

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

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

October 12, 1990

BHP Petroleum  
5847 San Felipe  
Suite 3600  
Houston, TX 77057

Attention: Chuck Williams

*Administrative Order NSL-2893*

Dear Mr. Williams:

Reference is made to your application dated September 5, 1990 for a non-standard coal gas well location for your **Gallegos Canyon Unit Well No. 396** to be located 720 feet from the South line and 1155 feet from the West line (**Unit M**) of **Section 35, Township 29 North, Range 13 West**, NMPM, Basin Fruitland Coal (Gas) Pool, San Juan County, New Mexico. The W/2 of said Section 35 shall be dedicated to the well forming a standard 320-acre gas spacing and proration unit for said pool.

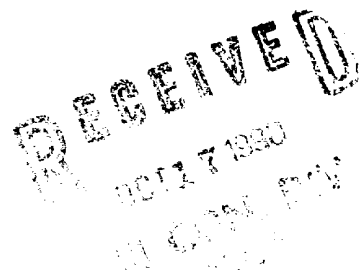
By the authority granted me under the provisions of Rule 8 of the Special Rules and Regulations for the Basin-Fruitland Coal (Gas) Pool as promulgated by Division Order No. R-8768, the above-described unorthodox coal gas well location is hereby approved.

Sincerely,

William J. LeMay  
Director

WJL/MES/ag

cc: Oil Conservation Division - Aztec  
US Bureau of Land Management - Farmington





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

1000 HIGHWAY 100  
AZTEC, NEW MEXICO 87410  
(505) 334-0170

GARREY CARPENTERS  
GOVERNOR

Date: 10-3-90

*ATTN: Mr. STOGNER*

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

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

Gentlemen:

I have examined the application dated 9-12-90  
for the B.H.P. PET. (AMERICAS) INC. G.C.U. # 396  
Operator Lease & Well No.

M-35-29N-13W and my recommendations are as follows:  
Unit, S-T-R

*Approve*  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Yours truly,

*Eugene B. Smith*

September 5, 1990

**RECEIVED**

SEP 12 1990

**OIL CON. DIV.**  
**DIST. 3**

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



RE: Unorthodox Location, Administrative Approval Request  
Gallegos Canyon Unit #396  
SW 1/4 SW 1/4 Sec. 35 T29N R13W  
San Juan County, New Mexico

*9/11/90*

*Attn: E. Busch*

Gentlemen:

BHP Petroleum respectfully requests that a non standard location be administratively approved to allow the GCU #396 well to be drilled 720' FSL and 1155' FWL to be completed in the Fruitland Coal.

The non standard location is requested due to topographical reasons and the surface owner's requirements to minimize surface disturbing activities by offsetting existing wells.

The terrain where a well could be drilled at a standard location is such that a significant amount of dirt work would be necessary. The surface is owned by the Bolack Family and they have told us any location other than the one that is adjacent to Amoco's existing #164 well is unacceptable. The Amoco well is completed in the Dakota formation.

BHP is the operator of all offsetting proration units.

Ernie Busch visited the subject location with J. C. Harris and myself on August 10, 1990 and concurred that the subject location was the most feasible, given the surface owner's stance. Mr. Busch did request that we investigate the amount of cement used in the adjacent Amoco well. We did that and submitted the results to him in a letter dated August 21, 1990.

For both economical and mechanical reasons BHP doesn't 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,

*Chuck Williams*

Chuck Williams *By fm*  
Field Services Administrator

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPPLICATE\*  
(Other instructions on  
reverse side)

Form approved.  
Budget Bureau No. 1004-0136  
Expires August 31, 1985

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK			
1A. TYPE OF WORK DRILL <input checked="" type="checkbox"/> DEEPEN <input type="checkbox"/> PLUG BACK <input type="checkbox"/>			
B. TYPE OF WELL OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER <input type="checkbox"/> SINGLE ZONE <input checked="" type="checkbox"/> MULTIPLE ZONE <input type="checkbox"/>			
2. NAME OF OPERATOR BHP Petroleum (Americas) Inc.			
3. ADDRESS OF OPERATOR 5847 San Felipe Ste 3600 Houston TX 77057-3005			
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)* At surface SWSW At proposed prod. zone			
14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE* Approximately 3 miles south of Farmington, New Mexico			
15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any) Unit Boundary		16. NO. OF ACRES IN LEASE 2,561.19	17. NO. OF ACRES ASSIGNED TO THIS WELL 320
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. 150'		19. PROPOSED DEPTH 1757'	20. ROTARY OR CABLE TOOLS Rotary
21. ELEVATIONS (Show whether DF, RT, GR, etc.) 5851' GR			22. APPROX. DATE WORK WILL START* Fall 1990
23. PROPOSED CASING AND CEMENTING PROGRAM			
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH
8 3/4"	7"	20#	± 130'
6 1/4"	4 1/2"	10.5#	± 1757'
		QUANTITY OF CEMENT	
		50 SX (57.5 cu.ft.)	
		221 SX (273 cu.ft.)	

