Dockets Nos. 22-88 and 23-88 are tentatively set for July 20 and August 3, 1988. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - JULY 6, 1988

8:30 A.M. - SAN JUAN COLLEGE, COMPUTER SCIENCE LECTURE CENTER, ROOM 7103, FARMINGTON, NEW MEXICO

The following cases will be heard before David R. Catanach, Examiner, or Michael E. Stogner, Alternate Examiner:

ALLOWABLE: (1) Consideration of the allowable production of gas for August, 1988, from fourteen prorated gas pools in Lea, Eddy, and Chaves Counties, New Mexico.

(2) Consideration of the allowable production of gas for August, 1988, from four prorated gas pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.

CASE 9420: In the matter of the hearing called by the Oil Conservation Division (OCD) on its own motion for pool creation and Special Pool Rules, San Juan, Rio Arriba, McKinley and Sandoval Counties, New Mexico. The OCD on the recommendation of the Fruitland Coalbed Methane Committee, seeks the creation of a new pool for the production of gas from the coalbed seams within the Fruitland formation underlying the following described area:

Township 19 North, Ranges 1 West through 6 West;
Township 20 North, Ranges 1 West through 8 West;
Township 21 North, Ranges 1 West through 9 West;
Township 22 North, Ranges 1 West through 11 West;
Township 23 North, Ranges 1 West through 14 West;
Township 24 North, Ranges 1 East through 16 West;
Township 25 North, Ranges 1 East through 16 West;
Township 26 North, Ranges 1 East through 16 West;
Township 27 North, Ranges 1 West through 16 West;
Township 28 North, Ranges 1 West through 16 West;
Township 29 North, Ranges 1 West through 15 West;
Township 30 North, Ranges 1 West through 15 West;
Township 31 North, Ranges 1 West through 15 West; and
Township 32 North, Ranges 1 West through 13 West.

Also to be considered is the promulgation of special rules, regulations and operating procedures for said pool including, but not limited to, provisions for 320-acre spacing units, designated well locations, limited well density, horizontal wellbore and deviated drilling procedures, venting and flaring rules, and gas well testing requirements.

CASE 9421: In the matter of the hearing called by the Oil Conservation Division on its own motion for an order contracting the vertical limits of certain pools in San Juan and Rio Arriba Counties.

(a) Contract the vertical limits of the Aztec-Fruitland Pool to include only the sandstone interval of the Fruitland formation and to redesignate said pool as the Aztec-Fruitland Sand Pool.

(b) Contract the vertical limits of the North Aztec-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the North Aztec-Fruitland Sand Pool.

(c) Contract the vertical limits of the Blanco-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Blanco-Fruitland Sand Pool.

(d) Contract the vertical limits of the Conner-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Conner-Fruitland Sand Pool.

(e) Contract the vertical limits of the Cottonwood-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Cottonwood-Fruitland Sand Pool.

(f) Contract the vertical limits of the Crouch Mesa-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Crouch Mesa-Fruitland Sand Pool.

(g) Contract the vertical limits of the Farmer-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Farmer-Fruitland Sand Pool.

(h) Contract the vertical limits of the Flora Vista-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Flora Vista-Fruitland Sand Pool.

(i) Contract the vertical limits of the Gallegos-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Gallegos-Fruitland Sand Pool.

(j) Contract the vertical limits of the South Gallegos-Fruitland-Pictured Cliffs Pool to include only the Pictured Cliffs formation and the sandstone interval in the Fruitland formation and to redesignate said pool as the South Gallegos-Fruitland Sand-Pictured Cliffs Pool.

(k) Contract the vertical limits of the Glades-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Glades-Fruitland Sand Pool.

(l) Contract the vertical limits of the Harper Hill-Fruitland Pictured Cliffs Pool to include the Pictured Cliffs formation and the sandstone interval of the Fruitland formation and to redesignate said pool as the Harper Hill Fruitland Sand-Pictured Cliffs Pool.

(m) Contract the vertical limits of the Jasis Canyon-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Jasis Canyon-Fruitland Sand Pool.

(n) Contract the vertical limits of the Kutz-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Kutz-Fruitland Sand Pool.

(o) Contract the vertical limits of the West Kutz-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the West Kutz-Fruitland Sand Pool.

(p) Contract the vertical limits of the La Jara-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the La Jara-Fruitland Sand Pool.

