MERIDIAN OIL

CASE # 10754

JULY 1, 1993

**EXHIBIT 1**

MERIDIAN OIL

June 8, 1993

Mr. William J. LeMay
Oil Conservation Division
State Land Office Building
310 Old Santa Fe Trail, Room 219
Santa Fe, NM 87501

**Faxed June 8, 1993**

RE: Application of Meridian Oil Inc. for Non-Standard Spacing Units, Non-Standard Location and Downhole Commingling, Rio Arriba County, New Mexico
San Juan 28-4 Unit #225 Well

Dear Mr. LeMay:

On behalf of Meridian Oil Inc., please find enclosed our Application for a non-standard spacing unit, a non-standard location, and downhole commingling as referenced above, which we request be set for hearing on the next available Examiner's docket now scheduled for July 1, 1993.

By copy of this letter and application, sent certified mail-return receipt requested, we are notifying all interested parties offsetting the subject well and its proposed spacing and proration unit of their right to appear at the hearing and participate in this case, including the right to present evidence either in support of or in opposition to the application and that failure to appear at the hearing may preclude them from any involvement in this case at a later date. Also, all parties entitled to notice are hereby informed that pursuant to Division requirements all parties appearing in this case are required to file a Pre-Hearing Statement with the Division no later than 4:00 p.m. on Friday, June 25, 1993.

Very truly yours,

Alan Alexander
Senior Land Advisor

AA:ll
NM-2500
cc: with Enclosures
Tom Kellahin - Kellahin & Kellahin

By Certified Mail - Return Receipt
All Parties Listed on Exhibit C of Application

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

APPLICATION OF MERIDIAN OIL INC.
FOR A NON-STANDARD SPACING UNIT,
NON-STANDARD LOCATION
AND DOWNHOLE COMMINGLING
RIO ARRIBA COUNTY, NEW MEXICO.

CASE:

**APPLICATION**

Comes now MERIDIAN OIL INC., ("Meridian") and applies to the New Mexico Oil Conservation Division for approval to downhole commingle Choza Mesa Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Gas Pool production within the wellbore of its proposed San Juan 28-4 Unit #225 well to be drilled at a non-standard gas well location 695 feet FSL and 1375 feet FWL of Section 7, Township 28 North, Range 4 West, NMPM, Rio Arriba County, New Mexico. Said well is to be dedicated a non-standard 229.88-acre gas spacing unit for the Basin-Fruitland Coal Gas Pool being All of Section 7 and to a non-standard 114.60-acre gas spacing unit for the Choza Mesa Pictured Cliffs Gas Pool being Lots 3-5, SE/SW of said Section 7.

In support of its application, Meridian states:

(1) Meridian is the operator for the proposed San Juan 28-4 Unit #225 Well to be drilled at a non-standard gas well location 695 feet FSL and 1375 feet FWL of Section 7, Township 28 North, Range 4 West, NMPM, Rio Arriba County, New Mexico as shown on Exhibit "A" attached.

(2) The Well is to be drilled so that production from the Basin-Fruitland Coal Gas Pool and the Choza Mesa Pictured Cliffs Gas Pool can be downhole commingled in the wellbore.

(3) All of Section 7 is to be dedicated to any production from the Basin Fruitland Coal Gas Pool. It consists of Lots 1 through 5, SE/4 SW/4 and S/2 SE/4 of Section 7 and contains 229.88 acres, more or less. See Exhibit "A" attached. Meridian proposes to follow the "Mesaverde solution" for acreage dedicated to a non-standard Mesaverde Unit for the San Juan 28-4 Unit #21 Well and apply this solution to the Basin Fruitland Coal formation.

(4) Lots 3, 4, 5, SE/4 SW/4 of Section 7, containing 114.60 acres, is to be dedicated to any production from the Choza Mesa Pictured Cliffs Gas Pool. See Exhibit "A" attached.

(5) The ownership is common between these two spacing units.

(6) In accordance with Division Rule 303-C-1.(b), the Applicant states and will demonstrate at hearing:

a. That drilling the San Juan 28-4 Unit #225 Well initially for downhole commingling in the wellbore is necessary because it is not otherwise economic to attempt to drill and complete a separate well for Fruitland coal gas production nor is it economic to attempt to dually complete those formations in the proposed well.

b. That there will be no crossflow between the two zones commingled.

c. That the ownership in each of the two spacing units is common between the two pools and no impairment of correlative rights will occur.

d. It is expected that the bottom hole pressure of the lower pressure zone is not less than 50 percent of the bottom hole pressure of the higher pressure zone adjusted to a common datum.

e. That the value of the commingled production will not be less than the sum of the values of the individual production.

(7) The Fruitland Coal formation in this area of the basin should be marginally productive.

(8) Due to the nature of the Basin-Fruitland Coal Gas production, straight allocation of gas volumes from both zones is not appropriate. Meridian therefore seeks the adoption of a monthly allocation formula, to be presented at the hearing in this matter.

(9) While the downhole commingling is subject to administrative approval, the non-standard spacing unit and non-standard location for both the Choza Mesa Pictured Cliffs Gas Pool and the Basin-Fruitland Coal Pool requires a hearing. Therefore, Applicant requests that these matters be docketed for hearing on the Division's Examiner docket now scheduled for July 1, 1993.

(10) In accordance with Division Rule 1207.A(6) a copy of this application has been sent to all offsetting operators as set forth on Exhibit "C".

WHEREFORE Applicant requests that this matter be set for hearing on July 1, 1993, before a duly appointed Examiner of the Oil Conservation Division and that after notice and hearing as required by law, the Division enter its order granting this application.

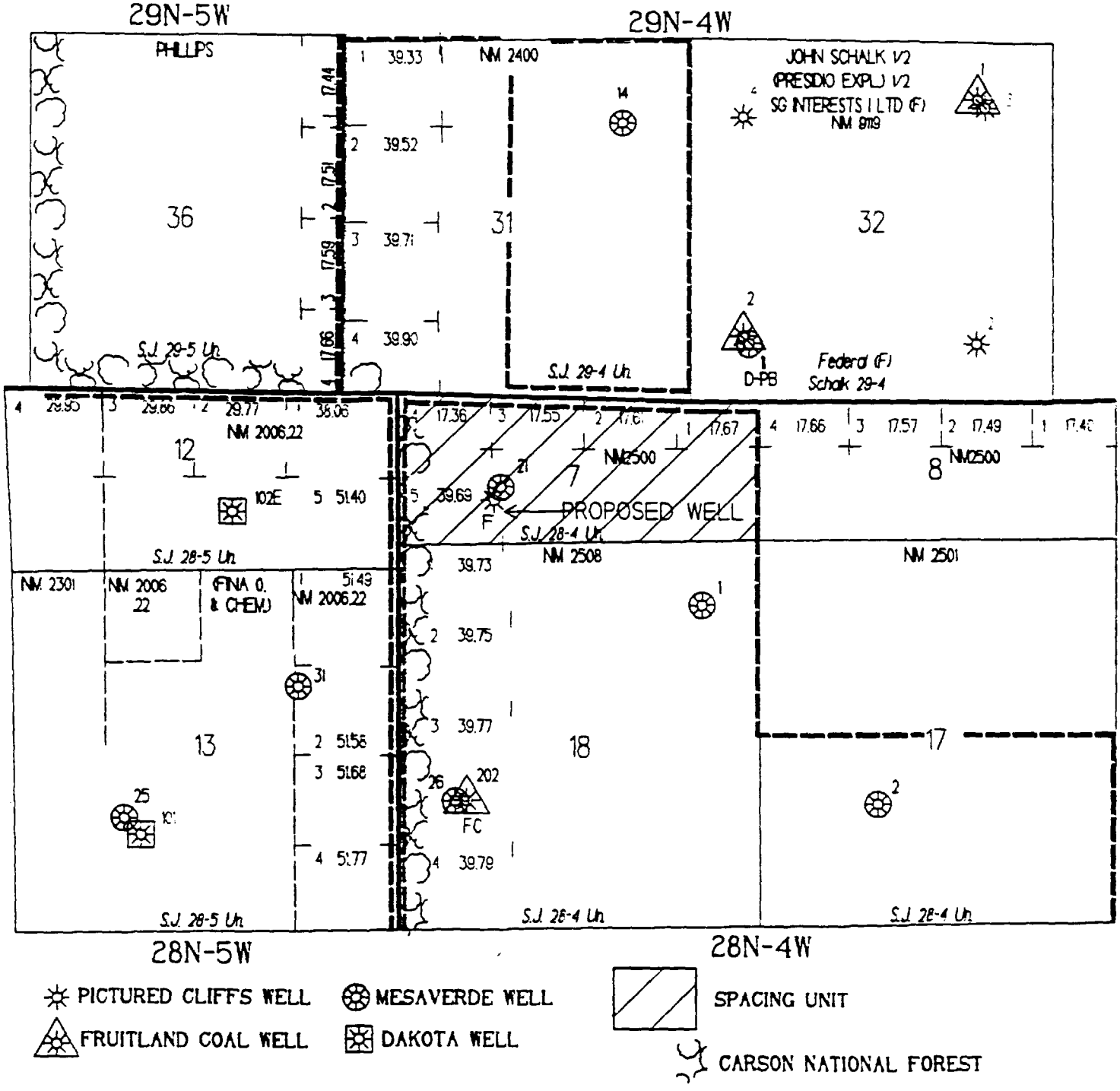
Respectfully submitted,

Alan Alexander
Senior Land Advisor
MERIDIAN OIL INC.
P. O. Box 4289
Farmington, NM 87499-4289
(505) 326-9757