RECEIVED  
SEP 12 1990  
OIL CON. DIV.]  
DIST. 3

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. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED Chuck Williams TITLE Field Services Administrator DATE 8/1/90  
Chuck Williams  
(This space for Federal or State office use)

PERMIT NO. \_\_\_\_\_ APPROVAL DATE \_\_\_\_\_  
APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_  
CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions On Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

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-302  
Revised 1-4-89

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

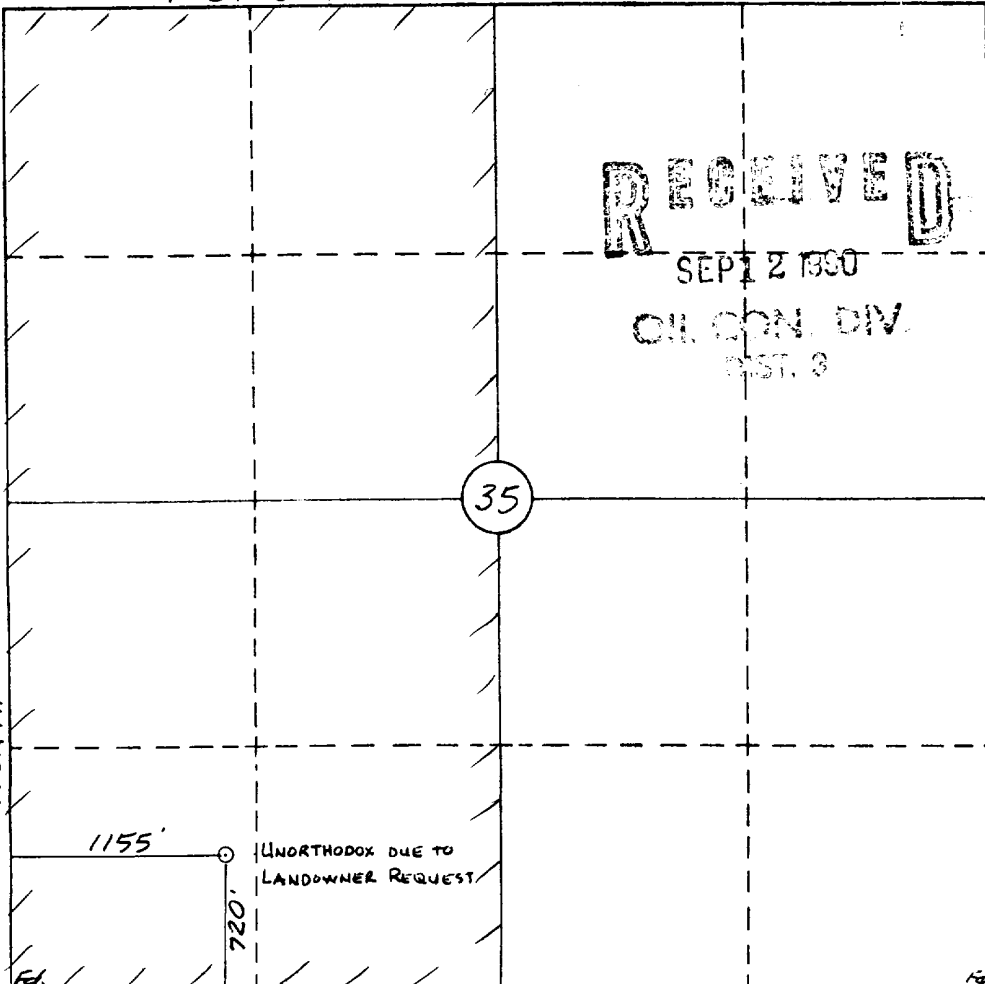
All Distances must be from the outer boundaries of the section

