

BRIGHT AND COMPANY
S35-21N-2W

CUBA MESA 35-2
OFFSET WELL
SANDOVAL COUNTY
NEW MEXICO

P R O P O S A L L I S T I N G

by
Baker Hughes Inteq

Your ref : OFFSET TO CUBA MESA 35-1
Our ref : prop660
License :

Date printed : 16-Jul-93
Date created : 8-Jul-93
Last revised : 16-Jul-93

Field is centred on n36 15 0.000,w107 15 0
Structure is centred on n36 15 0.000,w107 15 0

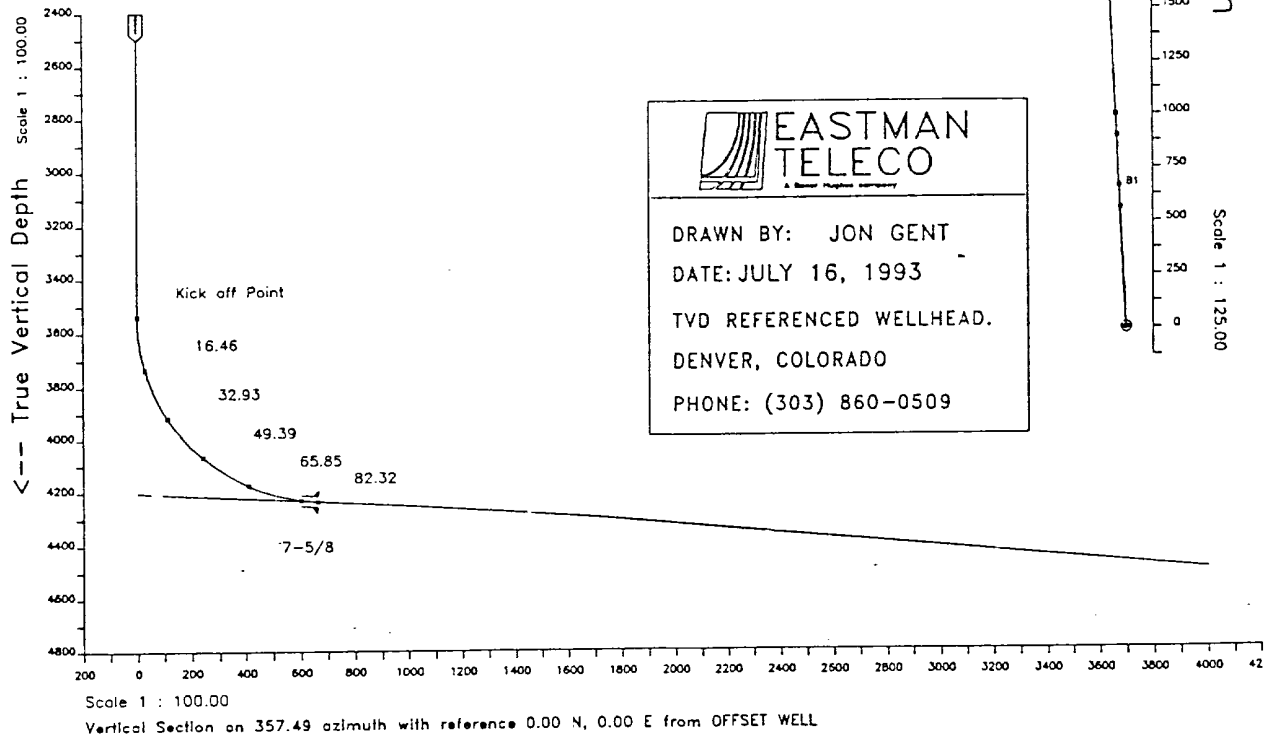
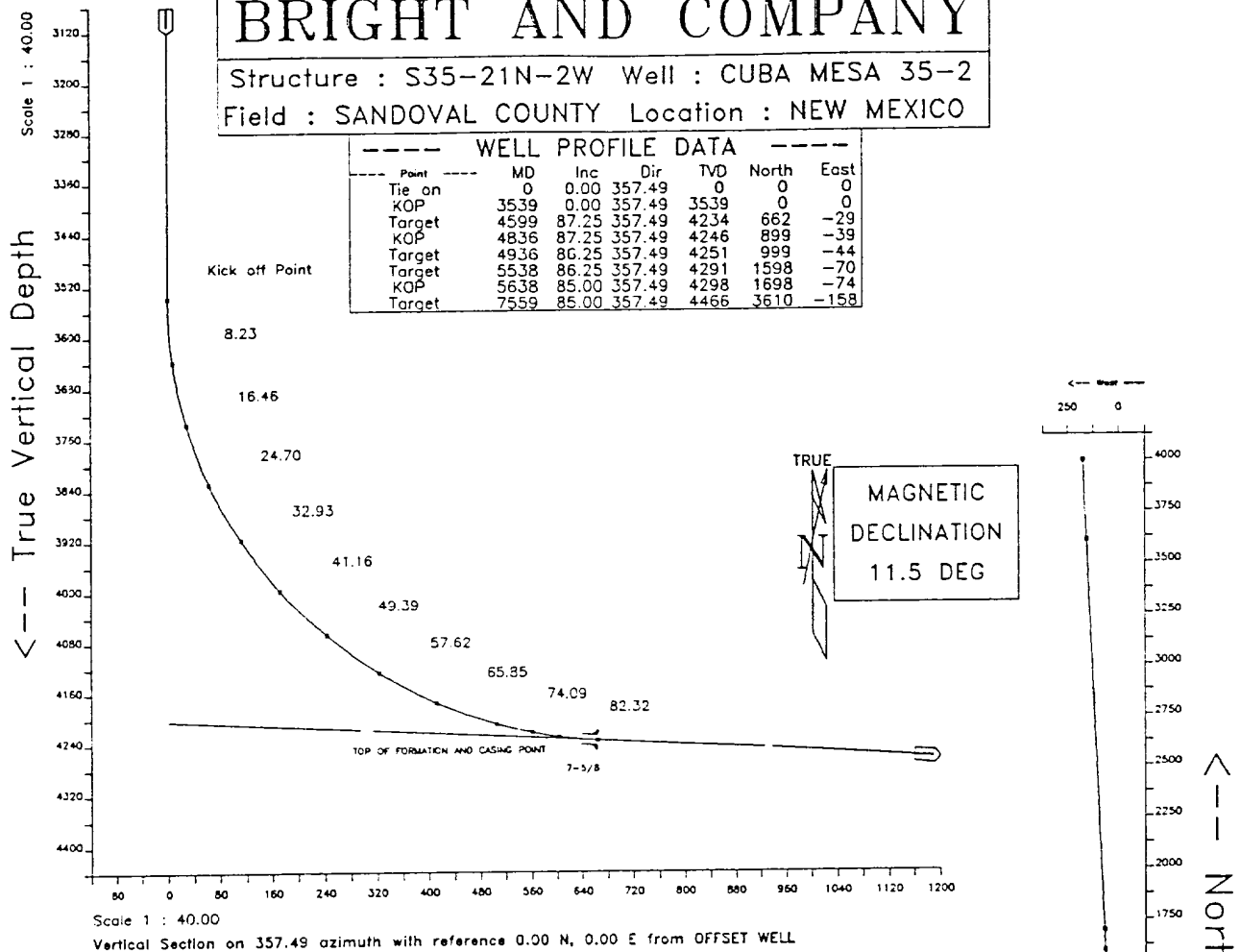
Slot location is n36 15 2.769,w107 15 2.198
Slot Grid coordinates are N 1912013.566, E 204965.239
Slot local coordinates are 280.00 N 180.00 W
Reference North is True North

