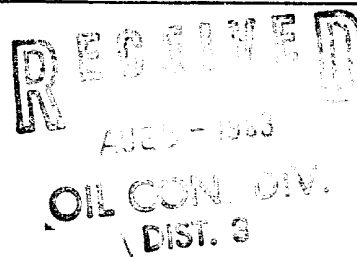


# dugan production corp.



*file*  
August 3, 1983

Mr. Frank Chavez  
Oil Conservation Division  
1000 Rio Brazos Road  
Aztec, New Mexico 87410

Re: Proposed Allocation Formula for Commingled Production  
Dugan Production Corp.  
Big Eight Well No. 1E  
Lease NM-25440  
Bisti Gallup - Basin Dakota Fields  
SW SE Sec. 8, T24N, R9W NMPM  
San Juan County, New Mexico

Dear Mr. Chavez:

As stipulated in Order Number R-6825 issued November 24, 1981, Dugan Production proposes to allocate the commingled production between the Gallup and Dakota formations as follows: Oil - 90% to Gallup, 10% to Dakota; Gas 13% to Gallup, 87% to Dakota; Water - 25% to Gallup, 75% to Dakota. These allocation factors are based upon an estimate of ultimate recoveries of hydrocarbons from each reservoir, using our experience in the area and volumetric analysis with data from open hole logs. (Reserve calculations are summarized on Table No. 1).

These allocation factors are consistent with allocation factors for 5 wells similarly commingled in this general area, also operated by Dugan Production. I have summarized these wells on Table No. 2. In addition, I have included 2 excerpts from the exhibits that were recently utilized in support of the commingling hearing for Dugan Production's April Surprise #4 located in the NW SW of Sec. 19, T24N, R9W approximately 2 miles to the southwest (Exhibits No. 6 & 7). These exhibits present actual production performance of 6 Dakota, 6 Gallup, and 3 commingled Gallup-Dakota wells in this area and production based reserves using this data is in good agreement with volumetric calculations utilizing log data.

The Big Eight #1E was spudded on March 8, 1982 and completed on July 20, 1982. We cemented 4½" casing at 6443' and perforated the Dakota 6288-6300' following the abandonment of Dakota perforations 6375-6394' which were tested to be non-productive. The Dakota interval 6288-6300' was fracture stimulated utilizing 18,000# of 20-40 sand and 14,000 gallons of gelled water. The Gallup formation was then perforated with a total of 33 holes throughout the interval 5196-5314'. This interval was fractured utilizing 75,000# 20-40 sand, 65,970 gallons of slickwater.


Mr. Frank Chavez  
Oil Conservation Division  
August 3, 1983  
Page 2

Production tubing was landed at 6275' and a rate of 27 BOPD plus 120 BLWPD plus 246 MCFD was tested prior to shutting in, pending a pipeline connection for gas sales. A total of 163 BO was produced during testing in 1982, and during the first 6 months of 1983 the well was shut in. We have recently obtained a pipeline connection.

Should you have any questions regarding this matter, please feel free to contact me.

Also included for your use is a map of the general area on which I have indicated the daily average production during the first 6 months of 1983 for the 5 commingled wells in the vicinity of the Big Eight #1E.

Sincerely,



John D. Roe  
Petroleum Engineer

JDR:mba

Enclosures

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OCT 10 1983  
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Dugan Production Corp.  
Reserve Estimate  
Big Eight No. 1E

Gallup

<u>Perfs</u>	<u>Pay Ft.</u>	<u>Porosity %</u>	<u>Water Saturation</u>	<u>Pay Quality</u>
5196-5202'	3	6½	66%	S
5268-5275'	9	11½	41	F
5278-5286'	10	9	?	S
5302-5314'	14	8	29	F

36 ft.

