



**dig**  
Dolan Integration Group

Geochemistry for Energy

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**Hydrocarbon Gas Composition and Stable Isotopes  
Data and Interpretation**

**Job #:** 21116738  
**Lab #:** DIG-026729  
**Client:** Southern Petroleum Labs, Inc.  
**Well Name:** GM 230-34

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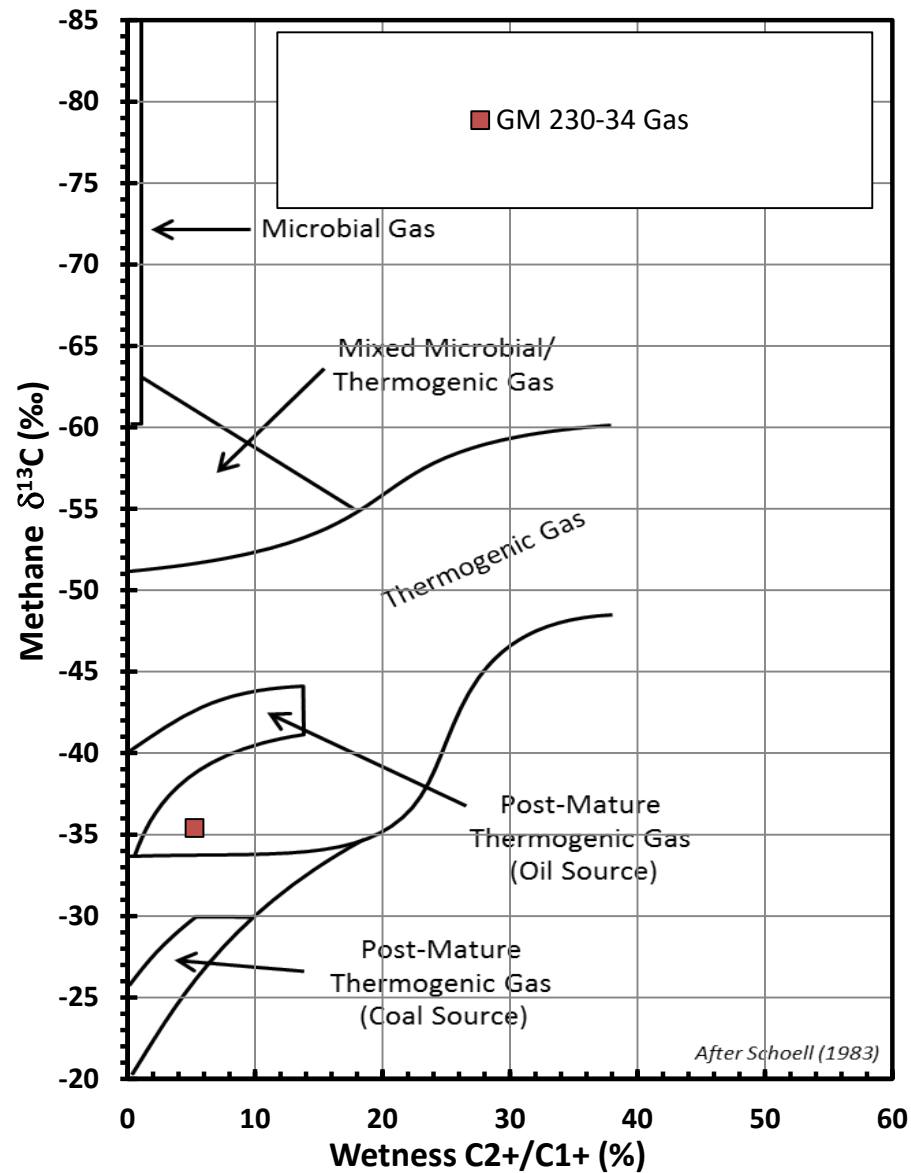
Client/Well Name: Southern Petroleum Labs, Inc. / GM 230-34  
 Job #: 21116738  
 Lab #: DIG-026729