BRIGHT AND COMPANY

Structure : S35-21N-2W Well : CUBA MESA 35-2
Field : SANDOVAL COUNTY Location : NEW MEXICO

WELL PROFILE DATA

Point	MD	Inc	Dir	TVD	North	East
Tie on	0	0.00	357.49	0	0	0
KOP	3539	0.00	357.49	3539	0	0
Target	4599	87.25	357.49	4234	662	-29
KOP	4836	87.25	357.49	4246	899	-39
Target	4936	86.25	357.49	4251	999	-44
Target	5538	86.25	357.49	4291	1598	-70
KOP	5638	85.00	357.49	4298	1698	-74
Target	7559	85.00	357.49	4466	3610	-158



BRIGHT AND COMPANY
S35-21N-2W, CUBA MESA 35-2
SANDOVAL COUNTY, NEW MEXICO

PROPOSAL LISTING Page 1
Your ref : OFFSET TO CUBA MESA 35-1
Last revised : 16-Jul-93

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S			Dogleg Deg/100Ft	Vert Sect
0.00	0.00	357.49	0.00	0.00 N	0.00 E	0.00	0.00	0.00
500.00	0.00	357.49	500.00	0.00 N	0.00 E	0.00	0.00	0.00
1000.00	0.00	357.49	1000.00	0.00 N	0.00 E	0.00	0.00	0.00
1500.00	0.00	357.49	1500.00	0.00 N	0.00 E	0.00	0.00	0.00
2000.00	0.00	357.49	2000.00	0.00 N	0.00 E	0.00	0.00	0.00
2500.00	0.00	357.49	2500.00	0.00 N	0.00 E	0.00	0.00	0.00
3000.00	0.00	357.49	3000.00	0.00 N	0.00 E	0.00	0.00	0.00
3500.00	0.00	357.49	3500.00	0.00 N	0.00 E	0.00	0.00	0.00
3539.00	0.00	357.49	3539.00	0.00 N	0.00 E	0.00	0.00	0.00
3639.00	8.23	357.49	3638.66	7.16 N	0.31 W	8.23	7.17	
3739.00	16.46	357.49	3736.26	28.51 N	1.25 W	8.23	28.54	
3839.00	24.70	357.49	3829.80	63.60 N	2.78 W	8.23	63.66	
3939.00	32.93	357.49	3917.34	111.70 N	4.89 W	8.23	111.81	
4039.00	41.16	357.49	3997.10	171.83 N	7.53 W	8.23	172.00	
4139.00	49.39	357.49	4067.40	242.75 N	10.63 W	8.23	242.99	
4239.00	57.62	357.49	4126.83	323.00 N	14.15 W	8.23	323.31	
4339.00	65.85	357.49	4174.14	410.92 N	18.00 W	8.23	411.31	
4439.00	74.09	357.49	4208.36	504.70 N	22.11 W	8.23	505.18	
4539.00	82.32	357.49	4228.78	602.41 N	26.39 W	8.23	602.99	
4598.92	87.25	357.49	4234.23	662.00 N	29.00 W	8.23	662.63	TOP OF FORMATION AND CASING POINT
4836.59	87.25	357.49	4245.63	899.17 N	39.39 W	0.00	900.03	
4861.67	87.00	357.49	4246.89	924.19 N	40.48 W	1.00	925.08	
4936.59	86.25	357.49	4251.30	998.92 N	43.76 W	1.00	999.87	
5000.00	86.25	357.49	4255.45	1062.13 N	46.53 W	0.00	1063.15	
5500.00	86.25	357.49	4288.15	1560.58 N	68.36 W	0.00	1562.08	
5538.04	86.25	357.49	4290.64	1598.50 N	70.02 W	0.00	1600.03	
5538.11	86.25	357.49	4290.64	1598.57 N	70.02 W	1.25	1600.11	
5638.04	85.00	357.49	4298.27	1698.11 N	74.38 W	1.25	1699.74	
6000.00	85.00	357.49	4329.81	2058.35 N	90.16 W	0.00	2060.32	
6500.00	85.00	357.49	4373.39	2555.97 N	111.96 W	0.00	2558.42	
7000.00	85.00	357.49	4416.97	3053.59 N	133.75 W	0.00	3056.52	
7500.00	85.00	357.49	4460.55	3551.21 N	155.55 W	0.00	3554.62	
7558.64	85.00	357.49	4465.66	3609.57 N	158.11 W	0.00	3613.03	

All data is in feet unless otherwise stated
Coordinates from OFFSET WELL and TVD from wellhead.
Vertical section is from wellhead on azimuth 357.49 degrees.
Declination is 11.45 degrees, Convergence is -0.59 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes Inteq

BRIGHT AND COMPANY
S35-21N-2W, CUBA MESA 35-2
SANDOVAL COUNTY, NEW MEXICO

PROPOSAL LISTING Page 2
Your ref : OFFSET TO CUBA MESA 35-1
Last revised : 16-Jul-93

Comments in wellpath
=====

MD	TVD	Rectangular Coords.	Comment
4598.92	4234.23	662.00 N 29.00 W	TOP OF FORMATION AND CASING POINT

Casing positions in string 'A'
=====

Top MD	Top TVD	Rectangular Coords.	Bot MD	Bot TVD	Rectangular Coords.	Casing
0.00	0.00	0.00N 0.00E	4598.30	4234.20	661.38N 28.97W	7-5/8"

Targets associated with this wellpath
=====

Target name	Position	T.V.D.	Local rectangular coords.	Date revised
B1	not specified	4234.23	662.00N 29.00W	8-Jul-93

All data is in feet unless otherwise stated
Coordinates from OFFSET WELL and TVD from wellhead.
Bottom hole distance is 3613.03 on azimuth 357.49 degrees from wellhead.
Vertical section is from wellhead on azimuth 357.49 degrees.
Declination is 11.45 degrees, Convergence is -0.59 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes Inteq

