



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 #: 20125051
Lab #: DIG-024407 - DIG-024408
Client: Southern Petroleum Labs, Inc.
Well Name: RAZOR 26-3524H

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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 ₂ H ₆ 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/H ¹	
20125051	DIG-024407	RAZOR 26-3524H Brademhead gas	Brademhead gas	12/02/20	13:00	12/31/2020	233245	67374	1029	526906	111940	65410	4945	11819	1117	1001	529			66.8	72.8	15.47	9.04	0.68	1.63	0.15	0.14	0.07	937	
20125051	DIG-024408	RAZOR 26-3524H Production gas	Production gas	12/02/20	14:00	12/31/2020	308986	90207	20753	440736	81127	64754	5795	15577	1985	2312	1822				71.8	13.22	10.54	0.94	2.54	0.32	0.38	820		

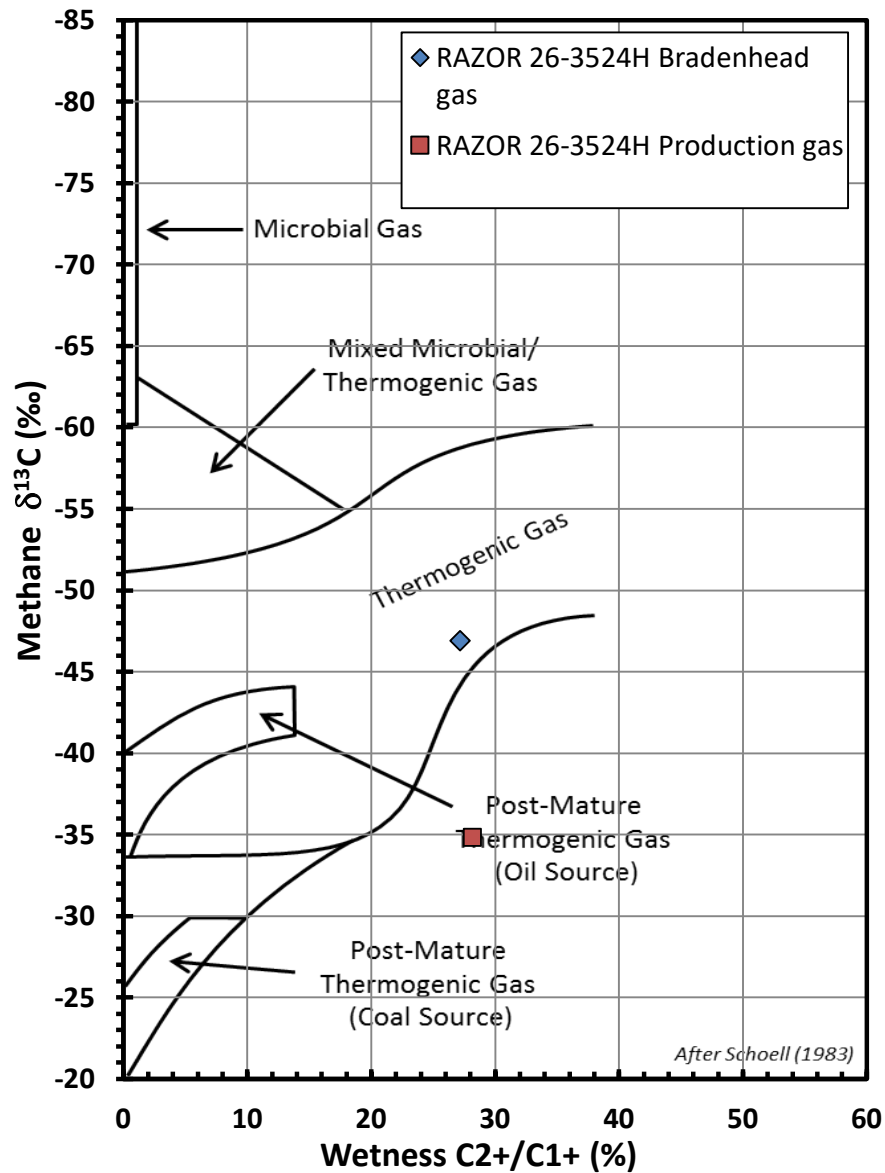
SAMPLE INFORMATION						HYDROCARBON RATIOS				STABLE ISOTOPE ANALYSIS										Comments	
Job Number	Lab Number	Well Name	Sample Type	Sample Date	Sample Time	Total HC ppm	Wetness N ₂ /C ₁ to C ₃	C ₂ /C ₁ -C ₃ mol/mol	Balance Ratio C ₄ /C ₁ -C ₃ -C ₅	Mass Spec Date	δ ¹³ C ₁ ‰ VPDB	δ ¹³ C ₂ ‰ VPDB	δ ¹³ C ₃ ‰ VPDB	δ ¹³ iC ₄ ‰ VPDB	δ ¹³ nC ₄ ‰ VPDB	δ ¹³ iC ₅ ‰ VPDB	δ ¹³ nC ₅ ‰ VPDB	δ ¹³ CO ₂ ‰ VPDB	δD ‰ VSMOW		
20125051	DIG-024407	RAZOR 26-3524H Brademhead gas	Brademhead gas	12/02/20	13:00	723647	27.2	3.0	7.6	1/21/2021	-46.9	-35.1	-31.1		-29.1				-257		
20125051	DIG-024408	RAZOR 26-3524H Production gas	Production gas	12/02/20	14:00	614120	28.2	3.0	5.8	1/21/2021	-34.8	-31.6	-29.6		-28.8				-251		

