



dig
Dolan Integration Group

Geochemistry for Energy

11025 Dover Street Unit 800
Westminster, CO 80021
p: 303.531.2030

Hydrocarbon Gas Composition and Stable Isotopes Data and Interpretation

Job #: 22047370
Lab #: DIG-027676
Client: Olsson
Well Name: SCMW 04-14-22
API #:

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Client/Well Name: Olsson / SCMW 04-14-22
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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 ₁₆ 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/B*
22047370	DIG-027676	SCMW 04-14-22 Gas	Gas	04/14/22	13:20	4/20/2022	635796	167749	1061	159734	25596	10941	1472	2933	665	539	155				79.1	12.67	5.42	0.73	1.45	0.33	0.27	0.08	253

SAMPLE INFORMATION			HYDROCARBON RATIOS				STABLE ISOTOPE ANALYSIS										Comments			
Job Number	Lab Number	Well Name	Sample Type	Sample Date	Sample Time	Total HC ppm	Wetness % C ₂ to C ₁	C ₂ /C ₁ +C ₂ mol/mol	Balance Ratio C ₃ +C ₄ /C ₂ -C ₁	Mass Spec Date	δ ¹³ C ₁ ‰ VPDB	δ ¹³ C ₂ ‰ VPDB	δ ¹³ C ₃ ‰ VPDB	δ ¹³ C ₄ ‰ VPDB	δ ¹³ C ₅ ‰ VPDB	δ ¹³ C ₆ ‰ VPDB	δ ¹³ C ₇ ‰ VPDB	δ ¹³ CO ₂ ‰ VPDB	δ ¹⁸ O ‰ VSMOW	
22047370	DIG-027676	SCMW 04-14-22 Gas	Gas	04/14/22	13:20	202035	20.9	4.4	11.2	4/21/2022	-46.7	-12.1	-28.4		-28.5				-253	

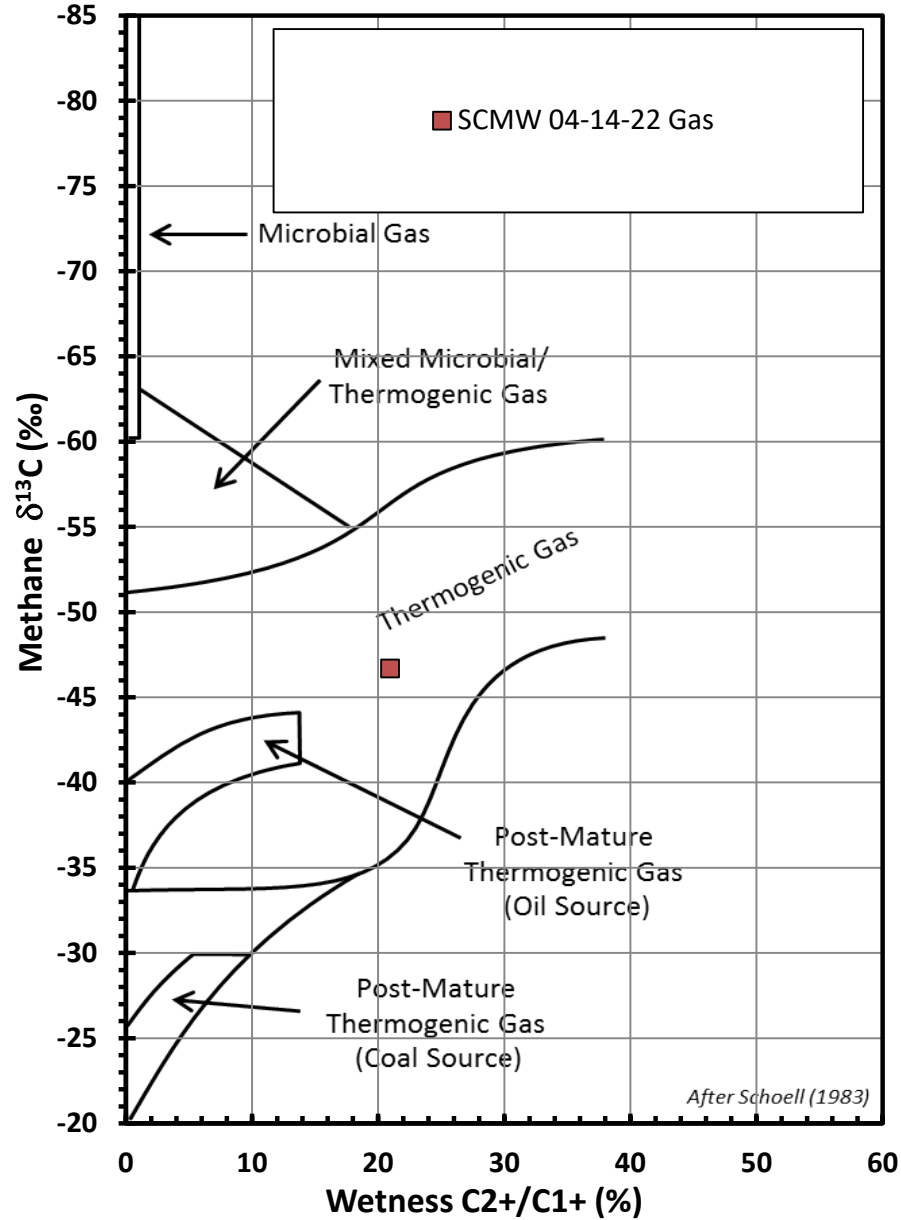
Stable isotope results based on multi-point laboratory calibration
 Values in red represent low signal; interpret with caution
 Precision δ¹³C < 0.5 ‰
 Precision δ¹⁸O < 5 ‰