BRIGHT & COMPANY DRILLING PROGRAM

PAGE 1

DATE 7/19/93

WELL NAME Cuba Mesa Unit #35-2 TD 4466 TVD, 7559 MD

FIELD Rio Puerco COUNTY Sandoval STATE New Mexico

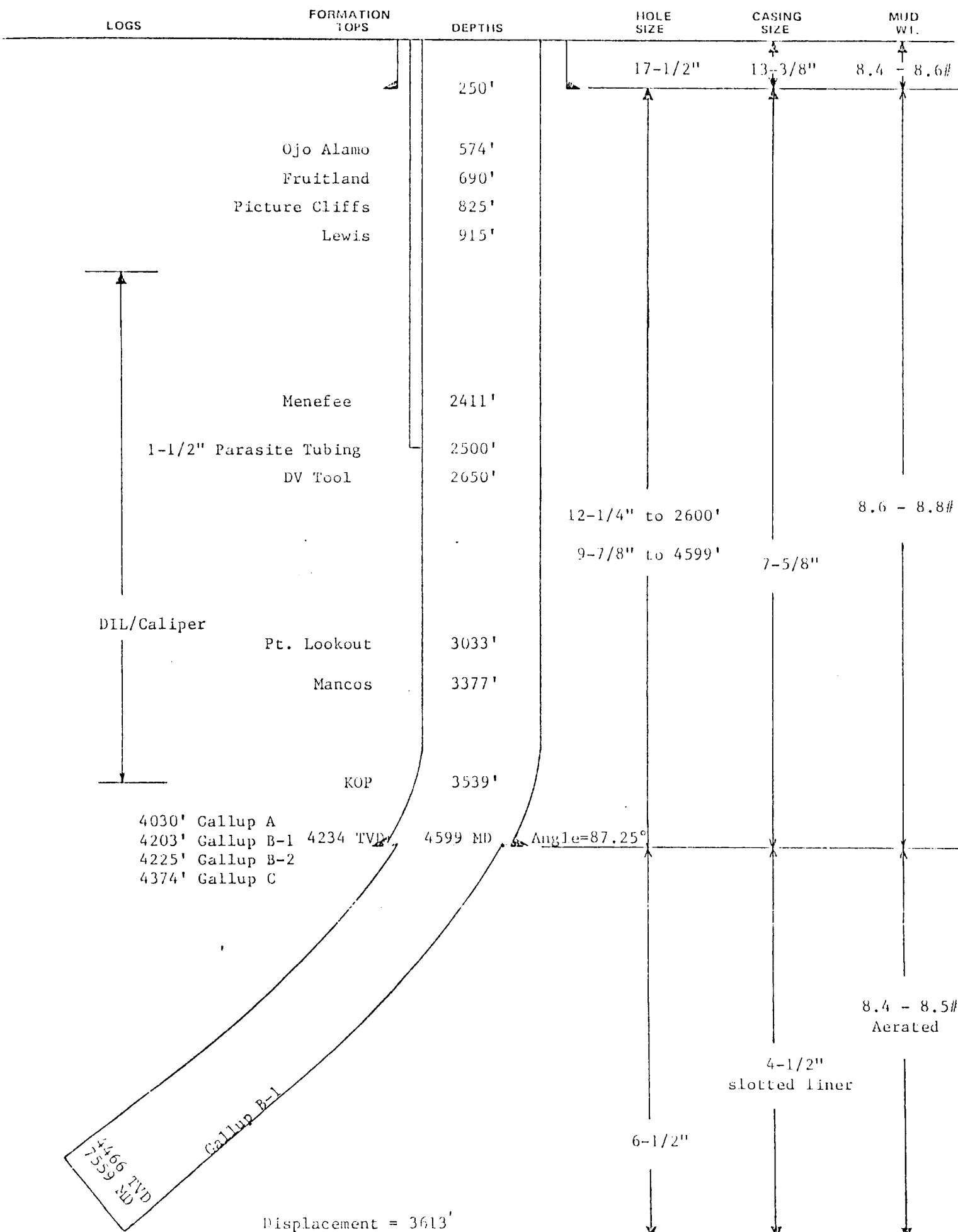
LOCATION 1010' FSL & 820' FWL of Section 35, T 21 N, R 2 W

BHL: 660' FNL & 660' FWL of Section 35.