Stable isotope results based on multi-point laboratory calibration
 low signal; interpret with caution
 Precision δ¹³C < 0.5 ‰
 Precision δD < 5 ‰
 * As ideal gas, with gas concentrations normalized to 100%;
 calculations based on GPA 2145-09 physical constants.

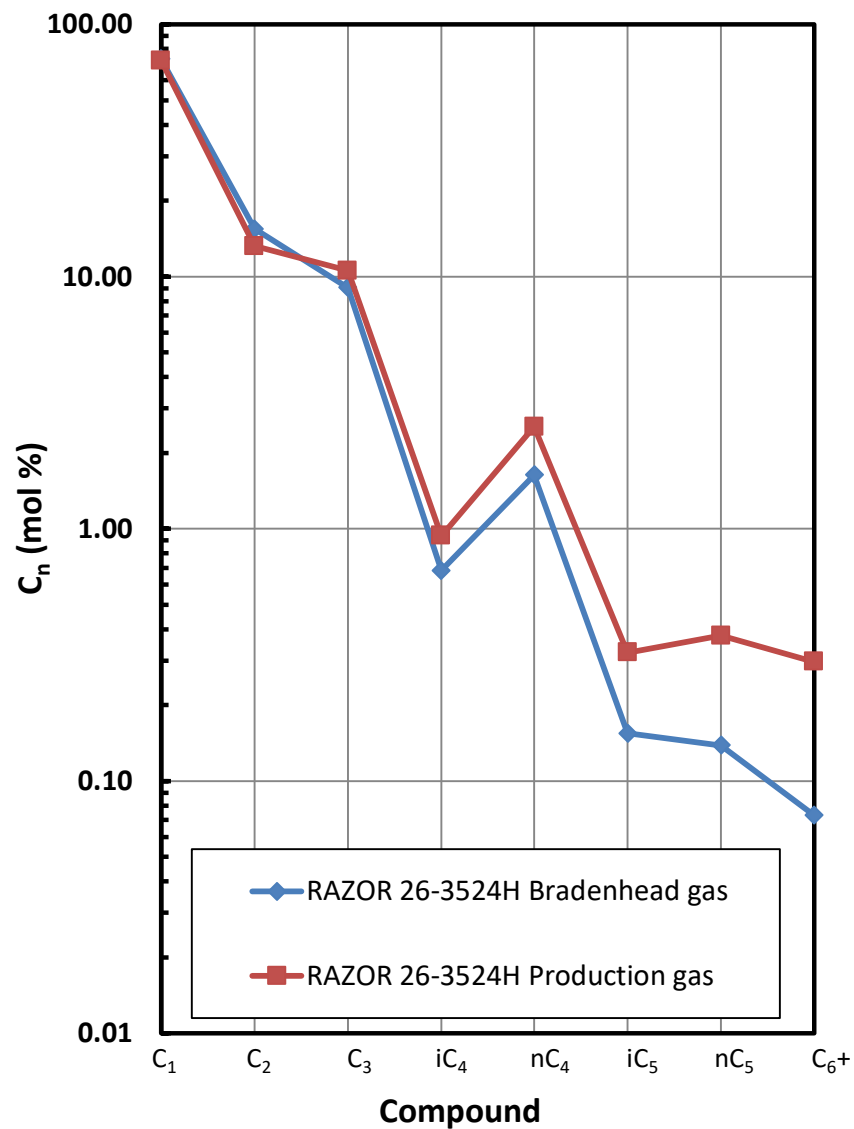
SPECIFIC GRAVITY*	
Total Gas Spec Grav	HCs only Spec Grav
0.829	0.797
0.886	0.791