Primary = 23 ft. w/Ø = 9% Sw 35%  
Secondary = 13 ft. w/Ø = 8% Sw 40%

Estimated Oil Reserves =  $[7758 \times 80 \times 23 \times .09 \times (1 - .35)/1.5] \times .05 +$   
 $[7758 \times 80 \times 13 \times .08 \times (1 - .40)/1.5] \times .01$   
 = 27,835 + 2580  
 = 30,400 STB

Estimated Gas Reserves @ Field Average GOR of 3500 SCF/STB = 106,400 MCF

Dakota

<u>Perfs</u>	<u>Pay Ft.</u>	<u>Porosity %</u>	<u>Water Saturation</u>	<u>Pay Quality</u>
6258-6300'	10	10	32	P

Estimated Gas Reserves =  $43.56 \times (320 \times .5) \times 10' \times .10 \times (1 - .32) \times 180 \times .80$   
 = 682 MMCF

Estimated Condensate Reserves = 682 mm x 5.0 B/mm = 3400 B

Reserve Summary

	<u>Oil-Bbl</u>	<u>Gas-MMCF</u>
Gallup	30,400 (90%)	106 (13%)
Dakota	<u>3,400 (10%)</u>	<u>682 (87%)</u>
Total	33,800	788

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DUGAN PRODUCTION CORP.  
BIG EIGHT NO. 1E

Table No. 2

Allocation Factors for Commingled Gallup-Dakota Wells

Operated by Dugan Production Corp.

Township 24 North, Ranges 8 and 9 West  
San Juan County, New Mexico

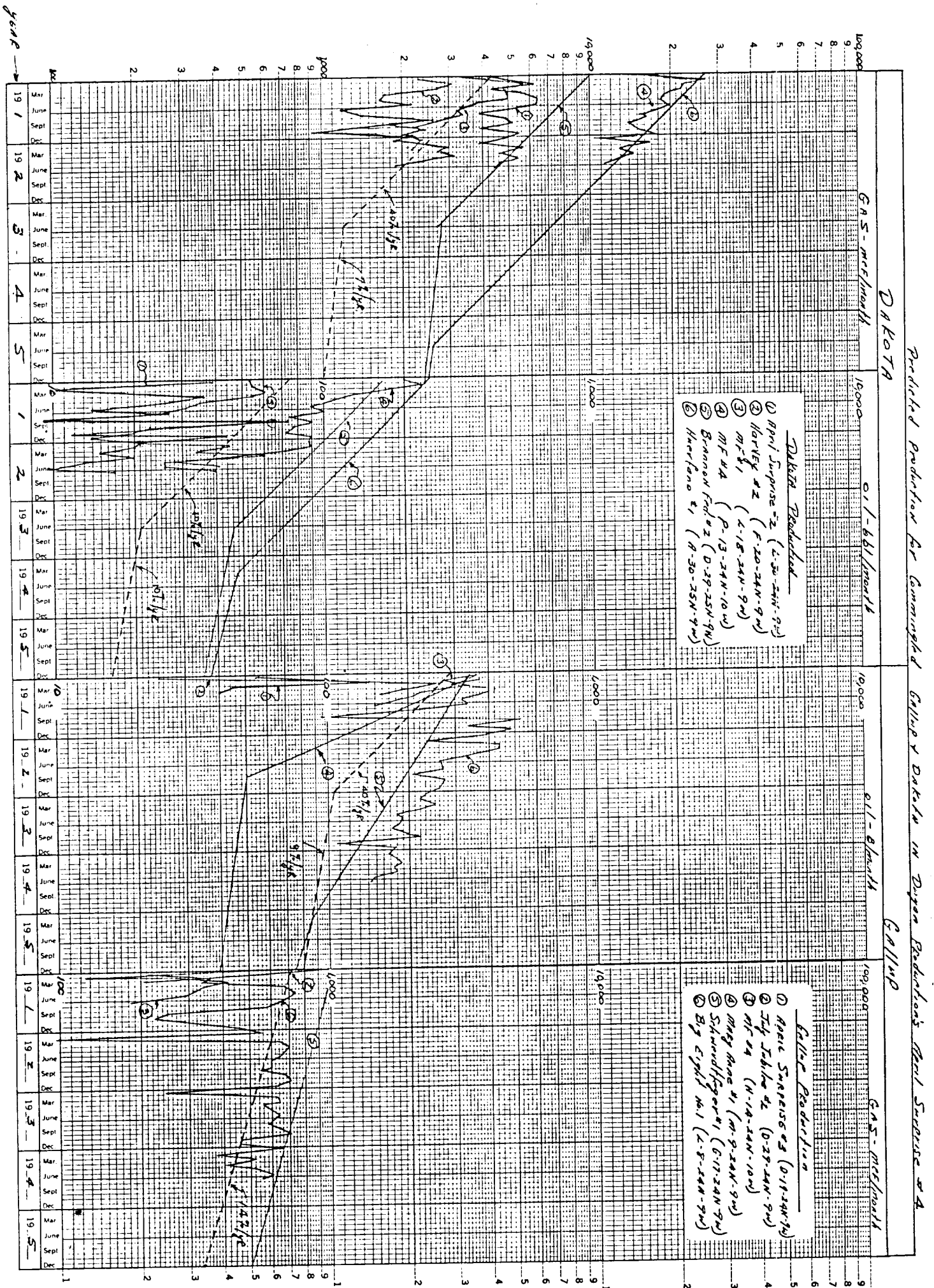
	April Surprise #4 <u>R-7210</u>	Holly #1 <u>R-7143</u>	Merry May #1 <u>R-6571</u>	July Jubilee #1 <u>R-6826</u>	June Joy #2 <u>R-6396*</u>
<u>Oil</u>					
Gallup	85%	95%	85%	90%	80%
Dakota	15%	5%	15%	10%	20%
<u>Gas</u>					
Gallup	15%	80%	15%	10%	80%
Dakota	85%	20%	85%	90%	20%

