

11/04/91

09:20

713 780 5398

BHP PET. IBU 33

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**COPY**

5847 San Felipe Suite 3600  
Houston, Texas 77057  
Telephone: (713) 780-6000  
FAX (713) 780-5273  
Telex 9108813903

October 9, 1991

State of New Mexico  
Oil Conservation Division  
P. O. Box 2088  
Santa Fe, New Mexico 87504-2088



**BHP**  
**Petroleum**  
(Americas) Inc

RE: Unorthodox Location, Administrative Approval Request  
Gallegos Canyon Unit #518  
1225' FSL & 1150' FWL  
Sec. 25, T29N, R12W  
San Juan, NM.

Gentlemen:

BHP Petroleum respectfully requests that a non-standard location be administratively approved to allow the GCU #518 well to be drilled 1225' FSL and 1150' FWL to be completed in the Pictured Cliffs formation.

The non-standard location is requested due to topographical reasons. A standard location would interfere with residential dwellings and development of the San Juan Estates by Mr. Carroll E. Crawford. The location is requested to minimize landowner disruption and surface damage.

The subject location is immediately adjacent to the existing Amoco well location #143 E producing from the Dakota Formation.

For both economical and mechanical reasons BHP does not think that directionally drilling the proposed well to a standard location is feasible. Economically it is not feasible based on the extra expense of drilling a directional hole compared to the anticipated production. Our experience has shown that a rod pump will have to be installed to remove excess water from the well bore and a directionally drilled hole would greatly hinder or prohibit that.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Carl Kolbe  
Regulatory Affairs Coordinator  
(713) 780-5301

Submit to Appropriate District Office  
State Lease - 6 copies  
Fee Lease - 5 copies

State of New Mexico  
Energy, Minerals and Natural Resources Department

Copy

Form C-101  
Revised 1-1-89

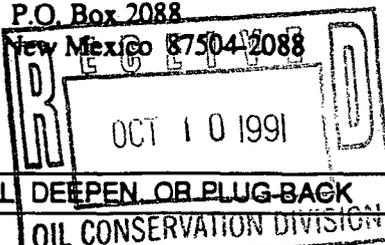
OIL CONSERVATION DIVISION

DISTRICT I  
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II  
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III  
1000 Rio Brazos Rd., Aztec, NM 87410

Santa Fe, New Mexico 87504-2088



API NO. (assigned by OCD on New Wells)  
30-045-28600  
5. Indicate Type of Lease  
STATE  FEE   
6. State Oil & Gas Lease No.

APPLICATION FOR PERMIT TO DRILL DEEPEN OR PLUG-BACK

1a. Type of Work: DRILL  RE-ENTER  DEEPEN  PLUG BACK   
b. Type of Well: OIL WELL  GAS WELL  OTHER  SINGLE ZONE  MULTIPLE ZONE   
2. Name of Operator: BHP Petroleum (Americas) Inc.  
3. Address of Operator: 5847 San Felipe Suite 3600 Houston, Texas 77057  
4. Well Location: Unit Letter M : 1225 Feet From The South Line and 1150 Feet From The West Line  
Section 25 Township 29N Range 12W NMPM San Juan County

7. Lease Name or Unit Agreement Name: Gallegos Canyon Unit  
8. Well No.: 518  
9. Pool name or Wildcat: W. Kutz Pictured Cliffs  
10. Proposed Depth: 1700'  
11. Formation: Pictured Cliffs  
12. Rotary or C.T.: Rotary  
13. Elevations (Show whether DF, RT, GR, etc.): 5464 GR  
14. Kind & Status Plug Bond: Blanket  
15. Drilling Contractor: Unknown  
16. Approx. Date Work will start: As soon as approved

17. PROPOSED CASING AND CEMENT PROGRAM

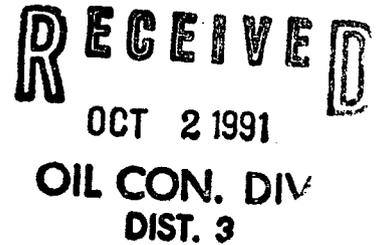
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
8 3/4"	7"	20#	140'	50sx	Surface
6 1/4"	4 1/2"	10.5#	1700'	230sx	Surface

It is proposed to drill the subject well to 1700' with the primary production anticipated from the Pictured Cliffs formation.

Estimated Formation Tops:

- Ojo Alamo 150'
- Kirtland Sh 291'
- Fruitland Fm 1163'
- Upper Fruitland Coal 1200'
- Basal Fruitland Coal 1482'
- Pictured Cliffs 1483'
- TD 1700'

APPROVAL EXPIRES 4-2-92  
UNLESS DRILLING IS COMMENCED,  
SPUD NOTICE MUST BE SUBMITTED  
WITHIN 10 DAYS.



B.O.P.E. will consist of a 2000# Reagan bladder type preventor, pipe rams and blind ram B.O.P.E.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: IF PROPOSAL IS TO DEEPEN OR PLUG BACK, GIVE DATA ON PRESENT PRODUCTIVE ZONE AND PROPOSED NEW PRODUCTIVE ZONE. GIVE BLOWOUT PREVENTER PROGRAM, IF ANY.