SPECIFIC GRAVITY*	
Total Gas	HCs only
Spec Grav	Spec Grav
0.940	0.713

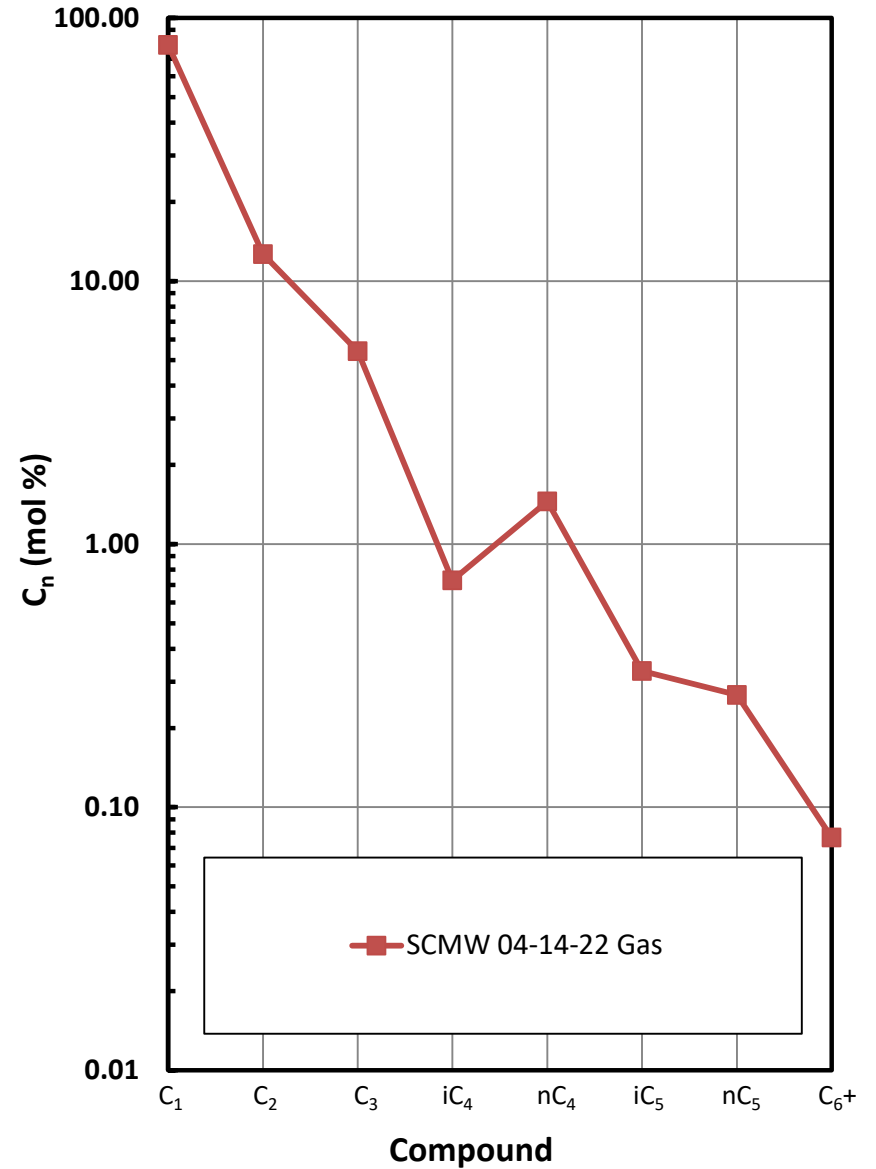
* As ideal gas, with gas concentrations normalized to 100%; calculations based on GPA 2145-09 physical constants.