(q) Contract the vertical limits of the North Los Pinos-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the North Los Pinos-Fruitland Sand Pool.

(r) Contract the vertical limits of the South Los Pinos Fruitland-Pictured Cliffs Pool to include the Pictured Cliffs formation and the sandstone interval of the Fruitland formation and to redesignate said pool as the South Los Pinos Fruitland Sand-Pictured Cliffs Pool.

(s) Contract the vertical limits of the Mt. Nebo-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Mt. Nebo-Fruitland Sand Pool.

(t) Contract the vertical limits of the Ojo Fruitland-Pictured Cliffs Pool to include the Pictured Cliffs formation and the sandstone interval of the Fruitland formation and to redesignate said pool as the Ojo Fruitland Sand-Pictured Cliffs Pool.

(u) Contract the vertical limits of the Pinon-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Pinon-Fruitland Sand Pool.

(v) Contract the vertical limits of the North Pinon-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the North Pinon-Fruitland Sand Pool.

(w) Contract the vertical limits of the Pump Mesa-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Pump Mesa-Fruitland Sand Pool.

(x) Contract the vertical limits of the Sedro Canyon-Fruitland Pool to include only the sandstone interval in the Fruitland formation and to redesignate said pool as the Sedro Canyon-Fruitland Sand Pool.

(y) Contract the vertical limits of the Twin Mounds Fruitland-Pictured Cliffs Pool to include the Pictured Cliffs formation and the sandstone interval of the Fruitland formation and to redesignate said pool as the Twin Mounds Fruitland Sand-Pictured Cliffs Pool.

(z) Contract the vertical limits of the WAW Fruitland-Pictured Cliffs Pool to include the Pictured Cliffs formation and the sandstone interval of the Fruitland formation and to redesignate said pool as the WAW Fruitland Sand-Pictured Cliffs Pool.

CASE 9413: (Continued from June 22, 1988, Examiner Hearing)

Application of Yates Petroleum Company for special pool rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of temporary special pool rules for the Avalon-Delaware Pool located in portions of Township 20 South, Ranges 27 and 28 East, including a provision to increase the gas-oil ratio limitation to 5,000 cubic feet of gas per barrel of oil. Said area is located approximately 9 miles north of Carlsbad, New Mexico.

CASE 9389: (Continued from June 22, 1988, Examiner Hearing)

Application of Robert N. Enfield for compulsory pooling and an unorthodox gas well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests from the surface to the base of the Devonian formation underlying the NW/4 of Section 29, Township 7 South, Range 31 East, to form a standard 160-acre gas spacing and proration unit for any and all formations and/or pools developed on 160-acre spacing within said vertical limits or the W/2 of said Section 29 to form a standard 320-acre gas spacing and proration unit for any and all formations and/or pools developed on 320-acre spacing within said vertical limits, both aforementioned units to be dedicated to its E. McCombs Well No. 1 drilled at an unorthodox gas well location (for a 320-acre dedication) 1650 feet from the North line and 990 feet from the West line (Unit E) of said Section 29. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well. Said units are located approximately 11 miles south by west of Kenna, New Mexico.

CASE 9359: (Continued from May 25, 1988, Examiner Hearing)

Application of Dugan Production Corporation for a non-standard oil proration unit, Sandoval County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the Special Rules and Regulations for the Rio Puerco-Mancos Oil Pool as promulgated by Division Order No. R-7471, as amended, to form a 160-acre non-standard oil spacing and proration unit for said pool comprising the NW/4 of Section 25, Township 21 North, Range 4 West, to be dedicated to the existing Husky Federal Well No. 2 located at a standard location 990 feet from the North and West lines (Unit D) of said Section 25. Said well is located approximately 3.25 miles south of Milepost 75 on New Mexico Highway No. 44.

CASE 9422: Application of Meridian Oil Company for central-point gas measurement, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval to install a central meter run at the end of El Paso Natural Gas Company's pipeline lateral 2C-90, thereby allowing 17 Ballard-Pictured Cliffs producing wells in the Canyon Large Unit to be commingled on the surface and their combined volumes to be metered at one central point. Said metering location is to be in the SE/4 of Section 4, Township 25 North, Range 7 West, being approximately 6 miles northeast by north of Nageesi, New Mexico.