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

SIGNATURE Carl Kolbe TITLE Regulatory Affairs Coordinator DATE 10/1/91  
TYPE OR PRINT NAME Carl Kolbe TELEPHONE NO. (713) 780-5301

(This space for State Use)

APPROVED BY \_\_\_\_\_ TITLE SUPERVISOR DISTRICT # 3 DATE OCT 02 1991

CONDITIONS OF APPROVAL, IF ANY:

*Hold 104 for NSZ*

Submit to Appropriate District Office  
 State Lease - 4 copies  
 Fee Lease - 3 copies

State of New Mexico  
 Energy, Minerals and Natural Resources Department

Form C-102  
 Revised 8-1-89

**OIL CONSERVATION DIVISION**

P.O. Box 2088  
 Santa Fe, New Mexico 87504-2088

**DISTRICT I**  
 P.O. Box 1980, Hobbs, NM 88240

**DISTRICT II**  
 P.O. Drawer DD, Artesia, NM 88210

**DISTRICT III**  
 1000 Rio Brazos Rd., Aztec, NM 87410

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

All Distances must be from the outer boundaries of the section

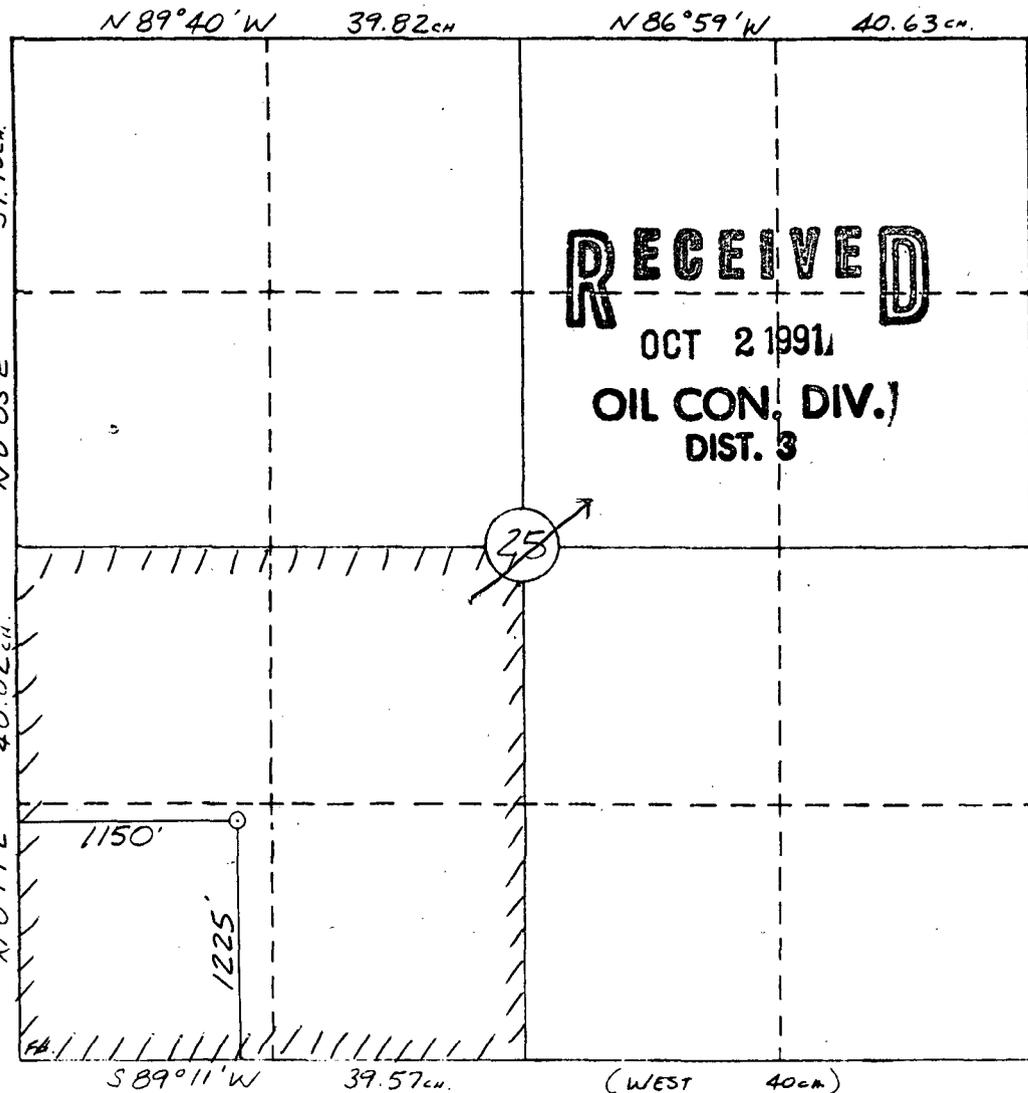
Operator <b>BHP PETROLEUM (AMERICAS) INC.</b>		Lease <b>GALLEGOS CANYON UNIT</b>		Well No. <b>518</b>
Unit Letter <b>M</b>	Section <b>25</b>	Township <b>29 N</b>	Range <b>12 W</b>	County <b>San Juan</b>
Actual Footage Location of Well: <b>1225</b> feet from the <b>South</b> line and <b>1150</b> feet from the <b>West</b> line				
Ground level Elev. <b>5464</b>	Producing Formation <b>Pictured Cliffs</b>	Pool <b>W. Kutz Pictured Cliffs</b>	Dedicated Acreage: <b>160</b> Acres	

- Outline the acreage dedicated to the subject well by colored pencil or hatchure marks on the plat below.
- If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
- If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, unitization, force-pooling, etc.?
 

