

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 25A From 8/29/47 Hr. to 8/30/47 Hr. 0700

FLOWS		RUN CONDITIONS			DISTILLATIONS			CATALYST DATA		CATALYST ANALYSIS				
	SCFH	%	Generator Press.	515	ASTM			Hempel Dist.		In Reactor at Start of Period		Particle Size		
Oxygen	3200		O <sub>2</sub> Preheat, °F	474	Prod.		°F	%	A.P.I.	Fresh Catalyst Charged		Screen		
Nat. Gas	4320		Gas Preheat, °F	723	A.P.I.		to 400			Catalyst Recharged		Sedimentation		
Total	7560	427	Reaction Press.	300	I.B.P.		400-550			Total		312		
Fresh Feed	10770		Steam Back Press.	1000	5%		550+			Catalyst Taken Out		98		
F.F. by C	12830		Temperatures, °F		10%					In Reactor at End of Period		220		
Avg. F.F.	11800		Heater Outlet	210	20					200	104-74	189	20-10	
Wet Gas	5270		Catalyst #1	682	30					WATER				
Contraction		55.4	#2	699	40		Temp.	%	Reactor d-P, H <sub>2</sub> O		30			
Recycle	11340		#3	642	50		200		Pounds in Reactor		336	<325	43-0	
Bleed	324		#4	612	60		203		Density, lbs./cu. ft.		109	Density, lbs./cu. ft.		
Total	11664		#5	580	70		208		Bed Height, Feet		6.0	Aerated		
Total Feed	24494		Average	645	80							Settled		
Recycle/F.F.	0.98		Product Separator		90							Compacted		
Inlet Vel.	105 ft/sec				95				Space Vel. SCFH/lb. cat.			Sp. Grav.	5.1	Specific Surface
Steam Flow									Inventory Figures		53.7			
									From d-P Meters		35.2			

NATURAL GAS			PRODUCT INSPECTION						GENERATOR ELEMENTAL BALANCE										
%			Oil	Water	Product	Pour °F	SUS @ °F		#/lb. Mol-%	SEFH m/hr	C	H	O	Mol %	SEFH m/hr	C	H	O	
CO <sub>2</sub>	1.58	Neut. No.							O <sub>2</sub>	271872	8.496			16.992	CO <sub>2</sub>	2.4	747	747	1494
CH <sub>4</sub>	83.37	Sap. No.							CO <sub>2</sub>	7.920	.180	.180	.360	CO	34.8	10.835	10.835	21.67	
C <sub>2</sub> H <sub>6</sub>	10.46	Hydrox. No.							CH <sub>4</sub>	152048	9503	9503	38.012	CH <sub>4</sub>	4.6	1.432	1.432	5.728	
C <sub>3</sub> H <sub>8</sub>	4.59	Bromine No.							C <sub>2</sub> H <sub>6</sub>	25.760	1.192	2.384	7.152	H <sub>2</sub>	59.1	18.401		36.802	
C <sub>4</sub> H <sub>10</sub>		% Fe							C <sub>3</sub> H <sub>8</sub>	23.012	.523	1.569	4.184	N <sub>2</sub>	1.1	.342			
N <sub>2</sub>		% Alc							C <sub>4</sub> H <sub>10</sub>					H <sub>2</sub> O				6.818	
O <sub>2</sub>									N <sub>2</sub>					Total	31.135	13.014	49.348	17.352	
									Total	490612	19.894	13.636	49.348						