SAMPLE INFORMATION			COMPLETE GAS ANALYSIS														HYDROCARBON GAS ANALYSIS (normalized to total HC content)								BTU CONTENT*				
Job Number	Lab Number	Well Name	Sample Type	Sample Date	Sample Time	GC Date	N <sub>2</sub> ppm	O <sub>2</sub> + Ar ppm	CO <sub>2</sub> ppm	C <sub>1</sub> ppm	C <sub>2</sub> ppm	C <sub>3</sub> ppm	iC <sub>4</sub> ppm	nC <sub>4</sub> ppm	iC <sub>5</sub> ppm	nC <sub>5</sub> ppm	C <sub>6</sub> + ppm	C <sub>7</sub> H <sub>16</sub> ppm	He ppm	H <sub>2</sub> ppm	C <sub>1</sub> mol%	C <sub>2</sub> mol%	C <sub>3</sub> mol%	iC <sub>4</sub> mol%	nC <sub>4</sub> mol%	iC <sub>5</sub> mol%	nC <sub>5</sub> mol%	C <sub>6</sub> + mol%	Total Gas BTU/H <sup>1</sup>
21116738	DIG-026729	GM 230-34 Gas	Gas	11/12/21	11:30	11/26/2021	260883	64032	170	64338	24187	6732	1305	1421	597	478	1075				84.7	3.55	0.99	0.19	0.21	0.09	0.07	0.16	740

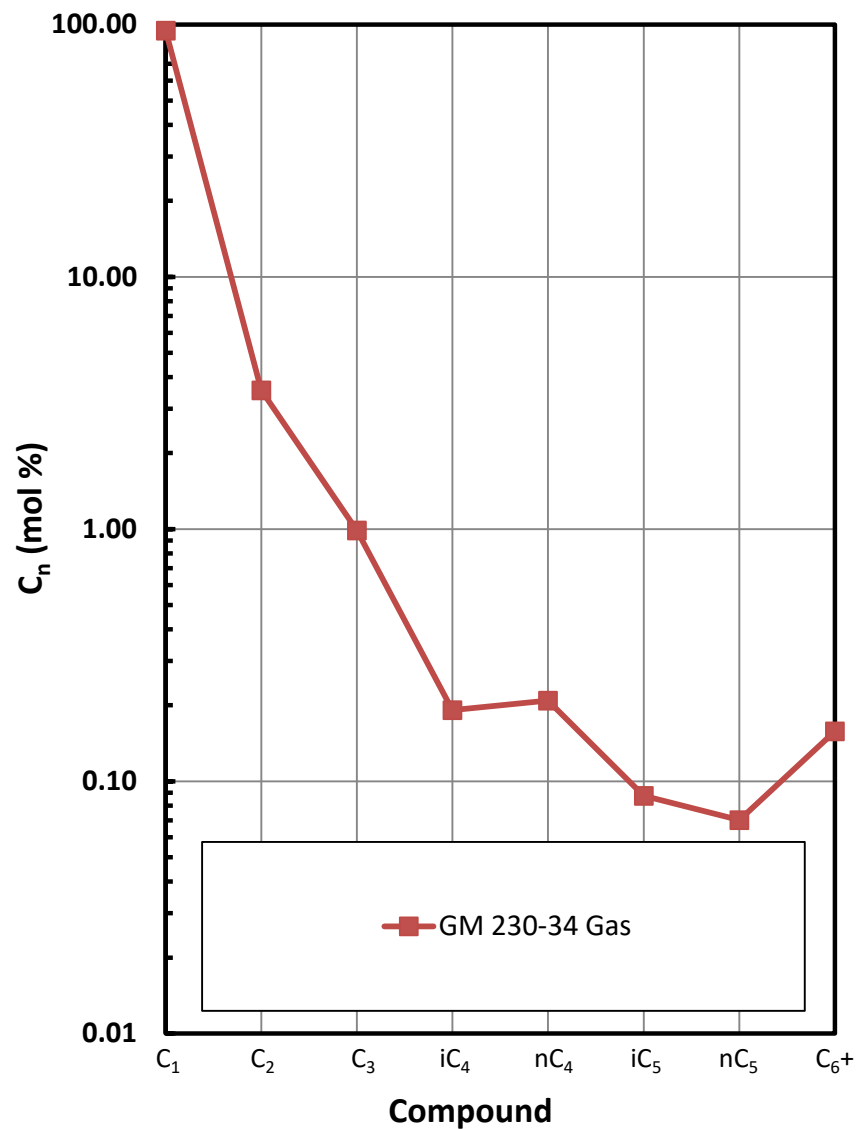
SAMPLE INFORMATION			HYDROCARBON RATIOS				STABLE ISOTOPE ANALYSIS										SPECIFIC GRAVITY*						
Job Number	Lab Number	Well Name	Sample Type	Sample Date	Sample Time	Total HC ppm	Wetness % C <sub>2</sub> to C <sub>5</sub>	C <sub>2</sub> /C <sub>1</sub> +C <sub>2</sub> mol/mol	Balance Ratio C <sub>1</sub> +C <sub>2</sub> /C <sub>3</sub> -C <sub>5</sub>	Mass Spec Date	δ <sup>13</sup> C <sub>1</sub> ‰ VPDB	δ <sup>13</sup> C <sub>2</sub> ‰ VPDB	δ <sup>13</sup> C <sub>3</sub> ‰ VPDB	δ <sup>13</sup> C <sub>4</sub> ‰ VPDB	δ <sup>13</sup> C <sub>5</sub> ‰ VPDB	δ <sup>13</sup> C <sub>6</sub> ‰ VPDB	δ <sup>13</sup> C <sub>7</sub> ‰ VPDB	δ <sup>13</sup> CO <sub>2</sub> ‰ VPDB	δ <sup>18</sup> O ‰ VSMOW	Comments	Total Gas Spec Grav	HCs only Spec Grav	
21116738	DIG-026729	GM 230-34 Gas	Gas	11/12/21	11:30	68343	5.3	29.8	69.6	3/21/2021	-15.4	-17.0	-16.5						-188			0.718	0.593