CASE 9423: Application of Meridian Oil Company for central-point gas measurement, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval to install a central meter run at the end of El Paso Natural Gas Company's pipeline laterals 2C-18 and 2C-151, which are looped together, thereby allowing 26 Blanco Pictured Cliffs producing wells in the Lindrith Unit to be commingled on the surface and their combined volumes to be metered at one point. Said metering location to be in the NW/4 of Section 13, Township 24 North, Range 3 West, being approximately 4 miles west of Lindrith, New Mexico.

CASE 9415: (Continued from June 22, 1988, Examiner Hearing)

Application of Manzano Oil Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests from the surface to the base of the Undesignated Santo Nino-Bone Spring Pool underlying either the SW/4 SE/4 of Section 30, Township 18 South, Range 30 East, to form a standard statewide 40-acre oil spacing and proration unit within said vertical limits or the W/2 SE/4 of said Section 30, to form a standard 80-acre oil spacing and proration unit for any and all formations and/or pools within said vertical limits developed on 80-acre spacing, both aforementioned units to be dedicated to a well to be drilled at a standard oil well location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge risk involved in drilling said well. Said units are located 7.5 miles south by west of Loco Hills, New Mexico.

CASE 9424: (This case will be continued to July 20, 1988)

Application of Horizon Oil and Gas Company for a non-standard oil proration unit and downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an approval to commingle production from the Monument-Paddock, Monument-Blinebry, and Undesignated Monument-Tubb Pools within the wellbore of its Anderson Well No. 1 located at a standard oil well location for said zones 330 feet from the South line and 1980 feet for the East line (Unit O) of Section 8, Township 20 South, Range 37 East. Applicant further seeks approval for a 40-acre non-standard oil spacing and proration unit for the Monument-Tubb Pool production for said well comprising the SW/4 SE/4 of said Section 8. Said well is located approximately three miles south of Monument, New Mexico.

CASE 9402: (Continued from June 8, 1988, Examiner Hearing)

Application of Union Texas Petroleum Corporation for an infill well finding, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order, pursuant to FERC Rule 271.305 of the Natural Gas Policy Act of 1978 and to Rule 16.A.5 of Division Order No. R-5878-B, as amended, showing that its State Com Well No. 1-A located 1028 feet from the North line and 1120 feet from the East line (Unit A) of Section 16, Township 28 North, Range 9 West, Basin-Dakota Pool, is needed to effectively and efficiently drain the existing 320-acre gas spacing and proration unit comprising the E/2 of said Section 16 which could not otherwise be produced by either the existing well or any other such well which has produced from the Basin-Dakota Pool within said unit. This unit is located approximately 4.75 miles southeast by south of Blanco, New Mexico.

CASE 9385: (Continued from June 22, 1988, Examiner Hearing)

Application of Blackwood & Nichols Co., Ltd. for salt water disposal, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Ojo Alamo or Kirtland formation in the perforated interval from approximately 2422 feet to 2531 feet in its Northeast Blanco Unit Well No. 206 located 790 feet from the South line and 1190 feet from the West line (Unit M) of Section 10, Township 31 North, Range 7 West. Said well is approximately 8 miles north-northeast of the Navajo Lake Dam.

CASE 9425: Application of Nearburg Producing Company for an unorthodox gas well location and simultaneous dedication, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox gas well location for its B & B Well No. 2 to be drilled 660 feet from the South and East lines (Unit P) of Section 22, Township 19 South, Range 25 East, Boyd-Morrow Gas Pool, the E/2 of said Section 22 to be simultaneously dedicated to said well and to the existing B & B Well No. 1 located at a standard gas well location 1980 feet from the North and East lines (Unit G) of said Section 22. Said unit is located approximately 4.5 miles northwest of north of Seven Rivers, New Mexico.

CASE 9426: Application of Nearburg Producing Company for compulsory pooling and an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formations underlying the N/2 of Section 26, Township 19 South, Range 25 East, to form a standard 320-acre gas spacing and proration unit to be dedicated to a well to be drilled at an unorthodox gas well location 990 feet from the North and West lines (Unit D) in said Section 26. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well. Said unit is located approximately 5 miles west of Lakewood, New Mexico.

CASE 9427: Application of Nearburg Producing Company for an unorthodox gas well location, and simultaneous dedication, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox gas well location for its Parino Well No. 2 to be drilled 1500 feet from the South and West lines (Unit K) of Section 23, Township 19 South, Range 25 East, Boyd-Morrow Gas Pool, the S/2 of said Section 23 to be simultaneously dedicated to said well and to the existing Parino Well No. 1 located at a previously approved unorthodox gas well location (R-7381) 1980 feet from the South and East lines (Unit I) of said Section 23. Said unit is located approximately 4 miles northwest by north of Seven Rivers, New Mexico.

