Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 87240
District II
811 South First, Artesia, NM 87210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

Form C-103
Revised March 25, 1999

WELL API NO.
30-045-29781

5. Indicate Type of Lease
STATE ☒ FEE ☐

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name:
State

1. Type of Well:
Oil Well ☐ Gas Well ☒ Other

2. Name of Operator
Conoco Inc.

8. Well No. 4E

3. Address of Operator
P.O. Box 2197 DU 3066 Houston, TX 77252-2197

9. Pool name or Wildcat
72319 MV / 71599 DK

4. Well Location
Unit Letter D : 790 feet from the north line and 890 feet from the west line

Section 32 Township 29N Range 8W NMPM County SAN JUAN

10. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
GR 5924

11. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

| NOTICE OF INTENTION TO: | | SUBSEQUENT REPORT OF: | |
|---|---|---|---|
| PERFORM REMEDIAL WORK ☐ | PLUG AND ABANDON ☐ | REMEDIAL WORK ☐ | ALTERING CASING ☐ |
| TEMPORARILY ABANDON ☐ | CHANGE PLANS ☐ | COMMENCE DRILLING OPNS. ☐ | PLUG AND ABANDONMENT ☐ |
| PULL OR ALTER CASING ☒ | MULTIPLE COMPLETION ☐ | CASING TEST AND CEMENT JOB ☐ | |
| OTHER: mud drill ☒ | | OTHER: ☐ | |

12. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompilation.

CONOCO is requesting to change the above referenced to mud drill and change the casing and cement program as per attached:

MAR 2000
RECEIVED
OIL CON. DIV.
DIST. 3

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Yolanda Perez TITLE Regulatory Analyst DATE 03/01/00

Type or print name Yolanda Perez Telephone No. (281) 293-1613

(This space for State use)

APPPROVED BY Charlie T. Perrin TITLE DEPUTY OIL & GAS INSPECTOR, DIST. #3 DATE MAR - 1 2000

Conditions of approval, if any:

C-115 - Operator's Monthly Report (Continuation Page)

| 2 Operator: APACHE CORPORATION | 3 OGRID: 000873 | 4 Month/Year 11/99 | 6 Page 60 of 91 |
|---|---|---|---|

| | | INJECTION | | | PRODUCTION | | | | DISPOSITION OF OIL, GAS, AND WATER | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7<br>POOL NO. AND NAME<br>Property NO. and Name<br>Well No. & U-L-S-T-R<br>API No. | 8<br>CODE 1 | 9<br>Volume | 10<br>Pressure | 11<br>CODE 2 | 12<br>Barrels of oil/condensate produced | 13<br>Barrels of water produced | 14<br>MCF Gas Produced | 15<br>Days Produced | 16<br>CODE 3 | 17<br>Point of Disposition | 18<br>Gas BTU or Oil API Gravity | 19<br>Oil on hand at beginning of month | 20<br>Volume (Bbls/mcf) | 21<br>Transporter OGRID | 22<br>CODE 4 | 23<br>Oil on hand at end of month |
| | | | | | | | | | G | 2807336 | 1330 | | 1817 | 007057 | | |
| | | | | | | | | | G | 2807350 | 1306 | | 1017 | 007057 | | |
| | | | | | | | | | G | 2807354 | 1336 | | 682 | 007057 | | |
| | | | | | | | | | G | 2807339 | 1381 | | 736 | 007057 | | |
| | | | | | | | | | G | 2807332 | 1342 | | 1487 | 007057 | | |
| | | | | | | | | | G | | | | 0 | | O | |
| | | | | | | | | | G | | | | 46 | | U | |
| 023760 PHILLIPS, FRED C | | | | | | | | | | | | | | | | |
| 003 E-15-25N-3W<br>30-039-23225 | P | | | | 66 | 15 | 1136 | 30 | | | | | | | | |
| A003 H-15-25N-3W<br>30-039-23751 | F | | | | 59 | 55 | 1570 | 30 | | | | | | | | |
| | | | | | | | | | O | 1956410 | | 76 | | | | 142 |
| | | | | | | | | | O | 1956610 | | 121 | | | | 180 |
| | | | | | | | | | G | 1956430 | 1287 | | 1132 | 007057 | | |
| | | | | | | | | | G | 1956630 | 1280 | | 1565 | 007057 | | |
| | | | | | | | | | G | | | | 9 | | U | |
| 023764 PHILLIPS, FRED G | | | | | | | | | | | | | | | | |
| 001 C-10-25N-3W<br>30-039-23577 | F | | | | 34 | 8 | 1237 | 29 | | | | | | | | |
| A001 A-10-25N-3W<br>30-039-23494 | F | | | | 43 | 7 | 1624 | 30 | | | | | | | | |
| | | | | | | | | | O | 1956010 | | 88 | | | | 132 |
| | | | | | | | | | O | 1957410 | | 173 | | | | 206 |
| | | | | | | | | | G | 1956030 | 1245 | | 1620 | 007057 | | |
| | | | | | | | | | G | 1957430 | 1234 | | 1232 | 007057 | | |
| | | | | | | | | | G | | | | 9 | | U | |
| | | | | | | | | | W | 1957450 | | | 15 | | | |

