

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-2 (J-M)
HOURS 206-303
CATALYST Fresh CM&S

FRESH FEED				WET GAS		RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H ₂ + CO FED				
	%	m/hr	#/hr	%	At Wt. Balance	m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE		YIELDS BASIS	BROWNSVILLE DESIGN	FEED RATE*
					m/hr	#/hr					#/MCF	#/gal	gal/hr	gal/MCF	
CO		15.423					22.433		-12.772	357.74					
H ₂		24.899					46.277		-16.819	-33.91				400 EP	6.748
CO ₂									3.037	133.66	8.735			400-550	1.600
N ₂														550 +	1.248
CH ₄								0.859	13.78	0.901					
C ₂ H ₆								0.250	7.01	0.458					
C ₃ H ₈								0.147	4.42	0.289				PROPYLENE	3.111
C ₄ +C ₅									25.21	1.647				C ₄ POLY GASO.	0.455
C ₆ H ₁₂								0.215	9.05	0.591	4.32	2.095	0.137	C ₆ POLY TAR	0.052
C ₇ H ₁₄								0.029	1.28	0.084	4.24	0.302	0.020		
C ₈ H ₁₈								0.220	12.34	0.806	5.00	2.468	0.161		
C ₉ H ₁₂								0.085	4.94	0.323	4.86	1.016	0.066	C ₉ H ₁₀	68.0
C ₁₀ H ₁₆								0.121	8.49	0.555	5.48	1.558	0.102	C ₁₀ POLY GASO.	1.5
C ₁₁ H ₁₄								0.032	2.31	0.151	5.25	0.440	0.029	C ₁₁ H ₁₀	5.8
C ₁₂ H ₁₈								0.050	4.21	0.275	5.54	0.760	0.050	C ₁₂ FREE GASO.	5.8
C ₁₃ +C ₁₄									42.62	2.785	8.639	0.565		C ₁₃ POLY TAR	0.205
TOTAL															
H ₂ +CO	40.322		15302	SCFH			68.710		-29.591						
H ₂ /CO			Factor	653509											
Weight Recovery, %	94.80	Catalyst Age, hrs. Ave.	243	Space Velocity, vhr	1226	RECOVERED OIL	63.41	4.144	9.726	0.636				10 # BPP 400 EP GASOLINE	4520
Pressure, psig	372	Inlet Velocity, Ft/sec	1.01	Catalyst Vol., CF	12.49	TOTAL OIL	106.03	6.929	18.365	1.200				FUEL OIL	442
Temperature, °F	659	Bed Depth, Ft	18.9	Weight, #	1549	WATER SOLUBLE CHEMICALS	5.40	0.353	0.673	0.044				POLY TAR	91
Recycle Ratio	1.08	Bed Density, #/CF	124	Effluent (H ₂)(CO ₂) Shift Ratio (H ₂ O)(CO)		TOTAL LIQUID PRODUCTS C ₆ +	123.60	8.077	20.554	1.343				TOTAL	5620
FRESH FEED CONVERSION - %				TOTAL FEED CONVERSION - %				SELECTIVITY		NET WATER					
Contraction	CO	H ₂	H ₂ +CO	CO	H ₂	CO+H ₂	C ₃ +C ₄ +	GROSS WATER	123.94	8.100	14.935	0.976	TOTAL	18.051	1.1796
59.09	82.81	67.55	73.39	56.93	36.34	43.07	83.06	HYDROCARBON TOTAL - C ₁ +	148.81	9.725			W. S. CHEM.	239	

Form ML-11 AI = (35.01)(0.5750)=20.13 Acids = (0.117)(37.28)=4.36% g/NCM = 16.91 X #/MCF #9488 MCFH₂ + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-3 (N-Q)
HOURS 303-399
CATALYST Fresh CM&S