\* Allocation factors in the order are transposed from that which was testified at the hearing. We are working to get this resolved.

Application for Downhole Commingling  
Dugan Production Corp.  
April Surprise #4 Well  
Unit L, Sec. 19, T-24-N, R-9-W  
San Juan County, New Mexico  
Case No. 7790 Exhibit No. 6

K-E 20 YEARS BY MONTHS X 3 LOG CYCLES  
KEUFFEL & ESSER CO. MADE IN U.S.A.

47 6840



Application for Downhole Commingling  
 Dugan Production Corp.  
 April Surprise #4 Well  
 Unit L, Sec. 19, T-24-N, R-9-W  
 San Juan County, New Mexico  
 Case No. 1790 Exhibit No. 7

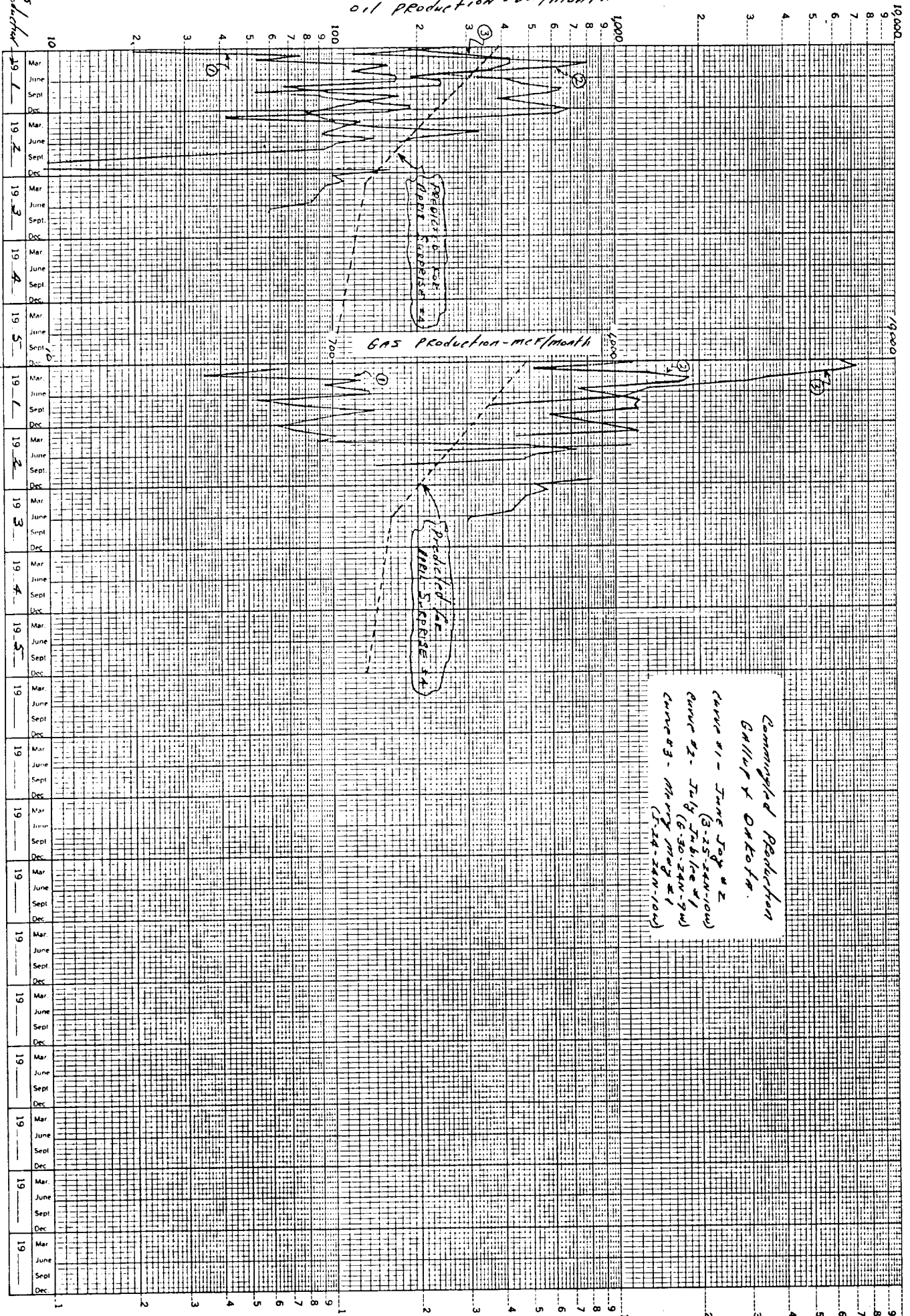
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 APR 5 - 1963  
 OIL CON. DIV.  
 DIST. 3