Loss No 400.198

	FRESH FEED		WET GAS				RECYCLE	COMB. FEED	EFFLUENT	NET CHANGE ON REACTION											
	%	m/hr	#/hr	%	Measured	At Wt. Balance				m/hr	m/hr	%	m/hr	%	Carbon	Hydrogen	Oxygen	Ultimate Oil	Unsat.		
CO	34.8	10.835	30.338	8.54	1.228	34.38	1.265	35.42	2.623	13.46	21.54	3888	7.91	-9.570	-9.570	38.92					
H <sub>2</sub>	59.1	18.401	36.90	48.35	6.953	12.91	7.162	14.32	14.848	33.25	53.21	22.010	44.79	-11.239							
CO <sub>2</sub>	2.4	747	32.87	25.83	3.714	162.42	3.825	168.30	7.932	8.68	18.89	11.757	23.93	3.018	3.018	28.38					
N <sub>2</sub>	1.1	342	9.58	9.3	1.134	3.75	1.18	3.86	.286	1.63	1.01	.424	.86	-	.204						
CH <sub>4</sub>	4.6	1.432	22.91	8.71	1.252	20.03	1.290	20.04	2.675	4.11	6.58	3.965	8.07	1.42	1.42	1.31	.868				
C <sub>2</sub> H <sub>6</sub>				2.82	4.06	11.37	4.18	11.70	.846	.87	1.29	1.284	2.61	.418	.836	7.71	1.672				
C <sub>3</sub> H <sub>8</sub>				.72	1.04	3.12	1.07	3.21	.221	.22	.35	.328	.67	1.07	.214	1.87	1.642				
C <sub>4</sub> H <sub>10</sub>				1.58	2.27	9.53	2.34	9.83	4.85	4.9	.78	7.19	1.46	.234	7.02	6.47	1.404				8.85
C <sub>5</sub> H <sub>12</sub>				.38	.55	2.42	.57	2.57	1.17	.12	.19	.174	.35	.057	.171	1.58	1.456				1.42
C <sub>6</sub> H <sub>14</sub>				1.10	1.58	8.85	1.63	9.13	3.38	.34	.54	.501	1.02	1.63	1.652	6.01	1.304				8.67
C <sub>7</sub> H <sub>16</sub>				.38	.55	3.19	.57	3.31	1.17	.12	.19	.174	.35	.057	.228	2.10	5.70				3.31
C <sub>8</sub> H <sub>18</sub>				.52	.75	5.25	.97	5.39	1.60	.16	.26	.237	.48	.277	.385	3.55	7.70				5.39
C <sub>9</sub> H <sub>20</sub>				.14	.20	1.72	.21	1.81	.643	.04	.06	.064	.13	.021	.126	1.16	2.52				1.81
OIL							42.56					.304	.62	3.036	27.99	6.072					42.56
WATER												3.414	6.95		8.768						
TOTAL		31.135	405.54		14.380	200.94			62.49			49.263	16.657								
H <sub>2</sub> +CO		29.236																			
H <sub>2</sub> /CO		1.69					5.64		2.47			5.66									

ULTIMATE YIELDS						WEIGHT BALANCE				EFFLUENT RATIOS		CONTRACTION: 53.5	
% CO Fed	#/hr	H <sub>2</sub> /CO #/MCF	g/M <sup>3</sup>	Gal/hr	H <sub>2</sub> /CO Gal/MCF	Wet Gas	#/hr	%	#/hr	H <sub>2</sub> /H <sub>2</sub> O	CO Conversion:	H <sub>2</sub> Conversion:	
C1+C2	10.89	12.64	1.14	19.28		Oil	26.6			6.45	61.08		
C3+	48.86	74.54	6.73	113.80		Water	90.3			3.02	61.08		
C4+	40.81	62.20	5.61	94.87		Total	397.84	98.1	405.54	(H <sub>2</sub> )(CO <sub>2</sub> )(H <sub>2</sub> O)(CO)			
Un. Oil		70.59	6.37	107.72	11.06					19.50			
CO <sub>2</sub>	28.38	135.43	12.22	206.64									
H <sub>2</sub> O		61.45	5.55	93.85									

Yield Calculations assume "oil" is CH<sub>2</sub>, and is found by difference on Carbon, and H<sub>2</sub>O by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M<sup>3</sup> = 16.91 x #/MCF. cc/M<sup>3</sup> = 141.3 x gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 238 From 8/30/47 Hr. 0700 to 8/31/47 Hr. 0700

