and subtract from that the volume of third party natural gas from RoseValley – with the difference representing the coal mine methane output, correct?**

Correct. The total amount of methane gathered by the facility is measured by subtracting the volume of third party natural gas that enters the facility system, as recorded by Meter G, from the volume of blended methane and natural gas exiting the system at the end of CGT's pipeline prior to its entry into DOE's pipeline, TPL 15, as recorded by Meter B.

**5. The response to G.1 of the application indicates that DEO blends CGT's gas with high BTU natural gas prior to delivery to the public transportation system. Is this additional natural gas also**

**subtracted when quantifying the facility's methane output, or is the system's total methane output determined prior to DEO's subsequent blending?**

The total output of methane gathered by CGT's facility is calculated without reference to any natural gas subsequently added by DEO. DEO's pipeline system carries natural gas, so it naturally blends with the methane generated by CGT's facility as it is transported through DEO's pipeline system. In order to ensure that gas generated by the facility meets or exceeds pipeline quality standards - established by O.R.C. Section 4933.06 as being "not less than nine hundred British thermal units per cubic foot" - CGT blends the methane extracted from abandoned coal mines with natural gas before it enters the DEO pipeline.

**6. The applicant's response to Question G.2 of the application proposes an energy equivalent of 700 BTUs per 1,000 MCF of methane. Please detail the source of the methane energy equivalent (i.e., 700 BTUs). Is that an estimate – and if so, provide the source. If it is measured, provide details on the measurement frequency and methodology.**

The energy equivalent of 700 BTU's per 1,000 MCF of methane is CGT's conservative estimate of the energy equivalent of the methane its facility produces. That estimate is based on an analysis conducted by Gas Analytical Services in April and May of 2013 of spot samples of methane produced by the facility (**Attachment C**), indicating an average energy equivalent in the range of 749-755 BTU's. To account for the potential that increased production by the facility could produce methane gas of a slightly lower energy equivalent, the energy equivalent is rounded down to 700 BTU's.

**7. The application suggests that the facility would be eligible for certification as a biologically-derived methane gas. Please explain the basis for this conclusion.**

The application relies upon the formula provided by S.B. 310 with respect to converting biologically derived methane gas to electricity as a basis for calculating the electric equivalent of methane emitted from an abandoned mine.

Per the language of S.B. 310, methane emitted from an abandoned coal mine does not need to be certified as biologically derived methane gas in order to be considered a "renewable energy resource." While CGT is not required to establish that the gas generated by the facility it operates is "biologically derived methane gas," there are a number of studies illustrating that abandoned coal mine methane is continually regenerated by microbial bacteria. See, e.g., Dariusz Strąpoć, et. al., "Methane-Producing Microbial Community in a Coal Bed of the Illinois Basin," Appl. Environ. Microbiol. April 2008, vol. 74, no. 8, 2424-2432, available at <http://aem.asm.org/content/74/8/2424.full>; Michael S. Green, et. al, "Characterization of a methanogenic consortium enriched from a coalbed methane well in the Powder River Basin, U.S.A.," Int'l Journal of Coal Geology, October 2008, vol. 76, no. 2, at 34-45, available at <http://www.sciencedirect.com/science/article/pii/S0166516208000712>. Moreover, methane derived from animal or human sources is chemically indistinguishable from methane emitted from an abandoned coalmine; a methane molecule derived from either source is composed of one atom of carbon and four atoms of hydrogen. Therefore, it would seem reasonable for the formula applicable to converting methane emitted from an abandoned mine to electricity to be equivalent to the formula designed to convert biologically derived methane gas to electricity.

**8. For the past two years, provide monthly data as to the (a) total methane gas output, and (b) the total volume of third party gas entering the system.**

A chart depicting total methane gas output and total volume of third party gas entering the system between January 2012 and May 2014 is included as **Attachment D**. The chart does not contain any entries between March 2011 and February 2013. The absence of data during this period is due to the fact that, for economic reasons, CGT did not deliver any methane gas to DEO between March 2012 and February 2013. Because CGT was only transporting third party gas during this period at a flat rate, it did not track third party gas production levels.

