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# dugan production

Application for Downhole Commingling  
Jerome P. McHugh  
Wright Way #1 Well  
T-24-N, R-2-W, NMPM  
Sec. 2: Unit Letter C  
950' FNL & 1680' FWL  
Rio Arriba Co., New Mexico  
Case No. 7968 Exhibit No C5

JEROME P. McHUGH  
Wright Way #1  
950' FNL - 1680' FWL  
Sec. 2 T24N R2W  
Rio Arriba County, NM

## MORNING REPORT

5-25-83 253' - W.O.C.  
MI & RU Four Corners Drilling Co. Rig #10. Spudded 12 $\frac{1}{4}$ " hole  
at 1:00 p.m. 5-24-83. Drilled to 253'. Ran 5 jts. 9-5/8"  
O.D., 47 #, 8 Rd, LT&C casing. T.E. 233' set at 245' RKB.  
Cemented with 125 sx class "B" plus 2% CaCl<sub>2</sub>. (Total slurry  
147.5 cf). P.O.B. at 7:30 p.m. 5-24-83. Good cement circulated.  
 $\frac{1}{4}^{\circ}$  at 100'; 0° at 215'.

6 hrs - MI & RU  
1 hr - Drill rat & mouse holes  
3-3/4 hrs - drilling 12 $\frac{1}{4}$ " hole  
1/4 hr - circ.  
1/4 hr - trip  
1-1/4 hrs - run casing  
1/2 hr - cement casing  
10-1/2 hrs - W.O.C.  
1/2 hr - survey

5-26-83 2560' - Drilling Wt. 8.7 Vis 28 W.L. 10.0.  
1° at 746'; 1 $\frac{1}{4}^{\circ}$  at 1240'; 2 $\frac{1}{4}^{\circ}$  at 1601'; 2 $\frac{1}{4}^{\circ}$  at 1737'; \*2° at  
1979'; 1 $\frac{1}{2}^{\circ}$  at 2104'; 2° at 2230'; 2 $\frac{1}{2}^{\circ}$  at 2354'; 2-3/4° at  
2478' \*2° at 1854'

1 hr - trip  
18 hrs - drilling  
1/2 hr - rig service  
2-3/4 hrs - survey  
1-1/2 hrs - W.O.C.  
1/4 hr - wash to bottom

(Pressure tested casing and B.O.P. to 800 psi for 30 minutes  
before drilling out. Held OK.)

- 5-27-83      3421' - Mixing mud (lost 65 bbls. at 3421')  
Wt. 8.8      Vis 28      W.L. 10.0  
2¼° at 2612'; 2° at 2742'; 1½° at 2866'; 1-3/4° at 2988';  
1½° at 3097'; 1½° at 3202'; 1½° at 3345'.  
  
5 hrs - trip  
15-1/2 hrs - drilling  
1/2 hrs - rig service  
1-3/4 hrs - surveys  
1 hr - wash to bottom  
1/4 hr - mixing mud and L.C.M.
- 5-28-83      3955' Drilling      Wt. 8.8      Vis 28      W.L. 11.6  
2½° 3570'; 1½° at 3818'; 1° at 3918'  
  
4 hrs - trip  
17 hrs - drilling  
3/4 hr - rig service  
3/4 hr - surveys  
1½ hrs - lost circ. at 3625' (150 bbls.)
- 5-29-83      4515' - Drilling      Wt. 8.9      Vis 28      W.L. 11.0      2¼°  
2¼° at 4161'; 2½° at 4259'; 2° at 4348'; 2½° at 4443'  
  
22-1/4 hrs - drilling  
1/4 hr - rig service  
1-1/2 hrs - surveys
- 5-30-83      4978' - mixing mud      Wt. 8.9      Vis 28      W.L. 11.5  
3¼° at 4536'; 2¼° at 4566'; 1½° at 4679'; 1° at 4955'  
  
1 hr - trip  
20-3/4 hrs - drilling  
1 hr - survey  
1 hr - lost circ.  
1/4 hr - rig service
- 5-31-83      4978' - Pulling out of hole to pick up drill collars and bumper  
sub. Regained circulation and started T.O.H. for new bit.  
Stuck pipe while making trip. Unable to work free. Ran free  
point and backed off drill pipe.  
  