FLOWS		RUN CONDITIONS		DISTILLATIONS				CATALYST DATA		CATALYST ANALYSIS					
	SCFH	%	Generator Press	313	A S T M				Hempel Dist.		Particle Size				
Oxygen	2910		O <sub>2</sub> Preheat, °F	555	Prod.	640		°F	%	A.P.I.	Fresh Catalyst Charged 220				
Nat Gas	3855		Gas Preheat, °F	767	A.P.I.	389		to 400	663		Fresh Catalyst Charged 109				
Total	6765	42.0	Reactor Press.	303	I.B.P.	138		400-550	25.0		Catalyst Recharged 56				
Fresh Feed	4880		Steam Back Press	1000	5%			550+			Total 385				
F.F. by C	11320		Temperatures, °F		10%	166					Catalyst Taken Out 155				
Avg F.F.			Heater Outlet	332	20	200					In Reactor at End of Period 260				
Wet Gas	5780		Catalyst #1	718	30	218		WATER				On 40 420+ 2.1 80+ 23.0			
Contraction		54.2	#2	733	40	236		Temp	%		Reactor d-P, H <sub>2</sub> O 30				
Recycle	11400		#3	659	50	254		200			Pounds in Reactor 325				
Bleed	381		#4	617	60	274		203			Density, lbs./cu. ft. 98				
Total	11781		#5	585	70	292		208			Bed Height, Feet 6.7				
Total Feed	23101		Average	661	80	320					Aerated % Fe				
Recycle:F.F.	1.04		Product Separator		90	354					Settled % C				
Inlet Vel	1.58 ft/sec				95	382					Compacted % Oil				
Steam Flow					E.P.	406					Space Vel. SCFH/lb. cat.				
					Rec	985					Inventory Figures 43.6				
					Res.	0.8					From d-P Meters 35.0				
					Loss	0.7					Sp. Grav.				
											Specific Surface				
											m <sup>2</sup> gm				

NATURAL GAS		PRODUCT INSPECTION						GENERATOR ELEMENTAL BALANCE								
%		Oil	Water	Product	Pour °F	SUS @ °F	IN			OUT						
							Mol %	SCFH	C	H	O	Mol %	SCFH	C	H	O
CO <sub>2</sub>	1.65	Neut No. 41.6					O <sub>2</sub>	246.696	7.678		15.356	CO <sub>2</sub>	2.4	.717	.717	1.434
CH <sub>4</sub>	80.09	Sap No. 62.6					CO <sub>2</sub>	7.392	.168	.168	.336	CO	34.1	10.185	10.185	10.185
C <sub>2</sub> H <sub>6</sub>	10.96	Hydrox No.					CH <sub>4</sub>	130.352	8.147	8.147	32.588	CH <sub>4</sub>	3.7	1.105	1.105	4.420
C <sub>3</sub> H <sub>8</sub>	7.30	Bromine No.					C <sub>2</sub> H <sub>6</sub>	33.453	1.115	2.230	6.690	H <sub>2</sub>	59.2	17.682		35.364
C <sub>4</sub> H <sub>10</sub>		% Fe					C <sub>3</sub> H <sub>8</sub>	32.692	.743	2.229	5.944	N <sub>2</sub>	0.6	.179		
N <sub>2</sub>		% Alc					C <sub>4</sub> H <sub>10</sub>					H <sub>2</sub> O				5.438
O <sub>2</sub>							N <sub>2</sub>					Total				29.868
							Total	449.582	17.851	12.774	45.222	15.692				12.007
																45.222
																15.692