AA:ll

EXHIBIT "A"

# SAN JUAN 28-4 UNIT # 225 WELL
# 695'FSL, 1375'FWL
# SECTION 7-28N-4W

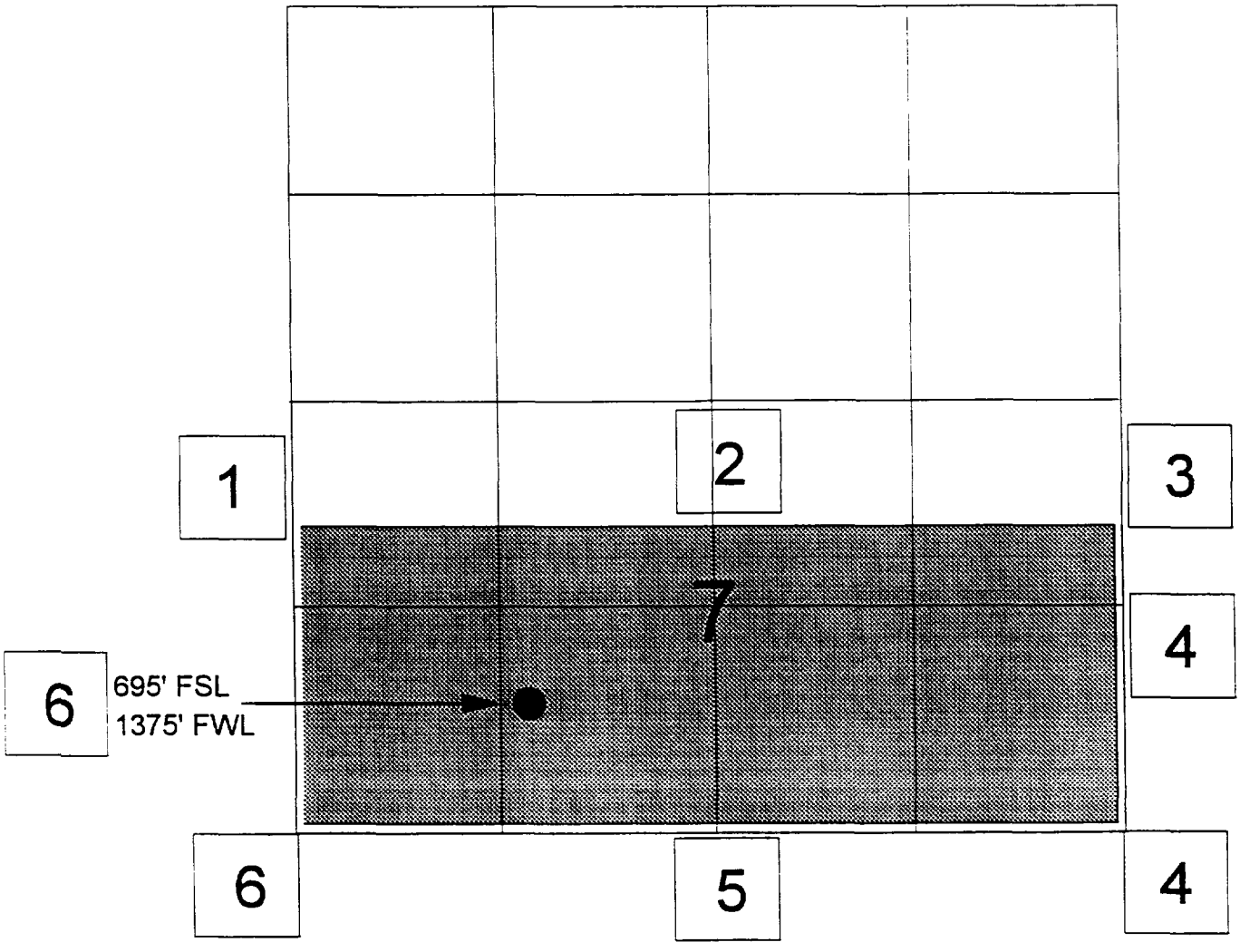


# MERIDIAN OIL INC.

EXHIBIT "B"

## OFFSET OPERATOR/OWNER PLAT

**Pictured Cliffs-Fruitland Commingle**
**San Juan 28-4 Unit #225**
**SE SW Section 7, T28N, R4W**
**Rio Arriba County, New Mexico**




1) Phillips Petroleum, Operator, San Juan 29-5 Unit, 5525 Hwy. 64 NBU 3004, Farmington, New Mexico 87401-**(PC & FR)**

2) Meridian Oil Inc., Operator, San Juan 29-4 Unit, 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289-**(PC & FR)**

3) Richmond Petroleum, 2651 N. Harwood, Suite 500, Dallas, Texas 75201-1505- **(FR Only)**

4) Meridian Oil Inc., Operator, 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289-**(FR Only)**

5) Meridian Oil Inc., Operator, San Juan 28-4 Unit, 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289-**(PC & FR)**

6) Meridian Oil Inc., Operator, San Juan 28-5 Unit, 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289-**(PC & FR)**

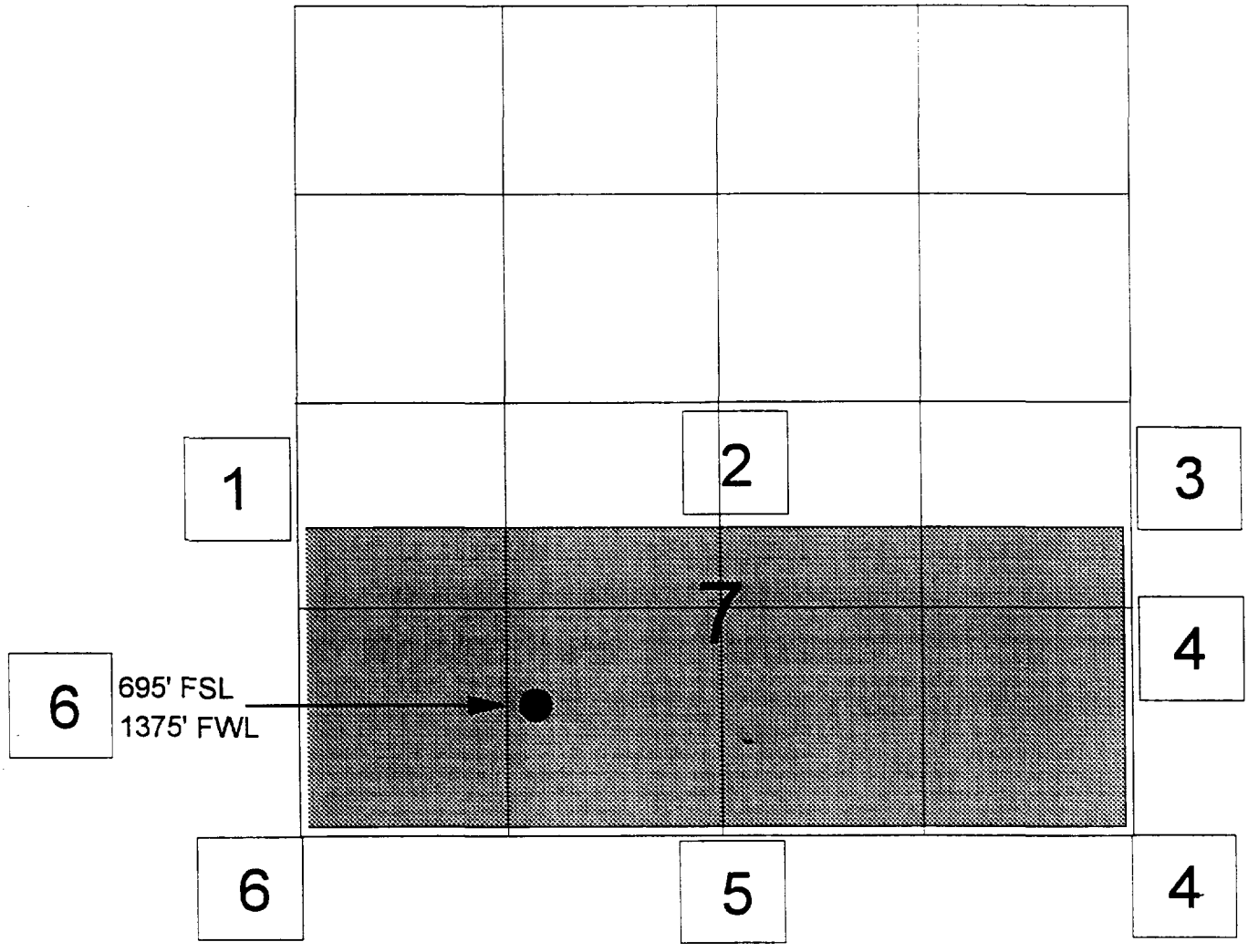
**EXHIBIT 2**

# MERIDIAN OIL INC.

EXHIBIT "B"