INTERPRETIVE PLOTS

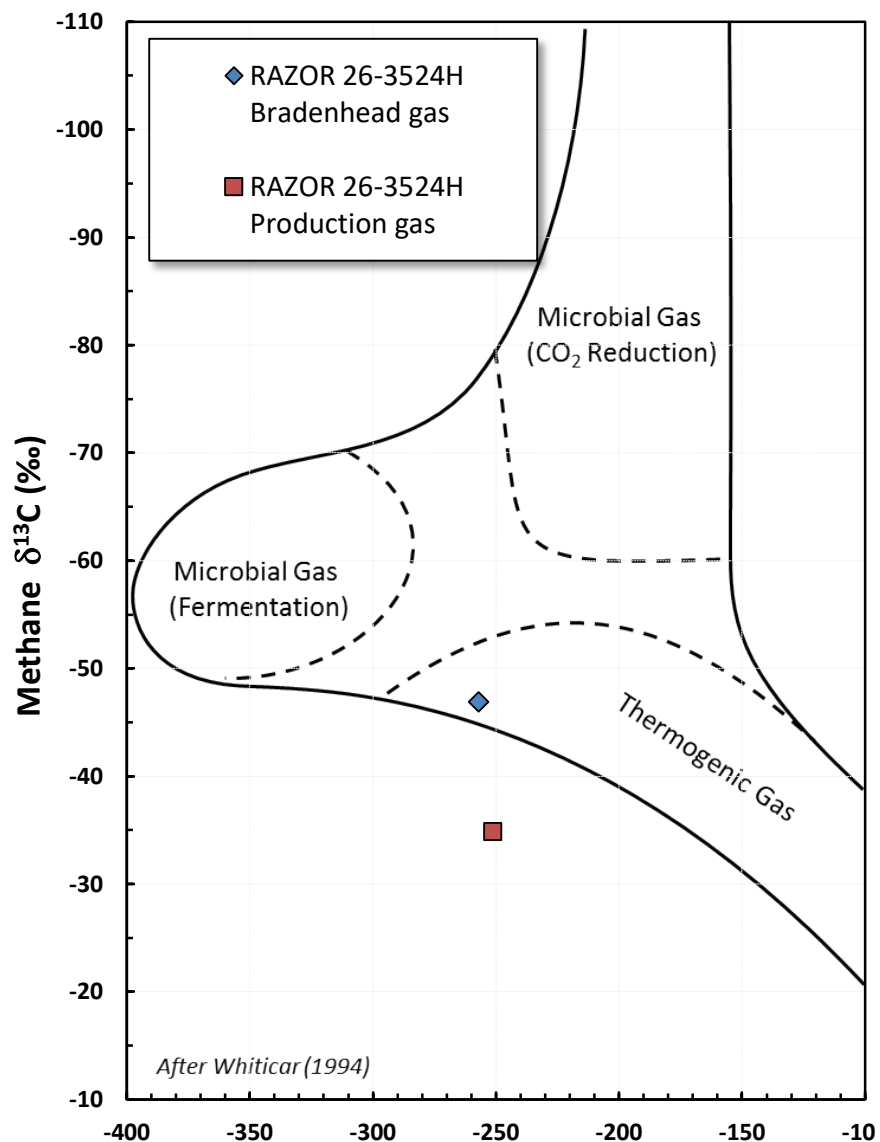
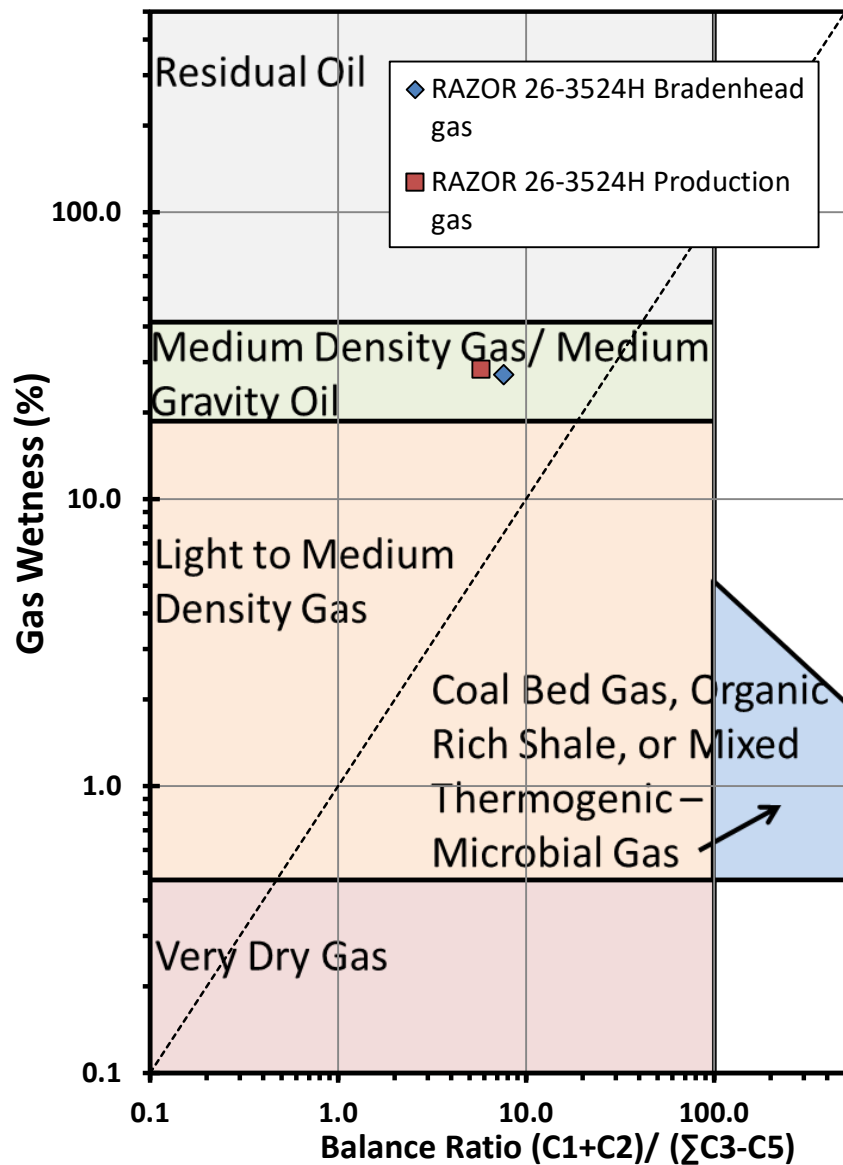
Methane $\delta^{13}\text{C}$ vs Wetness Genetic Classification Plot