# PRIMARY CEMENTING PROPOSAL

## *SURFACE & 3 STAGE LONGSTRING*

---

# *Conoco*

## *State 4E*

---

### Well Location

Field : Cutter Dam
County : San Juan
State : Nm
Country : USA

**Prepared for** : **Ricky Joyce**
**Brett Thompson**
Date Prepared : 2/12/00

Service Point : FARMINGTON. NM
Business Phone : 505-325-5096
FAX No. : 505-327-0317

Prepared by : Duane Gonzalez
Phone : (281) 293-4538
FAX : (281) 293-4424
E-Mail address : dgonzalez@houston.dowell.slb.com

## Well Data: 9 5/8 in. Surface


| | | |
|---|---|---|
| Depth | 500 | ft. |
| Casing Size | 9 5/8 | in., 36 lbs./ft. |
| Open Hole Diameter | 12 1/4 | in. |
| BHST | 90 | °F |
| BHCT | 80.0 | °F |
| Total Excess | 100 | % |
| Tail Excess | 100 | % |

***Mud Wt./Type: 8.4 ppg Fresh Wtr. Based***

## Calculations:

### Volume Factors:

| | |
|---|---|
| Casing x Open Hole | 0.3132 cu.ft./ft |
| Casing (Internal) | 0.4338 cu.ft./ft |

**Top of Cement** **Surface**

### Cement System:

| | |
|---|---|
| Open Hole Fill | (500 x 0.3132 x 2.) / 1.19 = 262 sks. |
| Casing Shoe Cement | (40 x 0.4338) / 1.19 = 15 sks. |
| | Total Tail Cement = 277 sks. |

# Cementing Systems

## Spacer System: 20 bbls .

**Fresh Water**

## Cement System: 275 sks.

**Class B + 2% S1 + 0.25 pps D29**

| | | | |
|---|---|---|---|
| Mix Weight | : | 15.6 | PPG |
| Yield | : | 1.19 | cu.ft./sk. |
| Mix Water | : | 5.19 | gal./sk. |
| Fluid Loss | : | 800 | cc/30 minutes |
| Thickening Time | : | 0.125 | hours:minutes |
| Comp. Strength | : | 1,000 | psi in 12 hrs. |

## Well Data: 4 1/2 in. Production - Stage 1


| | | |
|---|---|---|
| Depth | 7,331 | ft. |
| Casing Size | 4 1/2 | in., 10.5 lbs./ft. |
| Open Hole Diameter | 8 3/4 | in. |
| Previous Csg. Depth | 500 | ft. |
| Previous Csg. Size | 9 5/8 | in., 36 lbs./ft. |
| BHST | 175 | °F |
| BHCT | 128.5 | °F |
| Total Excess | 35 | % |
| Tail Excess | 35 | % |
| Stage Collar Depth | 6,322 | ft. |

***Mud Wt./Type: 9 ppg Fresh Wtr. Based***

## Calculations:

### Volume Factors:

| | |
|---|---|
| Casing x Open Hole | 0.3071 cu.ft./ft |
| Casing x Previous Casing | 0.3234 cu.ft./ft |
| Casing (Internal) | 0.0896 cu.ft./ft |

**Top of Cement** **6,322 ft.**

### Cement System:

| | |
|---|---|
| Open Hole Fill | (1,009 x 0.3071 x 1.35) / 1.59 = 262 sks. |
| Casing Shoe Cement | (80 x 0.0896) / 1.59 = 4 sks. |
| | Total Tail Cement = 267 sks. |

