

NO. OF COPIES RECEIVED	5
DISTRIBUTION	
SANTA FE	1
FILE	1
U.S.G.S.	2
LAND OFFICE	
OPERATOR	

Form C-105
Revised 11-1-74

NEW MEXICO OIL CONSERVATION COMMISSION
WELL COMPLETION OR RECOMPLETION REPORT AND LOG

RECEIVED

JUL 14 1978

1a. TYPE OF WELL		OIL WELL ☐		GAS WELL ☒		DRY ☐		OTHER ☐	
b. TYPE OF COMPLETION		NEW WELL ☒		WORK OVER ☐		DEEPEN ☐		PLUG BACK ☐	
								DIFF. RESVN ☐	
2. Name of Operator		Cities Service Company		3. Address of Operator		P.O. Box 1919		Midland, TX 79702	
4. Location of Well		UNIT LETTER B		LOCATED 660		FEET FROM THE North		LINE AND 2310	
								FEET FROM	
THE East		LINE OF SEC. 17		TWP. 23S		RGE. 28E		NORTH	
15. Date Spudded		12-15-77		16. Date T.D. Reached		3-29-78		17. Date Compl. (Ready to Prod.)	
								6-28-78	
18. Elevations (DF, RKB, RT, GR, etc.)		3025.5 GR		19. Elev. Casinghead		3025.5 GR			
20. Total Depth		12,574'		21. Plug Back T.D.		12,171'		22. If Multiple Compl., How Many	
								2	
23. Intervals Drilled By		Rotary Tools		Cable Tools		0-12,574'			
24. Producing Interval(s), of this completion - Top, Bottom, Name		12,076- 12,150' Morrow		25. Was Directional Survey Made		No			
26. Type Electric and Other Logs Run		FDC/CNL - GR - CAL - DLL - MSFC		27. Was Well Cored		No			
28. CASING RECORD (Report all strings set in well)									
CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED				
13-3/8" OD	48	400'	17-1/2"	400 sacks	None				
9-5/8" OD	36 & 40	5500'	12-1/4"	3050 sacks	None				
7" OD	23 & 26	11001'	8-3/4"	800 sacks	None				
29. LINER RECORD									
SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN					
5" OD	10,652	12,574	150						
30. TUBING RECORD									
SIZE	DEPTH SET	PACKER SET							
2-3/8"	12,004	12,022							
31. Perforation Record (Interval, size and number)									
2 holes each @ 12,076, 12,077, 12,078 12,079, 12,080, 12,144, 12,145, 12,146, 12,147, 12,148 and 12,150									
32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.									
DEPTH INTERVAL					AMOUNT AND KIND MATERIAL USED				
12,076 -12,150					100 gals 10% acetic acid W/additives				
33. PRODUCTION									
Date First Production		Production Method (Flowing, gas lift, pumping - Size and type pump)				Well Status (Prod. or Shut-in)			
6-28-78		Flowing				Shut-in			
Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period	Oil - Bbl.	Gas - MCF	Water - Bbl.	Gas - Oil Ratio		
6-28-78	8-1/2	32/64"		None	4,540	None			
Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate	Oil - Bbl.	Gas - MCF	Water - Bbl.	Oil Gravity - API (Corr.)			
800#									
34. Disposition of Gas (Sold, used for fuel, vented, etc.)						Test Witnessed By			
Vented						Pastor 7-31-78 7-31-78			
35. List of Attachments									
Deviation Survey									
36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.									
SIGNED <u>E. Spender</u>				TITLE <u>Region Operations Manager</u>				DATE <u>July 12, 1978</u>	

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Commission not later than 20 days after the completion of any newly-drilled or deepened well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, Items 30 through 34 shall be reported for each zone. The form is to be filed in quintuplicate except on state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico

Northwestern New Mexico

T. Anhy _____	T. Canyon <u>10,315</u>	T. Ojo Alamo _____	T. Penn. "B" _____
T. Salt _____	T. Strawn <u>10,784</u>	T. Kirtland-Fruitland _____	T. Penn. "C" _____
B. Salt _____	T. Atoka <u>11,441</u>	T. Pictured Cliffs _____	T. Penn. "D" _____
T. Yates _____	T. Miss <u>12,526</u>	T. Cliff House _____	T. Leadville _____
T. 7 Rivers _____	T. Devonian _____	T. Menefee _____	T. Madison _____
T. Queen _____	T. Silurian _____	T. Point Lookout _____	T. Elbert _____
T. Grayburg _____	T. Montoya _____	T. Mancos _____	T. McCracken _____
T. San Andres _____	T. Simpson _____	T. Gallup _____	T. Ignacio Qizte _____
T. Glorieta _____	T. McKee _____	Base Greenhorn _____	T. Granite _____
T. Paddock _____	T. Ellenburger _____	T. Dakota _____	T. _____
T. Blinberry _____	T. Gr. Wash _____	T. Morrison _____	T. _____
T. Tubb _____	T. Granite _____	T. Todilto _____	T. _____
T. Drinkard _____	T. Delaware Sand <u>2,491</u>	T. Entrada _____	T. _____
T. Abo _____	T. Bone Springs <u>6,044</u>	T. Wingate _____	T. _____
T. Wolfcamp <u>9,296</u>	T. Dean <u>8,934</u>	T. Chinle _____	T. _____
T. Penn. _____	T. _____	T. Permian _____	T. _____
T. Cisco (Bough C) <u>Not Pres.</u>	T. _____	T. Penn. "A" _____	T. _____

OIL OR GAS SANDS OR ZONES

No. 1, from <u>5,700</u> to <u>5,720</u>	No. 4, from <u>12,144</u> to <u>12,152'</u>
<u>11,150</u> to <u>11,160</u>	<u>2,508</u> to <u>2,512</u>
No. 2, from _____ to _____	No. 5, from _____ to _____
No. 3, from <u>12,076</u> to <u>12,081</u>	No. 6, from <u>2,532</u> to <u>2,539</u>

IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole.

No. 1, from _____ Drilled with Rotary. to _____ Information not available. feet. _____
No. 2, from _____ to _____ feet. _____
No. 3, from _____ to _____ feet. _____
No. 4, from _____ to _____ feet. _____

FORMATION RECORD (Attach additional sheets if necessary)

From	To	Thickness in Feet	Formation	From	To	Thickness in Feet	Formation
0'	400'	400'	Red Bed & Anhydrite				
400'	1440'	1040'	Anhydrite				
1440'	1580'	140'	Anhydrite & Sand				
1580'	2275'	695'	Anhydrite & Salt				
2275'	5550'	3275'	Anhydrite & Sand				
5550'	5754'	204'	Lime & Sand				
5754'	5895'	141'	Sand, Shale, & Lime				
5895'	9955'	4060'	Lime & Shale				
9955'	11940'	1985'	Shale & Lime				
11940'	12089'	149'	Sand, Lime & Shale				
12089'	12390'	301'	Sand & Shale				
12390'	12466'	76'	Shale, Sand & Lime				
12466'	12574'	108'	Shale				

NEW MEXICO OIL CONSERVATION COMMISSION
MULTIPLE TEST AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Form C-122
Revised 9-1-65

RECEIVED

Type Test ☒ Initial ☐ Annual ☐ Special				Test Date 8-25-78		OCT 2 1978	
Company CITIES SERVICE COMPANY ✓				Production EL PASO NATURAL GAS CO.		O. C. C. ARTESIA, OFFICE	
Well Name <i>Livingston-Morrow</i>				MORROW		Unit	
Completion Date 6-28-78		Total Depth 12,574'		Ming Back TD 12,165'		Elevation 3025.5 GR.	
Csg. Size 5 1/2"		Wt. 20#		Set At 12,574'		Perforations: From 12,076' To 12,150'	
Tbg. Size 2 3/8"		Wt. 4.7#		Set At 12,022'		Perforations: From OPEN ENDED	
Type Well - Single - Brdenhead - G.G. or G.O. Multiple G.G. DUAL				Packer Set At 12,022'		Farm or Lease Name POLK "A" Com.	
Producing Thru TUBING		Reservoir Temp. °F 196 @ 12,160'		Mean Annual Temp. °F 60		Baro. Press. - P _o 13.2	
L 12160		H 12160		G _g .599		State NEW MEXICO	
				% CO ₂		County EDDY	
				% N ₂		City B 17 23S 28E	
				% H ₂ S		Taps 4" FLANGE	
FLOW DATA				TUBING DATA		CASING DATA	
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. h _w	Temp. °F	Duration of Flow
1.	4"	x	1.750"	512	4.8	84	67.5 HR.
2.	4"	x	1.750"	512	9.0	78	1.0 HR.
3.	4"	x	1.750"	505	16.8	69	1.0 HR.
4.	4"	x	1.750"	505	33.6	59	1.0 HR.
5.							
RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor F _t	Gravity Factor F _g	Super Compress. Factor, F _{pv}	Rate of Flow Q, Mcfd
1.	14.93	50.21	525.2	.9777	1.292	1.038	983
2.	14.93	68.75	525.2	.9831	1.292	1.039	1355
3.	14.93	93.30	518.2	.9915	1.292	1.042	1859
4.	14.93	131.95	518.2	1.0010	1.292	1.044	2660
5.							
NO.	P _r	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio DRY Mcf/bbl.		
1.	.78	544	1.54	.929	A.P.I. Gravity of Liquid Hydrocarbons _____ Deg.		
2.	.78	538	1.52	.926	Specific Gravity Separator Gas .599 X X X X X X X X		
3.	.77	529	1.49	.921	Specific Gravity Flowing Fluid X X X X X		
4.	.77	519	1.47	.918	Critical Pressure 672 P.S.I.A. _____ P.S.I.A.		
5.					Critical Temperature 354 °R _____ °R		
$P_c = 4167.9 P_c^2 = 17371.4$							
NO.	P _r ²	P _w	P _w ²	P _c ² - P _w ²	$(1) \frac{P_c^2}{P_c^2 - P_w^2} = 2.819$		
1.		3973.3	15787.1	1584.3	$(2) \left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 2.819$		
2.		3777.1	14266.5	3104.9			
3.		3638.7	13240.1	4131.3			
4.		3347.9	11208.4	6163.0			
5.							
$\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 7.498$							
Absolute Open Flow 7.498 Mcfd @ 15.025 Angle of Slope 45 Slope, n 1.00							
Remarks: BOTTOM HOLE PRESSURES MEASURED WITH AMERADA GAUGE @ 12,160 FEET. P _c & P _w CALCULATED FROM KNOWN BOTTOM HOLE PRESSURES.							
Approved By Commission:		Conducted By: B.R.D.		Calculated By: R.R.		Checked By: J.W.W.	