FRESH FEED				WET GAS		RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H ₂ + CO FED				
	%	m/hr	#/hr	%	At Wt. Balance	m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE		YIELDS BASIS	BROWNSVILLE DESIGN	FEED RATE*
					m/hr	#/hr					#/MCF	#/gal	gal/hr	gal/MCF	
CO		15.361					23.166		-12.131	-339.79					
H ₂		24.598					46.956		-15.347	-30.94				400 EP	5.767
CO ₂									3.096	136.25	8.985			400-550	1.442
N ₂														550 +	1.068
CH ₄								0.894	14.34	0.946					
C ₂ H ₆								0.237	6.65	0.439					
C ₃ H ₈								0.143	4.30	0.284				PROPYLENE	2.732
C ₄ +C ₅									25.29	1.668				C ₄ POLY GASO.	0.400
C ₆ H ₁₂								0.210	8.84	0.583	4.32	2.046	0.135	C ₆ POLY TAR	0.045
C ₇ H ₁₄								0.032	1.41	0.093	4.24	0.333	0.022		
C ₈ H ₁₈								0.207	11.61	0.766	5.00	2.322	0.153		
C ₉ H ₁₂								0.086	5.00	0.330	4.86	1.029	0.068	C ₉ H ₁₀	68.0
C ₁₀ H ₁₆								0.123	8.63	0.569	5.45	1.583	0.104	C ₁₀ POLY GASO.	1.5
C ₁₁ H ₁₄								0.031	2.24	0.148	5.25	0.427	0.028	C ₁₁ H ₁₀	68.0
C ₁₂ H ₁₈								0.053	4.46	0.294	5.54	0.805	0.053	C ₁₂ FREE GASO.	5.8
C ₁₃ +C ₁₄									42.19	2.782	8.545	0.564		C ₁₃ POLY TAR	0.193
TOTAL															
H ₂ +CO	39.959		15164	SCFH			70.122		-27.478						
H ₂ /CO			Factor	659456											
Weight Recovery, %	92.58	Catalyst Age, hrs. Ave.	339	Space Velocity, vhr	1309	RECOVERED OIL	54.84	3.616	8.395	0.554				10 # BPP 400 EP GASOLINE	4140
Pressure, psig	371	Inlet Velocity, Ft/sec	1.02	Catalyst Vol., CF	11.59	TOTAL OIL	97.03	6.399	16.940	1.117				FUEL OIL	382
Temperature, °F	658	Bed Depth, Ft	17.6	Weight, #	1402	WATER SOLUBLE CHEMICALS	5.12	0.338	0.636	0.042				POLY TAR	85
Recycle Ratio	1.11	Bed Density, #/CF	121	Effluent (H ₂)(CO ₂) Shift Ratio (H ₂ O)(CO)		TOTAL LIQUID PRODUCTS C ₆ +	112.60	7.425	18.875	1.245				TOTAL	5123
FRESH FEED CONVERSION - %				TOTAL FEED CONVERSION - %				SELECTIVITY		NET WATER					
Contraction	CO	H ₂	H ₂ +CO	CO	H ₂	CO+H ₂	C ₃ +C ₄ +	GROSS WATER	109.00	7.188	13.129	0.866	TOTAL	16.264	1.0725
54.08	78.97	62.39	68.77	52.37	32.68	39.19	81.66	HYDROCARBON TOTAL - C ₁ +	137.89	9.093			W. S. CHEM.	465	