OBJECTIVE ZONE(S) Gallup B-1 GR. ELEV. 7016'

GEOLOGICAL

MECHANICAL



BRIGHT & COMPANY
DRILLING PROGRAM

CASING and TUBING DESIGN

	SIZE	INTERVAL	LENGTH	WT.	GR.	CPLG.	DESIGN FACTORS		
							COL.	TENSION	BURST
URFACE.....	13-3/8"	0 - 250	250	48#	H-40	ST&C	6.85	26.8	3.63
ROTECTIVE.....	7-5/8"	0 - 3500	3500	26.4#	N-80	LT&C	1.81	4.08	3.43
		3500 - 4599	1099	26.4#	N-80	LT&C	1.66	--	4.99
Parasite Tbg	1-1/2"	0 - 2500	2500	2.76#	CW55	IJ10-Rd			
		Coupling OD = 2 1/2"							
INNER.....	4-1/2"	4100 - 7559	3459	11.6#	K-55	LT&C			
		2-3/4" holes per ft., 90°		phasing					
		Leave 3 ft. from each end		blank					
UBING.....	2-7/8"	0 - 3700	3700	6.5#	N-80	EUE			

CEMENT PROGRAM

	FT. of FILL	CEMENT TYPE	SACKS	EXCESS %	WEIGHT	YIELD
SURFACE.....	to surface	Class B + 3% CaCl ₂ + .25 lb/sk	320	100%	15.64	1.20
		Cello-Seal				
Protective Stage 1	300'	47 PPS Class B + 18.5 PPS Poz A	40	25%	11.50	2.23
		+ 5% salt + 18.5 PPS CSE + .25 PPS Cello-Seal				
	1000'	Class B + .25 PPS Cello-Seal	240	25%	15.63	1.18
Stage 2	2400'	47 PPS Class B + 18.5 PPS Poz A	650	25%	11.50	2.23
DV Tool at 2650'		+ 5% salt + 18.5 PPS CSE + .25 PPS Cello-Seal				
	250'	Class B + 2% CaCl ₂ + .25 PPS Cello-Seal	115	25%	15.63	1.18

FLOAT EQUIPMENT and CENTRALIZER PROGRAM

	TYPE and SPACING
SURFACE.....	13-3/8", ST&C Guide Shoe, 13-3/8" ST&C Insert Float Valve 1 jt. up. Cent. 5' above G.S., 5' above F.C. and then every other jt to surface (5 Cent.)
PROTECTIVE.....	7-5/8", LT&C Float Shoe; 7-5/8" LT&C Float Collar, 1 jt up; 7-5/8". DV Tool at 2650'. Slip-on type Cent. 5' above shoe, 5' above F.C., and on every jt to 3500'. Cent. on every other joint to 2700'.

WELLHEAD EQUIPMENT

SIZE AND WP..... Casinghead: 12" 3000# x 13-3/8" SOW. Tubinghead: 3000# x 7-1/16" 3000# x 7-5/8" 3000#

BRIGHT & COMPANY
DRILLING PROGRAM

MUD PROGRAM

DEPTH

INTERVAL	TYPE	WT.	VISC.	WATER LOSS	TREATMENT
0 - 250	Gel/Lime	8.4-8.6	28-45	NC	Use gel for viscosity and lime to settle drilled solids
250 - 4599 MD	Gel/Polymer	8.6-8.8	38-46	10-8	Add polymer to stabilize shales. Maintain the mud wt. as low as possible when drilling the Gallup.
4599 MD-7559 TVD	KCl/Polymer	8.4-8.5	29-32	NC	Aerate mud down parasite tubing. Pump polymer sweeps as needed. Monitor corrosion with coupons and adjust corrosion inhibitor as needed in mud and in injected air.

REMARKS:

GEOLOGICAL DATA

1. LOGGING:

DEPTH:

TYPE LOGS

- 3539' (KOP) DIL/Caliper
2. MUD LOGGER: Install at 3000'. Subsurface (303/292-1414)
3. SAMPLES: None
4. CORING: None
5. DST: None

ADDITIONAL INFO: Call morning reports to office by 8:30 AM (CST). Office phone 800/929-0336

On weekends and after 5PM (CST), call Mike Hunt at 800/929-2288

Jack Richards at 800/929-0675.

PROJECT ENGINEER

M. W. Hunt

G.W. Hunt

DATE

7/19/93

APPROVED

Cuba Mesa Unit No. 35-2
Rio Puerco Field
Sandoval County, New Mexico

Procedure

- 1) Move-in drilling rig. Install centrifuge and Dual Flo Line Cleaners.
- 2) Drill 17-1/2" hole to 250'. Run and cement 13-3/8" casing as per drilling program. Reciprocate casing while cementing.

Note: Notify BLM at 507/327-5344 when the well is spudded. Also, notify the BLM 48 Hrs prior to cementing casing.

- 3) Install casinghead on 13-3/8" casing, (13-5/8", 3000# x 13-3/8" SOW). Nipple-up 12", 3000# double ram BOP's (with pipe rams on bottom and blind rams on top).
- 4) Prior to drilling out of surface casing, test BOP's, choke manifold, inside BOP, kelly cock, stand pipe valve, and kill line to rated pressure. Install wear ring.