1/2 hr - mixing mud and lost circ. material  
3-3/4 hrs - trip  
14-3/4 hrs - work stuck pipe  
2-1/2 hrs - run free point and backed off  
2-1/2 hrs - circ. after backing off.

6-1-83      5009' - Drilling      Wt. 9.0      Vis 50      W.L. 10.0  
             8 hrs - trip  
             1-3/4 hrs - drilling  
             1 hr - pick up fishing tools  
             1-3/4 hrs - repairs  
             1-1/4 hrs - circ. top of fish  
             1 hr - cut drilling line  
             7-1/4 hrs - wash 2348-3311'  
             1-1/4 hrs - wash 160'  
             3/4 hr - jar down on fish

6-2-83      5590' - Drilling      Wt. 9.0      Vis 46      W.L. 10.5      1 1/4° 5514'  
             22-1/2 hrs - drilling  
             1/2 hr - rig service  
             1 hr - survey

6-3-83      6020' - Drilling      Wt. 9.0      Vis 46      W.L. 11.0      12% LCM  
             20-3/4 hrs - drilling  
             1/2 hr - rig service  
             2-3/4 hrs - mixing mud and L.C.M. (lost 200 bbls. at 5710')

6-4-83      6400' - Drilling      Wt. 9.0      Vis 38      W.L. 11.0      3% LCM  
             1 1/4 degree @ 6010'.  
             23 hrs - drilling  
             1/4 hr - rig service  
             3/4 hr - survey

6-5-83      6798' - Drilling (398'/23 1/4 hrs.).      Wt. 9.1#      Vis 38      W.L. 10.5  
             1/4 degree @ 6510'  
             23-1/4 hrs - drilling  
             1/2 hr - rig service  
             1/4 hr - survey  
  
             No mud log shows last 24 hours, and no mud loss. Sample top of  
             Mancos - 5925'.

6-6-83      7102' - Drilling      Wt. 9.0      Vis 38      W.L. 10.0  
             3/4 degree @ 6887'.  
             4-1/2 hrs - trip  
             18-3/4 hrs - drilling  
             1/2 hr - rig service  
             1/4 hr - survey  
             1/4 hr - wash to bottom

6-7-83      7332' - Drilling      Wt. 9.1      Vis 38      W.L. 10.0      Trace LCM  
1¼ degree @ 7196'.  
4-1/2 hrs - trip  
17 hrs - drilling  
1/4 hr - rig service  
1/4 hr - survey  
1/4 hr - wash to bottom  
1-3/4 hrs - mix mud & LCM (lost 200 Bbls @ 7233')

6-8-83      7535' - Trip.      Wt. 9.0      Vis 40      W.L. 10.0      5% LCM  
1/4 degree @ 7535'.  
11 hrs - trip  
10-3/4 hrs - drilling  
1/2 hr - rig service  
1/4 hr - survey  
1/2 hr - mix mud & LCM (lost 100 Bbls @ 7525')  
1 hr - cut drilling line

6-9-83      7787' - Drilling.      Wt. 9.1      Vis 38      W.L. 10.8      4% LCM  
3 hrs - trip  
20 hrs - drilling  
1/4 hr - rig service  
1/2 hr - cut drilling line  
1/4 hr - wash to bottom

6-10-83      8011' - Drilling.      Wt. 9.2      Vis 60      W.L. 10.0      3% LCM  
23-1/2 hrs - drilling  
1/2 hr - rig service

6-11-83      8185' - Short trip. Prep to log.      Wt. 9.1      Vis 65  
W.L. 9.6      3% L.C.M.      1½° at 8071'  
6-1/2 hrs - trip  
15 hrs - drilling  
1/4 hr - rig service  
2 hrs - repairs  
1/4 hr - short trip

6-12-83      T.D. 8185' - Laying down drill pipe      1½° at 8185'  
6-1/4 hrs - trip  
1/4 hr - rig service  
3-3/4 hrs - circ.  
7-1/2 hrs - logging (Ran IES & CDL CNL logs by Welex)  
3/4 hr - cut drilling line  
5-1/2 hrs - laying down drill pipe