Stable isotope results based on multi-point laboratory calibration  
 Values in red represent low signal; interpret with caution  
 Precision δ<sup>13</sup>C < 0.5 ‰  
 Precision δ<sup>18</sup>O < 5 ‰  
 \* As ideal gas, with gas concentrations normalized to 100%;  
 calculations based on GPA 2145-09 physical constants.

**Methane  $\delta^{13}\text{C}$  vs Wetness Genetic Classification Plot**

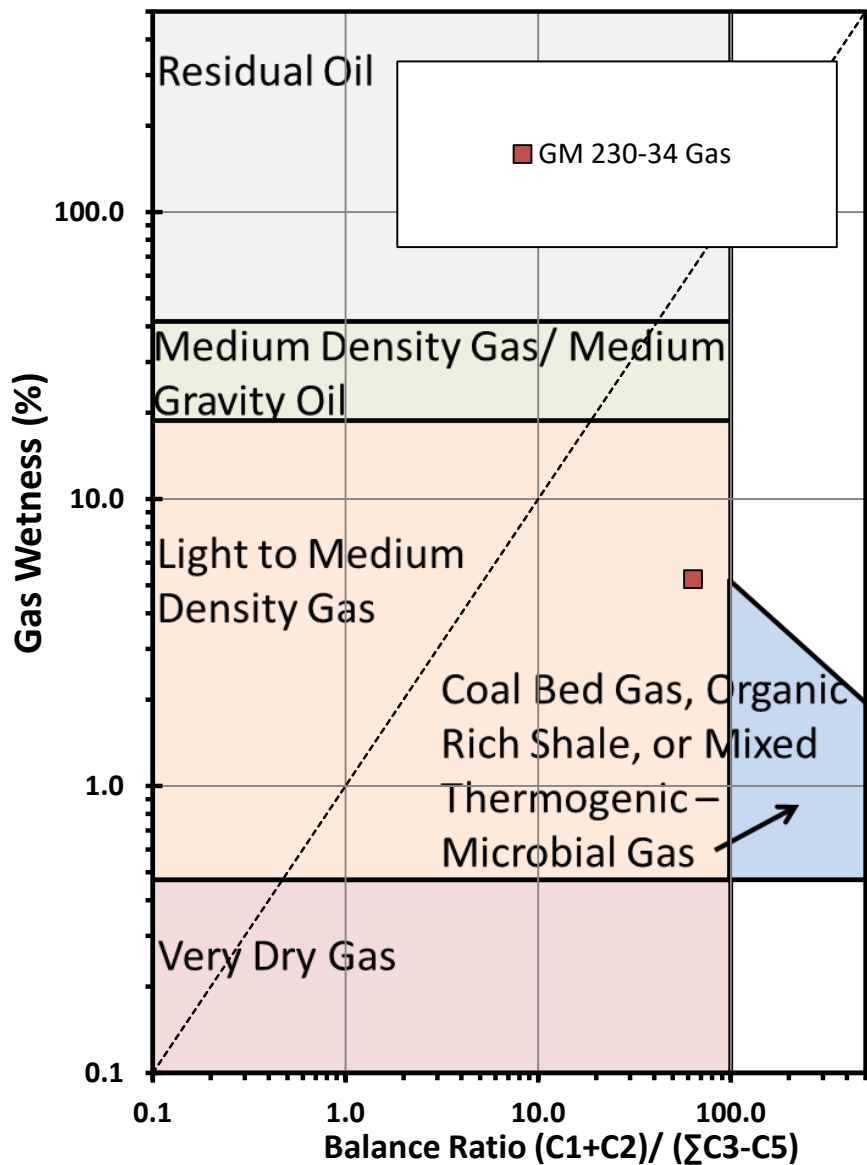


**Hydrocarbon Composition Plot**

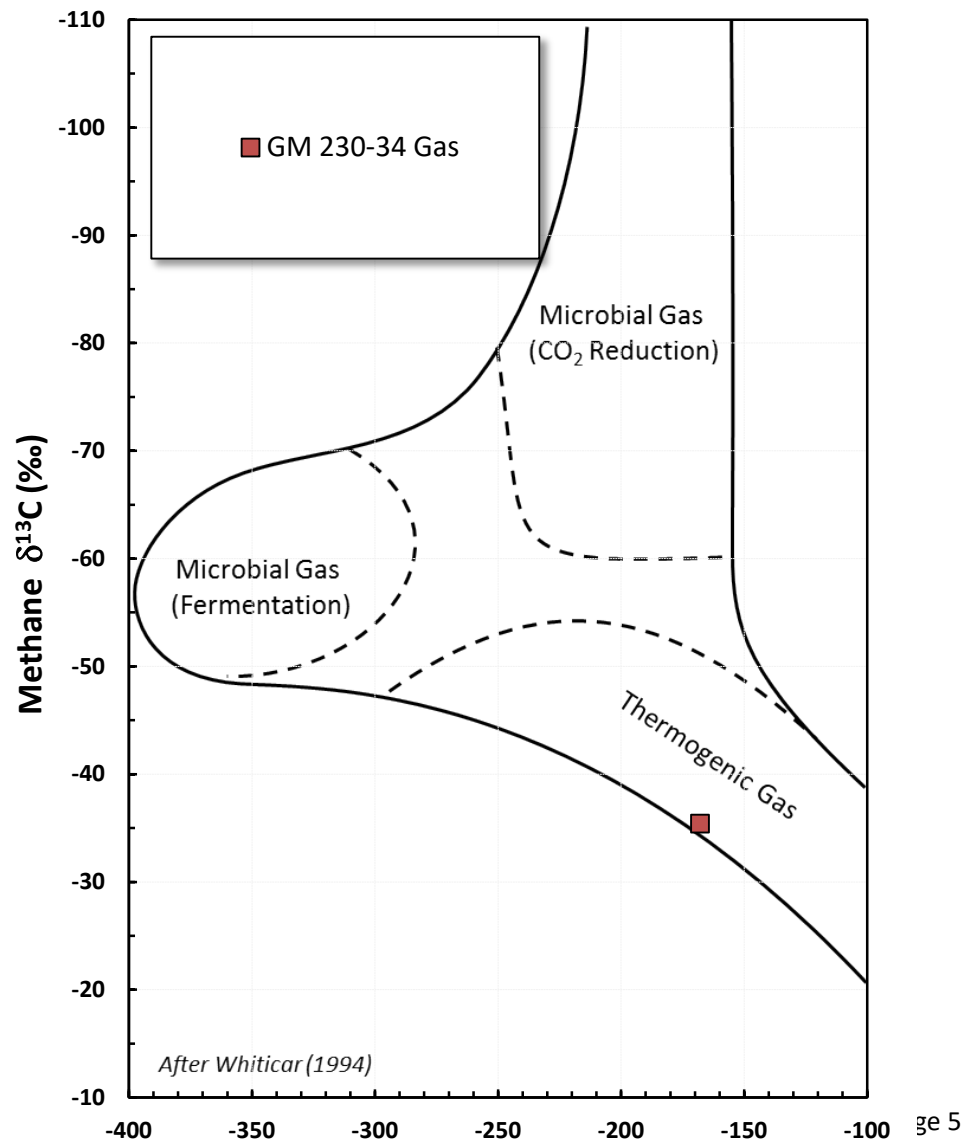