less H<sub>2</sub>O 376.268

	FRESH FEED		WET GAS				RECYCLE	COMB. FEED	EFFLUENT		NET CHANGE ON REACTION														
	%	m/hr	%	Measured	At Wt. Balance	m/hr			m/hr	%	m/hr	%	Carbon			Hydrogen			Oxygen			Ultimate Oil	Unsat.		
			m/hr	#/hr	m/hr	#/hr					m/hr	a/hr	%	a/hr	%	a/hr	%	#/hr	#/gal	gal/hr	%				
CO	34.1	10.185	285.18	9.57	1.708	36.62	1.308	36.62	2.879	13.064	21.79	4.187	8.50	-8.977	-8.877	12.84									
H <sub>2</sub>	59.2	17.682	35.36	28.91	7.231	14.46	7.231	14.46	15.915	33.597	56.05	23.146	46.89	-10.451		-20.902									
CO <sub>2</sub>	2.4	.717	31.55	19.89	2.574	114.14	2.574	114.14	5.709	6.426	10.72	9.303	16.86	1.877	1.877	18.43									
N <sub>2</sub>	0.6	.179	5.01	1.60	.219	6.13	.219	6.13	4.81	10.60	1.10	.700	1.42	-.040											
CH <sub>4</sub>	3.7	1.105	17.68	10.57	1.445	23.12	1.445	23.12	3.179	5.6284	7.15	4.624	9.39	.240	.340	3.34	1.360								
C <sub>2</sub> H <sub>6</sub>				1.47	.201	5.63	.201	5.63	4.42	4.42	.74	1.643	1.31	.201	4.02	3.95	.804								
C <sub>3</sub> H <sub>8</sub>				.72	.098	2.94	.098	2.94	2.17	2.17	.36	.315	.64	.098	1.96	1.92	.588								
C <sub>4</sub> H <sub>10</sub>				1.44	.197	8.27	.197	8.27	1.33	1.33	.22	.630	1.28	.197	1.591	5.80	1.182					7.44	1.19	73.10	
C <sub>5</sub> H <sub>12</sub>				.53	.072	3.17	.072	3.17	1.59	1.59	.27	.231	.47	.072	2.16	2.12	.576								
C <sub>6</sub> H <sub>14</sub>				1.16	.189	8.90	.189	8.90	3.49	3.49	.58	.588	1.03	.189	6.36	6.24	1.272					8.46	1.39	82.06	
C <sub>7</sub> H <sub>16</sub>				.22	.030	1.74	.030	1.74	.066	.066	.11	.096	.19	.030	1.02	1.18	.300					1.74	.36		
C <sub>8</sub> H <sub>18</sub>				.66	.090	6.30	.090	6.30	1.99	1.99	.33	1.289	.59	.090	4.50	4.42	.900					6.30	1.17		
C <sub>9</sub> H <sub>20</sub>				.16	.022	1.89	.022	1.89	.048	.048	.08	.070	.14	.022	1.32	1.30	.264					1.89			
OIL							54.84					.391	.74		3.917	38.46	7.834					54.84	8.44		
WATER												8.123	10.40		5.829										
TOTAL				28.668	374.78		13.167	233.31				59.944	49.236		16.282										
H <sub>2</sub> +CO				27.867																					
H <sub>2</sub> /CO				1.74			5.52					2.57			5.53										

	ULTIMATE YIELDS				WEIGHT BALANCE				EFFLUENT RATIOS	CONTRACTION: 54.5			
	% CO Fed	#/hr	H <sub>2</sub> /CO #/MCF	g/M3	Gal/hr	H <sub>2</sub> /CO Gal/MCF	cc/M3	#/hr		%	C <sub>0</sub> Conversion:	H <sub>2</sub> Conversion:	
C1+C2	9.21	1401	1.32	22.32				Wet Gas	233.3	234.3	H <sub>2</sub> /H <sub>2</sub> O	4.878	87.16
C3+	59.52	85.11	8.03	135.79				Oil	36.2		CO <sub>2</sub> /CO	1.983	59.1
C4+	57.60	73.67	6.95	117.52				Water	104.3		(H <sub>2</sub> )/CO <sub>2</sub>	8.959	
Ult. Oil		80.67	7.61	128.69	12.55	1.19	168.15	Total	373.8	99.7	(H <sub>2</sub> )/(H <sub>2</sub> O)		
CO <sub>2</sub>	18.43	82.59	7.79	131.73									
H <sub>2</sub> O		82.21	8.70	147.12									

Yield Calculations assume "oil" is CH<sub>2</sub>, and is found by difference on Carbon, and H<sub>2</sub>O by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M3 = 16.91 x #/MCF. cc/M3 = 141.3 x gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 23C From 8/31/47 Hr. 0800 to 9/1/47 Hr. 0800