CASE 9407: (Continued from June 22, 1988, Examiner Hearing)

Application of Nearburg Producing Company for an unorthodox gas well location, Eddy County. Applicant, in the above-styled cause, seeks approval for an unorthodox gas well location 2310 feet from the South line and 960 feet from the East line (Unit I) of Section 11, Township 22 South, Range 24 East, Undesignated McKittrick Hills-Morrow Gas Pool, the S/2 of said Section 11 to be dedicated to said well. This location is approximately 14.5 miles west of Carlsbad, New Mexico.

DOCKET: COMMISSION HEARING - THURSDAY - JULY 14, 1988

9:00 A.M. - MORGAN HALL, STATE LAND OFFICE BUILDING,
SANTA FE, NEW MEXICO

CASE 9428: In the matter of Case 9428 being called by the Oil Conservation Division on its own motion pursuant to the provisions of Division Order No. R-6446-B, as amended, which approved the Bravo Dome Carbon Dioxide Gas Unit Agreement in Harding, Union, and Quay Counties, New Mexico, to permit Amoco Production Company, the operator of said unit, to review operations and demonstrate to the Commission that its operations within the unit are resulting in the prevention of waste and the protection of correlative rights on a continuing basis.

CASE 9365: (De Novo)

Application of Hanley Petroleum Inc. for an unorthodox oil well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox oil well location 990 feet from the South line and 330 feet from the West line (Unit M) of Section 10, Township 17 South, Range 37 East, Undesignated Shipp-Strawn Pool or Undesignated Humble City-Strawn Pool, the W/2 SW/4 of said Section 10 to be dedicated to the well forming a standard 80-acre oil spacing and proration unit for either pool. Said location is approximately 3.8 miles Northwest by North of Humble City, New Mexico. Upon application of Exxon Corporation, this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 9129: (De Novo)

Application of Virginia P. Uhden, Helen Orbesen, and Carroll O. Holmberg to vacate Division Order Nos. R-7588 and R-7588-A, and/or for the formation of six 160-acre gas proration units, San Juan County, New Mexico. Applicants, in the above-styled cause, seek an order vacating the 320-acre spacing provisions of Order Nos. R-7588 and R-7588-A as to applicants from February 1, 1984 through the date notice of 320-acre spacing was provided to applicants, and/or the formation of six 160-acre gas spacing and proration units for said pool in the W/2 of Section 33 and all of Section 28, Township 32 North, Range 10 West. This area encompasses Cedar Hill, New Mexico. Upon application of Virginia P. Uhden, Helen Orbesen, and Carroll O. Holmberg, this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 9331: (De Novo)

Application of Phillips Petroleum Company for a non-standard gas proration unit and unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox gas well location 660 feet from the North and West lines (Unit D) of Section 22, Township 17 South, Range 35 East, to test the South Shoe Bar-Atoka Gas Pool and the Morrow formation, said well to be dedicated either to a 160-acre non-standard gas proration and spacing unit consisting of the N/2 SW/4 and W/2 NW/4 of said Section 22, or in the alternative, to an 80-acre non-standard gas proration and spacing unit consisting of the W/2 NW/4 of said Section 22. Said location is approximately 3.5 miles Northeast by East of Buckeye, New Mexico. Upon application of Phillips Petroleum Company, this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 9429: Application of Phillips Petroleum Company for compulsory pooling and amend Division Administrative Order NSP-1470 (L) or in the alternative, to rescind Division Administrative Order NSP-1470(L), rededicate acreage to form a standard 320-acre gas spacing and proration unit, and for an order pooling all mineral interests therein, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests from the top of the Wolfcamp formation to the base of the Pennsylvanian formation underlying the W/2 of Section 22, Township 17 South, Range 35 East, forming a standard 320-acre spacing and proration unit to be dedicated to a well to be drilled at a standard gas well location in either Unit E or Unit F of said Section 22, with the corresponding deletion of the E/2 NW/4 from the existing 240-acre non-standard spacing and proration unit, approved by Administrative Order NSP-1470(L), which now comprises the NE/4 and the E/2 NW/4 of said Section 22 dedicated to the T. H. McElvain New Mexico "AC" State Well No. 1 located 1980 feet from the North line and 660 feet from the East line (Unit H) of said Section 22. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the proposed well and a charge for risk involved in drilling said well. IN THE ALTERNATIVE, applicant seeks the termination of the existing 240-acre non-standard spacing and proration unit now dedicated to said New Mexico "AC" State Well No. 1 as authorized by said Order NSP-1470(L) and the concomitant pooling of all mineral interests from the top of the Wolfcamp to the base of the Pennsylvanian formation underlying the N/2 of Section 22 forming a standard 320-acre spacing and proration unit to be dedicated to said New Mexico "AC" State Well No. 1. Also to be considered will be the cost of participation in the well and the allocation of the costs thereof as well as actual operating costs and charges for supervision. Applicant further requests that T. H. McElvain Oil and Gas Properties remain as operator of the well. This area is located approximately 3.75 miles east-northeast of Buckeye, New Mexico.