**INTERPRETIVE PLOTS**

**Haworth Ratio Plot - Characterization of Hydrocarbon Type**

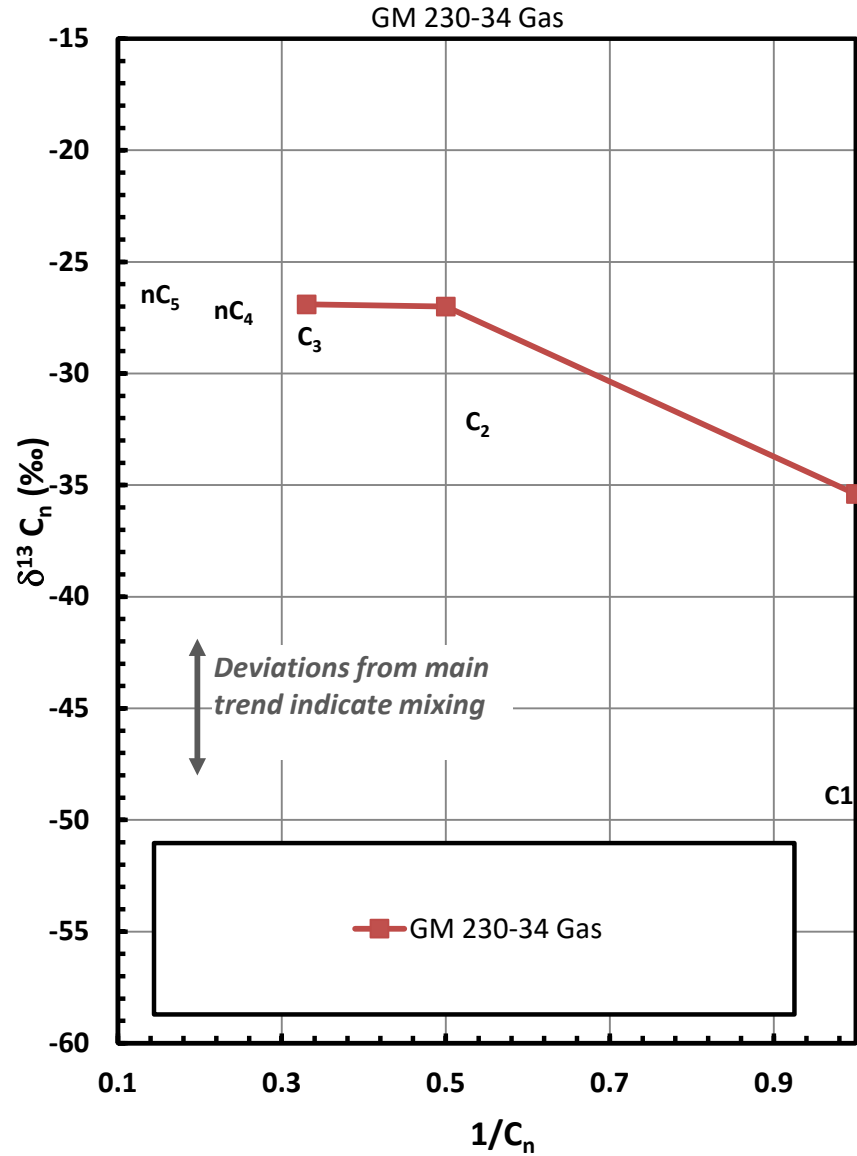


**Methane  $\delta^{13}\text{C}$  vs  $\delta\text{D}$  Genetic Classification Plot**

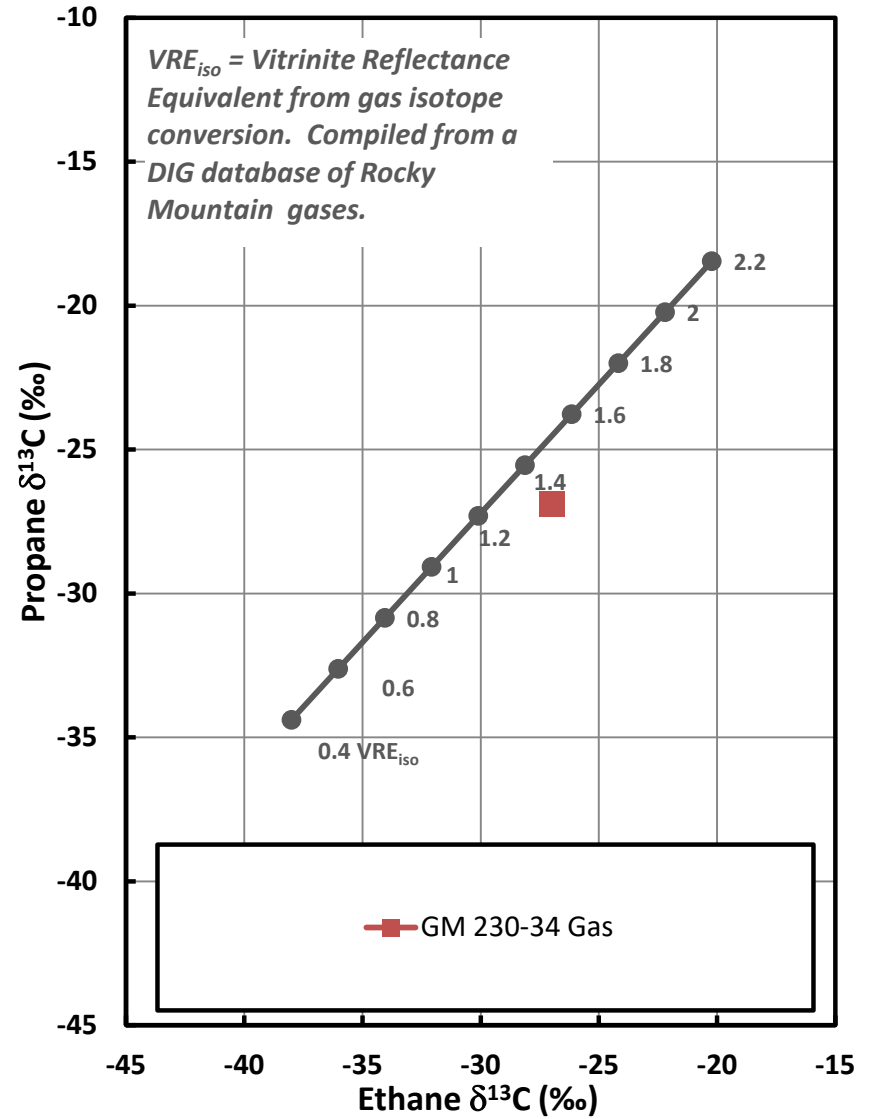


**INTERPRETIVE PLOTS**

**Mixing Plot**



**Ethane - Propane Maturity Plot**



**INTERPRETIVE PLOTS**

**Methane  $\delta^{13}\text{C}$  vs  $\text{C}_1/(\text{C}_2+\text{C}_3)$  Genetic Classification Plot**

