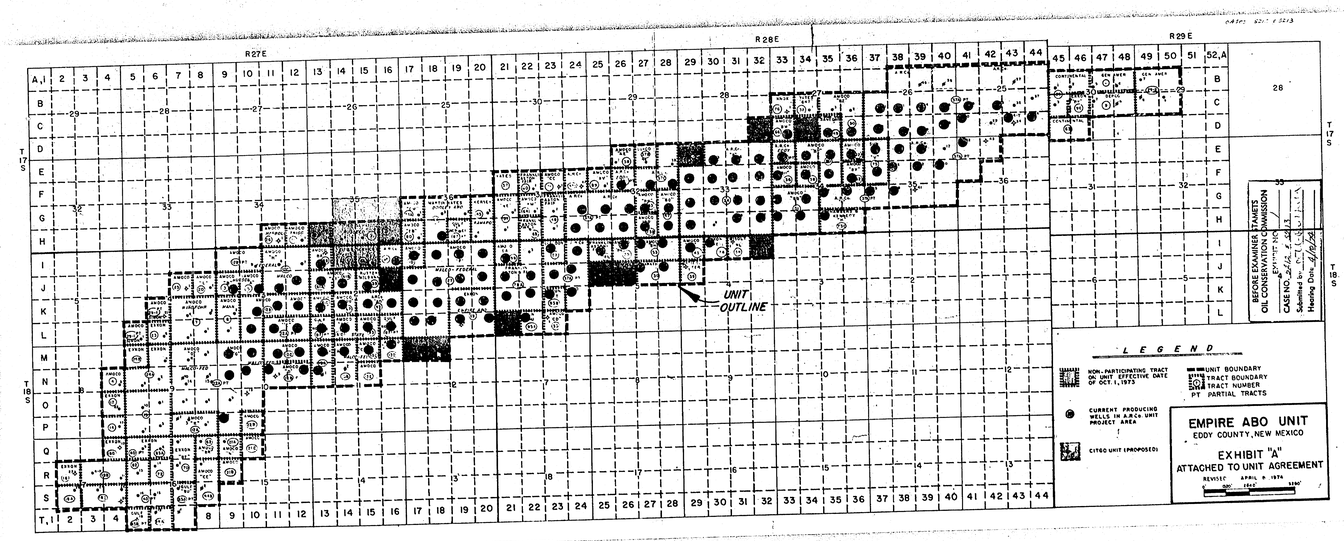
Case No.

5212+5213

Large Exhibits

V.N.N.C.F. MICROGRAPHICS

BEST AVAILABLE COPY



U.S.N.C.F. MICROGRAPHICS
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WN5ACND     1913ACDT     09/07/73

CMF RUN STARTED
RUN=100 FAAP

FAAP        1913ACDT     09/07/73
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EMPIRE ABO PRESSURE MAINTENANCE PROJECT

TO: N.M.O.C.C. DIST II (3)
P.O. DRAWER DD
ARTESIA, NEW MEXICO-88210
ATTN: MR. W.A.GRESSETT

(N.M.O.C.C. ORDERS R-4544, R-4549)

ATLANTIC RICHFIELD COMPANY - OPERATOR
MONTHLY REPORT FOR MAR. , 1973 .