CASE 9430: Application of Mobil Exploration and Producing U.S. Inc. as agent for Mobil Producing Texas and New Mexico, Inc. for compulsory pooling or in the alternative, either: (1) to rescind Division Administrative Order NSP-1470(L), rededicate acreage to form a standard 320-acre gas spacing and proration unit, and for an order pooling all mineral interests therein; or, (2) for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks to rescind Division Administrative Order NSP-1470 (L), which order authorized a 240-acre non-standard gas spacing and proration unit in the Atoka formation for the T. H. McElvain Oil and Gas Properties New Mexico "AC" State Well No. 1 located at an unorthodox gas well location 1980 feet from the North line and 660 feet from the East line (Unit H) of Section 22, Township 17 South, Range 35 East and to pool all mineral interests in the South Shoe Bar-Atoka Gas Pool underlying the E/2 of said Section 22, thereby forming a standard 320-acre oil spacing and proration unit to be dedicated to said existing well. Also to be considered will be the cost of participation in the well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Applicant further requests that T. H. McElvain Oil and Gas Properties remain as operator of the well; or IN THE ALTERNATIVE, the applicant seeks, either: (1) an order pooling all mineral interests in the South Shoe Bar-Atoka Gas Pool and Morrow formation underlying the S/2 of Section 22, Township 17 South, Range 35 East, forming a standard 320-acre gas spacing and proration unit, to be dedicated to a well to be drilled at a standard gas well location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well; or, (2) approval for a 240-acre non-standard gas spacing and proration unit for production for the Atoka and Morrow formations comprising the SE/4 and S/2 SW/4 of said Section 22, to be dedicated to a well to be drilled at a standard gas well location in the SE/4. This area is located approximately 3.75 miles east-northeast of Buckeye, New Mexico.

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date JULY 14, 1988 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
KENT LUND	AMOCO PROD. CO	DENVER
William F. Carr	Campbell and Black P.A.	Santa Fe
D. R. Currens	Amoco Prod. Co.	Houston
J. W. Collier	"	"
V. A. Brock	Shell Western E&P	Houston
SCOTT HALL	CAMPBELL + BLACK	SF
RL Hocker	OXY USA Inc.	Tulsa, OK
JC Hayes	Amoco Production Co	HOUSTON
James C. Allen	"	"
JERRY SULLIVAN	OXY USA INC	MIDLAND
J. D. McElhaney	Amoco Production Co	Houston
Bob Hulme	Bryan	Santa Fe
James Bruce	Hinkle Law Firm	SF
Teresa Mouths	"	Albuquerque
T. L. Hill	Mobil Prod. Tx + N.M. Inc.	Midland TX
Robert Gilbert	MOBIL PROD. TX & N.M. INC.	MIDLAND, TX
MK Moshell	Mobil	Midland

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date JULY 14, 1988 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
Richard G. McCann	MOCD	Midland
Jerry N. Hendrix, Jr.	Clo Trainer	Roswell, NM
Richard E Haller	Phillips	Odessa TX
W. T. Mueller	Phillips Petr	Odessa, TX
Patty Patton	Oxy USA Inc	Tulsa
Charles Creekmore	Oxy USA Inc.	Tulsa
Brian Brendan Tubby	"	"
W. Kellahin	Kellahin & Kellahin	Santa Fe
Richard D Campbell	ARCO Oil & Gas	Midland, TX
Sarah M Singleton	Montgomery & Andrews	SF
Frank Hulse	Phillips	Odessa
Catherine Harvey	THM Oil + Gas	SF
Michael von Hellens	"	"
Jack Ahlen	Consulting for McElvain	Roswell, NM