CITIES SERVICE COMPANY
 POLK "A" NO. 1 (MORROW)
 BOTTOM HOLE PRESSURE BUILD-UP TEST, PRESSURES
 TO USE FOR CALCULATING 4-POINT AND BUILD-UP TEST
 TABULATION OF PRESSURE AND TIME

TEST CONDUCTED BY:
 JOHN WEST ENGINEERING CO.

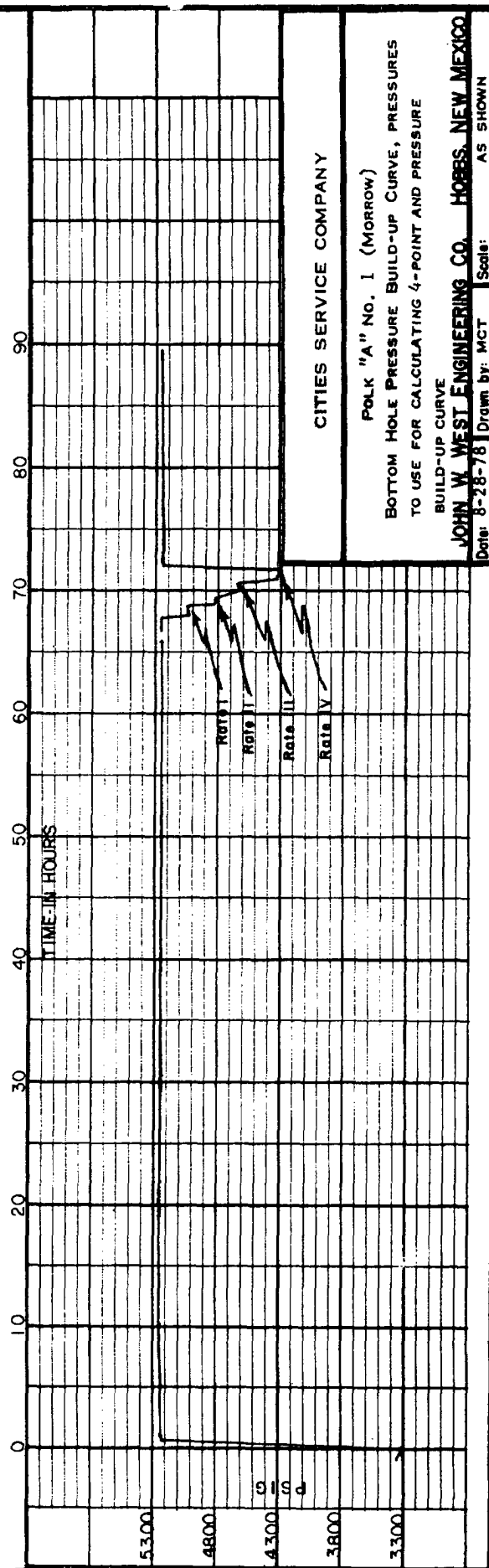
TEST DATE: AUGUST 22 TO 26, 1978
 TEST DEPTH: 12,160 FEET
 ELEMENT NO.: 34912 (0-8000 PSI)
 OPER.: B.R.D.