K-E 20 YEARS BY MONTHS X 3 LOG CYCLES  
 KEUFFEL & ESSER CO. MADE IN U.S.A.

47 6840

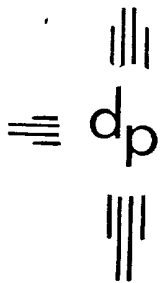
years  
 on production

oil production - bbl/month



Commingled Production  
 Gallery & Dakota  
 Curve #1 - June 1961 to June 1962  
 (3-25-24N-10W)  
 Curve #2 - July 1962 to June 1964  
 (8-30-24N-9W)  
 Curve #3 - May 1964 to June 1965  
 (8-14-24N-10W)

Dugan Production Corp



# dugan production corp.

DUGAN PRODUCTION CORP.  
Big Eight #1E  
890' FSL - 1850' FEL  
Sec 8 T24N R9W  
San Juan County, NM

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## MORNING REPORT

- 3-9-82 183' W.O.C. 3/4° at 183'  
MI & RU Four Corners Drilling Co. Rig #3. Spudded 12 1/4" hole at  
2:00 p.m. 3-8-82. Drilled to 183'. Ran 4 jts. 9-5/8" O.D.,  
8 Rd, ST&C "B" condition csg. T.E. 159' set at 171' RKB  
(Permanent datum: G.L. to RKB = 12')  
  
Cemented with 115 sx class "B" plus 2% CaCl. (Total slurry  
136 cu.ft.) P.O.B. at 7:15 p.m. 3-8-82. Circ. approx. 2 bbls.  
cement.  
  
7-1/2 hrs - MI & RU  
1/2 hr - drill rat & mouse holes  
3-1/4 hrs - drilling 12 1/4" surface hole  
1 hr - circ. and drop Totco  
1 hr - run csg.  
1/2 hr - cement  
10-1/4 hrs - W.O.C.
- 3-10-82 2131' - Drlg. with water 3/4° at 680'; 3/4° at 1190', 1° at 1694';  
1-3/4° at 2027'  
  
2 hrs - trip  
16-1/2 hrs - drlg.  
1/4 hr - rig service  
3/4 hrs - survey  
1-3/4 hrs - W.O.C.  
2-1/4 hrs - repairs  
1/2 hr - wash to btm.
- 3-11-82 3222' - Drlg. with water 1-3/4° 2520'; 1° at 3012'  
  
3-1/4 hrs - trip  
20 hrs - drlg.  
1/2 hr - rig service  
1/4 hr - survey

DUGAN PRODUCTION CORP.  
Big Eight #1E  
Page 2

3-12-82 4024' - Drlg. w/ wtr. 1° at 3535'  
3-1/4 hrs - tri½  
19-1/2 hrs - Drlg.  
1/2 hr - rig service  
1/4 hr - survey  
1/2 hr - wash to btm.