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

14 July 1988

COMMISSION HEARING

IN THE MATTER OF:

In the matter of Case 9428 being called by the Oil Conservation Division on its own motion pursuant to the provisions of Division Order No.R-6446-B, as amended, which approved the Bravo Dome Carbon Dioxide Gas Unit Agreement in Harding, Union, and Quay Counties, New Mexico. CASE 9428

BEFORE: William J. Lemay, Chairman
Erling Brostuen, Commissioner
William M. Humphries, Commissioner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division: Robert G. Stovall
Attorney at Law
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico

A P P E A R A N C E S Cont'd

For Amoco:

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Attorney at Law
CAMPBELL and BLACK
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Daniel R. Currens
Attorney at Law
Amoco Production Company
Post Office Box 3092
Houston, Texas 77253

For Norman W. Libby:

W. Perry Pearce
and
Sara M. Singleton
Attorneys at Law
MONTGOMERY & ANDREWS
Post Office Box 2307
Santa Fe, New Mexico 87504

I N D E X

E X H I B I T S

E X H I B I T S CONT'D

MR. LEMAY: We'll now call Case Number 9428.

MR. STOVALL: In the matter of Case Number 9428 being called by the Oil Conservation Division on its own motion pursuant to the provisions of Division Order Number R-6446-B, as amended, which approved the Bravo Dome Carbon Dioxide Gas Unit Agreement in Harding, Union, and Quay Counties, New Mexico, to permit Amoco Production Company, the operator of said unit, to review operations and demonstrate to the Commission that its operations within the unit are resulting in the prevention of waste and the protection of correlative rights on a continuing basis.

MR. LEMAY: Thank you, Mr. Stovall.

Appearances in Case Number 9428.

MR. CARR: May it please the Commission, my name is William F. Carr, with the law firm of Campbell & Black, P. A., of Santa Fe.

We represent Amoco Production Company.

I'm appearing in association with Daniel R. Curren, Attorney for Amoco Production Company from Houston, who will present our three witnesses.

MR. LEMAY: May I ask if Mr. Currens is appearing as an engineer or as a lawyer>

MR. CURRENS: As an attorney, Mr. Chairman.

MR. CARR: We will try to keep him on track and in that role. Remember that lawyers are incompetent. We're having a hard time forgetting that.

MR. PEARCE: May it please the Commission, I am W. Perry Pearce of the law firm of Montgomery and Andrews, P. A..

I'm appearing in this matter in association with Sara M. Singleton, who is also with our firm.

We are appearing representing Mr. Norman W. Libby, L-I-B-B-Y.

We do not expect to have a witness, Mr. Chairman.

MR. LEMAY: Thank you, Mr. Pearce.

Additional appearances in the case?

If not, we shall begin.

Yes, sir.

MR. HOCKER: May I make a statement at the end?

MR. LEMAY: Oh, yeah, I'm sorry.

MR. HOCKER: I just wanted to make sure that was clear.

MR. LEMAY: I'm sorry, I needed to say that.

Our general policy is to have the proponents in the case present their evidence first, and there's cross examination, and all that, and then we have the other side again with the same procedure, and then at the end we do accept statements, unless -- if any of you have any time constraints because you have to leave early, we can accept statements earlier.

Are you okay, there?

MR. HOCKER: Fine.

MR. LEMAY: Mr. Carr.

MR. CARR: May it please the Commission, I have a brief opening statement.

Amoco Production Company is before you here today to review its activities as operator of the Bravo Dome Carbon Dioxide Gas Unit as it is required to do by this Commission's order which originally approved the unit agreement.

There have been a number of hearings over the past ten years involving the Bravo Dome i

Unit, not only the approval hearings but hearings directed at appropriate spacing in the unit, testing procedures, things of that nature, and although we've been before the Commission on numerous occasions, none of you have been on the Commission at that time.

And so what we're intending to do is to provide you with a general overview of our operations in the unit and tell you where we are today and what we are doing as unit operator.

I think it's fair to say that development of carbon dioxide in northeastern New Mexico has been an imaginative project. It's been a major undertaking even for companies the size of Amoco and the other companies involved in the development of this resource.