Form ML-11 Activity Index = (36.18)(0.5054)=18.29 Acids = (0.117)(40.2)=4.70% g/NCM = 16.91 X #/MCF #9488 MCFH₂ + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-4 (R-W)
HOURS 399-543
CATALYST Fresh CM&S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		YIELD BASIS H ₂ + CO FED									
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	#/gal	gal/hr	gal/MCF	YIELDS	BASIS	BROWNSVILLE	DESIGN FEED RATE*		
CO					m/hr	#/hr										CONNECTED	TREATING				
																RECOVERY %	RECOVERY %	gal/hr	gal/hr		
CO		15.234					21.858		-12.567	-352.00											
H ₂		24.429					46.027		-15.720	-31.69							400 EP	69.95	6.431	98.0	6.302
CO ₂									3.263	143.60	9.543						400-550	18.78	1.726	91.4	1.578
N ₂																	550 +	11.27	1.036	114.6	1.187
CH ₄									0.866	13.89	0.923										
C ₂ H ₆									0.251	7.04	0.468										
C ₃ H ₈									0.128	3.85	0.256						PROPYLENE	32.23	2.562		
C ₄ +C ₅										24.78	1.647						C ₄ POLY GASO.	87.5	2.242	0.375	
C ₂ H ₄									0.189	7.95	0.528	4.32	1.840	0.122			C ₂ POLY TAR	12.5	0.320	0.042	
C ₂ H ₂									0.026	1.15	0.076	4.24	0.271	0.018							
C ₂ H ₂									0.201	11.28	0.750	5.00	2.256	0.150				#/gal	#/hr	gal/hr	RVP
C ₂ H ₂									0.084	4.88	0.324	4.86	1.004	0.067	C ₂ H ₂	5.00	-	-	68.0		
C ₂ H ₂									0.126	8.84	0.587	5.45	1.622	0.108	C ₂ H ₂	5.98	9.87	1.651	1.5		
C ₂ H ₂									0.033	2.38	0.158	5.25	0.453	0.030	C ₂ H ₂	4.86	4.53	0.933	68.0		
C ₂ H ₂									0.052	4.38	0.291	5.54	0.791	0.053	C ₂ H ₂				9.543	5.8	
C ₂ -C ₆										40.86	2.715		8.237	0.547	C ₂ POLY TAR	7.58	1.41	0.187			
TOTAL																					
H ₂ +CO		39.663	15047	SCFH			67.885		-28.287												
H ₂ /CO				Factor	664584																
Weight Recovery, %	92.68	Catalyst Age, hrs.	Ave. 416	Space Velocity, v/v	1513	RECOVERED OIL		59.93	3.983	9.193	0.611										
Pressure, psig	370	Inlet Velocity, Ft/sec	1.01	Catalyst Vol., CF	9.98	TOTAL OIL		100.79	6.698	17.430	1.158										
Temperature, °F	659	Bed Depth, Ft	15.1	Weight, #	1213	WATER SOLUBLE CHEMICALS		5.07	0.337	0.625	0.042										
Recycle Ratio	1.10	Bed Density, #/CF	122	Effluent (H ₂)(CO ₂) Shift Ratio (H ₂ O)(CO)		TOTAL LIQUID PRODUCTS C ₂ +		116.39	7.735	19.353	1.286										
FRESH FEED CONVERSION — %				TOTAL FEED CONVERSION — %				SELECTIVITY	NET WATER			95.17	6.325	11.408	0.758						
Contraction	CO	H ₂	H ₂ +CO	CO	H ₂	CO+H ₂	C ₃ +C ₄	GROSS WATER			110.77	7.362	13.331	0.886							
	55.92	82.49	64.35	71.32	57.49	34.15	41.67	82.45	HYDROCARBON TOTAL — C ₂ +			141.17	9.382								

Form ML-11 Activity Index = (38.90)(0.5425) = 21.10 Acids = (0.117)(39.18) = 4.58% g/NCM = 16.91 x #/MCF 99488 MCFH₂ + CO, Bbl/Day = 3421.6 x gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-B
HOURS 22-46
CATALYST Fresh CM&S

Table with columns: FRESH FEED, WET GAS, RECYCLE, COMBINED FEED, EFFLUENT, NET CHANGE, YIELD BASIS H2 + CO FED. Includes rows for various hydrocarbons (CO, H2, CO2, N2, CH4, C2H4, C2H6, C3H8, C4H10, C4H12, C5-C6) and summary rows for TOTAL, H2+CO, H2/CO, and various recovery percentages.

Form ML-11

g/NCM = 16.91 X #/MCF #0488 MCFH H2 + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-B
HOURS 22-46

Table with columns: OPERATING CONDITIONS, PRODUCT TESTS, CATALYST DATA. Includes rows for Pressures (Oxygen, Natural Gas, Generator, Reactor Inlet, Condenser Inlet, Product Accumulator), Temperatures (Oxygen, Natural Gas, Generator, Reactor Inlet, Condenser Inlet, Product Accumulator), and Catalyst No. (1-11).