## OFFSET OPERATOR/OWNER PLAT

**Pictured Cliffs-Fruitland Commingle**
**San Juan 28-4 Unit #225**
**SE SW Section 7, T28N, R4W**
**Rio Arriba County, New Mexico**

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**STATE OF NEW MEXICO**
**ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT**
**OIL CONSERVATION DIVISION**

**IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:**

**CASE NO. 10754**

**APPLICATION OF MERIDIAN OIL INC. FOR NON-STANDARD SPACING UNITS, NON-STANDARD LOCATION, AND DOWNHOLE COMMINGLING FOR THE SAN JUAN 28-4 UNIT #225, RIO ARRIBA COUNTY, NEW MEXICO**

## CERTIFICATE OF MAILING

## AND

## COMPLIANCE WITH ORDER R-8054

Alan Alexander, authorized representative of MERIDIAN OIL INC., states that the notice provisions of Division Rule 1207 (Order R-8054) have been complied with, that Applicant has caused to be conducted a good faith diligent effort to find the correct address of all interested parties entitled to receive notice, that on June 7, 1993, I caused to be mailed by certified mail, return-receipt requested notice of this hearing and a copy of the application for the above referenced, along with the cover letter, at least twenty days prior to the hearing set of July 1, 1993, to the parties shown in the application as evidenced by the attached copies of return-receipt cards, and that pursuant to Division Rule 1207, notice has been given at the correct addresses provided by such rule.

Alan Alexander

SUBSCRIBED AND SWORN to before me this 30th day of June, 1993.

Notary Public

My commission expires:
January 8, 1995

**SENDER:**
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Richmond Petroleum
2651 N. Harwood, Ste 300
Dallas, TX 75201-1505

4a. Article Number
P 144 971 339

4b. Service Type
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
JUN 14 1993

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)
L. Williams

PS Form 3811, November 1990 ☆U.S. GPO: 1991—287-066 **DOMESTIC RETURN RECEIPT**

**SENDER:**
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Phillips Petroleum
5525 Hwy NBU 3004
Farmington, NM 87410

4a. Article Number
P 144 971 338

4b. Service Type
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
6-10-93

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

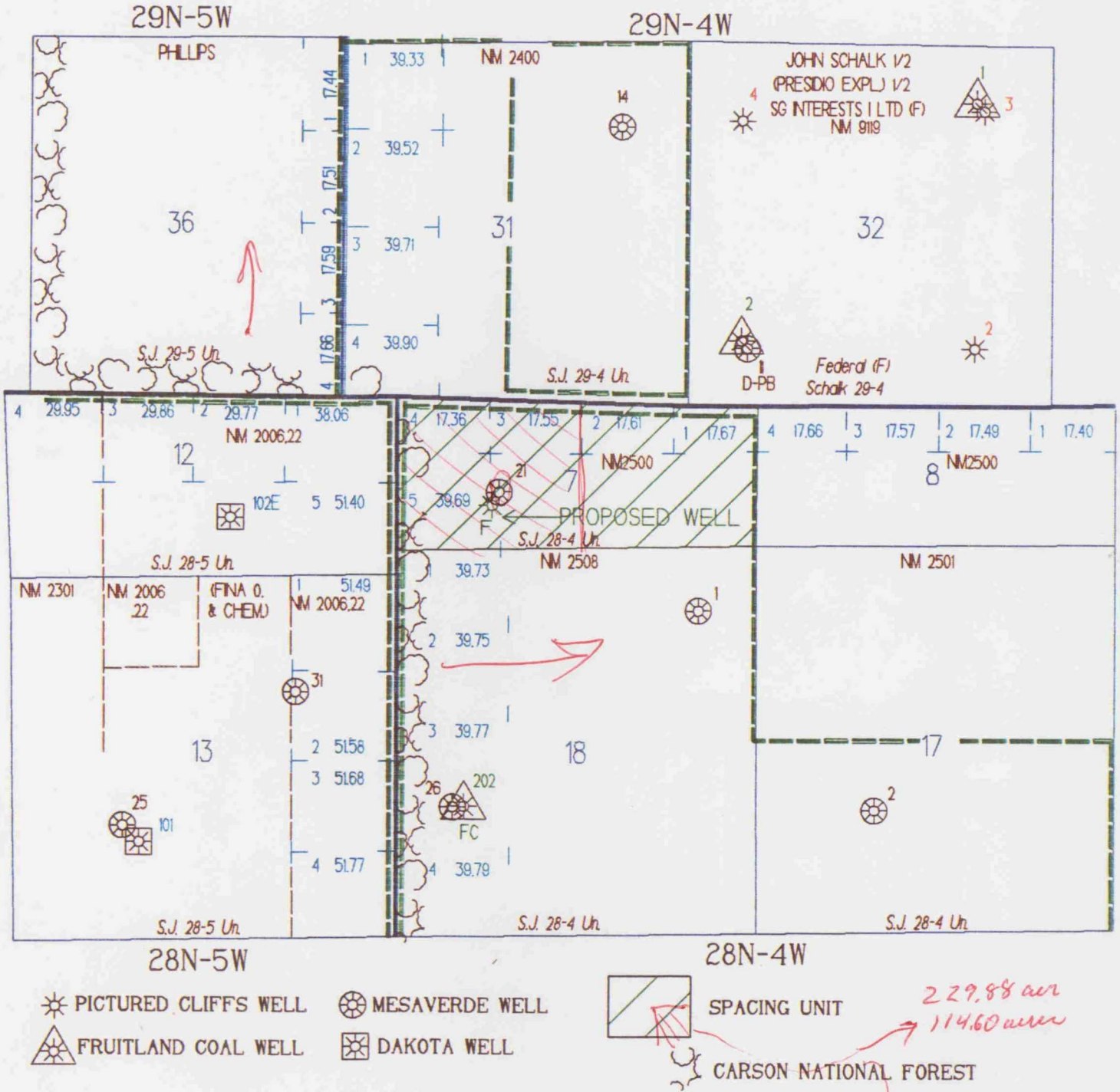
6. Signature (Agent)
Julie Junker

PS Form 3811, November 1990 ☆U.S. GPO: 1991—287-066 **DOMESTIC RETURN RECEIPT**

**EXHIBIT 3**

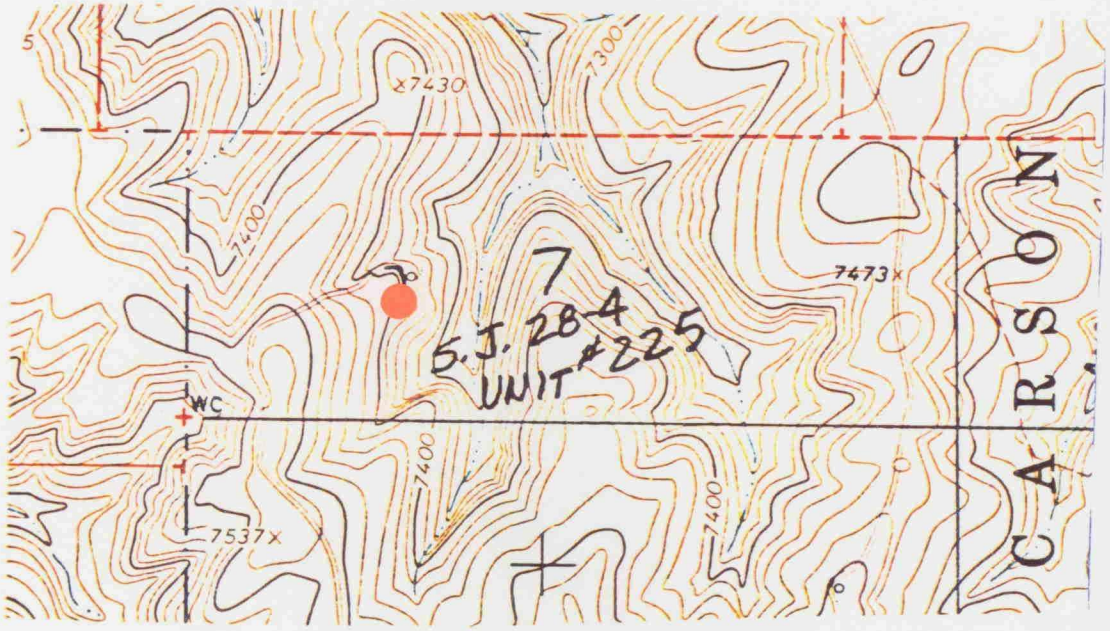
EXHIBIT "A"