Operator <b>BHP PETROLEUM (AMERICAS) INC.</b>			Lease <b>GALLEGOS CANYON UNIT</b>		Well No. <b>396</b>
Unit Letter <b>M</b>	Section <b>35</b>	Township <b>29 N</b>	Range <b>13 W</b>	County <b>San Juan</b>	
Actual Footage Location of Well: <b>720</b> feet from the <b>South</b> line and <b>1155</b> feet from the <b>West</b> line					
Ground level Elev. <b>5851</b>	Producing Formation <b>Fruitland Coal</b>		Pool <b>Basin Fruitland Coal</b>		Dedicated Acreage: <b>320</b> Acres
<p>1. Outline the acreage dedicated to the subject well by colored pencil or hatchure marks on the plat below.</p> <p>2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).</p> <p>3. 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.? <input type="checkbox"/> Yes <input type="checkbox"/> No If answer is "yes" type of consolidation _____</p> <p>If answer is "no" list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____</p> <p>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.</p>					

0 330 660 990 1320 1650 1980 2310 2640 2970 3300 3630 3960 4290 4620 4950 5280 5610 5940 6270 6600

N 89° 57' W

80.24 ch.



OPERATOR CERTIFICATION

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

Signature *Chuck Williams*  
Printed Name **Chuck Williams**  
Position **Field Services Administrator**  
Company **BHP Petroleum (Americas) Inc.**  
Date **7/26/90**

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.

7-13-90

Date Surveyed  
**William E. Mahnke II**

Signature & Seal of Professional Surveyor  
*William E. Mahnke II*

Professional Surveyor  
New Mexico  
#8466  
Certificate No. **8466**  
PROFESSIONAL LAND SURVEYOR

BHP PETROLEUM (AMERICAS) INC.  
**GALLEGOS CANYON UNIT NO. 396**  
 720' FSL & 1155' FWL SECTION 35 T29N-R13W  
 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	294	
Kirtland	407	
Fruitland	1294	
Basal Fruitland Coal	1578	Gas
Pictured Cliffs	1607	Gas
Total Depth	1757	

4. **Casing and Cementing Program:** A string of 7" 20# K-55 casing with ST&C couplings is to be set at  $\pm 130'$  in an 8 3/4" hole and cemented to the surface in a single stage with 50 sx Class 'H' cement (yield = 1.15 ft<sup>3</sup>/sx) containing 3 % CaCl<sub>2</sub> and 1/4 #/sx celloflake. Slurry volume assumes a 100 percent excess over calculated hole volume. 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 as it has been BHP P(A)'s experience centralizers have a tendency to knock off boulders and hang up the casing while running in the hole. Minimum clearance between collars and hole is 1.094". Prior to drilling out 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# overpull whichever was greater.

A production string of 4 1/2" 10.5# K-55 casing with ST&C couplings 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 171 sx of 50-50 pozmix containing 2 % gel, 0.5 % fluid loss additive and 1/4 #/sx celloflake (yield = 1.26 ft<sup>3</sup>/sx) followed by 50 sx of Class 'G' cement containing low fluid loss additives (yield = 1.15 ft<sup>3</sup>/sx). Slurry volume assumes a 50 percent excess over calculated hole volume. Cement volume is subject to change after review and recalculation of

hole volume from the open hole calipers. Centralizers will be spaced such that a minimum of two are located above and two are located below the Basal Fruitland Coal; and, if any Ojo Aloma is present in the open hole section at the top of the hole, a minimum of one centralizer will be run just below the base and another into the base of Ojo Alamo. Minimum clearance between collars 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# overpull whichever was greater.

A chronological log following the completion of the cementing operations detailing the pump rate, pump pressure, slurry density, and slurry volume for each job will be submitted in a Sundry Notice.

5. **Pressure Control Equipment:** (See attached schematic diagrams) A minimum of a 2M BOPE 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 70 percent of the internal yield pressure of the casing. The annular preventor will be tested to 50 percent of its working pressure.

A full opening internal blowout preventor or drill pipe safety valve will be on the drilling 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 of the Kirtland Formation. All drilling fluids will be contained in a steel 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 dumped into a small earthen pit beside the steel pit. As soon as this pit dries up, it will be covered up.

Mud program summary is as follows:

<u>Interval</u> <u>(feet)</u>	<u>Mud Weight</u> <u>(#/gal)</u>	<u>Viscosity</u> <u>(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 will be utilized. At a minimum, a flow sensor will be installed in the system and the mud volume constantly be visually monitored.