PROJECT AREA: EMPIRE ABO UNIT
SHEET A

TOTAL REQUESTED ALLOWABLE FOR JUNE , 1973 IS 3780. BOPD

(1) TCT NO.	(2) WELL NO.	(3) HN SEC T W	*STA N YR	WELL DATE MNL	TEST DATA (LATEST 24-HR) OIL BBL	WTR BBL	GAS MCF	GOR CF/B	(4) PRODUCTION AVERAGE (MAR. , 1973) OIL BOPD	WTR BOPD	GAS MCF/D	GOR CF/B	(5) * GAS MCF/D	(6) INJECTION-AVERAGE PRESS PSI	INJ MMCF	(7) VOID *REQUE-* NET *ANNUAL* STED * VOID *TRANS.*TRANS.* (2) *FOR(1)* VOID *AT NUA*(A+9)	(8) NET *REQU-ESTED *SEE I9*ALLOW *RSVB/D*RSVB/D*RSVB/D*RSVB/D* BOPD	(9) * (10) * (11) *REQUES* * NET *VOID *ESTED *ALLOW*COL.* BOPD
1	1	A 3N 17 27* I											* 2773.	1860.	250.*	4ABS.*		
1	2	H 3N 17 27* F	3 74	350.	0.	245.	700.*	300.	0.	210.	700.*					* 57.*	59.*	115.* 300.
1	3	F 3N 17 27* F	3 74	400.	0.	320.	800.*	300.	0.	240.	800.*					* 65.*	66.*	131.* 300.
1	4	D 3N 17 27* F	3 74	365.	0.	379.	901.*	300.	0.	270.	900.*					* 73.*	73.*	146.* 300.
1	5	E 3N 17 27* F	3 74	382.	0.	382.	1000.*	300.	0.	300.	1000.*					* 81.*	81.*	162.* 300.
1	6	F 3N 17 27* F	3 74	424.	0.	446.	1099.*	348.	0.	343.	1101.*					* 114.*	88.*	207.* 348.
1	7	G 3N 17 27* F	3 74	372.	0.	446.	1199.*	284.X	0.	341.	1201.*					* 95.*	95.*	192.* 284.
1	8	H 3N 17 27* I	3 74	325.	0.	229.	702.*	284.X	0.	199.	701.*					* 58.*	59.*	109.* 284.
1	9	I 3N 17 27* F	3 74	310.	0.	248.	800.*	284.X	0.	227.	799.*					* 57.*	66.*	123.* 284.
1	10	J 3N 17 27* F	3 74	360.	0.	324.	900.*	250.	0.	225.	900.*					* 67.*	73.*	120.* 250.
1	11	K 3N 17 27* F	3 74	250.	0.	250.	1000.*	250.	0.	250.	1000.*					* 52.*	81.*	133.* 250.
1	12	L 3N 17 27* F	3 74	250.	0.	275.	1100.*	210.	0.	231.	1100.*					* 33.*	88.*	121.* 210.
1	13	M 3N 17 27* F	3 74	150.	0.	190.	1200.*	150.	0.	180.	1200.*					* 24.*	95.*	92.* 150.
1	14	N 3N 17 27* D	3 74	150.	100.	190.	1200.*	150.	100.	190.	1200.*					* 96.*	95.*	192.* 150.
1	15	O 3N 17 27* D	3 74	150.	75.	195.	700.*	150.	75.	195.	700.*					* 69.*	49.*	128.* 150.
1	16	P 3N 17 27* F	3 74	100.	35.	500.	5000.*	100.Y	35.	500.	5000.*					* *	* 288.*	288.* 100.
1	17	Q 3N 17 27* F	3 74	40.	0.	120.	3000.*	40.Y	0.	120.	3000.*					* *	55.*	55.* 40.
1	18	R 3N 17 27* S	3 74	14.	2.	42.	3000.*									* 66.*	*	* *
1	19	S 3N 17 27* S	3 74	5.	1.	70.	14000.*									* 128.*	*	* *
1	20	T 3N 17 27* S	3 74	158.	0.	583.	3500.*									* 481.*	*	* *

EMPIRE ABO UNIT OIL PRODUCTION= 3780. BOPD

EMPIRE ABO UNIT WATER PRODUCTION= 210. BWPD

EMPIRE ABO UNIT GAS PRODUCTION= 3961. MCF/D

EMPIRE ABO UNIT GOR= 1071. CF/B

TOTAL DAILY GAS INJECTION= 2773. MCF/D

TOTAL CUM. GAS INJ.= 250. MMCF

TOTAL VOIDAGE AVAIL. FOR TRANS.= 1143. RSVB/D

TOTAL REQUESTED VOIDAGE TRANS.= 881. RSVB/D

TOTAL NET VOIDAGE AT NUA= 1422. RSVB/D

TOTAL REQUESTED NET VOIDAGE= 2303. RSVB/D

TOTAL REQUESTED OIL ALLOWABLE= 3780. BOPD

(1-SEE ATTACHMENT I (B) COL. (9)).
(2-SEE ATTACHMENT I (A) COL. (10)).
(X=PRODUCTION LIMITED TO TWICE NUA)
(Y=LIMITED CAPACITY. SEE ATTACHMENT I (C) COL.=S (9) & 9(C).)

EMPIRE ABO PRESSURE MAINTENANCE PROJECT

MONTHLY REPORT FOR MAR. , 1973 .

ATTACHMENT I: ALLOWABLE CALCULATIONS BASED ON NET RESERVOIR VOIDAGE.