FLOWS		RUN CONDITIONS				DISTILLATIONS				CATALYST DATA				CATALYST ANALYSIS			
SCFH	%	Generator Press	A S T M			Hempel Dist.		In Reactor at Start of Period		Particle Size							
Oxygen	2960	O <sub>2</sub> Preheat, °F	308	Prod.	6450	°F	%	A.P.I.	Fresh Catalyst Charged	Screen				Sedimentation			
Nat Gas	3950	Gas Preheat, °F	780	A.P.I.	425	to 400	673		Catalyst Recharged	493	Frac.	M	%	M	%		
Total	6910	Reactor Press	300	I.B.P.	130	400-550	203		Total	753	On 40	420+	1.4	80+	60.0		
Fresh Feed	9540	Steam Back Press	1000	5%		550+	1.1		Catalyst Taken Out	423.5	100	419-150	12.4	80-40	20.0		
F F by C	11800	Temperatures, °F		10%	166				In Reactor at End of Period	329.5	150	149-105	24.7	40-20	19.0		
Avg F F		Heater Outlet	331	20	190						200	104-74	25.2	20-10	1.0		
Wet Gas	5520	Catalyst #1	695	30	210	WATER					250	73-62	5.1	10-0			
Contraction		#2	704	40	230	Temp.	%		Reactor d-P, H <sub>2</sub> O		325	61-44	9.4				
Recycle	11600	#3	647	50	248	200			Pounds in Reactor	249	<325	43-0	21.8				
Bleed	382	#4	614	60	268	203			Density, lbs./cu. ft.	84				Density, lbs./cu. ft.	Chem. Anal.		
Total	11982	#5	589	70	286	208			Bed Height, Feet	4.6				Aerated	% Fe		
Total Feed	23782	Average	649	80	312									Settled	% C		
Recycle/F F	1.01	Product Separator		90	348				Space Vel. SCFH/lb. cat.					Compacted	% Oil		
Inlet Vel.	157 ft/sec			95	378				Inventory Figures	35.8				Sp. Grav.	4.7	Specific Surface	
Steam Flow				E.P.	401				From d-P Meters	47.4						m <sup>2</sup> gm	
				Rec	98.0												
				Res	0.7												
				Loss	1.3												

GENERATOR ELEMENTAL BALANCE

NATURAL GAS				PRODUCT INSPECTION				IN				OUT							
%		Oil	Water	Product	Pour °F	SUS @ °F		#/hr	Mol %	SCFH m/hr	C	H	O		Mol %	SCFH m/hr	C	H	O
CO <sub>2</sub>	1.37	Neut No.	44.09					O <sub>2</sub>	249.920	7810			15.620	CO <sub>2</sub>	2.1	654	654		1.308
CH <sub>4</sub>	78.82	Sap No.	62.6					CO <sub>2</sub>	4.292	143	143		286	CO	35.6	11084	11084		11084
C <sub>2</sub> H <sub>6</sub>	11.42	Hydrox No.						CH <sub>4</sub>	131.440	8215	8215	28.860	CH <sub>4</sub>	2.3	716	716	2.864		
C <sub>3</sub> H <sub>8</sub>	8.39	Bromine No.	59.9					C <sub>2</sub> H <sub>6</sub>	35.700	1190	2380	7.140	H <sub>2</sub>	59.5	18525		37050		
C <sub>4</sub> H <sub>10</sub>		% Fe						C <sub>3</sub> H <sub>8</sub>	38.456	874	2622	6.992	N <sub>2</sub>	0.5	856				
N <sub>2</sub>		% Alc						C <sub>4</sub> H <sub>10</sub>					H <sub>2</sub> O						7.078
O <sub>2</sub>								N <sub>2</sub>					Total						31.135
								Total	461.808	18.232	13360	46.992	15.906						12.958
																			46.992
																			15.906