8. **Logging Program:** SP-DIL and GR-FDC-CNL logs will be run from TD to surface casing shoe.

**Coring Program:** No cores are planned.

**Testing Program:** No tests are planned.

**Stimulation Program:** Perf the Basal Fruitland Coal with 2 JSPF and frac with 50,000 gals of either a 70 quality nitrogen foam or a crosslinked-gelled water containing a minimum of 50,000 lbs of 20-40 mesh sand.

9. **Abnormal Pressure:** Although not expected, abnormal pressures are possible in the Farmington Sands of the Kirtland Formation.

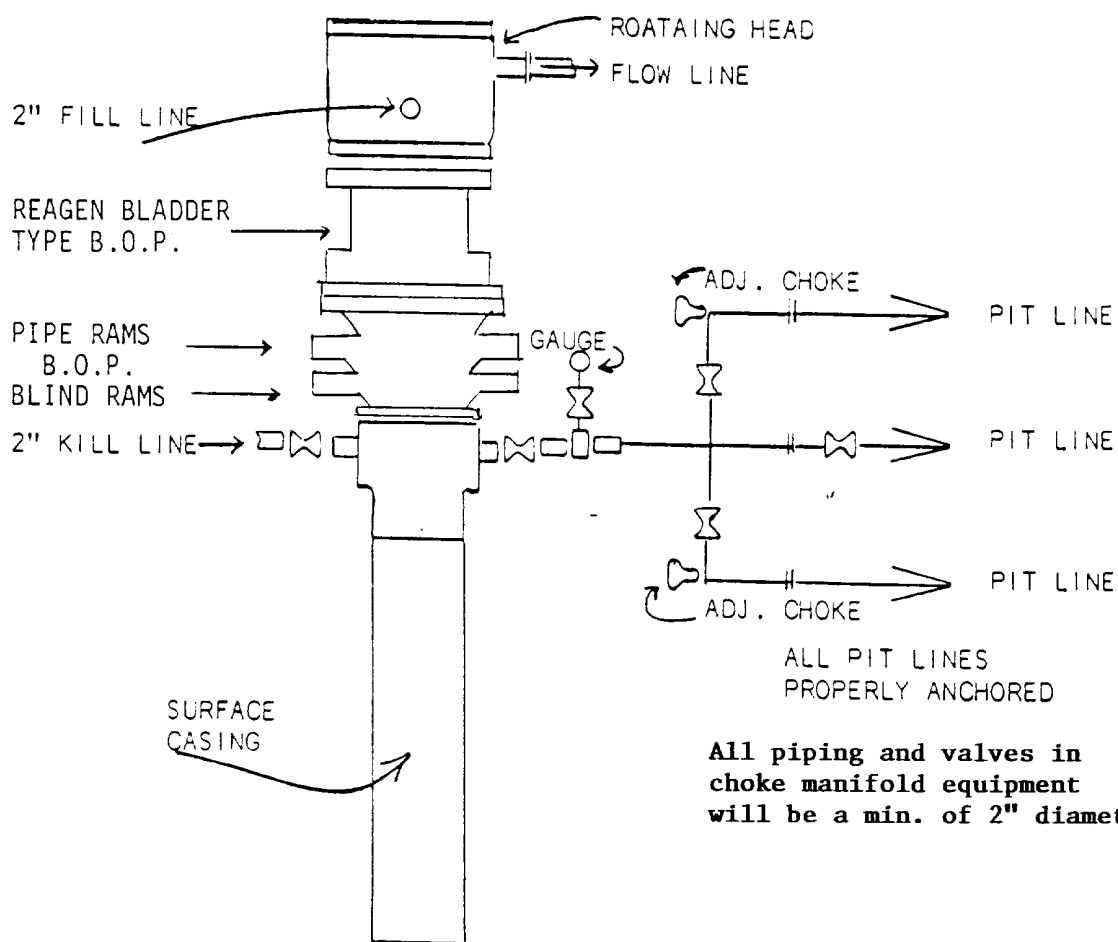
**Estimated Bottom Hole Pressure:** 400 psi.