INTERPRETIVE PLOTS

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

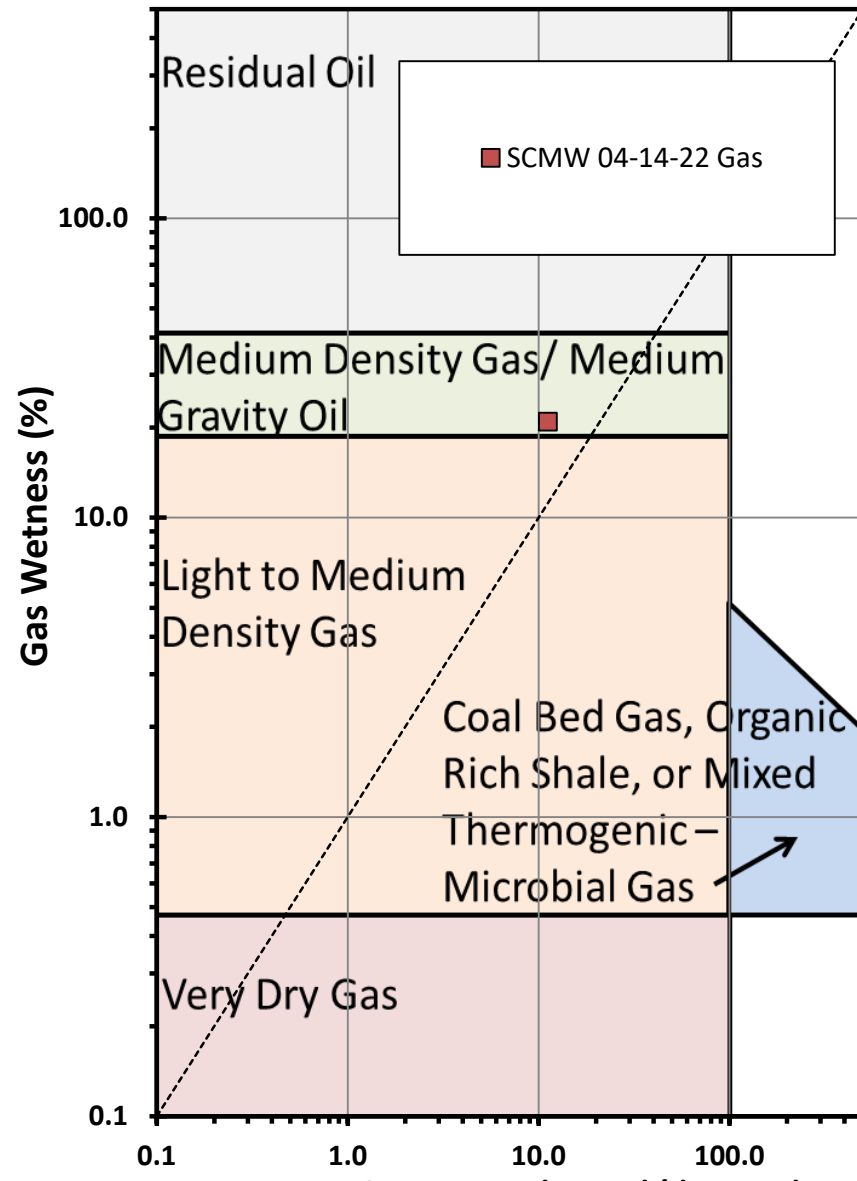