# SAN JUAN 28-4 UNIT # 225 WELL
# 695'FSL, 1375'FWL
# SECTION 7-28N-4W




PICTURED CLIFFS WELL
MESAVERDE WELL
FRUITLAND COAL WELL
DAKOTA WELL
SPACING UNIT
229.88 acres
114.60 acres
CARSON NATIONAL FOREST

MOI San Juan 28-4 Unit #225
695' FSL, 1375' FWL
Sec. 7, T28N, R4W, N.M.P.M.
Rio Arriba County, New Mexico




This location staked at these footages due to Forest Service approval and existing terrain, pipelines, and locations.

Neale C. Edwards
N.M. R.L.S. #6857

**EXHIBIT 4**

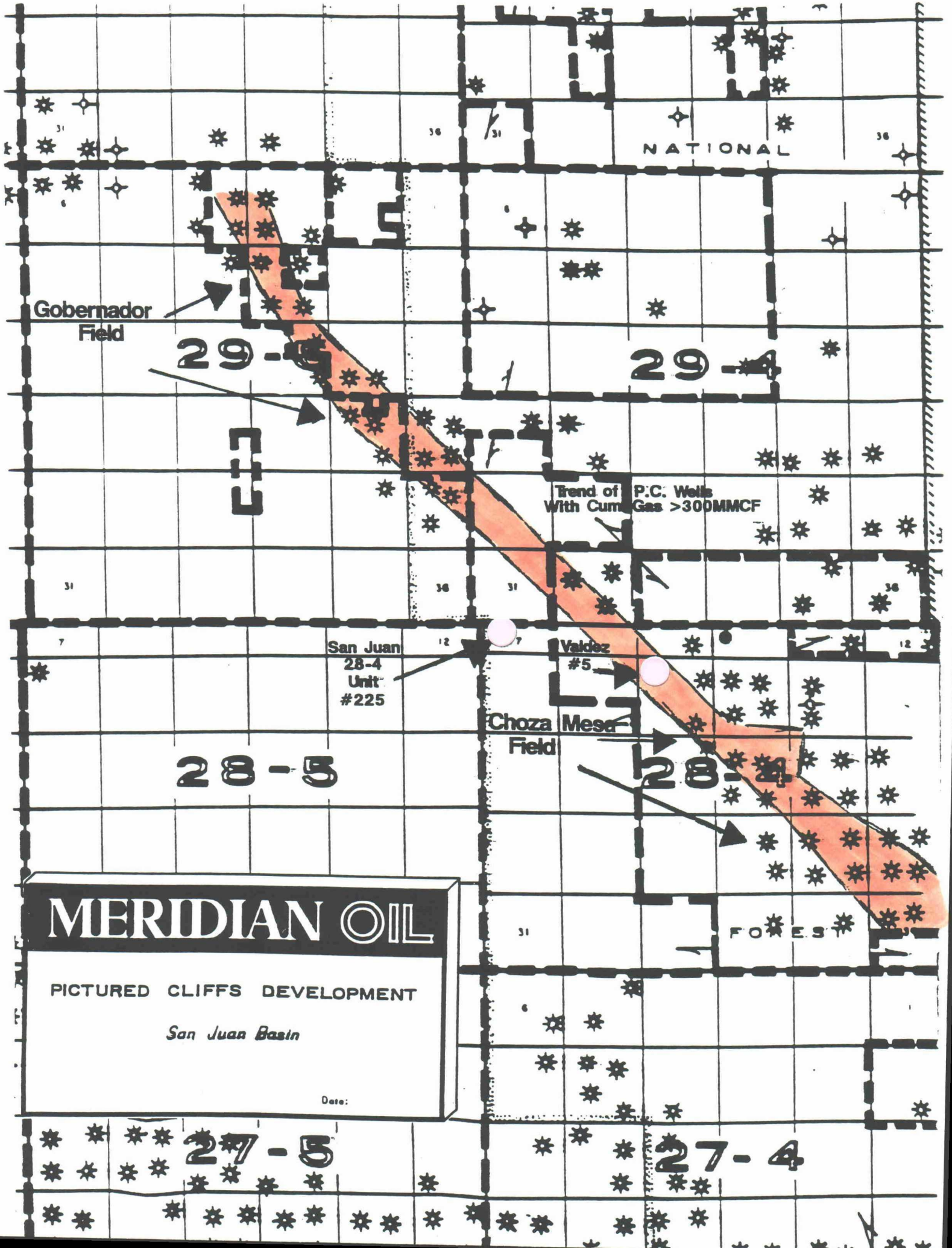
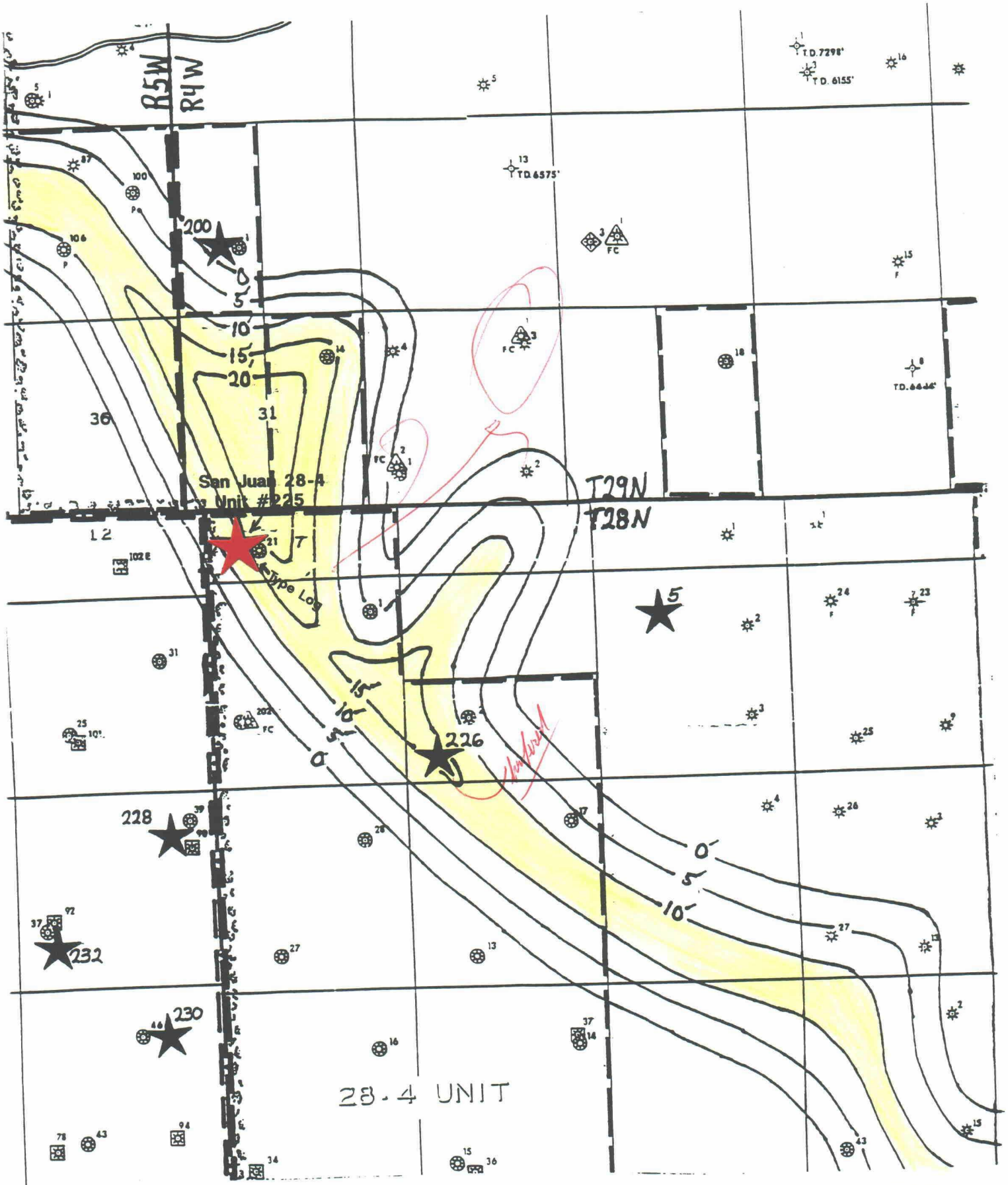