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

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



# 2M SYSTEM



## **SURFACE USE & OPERATIONS PLAN**

**WELL NAME AND NO.:** Gallegos Canyon Unit Well No. 396

**LOCATION:** 720' FSL 1155' FWL (SW/SW) Section 35, T29N-R13W

**LEASE NO.:** SF 078926

1) **EXISTING ROADS:**

- A. See Attached map.
- B. Travel south on Road #371 for approximately 5 miles, turn left on ridge road, go to auto gate, continue on ridge road for approximately .2 miles to Amoco Production Company's #164. Proposed well is adjacent to Amoco well.
- C. Access Roads to Location: See map
- D. Exploratory well: N/A
- E. Development Well: For all applicable access roads within a one (1) mile radius, see attached map.
- F. Plans for Improvement and/or Maintenance: BHP Petroleum, Amoco, and El Paso Natural Gas Company currently maintain the non-county, state or Irrigation Project roads. Maintenance is conducted on an as-needed basis.

2) **PLANNED ACCESS ROADS:**

- A. No new road is required.

3) **LOCATION OF EXISTING WELLS:**

- A. Water Wells: None
- B. Abandoned Wells: None
- C. Temporarily Abandoned Wells: None
- D. Disposal Wells: Gallegos Canyon Unit #307 is the nearest disposal well.
- E. Drilling Wells: None presently.
- F. Producing Wells: Amoco #164 is the nearest well, approximately 150' away. For additional wells see map.
- G. Shut-in Wells: None.
- H. Injection Wells: None.
- I. Monitoring or Observation Wells: None.

4) **LOCATION OF EXISTING AND/OR PROPOSED FACILITIES OWNED AND/OR CONTROLLED BY BHP:**

- A. Existing facilities: BHP Petroleum currently operates the Pictured Cliffs participating area within the Gallegos Canyon unit.
  - 1. Tank Batteries: No oil or condensate is currently produced from BHP wells in the unit.
  - 2. Production: All wells produce natural gas.  
Facilities: Some wells are equipped with rod pumps to remove excess water. Wells are normally equipped with a two (2) phase separator. El Paso Natural Gas Company has a glycol dehy unit upstream of the sales meter.
  - 3. Oil Gathering Lines: N/A
  - 4. Gas Gathering Lines: El Paso Natural Gas Company purchases all gas produced by BHP in this unit. There are two (2) systems in which our wells are introduced depending on the initial wellhead pressure.
  - 5. Injection Lines: N/A
  - 6. Disposal Lines: Each well which produces water is tied into one of four (4) disposal systems.

B. New Production Facilities:

1. Proposed Tank Battery: None
2. Dimensions of Facilities: All new facilities are restricted to the existing pad area. New facilities will consist of a separator, dehy unit, meter house and two small earthen pits, unless the well requires a disposal line to remove excess water, in which case a pumping unit will be installed and the separator pit eliminated. All surface equipment to be painted tan. If water disposal pipelines are need, they will be applied for at a later date.
3. Construction Methods and Materials: The site will be leveled with a crawler type dozer. Native soils will be used. Any foundation material such as gravel will be purchased and trucked to the site if a pumping unit is needed.
4. Protective Measures and Devices: Any pits will be fenced to prevent entry by livestock or wildlife.

5) **LOCATION AND TYPE OF WATER SUPPLY:**

- A. Location: San Juan River
- B. Method of Transportation: Water will be hauled by truck over existing roads.
- C. Water Wells to be Drilled: N/A

6) **SOURCE OF CONSTRUCTION MATERIALS:**

- A. Location: Only native materials are necessary for the construction of drill site and related facilities.
- B. From Federal or Indian Lands: N/A
- C. Additional Materials: It may be necessary to haul gravel for a pumping unit base. If needed it will be hauled from Farmington.
- D. Access Roads on Federal or Indian Lands: All roads are on private surface. Amoco Production Company's Right-of-Way easements will be utilized for access.

7) **METHODS OF HANDLING WASTE DISPOSAL:**

- A. Cuttings and drilling fluids will be placed in the reserve pit.
- B. Same as listed above.
- C. Produced fluids (water) will be placed in the reserve pit during testing.
- D. Sewage will be contained in a portable chemical toilet.
- E. Garbage and other water material will be place in a small trash cage, and disposed of in an approved sanitary land fill.
- F. Upon completion of the well the reserve pit will be backfilled.