Yes     No    If answer is "yes" type of consolidation \_\_\_\_\_

If answer is "no" list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.)

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interest, has been approved by the Division.



**OPERATOR CERTIFICATION**

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

Signature: *Carl Kolbe*  
 Printed Name: Carl Kolbe  
 Position: Regulatory Affairs Coordinator  
 Company: BHP Petroleum (Americas) Inc.  
 Date: 10/1/91

**SURVEYOR CERTIFICATION**

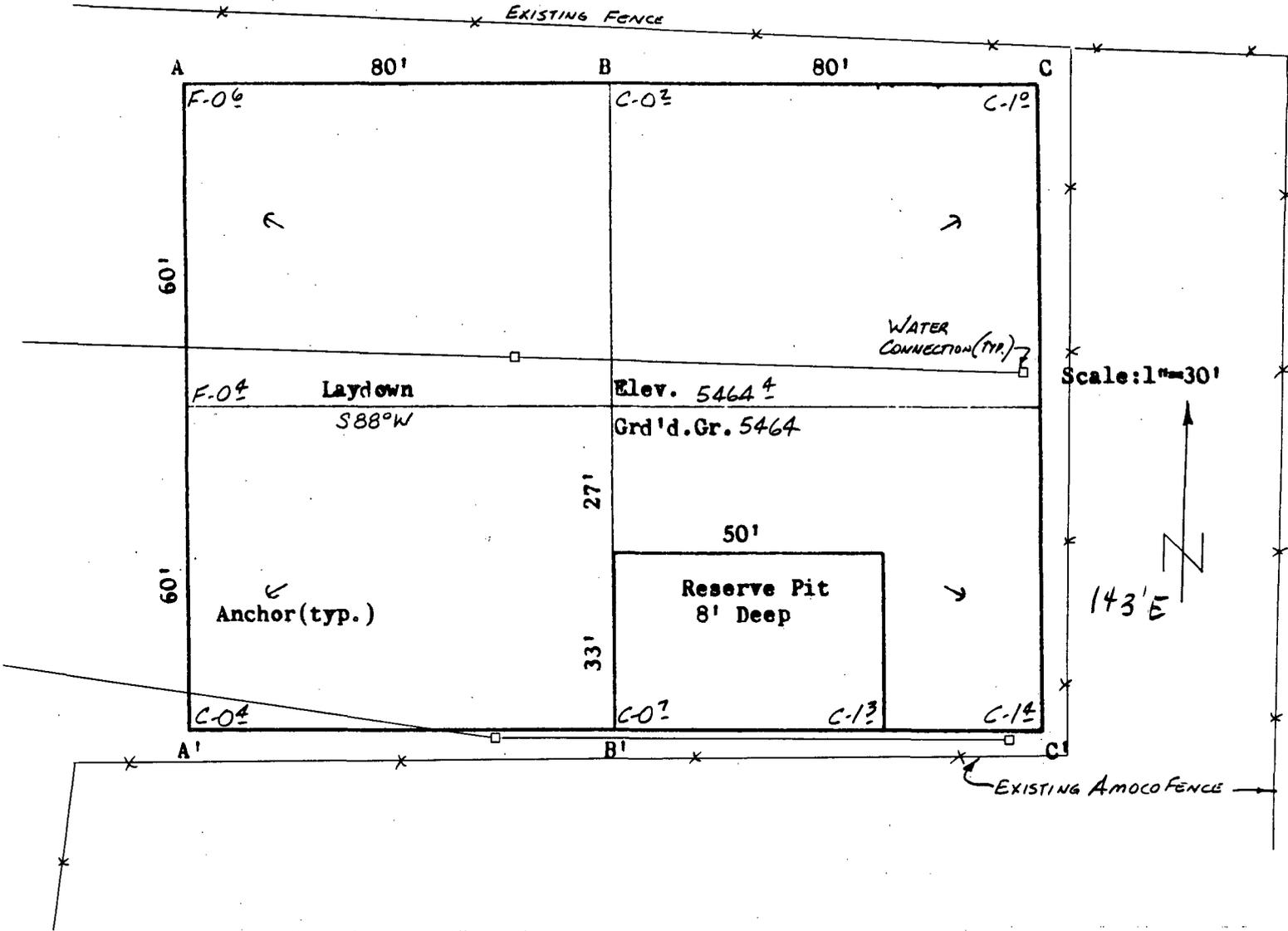
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

9-24-91

Date Surveyed: William E. Mahnke II

Signature & Seal of Professional Surveyor  
 William E. Mahnke II  
 #8466  
 State of New Mexico  
 Professional Land Surveyor

BHP PETROLEUM (AMERICAS) INC.  
 G.C.U. #518  
 1225'FSL & 1150'FWL  
 Sec.25, T29N, R12W  
 San Juan Co., N.M.