Hydrocarbon Composition Plot

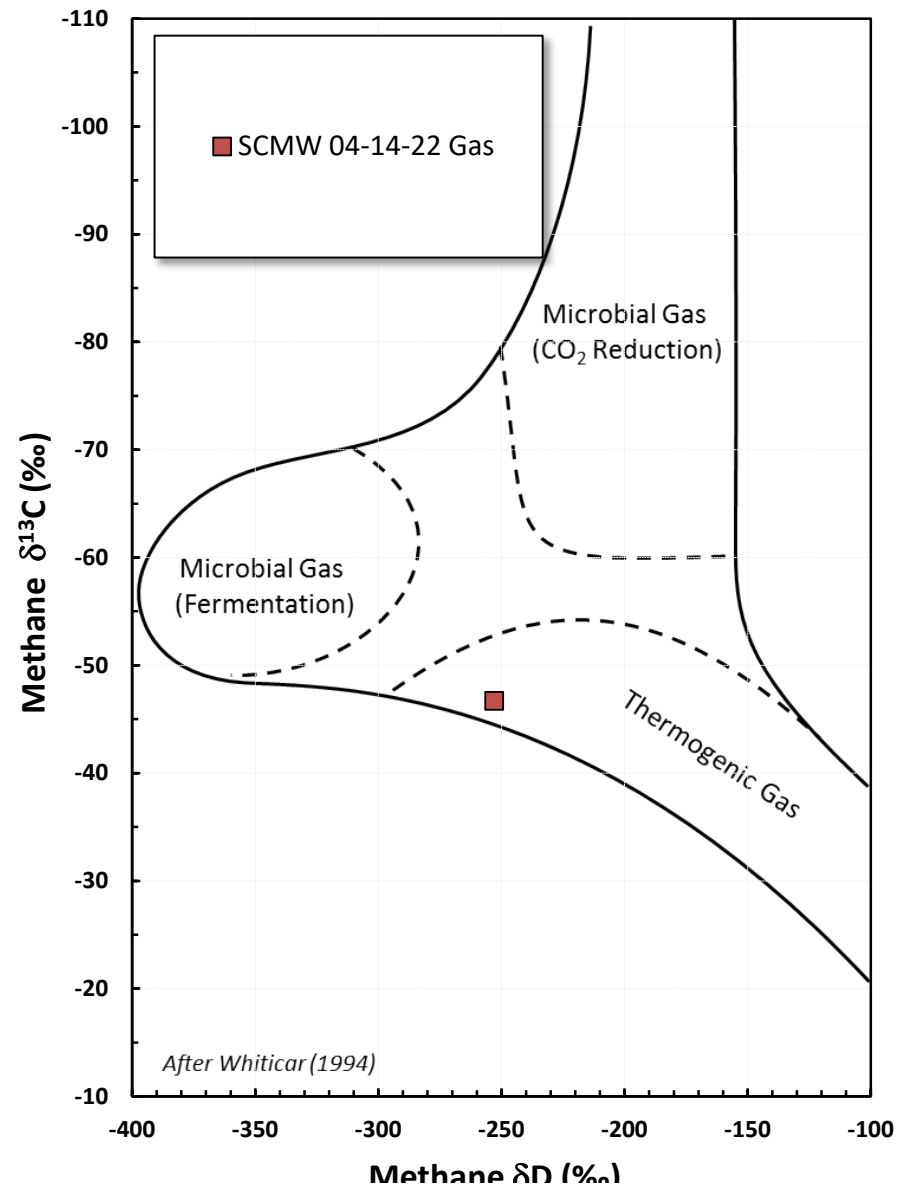


INTERPRETIVE PLOTS

Haworth Ratio Plot - Characterization of Hydrocarbon Type



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

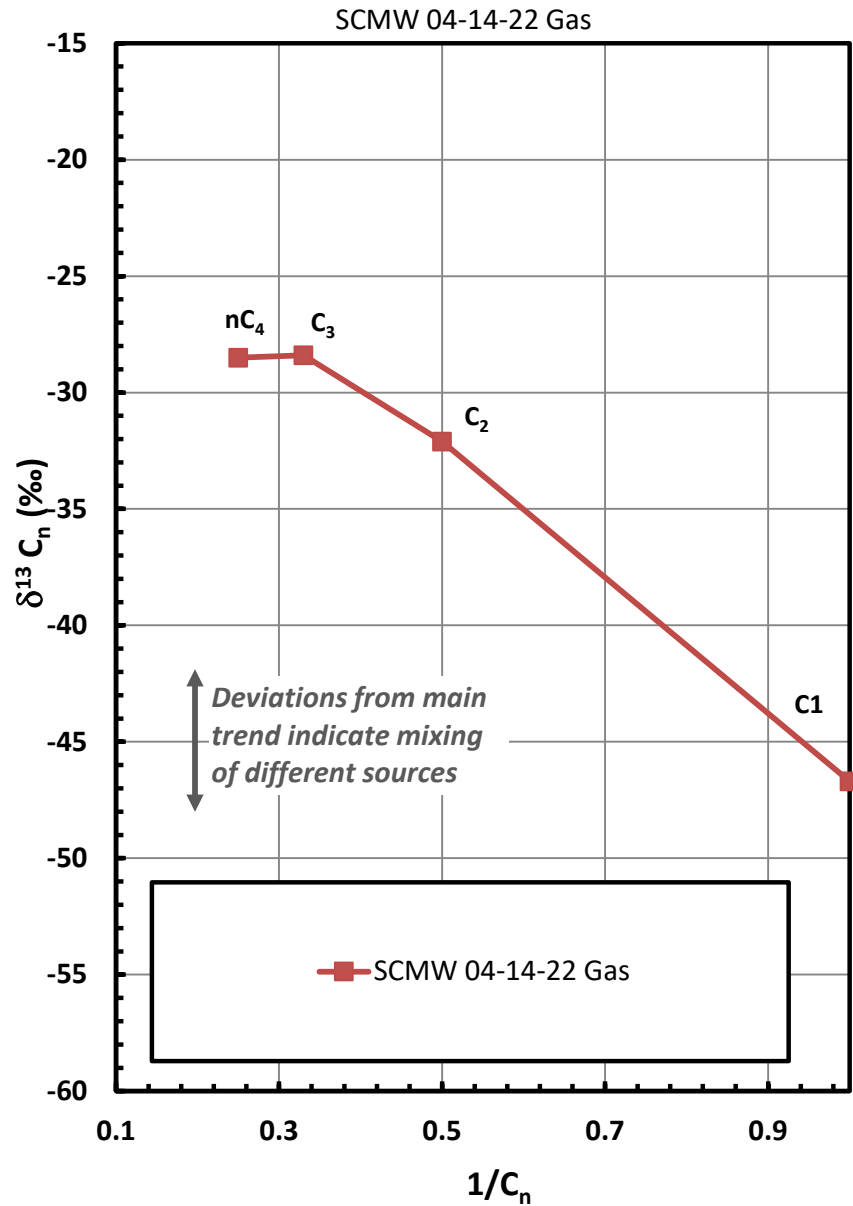