DATE	TIME	CUM. HRS./MIN.		PSIG @ 12,160 FEET
8-22-78	2:15 PM			3356 GAUGE REACHED 12,160', FLOWING
	2:45 PM			3312 FLOWING D.W. 2485 PSIG
8-22-78	3:15 PM	00 HRS.	00 MIN.	3308 SHUT-IN, BEGIN BUILD-UP
		00	15	4672
		00	30	5222
		00	45	5234
		01	00	5246
		02	00	5246
		03	00	5246
		04	00	5246
8-22-78	8:15 PM	05	00	5246
8-23-78	1:15 AM	10	00	5254
	11:15 AM	20	00	5258
8-23-78	9:15 PM	30	00	5258
8-24-78	7:15 AM	40	00	5262
8-24-78	5:15 PM	50	00	5262
8-25-78	3:15 AM	60	00	5270
8-25-78	9:00 AM	65	45	5270 GAUGE OUT, CHANGE CHARTS
8-25-78	10:00 AM	66	45	5270 GAUGE BACK TO 12,160 FEET
	10:45 AM	67	30	5270 OPEN CHOKE 7/64, D.W. 4135
		67	45	5123
		68	00	5024
		68	15	5028
	11:45 AM	68	30	5044 END RATE I
		68	45	4896 9/64 CHOKE
		69	00	4812
		69	15	4832
	12:45 PM	69	30	4812 END RATE II
		69	45	4644 10/64 CHOKE
		70	00	4608
		70	15	4668
	1:45 PM	70	30	4648 END RATE III
		70	45	4372 13/64 CHOKE
		71	00	4320
		71	15	4312
8-25-78	2:45 PM	71 HRS.	30 MIN.	4300 END RATE IV, SHUT-IN
8-25-78	2:45 PM	00	00	4300 BEGIN BUILD-UP
		00	15	4812
		00	30	5250
		00	45	5254
		01	00	5258
		02	00	5258
		03	00	5258
		04	00	5258
8-25-78	7:45 PM	05	00	5262
8-26-78	12:45 AM	10	00	5262
		15	00	5266
8-26-78	9:00 AM	18 HRS.	15 MIN.	5266 GAUGE OUT, END TEST, D.W. 4128

TEST DATE: AUGUST 22 TO 26, 1978
TEST DEPTH: 12,160 FEET

ELEMENT No.: 34912
RANGE: 0-8000 PSI
CLOCK No.: C-1919
RANGE: 0-72 HOUR
CLOCK No.: C-4020
RANGE: 0-24 HOUR

NOTE: SEE TABULATION OF PRESSURE AND TIME ON ATTACHED SHEET.





UNITED CHEMICAL CORPORATION

OF NEW MEXICO

P. O. BOX 1499

PHONE (505) 393-7751

HOBBS, NEW MEXICO 88240

No. 7762

Run No. _____

Date of Run 8-26-78

Date Secured 8-25-78

CERTIFICATE OF ANALYSIS

Sample of Cities Service Oil Company Polk "A" Morrow
Secured from West Engineering
412 N. Dal Paso Secured by _____
Hobbs, New Mexico 88240 Time _____ Date _____
Sampling conditions: Press _____
Temp. _____

FRACTIONAL ANALYSIS

Percentage Composition

	MOL %	LIQ. %	G.P.M.
Carbon Dioxide	1.188		
Air			
Hydrogen	.070		
Oxygen			
Hydrogen sulfide			
Hydrogen			
Methane	95.116		
Ethane	2.375		.633
Propane	.476		.170
Isobutanes			
Normal Butane	.123		.021
Isobutane	.124		.039
Pentanes			
Isopentane	.120		.039
Normal Pentane	.121		.040
Hexanes	.138		.057
Heptanes	.149		.063
TOTAL	100.000		1.062

Calc. Sp. Gr. 0.5986
Calc. A.P.I. _____
Calc. Vapor Press. _____ PS
Sp. Gr. _____
Mol. Wt. 17.35

LIQUID CONTENT (GAL./MCF)

Propane Calc. G.P.M. .170
Butanes Calc. G.P.M. .060
Pentanes Plus. G.P.M. .199
Ethane Calc. G.P.M. .633
RVP Gasoline G.P.M. _____
B.T.U./Cu. Ft. @ 14.696 P.S.I.A.
Dry Basis 1050
Wet Basis 1032
Sulfur Analysis by Titration
Gr./100 Cu. Ft. _____
Hydrogen Sulfide _____
Mercaptans _____
Sulfides _____
Residual Sulfur _____
Total Sulfur _____

