

Reference: THUND22B  
Crude: Thunder Horse



## Crude Summary Report

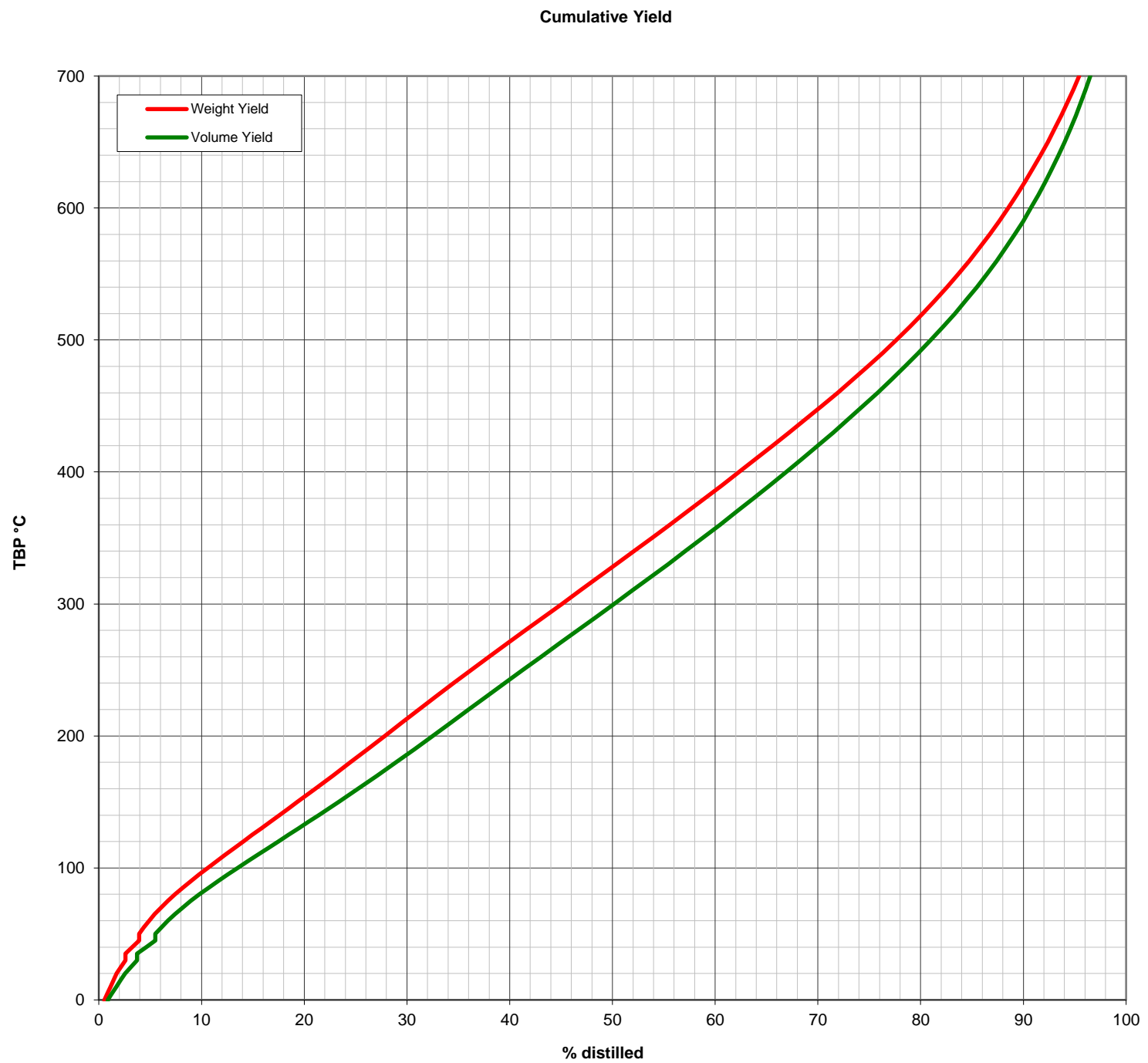
General Information		Molecules (%wt on crude)				Whole Crude Properties			
Reference:	THUND22B	methane + ethane	0.02	Density @ 15°C (g/cc)	0.8497				
Name:	Thunder Horse	propane	0.40	<b>API Gravity</b>	<b>35.0</b>				
Origin:	Gulf of Mexico	isobutane	0.26	Total Sulfur (% wt)	0.70				
Assay Date:	4/28/2022	n-butane	1.06	Pour Point (°C)	-26				
Comments:		isopentane	0.81	Viscosity @ 20°C (cSt)	9.6				
		n-pentane	1.26	Viscosity @ 40°C (cSt)	5.0				
		cyclopentane	0.13	Nickel (ppm)	9.0				
		C6 paraffins	2.34	Vanadium (ppm)	7.8				
		C6 naphthenes	0.90	Total Nitrogen (ppm)	1220				
		benzene	0.15	Total Acid Number (mgKOH/g)	0.07				
		C7 paraffins	2.25	Mercaptan Sulfur (ppm)	7.3				
		C7 naphthenes	1.50	Hydrogen Sulfide (ppm)	0.0				
		toluene	0.41	Reid Vapor Pressure (kPa)	48.7				