Balance Ratio $(C1+C2) / (\sum C3-C5)$

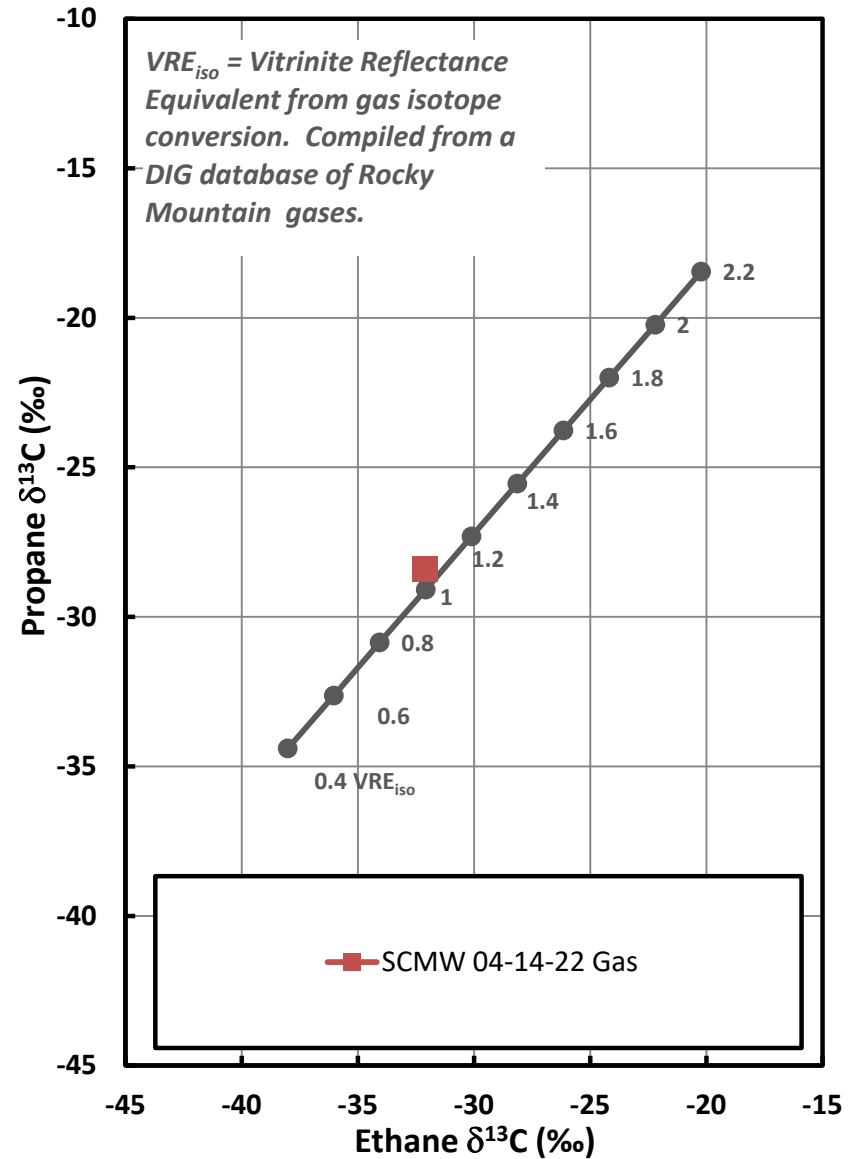
MECHANIC 02 (100)