Hydrocarbon Composition Plot

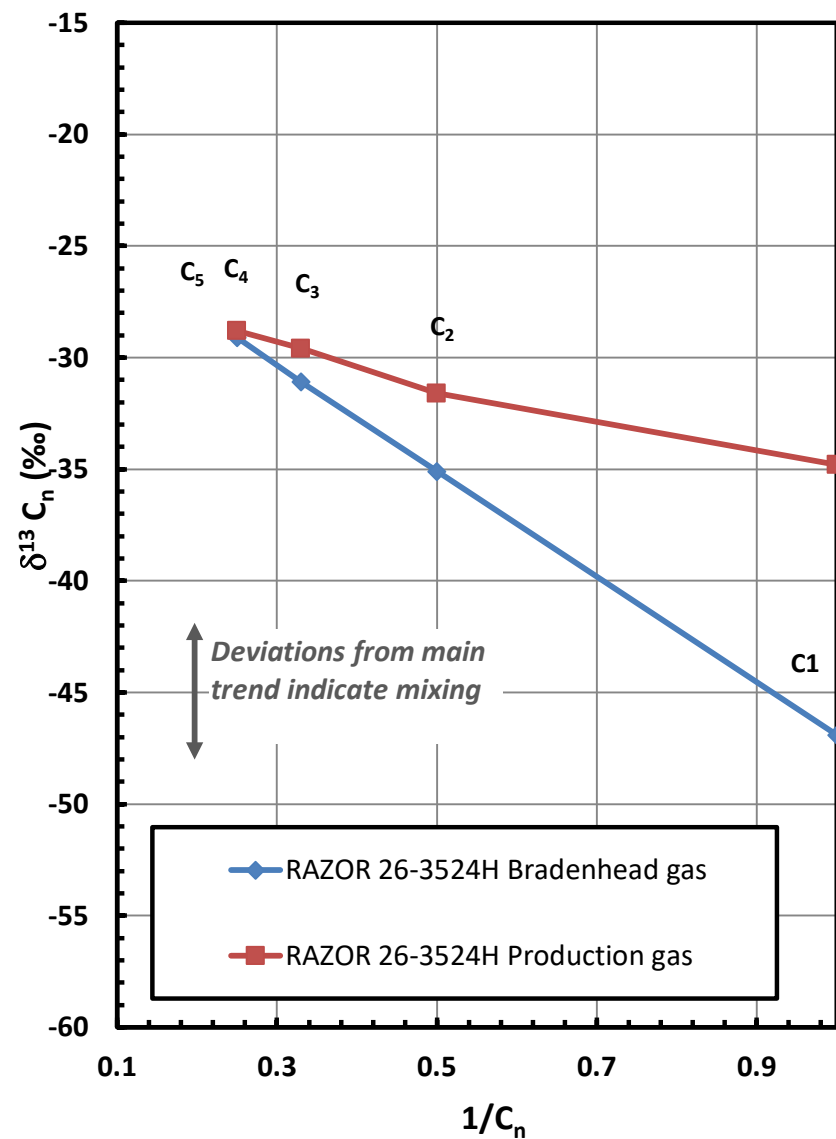


Haworth Ratio Plot - Characterization of Hydrocarbon Type Methane $\delta^{13}\text{C}$ vs δD Genetic Classification Plot