# Cementing Systems

## Spacer System: 20 bbls .

**CW-100 Chemical Wash**

## Cement System: 265 sks.

**50:50 Poz:Class B + 2% D20 + 0.2% D167 + 0.2% D46 + 0.25 pps D29**

| | | | |
|---|---|---|---|
| Mix Weight | : | 12.4 | PPG |
| Yield | : | 1.59 | cu.ft./sk. |
| Mix Water | : | 8.27 | gal./sk. |
| Fluid Loss | : | 372 | cc/30 minutes |
| Thickening Time | : | 4:30 | hours:minutes |
| Comp. Strength | : | 1,200 | psi in 48 hrs. |

## Well Data: 4 1/2 in. Production - Stage 2


| | | |
|---|---|---|
| Depth | 7,331 | ft. |
| Casing Size | 4 1/2 | in., 10.5 lbs./ft. |
| Open Hole Diameter | 8 3/4 | in. |
| Previous Csg. Depth | 500 | ft. |
| Previous Csg. Size | 9 5/8 | in., 36 lbs./ft. |
| BHST | 175 | °F |
| BHCT | 121.6 | °F |
| Total Excess | 35 | % |
| Tail Excess | 35 | % |
| Stage Collar Depth | 6,322 | ft. |

***Mud Wt./Type: 9 ppg Fresh Wtr. Based***

## Calculations:

### Volume Factors:

| | |
|---|---|
| Casing x Open Hole | 0.3071 cu.ft./ft |
| Casing x Previous Casing | 0.3234 cu.ft./ft |
| Casing (Internal) | 0.0896 cu.ft./ft |

**Top of Cement** **3,915 ft.**

### Cement System:

| | |
|---|---|
| Open Hole Fill | (2,407 x 0.3071 x 1.35) / 1.61 = 621 sks. |
| Casing Shoe Cement | (40 x 0.0896) / 1.61 = 2 sks. |
| | Total Tail Cement = 624 sks. |

# Cementing Systems

## Spacer System: 20 bbls .

**CW-100 Chemical Wash**

## Cement System: 625 sks.

**50:50 Poz:Class B + 2.75% D20 + 0.2% D167 + 0.2% D46 + 0.25 pps D29**

| | | | |
|---|---|---|---|
| Mix Weight | : | 12.4 | PPG |
| Yield | : | 1.61 | cu.ft./sk. |
| Mix Water | : | 8.33 | gal./sk. |
| Fluid Loss | : | 372 | cc/30 minutes |
| Thickening Time | : | 4:30 | hours:minutes |
| Comp. Strength | : | 1,200 | psi in 48 hrs. |

## Well Data: 4 1/2 in. Production - Stage 3


| | | |
|---|---|---|
| Depth | 7,331 | ft. |
| Casing Size | 4 1/2 | in., 10.5 lbs./ft. |
| Open Hole Diameter | 8 3/4 | in. |
| Previous Csg. Depth | 500 | ft. |
| Previous Csg. Size | 9 5/8 | in., 36 lbs./ft. |
| BHST | 128 | °F |
| BHCT | 100.2 | °F |
| Total Excess | 35 | % |
| Lead Excess (calculated O.H.) | 35.0 | % |
| Stage Collar Depth | 3,915 | ft. |

***Mud Wt./Type: 9 ppg Fresh Wtr. Based***

## Calculations:

### Volume Factors:

| | |
|---|---|
| Casing x Open Hole | 0.3071 cu.ft./ft |
| Casing x Previous Casing | 0.3234 cu.ft./ft |
| Casing (Internal) | 0.0896 cu.ft./ft |

**Top of Cement** **Surface**

### Cement System:

| | |
|---|---|
| Open Hole Fill | (3,415 x 0.3071 x 1.35) / 2.86 = 495 sks. |
| Previous Casing Fill | (500 x 0.3234) / 2.86 = 57 sks. |
| Casing Shoe Cement | (40 x .0896) / 2.861 = 1 sks. |
| | Total Lead Cement = 553 sks. |

# Cementing Systems

## Spacer System: 20 bbls .

### CW-100 Chemical Wash

## Cement System: 555 sks.

### Class B + 3% D79 + 0.1% D46 + 0.25 pps D29

| | | | |
|---|---|---|---|
| Mix Weight | : | 11.4 | PPG |
| Yield | : | 2.86 | cu.ft./sk. |
| Mix Water | : | 17.64 | gal./sk. |
| Fluid Loss | : | N/C | cc/30 minutes |
| Thickening Time | : | 5:00 | hours:minutes |
| Comp. Strength | : | 300 | psi in 72 hrs. |