8) **ANCILLARY FACILITIES:**

- A. None are planned.
- B. Location and Pits and Stock Piles: For location of mud tanks, reserve pit, and pipe rack see attached diagram.
- C. Pad Orientation: For rig orientation and access roads, see attached diagram.
- D. Lining of Pits: It is not planned to line the reserve pit.
- E. O.S.H.A. Requirements: The disturbed area requested is sufficient to allow fracturing operations in a safe manner and in accordance with O.S.H.A. standards.

9) **PLAN FOR RESTORATION OF THE SURFACE:**

- A. Revegetation will be in accordance with BLM stipulations.

10) **OTHER INFORMATION:**

- A. Topography, Soil Characteristics, Geologic Features, Flora and Fauna:

The Gallegos Canyon Unit area topography varies considerably throughout the participating area. The southwest portion is primarily highly eroded sandstone with deep channels and rock outcroppings. The southeast portion is separated by the Gallegos Wash and is mostly

rock outcroppings. The southeast portion is separated by the Gallegos Wash and is mostly within the NAPI farming area. The north portion is separated by the San Juan River. Most all of the area north of the river is private land consisting of rural business and small farms and residences.

This site is on an existing well pad serving Amoco well #164. No significant additional disturbance will be required.

- B. Surface Use: Livestock grazing.
- C. Surface Ownership: Surface is privately owned.
- D. Proximity of Water, Dwellings, Archaeological, Historical Sites: Closest live water is the San Juan River approximately 2.2  
5 miles north of the proposed location.
- E. There are no occupied dwellings within close proximity to the proposed location.

**Archaeology**

- F. A cultural inventory report will be mailed directly to the Farmington BLM office.

11) **LESSEE'S OR OPERATOR'S FIELD REPRESENTATIVE:**

BHP Petroleum (Americas) Inc.  
Post Office Box 977  
Farmington, New Mexico  
Houston, Texas 77057  
c/o Fred Lowery

BHP Petroleum (Americas) Inc.  
5847 San Felipe, Suite 3600

c/o Chuck Williams

(505) 327-1639 (24 hour answering service)

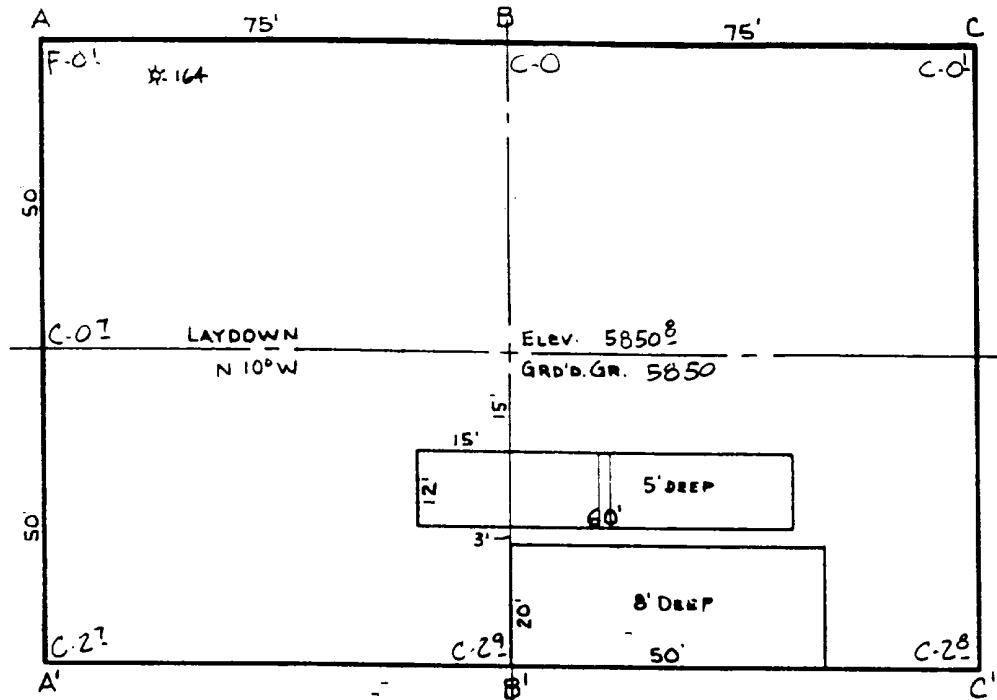
(713) 780-5448

12) **CERTIFICATION:**

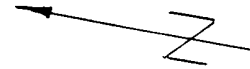
I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are to the best of my knowledge true and correct; and that the work associated with the operations proposed herein will be performed by BHP Petroleum (Americas) Inc. and its contractors in conformity with this plan and the terms and conditions under which it is approved.

