



dig
Dolan Integration Group

Geochemistry for Energy

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Westminster, CO 80021
PH 303.531.2050

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

Job #: 23059879
Lab #: DIG-032091
Client: Olsson
Well Name: SCMW 052423
API #:

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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 ₂ ppm	O ₂ + Ar ppm	CO ₂ ppm	C ₁ ppm	C ₂ ppm	C ₃ ppm	iC ₄ ppm	nC ₄ ppm	iC ₅ ppm	nC ₅ ppm	C ₆ + ppm	C ₇ H ₈ ppm	He ppm	H ₂ ppm	C ₁ mol%	C ₂ mol%	C ₃ mol%	iC ₄ mol%	nC ₄ mol%	iC ₅ mol%	nC ₅ mol%	C ₆ + mol%	Total Gas BTU/ft ³	
23059879	DIG-032091	SCMW 052423 Gas	Gas	05/24/23	11:10	5/25/2023	623443	175336	320	158928	25720	11360	1891	3017	657	940	175				78.3	13.0	5.68	0.75	1.53	0.33	0.27	0.09	152	

SAMPLE INFORMATION						HYDROCARBON RATIOS				STABLE ISOTOPE ANALYSIS										Comments
Job Number	Lab Number	Well Name	Sample Type	Sample Date	Sample Time	Total HC	Wetness	C ₁ /C ₂ +C ₃	Balance Ratio	Mixes Spec	δ ¹³ C ₁	δ ¹³ C ₂	δ ¹³ C ₃	δ ¹³ C ₄	δ ¹³ C ₅	δ ¹³ C ₆	δ ¹³ C ₇	δ ¹³ CO ₂	δD	
						ppm	% C ₂ to C ₁	mol/mol	C ₁ +C ₂ /C ₃ +C ₄	Date	% VPDB	% VPDB	% VSMOW							
23059879	DIG-032091	SCMW 052423 Gas	Gas	05/24/23	11:10	197768	21.7	4.2	10.7	5/27/2023	-47.1	-31.8	-28.3	-30.5	-27.6	-27.8	-25.7		-248	

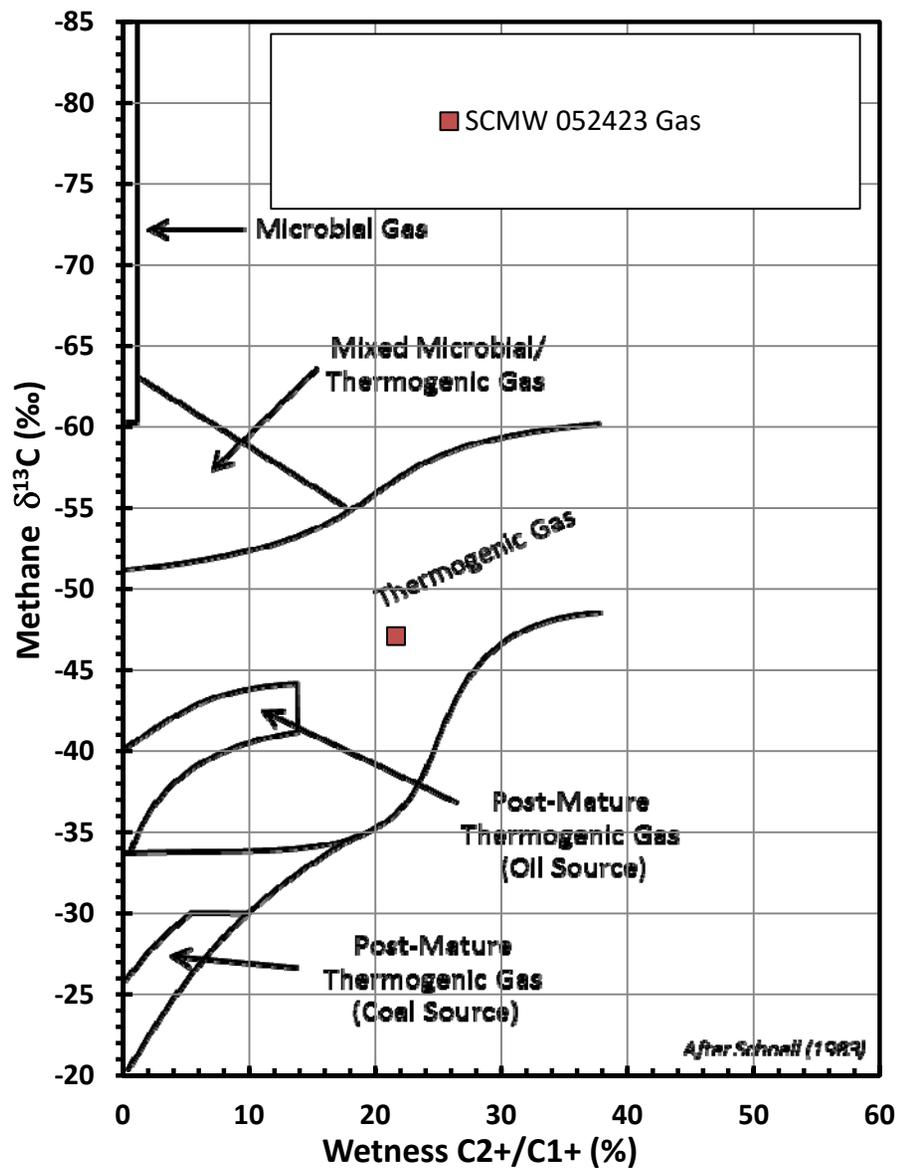
Stable isotope results based on multi-point laboratory calibration
 Values in red represent low signal; interpret with caution
 Precision 013C < 0.5 ‰
 Precision 0D < 5 ‰