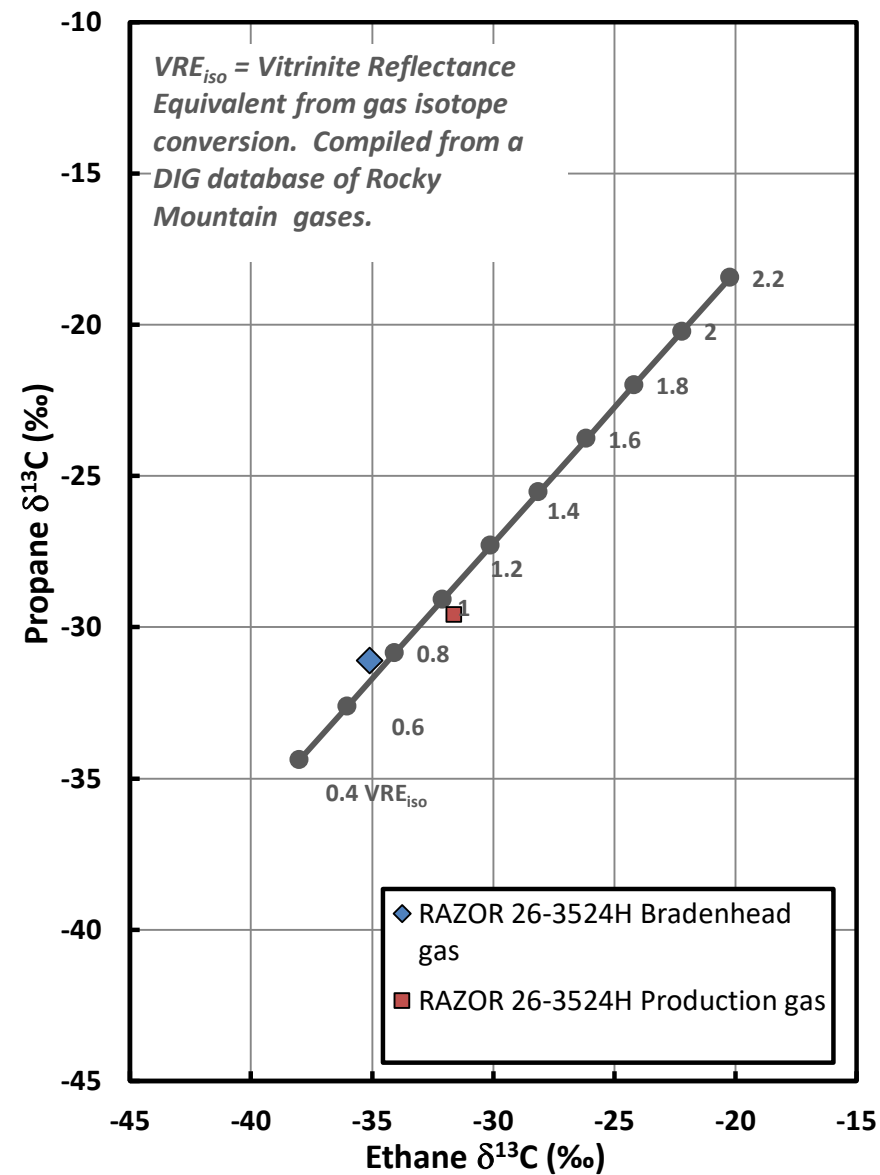


Methane δD (‰)