A-A'      Vert: 1" = 30'    Horiz: 1" = 100'      C/L

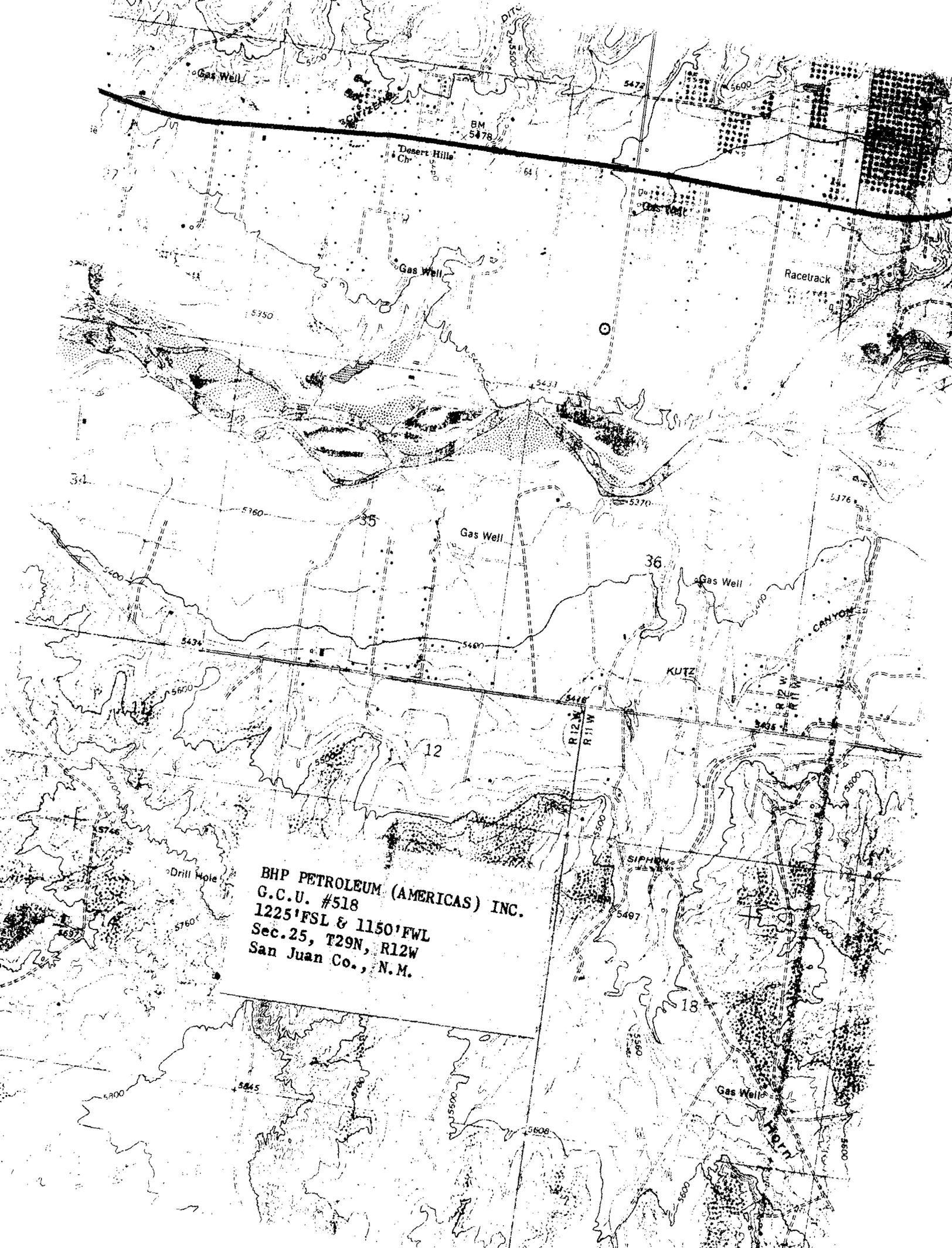
5470	-----	-----	-----	-----	-----	-----
5460	-----	-----	-----	-----	-----	-----

B-B'