- 6-13-83 Finished laying down drill pipe. Rigged up and ran 4½" casing. Unable to gain circulation when getting casing run. Cemented first and 2nd stages without returns. Unable to close bottom stage tool. Prep. to open top stage tool and cement 3rd stage. Detailed casing information will follow on 6-14-83 report.
- 6-14-83 Ran 210 jts. 4½" O.D., N-80, 11.6#, LT&C casing. T.E. 8196.65' set at 8182' RKB. Attempted to circulate before cementing. Unable to get circulation (hole standing full). Pulled 10 jts. casing and attempted to gain circulation with no success. Re-ran casing to bottom. Mixed pit of mud with viscosity of 45 and 20% L.C.M. Did not get circulation with 400 bbls. mud. Mixed pit of mud and cemented 1st stage with 10 bbls. mud flush followed by 370 sx 50-50 poz plus 2% gel & 6¼# Kolite per sk & ¼# cello flake per sk followed by 100 sx class "B" neat with ¼# cello flake per sk. (Total cement slurry 1st stage 636 cf). No mud returns while cementing. Maximum cementing pressure 800 psi. Bumped plug with 1500 psi. Float held OK. Dropped opening bomb. Opened Dowell stage tool at 5862' (Took 2000 psi to open tool.) Pumped away one pit of mud with no returns through stage tool. Mixed additional pit of mud - 45 vis with 17% L.C.M. Cemented 2nd stage with 10 bbls. mud flush followed by 275 sx 65-35 plus 12% gel and \*\* ¼# cello flake per sk followed by 310 sx 50-50 pso plus 2% gel and ¼# cello flake per sk. (Total cement slurry 2nd stage 1038 cf) No mud returns while cementing. Over displaced by 25 bbls. Plug did not bump. Dropped opening bomb. Opened stage tool at 3578'. Established circulation. Cemented 3rd stage with 10 bbls. mud flush followed by 500 sx 65-35 plus 12% gel & ¼# cello flake per sk followed by 110 sx 50-50 pos plus 2% gel and ¼# cello flake per sk (Total cement slurry 3rd stage 1245 cf). Good mud returns while mixing cement and cementing until last 11 bbls. of displacement. Lost partial returns last 11 bbls. Closed stage tool with 2500 psi. Held OK. Job complete at 8:45 a.m. 6-13-83. Set 4½" casing slips. Cut off casing and released rig at 10:45 a.m. 6-13-83.
- [\*\*6¼# Kolite per sk and]

#### DAILY REPORT

- 6-20-83 MI & RU Farmington Well Service Rig. Picked up 2-3/8" tubing. T.I.H. and drilled top stage tool at 3578'. Circulated hole clean. S.D.O.N.
- 6-21-83 T.I.H. with tubing and bit to 3993'. Tagged bridge. Rigged up power swivel and cleaned out to 4123'. Returns consisted of lost circ. material - no cement. T.I.H. to 5200'. Hit fill. Circulated hole clean. Pressure tested with rig pump to 2000 psi. Held OK. Rigged up swivel and drilled cement from 5200' to 5483'. Bit started bouncing and pipe torquing. P.O.H. to check bit. One cone loose. S.D.O.N.