NATIONAL
Gobernador Field
29-5
29-4
Trend of P.C. Wells With Cum Gas >300MMCF
San Juan 28-4 Unit #225
Valdez #5
Choza Mesa Field
28-5
28-4
FOREST
MERIDIAN OIL
PICTURED CLIFFS DEVELOPMENT
San Juan Basin
Date:
27-5
27-4

**EXHIBIT 5**

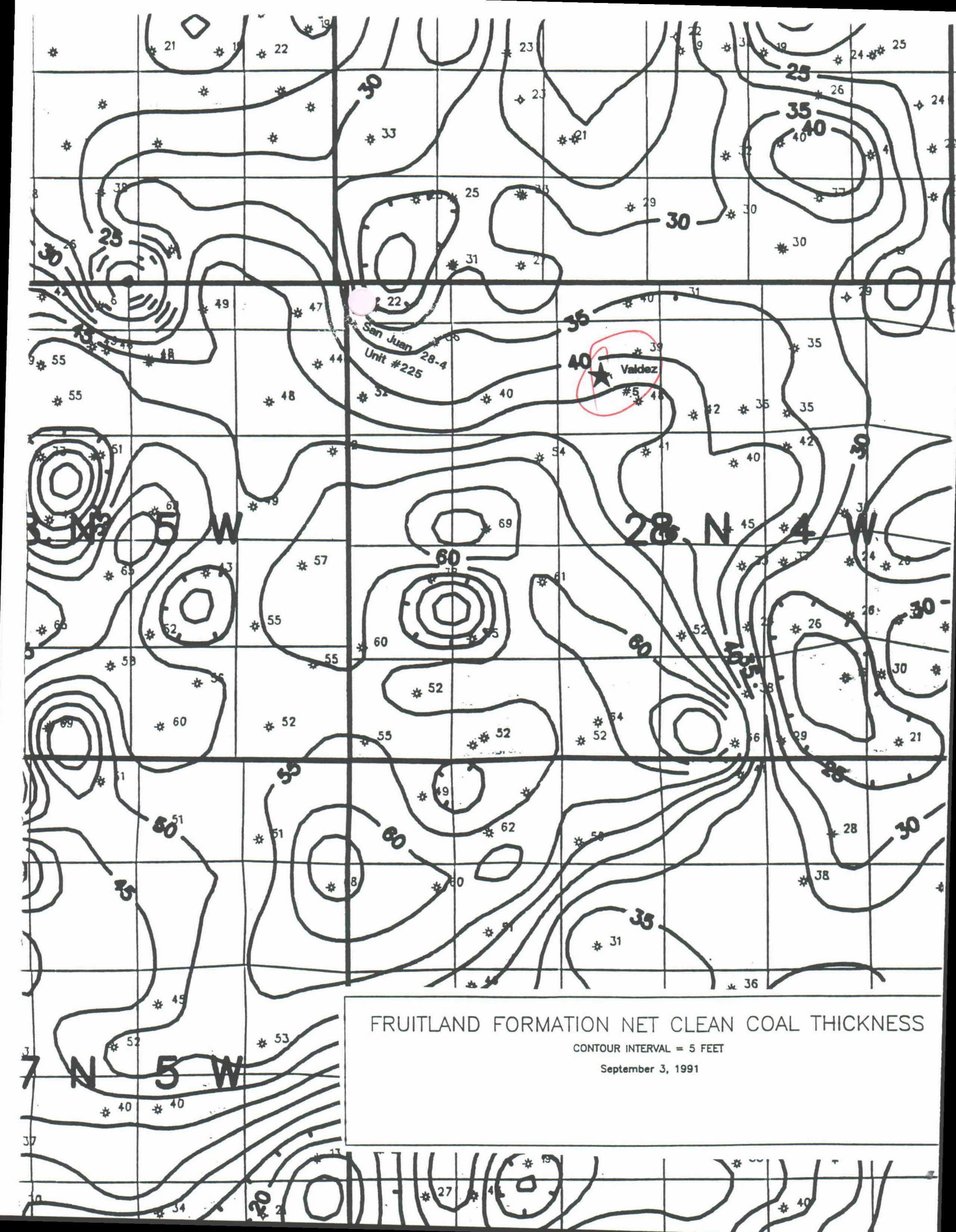



**Upper Pictured Cliffs**

**Net Sandstone Isopach**

**sp > 20mv Res > 20ohm**

**CI: 5ft MKD 11-17-92**

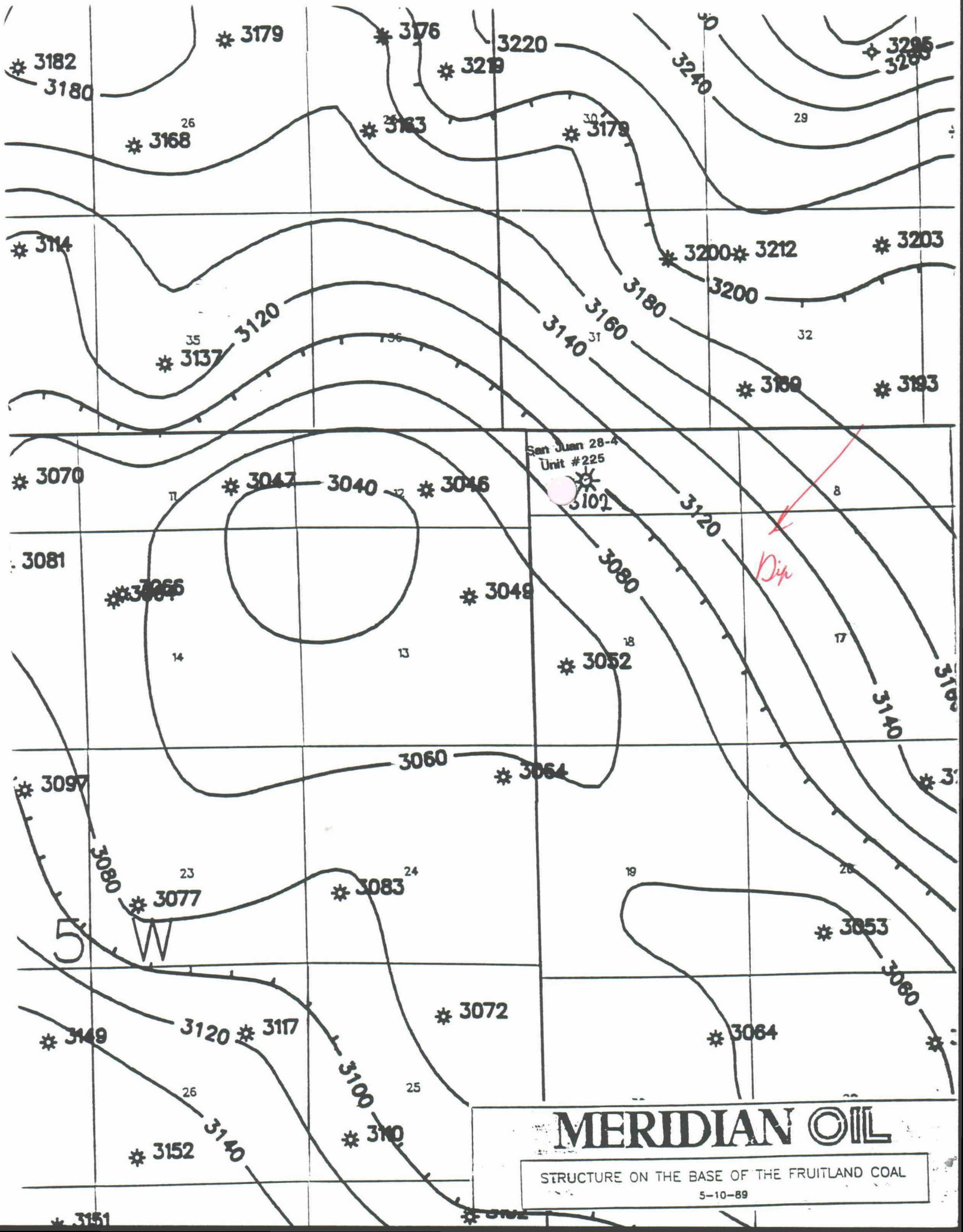



# FRUITLAND FORMATION NET CLEAN COAL THICKNESS

CONTOUR INTERVAL = 5 FEET

September 3, 1991

EXHIBIT 6



3179
3176
3220
3182
3180
3219
3240
3168
3163
3179
3114
3200
3212
3203
3200
3180
3160
3140
3120
3137
3169
3193
San Juan 28-4
Unit #225
3102
3070
3047
3040
3046
3120
3081
3049
3080
Dip
3052
3140
3060
3064
3097
3080
3077
3083
5 W
3053
3060
3072
3149
3120
3117
3064
3100
3140
3152
3110
3151
MERIDIAN OIL
STRUCTURE ON THE BASE OF THE FRUITLAND COAL
5-10-89