Mixing Plot

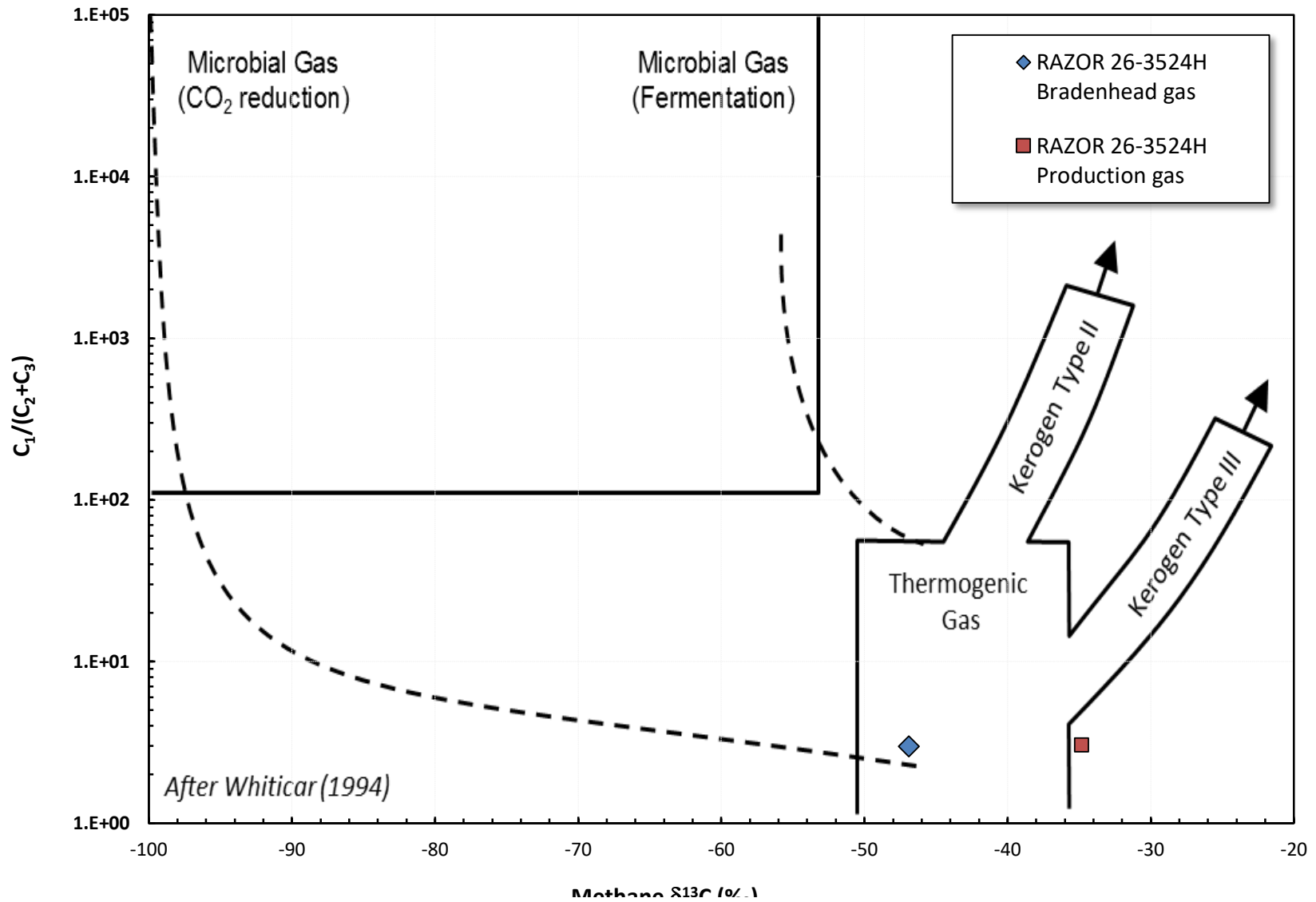


Ethane - Propane Maturity Plot



INTERPRETIVE PLOTS

Methane $\delta^{13}C$ vs $C_1/(C_2+C_3)$ Genetic Classification Plot



VIETNAMESE (700)

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 mloveley@spl-inc.com

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Contact: []
Phone: 9
Invoice To: []
(Company Name): []
Address: []

City/State/Zip: []
Contact: []
Phone: []
Client PO# or Ref. No.: []
Contract/Proposal #: []
 (i.e. SPL C###)

SPL COLORADO

will be rented for checked out are thin 21 days, sample or not, and after 30 days cost and will be placement cost.

Project/Station Number:	N/A	Project/Station Location:	N/A
Requested 1		Requested 1	
Net 30 day Acct.		Check #	
Credit Card		Requested Analysis	(Place an "X" next to Sample ID below)
		C1-C8+	
		H2S, Ethene	
		BTEX	
		Oxygen, Nitrogen, Argon	
		BTU	
		HAPS including 2,2,4 Trimethylpentane Stable Isotopes - ΔDC1, Δ13C1, Δ13C2, Δ13C3.	
		Temperature	
		PSI	
		Comments	

Sample ID (used to log/track sample)	Sample Date	Sample Time	Sample Type (Gas/liq./Solid)	Duplicate	Composite	Spot	Cylinder Tracking Info		Comments
							Cylinder #	Date In	
6-BH-Razor 1E-1402	12/3/2020		Gas						Broken head Produced Gas