Loss H<sub>2</sub>O 398.856

FRESH FEED				WET GAS				RECYCLE	COMB. FEED	EFFLUENT	NET CHANGE ON REACTION									
%	m/hr	#/hr	%	Measured m/hr	At Wt. Balance #/hr	m/hr	m/hr	%	m/hr	%	Carbon			Hydrogen		Oxygen	Ultimate Oil		Unsat.	
CO	35.6	11084	310.35	10.51	1.531	42.87	1.776	49.729	3.322	14.406	22.96	5.098	9.45	-9.308	-7.308	16.02	-9.308			
H <sub>2</sub>	59.5	18525	37.05	53.14	7.740	15.48	8.978	17.956	16.798	35.323	40.36	25.776	47.69	-9.547	-19.094					
CO <sub>2</sub>	2.1	654	28.78	19.01	2.769	12.184	3.212	14.328	4.009	6.663	10.62	9.221	17.06	2.558	2.558	23.08		5.116		
N <sub>2</sub>	0.5	156	4.37	2.44	3.85	9.84	1.412	11.336	1.771	1.927	1.48	1.183	2.19	-2.56						
CH <sub>4</sub>	2.3	716	11.46	8.46	1.232	19.71	1.429	22.864	2.674	3.390	5.40	4.103	7.59	7.13	7.13	6.43	2.852			
C <sub>2</sub> H <sub>6</sub>				1.66	2.24	6.78	2.81	7.968	1.525	1.525	.84	.806	1.49	2.81	5.62	5.07	1.124			67.21
C <sub>3</sub> H <sub>8</sub>				.81	1.18	3.54	1.17	4.110	2.56	2.56	.41	.393	.73	1.37	2.74	2.47	.822			
C <sub>4</sub> H <sub>10</sub>				1.59	2.22	9.74	2.64	11.298	5.03	5.03	.80	.772	1.43	2.69	8.07	7.28	1.614		10.17	1.63
C <sub>2</sub> H <sub>4</sub>				.57	1.08	3.65	1.06	4.224	1.80	1.80	.29	.276	.51	1.096	2.88	2.60	.768			
C <sub>3</sub> H <sub>6</sub>				.88	1.28	7.17	1.48	8.288	2.78	2.78	.44	4.216	.79	1.48	2.92	5.34	1.184		7.87	1.29
C <sub>4</sub> H <sub>8</sub>				.14	1.02	1.16	1.02	1.334	1.04	1.04	.07	1.067	.12	1.023	1.092	.83	.230		1.33	.27
C <sub>5</sub> H <sub>10</sub>				.57	1.08	5.81	1.06	6.720	1.80	1.80	.29	.276	.51	1.096	4.80	4.33	.960		6.72	1.24
C <sub>6</sub> H <sub>12</sub>				.21	1.031	2.67	1.036	3.096	1.066	1.066	.11	1.02	.19	1.036	2.16	1.95	.432		3.10	
OIL							38.220					2.73	.51	2.726	2.459	5.452		38.22	5.88	
WATER												4.192	7.76		3.656					
TOTAL		31.135	392.01			14.565	250.76		62.741			52.964	14.754					4.192	1.828	67.41
H <sub>2</sub> +CO		29.629																		10.31
H <sub>2</sub> /CO		1.67																		

ULTIMATE YIELDS				WEIGHT BALANCE				EFFLUENT RATIOS		CONTRACTION: 47.4	
%	CO Fed	#/hr	H <sub>2</sub> /CO #/MCF	Gal/hr	H <sub>2</sub> /CO g/M3	#/hr	%	#/hr	%	H <sub>2</sub> /H <sub>2</sub> O	C <sub>0</sub> Conversion:
C1+C2	13.97	2238	2.08	75.17		250.36		289.57		6.149	83.98
C3+	46.92	73.18	6.72	110.25		27.0		27.0		1.809	57.5
C4+	37.04	57.66	5.14	86.92		75.5		75.5		(H <sub>2</sub> )(CO <sub>2</sub> )(H <sub>2</sub> O)(CO)	
Ult. Oil		67.41	6.01	101.63	10.31						
CO <sub>2</sub>		23.08	112.58	10.03	169.61						
H <sub>2</sub> O			75.46	6.73	113.80						

Yield Calculations assume "oil" is CH<sub>2</sub>, and is found by difference on Carbon, and H<sub>2</sub>O by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C and 14.7 psig. g/M3 = 16.91 x #/MCF. cc/M3 = 141.3 x gal/MCF.