  
Signed

BHP PETROLEUM (AMERICAS) INC.  
 GALLEGOS CANYON UNIT #396  
 720' FSL & 1155' FWL  
 Sec. 35, T29N, R13W  
 San Juan Co., N.M.



SCALE: 1" = 30'



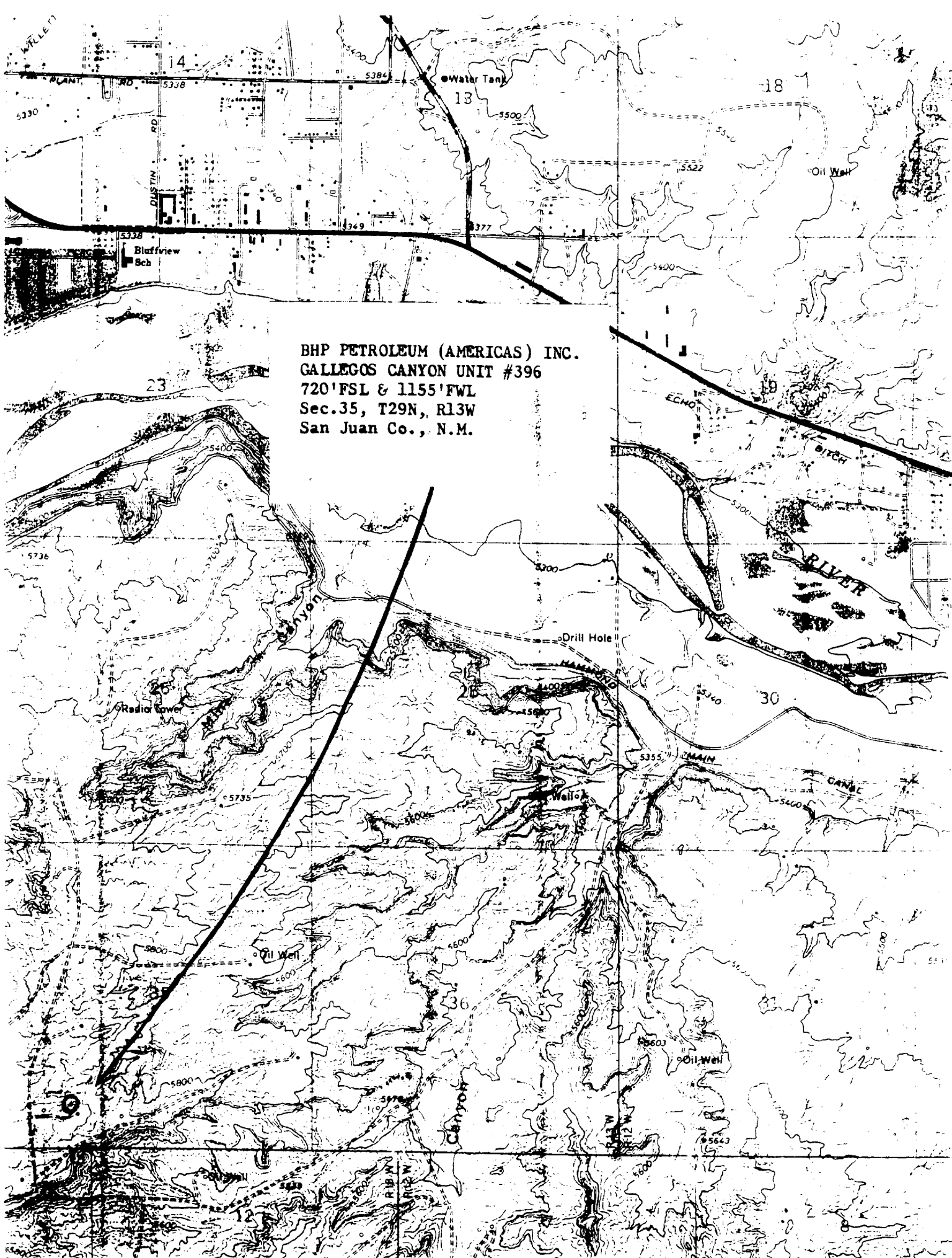
A-A'	Vert.: 1" = 30'	Horiz.: 1" = 50'	C/L
5850			
5840			