Note: 1) Have a full opening valve and inside BOP on the floor for each size of tubulars being used.
2) Record BOP test on IADC report form.

- 5) Test 13-3/8" casing to 1000# (rated at 1730 psi)
- 6) Drill a 12-1/4" hole to +/- 2600', using a pendulum stabilizer assembly and shock sub. At 2600', reduce hole size to 9-7/8". Take surveys at 500 ft intervals. On last bit run prior to KOP, run monel drill collar above bit.

Note: 1) On the Cuba Mesa Unit #35-1, loss circulation 3125' and 3798'.
2) Install mud logger at 3000' (Subsurface Inc.).
3) Prior to setting 7-5/8" casing, install the following:
- Skimmer System
- Super Choke
- Air Compressors from Northwestern Air Drilling Service Co. (rated at 800 SCFM)

- 7) At KOP (3539') run multi-shot survey from TD to surface casing.
- 8) Log with DIL/Caliper.

Note: The Gallup "B-1" target in the Cuba Mesa Unit #35-1 pilot hole is at 4186 MD (4185 TVD). The surface location of the Cuba Mesa Unit #35-2 is 333' from the #35-1 in a direction of 327°. This projected Gallup "B-1" target in the #35-2 (at end of curve) is at 4599 MD (4234 TVD). The formation dip is 2.75 degrees in a direction of 355 degrees (downdip).

- 9) GIH with 9-7/8" bit, 6-1/2" AKO mud motor, 2 non mag DC's, 22 jts of 4-1/2" HWDP and 6-1/2" DC's. build angle at 8.23 degrees per 100 ft. to 87.25 degrees at 4599 MD (4234 TVD) in a direction of 357.49 degrees. The casing seat will be the Gallup "B-1" target.

Note:
1) Notify the supervisor of the Aztec district office of the date and time of commencement of directional drilling operations.
2) Eastman's retrievable MWD & GR will be used.

- 10) Lay down 4-1/2" drill pipe and drill collars.

- 11) Run and cement 7-5/8" casing and parasite tubing (1-1/2") as per drilling program. Run DV tool at 2650'.

Note: Figure 1 shows how the 1-1/2" tubing is attached to the 7-5/8" casing.

- a) Step 1 - Cut end of a joint of 1-1/2", 2.76#, CW-55, IJ 10 Rd tubing at an angle to make a 7.2" (long axis) elliptical opening.
 - b) Step 2 - 1-1/2" tubing is welded onto the 7-5/8" at 4 ft. above the pin end of 7-5/8". The tubing is bent very gradually to run parallel to the casing. The joint of tubing is tack-welded with straps to the casing.
 - c) Step 3 - A piece of 2-3/8" tubing is split and welded over the 1-1/2" tubing. A piece of 8-5/8" casing is split and welded over the 7-5/8" casing opposite the entry position of the injected air.
 - d) All welds will be x-rayed, magnafluxed and pressure tested in shop.
 - e) Install the injection joint of 7-5/8" casing at 2500'.
 - f) As 7-5/8" casing is run, attach tubing to casing with an air bander at 10 ft intervals and tack-weld the tubing to the casing collars every 120 ft using brackets.
 - h) After cementing, flush 1-1/2" tubing with water.
- 12) Cut-off the 13-5/8" 3000# casinghead. Orange peel 13-3/8" casing onto 7-5/8" casing. Install 2" collar in 13-3/8" casing with a 2" 1500# ball valve.
 - 13) Install tubinghead on 7-5/8" casing (7-1/16" 3000# x 7-5/8" SOW).
 - 14) Nipple up 11" 3000# BOP's, annular preventer and rotating head.
 - 15) Prior to drilling out of a 7-5/8" casing, test BOP's, choke, manifold, inside BOP, kelly cock, stand pipe valve, and kill line to 3000 psig. Test annular preventer to 1500 psig. Install wear ring.

Note:

- 1) BOP's to have pipe rams on bottom and blind rams on top.
 - 2) Have a full opening valve and inside BOP on the floor for each size of tubulars being used.
 - 3) Record BOP test on IADC report form.
- 16) Test 7-5/8" casing to 1500 psig (rated at 4140#).
 - 17) The mud system will be an aerated KCl/Polymer system. Circulate through skimmer system. Maintain the solids in the mud as low as possible using Flo Line Cleaner and Centrifuge. Inject sufficient air down 1-1/2" parasite tubing to maintain a hydrostatic head equivalent to 5.5 ppg at TVD. The formation pressure of the Gallup is approximately 6.5 ppg.