- 6-22-83 Ran in with new 3-7/8" bit, sub and 2-3/8" tubing. Rigged up power swivel and drilled hard cement 5483-5862'. Had trouble drilling 5550-82', and had metal cuttings in returns (think drilling on junk from 3rd stage DV tool). Drilled DV tool at 5862' in 30 minutes with all of the weight of the tubing on the bit. Pressure tested 4 1/2" casing. Could pump in at 2 BPM and 800-1000 psi. Ran in with bit and tagged up at 7745'. Plugged bit. Worked to unplug bit and prepare to clean out. Shut down for night.
- 6-23-83 Drilled cedar fiber 7737-7833' and junk at 7833' (closing plug and opening bomb?). Drilled hard cement 7833 to float at 8142' (8137' tubing measurement). Circulated hole clean and pulled out of hole with tubing and bit. Shut down for night.
- 6-24-83 Ran in with 3-7/8" bit, sub, Baker casing scraper and 2-3/8" tubing. Worked and rotated bit and scraper through D.V. tool at 5862'. (5859' tubing measurement). Ran in to 8140'. Pulled out with tubing, bit and scraper. Ran in with Baker retrievematic packer and mechanical collar locator on 2-3/8" tubing. Set packer at 5860' (set packer in D.V. closing sleeve.). Pressured back side several times with tubing weight set on packer. D.V. tool would not close. Released packer and reset at 5875'. Pressured tubing to 2000 psi. Held OK. Pulled and reset packer at 5529'. Cement squeezed D.V. tool at 5862' with 100 sx class B and displaced with 22 bbl. water at 2 BPM and 750 psi. Shut down and attempted to squeeze as follows:
- Wait 10 min. Pump 1/4 bbl. & press. to 1100#; bled to 800#.
  - Wait 10 min. Pump 1/4 bbl. & press. to 850#.
  - Wait 10 min. Pump 1/4 bbl. & press. to 1100#; bled to 700#
  - Wait 10 min. Pump 1/4 bbl. & press. to 800#.
  - Wait 10 min. Pump 1/4 bbl. & press. to 1000#.
  - Wait 15 min. Pump 1/8 bbl. & press. to 1500#.
  - Wait 15 min. & bleed back. Hole not taking fluid. Did not flow back. Cement top 5674'. Reverse circ. with 40 bbls. water. Pulled 5 stands. Pressured tubing to 1500#. Pressured casing to 1000#.
- Shut in for night.
- 6-25-83 T.O.H. with 2-3/8" tubing, collar locator and packer.  
T.I.H. with 3-7/8" bit, sub and 2-3/8" tubing. Tagged cement at 5646'. Rigged up power swivel. Drilled soft cement 5726-80'. 2-3 pts to drill, 10-15 min./jt. Circ. hole clean. Shut in for cement to set.
- 6-26-83 Shut down.

- 6-27-83 Drilling 5726-5860' - Medium hard cement, 20-25 min./jt. Circ. hole clean. Pressure tested to 2000#. Held OK. T.I.H. to ETD with bit, sub and 2-3/8" tubing. Circ. hole. Rigged up Western Co. and pressure tested casing to 4000#. Held OK. Shut in for night.
- 6-28-83 Spotted 250 gal. double inhibited 15% HCL at 8125'. T.O.H. with 2-3/8" tubing, sub and 3-7/8" bit. Rigged up Basin Perforators. Recorded Gamma Ray-Collar log over intervals 8153-7700', 7100-6700', 5850-5050', 3500-3250'. Had 3.771" O.D. gauge ring on logging tool.

OK Perforated density log intervals with 1 jet shot at 7865, 71, 81, 96; 7907, 10, 15, 33, 66, 97; 8053; 8111, 15, 23, 31, 37, 39, 41 select fire and 7979, 81, 84, 88, 91 & 94 dual fire. \*\*Broke down interval 7865-8141' with fresh water and established rate - 10 BPM at 1700#. ISIP - 900#. Dropped 36 7/8" balls. Had good ball action with complete ball off. Pumped 145 bbls. water. Ran junk basket and recovered 36 balls with 25 hits indicated. Shut in for night. [\*\*24 holes]

- 6-29-83 Frac Dakota perfs 7865-8141' with 40,000 gal. 30# gel and 55,000# 20-40 sand with 2% diesel. Ave. injection rate 35 BPM at 2600#. ISIP 1600#; 15 min. 1300#.

10,000 gal. Mini Max 3-30 pad with 2% diesel  
10,000 gal. Mini Max 3-30 with 2% diesel and 1# 20-40 sand  
10,000 gal. Mini Max 3-30 with 2% diesel and 2# 20-40 sand  
10,000 gal. Mini Max 3-30 with 2% diesel and 2½# 20-40 sand  
5134 gal. flush.

T.I.H. with retrievable bridge plug on wireline and set at 7600'. Pressure tested to 4000#. Held OK. Poured 1 sk sand down casing and waited 1 hr for sand to fall.