Run by Deane Simpson Checked by _____ Approved by Deane Simpson

Additional Data and Remarks

831dh

WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURES (P_c or P_w)

Form C-122F
Adopted 9-1-65

FROM KNOWN BOTTOM HOLE PRESSURE (P_f or P_g)

COMPANY Cities Service LEASE BK 11A WELL NO. 235 DATE 8-25-78

LOCATION: Unit C Section 17 Township 23S Range 28E

L 12,160 H 12,160 LH 1.00 G 1.599 % CO₂ _____ % N₂ _____ % H₂S _____

GH 17121 P_{CT} 672 T_{CT} 354

TABLE IX & X
TABLE IX & X

LINE	1	2	3	4	5	6	7	8
1	T _w (W.H. °R)	534	534					
2	T _s (B.H. °R)	656	656					
3	T = $(\frac{T_w + T_s}{2})$	595	595					
4	Z (Est.)	1.010	968					
5	TZ	601.0	576.0					
6	GH/TZ	12.121	12.697					
7	e ^s (Table XIV)	1.575	1.607					
8	P _f or P_g	5283.2	5283.2					
9	P _f ² or P_g²	27912.2	27912.2					
10	P _c ² = P _f ² /e ^s or P _w ² = P _s ² /e ^s	17717.2	17371.2					
11	P _c or P_w	4209.2	4167.9					
12	P _r = $(\frac{P_w + P_s}{2})$ or $(\frac{P_c + P_f}{2})$	4746.2	4725.5					
13	P _r = (P/P _{CT})	7.06	7.03					
14	T _r = (T/T _{CT})	1.68	1.68					
15	Z (Table XI)	968	966					

WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURES (P_{wh} or P_w)

Form C-122F
Adapted 9-1-65

FROM KNOWN BOTTOM HOLE PRESSURE (P_b or P_s)

COMPANY CITRUS SERVICE LEASE POK "A" WELL NO. 1 (MORROW) DATE 8-25-78

LOCATION: Unit C Section 17 Township 23S Range 28E

L 12.160 H 13.160 LH 1.00 G 1.599 % CO₂ _____ % N₂ _____ % H₂S _____

GH 72.84 P_{CT} 672 T_{CT} 354

LINE	1	2	3	4	5	6	7	8
1	$T_w(W.H. \circ R)$	534	534	534	534	534	534	534
2	$T_s(B.H. \circ R)$	656	656	656	656	656	656	656
3	$T = \frac{T_w + T_s}{2}$	605	595	595	595	595	595	595
4	Z (Est.)	.992	.952	.974	.937	.927	.937	.906
5	TZ	590.2	566.4	579.5	557.5	551.6	557.5	539.1
6	GH/TZ	12.341	12.859	12.569	13.665	12.726	13.065	13.512
7	e^S (Table XIV)	1.589	1.620	1.602	1.632	1.612	1.632	1.660
8	P_b or P_s	5052.2	5057.2	4825.2	4825.2	4661.2	4313.2	4313.2
9	P_b^2 or P_s^2	25525.3	25525.3	23282.6	23282.6	21726.8	18603.7	18603.7
10	$P_c^2 = P_b^2 / e^S$ or $P_w^2 = P_s^2 / e^S$	16.095.2	15787.2	14533.5	14266.3	13478.2	13246.0	11208.3
11	P_c or P_w	4011.9	3973.3	3812.3	3777.1	3671.3	3638.7	3376.1
12	$P_c \cdot \left(\frac{P_w + P_s}{2} \right)$ or $\left(\frac{P_c + P_s}{2} \right)$	4534.6	4515.3	4318.8	4301.2	4166.3	4150.0	3830.5
13	$P_T = (P/P_{CT})$	6.75	6.72	6.43	6.40	6.30	6.18	5.72
14	$T_T = (T/T_{CT})$	1.68	1.68	1.68	1.68	1.68	1.68	1.68
15	Z (Table XI)	.952	.951	.937	.936	.927	.926	.905

RATE I RATE II RATE III RATE IV

$$\begin{aligned} \text{ABS. SLOPE } N &= Q_1 = 10,000 = 4.000000 \\ Q_2 &= 1,000 = \frac{3.000000}{N} \\ N &= 1.000000 \end{aligned}$$

$$\text{CAOF} = 2660 \left(\frac{17371.4}{6163.0} \right)^{1.00} = 7,498 \text{ MCF/DAY}$$