A) WELLS ACCEPTING TRANSFERRED ALLOWABLES	(1) TCT WELL NO.	(2) WELL NO.	(3) QO= W PER * ALLOW *(66/A5)	(4) RI/GP *1- GI/GP*	(5) GI/GP= RP.FROM=	(6) RPN= *COL. 4-5*	(7) VR(HC) FOU. 1A*	(8) VR(W) *(EQU. 1)*	(9) VRT= *(7)+(8)	(10) *PER WELL* *ANNUAL* TOTAL * AT NUA * *REQ ESTED* VOID* (EQU. 11)*
	*NO.	NO.*	*STROPD*	*FRACTION*	*FRACTION*	*CF/BO	*CF/BO	*RSVB/D	*RSVB/D	*RSVB/D *RSVB/D*
	1	2	* 300.	* 0.700	* 0.300	* 0.700	* 0.210	* 124.	* -9.0	* 115. * 59. *
	1	3	* 300.	* 0.700	* 0.300	* 0.800	* 0.240	* 140.	* -9.2	* 131. * 66. *
	1	4	* 300.	* 0.700	* 0.300	* 0.900	* 0.270	* 155.	* -9.0	* 146. * 73. *
	1	5	* 300.	* 0.700	* 0.300	* 1.000	* 0.300	* 171.	* -9.0	* 162. * 81. *
	1	6	* 348.	* 0.700	* 0.300	* 1.101	* 0.330	* 214.	* -9.0	* 207. * 88. *
	1	7	* 284.	* 0.700	* 0.300	* 1.201	* 0.360	* 191.	* -9.0	* 182. * 95. *
	1	8	* 284.	* 0.700	* 0.300	* 0.701	* 0.210	* 118.	* -9.0	* 109. * 59. *
	1	9	* 284.	* 0.700	* 0.300	* 0.799	* 0.240	* 137.	* -9.0	* 128. * 66. *
	1	10	* 250.	* 0.700	* 0.300	* 0.900	* 0.270	* 129.	* -9.0	* 120. * 73. *
	1	11	* 250.	* 0.700	* 0.300	* 1.000	* 0.300	* 142.	* -9.0	* 133. * 81. *
	1	12	* 210.	* 0.700	* 0.300	* 1.100	* 0.330	* 130.	* -9.0	* 121. * 88. *
	1	13	* 150.	* 0.700	* 0.300	* 1.200	* 0.360	* 101.	* -9.0	* 92. * 95. *
	1	14	* 150.	* 0.700	* 0.300	* 1.200	* 0.360	* 101.	* 91.0	* 192. * 95. *
	1	15	* 150.	* 0.700	* 0.300	* 0.700	* 0.210	* 62.	* 66.0	* 128. * 59. *
A) TOTALS:			3560.					1911.	49.0	1960. 1079.

B) WELLS TRANSFERING ALLOWABLES										
1	1	* 142.	* 0.	* 1.000	* 2.000	* 2.000	* 494.	* -9.0	* 485.	
1	18	* 14.	* 0.	* 1.000	* 1.000	* 1.000	* 73.	* -7.0	* 66.	
1	19	* 5.	* 0.	* 1.000	* 14.000	* 14.000	* 120.	* -8.0	* 112.	
1	20	* 81.	* 0.	* 1.000	* 3.500	* 3.500	* 490.	* -9.0	* 481.	
B) TOTALS:		242.					1176.	-33.0	1143.	

C) CAPACITY WELLS ALLOWABLE CALCULATIONS										(9A) *VRT FOR * TA MAX *GOR WELL* * IR(9) * RSVA/D	(9B) *RATIO *VRT(9A)/* (2) *(2)X(9B) *FRACTION*	(9C) *REQ. CAP. *ALLOW=COL.* *(2) OX COL* * BOPD *
1	16	* 100.	* 0.700	* 0.300	* 5.000	* 1.500	* 262.	* 26.0	* 288.	* 485.	* 1.682	* 100.
1	17	* 40.	* 0.700	* 0.300	* 3.000	* 0.900	* 54.	* -9.0	* 55.	* 485.	* 0.847	* 40.

(2 NOTE: CAPACITY WELLS ALLOWED TO PRODUCE AT ANY RATE AS LONG AS VRT(9A)/VRT(9) > OR = 1.0
WHEN VRT(9A)/VRT(9) < 1.0, DAILY OIL ALLOWABLE OF CAPACITY WELLS MUST BE NO GREATER
THAN (2) X VRT(9A)/VRT(9) OR (2) X (9A)).

FLUID FACTORS: (BASED ON PREVIOUS RESERVOIR PRESSURE SURVEY, 1343, PSI, JULY, 1973):
BO, OIL FORMATION VOLUME FACTOR, RES. BBLS/STBO = 1.415
BG, GAS FORMATION VOLUME FACTOR, RES. BBLS/MCF = 1.710
RS, SOLUTION GAS-OIL RATIO, MCF/STBO = 0.795
BW, WATER FORMATION VOLUME FACTOR, RES. BBLS/STBWL = 1.000

ESTABLISHED CONSTANTS: QWF, NATURAL WATER ENCROACHMENT, STBW/DAY, BASED ON NUMERIC MODEL STUDIES = 1950. BWPD
QO, TOP PER-WELL N.U.A., STBOPD = 142.

BASIC VOIDAGE EQUATIONS: 1) VR(HC)=QO X (BO + (RPN - RS) X BG), NET HYDROCARBON RESV. VOIDAGE, RSVB/D
1A) RPN= RP X (1.0 - GI/GP) + MCF/STBO
2) VOW= (QWP - QWF(PER WELL)) X BW, NET RESV. SPACE VOIDED BY WATER, RSVB/D
3) VRT= VR(HC) + VRW, TOTAL NET RESV. SPACE VOIDED ON DAILY BASIS, RSVB/D

ADDITIONAL ALLOWABLE IN EXCESS OF 10000. BOPD

(BASED ON R=(GI/GP)X10.0, RATIO)

ADDITIONAL ALLOWABLE = 97.07 X (20XR + 0).BOPD

R= (GI/GP)X10.0 = 7.000

ADDITIONAL ALLOWABLE = 10192. BOPD

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PROGRAM STOP AT 1445
DFAMV
END OF CMF RUN
DFAMV
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V.N.M.C.F. MICROGRAPHICS
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