350
4:30
500

*At Conoco our work is never so urgent or important that we cannot take time to do it safely.*

# *SAN JUAN DRILLING PROGRAM*

**WELL INFO**

| | | | | |
|---|---|---|---|---|
| **Well:** State 4E | **Area:** Cutter Dam | **AFE #** 8469 | **AFE $:** 346,712 | |
| **County:** San Juan | **State:** New Mexico | **Rig:** Key #49 | **RKB-GL:** 13' | |
| **API #** 30-045-29781 | **Permit #** | **Fresh Wtr Prot:** Circulate cement on surface casing | | |
| **MD:** 7131' | **TVD:** 7131' | **KOP:** N/A | **G.L. Elev:** 5926' | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Co-ordinates:** | **WELL** | Latitude: 36° 41.3' | Longitude: 107° 42.4' | **ERA** | Latitude: | 36°41.1' | Longitude: | 107°42.1' |
| **Location:** | 790' FNL & 890' FWL | | | | | | | |
| | Sec. 32, T29N, R8W | | | | | | | |
| **Directional:** | N/A | | | | | | | |

**DISCUSSION**

**THESE WELLS ARE TO BE DRILLED WITH SAFETY AND PROTECTION OF THE ENVIRONMENT AS THE PRIMARY OBJECTIVES!**

**IT IS THE DRILLING REPRESETATIVES RESPONSIBILITY TO READ AND FOLLOW ALL STIPULATIONS FOR EACH PERMIT AND ENSURE COMPLIANCE**

**REGULATORY NOTIFICATIONS**

Notify the U.S. Bureau of Land Management:

1. Anytime a major deviation from the well plan (plug back, sidetrack, etc...) is going to occur. Leave a message with the intended plan if no one answers. **If in doubt notify!** Better to notify unnecessarily than not to and get a fine.
2. Immediately upon spudding
3. Complete the Notice of Spud Sundry and **FAX** to Trigon Engineering Inc. at (970) 385-9107, attention Debra Sittner. Call her at (970) 385-9100, ext. 25 or Verla Johnson @ ext. 20 to confirm that the fax was received. This is in addition to the phone calls to the BLM.
4. 24 hours prior to any BOP or casing pressure test.
5. 24 hours prior to any cementing operation

PHONE NUMBERS

BLM – Farmington: (505) 599-8907

BLM – Albuquerque: (505) 761-8700

New Mexico Oil Conservation Department: (505) 334-6178

**NOTE – Permits come from either the Farmington OR Albuquerque depending upon the area. Refer to the permit for the correct number to call.**

Review Emergency Response Plan before rigging up and be prepared to execute the plan if needed!

The objective of this well is to develop the Mesa Verde (MV) and Dakota (DKTA) geologic horizons.

**TIME**

| | Days From Spud to... | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Surf Csg Pt** | **Drlg Out** | **Int. Csg Pt** | **Drlg Out** | **TD** | **Log** | **Prod Csg Set** | **Rig Rel.** |
| **Days** | 0.5 | 1.0 | N/A | N/A | 11 | 12 | 12.5 | 13 |

**FORMATIONS**

| Zone | Depth (TVD) | MW | Zone EMW | Hole Size | Csg Size | FIT / LOT | Remarks |
|---|---|---|---|---|---|---|---|
| **Surface Casing** | 320+ | 8.6 - 9.0 | | 12 ¼" | 9-5/8" | None | Severe lost circulation is possible. 320' is the minimum surface casing depth below ground level per NMOCD. |
| OJAM | 1407 | 8.6 - 8.8 | | 8 3/4" | 4 ½" | N/A | Possible water flows. |
| KRLD | 1551 | | | | | | |
| FRLD | 1970 | | | | | | Possible gas |
| PCCF | 2413 | | | | | | Possible lost circulation & differential sticking |
| LEWS | 2568 | | | | | | |
| CHRA | 3385 | | | | | | |
| **CLFH/MV** | 4065 | | | | | | Possible gas |
| **MENF/MV** | 4172 | 8.6 - 9.0 | | | | | |
| **PTLK/MV** | 4643 | | | | | | Probable lost circulation. Pretreat system with 4-6% LCM. |
| MNCS | 5071 | | | | | | Possible Sloughing shale |
| GLLP | 5916 | | | | | | Possible lost circulation |
| GRHN | 6661 | | | | | | |
| **GRRS/DKTA** | 6722 | | | | | | Possible gas |
| **TWO WELLS/ DKTA** | 6760 | | | | | | Possible gas |
| **PAGU/DKTA** | 6894 | | | | | | Possible gas |
| **TOTAL DEPTH** | 7131 | 8.8 - 9.0 | | | | | Possible gas |
| **PERMIT TO** | 7331 | | | | | | |