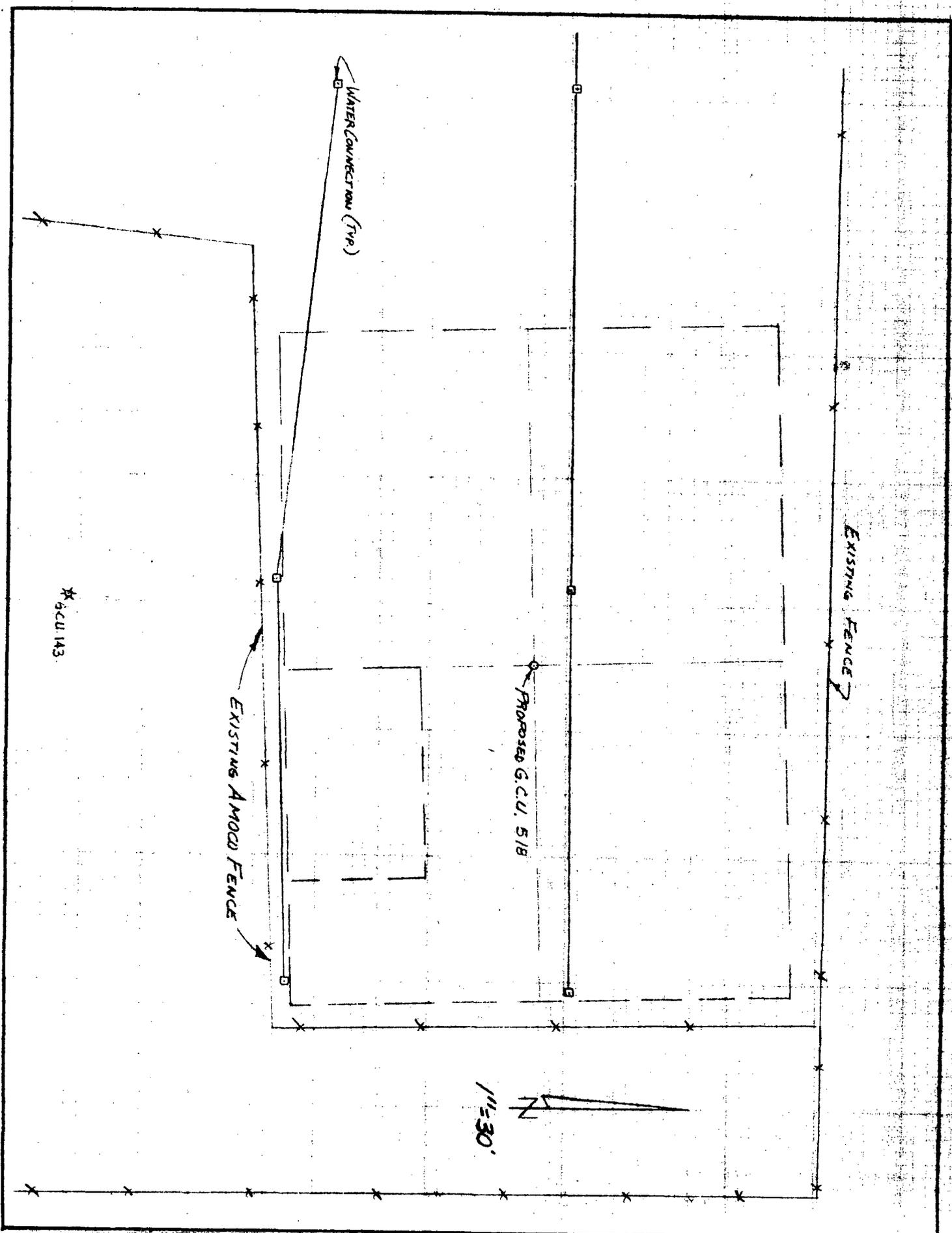
5470	-----	-----	-----	-----	-----	-----
5460	-----	-----	-----	-----	-----	-----

C-C'

5470	-----	-----	-----	-----	-----	-----
5460	-----	-----	-----	-----	-----	-----



BHP PETROLEUM (AMERICAS) INC.  
G.C.U. #518  
1225' FSL & 1150' FWL  
Sec. 25, T29N, R12W  
San Juan Co., N.M.



WATER CONNECTION (TYP)

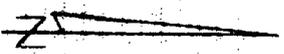
EXISTING FENCE

PROPOSED G.C.U. 518

EXISTING AMOCD FENCE

\* 9CU 1A3

1"=30'



BHP PETROLEUM (AMERICAS) INC.  
GALLEGOS CANYON UNIT NO. 518  
SW SECTION 25-T29N-R12W  
SAN JUAN COUNTY, NEW MEXICO

TEN POINT PROGRAM

1. Surface Formation: Nacimiento or valley fill
2. &
3. Estimated Formation Tops:

<u>Formation</u>	<u>Top</u>	<u>Expected Production</u>
Ojo Alamo	150'	
Kirtland Sh	291'	
Fruitland Fm	1163'	
Upper Fruitland Coal	1200'	Gas
Basal Fruitland Coal	1482'	Gas
Pictured Cliffs	1483'	Gas
Total Depth	1700'	

4. Casing and Cementing Program: A string of 7" 20# K-55 ST&C casing will be set at ±140' in an 8-3/4" hole and cemented to the surface in a single stage with 50 sx Class "B" cement (yield 1.18 cf/sk) containing 3% CaCl<sub>2</sub> and 1/4 lb/sk celloflake. Slurry volume assumes 100% excess over calculated hole volume. If the cement job does not circulate to surface, cement will be topped off using 1" pipe down the 8-3/4" by 7" annulus. Centralizers will be run on the bottom two joints as long as boulders are not encountered while drilling the surface hole. If boulders are encountered while drilling the surface hole, no centralizers will be run. Minimum clearance between couplings and hole is 1.094". Prior to drilling out the shoe, casing and BOPE will be tested to a minimum of 2000 psi. Safety factors utilized in the design of this casing string were: burst = 1.1; collapse = 1.125; and tension = 1.8 or 100,000 lb overpull, whichever is greater.