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

RUN NO. 62-C
HOURS 46-70
CATALYST Fresh CM&S

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT		NET CHANGE		YIELD BASIS H ₂ + CO FED									
	%	m/hr	#/hr	%	At Wt. Balance		m/hr	m/hr	m/hr	m/hr	#/hr	CONDENSATE			YIELDS BASIS BROWNSVILLE DESIGN FEED RATE*							
					m/hr	#/hr						#/MCF	#/gal	gal/hr	gal/MCF		gal/hr	TREATING RECOVERY	gal/hr			
CO _{29.010}	37.217	16.019	448.69	14.543	2.458	68.85	6.375	22.394	8.833	-13.561	-379.84											
H ₂ _{2.018}	59.486	25.605	51.62	44.077	7.450	15.02	19.320	44.925	26.770	-18.155	-36.60						400 EP	73.1	7.751	98.0	7.598	
CO _{44.010}	2.560	1.016	44.72	24.850	4.200	184.94	10.893	11.909	15.093	3.184	140.12	8.870					400-550	18.3	1.993	91.4	322	
N ₂ _{28.016}	0.207	0.089	2.49	1.137	0.192	5.58	0.499	0.588	0.691								550 +	8.1	0.859	114.6	0.984	
CH ₄ _{16.012}	0.750	0.314	5.04	7.523	1.271	20.39	3.297	3.611	4.568	0.957	15.35	0.972										
C ₂ H ₆ _{28.052}				1.707	0.288	8.08	0.748	0.748	1.036	0.288	8.08	0.512						RECOVERY %	#/hr	gal/hr		
C ₂ H ₄ _{30.058}				0.967	0.163	4.90	0.424	0.424	0.587	0.163	4.90	0.310						PROPYLENE	35.7	4.54		
C ₁ +C ₂											28.33	1.794						C ₃ POLY GASO.	87.5	3.97	0.664	
C ₃ H ₈ _{42.078}				1.787	0.302	12.71	0.783	0.783	1.085	0.302	12.71	0.805	4.32	2.942	0.187			C ₃ POLY TAR	12.5	0.57	0.076	
C ₃ H ₆ _{44.074}				0.263	0.044	1.94	0.115	0.115	0.159	0.044	1.94	0.123	4.24	0.458	0.029							
C ₄ H ₁₀ _{56.114}				1.527	0.258	14.47	0.669	0.669	0.927	0.258	14.47	0.916	5.00	2.894	0.183			#/gal	#/hr	gal/hr	RVP	
C ₄ H ₈ _{58.120}				0.480	0.081	4.71	0.210	0.210	0.291	0.081	4.71	0.298	4.86	0.969	0.061			C ₄ H ₈	5.00	0.58	0.116	68.0
C ₅ H ₁₀ _{70.120}				0.693	0.117	8.21	0.304	0.304	0.421	0.117	8.21	0.520	5.45	1.506	0.095			C ₄ POLY GASO.	5.98	12.15	2.032	1.5
C ₅ H ₁₂ _{72.126}				0.163	0.028	2.02	0.071	0.071	0.099	0.028	2.02	0.128	5.25	0.385	0.024			C ₄ H ₁₀	4.86	4.71	0.969	68.0
C ₅ H ₁₄ _{84.126}				0.283	0.048	4.04	0.124	0.124	0.172	0.048	4.04	0.256	5.84	0.729	0.046			C ₄ -FREE GASO.			10.980	5.8
C ₅ -C ₆											49.10	3.046						C ₄ POLY TAR	7.58	1.74	0.231	
TOTAL		43.043	552.56		16.900	355.56	43.832	86.875	67.894													
H ₂ +CO	96.703	41.624	15796435	SCFH	9.908		25.695	67.319	35.603	-31.716								gal/hr	gal/MCF	Bbl/Day		
H ₂ /CO		1.60	Factor	633054	3.03		3.03	2.01	3.03	1.34								10% FPP 400 EP GASOLINE	13.927	0.9861	4804	
Weight Recovery, %	93.32	Catalyst Age, hrs.			Space Velocity, vhr			1264	RECOVERED OIL			0.492	68.94	4.364		10.603	0.671	GAS OIL	1.922	0.1153	625	
Pressure, psig	421	Inlet Velocity, Ft/sec			1.00	Catalyst Vol CF			12.50	TOTAL OIL			117.04	7.410		20.486	1.296	FUEL OIL	0.984	0.0623	338	
Temperature, °F	553	Bed Depth, Ft			18.94	Weight, #			1888	WATER SOLUBLE CHEMICALS			0.225	11.94	0.756		1.497	0.095	POLY TAR	0.307	0.0194	105
Recycle Ratio	1.02	Bed Density, #/CF			151	Effluent (H ₂)(CO) ₂ Shift Ratio (H ₂ O)(CO)			7.10	TOTAL LIQUID PRODUCTS C ₂ +			129.98	8.166		21.983	1.391	TOTAL	17.110	1.0331	5872	
FRESH FEED CONVERSION - %				TOTAL FEED CONVERSION - %				SELECTIVITY				NET WATER		6.441	116.12	7.351	13.940	0.883	W S CHEM.	1.497	0.0948	514
Contraction	CO	H ₂	H ₂ +CO	CO	H ₂	CO+H ₂	C ₃ +C ₂ +	GROSS WATER				128.06	6.107		15.437	0.998	TOTAL	18.607	1.1779	6386		
60.74	84.66	70.90	76.20	60.56	40.41	47.11	81.99	HYDROCARBON TOTAL - C ₂ +				157.31	9.959									