SPECIFIC GRAVITY*	
Total Gas	HCI only
Spec Grav	Spec Grav
0.942	0.719

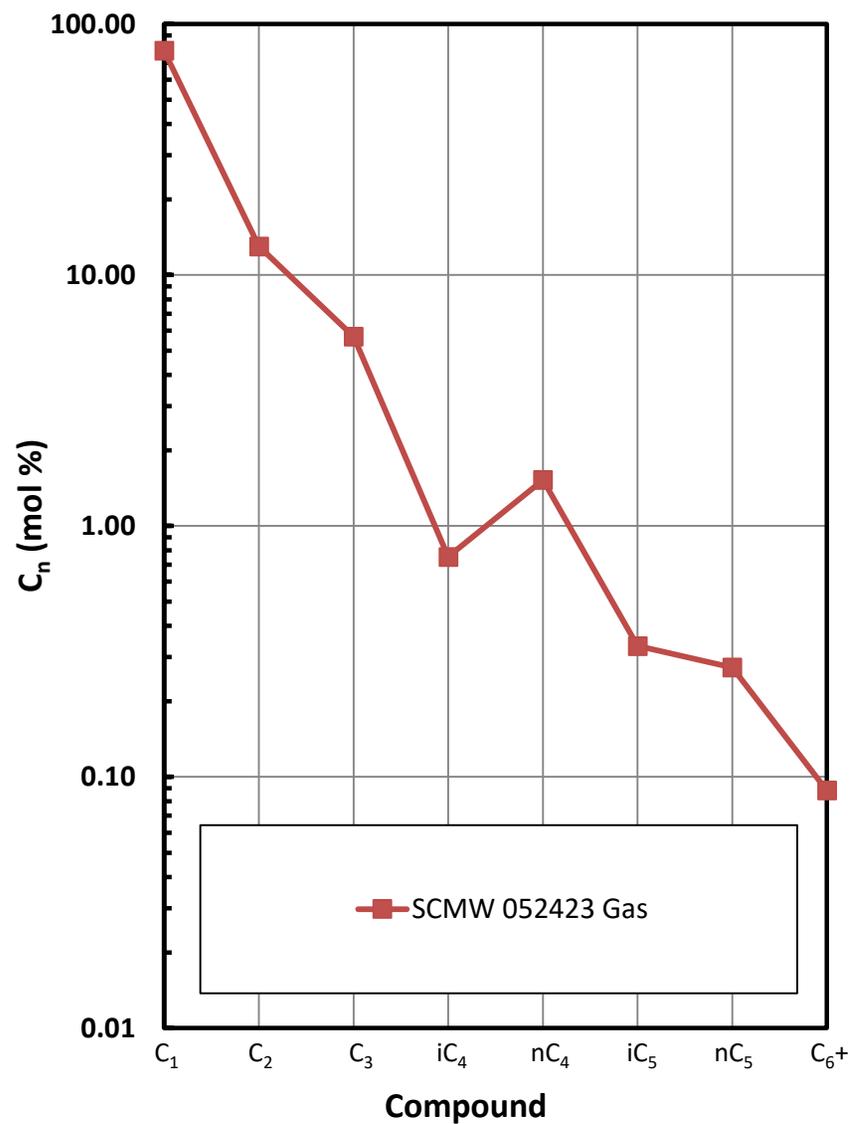
* As ideal gas, with gas concentrations normalized to 100%
 calculations based on GPA 2145-09 physical constants.