THE TEXAS COMPANY — MONTEBELLO LABORATORY

DATA SUMMARY SHEET

Synthesis Run Number 23 D From 9/1/47 Hr. 0700 to 9/1/47 Hr. 1900

FLOWS		RUN CONDITIONS				DISTILLATIONS				CATALYST DATA				CATALYST ANALYSIS				
SCFH	%	Generator Press.				A S T M		Hempel Dist.		In Reactor at Start of Period		Particle Size						
Oxygen	2950	O <sub>2</sub> Preheat, °F	306	Prod	6480			°F	%	A.P.I.	Fresh Catalyst Charged	50	Screen :		Sedimentation			
Nat. Gas	3830	Gas Preheat, °F	844	A.P.I.	43.4			to 400	76.3		Catalyst Recharged	193	Frac.	M	%	M	%	
Total	6780	Reactor Press.	298	I.B.P.	122			400-550	18.0		Total	572.5	On 40	420+	1.0	80+	41.0	
Fresh Feed	9150	Steam Back Press	950	5%				550+			Catalyst Taken Out	378.5	100	419-150	9.9	80-40	22.0	
F.F. by C	12100	Temperatures, °F		10%	168						In Reactor at End of Period	194.0	150	149-105	14.9	40-20	25.0	
Avg F.F.		Heater Outlet	372	20	182								200	104-74	19.8	20-10	10.0	
Wet Gas	5760	Catalyst #1	685	30	216			WATER										
Contraction		#2	653	40	234			Temp	%		Reactor d-P, H <sub>2</sub> O							
Recycle	11000	#3	602	50	256			200			Pounds in Reactor	234.0	<325	43-0	39.0			
Bleed	364	#4	578	60	278			203			Density, lbs./cu. ft.	86.8						
Total	11364	#5	580	70	298			208			Bed Height, Feet	4.0						
Total Feed	22464	Average	615	80	322													
Recycle/F.F.	1.07	Product Separator		90	356													
Inlet Vel.	1.52 ft/sec			95	380						Space Vel. SCFH/lb. cat.				Sp. Grav.	4.6		Specific Surface
Steam Flow				E.P.	405						Inventory Figures	62.3						m <sup>2</sup> /gm
				Rec	98.0						From d-P Meters	51.8						
				Res	2.8													
				Loss	1.8													

NATURAL GAS		PRODUCT INSPECTION						GENERATOR ELEMENTAL BALANCE										
%		Oil	Water	Product	Pour °F	SUS @ °F		IN		OUT								
								#/hr	Mol-%	SCFH	C	H	O	Mol %	SCFH	C	H	O
CO <sub>2</sub>	1.59	Neut No.	53.14					O <sub>2</sub>	249.086	7.784			15.368	CO <sub>2</sub>	1.0	3.19	3.19	6.38
CH <sub>4</sub>	81.44	Sap No.	63.1					CO <sub>2</sub>	7.084	.161	.161		.322	CO	34.0	10.856	10.856	10.856
C <sub>2</sub> H <sub>6</sub>	10.53	Hydrox No.						CH <sub>4</sub>	131.680	8.230	8.230	32.920		CH <sub>4</sub>	1.3	.415	.415	1.660
C <sub>3</sub> H <sub>8</sub>	6.44	Bromine No.	36.1					C <sub>2</sub> H <sub>6</sub>	31.920	1.064	2.128	6.384		H <sub>2</sub>	61.6	19.669	39.338	
C <sub>4</sub> H <sub>10</sub>		% Fe						C <sub>3</sub> H <sub>8</sub>	25.644	.651	1.953	5.208		N <sub>2</sub>	2.1	.671		
N <sub>2</sub>		% Alc						C <sub>4</sub> H <sub>10</sub>						H <sub>2</sub> O				3.574
O <sub>2</sub>								N <sub>2</sub>						Total				31.930
								Total	448.416	17.890	124.72	44.512	15.890					11.590