A production string of 4-1/2" 10.5# K-55 ST&C casing will be run from the surface to total depth in a 6-1/4" hole. This string will be cemented to the surface with a minimum of 180 sx of 50-50 pozmix containing 2% gel, 10% salt and 1/4 lb/sk celloflake (yield = 1.26 cf/sk) followed by 50 sx of Class "B" cement containing fluid loss additive (yield = 1.18 cf/sk). Slurry volume assumes a 50% excess over calculated hole volume. Cement volume is subject to change after review and recalculation of hole volume from the open hole calipers. If the primary cement job does not circulate to surface, the cement will be topped off using 1" pipe down the 6-1/4" by 4-1/2" annulus. Centralizers will be spaced such that a minimum of two are located above and two are located below the Basal Fruitland Coal; and, a minimum of

**GALLEGOS CANYON UNIT #518  
TEN POINT PROGRAM, continued**

one centralizer will be run just below the base and another into the base of the Ojo Alamo. Minimum clearance between couplings and hole is 1.25". Prior to perforating the casing for any attempted completion, the casing will be tested to a minimum of 2500 psi. Safety factors utilized in the design of this casing string were: burst = 1.1; collapse = 1.125; and tension = 1.8 or 100,000 lb overpull, whichever is greater.

Following the completion of the cementing operations, a sundry notice detailing the cement volumes and densities for each job will be submitted.

5. **Pressure Control Equipment:** (See attached schematic diagrams.) A minimum of a 2M psi BOP well control system will be utilized. BOP's and choke manifold will be installed and pressure tested before drilling out under surface casing and then will be checked daily as to mechanical operation condition. Ram type preventors will be tested to 2M psi. The annular preventor will be tested to 50% of its working pressure.

A full opening internal blowout preventor or drill pipe safety valve will be on the drill floor at all times and will be capable of fitting all connections.

6. **Mud Program:** A fresh water low solids, non-dispersed mud system will be used to drill this well. Sufficient materials will be on location at all times to maintain mud properties and to control any unforeseen lost circulation problems or abnormal pressures in the Farmington sands within the Kirtland formation. All drilling fluids will be contained in an earthen pit. At the completion of drilling, the drilling fluid will be hauled off to be used for another well. The remaining accumulation of solids in the pit will be allowed to dry out and the pit will be covered up.

Mud program summary is as follows:

<u>Interval(ft)</u>	<u>Mud Weight(ppg)</u>	<u>Viscosity(sec/qt)</u>
0 - 1000	8.4 or less	30 - 38
1000 - TD	9.3 or less	40 - 55

7. **Auxiliary Equipment:** An upper kelly cock with handle available will be utilized. At a minimum, a flow sensor will be installed in the system and the mud volume will be visually monitored constantly.
8. **Logging Program:** SP-DIL and GR-FDC-CNL logs will be run from TD to surface casing shoe depth.

**GALLEGOS CANYON UNIT #518  
TEN POINT PROGRAM, continued**

Coring Program: No cores are planned.

Testing Program: No tests are planned.

Stimulation Program: Perforate the Pictured Cliffs Sand with 4 JSPF and fracture stimulate with a minimum of 30,000 lbs of 20/40 mesh sand in either a 70 quality nitrogen foam system or a cross-linked gelled water system.

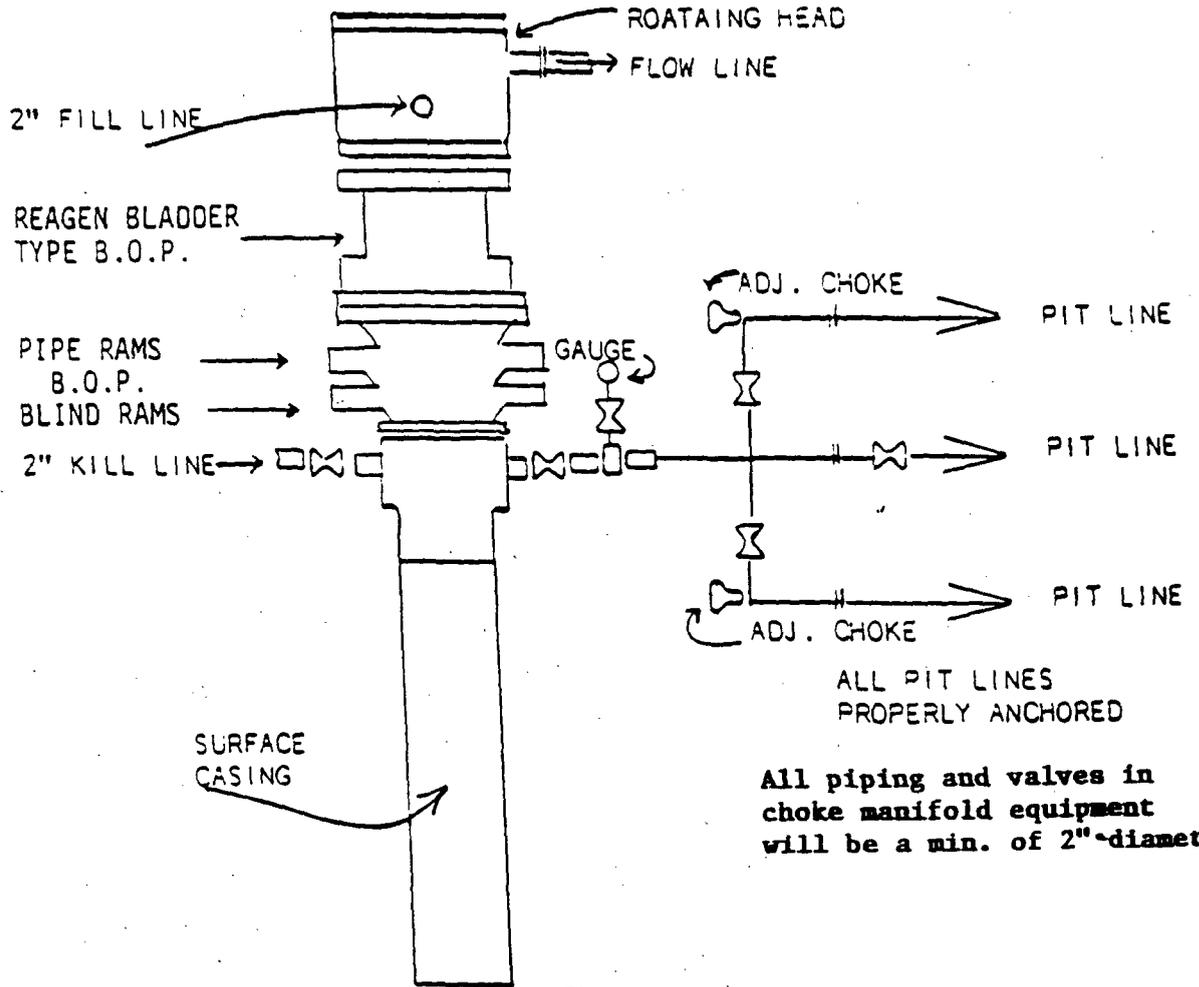
9. Abnormal Pressure: Although not expected, abnormal pressures are possible in the Farmington sands of the Kirtland formation.