INTERPRETIVE PLOTS

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

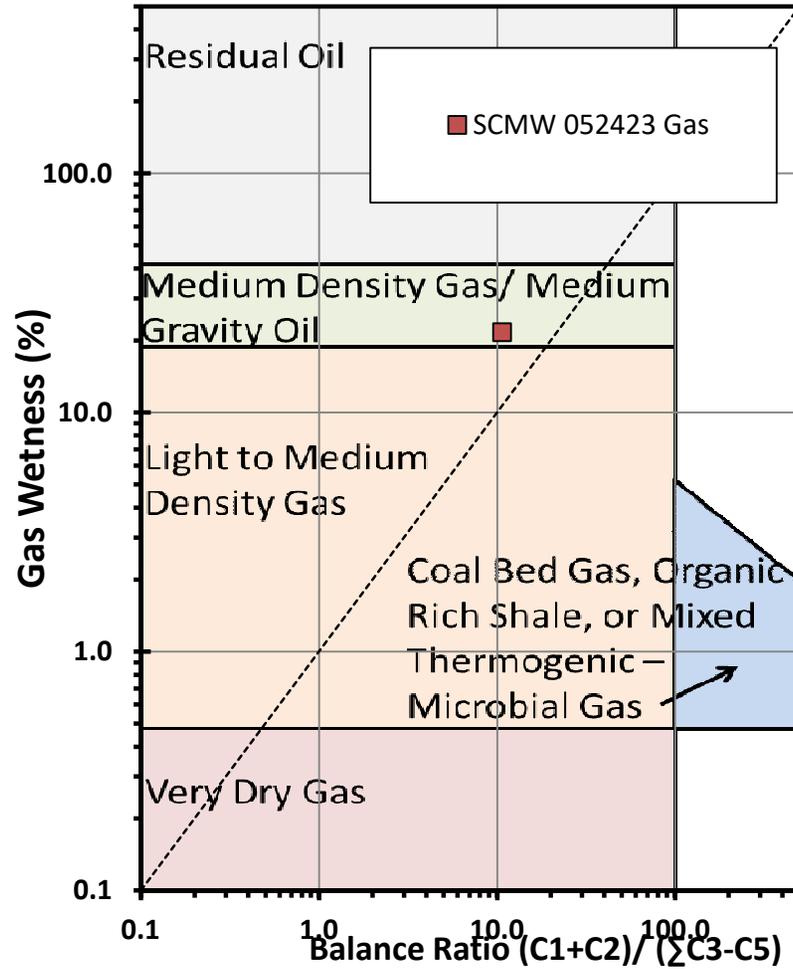


Hydrocarbon Composition Plot

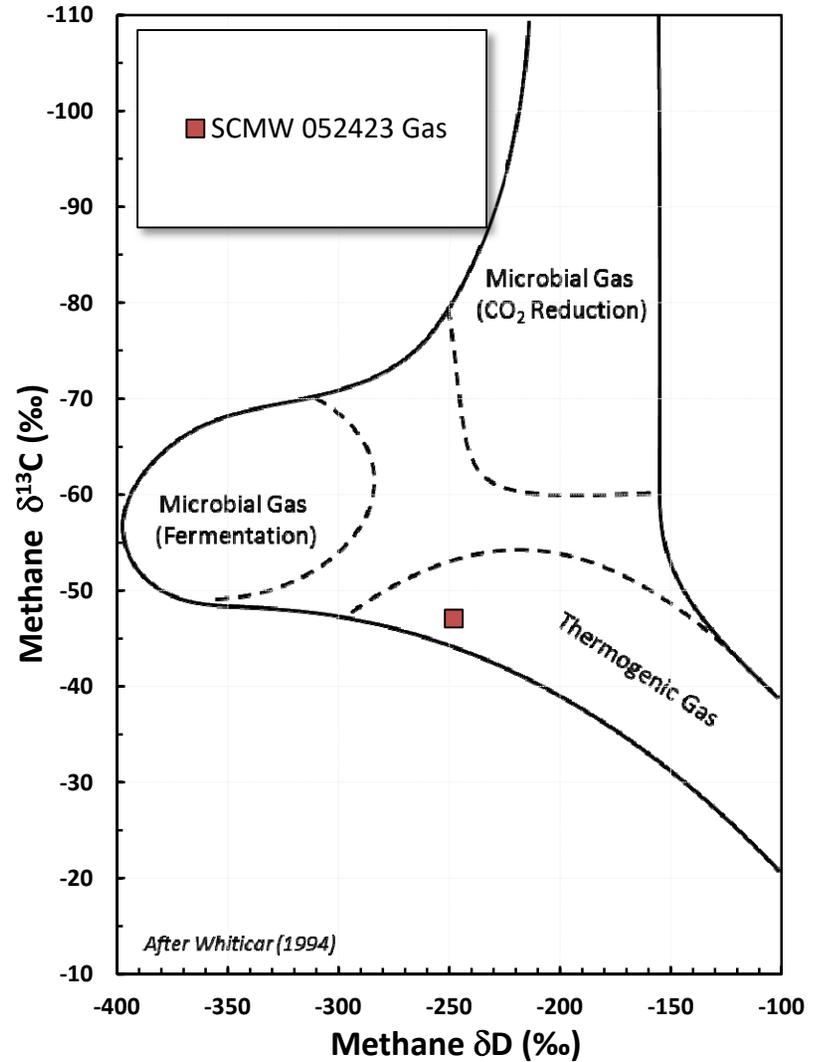


INTERPRETIVE PLOTS

Haworth Ratio Plot - Characterization of Hydrocarbon Type

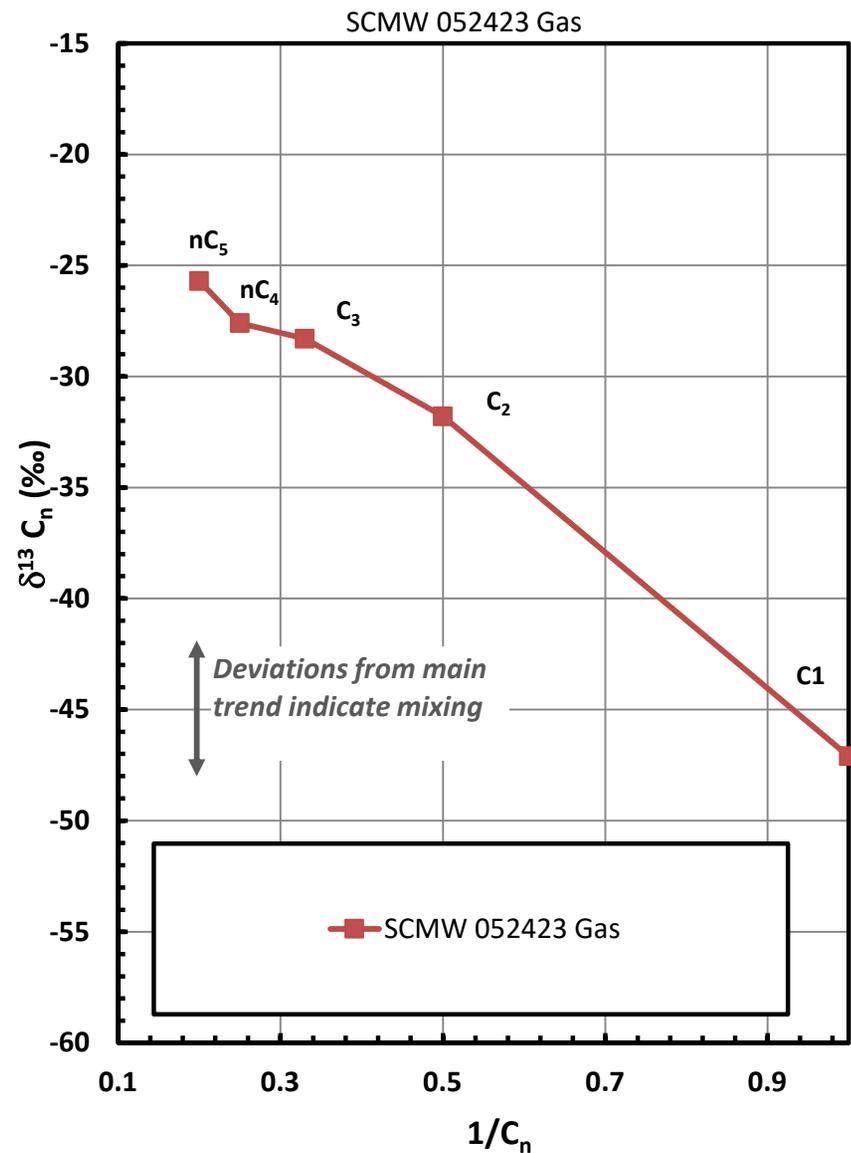


Methane $\delta^{13}\text{C}$ vs δD Genetic Classification Plot

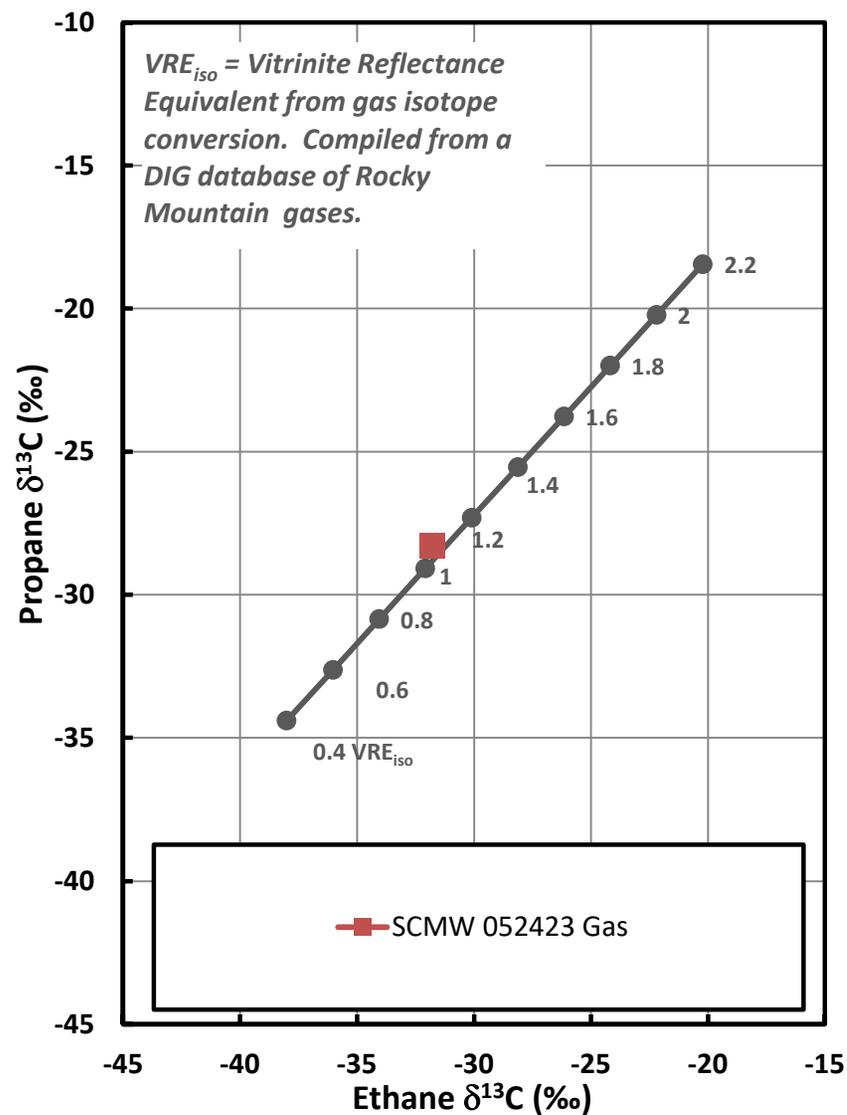


INTERPRETIVE PLOTS

Mixing Plot

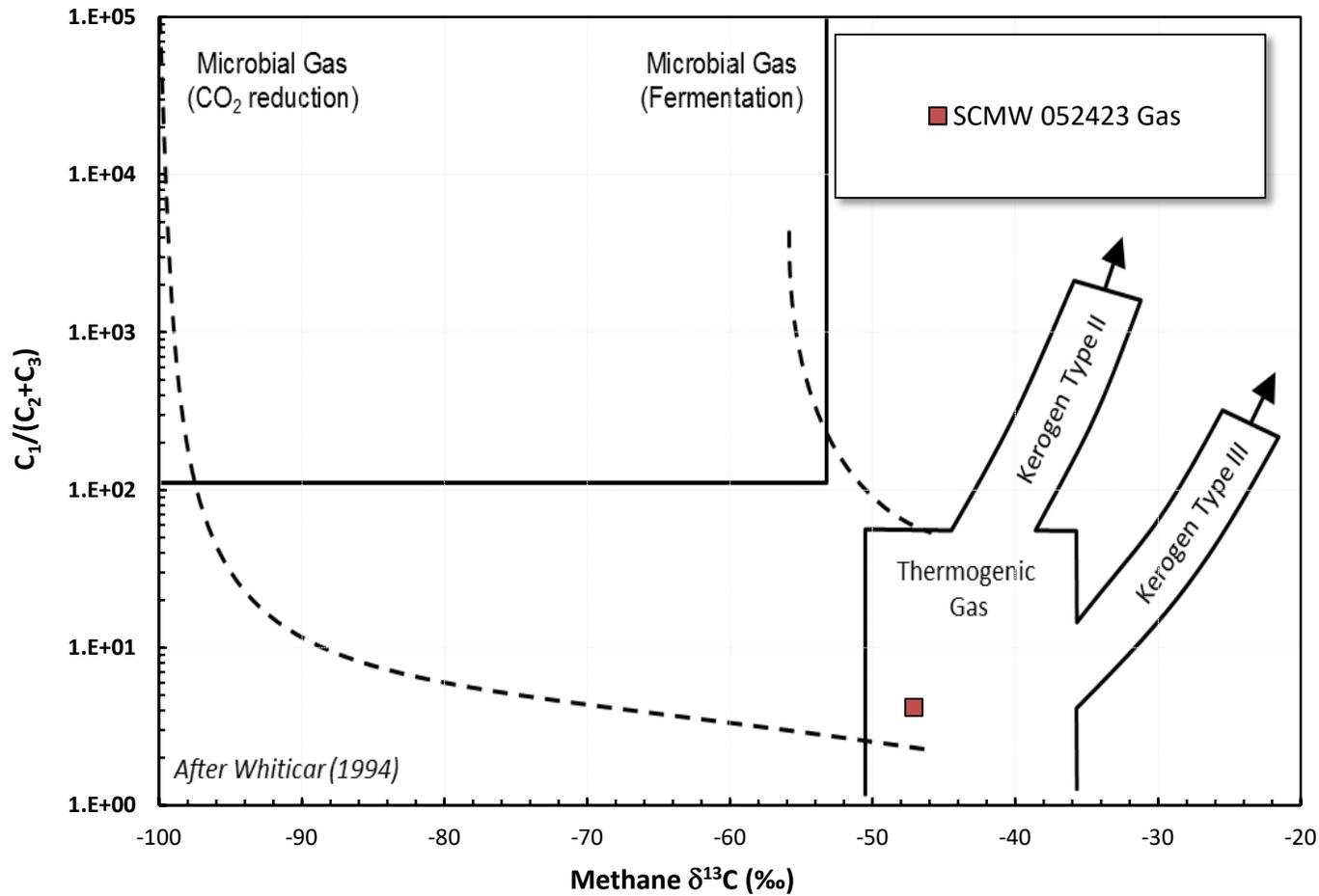


Ethane - Propane Maturity Plot



INTERPRETIVE PLOTS

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