As perhaps you know, this is a unit that is the largest gas unit anywhere unit anywhere in the world. It's comprised of over a million acres. It's in a relatively remote area and as the resource was developed and the early decisions were made, they were made really with relatively limited data for it was not known exactly how to produce carbon dioxide, what it would require to treat it, how it could be transported; in fact, it wasn't even really known how it would work in a reservoir when injected for enhanced oil recovery purposes.

But it was apparent that there

was a potential for this resource in tertiary oil recovery.

So, in the 1970's Amoco and others undertook an aggressive leasing program in northeastern New Mexico. They drilled some wells, developed initial data, and then it was decided that because of all the uncertainties, because of the large area, because of the remoteness, unitized development of this resource was the appropriate way to go and in the late 1970's Amoco and the other working interest owners in the area met and they developed a unit agreement whereby they would share the burdens and the benefits that they hoped could be obtained from the development of carbon dioxide gas. This unit agreement is, and always has been voluntary in nature, and it contains some unique provisions. We won't go into all those today but one, I think, that is important at this point to note is that prior to this unit becoming effective, we provided in that agreement that we would come to this Commission, seek and obtain its approval, and in 1980 we appeared before you on two occasions, there were two hearings. Following both of those hearings the New Mexico Oil Commission approved the Bravo Dome Unit.

We obtained approval from the Commissioner of Public Lands. We obtained approval from the Bureau of Land Management, and the unit was in effect.

The unit -- the orders from

this Commission that approved the agreement gave you a continuing role. Various things apply to it, but one of the things, the reason we're here today, is that that order required that we would come back before you once every four years and tell you and show you that we were doing what we were at that time saying we were going to do; that is, develop this area in an efficient and effective manner.

And so for that reason we're here today before you to give you our progress report, and in doing this we're going to call three witnesses.

The first witness is a geologist. His name is Jim Wyles, and we will start by giving you a brief, general background of the development of the Tubb formation from a geologic point of view.

We will start from that point and then we will show you what Amoco has done, particularly in the last four years, since the first four years will be apparent, what we have done to further define and understand this reservoir, and we will show you that our early impression has been confirmed, that the Tubb is present throughout the unit area, and we're going to also show you that we now have a much clearer picture of this formation and that we are, even though development is down because CO_2 is tied with oil prices, that has not slowed us down in terms of actively and aggressively trying to understand the

reservoir and develop the information that we need to carry out our duties as unit operator as we move toward full development of those areas which we determine to be capable of commercial carbon dioxide production.

We will then call an engineering witness, Mr. Jim Collier, and he is going to take you briefly through the history of the development of this unit and he's going to show you that we have explored and are developing this resource in an efficient, orderly, and economical fashion and that there have been economies achieved in drilling, gathering, treating, and producing this resource, and that these reduced costs are beneficial to all those who have an interest in the Bravo Dome Unit Area, including the State.

We then will call the Manager of CO_2 Sales and Supply, David McElhaney. He is going to review with you the volumes of production that have been obtained to date, the investments made, and the benefits that we see flowing from the Bravo Dome Unit in terms of royalty payments and taxes.

This is New Mexico's only CO_2 source at this time and the industry which it serves, the oil industry, as we all know, is down but we will show you that even with the industry down Amoco, through its efforts in Bravo Dome, is marketing and producing substantial

volumes of carbon dioxide gas.

This is, and has been, an ambitious project and we have felt from the beginning at our request this Commission became our partner in that endeavor. We've made huge capital investments. We've put $150-million into the project before the first MCF of CO_2 was sold.

We have over $280-million in the effort now. We are producing and we are marketing carbon dioxide. We are continuing to study the reservoir and we believe at the end of this hearing you will see that in all ways we are continuing to meet our duties as unit operator and we are achieving what we believe are our common goals, ours and yours, to develop this resource in an efficient manner, preventing waste of the resource, and protecting the interests of all interest owners in the Bravo Dome Area.

Thank you, Mr. Chairman.

MR. LEMAY: Mr. Pearce, did you have an opening statement?

MR. PEARCE: Nothing, thank, you, Mr. Chairman.

MR. LEMAY: Are there any other opening statements?

If not, I would like the wit-

nesses to stand now and be sworn in.

(Witnesses sworn.)

MR. LEMAY: Mr. Carr, you may call your first witness.

MR. CARR: Mr. Currens will present Amoco's witnesses.