**EXHIBIT 7**

ELECTRICAL LOG
GAMMA RAY NEUTRON LOG
INDUCTION LOG

COMPANY EL PASO NATURAL GAS COMPANY
WELL SAN JUAN 28-4 21-7
FIELD BLANCO MV
LOCATION SEC. 7-28N-4W
COUNTY RIO ARRIBA
STATE NEW MEXICO

Location of Well
815' FR S/L
1475' FR W/L
SEC. 7-28N-4W

OTHER SURVEYS
TEMP

7391
Elevation: D.F. ~~7389~~
K.B.:
or G.L. ~~7380~~ 7391

FILING No.

| RUN No. | ONE ES | ONE GRN | ONE IND |
|---|---|---|---|
| Date | 11-7-59 | 11-18-59 | 11-7-59 |
| Reading | 4544 | 6776 | 6772 |
| Reading | 256 | 4100 | 4545 |
| Measured | 4288 | 2676 | 2224 |
| Schlum. | 256 | 4545 | 4545 |
| Driller | 256 | | |
| Depth Reached | 4545 | 6777 | 6777 |
| From Driller | 4545 | 6772 | 6772 |
| Depth Datum | KB | KB | KB |
| Mud Nat. | CHEM GEL | GAS | |
| Density | 9.8 | - | - |
| Viscosity | 62 | - | - |
| Resist. | 2.2 @67 °F | - @ °F | - |
| Res. BHT | 1.4 @117°F | - @ °F | - |
| pH | 8 @ °F | - @ °F | - |
| Wtr. Loss | 8 CC 30 min. | - CC 30 min. | - |
| Max. Temp. °F | 117 | 175 | 175 |

twin well

# S.J. 28-4 UNIT #225

# TYPE LOG

4200

Coals Washed Out

30' Net Coal

Up. PC

4300

Microlog

X-overs

Lwr. PC

4400

4500

**EXHIBIT 8**

# SAN JUAN 28-4 UNIT #225

In order to facilitate an economic Pictured Cliffs completion three requirements must be met. It is the combination of these three requirements that determines the economic status and completion method (PC single completion, PC-FTC Dual, PC-FTC commingle) utilized. These three requirements are as follows:

## RESERVES Np(pc)

## FLOW RATE (Qpci)

## COSTS (Investment and Operating)

Shown in the following example are the parameters and calculations used to determine Pictured Cliffs initial rate (Qpci), Pictured Cliffs Estimated Ultimate Recovery (Np(pc)), and Pictured Cliffs decline rate (Dpc). Additionally, estimated costs associated with each completion method and economic sensitivities (figures 1-3) are attached to show the effects of PC reserves (Np(pc)), initial PC rates (Qpci), and completion method (costs).

This example is for the San Juan 28-4 Unit #225, but the methodology is applicable for each of the subsequent commingle applications to submitted (the Valdez #5 in hearing; the San Juan 29-4 Unit #200, San Juan 28-4 Unit #226, San Juan 28-5 Unit #200, #227, #228, and #232 administratively). The variations in the Np(pc)'s are due to the specific drill block parameters (thickness, porosity, water saturation). Costs will be similar and the economic sensitivities are applicable for each case.

The monthly gas production allocaton formula presented is similar to the allocation formula presented by Meridian Oil in previous commingle hearings.

# SAN JUAN 28-4 UNIT #225

## MONTHLY GAS PRODUCTION ALLOCATION FORMULA

### GENERAL EQUATION

**Qt = Qftc + Qpc**

WHERE: Qt = TOTAL MONTHLY PRODUCTION (MCF/MONTH)

**Qftc = FRUITLAND COAL (ftc) MONTHLY PRODUCTION**
**Qpc = PICTURED CLIFFS (pc) MONTHLY PRODUCTION (MCF/MONTH)**

REARRANGING THE EQUATION TO SOLVE FOR Qftc:

**Qftc = Qt - Qpc**

**ANY PRODUCTION RATE OVER WHAT IS CALCULATED FOR THE PICTURED CLIFFS (PC) USING THE APPLIED FORMULA IS FRUITLAND COAL (FTC) PRODUCTION.**

PICTURED CLIFFS (PC) FORMATION PRODUCTION FORMULA IS:

**Qpc = Qpci X e^{-(Dpc) X (t)}**

WHERE: **Qpci** = INITIAL PC MONTHLY FLOW RATE (CALCULATED FROM FLOW TEST)

**Dpc** = PICTURED CLIFFS MONTHLY DECLINE RATE CALCULATED FROM:
**Dpc = (Qpci-Qpcabd)/Np(pc)**
See Determination of Qpci and PC Estimated Ultimate Recovery (Np(pc))
Qpcabd = 300 MCF/M

WHERE: **Np(pc)** = PICTURED CLIFFS ESTIMATED ULTIMATE RECOVERY (EUR)
**Np(pc) = P X 1.01 MMCF/PSI** X Rf**
P* = INITIAL RESERVOIR PRESSURE (SIBHP)
RF = RECOVERY (FIELD ANALOGY): = 0.95
** DETERMINED FROM MATERIAL BALANCE (FIELD ANALOGY) AND VOLUMETRIC RESERVES (LOG ANALYSIS)

By calculating Np(pc) from SIBHP and determining Qpci, Dpc can then be calculated utilizing the previously described parameters. See derivation of Dpc, item (c) on page 4.

THUS: **Qftc = Qt - Qpci X e^{-(Dpc) X (t)}**
WHERE: **(t) IS IN MONTHS**

REFERENCE: Thompson, R. S., and Wright, J. D., "Oil Property Evaluation", pages 5-2, 5-3, 5-4.

# SAN JUAN 28-4 UNIT #225

## DETERMINATION OF Qpci:
## (INITIAL PICTURED CLIFFS MONTHLY PRODUCTION)

**Qpci = Qt(1) X Qpc(p) / {Qpc(p) + Qftc (p)}**

**WHERE:**

Qt(1) = FIRST MONTH TOTAL PRODUCTION (MCF)

Qpc(p) = FINAL PICTURED CLIFFS FLOW TEST (MCFPD)

Qftc(p) = FINAL FRUITLAND COAL FLOW TEST (MCFPD)

# SAN JUAN 28-4 UNIT #225

EXAMPLE DETERMINATION OF:

| | |
|---|---|
| (a) Np(pc) | PC EUR |
| (b) Qpci | INITIAL PC MONTHLY FLOW RATE |
| (c) Dpc | PC MONTHLY DECLINE RATE |

## (a) DETERMINATION OF Np(pc)

(see page 5 for Np(pc) derivation)

Np(pc) = 1.01 (MMCF/PSI) X P*(PSI) X Rf

P* = 986 PSI (FROM SIBHP)

Np(pc) = 1.01 MMCF/PSI X 986 PSI X 0.95

**Np(pc) = 946.1 MMCF**

## (b) DETERMINATION OF Qpci

Qpci = Qt(1) X {Qpc(p)/(Qpc(p) + Qftc(p))}

| | | |
|---|---|---|
| Qt(1) = | 15,000 MCF | 1ST MONTH TOTAL PRODUCTION |
| Qpc(p) = | 500 MCF/D | PC FLOW TEST |
| Qftc(p) = | 400 MCF/D | FTC FLOW TEST |

Qpci = 15,000 MCF/M X {500 MCF/D/(500 MCF/D + 400 MCF/D)}

**Qpci = 8,333 MCF/M**

## (c) DETERMINATION OF Dpc

Dpc = (Qpci - Qpcabd)/Np(pc)

Qpcabd = 300 MCF/M

Dpc =(8,333MCF/M - 300MCF/M)/(946,100 MCF)