Example: At a mud weight of 8.4 ppg and a circulation rate of 250 GPM, an air injection rate of 500 CFM would be required through the 1-1/2" parasite string at 2500 ft, to maintain an equivalent circulation density of 6.1 ppg at a TVD of 4300 ft.
 - 18) Circulate through skimmer system. Inject defoamer and demulsifier upstream of mud gas separator as needed. Monitor corrosion with coupons and adjust corrosion inhibitor as needed in mud and in injected air.

- 19) GIH with 6-1/2" rock bit, float sub, 1 - 4-3/4" non mag drill collar, 23 jts of 4", 14#, S-135 DP (with 3-1/2" XH tool jts), 40 jts of 4" HWDP (with 3-1/2" XH tool jts), 4", 14#, S-135 drill pipe (with 3-1/2" XH tool jts). Install wear ring. Drill DV tool and test casing to 1500#. Drill casing shoe and 5' of new hole.

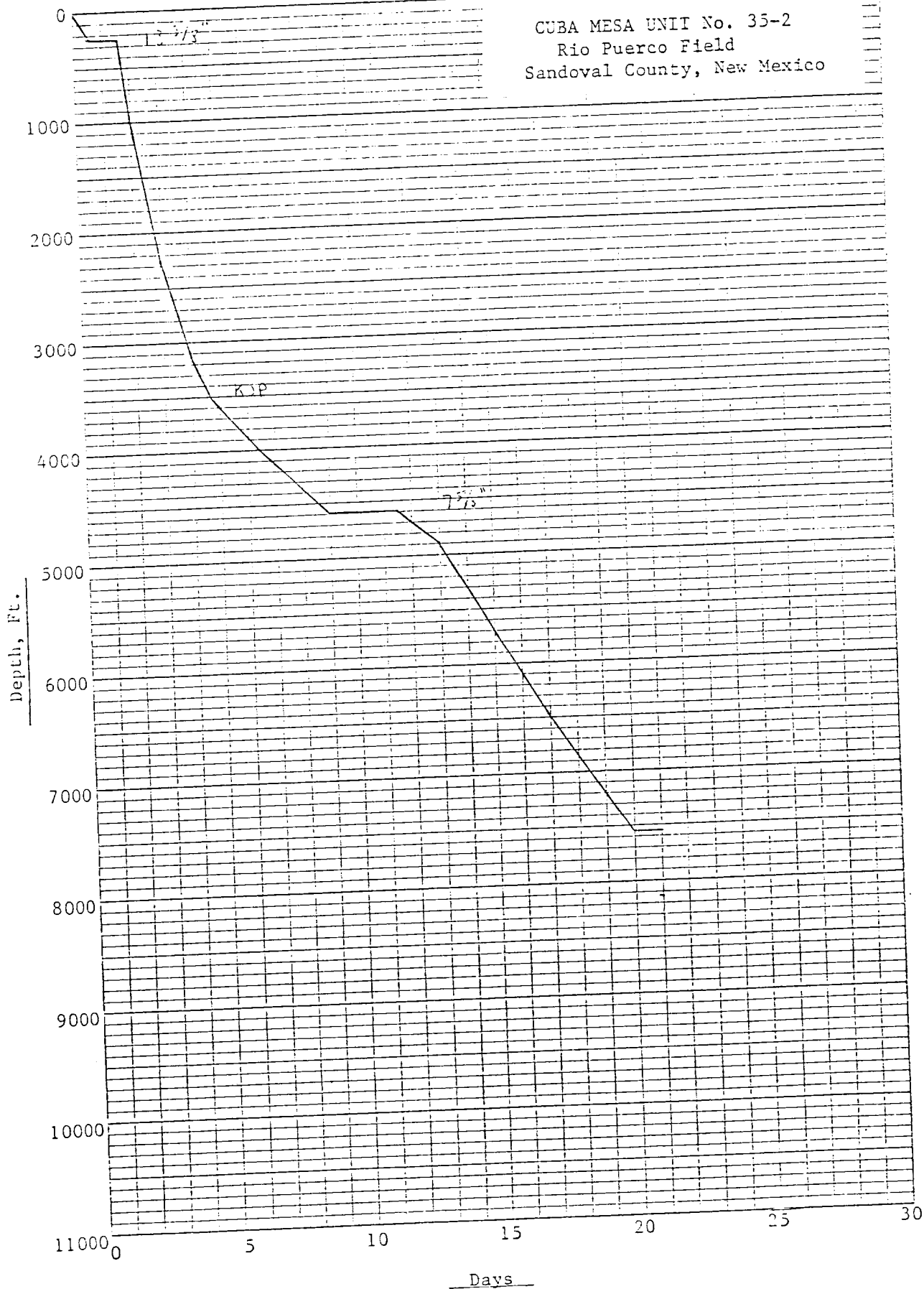
Note:

- 1) The 4", 14#, S-135 drill pipe will be run in the curve and horizontal portion of the hole. The ID of the tube on the 4", 14#, S-135 drill pipe is 3.34". The ID of the 3-1/2" XH tool jts is 2-7/16" (OD = 4-3/4").
 - 2) The 40 jts of HWDP will provide 25,000 lbs of effective bit weight. The ID of the tube on the 4" HWDP is 2-9/16".. The ID of the 3-1/2" XH tool joint is 2-1/4" (OD = 4-3/4").
 - 3) Drill pipe design will provide 300,000 lbs of overpull.
- 20) GIH with 6-1/2" PDC bit, AKO mud motor, float sub, Geoservices MWD (with Gamma Ray), 1 - non mag DC, wear sub, 131 jts of 4", S-135 DP, jet sub, string float, 40 jts of 4" HWDP, and 4" S-135 DP. Install wear ring. Hold the 87.25 degree angle and azimuth of 357.49 degrees until a displacement of 3613 ft is obtained. The estimated TD is 7559 MD (4466 TVD). The mud log samples and Gamma Ray on the MWD will be used to determine the change in hole angle needed to stay in the target. The initial dip angle is 2.75 degrees in a direction of 355 degrees. At 1000' displacement, the dip increase to 3.75 degrees. At 1700' displacement the dip increases to 5 degrees.

Note: The bottom hole location will be 660' FNL and 660' FWL of Section 35, T 21 N, R 2 W. The horizontal displacement will be 3613' with an azimuth of 357.49 degrees.

- 21) If the well indicates to be commercially productive, a 4-1/2" slotted liner will be run. The holes in the liner will be drilled with two 3/4" holes per ft with 90 degree phasing. Leave 3 ft from each end blank.
- 22) Run 4-1/2" liner on TIW "L" setting collar. A TIW packoff bushing will be run one joint above guide shoe. After picking up 4-1/2" liner, hang-off liner in slips. GIH with TIW polish jt (15 ft), 2-3/8" tubing, pup jts as required to space out, and TIW "LN" setting tool.
- 23) After setting liner, displace drilling fluid from behind liner with lease crude mixed with emulsion breaker. To release setting tool from setting collar, turn to the right and POOH.
- 24) To test well, GIH with 2-7/8" tubing (install seating nipple on bottom of tubing). Hang off tubing 10 ft above top of liner. Swab test well.
- 25) Based on the results of the swab test, a pump will be sized and installed with a workover rig.

CUBA MESA UNIT No. 35-2
 Rio Puerco Field
 Sandoval County, New Mexico



46 2290

1 PRODUCTION DAYS X 100 DIVISIONS
 REUPPEL & ESSER CO. - MARIETTA

FIGURE 1

AIR JOINT FOR PARASITIC STRING

DRAWING BY R. GRIFFIE 9/27/01
NOT TO SCALE

Air joint constructed by Coudar Johnson, Cooper, Va

construction cost - \$500

teeling cost - \$085

STEP 1

1 1/2" TUBING
INITIAL CUT

1 1/2" tubing
cut at an angle
to give an oval
end with a
7.2" long axis

STEP 2

AIR JOINT PRIOR TO SHIELDING

6" For
long and
slip space

1 1/2" / 2.76 PPF,
CW-55, IJ 10-RD
Coupl OD = 2.115"

TIG
TACK
WELDED
WITH
S.W.I.L.
PIECES
OF
STRIP

7.2" opening

4"

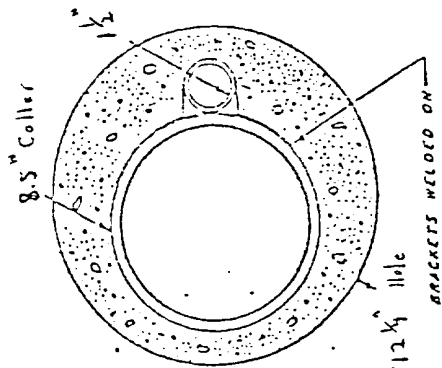
STEP 3

AIR JOINT AFTER SHIELDING

Tubing attached with
air border along end.
Should be welded at
100" intervals

7 3/8" / 26.4 PPF
K55. LTC

Coupl OD = 8.5"



2 3/8" TIG
TOWER 1 1/2"
TIG FOR
SHIELD

All welds scraped,
unquenched, and
pressure tested

8 3/8" CASTING OVER
7 5/8" CASTING FOR
SHIELD