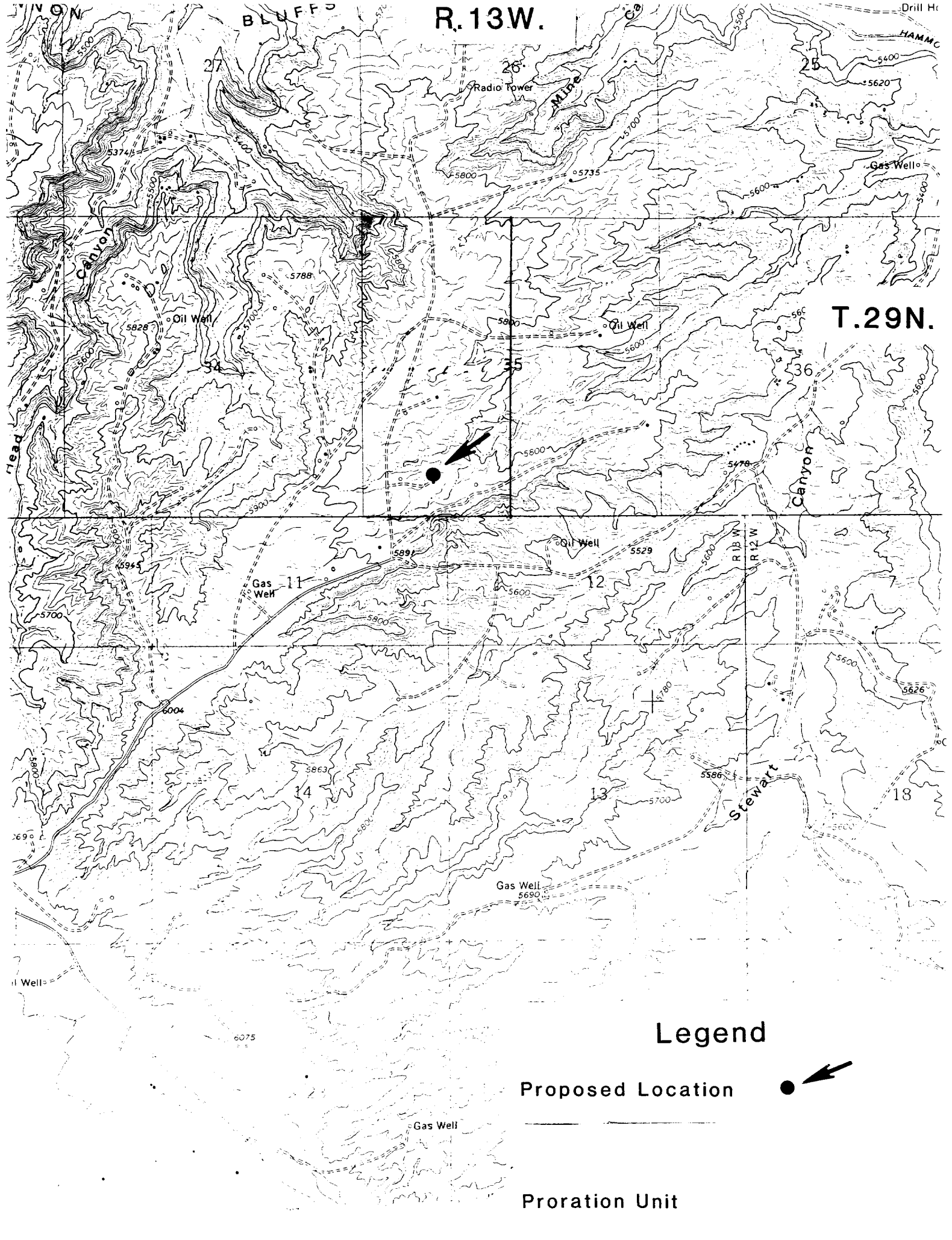
B-B'	Vert.: 1" = 30'	Horiz.: 1" = 50'	C/L
5850			
5840			

C-C'	Vert.: 1" = 30'	Horiz.: 1" = 50'	C/L
5850			
5840			



BHP PETROLEUM (AMERICAS) INC.  
GALLEGOS CANYON UNIT #396  
720' FSL & 1155' FWL  
Sec. 35, T29N, R13W  
San Juan Co., N.M.



Legend

Proposed Location



Proration Unit