GA 36 holes Perforated density log interval 6873, 84, 86, 98; 6915, 26, 29, 42, 49, 54, 57, 63, 89; 7006, 13, 41, 48, 54, 61 & 72 select fire. Perf 6855, 59, 63, 66; 7020, 23, 27, 29 dual fire. Perf 6760, 69, 99; 6805, 11, 26, 39 & 49 select fire.

Broke down perfs 6760-7072 with fresh water and pumped in at 39 BPM & 3600#. ISIP 400#. Resumed pumping and dropped 54 balls (1 ball/½ bbl.) at 50 BPM at 3200#. Good ball action. Balled off. Ran junk basket. Recovered 20 balls.

Continued

6-29-83      Fraced Gallup Perfs 6760-7072 with 60,000 gal. slick water and  
(cont.)      82,500# 20-40 sand. Average injection rate = 48 BPM at 2700#.  
Flush, 15 BPM at 2900#. ISIP = 600 psi.

15,000 gal. slick water pad with 40# AquaSeal/1000 gal.  
15,000 gal. slick water w/ 20# AquaSeal/1000 gal. & 1#  
20/40 sand  
15,000 gal. slick water w/ 10# Aqua Seal/1000 gal. & 2#  
20/40 sand  
15,000 gal. slick water w/ 10# Aqua Seal/1000 gal. & 2½#  
20/40 sand  
4,400 gal. slick water - flush

Shut in for night.

6-30-83      Ran in with bridge plug retrieving head on 2-3/8" tubing.  
Cleaned out sand 6884-7089' circulating with partial returns.  
Ran in to 7503' and cleaned out sand 7503-7586' with partial  
returns. Lost approx. 250 bbl. water. Released bridge plug and  
had flow of water for 30 minutes. Pulled out with 2-3/8"  
tubing and bridge plug. Shut down for night.

7-1-83      T.I.H. with sawtooth coupling, 1 jt. seating nipple & 2-3/8"  
tubing. Tagged sand at 8100'. Cleaned out sand to ETD and  
circulated well bore clean. Well attempting to flow water.  
Pumped in ±20 bbl. water and killed well. Pulled tubing to  
7996' and landed tubing, seating nipple at 7964'. Removed  
BOP and nipped up well head. Rig released. Shut in.

7-2-83      Shut down

7-3-83      Shut down

7-4-83      Shut down

7-5-83      Move in and Rig up Ponderosa Service Co. swabbing unit. Casing  
pressure 50 psi; tubing pressure 0. Swabbed well 8 hours.  
Fluid level at start of day 400' from surface. Swabbed an  
estimated 200 Bbls. of frac fluid. Casing pressure at end of  
day 25 psi. Fluid level 1800' at end of day.  
S.D.O.N.

7-6-83      Casing pressure 50 psi. Tubing pressure 0. Fluid level first  
run 600'. Made 32 swab runs. Swabbed an estimated 150 bbls. of  
frac fluid. Well gassing ahead of swab. Casing pressure at end  
of day 50 psi. Fluid level at 2200'.