3-13-82 4648' - Trip Wtr. 1½° at 4180'  
1-1/4 hrs - trip  
22-1/4 hrs - drlg.  
1/4 hr - rig service  
1/4 hr - survey

3-14-82 5180' - Drlg. with water 1¼° at 4947'  
4-1/2 hrs - trip  
18-1/2 hrs - drlg.  
1/4 hr - rig service  
1/4 hr - survey  
1/2 hr - wash to btm.

3-15-82 5660' - Drlg. with water 1¼° at 5448'  
23 hrs - drlg.  
1/2 hr - rig service  
1/2 hr - survey

3-16-82 6143' - Drlg. Wt. 9.1 Vis 38 1½° at 5936'  
22-1/2 hrs - Drlg.  
1/2 hr - rig service  
1/2 hr - survey  
1/2 hr - repair

3-17-82 6347' - Drlg. Wt. 9.4 Vis 58 1-3/4° at 6283'  
6-1/4 hrs. trip  
16 hrs - drlg.  
1/4 hr - rig service  
1/4 hr - survey  
1/2 hr - rig repair  
3/4 hr - ream 45'

3-18-82 TD 6380' - Attempting to run logs. Have made two attempts.  
Unable to get below 1430'.



3-19-82 T.D. 6380' - Runnings Logs Wt. 9.4 Vis 100

12 hrs - trip  
3-3/4 hrs - trying to log  
4-3/4 hrs - circ.  
3-1/2 hrs - logging

3-20-82 T.D. 6443' Wt. 9.4 Vis 100

Ran 4 1/2" casing cement first stage. POB 4:15 a.m. Open  
D.V. Tool. Circulating between stages.  
4-1/2 hrs - logging well  
3 hrs - trips  
3-1/4 hrs - drlg.  
1/2 hr - wash to bottom  
1 hr - circ. hole  
4 hrs - lay down D.P.  
3-1/2 hrs - run csg.  
1-3/4 hrs - circ. csg.  
3/4 hr - cement  
1-3/4 hrs - open D.V. tool and circulate between stages.

3-21-82 Ran 50 jts. 4 1/2" O.D., 11.6#, J-55, 8 Rd, LT&C csg. (2023.72')  
plus 111 jts. 4 1/2" O.D., 10.5# (4432.89'). T.E. 6456.61'  
set at 6443' RKB. Circulate with mud pumps for 45 min.  
Prelushed hole with 10 bbls. mud flush.

Cemented 1st stage with 250 sx class "B" with 4% gel + 1/4# flocele per sk followed by 150 sx class "B" neat. Total slurry 565 cu.ft. Had good mud returns and reciprocated pipe while cementing. Bumped plug with 1800 psi. Held OK. P.O.B. at 4:10 a.m. Opened D.V. tool with 1300 psi. Circulate 3 hrs. with mud pumps.

Cemented 2nd stage with 10 bbls. mud flush, 475 sx 65-35 with 12% gel + 1/4# flocele per sk followed by 100 sx class "B" + 1/4# flocele per sk. Total slurry 1400 cu.ft. Had good mud returns and circulated small amount of cement to surface. Bumped plug with 2500 psi. Held OK. P.O.B. at 8:10 a.m. Set slips, cut off casing. Rig released at 9:30 a.m. 3-20-82.

6-15-82 MI & RU MTK rig #2. Set drlg. equip. - N.U. B.O.P. start picking up tubing.

6-16-82 Finish picking up tubing to D.V. tool - Had to cull over 100 joints drlg. D.V. tool. Circulate clean.