**9. Are there minimum quality parameters that the blended gas must attain prior to entering DEO's pipeline, TPL 15? If yes, describe the minimum quality thresholds.**

As discussed above, in response to Interrogatory Question No. 5, O.R.C. Section 4933.06 establishes that pipeline quality gas must be "not less than nine hundred British thermal units per cubic foot." CGT blends the abandoned mine methane it gathers with natural gas to ensure that its product meets or exceeds this minimum quality threshold.

**10. Please provide a full-sized (8.5x11) figure of the metering configuration (p. 9 of 23).**

Full-size pdf's of the map (**Attachment A**) and schematic (**Attachment B**) of CGT's metering configuration included on page 9 of the application are attached hereto.

**11. With respect to the meter specifications provided in response to Question N of the application:**

- a. Please confirm that the total blended output prior to entry into DEO's pipeline, TPL 15, is measured by a Barton Meter (#B-412540) and a SilverSmith meter (S-01-06-9104).**

Confirmed.

- b. Please confirm that the total natural gas added to the recovered mine methane is measured by a Barton Meter (#B-202E-409398) and a SilverSmith meter (S-01-06-9954).**

Confirmed.

- c. Please confirm that the total methane output used to determine REC equivalence is the difference between (a) and (b).**

Confirmed.

- d. How are any differences between the readings from the Barton and SilverSmith meters resolved?**

CGT relies on readings taken by the SilverSmith meters. Barton meter readings are only relied on in the event a power outage, until the Silversmith meters are operational again.<sup>1</sup> As they are relied on at separate times, there are no discrepancies between the readings from the Barton and Silversmith meters.

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<sup>1</sup> Power outages due to major storm events have occurred approximately twenty (20) times over the past five (5) years.

**12. Under the applicant's proposed conversion formula, how many MWH-equivalents would it forecast to produce annually?**

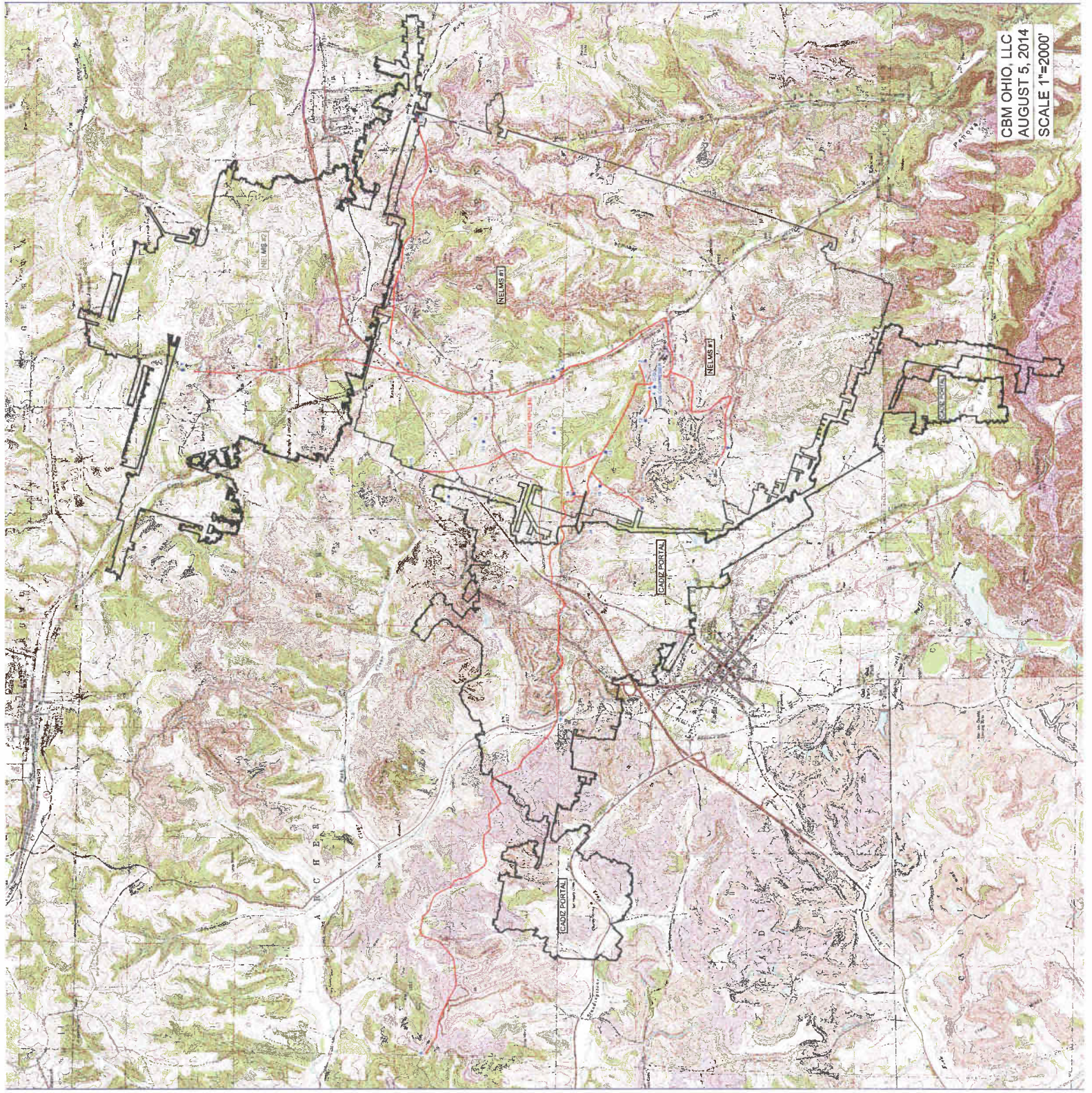
CGT estimates the facility will produce approximately 365,000 MCF of methane gas annually. The facility has the capacity to produce this amount of methane gas, and the availability of REC credits for production will make such production economically feasible. Pursuant to CGT's proposed conversion formula, the facility would produce approximately 74,825 MWH equivalents per year.