INTERPRETIVE PLOTS

Mixing Plot

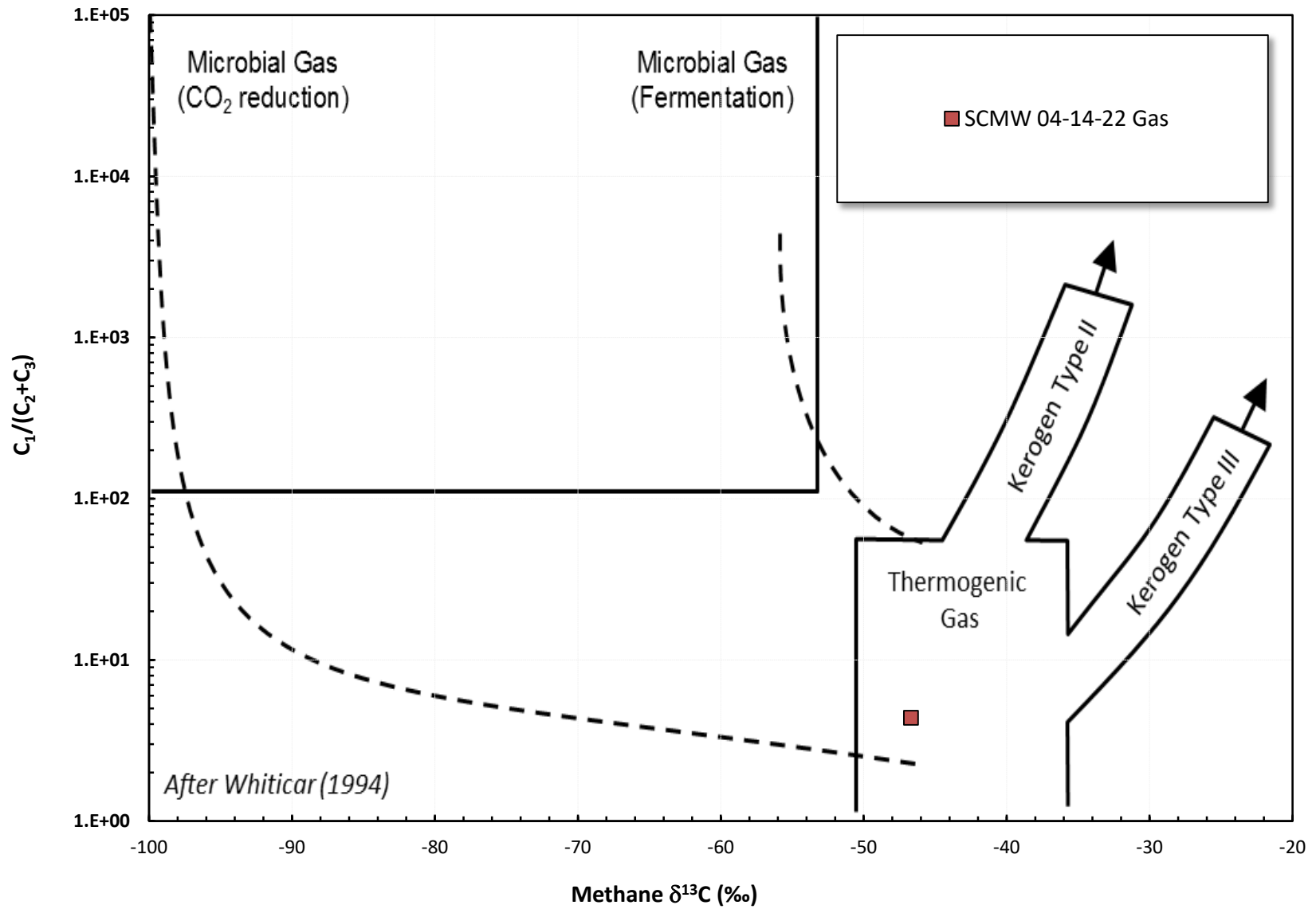


Ethane - Propane Maturity Plot



INTERPRETIVE PLOTS

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





Geochemistry for Energy
 1317 West 121st Ave
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 p: 303.531.2030

JOB 22047370
 DIG - 027676

Send Data and Invoice to:

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 Company: Olsson
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Denver, CO 80204
 Phone: (720) 720-7079
 Fax: ---
 Email: vscott@olsson.com

AFE #: ---
 Report Ctr: ---
 Project: 016-0111
 PO #: ---
 Location: SCMW
 Sampled By: ZS

Analysis Requested	
Gas Composition* H ₂ O, CO ₂ , H ₂ , H ₂ S, C ₂ H ₆	RSK-175* H ₂ O, CO ₂ , H ₂ , H ₂ S, C ₂ H ₆ with dissolved O ₂ , Cl ₂ & O ₃
δ ¹³ C Methane (Carbon)	δ ¹³ C Ethane-Propane (C ₂ & C ₃)

Sample Description

Container #	Sample Identification	Date Sampled	Time	Gas Composition*	RSK-175*	δ ¹³ C Methane (Carbon)	δ ¹³ C Ethane-Propane (C ₂ & C ₃)	Comments
	SCMW 04-14-22	04/14/22	1320	✓	✓	✓	✓	

Chain-of-Custody Record

Signature	Company	Date	Time
<i>[Signature]</i>	Olsson	04/14/22	1435
<i>[Signature]</i>	DIG	4/14/22	1430

*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