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JOB 23059879
 DIG-032091

Send Data to:	Send Invoice to (if different):	Additional Information:
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City, State: Denver, CO 80203	City, State:	Location:
Phone: 303-503-5140	Phone:	Sampled By:
Email: twatne@olsson.com	Email:	API #:

Turnaround Time**: Standard (≤ 10 Business days) Rush (≤ 5 Business days) Expedited Rush (≤ 3 Business days)

Container Number	Sample Identification	Date Sampled	Time	Sample Type*	Gas Composition	d13C of Methane (C1)	d13C of Ethane (C2)	d13C of Propane+ (C3+)	d13C of Carbon Dioxide (CO2)	DD of Methane (C1)	Whole Oil Gas Chromatography	Isotopes of Water	d18O and dD	RSK 175 Dissolved Gas Quantification
	SCMW 052423	05/25/23	11:00	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
				Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
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				Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Chain of Custody Record Comments:

Relinquished by Signature	Company	Date	Time	Received by Signature	Company	Date	Time
	Olsson	5/25	10:00		DIG	5-25-23	10:00

*Gas composition vs RSK-175 - Gas composition is a basic analysis of the concentration (ppm) of gases within the headspace of the sample (headspace is created at the lab). RSK-175 is a specific analysis technique combined with calculations to give the total dissolved gas of each species in the water sample (mg/L). Why one or the other? Gas composition gives us a quick, general look at relative concentrations and ratios (e.g., gas wetness). RSK-175 gives us an exact total of gas present in the sample (headspace and dissolved in the water). Questions? Give us a call at 303-531-2030.
 ** Rush and Expedited Rush turnaround time analysis will incur additional costs at 2x and 3x the standard turnaround time pricing.