Estimated Bottom Hole Pressure: 600 psi

10. Anticipated Starting Date: As soon as all required approvals are received.

Duration of Operation: It is estimated that a total of 4 days will be required for drilling operations and 5 days for completion operations.

2M SYSTEM



ALL PIT LINES  
PROPERLY ANCHORED

**All piping and valves in  
choke manifold equipment  
will be a min. of 2"-diameter.**



STATE OF NEW MEXICO  
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

This application has been approved with the following conditions:

1. Trash is to be taken to a sanitary landfill, not buried at the wellsite, unless approved by the landowner.
2. Wells which produce oil during cleanup and testing shall be flowed through a separator and the oil recovered in a tank.
3. Cement quantities shall be reported in cubic feet on all reports, with a description of cement type, additives, and different slurries used and calculated yield.
4. Casing and cementing reports must show water shutoff test, as required by Rule 107(C).
5. Reports of commencement of drilling operations must be filed within 10 days of spud, as required by Rule 1103.
6. It is the responsibility of the operator to make the appropriate contracts and arrangements with surface owners prior to commencing activities.



STATE OF NEW MEXICO  
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

San Juan Basin OCD Casing Cementing Policy

1. Cement must be circulated around surface pipe. If cement cannot be circulated, the top of the cement column shall be determined by temperature survey or other method approved by the OCD Aztec District Office.
2. All subsequent casing strings shall be cemented a minimum of 100' into the next shallower string.

If cement is not circulated on any string, the cement top shall be determined by temperature survey, CBL, or other method approved by the OCD Aztec District Office.

3. Minimum surface pipe requirements:

<u>Well Depth</u>	<u>Surface Pipe</u>
0-3000	120'
3001-5000	200'
5001-8000	320'
8001+	Consult with District Office

Wells drilled in valley fill areas must have surface pipe set at least 50' below the fill.

Minimum requirements may be modified as necessary to comply with Rule 106 and Rule 107. Special pool rules may apply.

Proposed casing plans may be modified by the Aztec District Office to address special conditions.

No C-104 will be approved for a well until all pressure tests and cement tops are reported in compliance with Rule 1103 B. (2).

Operators of wells being drilled on State or Fee lands shall notify the Aztec District Office at least 6 hours before cementing any casing string.



STATE OF NEW MEXICO  
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

M-E-M-O-R-A-N-D-U-M (3-90-11)

TO: OPERATORS DRILLING FOR OIL AND GAS IN THE SAN JUAN BASIN  
OF NEW MEXICO

FROM: Ernie Busch, Geologist District III

SUBJECT: Drill Cuttings Samples

DATE: November 30, 1990

A representative of the U.S. Geological Survey has informed us that they have enough samples from the Fruitland formation to establish a basin wide map for vitrinite reflectance. However, they do not have enough from the Menefee Coal interval of the Mesaverde formation.

As a condition of approval to drill, you are required to submit 4 4" x 6" sample bags of drill cuttings from the Menefee Coal interval if it is penetrated and drilling conditions permit. If a geologist is used, a copy of that recording from 50 feet above to 50 feet below the coal intervals will be submitted. The following information will be included:

- Operator name
- Well name and number
- Footage location, Section, Township and Range
- Date taken
- The name and address of the person in your company who is to receive a copy of the analysis.

Submit samples, information, and geologist to the following address:

Mr. Vito Nuccio  
U.S. Geological Survey  
P.O. Box 25046, MS 939 DFC  
Lakewood, CO 80225

These samples will be analyzed for vitrinite reflectance values and added to a data base available from the USGS in periodic reports.