Form ML-11

g/NCM = 16.91 X #/MCF 9488 MCFH H₂ + CO, Bbl/Day = 3421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

RUN NO. 62-C
HOURS 46-70

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA			
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE	
										Screen Analysis	
Oxygen	449	Fresh Feed	16335	* API	49.2	10.5	In Reactor at Start of Period		Sedimentation		
Natural Gas	443	Recycle	16634	Neut. No.	37.4	34.9	Fresh Catalyst Added	175	Mesh	Microns	%
Generator Outlet	426	Combined Feed	32969	Sap. No.	51.0	42.2	Total	On 40	419+	29.6	80+
Reactor Inlet	421	Wet Gas - Measured	5748	Hydrox. No.			Catalyst Recovered	75	100	150	40.4
Condenser Inlet		Adjusted	6414	Bromine No.	86		In Reactor at End of Period		150	105	14.3
Product Accumulator	375	Loss	666	Pour °F. Below	-35		REACTOR d-p, Inches H ₂ O		250	82	1.4
				Chemicals, % by K ₂ CO ₃		9.7	No. Height		325	44	3.8
TEMPERATURES - °F.		Recycle/Fresh Feed	1.02				0 See Per. A	51	<325		2.0
Oxygen	467	Inlet Velocity - ft./sec.	1.00				1	68	CATALYST		
Natural Gas	802	Fresh Feed Rate - S.C.F.H.	15796	HEMPEL, DIST. %		°API	2	82	Bulk Density, Lbs./Cu.Ft.		
Generator	2322	per Cu.Ft. Dense Bed	1264	205 °F.			3	79	Aerated		158
Quench Accumulator	160	per Lb. Catalyst	8.37	400	72.1	55.3	4	270	Settled		159
Reactor Inlet	421	per Sq. Ft.	23933	400-550	18.8	37.1	Total	550	Compacted		185
Condenser Inlet	578			550+	9.1				Particle Density, gm. cc.		4.48
Product Accumulator	97	Heat Trans. Calculations					CALCULATED FROM dp		NH ₃ Value, ml. gm.		
Catalyst No.	Height	Steam Rate = 455#/hr		A. S. T. M. DIST. ON			Density, Lbs./Cu.Ft.	151	N ₂ Surface, m ² gm.		
1	See Per. A	@ 706 psia & 505°F		Naphtha °F.			Inventory, Lbs.	1888			
2	653	1201 BTU/#		IBP	110		Bed Depth, Ft.	18.94	CHEMICAL ANALYSIS		
3	647	Water in @ 81°F = 49 BTU/#		10%	142		Vol., Cu Ft.	12.50	Fe		
4	654	Heat Trans./# steam = 1152 BTU		50%	246				C		6.21
5	659	(1152)(455) = 524160		90%	370				O		
6	658	Avg. Bed Temp = 653°F		EP	414				H		
7	648	dT = 653-505 = 148°F		Rec.	96.0				K ₂ O, W+, % basis Fe		
8	637	Tube Area = 34.3 sq ft							X-Ray Analysis -		
9	632	K = $\frac{524160}{(34.3)(148)} = 103.25$ BTU/°F/sq ft							Fe ₂ O ₃		
10	637								Fe ₃ O ₄		
11	628								Fe		