**Dpc = 0.0085/M**

**THUS: Qftc = Qt(MCF/M) - 8,333(MCF/M) X e^{-(0.0085(1/M)) X t(M)}**

# SAN JUAN 28-4 UNIT #225

A. DETERMINATION OF PC RESERVES Np(pc)= (HCPV X Bg X Rf)

Volumetric Evaluation (averages are for subject 160 acre drill block)

| | | | | | |
|---|---|---|---|---|---|
| a. | (t) | thickness | = | 28.0 | ft |
| b. | (phi) | porosity | = | 14.0 | % |
| c. | (Sw) | H2O saturation | = | 44.0 | % |
| d. | (Rf) | Recovery Factor | = | 95.0 | % |
| e. | (rcf) | Reservoir Cubic Feet | @ reservoir conditions | | |
| f. | (scf) | Standard Cubic Feet | @ standard conditions | | |

1. HCPV = HYDROCARBON PORE VOLUME (rcf)

= t (ft) X a (ft^2) X phi X (1-Sw)
= 28 (ft) X 160 (acres) X 43,560 (ft^2/acre) X 0.14 X (1-0.44)
= 15,299,666 ft^3 1mmrcf = 1,000,000 ft^3

**HCPV = 15.300 mmrcf**

2. Bg = FORMATION VOLUME FACTOR (scf/rcf)

UTILIZING THE REAL GAS LAW TO DETERMINE THE FORMATION VOLUME FACTOR (Bg):

REAL GAS LAW states: P V = Z n R T

Rearranging to solve for n: n = P V / Z R T

assuming: **nr = ns**

WHERE: **nr** = NUMBER OF MOLES OF GAS AT RESERVOIR CONDITION

**ns** = NUMBER OF MOLES OF GAS AT SURFACE CONDITIONS

THUS: Pr Vr/ Zr Tr R = Ps Vs / Zs Ts R

Rearranging: Vs/Vr = Bg = Zs Ts Pr / Zr Tr Ps

assuming:

| | | | | |
|---|---|---|---|---|
| Zs | = | 1.00 | | |
| Zr | = | 0.94 | | |
| Ts | = | 60 | *F | or 520 *R |
| Tr | = | 100 | *F | or 560 *R |
| Ps | = | 15.025 psia | | |
| Pr | = | Determined from build-up test | | |

Bg = FORMATION VOLUME FACTOR (scf/rcf)= Zs Ts Pr / Zr Tr Ps

= (scf/rcf) {1.00 X 520 (*R) X Pr (psia)}/ {0.94 X 560 (*R) X 15.025 (psia)}

**Bg = 0.0657 {scf/ (rcf psia)} X Pr (psia)**

3. EUR = HCPV X Bg X Rf

= 15.300 (mmrcf) X 0.0657 {scf/(rcf psia)} X Pr (psia) X 0.95

**Np(pc) = 1.01 (mmscf/psia) X Pr (psia) X 0.95**

# SAN JUAN 28-4 UNIT #225

## B. PICTURED CLIFFS DRILLING /COMPLETION COST SUMMARY

### 1. STAND ALONE SINGLE PC COMPLETION

| ESTIMATED COSTS: | TANGIBLE (M$) | INTANGIBLE (M$) | TOTAL (M$) |
|---|---|---|---|
| | 115.00 | 209.75 | 324.75 |

### 2. FTC/PC DUAL COMPLETION*

| ESTIMATED COSTS: | TANGIBLE (M$) | INTANGIBLE (M$) | TOTAL (M$) |
|---|---|---|---|
| | 127.20 | 144.34 | 271.54 |

### 3. FTC/PC COMMINGLE COMPLETION*

| ESTIMATED COSTS: | TANGIBLE (M$) | INTANGIBLE (M$) | TOTAL (M$) |
|---|---|---|---|
| | 58.90 | 141.45 | 200.35 |

*PICTURED CLIFFS COSTS ONLY

## C. ECONOMIC SUMMARY

**FIGURES 1-3 PICTURED CLIFFS RESERVES VS RATE OF RETURN (%)**

THREE CASES PER FIGURE (FTC/PC COMMINGLE, FTC/PC DUAL, PC SINGLE)

**FIGURE 1 INITIAL RATE = 100 MCF/D**
**FIGURE 2 INITIAL RATE = 200 MCF/D**
**FIGURE 3 INITIAL RATE = 300 MCF/D**

# SAN JUAN 28-4 UNIT #225

**Expected Reservoir Pressures**

Pictured Cliffs - Average of the 2 closest PC completions is 1041 psi SICP (pressures range from 1017 psi to 1065 psi). All of the completions are 2-3 miles east and northeast and 1-2 miles northeast of the subject location in T29N, R04W. The initial pressure at the subject location is expected to be the offsetting PC average of 1041 psi.

Fruitland Coal - Average of the 3 closest FTC completions is 1078 psi SICP (pressures range from 635 to 1459 psi). All of the completions are 1-2 miles south and northeast of the subject location within T28N, R04W and T29N, R04W. The pressure at the subject location is expected to be the offset FTC average of 1078 psi.

**PC - 1041 psi, FTC - 1078 psi. Within limits of pressure requirements for commingling.**

**Fluid Compatibility**

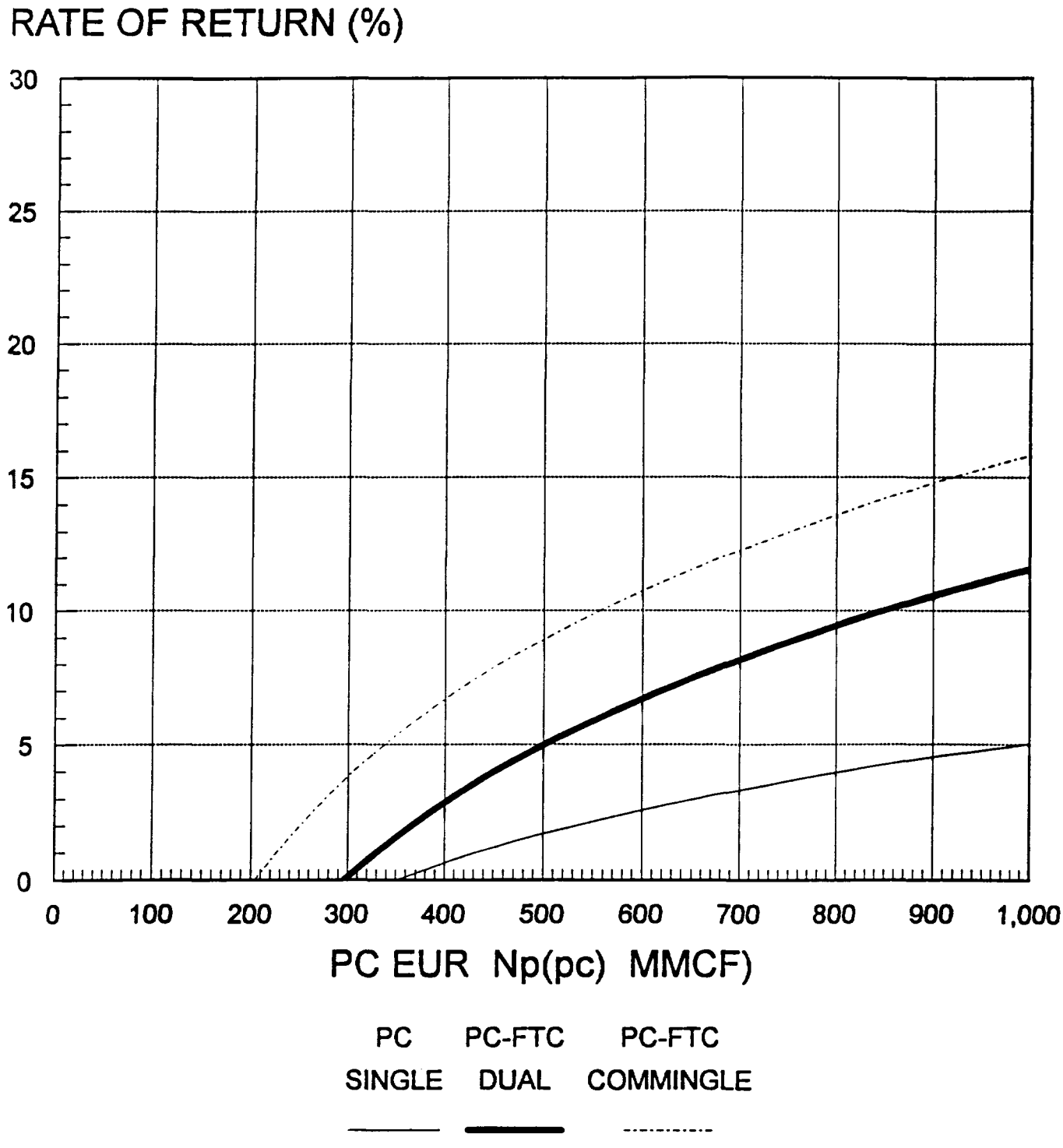
Neither producing formation makes oil or water in existing wells in the area. Both formations are very dry gas producers and no fluid production is anticipated in this well.