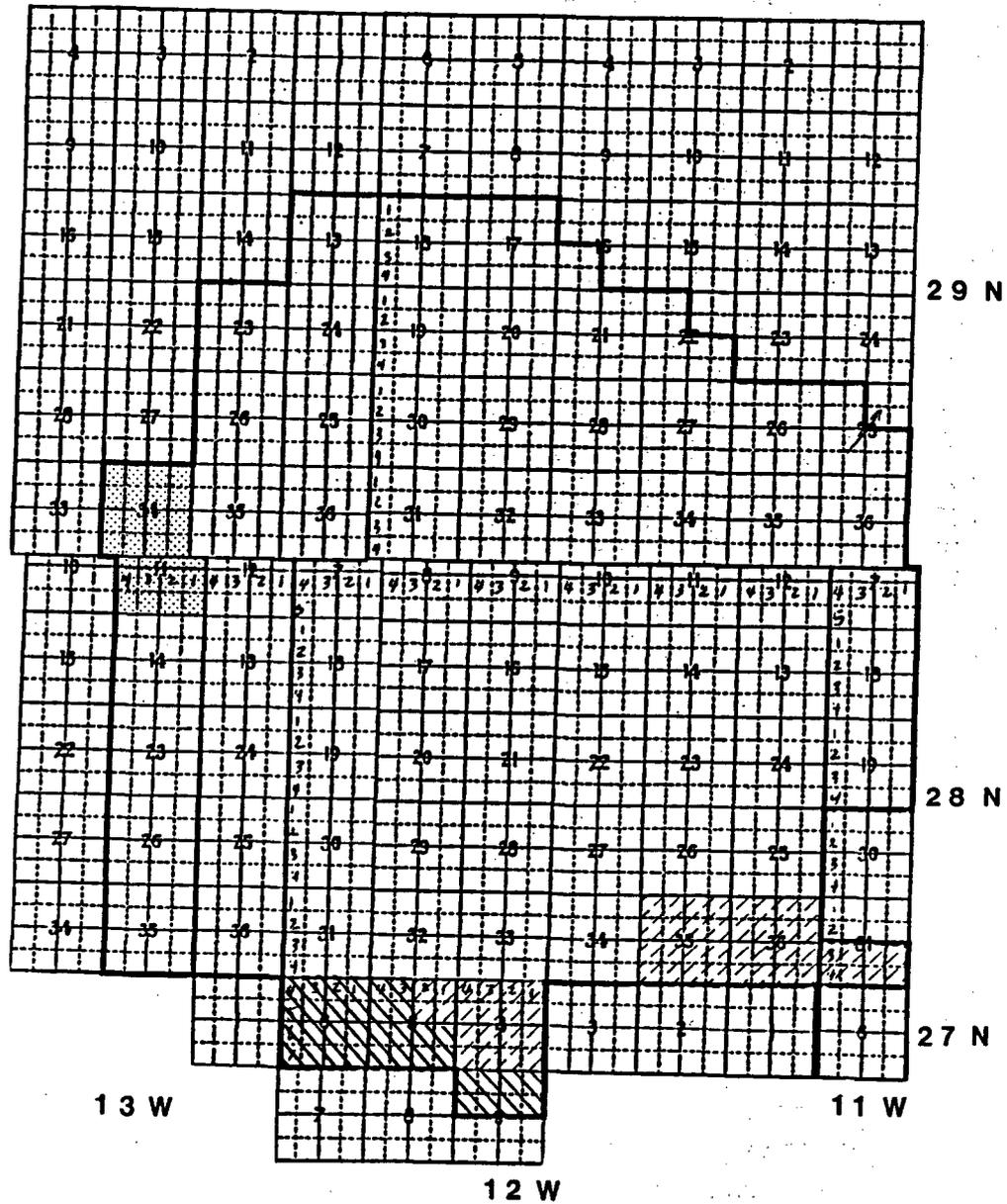
This information will be used to evaluate coals and coal gas potentials in the San Juan Basin.

# GALLEGOS CANYON

SAN JUAN COUNTY  
NEW MEXICO

No. I-Sec. No. 844

EFFECTIVE 7-25-51



**gulram, inc.**  
petroleum engineering and government regulation consultants

-  ENLARGEMENT I
-  ENLARGEMENT II
-  NOT COMMITTED



STATE OF NEW MEXICO  
**ENERGY AND MINERALS DEPARTMENT**  
 OIL CONSERVATION DIVISION  
 AZTEC DISTRICT OFFICE

OIL CONSERVATION DIVISION  
 RECEIVED

1100 RIO HAZARDO ROAD  
 AZTEC, NEW MEXICO 87410  
 (505) 334-0170

ARREY CARRUTHERS  
 GOVERNOR

'91 OCT 21 AM 9 38

Date: 10-11-91

*Attn: Mr. Stogner*

Oil Conservation Division  
 P.O. Box 2088  
 Santa Fe, NM 87504-2088

Re: Proposed MC \_\_\_\_\_  
 Proposed DHC \_\_\_\_\_  
 Proposed NSL X \_\_\_\_\_  
 Proposed SWD \_\_\_\_\_  
 Proposed WFX \_\_\_\_\_  
 Proposed PMX \_\_\_\_\_

Gentlemen:

I have examined the application dated 10-10-91  
 for the AMP PETROLEUM CCU # 518  
 Operator Lease & Well No.

M-25-29N-124 and my recommendations are as follows:  
 Unit, S-T-R

[Signature]  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Yours truly,

[Signature]