6-17-82 Go in hole to 6340'. Drlg. out cement & junk to ± 6412'. Circulate clean - P.O.H.

100-1000  
- 1000  
OILFIELD DIV.  
DIST. 9

- 6-18-82 RU Geosource. Ran GR - CCL from P.B. T.D. 6411-6000', 5500-5000'. Had 2 perforating runs misfire, perforated 6375-87' (12 holes) out of zone wrong gun fired on dual fire run - perforated 6288-94' (6 holes) in zone. G.I.H. with Baker model "R" packer. Swab tbg. down to 600'-700'.  
*error 6388-94*
- 6-19-82 Fluid level 1400-1500'. Swab down wait 30 min. - no fluid entry - wait 30 min. - no fluid entry - no show of gas - P.O.H. - Shut in.
- 6-21-82 RU Geosource. Set Baker 4½" cast iron bridge plug at 6360'. Dump 30' cement on top of bridge plug. Perforate Dakota formation 6288-6300' (12 holes) 1 hole per ft. Ran Baker 4½" model "R" packer. Set at 6185' RKB with seating nipple at 6179'. Swab tbg. down - wait 30 min - no fluid entry - no show of gas.
- 6-22-82 Tbg. pressure est. 100 psi. Blew down - made + 200' fluid over night. Swab down - small show of condensate. Wait 30 min. - no fluid entry. Well showing gas most of time. Rig up Western Co. Pressure up annulas to 1000 psi. Break Dakota perfs with water @ 3000 psi. Acidize with 250 gal. 15% HCL flush to perfs with water. Had 100 psi pressure break when acid hit formation. I.S.D.P. 1750 psi. Swab tbg; packer not holding - swabbed down to 2800'. No show of gas.
- 6-23-82 Fluid level 2100' (made 700' fluid over night). Good pres. on tbg. & csg. Lowered fluid level to 3000' - csg. 220 psi. P.O.H. with packer G.I.H. with tubing. T.E. 6297.02' land at 6305 RKB. N.D. B.O.P. NU well head. Rig down MTK, move to Slick Horn Gulch #2. (Tubing: 2-3/8", 4.7#, 8R, EUE)
- 7-3-82 SITP - 540 psig SICP 1230 psig
- 7-12-82 Tubing - 1145 psi Casing 1425 psi  
Opened well up. Did not unload. Rig up MTK Rig #2. T.O.H. with tubing. Wait on Western to repair frac head. Shut down.
- 7-13-82 Fraced Dakota perfs 6288-6300 as follows:
- 5,000 gal Mini-Max III-20 pad
  - 3,000 gal Mini Max III-20 + 1# per gal 20-40 sand
  - 3,000 gal Mini Max III-20 + 2# per gal 20-40 sand
  - 3,000 gal Mini Max III-20 + 3# per gal 20-40 sand
  - 4,199 gal slick water flush
- ISDP 2450 psi 15 min shut in 1900 psi  
Max treating pressure 3700 psi  
Min treating pressure 3400 psi  
Ave treating pressure 3500 psi at 27 bbl/min.

Continued

7-13-82 Totals: 14,000 gal slick water  
(Cont.) 42# FR-2  
16 gal Aquaflo

Left well shut in 4 hrs.

Perforated Gallup Formation as follows: 5196-5202 (6 holes), 5268-75 (7 Holes), 5278-86 (8 holes), 5302-14 (12 holes). Total 33 holes.

Fraced Gallup Formation as follows:

Spearhead 500 gals 15% HCL  
7,500 gal slickwater pad  
15,000 gal slickwater + 1# per gal 20-40 sand  
40,000 gal slickwater + 1½# per gal 20-40 sand  
3,470 gal slickwater flush

Initial breakdown 1500 psi  
ISDP 600 psi 15 min shut in 400 psi  
Max treating pressure 2000 psi  
Min treating pressure 1200 psi  
Ave treating pressure 1500 psi at 39 bbl/min.

Dropped 20 RCN ball sealers. Had good ball action

Totals: 75,000# 20-40 sand  
65,970 gal slickwater  
208# FR-2  
64 gal Aquaflo  
500 gal 15% HCL  
20 RCN ball sealers

Shut well in.