**LOGS**

| | |
|---|---|
| **Intermediate Logs:** | N/A |
| **TD Logs:** | Formation Compensated Density or Lithodensity with Gamma-ray & Caliper<br>Compensated Neutron Density<br>Induction Resistivity with Gamma-ray & SP |
| **Additional Information:** | NOTE: Logging was not in AFE Estimate. Carry as "Additional" time! |

**EQUIPMENT**

| | |
|---|---|
| **Wellhead:** | 9 5/8" 8RD x 11" 3M - Casing Head<br>11" 3M x 7 1/16" 5M – Tubing Spool |
| **Other:** | Tree: Adapter –7 1/16" 5M x 2 1/16" 5M with Master Valve & Wing Valve |
| **BOP's:** | **Rotating Head** – Flow line or Blooie line – Pipe Rams - Blind Rams – C/K Lines |
| **Remarks:** | High and low pressure BOP tests shall be conducted every 14 days and anytime flange seals are broken for repair or service. Functional and visual tests will be conducted daily and so noted on the daily drilling report.<br>Test BOP's and choke manifold to a low pressure of 250psi and then to a high pressure of 3000psi (rated working pressure).<br>**Proper test plug seating should be checked and the 2" casing head valve must be open and unobstructed.**<br>Caliper all wear bushings inside and out prior to running. |

**MUD PROGRAM**

| From | To | Mud Type | Wt | Vis | YP | Gels | FL | % Solids | pH |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 320 | Fresh water | 8.6 - 9.0 | 30 | As needed | As Needed | ~ | 2 - 5 | ~ |
| 320 | *** | Fresh water | 8.4 - 8.8 | 28 - 32 | ~ | As needed | None | 2 - 5 | ~ |
| *** | 6800 | Gel/Polymer | 8.8 - 9.0 | 42 - 46 | 10 - 12 | As needed | 8 - 10 | 3 - 5 | 9.0 - 10.0 |
| 6800 | 7131 | Gel/Polymer | 8.8 - 9.0 | 60 | 10 - 12 | As needed | 8 - 10 | 3 - 5 | 9.0 - 10.0 |

**Remarks:**

**12 ¼"** (0' to +320')

Spud with fresh water and circulate high viscosity sweeps formulated with GEL & LIME (Spud Mud) to remove the dense accumulation of cuttings from the hole.

Sweeps of POLYPLUS should be used if needed to enhance hole cleaning. A sweep should be pumped prior to reaching TD. Pump another sweep, and cirulate about half an hour prior to pulling out to run casing..

During the drilling of the surface hole, run all of the equipment in a solids removal mode.

**8 3/4"** (+320' to TD)

Drill out of surface with fresh water. Hole should build mud, but may require sweeps of Kwik Thik (beneficiated bentonite) to prevent excessive water losses.

While drilling add 1 quart (vis cup) of PolyPlus down DP on connections **as required.** Do not over treat. Adding PolyPlus when not dictated by hole conditions will only add to the cost without improving performance. Can also cause mud WT to increase quickly after light mud up. Kwik Thik will build viscosity at a lower cost than Poly Plus. Poly Plus adds some inhibition as we get deeper.

*** Drill with fresh water until seepage occurs. **Slight mud up of Polyplus System to control seepage. Full mud up once excessive seepage occurs or excessive drag is seen on connections.** At ~1300' pay close attention to the hole conditions (this is where we have fully mud up in the past).

Run all solids control & maintain mud weight as low as possible. If mud weight exceeds 9.0 ppg, dump and dilute.

Lost circulation is expected in the PTLK formation (~4643'). **Pretreat system with 4-6 % LCM at the top of the PTLK formation.** Have a pill with 25% LCM in the pre-mix tank in case losses are encountered. If losses are encountered, pull above the loss zone, spot the pill, and allow it to soak. If no losses are encountered through the Point Lookout, LCM in the system may be allowed to slowly drop back to 1-2%.

Increase funnel viscosity to 60 sec/qt after tripping for tri-cone bit to finish drilling the DKTA.

Spot a LCM pill across the Point Lookout when pulling out to log and run casing.