**13. The notary stamp is not visible on the version of the affidavit available through DIS. Please provide a copy of the signed affidavit on which the stamp is visible.**

A fresh copy of the signed affidavit is provided at **Attachment E**. The stamp reads: "Donna S. Burdette, Notary Public, State at Large, KY."

## **Attachment A**



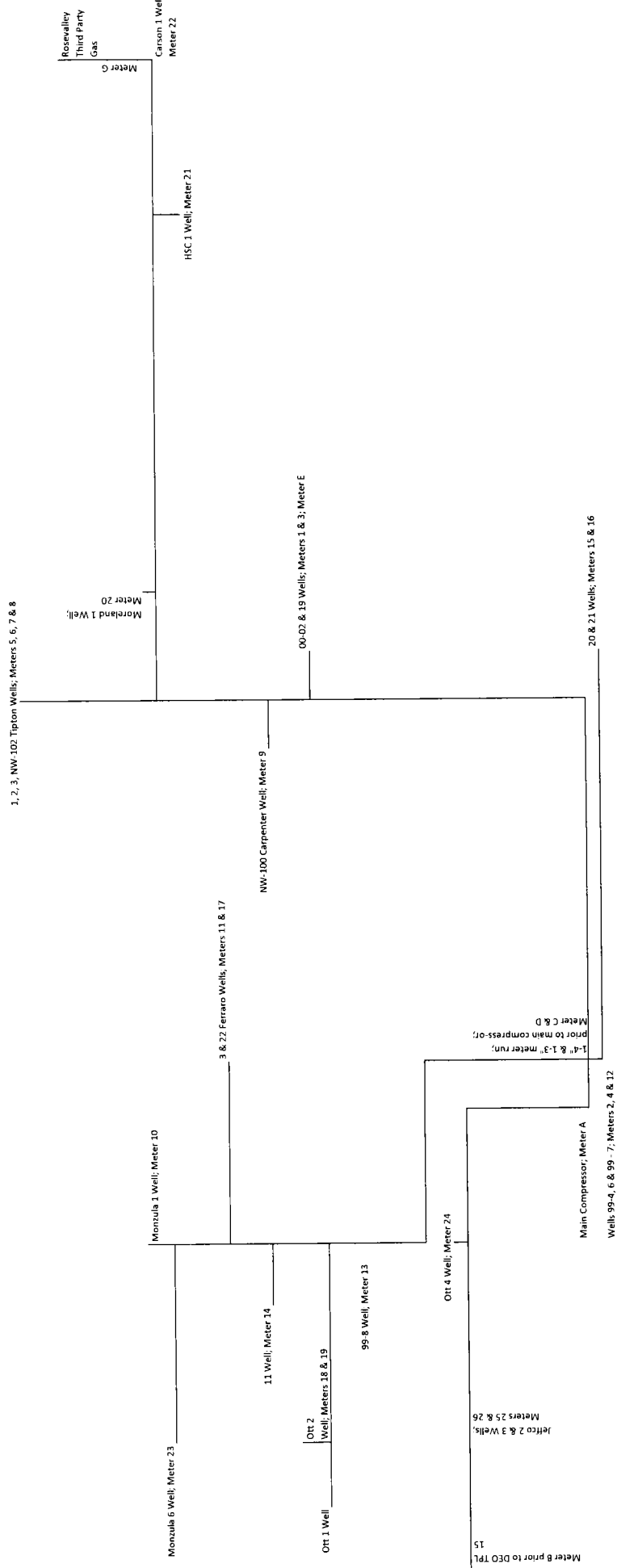


CBM OHIO, LLC  
AUGUST 5, 2014  
SCALE 1"=2000'



## **Attachment B**





## **Attachment C**

**Coal Gas Transportation, LLC (CGT)**  
**Monthly Production Totals**

<i>Period</i>	<i>CGT Methane (MCF)</i>	<i>Third Party Gas (MCF)</i>	<i>Total Deliverd to Dominion East Ohio (MCF)</i>
Jan-12	33,407	9,736	43,143
Feb-12	28,057	11,235	39,292
Mar-12	-	-	-
Apr-12	-	-	-
May-12	-	-	-
Jun-12	-	-	-
Jul-12	-	-	-
Aug-12	-	-	-
Sep-12	-	-	-
Oct-12	-	-	-
Nov-12	-	-	-
Dec-12	-	-	-
Jan-13	-	-	-
Feb-13	-	-	-
Mar-13	933	107,587	108,520
Apr-13	4,768	104,825	109,593
May-13	7,685	97,052	104,737
Jun-13	9,571	77,398	86,969
Jul-13	11,056	83,044	94,100