6-PG-Razor 1E-1402	12/3/2020		Gas						Broken head Produced Gas
6-BH-Razor 1E-1402	12/2/2020		Gas						Broken head Produced Gas
6-PG-Razor 1E-1402	12/2/2020		Gas						Broken head Produced Gas
6-BH-Razor 1E-1402	12/3/2020		Gas						Broken head Produced Gas
6-PG-Razor 1E-1402	12/3/2020		Gas						Broken head Produced Gas
6-BH-Razor 1E-1402	12/3/2020		Gas						Broken head Produced Gas
6-PG-Razor 1E-1402	12/3/2020		Gas						Broken head Produced Gas
6-BH-Razor 1E-1402	12/2/2020		Gas						Broken head Produced Gas
6-PG-Razor 1E-1402	12/2/2020		Gas						Broken head Produced Gas
6-BH-Razor 1E-1402	12/2/2020		Gas						Broken head Produced Gas
6-PG-Razor 1E-1402	12/2/2020		Gas						Broken head Produced Gas

Signature: Shane Oringdolph
Received By-Company: SPL, Inc

Relinquished By-Print Name: David Helmen
Signature: [Signature]
Date: 12/21/20
Time: 4:45

Relinquished By-Print Name: [Signature]
Signature: [Signature]
Date: [Date]
Time: [Time]

Relinquished By-Print Name: [Signature]
Signature: [Signature]
Date: [Date]
Time: [Time]

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epi CALIFORNIA

SPL, Inc.
Analysis Request Chain of Custody Record

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