- 7-14-82 Opened well up - no pressure. Went in hole w/ tbg. Tagged sand at 5316' RKB, just below Gallup perfs. Rig up Western Co. Circulate out sand bridges to 6000' and solid sand to 6120' Pull 16 stands. Shut in.
- 7-15-82 Well dead. P.O.H. G.I.H. w/ Baker Depec sand bailer. Hit sand bridge at 5256'. Cleaned out to 160' sand. G.I.H. to 5820'. Bailer not working. P.O.H. Lost all sand. Shut in.
- 7-16-82 T.I.H. w/ Depec bailer. Tag 60' sand bridge at 5316'. Cleaned out sand to 6245'. Bailer quit. T.I.H. Dump sand out of 380' tbg. T,I,H, w/ bailer. Clean out sand to 6342'. T.O.H. Dump sand out of bailer. Start in hole w/ tubing. Shut down. Lightning storm.
- 7-17-82 Tbg. had some pressure Blew down. Finish T.I.H. No sand fill up. Landed tubing as follows: 201 jts. 2-3/8" O.D., 4.7#, J-55, 3 Rd, EUE tubing. T.E. 6266.27' set at 6275' RKB. Nipple down BOP. Nipple up well head. Rig down MTK. Move to Slickhorn Gulch #2. Rig up Hinson swabbing service. Swab well. Tbg. & csg. pressure zero at start of day. F.L. 600'. Made 14 swab runs pulling 2500-3000' fluid per run at end of day. Fluid level 1800'. C.P. 90 psi.

DUGAN PRODUCTION CORP.

Big Eight #1E

Page 6

7-18-82 Shut down - Sunday

7-19-82 Casing pressure 475 psi; tubing pressure 360 psi; fluid level at 800' at start of day. Made 23 swab runs. Fluid level at 2000' at end of day. Casing pressure 550 psi. Well gassing. No show of oil.

7-20-82 Casing Pressure 675 psi. Fluid level at beginning of day 1260'. Made 19 swab runs to pit and 3 runs to tank. Tank gauge 1'2" (1" oil). Casing pressure 725 psi. Fluid level at 2600' at end of day.

7-21-82 Casing pressure 850 psi. Fluid level at 1500' at start of day. Swabbed 1 run to tank and 7 runs to pit. Unloaded 25 min. Swabbing off bottom. Made 12 runs to tank. Blew 5 min. after each run. Casing pressure 525 psi and fluid level at 2000' at end of day. Tank gauge 6'11"; drained 3'11"; 10" water-cut oil in tank.

7-22-82 Casing pressure 825 psi. Fluid level 1800'. Made 1 run to tank and 5 runs to pit. Flowed to tank 30 min. Made 3 runs to tank. Casing pressure 525 psi. Fluid level 3000'\* 5' in tank (did not drain water). Rig broke down. Moved to town for repairs.  
\*at end of day.

7-23-82 Tubing pressure 790 psi Casing pressure 1050 psi Shut in.

7-30-82 Moved in Hinson swabbing unit. Tubing open to tank. Csg. pr. 1325 psi. 1325 psi. Made one run to tank, 8 runs to pit. Well unloaded and flowed 30 min. Csg. pr. down to 590 psi. Logged off.

7-31-82 Casing pressure 1020 psi. Fluid level at start of day 1850'. Swabbed 1 run to tank, 8 runs to pit. Well blew for 3/4 hr. Made 9 runs to tank. Blew 5 min. Casing pressure at end of day 610 psi and fluid level at 2500'.

8-2-82 Csg. pressure 1100 psi. Tbg. pressure TSTM. Fluid level at start of day 1800'. Made 1 swab run to tank, 6 swab runs to pit. Est. 50 bbls. 100% water. 14 runs to tank - total of 62 bbls, 14 bbls oil & 48 bbls water. Well kicked off and flowed 35 minutes and died after making 6 swab runs to pit. Casing pressure at end of day 540 psi.

8-4-82 SCP  $\pm$ 1025 psi; Fluid level at 2000'. Made 1 swab run to tank then 4 runs to pit. Kicked well off to tank. FCP 600 psi. Made 1'1" of fluid. Rig down Hinson Service Co.