THE TEXAS COMPANY — MONTEBELLO LABORATORY
YIELD CALCULATIONS

FRESH FEED				WET GAS			RECYCLE	COMBINED FEED	EFFLUENT	NET CHANGE		CONDENSATE				YIELD BASIS H ₂ + CO FED				
%	m/hr	#/hr	%	At Wt. Balance	m/hr	m/hr	m/hr	m/hr	m/hr	#/hr	#/MCF	#/gal	gal/hr	gal/MCF	YIELDS	BASIS	BROWNSVILLE DESIGN	FEED RATE*		
				m/hr	#/hr										CORRECTED HEMPEL, %	gal/hr	TREATING RECOVERY, %	gal/hr		
CO _{28.010}	37.063	15.317	429.05	14.467	2.334	65.38	6.301	21.618	8.635	-12.983	-363.67									
H ₂ _{2.016}	59.810	24.719	49.83	45.536	7.346	14.81	19.835	44.554	27.181	-17.375	-35.02				400 EP	70.0	7.105	98.0	6.963	
CO _{24.010}	2.540	1.050	46.21	24.310	3.921	172.59	10.589	11.839	14.510	2.871	126.38	8.318			400-550	20.4	2.070	91.4	1.892	
N ₂ _{2.016}	0.277	0.114	3.19	1.220	0.197	5.52	0.531	0.645	0.728						550 +	9.6	0.974	114.6	1.116	
CH ₄ _{16.042}	0.310	0.128	2.05	5.853	0.944	15.14	2.549	2.677	3.493	0.816	13.09	0.862								
C ₂ H ₆ _{28.052}				1.837	0.296	8.30	0.800	0.800	1.096	0.296	8.30	0.546				RECOVERY %	#/hr	gal/hr		
C ₂ H ₄ _{30.068}				1.047	0.169	5.08	0.456	0.456	0.625	0.169	5.08	0.534			PROPYLENE	36.0	5.18			
C ₁ +C ₂											26.47	1.742			C ₃ POLY GASO.	87.5	4.53	0.758		
C ₂ H ₂ _{42.078}				2.123	0.342	14.39	0.925	0.925	1.267	0.342	14.39	0.947	4.32	3.331	0.219	C ₃ POLY TAR	12.5	0.65	0.086	
C ₂ H ₄ _{44.094}				0.317	0.051	2.25	0.138	0.138	0.189	0.051	2.25	0.148	4.24	0.531	0.035					
C ₂ H ₆ _{56.104}				1.670	0.269	15.09	0.727	0.727	0.996	0.269	15.09	0.993	5.00	3.018	0.199		#/gal	#/hr	gal/hr	RVP
C ₂ H ₁₀ _{68.120}				0.500	0.081	4.71	0.218	0.218	0.299	0.081	4.71	0.310	4.86	0.969	0.064	C ₄ H ₆	5.00	0.41	0.028	68.0
C ₂ H ₁₂ _{70.130}				0.693	0.112	7.85	0.302	0.302	0.414	0.112	7.85	0.517	5.45	1.440	0.095	C ₄ POLY GASO.	5.98	12.85	2.148	1.5
C ₂ H ₁₄ _{72.140}				0.157	0.025	1.80	0.068	0.068	0.093	0.025	1.80	0.118	5.28	0.343	0.023	C ₄ H ₁₀	4.86	4.71	0.969	68.0
C ₂ H ₁₆ _{74.150}				0.270	0.044	3.70	0.118	0.118	0.162	0.044	3.70	0.244	5.54	0.668	0.044	C ₄ -FREE GASO.			10.172	5.8
C ₃ +C ₄											49.79	3.277		10.300	0.679	C ₄ POLY TAR	7.53	1.83	0.243	
TOTAL		41.328	530.33		16.131	336.61	43.557	84.885	66.795											
H ₂ +CO	96.973	40.036	151935613	SCFH	9.680		26.136	66.172	35.816	-30.356										
H ₂ /CO		1.61	Factor	658173		3.15		3.15	2.06	3.15										
Weight Recovery, %	93.40	Catalyst Age, hrs.		Space Velocity, vhw	1180	RECOVERED OIL	0.471	66.03	4.346				10.149	0.668	GAS OIL	1.892	0.1245	675		
Pressure, psig	417	Inlet Velocity, Ft/sec	0.99	Catalyst Vol CF	12.88	TOTAL OIL		115.82	7.623				20.449	1.347	FUEL OIL	1.116	0.0735	398		
Temperature, °F	658	Bed Depth, Ft	19.51	Weight, #	1713	WATER SOLUBLE CHEMICALS	0.233	12.34	0.812				1.539	0.101	POLY TAR	0.329	0.0217	118		
Recycle Ratio	1.05	Bed Density, #/CF	133	Effluent (H ₂)(CO ₂) Shift Ratio (H ₂ O)(CO)	= 7.13	TOTAL LIQUID PRODUCTS C ₂ +		128.16	8.435				21.988	1.448	TOTAL	16.708	1.0997	5962		
FRESH FEED CONVERSION — %		TOTAL FEED CONVERSION — %		SELECTIVITY		NET WATER	6.403	115.35	7.592				13.848	0.911	W. S. CHEM.	1.539	0.1013	549		
Contraction	CO	H ₂	H ₂ +CO	CO	H ₂	CO+H ₂	C ₃ +C ₄ +	GROSS WATER					127.69	8.404	TOTAL	18.247	1.2010	6511		
60.97	84.76	70.28	75.82	60.06	38.99	45.87	82.88	HYDROCARBON TOTAL—C ₁ +				154.63	10.177							