- 7-7-83 Casing pressure 60 psi; tubing pressure 0.  
Fluid level first run 900'. Made 31 swab runs; swabbed an estimated 175 Bbls. of frac fluid. Very slight show of oil until last hour of swabbing. Oil increased to 5%. Casing pressure at end of day 25 psi. Slight show of gas ahead of swab.
- 7-8-83 Casing pressure 60 psi. Tubing pressure 0.  
Fluid level 1200' first run. Made 36 swab runs. Swabbed an estimated 180 Bbls of frac fluid. Very slight show of oil. (oil decreased from previous day). Fluid level at end of day 2600'. Casing pressure 40 psi.
- 7-9-83 Casing pressure 75 psi. Tubing pressure 0.  
*Tank set.  
1st row oil  
per gun*  
Fluid level 1200' first run. Swabbed an estimated 180 Bbls of frac fluid. No significant oil. Well gassed while pulling swab. Casing pressure 50 psi at end of day. Fluid level at end of day 2900'.
- 7-10-83 Shut Down.
- 7-11-83 Casing pressure 75 psi. Tubing pressure 0.  
Fluid level 2300' first run. Made 36 swab runs. Swabbed an estimated 190 bbls. frac fluid. Very slight show of oil and gas. Checked water resistivity of fluid; 1.6 Ohm-meters at 74°, indicates frac fluid. Fluid level at end of day 2500'. Casing pressure 80 psi.
- 7-12-83 Casing pressure 90; tubing pressure 0.  
Fluid level @ 2400'. Made 28 swab runs. Swabbed an estimated 140 Bbls. of frac fluid. Fluid level at end of day 2900'. Casing pressure 90 psi. Very slight show of gas; no oil.
- 7-13-83 Shut down.
- 7-14-83 Released swabbing unit.
- 8-10-83 M.I. & R.U. Shut down for night.
- 8-11-83 Run in with sand line and check seating nipple @ 8103'. Pulled tubing. Picked up and ran in with 4½" Baker Model "R" packer on 2-3/8" tubing. Set packer @ 7802'. Shut down for night.
- 8-12-83 Swabbed Dakota perms 7865-8141' for 6 hrs. making 13 swab runs. Had oil, gas, and water on 1st 3 runs, then water with gas. Swabbed fluid level from 1200' to 3300'. Recovered approximately 40 bbl. water and ½ bbl. oil.
- 8-13-83 SITP = 0. FL @ 2200'. Made 12 swab runs in 5½ hrs. recovering approximately 50 bbl. water with well gassing while swabbing. Had 200' of oil on 1st run. Fluid level swabbed down to 3300'. Pulled and reset packer @ 6732'. Shut down for unit repairs.  
 $R_w = 1.21$  ohm-meters at 100° F.
- 8-14-83 Shut down.

- 8-15-83 Swabbed 9 hrs., making 20 swab runs and recovering  $\pm$  3 bbl. oil and 100 bbl. water. Fluid level at start of day 2200' and at 4200' at end of day. Recovered approx. 3 bbl. oil on 1st run; then 100% water with gas. Shut in for night.
- 8-16-83 SITP = 50 psi. Checked fluid level at 3200'. Swabbed 7 hrs., recovering approx. 70 bbl. water with fluid level 3200-4000' and fluctuating between swab runs. Good blow of gas throughout day, with only a trace of oil in water. Pressure tested casing-tubing annulus to 3000 psi. Held OK. Shut down for night.
- 8-17-83 T.O.H. with 2-3/8" tubing and packer. T.I.H. with bull plug, seating nipple, 1 std, 12' perf subs on 2-3/8" tubing - 217 jts. Set packer at 7127'. Swabbed Gallup perfs 6760-7072' for 3½ hrs. Made 8 runs with fluid level 2000-3500'. Recovered approximately 40 bbl. water with slight amount of oil. Shut in for night.
- 8-18-83 SITP = SICP = 25 psi. Made 15 swab runs with fluid level standing at 3000' and recovered approximately 3 B0 & 75 BW. Oil cut 1-5% and started getting strong gas flow following each swab run on 9th swab run. Casing pressure incr. to 260 psi at end of day. Shut down for night.
- 8-19-83 Swabbed well six hours until 2:00 p.m. Casing pressure beginning of day 450 psi. Increased to 620 psi at 2:00 p.m. Swabbing to tank. Good show of oil and well gassing after each swab run. Made decision to land donut and nipple up X-mas tree and release pulling unit. Opened casing to tank. Well unloaded approx. 15 bbls. oil thru casing and died. Unseated model "R" packer. Packer appeared to unseat. While picking up on packer to install donut, packer became stuck. Worked packer one hour. Unable to unseat.
- 8-20-83 Worked packer three hours. Laid down two joints tubing. Tubing parted while working same. P.O.H. and found tubing parted at approx. 4000'. Shut down to get fishing tools to location.
- 8-21-83 Shut down - Sunday.
- 8-22-83 Trip in hole with overshot dressed with 2-3/8" grapple. Caught fish. Worked tubing 3 hrs. Unable to free packer. Backed off tubing manually. Pulled out of hole with 90 stands tubing. Laid down 21 jts. cork-screwed tubing. T.I.H. with tubing and screwed into fish. Rigged up and attempted to run swab mandrel. Unable to get below 5918' with 1-3/4" swab mandrel. S.D.O.N.