Aug-13	11,907	73,700	85,607
Sep-13	22,344	76,397	98,741
Oct-13	17,838	78,819	96,657
Nov-13	11,885	58,639	70,524
Dec-13	12,439	86,942	99,381
Jan-14	10,305	49,038	59,343
Feb-14	11,278	46,867	58,145
Mar-14	5,004	31,449	36,453
Apr-14	1,647	35,404	37,051
May-14	5,083	70,452	75,535
<b>Total</b>	<b>205,207</b>	<b>1,098,584</b>	<b>1,303,791</b>

## **Attachment D**



## Gas Analytical Services, Inc.

P.O. Box 1028  
Bridgeport, WV 26330-0461  
Phone: (304) 623-0020  
FAX: (304) 624-8065

Analysis#:	104262
Run Date:	4/29/2013
Run Time:	13:07
Cylinder#:	

# FRACTIONAL ANALYSIS

Customer:	CBM-Ohio	Sample Date:	4/25/2013
Field:		Sample Time:	13:07
Station:	8 Line	Sample Collected By:	BOB GRIFFIN
Meter:		Effective Date:	4/25/2013
		Sample Pressure:	53.00 PSIG
Sample Type:	Spot	Sample Temp. (°F):	N/G

Component	MOL%	GPM
Methane	72.5289	
Ethane	0.7640	0.20
Propane	0.0000	
I-Butane	0.0000	
N-Butane	0.0000	
I-Pentane	0.0000	
N-Pentane	0.0000	
Nitrogen	22.2376	
CO2	4.2050	
Oxygen	0.2645	
Hexanes+	0.0000	
Total:	100.0000	0.20