Cut Data	IBP	Atmospheric Cuts										Vacuum Cuts			
		C5	65	100	150	200	250	300	350	370	370	450	500	550	
Start (°C)															
End (°C)	FBP	65	100	150	200	250	300	350	370	FBP	450	500	550	FBP	
Yield (% wt)		4.0	5.2	8.7	8.5	8.4	8.8	8.8	3.5	42.7	13.1	7.3	6.0	16.3	
Yield (% vol)		5.3	6.1	9.8	9.2	8.8	8.9	8.6	3.3	37.9	12.3	6.6	5.5	13.5	
Cumulative Yield (% wt)		1.4	5.5	10.6	19.3	27.8	36.3	45.1	53.8	57.3	57.3	70.4	77.6	83.7	
Volume Average B.P. (°C)	318	41.3	83	125	175	225	275	325	360	523	409	474	524	650	
Density @ 15°C (g/cc)	0.8497	0.6456	0.7166	0.7531	0.7868	0.8131	0.8423	0.8617	0.8811	0.9557	0.9032	0.9306	0.9383	1.0227	
API Gravity	35.0	87.7	65.9	56.4	48.3	42.5	36.4	32.6	29.0	16.5	25.1	20.5	19.2	6.8	
UOPK	12.01			11.88	11.82	11.86	11.81	11.89	11.85	11.79	11.85	11.86	12.02	11.57	
Molecular Weight (g/mol)				110	138	172	209	255	289	519	343	437	556	974	
Total Sulfur (% wt)	0.7	0.000	0.001	0.005	0.026	0.091	0.305	0.59	0.75	1.37	0.89	1.04	1.23	1.96	
Mercaptan Sulfur (ppm)	7.3	0.0	0.0	1.1	8.6	7.5	2.9								
Total Nitrogen (ppm)	1220					14	34	166	440	2777	1046	1553	1938	5015	
Basic Nitrogen (ppm)	333					9	27	73	143	746	293	479	555	1297	
Total Acid Number (mgKOH/g)	0.07	0.00	0.00	0.01	0.03	0.06	0.10	0.14	0.14	0.07	0.12	0.09	0.09	0.03	
Viscosity @ 20°C (cSt)	9.63				1.26										
Viscosity @ 40°C (cSt)	5.01				0.98	1.54	2.81	6.07	11.8						
Viscosity @ 50°C (cSt)	3.85					1.34	2.34	4.74	8.66	758					
Viscosity @ 60°C (cSt)										377	22.9	96.5	350		
Viscosity @ 100°C (cSt)										50.0	15.9	58.7	189		
Viscosity @ 130°C (cSt)											5.48	13.8	31.3	9071	
Viscosity @ 150°C (cSt)														1069	
RON (Clear)		75.0	35.6	55.7	34.2										
MON (Clear)		72.8	51.7	56.4	32.5										
Paraffins (% wt)	33.1	96.2	68.7	45.4	51.5										
Naphthenes (%wt)	29.7	3.8	28.3	40.8	32.0										
Aromatics (% wt)	37.2	0.0	3.0	13.8	16.4										
Pour Point (°C)	-26					-45	-22	-2	9	39	23	38	48	73	
Cloud Point (°C)						-43	-20	-1							
Freeze Point (°C)						-64	-39	-16							
Smoke Point (mm)						24	20	15							
Cetane Index (D4737A)						40	48	53	60	61					
Naphthalenes (% vol)						0.1	2.5	7.6	9.9						
Aniline Point (°C)				51.1	55.3	62.7	70.2	76.4	79.5		85.7	92.9	95.2		
Hydrogen (% wt)	13.4	16.5	15.4	14.3	14.2	13.8	13.6	13.3	13.0		12.6	12.4	12.5		
Total Wax (% wt)	10.6									8.7	15.3	12.2	8.4	2.0	
C7 Asphaltenes (% wt)	1.3									3.0	0.0	0.0	7.9		
Micro Carbon Residue (% wt)	3.6									8.4	0.2	1.7	21.3		
Vanadium (ppm)	7.8									18.3	0.0	0.0	47.9		
Nickel (ppm)	9.0									21.0	0.0	0.0	54.8		
Iron (ppm)	0.8									2.0	0.0	0.0	5.1		
Sodium (ppm)	3.1														
Mercury (ppb)	4.0														
Arsenic (ppb)	5														

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## Yield Distribution



**Cumulative Volume % Distilled at 10 Degree C (TBP) Intervals**

	0	10	20	30	40	50	60	70	80	90
0				3.7	4.6	5.5	6.7	8.2	9.8	11.6
100	13.5	15.5	17.5	19.5	21.4	23.3	25.2	27.1	28.9	30.7
200	32.5	34.3	36.0	37.8	39.5	41.3	43.1	44.8	46.6	48.4
300	50.2	51.9	53.7	55.4	57.1	58.8	60.5	62.1	63.7	65.3
400	66.9	68.5	70.0	71.5	73.0	74.4	75.8	77.2	78.5	79.8
500	81.0	82.2	83.3	84.4	85.5	86.5	87.4	88.3	89.2	90.0