**Miscellaneous**

Run all solids control equipment while drilling. Very important to keep solids control equipment running at optimum performance to minimize solids and mud weight. Run the finest screens possible on both shakers.

Keep a good supply of fibrous lost circulation materials (Cedar Fiber, Multiseal, or Sawdust) on location to fight lost circulation

It is possible that treatments of DD (drilling detergent) may be needed to provide lubricity and minimize bit balling. Check with Drilling Engineer prior to use.

**CASING PROGRAM**

| Size (in) | Depth (ft) | Feet (ft) | Wt (ppf) | Grade | Conn | ID (in) | Drift (in) | Max OD (in) | Burst (psi) | Coll. (psi) | Ten. (psi) | M/U Torque (ft-lbs) Min | Opt | Max |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-5/8" | 320+ | 320+ | 36.0 | J-55 | STC | 8.921 | 8.765 | 9.721 | 3520 | 2020 | 394000 | 2710 | 3610 | 4510 |
| 4-1/2" | 7131 | 7131 | 10.5 | J-55 | STC | 4.052 | 3.927 | 5.000 | 4790 | 4010 | 132000 | 990 | 1320 | 1650 |

**9-5/8"**

NOTE: Sundry filed changing casing depth from 500' to 320'. **320' BELOW GROUND LEVEL** is the minimum required by NMOCD rules. Notify BLM of actual CSG depth.

Before POOH to run casing, sweep the hole with a 50 – 100 bbl high viscosity Gel/Lime slurry and circulate the hole clean, about a half hour.

**Casing Hardware:**

Texas Pattern (saw tooth) guide shoe

Fiberglass Baffle Plate

Stop ring – 10' off bottom

Centralizers: One over stop ring and then one every other joint to surface.

Space out casing to install screw on 9 5/8" head near ground level. Install screw on head as soon as cement is set up.

**Testing:** Test casing to 2464psi: (70% of internal yield pressure). If pressure declines more than 10% in 30 minutes corrective actions must be taken.

**4-1/2"**

Circulate hole clean before running casing.

Marker joint (10' pup):

±200' above the TWO WELLS/DKTA formation.

**Casing hardware:**

Float shoe

Float collar (Two shoe joints)

Stop ring – 10' off bottom & middle of second joint

DV tools (2) – One ~150' above the CLFH and the other ~400' above the GRRS. Based upon lost circulation and hole conditions; the exact depths will be determined in discussion between the Drilling Representative, Engineer and Geologist.

Cement basket – 2 (1 jnt below each DV tool)

Centralizers:

TD to FC: 2 /joint

FC to DV: 1 every other joint

DV to bottom MV: 1 every fourth joint

MV to DV: 1 every other joint

DV to Surface: 1 every fourth joint

(Use only Weatherford or Davis-Lynch Non-Welded centralizers)

**Make the rough cut and final cut before rig is moved. Make arrangements to have the tubing head installed the day after the rig is moved off.**

**Casing Makeup**

Position is critical to properly make up the API 8 rnd casing. The following procedure should be followed to ensure proper casing make up.

Make up the first ten joints of casing (excluding thread locked joints) so that the coupling is even with the last scratch of the pin thread. Use the average make up torque for the rest of the string, checking the position of the coupling. More than two full threads showing at maximum torque, or more than two rounds buried at minimum torque indicates a problem with the joint-lay it out. Torque should be adjusted within the range from minimum to maximum so that threads are made up to the proper position. **All casing should be made up using Best-O-Life 2000 which contains Teflon. The published casing torque values shown above must be multiplied by 0.89. Failure to apply this torque factor could result in improper torque on the pipe. Use of API Modified or any dope other than Best-O-Life 2000 could result in mismatched torque values and cause potential field problems.**

DO NOT make up the casing using published torque values without considering these factors!

Note that the torque values in the table above are directly from the casing torque tables, and DO NOT have the 0.89 torque factor applied.

**Notes**

BEST-O-LIFE 2000 thread compound is to be used on all casing. **DO NOT SUBSTITUTE!!!!!** If the supply store can not provide it, find another supply store.

Never leave anyone in a confined area, i. e. the cellar, without a designated watchman!!

A service hand for the DV tools is not required, and is an additional cost. However, make sure the placement and operation of the DV tools is clearly understood. If there is any question, get him out - having the tool hand is cheap insurance. If he is called out, make sure he instructs all supervisory personnel in the placement and operation of the tools to eliminate service calls in the future.