Form ML-11

R/NCM = 16.91 X #/MCF 99488 MCFH H₂ + CO, Bbl/Day = 5421.6 X gal/MCF

THE TEXAS COMPANY — MONTEBELLO LABORATORY
DATA SUMMARY

OPERATING CONDITIONS				PRODUCT TESTS				CATALYST DATA				
PRESSURES PSIG		RATES S.C.F.H.		OIL		WATER		INVENTORY DATA		PARTICLE SIZE		
Oxygen	444	Fresh Feed	15684	* API	49.4	10.5		In Reactor at Start of Period		Screen Analysis	Sedimentation	
Natural Gas	439	Recycle	16530	Neut. No.	32.1	34.0		Fresh Catalyst Added	24	Mesh	Microns %	Microns %
Generator Outlet	422	Combined Feed	32214	Sap. No.	49.3	41.0		Total		On 40	419+	80+
Reactor Inlet	417	Wet Gas—Measured	5485	Hydrox. No.				Catalyst Recovered	70	100	150	40—80
Condenser Inlet		Adjusted	6122	Bromine No.	89			In Reactor at End of Period		150	105	20—40
Product Accumulator	373	Loss	637	Pour °F.						200	74	10—20
				Chemicals, % by K ₂ CO ₃		10.0		REACTOR d-p, Inches H ₂ O		250	62	0—20
								No. Height		325	44	
TEMPERATURES—°F.		Recycle/Fresh Feed	1.05					0 See Per. A	48	<325		
Oxygen	470	Inlet Velocity—ft./sec.	0.99					1	68	CATALYST		
Natural Gas	815	Fresh Feed Rate—S.C.F.H.	15194	HEMPEL DIST. %		API		2	74	Bulk Density, Lbs./Cu.Ft.		
Generator	2380	per Cu.Ft. Dense Bed	1180	205 °F.				3	59	Aerated		
Quench Accumulator	179	per Lb. Catalyst	8.87	400	69.0	53.0		4	250	Settled		
Reactor Inlet	411	per Sq. Ft.	23021	400-550	20.4	37.0		Total	499	Compacted		
Condenser Inlet	586	Heat Transfer Calculations		550+		10.6				Particle Density, gm./cc.		
Product Accumulator	93	Steam Rate=423#/hr						CALCULATED FROM dp		NH ₃ Value, ml./gm.		
Catalyst No. Height		@705 psia & 506°F		A. S. T. M. DIST. ON				Density, Lbs./Cu.Ft.	133	N ₂ Surface, m ² /gm.		
1 See Per. A	623	=1201 BTU/#		Naphtha °F.				Inventory, Lbs.	1713			
2	658	Water in @ 65°F=33 BTU/#		IBP	114			Bed Depth, Ft.	19.51	CHEMICAL ANALYSIS		
3	651	Net Heat Trans/# steam		10%	146			Vol., Cu. Ft.	12.88	Fe		
4	659	=1168 BTU		50%	240					C		
5	664	(1168)(423)=494064		90%	358					O		
6	664	Ave. Bed Temp=658°F		EP	406					H		
7	654	dT=558-506=152°F		Rec.	97.0					K ₂ O. W+. % basis Fe		
8	641	Tube Area=35.4 sq ft								X-Ray Analysis—		
9	637	K= $\frac{494064}{(35.4)(152)}$ = 91.8 BTU/°F/sq ft								Fe ₂ O ₃		
10	636									Fe ₂ O ₃		
11	622									Fe		