Less H<sub>2</sub>O 369.288

FRESH FEED		WET GAS				RECYCLE	COMB. FEED	EFFLUENT		NET CHANGE ON REACTION										
%	m/hr	#/hr	%	Measured	At Wt. Balance	m/hr	m/hr	%	m/hr	%	Carbon		Hydrogen		Oxygen	Ultimate Oil		Unsat.		
				m/hr	#/hr	#/hr					m/hr	a/hr	%	a/hr	%	a/hr	#/hr	#/gal	gal/hr	%
CO	34.0	10.86	304.08	13.5	2.05	57.40	2.56	71.68	4.05	14.91	24.08	6.61	12.76	-8.30	23.57	-8.30				
H <sub>2</sub>	61.6	19.67	39.34	54.6	8.30	16.60	10.38	20.76	16.37	36.04	58.19	26.75	51.63	-9.29		-18.58				
CO <sub>2</sub>	1.0	.32	14.08	17.3	2.63	115.72	3.29	144.76	5.19	5.51	8.90	8.48	16.37	2.97	2.97	27.35				
N <sub>2</sub>	2.1	.67	18.76	1.4	.21	5.88	.26	8.12	.42	1.09	1.16	.68	1.31	-.41						
CH <sub>4</sub>	1.3	.42	6.72	7.1	1.08	17.28	1.35	21.60	2.13	3.55	4.12	3.48	6.72	.93	.93	9.56	3.72			
C <sub>2</sub> H <sub>6</sub>				1.4	.21	5.88	.26	7.28	.42	.42	.68	.68	1.31	.26	.52	4.79	1.04			53.85
C <sub>3</sub> H <sub>8</sub>				1.2	.18	5.40	.23	6.90	.36	.36	.88	.59	1.14	.23	.46	4.24	1.38			
C <sub>4</sub> H <sub>10</sub>				1.1	.17	7.14	.21	8.82	.33	.33	.83	.54	1.04	.21	.63	5.80	1.26	7.94	1.27	68.75
C <sub>5</sub> H <sub>12</sub>				0.5	.08	3.52	.10	4.40	.15	.15	.24	.25	.48	.10	.30	2.76	.80			
C <sub>6</sub> H <sub>14</sub>				0.8	.12	6.72	.15	8.40	.24	.24	.39	.39	.75	.15	.60	5.52	1.20	7.98	1.31	72.73
C <sub>7</sub> H <sub>16</sub>				0.4	.06	3.48	.08	4.64	.12	.12	.19	.20	.39	.08	.32	2.95	.80	4.64	.95	
C <sub>8</sub> H <sub>18</sub>				0.5	.08	5.60	.10	7.00	.15	.15	.24	.25	.48	.10	.50	4.60	1.00	7.00	1.30	
C <sub>9</sub> H <sub>20</sub>				0.2	.03	2.58	.04	3.44	.06	.06	.10	.10	.19	.04	.24	2.21	.48	3.44		
OIL							11.62					.08	.15		.83	7.64	1.66			1.79
WATER												2.36	4.56		5.24					
TOTAL		31.93	382.98		15.20	253.20			61.93		51.44		12.93			12.36		2.62	42.62	6.62
H <sub>2</sub> +CO		30.53																		
H <sub>2</sub> /CO		1.81				4.05			2.42		4.05									

ULTIMATE YIELDS				WEIGHT BALANCE		#/hr		EFFLUENT RATIOS		CONTRACTION: 40.5	
%	CO Fed	#/hr	#/MCF	H <sub>2</sub> /CO	g/M <sup>3</sup>	Gal/hr	Gal/MCF	H <sub>2</sub> /CO	cc/M <sup>3</sup>	Wet Gas	Oil
C1+C2	17.59	29.06	2.51	42.44				253.2	315.8	H <sub>2</sub> /H <sub>2</sub> O	11.33
C3+	31.48	48.33	4.17	70.51				10.6	10.6	CO <sub>2</sub> /CO	1.28
C4+	22.92	35.10	3.03	51.24				56.5	56.5	(H <sub>2</sub> )(CO <sub>2</sub> )	
Ult. Oil		42.62	3.67	62.06	6.62	0.571	80.68			(H <sub>2</sub> )(CO)	14.55
CO <sub>2</sub>	27.35	130.68	11.27	190.58						Total	320.3
H <sub>2</sub> O		42.48	3.66	61.89							83.8

Yield Calculations assume "oil" is CH<sub>2</sub>, and is found by difference on Carbon, and H<sub>2</sub>O by difference on Hydrogen. "Oil" figures therefore include hydrocarbon fraction of oxygenated compounds. Standard cubic feet measured at 60 F and 14.7 psig. Cubic Meters measured at 0 C. and 14.7 psig. g/M<sup>3</sup> = 16.91 x #/MCF. cc/M<sup>3</sup> = 141.3 x gal/MCF.