Analytical Results at Base Conditions (Real)	
BTU/SCF (Dry):	749.0062
BTU/SCF (Saturated):	736.8911
PSIA:	14.7300
Temperature (°F):	60.00
Z Factor (Dry):	0.99838
Z Factor (Saturated):	0.99832

Analytical Results at Contract Conditions (Real)	
BTU/SCF (Dry):	749.0062
BTU/SCF (Saturated):	736.8911
PSIA:	14.7300
Temperature (°F):	60.00
Z Factor (Dry):	0.99838
Z Factor (Saturated):	0.99832

Calculated Specific Gravities			
Ideal Grav.:	0.6915	Real Grav.:	0.6923
Molecular Weight:			20.0303

Gross Heating Values are Based  
on GPA 2145-09, 2172, 2261.  
Compressibility is Calculated using AGA-8.





## Gas Analytical Services, Inc.

P.O. Box 1028  
Bridgeport, WV 26330-0461  
Phone: (304) 623-0020  
FAX: (304) 624-8065

Analysis#:	105821
Run Date:	5/31/2013
Run Time:	16:07
Cylinder#:	

# FRACTIONAL ANALYSIS

Customer:	CBM-Ohio	Sample Date:	5/30/2013
Field:		Sample Time:	14:40
Station:	8 Line	Sample Collected By:	BOB GRIFFIN
Meter:		Effective Date:	5/30/2013
		Sample Pressure:	52.00 PSIG
Sample Type:	Spot	Sample Temp. (°F):	N/G

Component	MOL%	GPM
Methane	72.9614	
Ethane	0.7537	0.20
Propane	0.0294	0.01
I-Butane	0.0000	
N-Butane	0.0000	
I-Pentane	0.0000	
N-Pentane	0.0000	
Nitrogen	21.8302	
CO2	4.1571	
Oxygen	0.2421	
Hexanes+	0.0261	0.01
Total:	100.0000	0.22

Analytical Results at Base Conditions (Real)	
BTU/SCF (Dry):	755.3058
BTU/SCF (Saturated):	743.0812
PSIA:	14.7300
Temperature (°F):	60.00
Z Factor (Dry):	0.99836
Z Factor (Saturated):	0.99831

Analytical Results at Contract Conditions (Real)	
BTU/SCF (Dry):	755.3058
BTU/SCF (Saturated):	743.0812
PSIA:	14.7300
Temperature (°F):	60.00
Z Factor (Dry):	0.99836
Z Factor (Saturated):	0.99831

Calculated Specific Gravities			
Ideal Grav.:	0.6902	Real Grav.:	0.6910
Molecular Weight:			19.9915

Gross Heating Values are Based  
on GPA 2145-09, 2172, 2261.  
Compressibility is Calculated using AGA-8.

## **Attachment E**



# Public Utilities Commission

## Affidavit for Application for Certification as an Eligible Ohio Renewable Energy Resource Generating Facility

Please be advised that all applicant's contact information, including address and telephone number, will be made public and is not subject to confidential treatment. Additionally, any information pertaining to trade secrets contained within the application will be made public unless filed under seal with a motion for protective order, pursuant to Rule 4901-1-24 of the Ohio Administrative Code.

Case Number: 14-1515-EL-REN

Facility Name: Coal Gas Transportation, LLC

Name of person making this affidavit: Mark O'Brien

State of Kentucky

County of Jefferson

The undersigned, being duly sworn according to law, deposes and says that:

1. I am authorized to and do hereby make this affidavit on behalf of the Applicant,
2. All facts and statements made in the application for certification, including all attachments and supplemental information or filings, are true and complete to the best of my knowledge, information, and belief,
3. The facility has obtained or will obtain and will maintain all required local, state, and federal environmental permits,
4. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

\_\_\_\_\_, President

Signature of Affiant & Title

Sworn and subscribed before me this 2 day of Sept, 2014 Month/Year

Notary

My commission expires on 12.21.14



**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**10/3/2014 3:51:07 PM**

**in**

**Case No(s). 14-1515-EL-REN**

Summary: Response by Coal Gas Transportation, LLC  
to Staff Interrogatories electronically filed by Mr. Daniel Sullivan on behalf of Coal Gas  
Transportation, LLC