**PC - dry gas production , FTC - dry gas production. Only natural gas will be produced so fluids are compatible.**

# PICTURED CLIFFS

## ECONOMIC EVALUATION

## COMPLETION TECHNIQUE SENSITIVITY



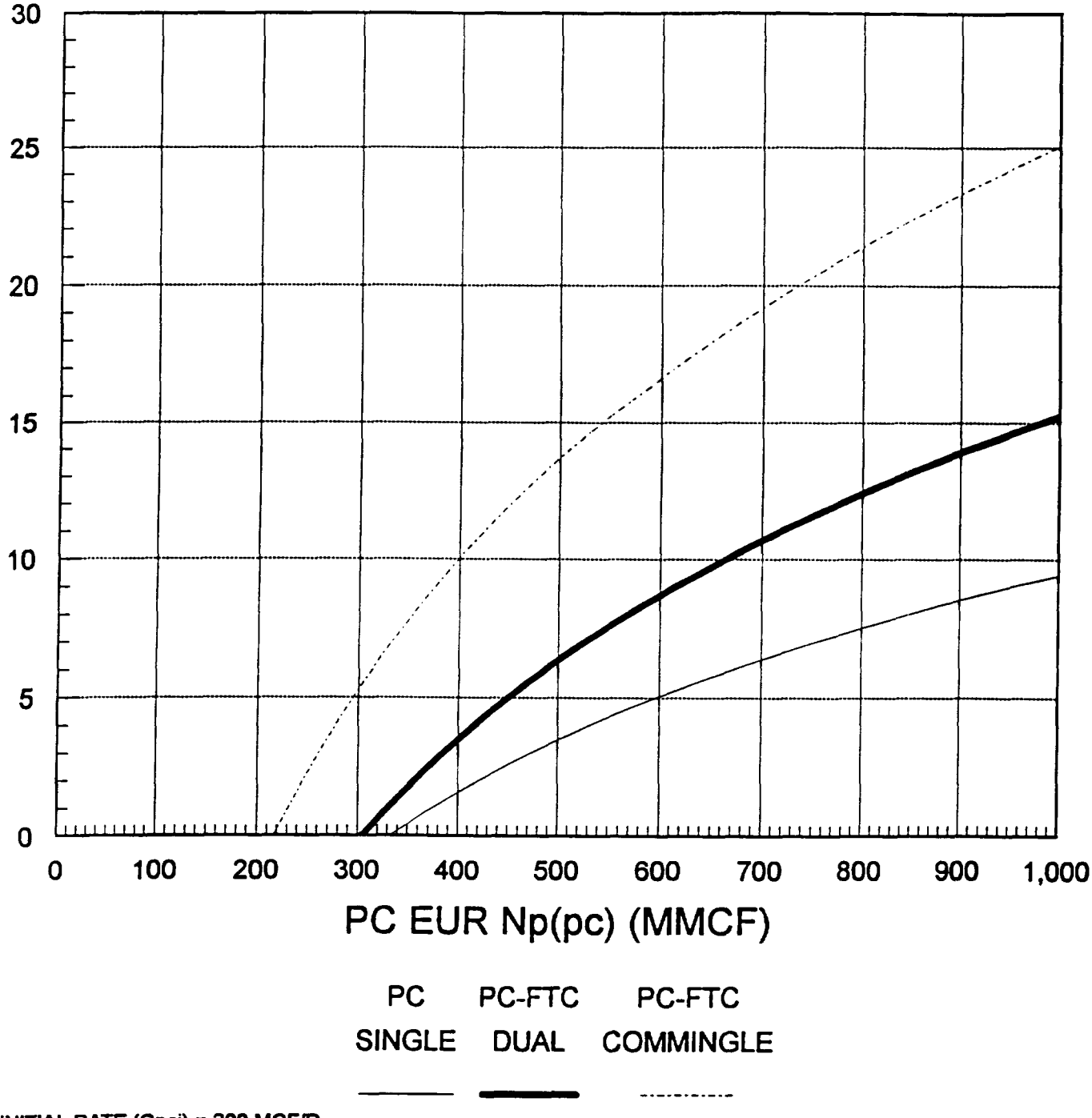

INITIAL RATE (Qpci) = 100 MCF/D
OR 3,000 MCF/M

FIGURE 1

# PICTURED CLIFFS

## ECONOMIC EVALUATION

## COMPLETION TECHNIQUE SENSITIVITY



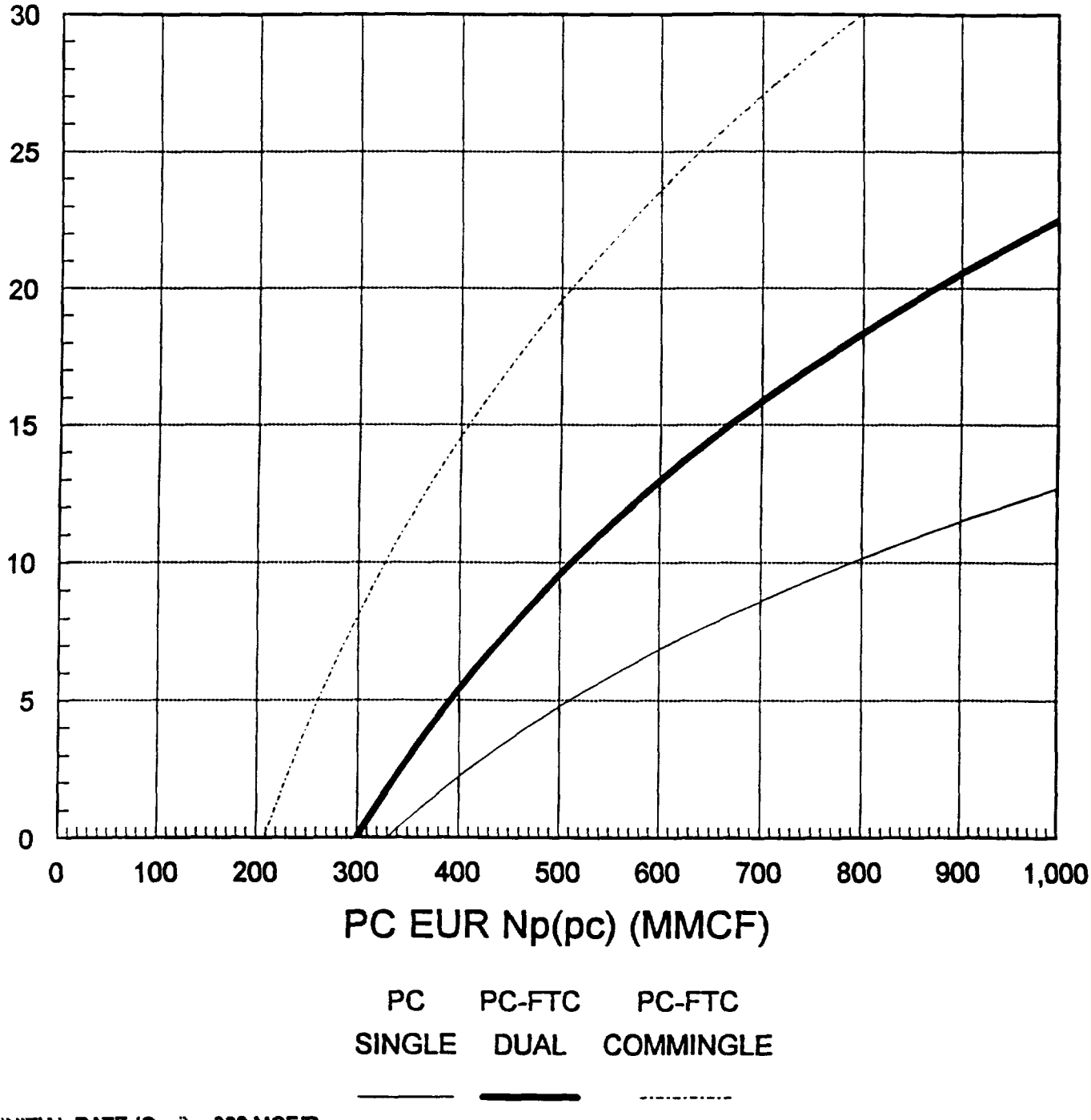

INITIAL RATE (Qpci) = 200 MCF/D
OR 6,000 MCF/M

FIGURE 2

# PICTURED CLIFFS

## ECONOMIC EVALUATION

## COMPLETION TECHNIQUE SENSITIVITY




INITIAL RATE (Qpci) = 300 MCF/D
OR 9,000 MCF/M

FIGURE 3