MR. LEMAY: Mr. Currens?

MR. CURRENS: We have previously handed you Commissioners a booklet that contains the exhibits that we will be going through here today. Some of them, when our witnesses are talking from them and testifying from them, we'll mount on some easels over here so they can be more readily seen throughout the room and we'll communicate a little better in that manner.

JAMES C. WYLES,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CURRENS:

Q Will you state your name, please?

A My name is James C. Wyles.

Q By whom are you employed, Mr. Wyles?

A Amoco Production Company in Houston, Texas.

Q And in what capacity?

A I'm a geologist.

Q Mr. Wyles, have you ever testified before this Commission before?

A No, sir.

Q Would you briefly give us some of your background? What's your educational background in geology?

A In 1981 I graduated from the University of Akron in Akron, Ohio, and received a Master's degree in geology.

Q And upon graduation with a Masters in geology, what did you do?

A I began employment in that same year with Amoco Production Company in Houston, Texas, working in the Exploitation Projects Group in west Texas, eastern New Mexico.

Q And very briefly, have your assignments in that area had to do with normal geological exploitation assignments a geologist would have?

A Yes, they have. My major responsibility was the evaluation and exploitation of certain existing

fields that Amoco operated in the Permian Basin.

Q Did that include the Bravo Dome Carbon Dioxide Gas Unit Area?

A Yes, it did. In 1984 I began my study of the Brave Dome Carbon Dioxide Gas Unit and since that time I've devoted approximately 50 percent of my time towards that effort.

Q In conjunction with this hearing today have you had occasion to take your knowledge, your studies, and prepare or have prepared certain exhibits that you will present?

A Yes, sir.

MR. CURRENS: I submit his qualifications as a geologist.

MR. LEMAY: His qualifications are acceptable.

Q Let me ask you to turn to Exhibit One. You have a set of exhibits there, Mr. Wyles?

A Yes, sir.

Q Exhibit One and tell us very briefly what's shown on that exhibit, please.

A This is a regional geographic location map of the Bravo Dome Carbon Dioxide Unit.

The Bravo Dome Unit is located in north-eastern New Mexico, near the Texas, Colorado, and Oklahoma

borders.

The inset map that you see there shows the unit boundary in the three counties which Bravo Dome covers, Union County, Harding County, and Quay County.

Q Okay, with that general location, and in that inset it also shows the outline of the unit, is that correct?

A That is correct.

Q Now this unit that we're talking about here is -- is it producing currently?

A Yes, it is.

Q And from what is it producing?

A It's producing from the Tubb formation.

Q And what substance is it producing?

A CO_2.

Q Carbon dioxide --

A That's correct.

Q -- out of the Tubb formation.

A Yes, sir.

Q Mr. Wyles, perhaps it would be generally helpful to us if you could give us a little background knowledge on the Tubb formation in this area; perhaps as to how it came to be deposited.

A Okay, if you will look at Exhibits Two-A, Two-B, and Two-C, these are three exhibits which

show the schematic depositional models of the Bravo Dome Unit Area through geologic time.

You'll note in the lower righthand corner of each of these exhibits the name Bruce I. May appears. He was the previous geologist that had worked on Bravo Dome and developed these models and we still believe these models to hold true today.

Q Why don't you start with the Two-A Exhibit, then, and discuss what that shows?

A Okay. Just to orient you on each of these exhibits, what I'd like to do is say that underneath the writing of the Sierra Grande Uplift, that will be the Sierra Grande Area on the block diagram, and below the writing where it says the Bravo Dome Area, that will be the general area for the Bravo Dome Area, and then to the right will be the Palo Duro Basin Area, and keep in mind these are schematic.

Q Okay, so this goes from the west on the left to the east on the right.

A That is correct.

Q Okay, go ahead with discussion of Two-A, please.

A This model that you see in Two-A is of Middle Pennsylvanian time. At this time we had a basement reactivation of faulting in the Sierra Grande Area as well

as the Bravo Dome Area, and this is shown by the red area in the lower lefthand corner where you can see a fault drawn in with up and down arrows with it.

This caused uplifting in both the Bravo Dome Area as well as in the Sierra Grande Area. This created horst and graben areas within the Bravo Dome Unit.

At this time we had high relief in the area and we had erosion of this PreCambrian basement rock, which was mainly granite.

We had deposition mainly through alluvial sand which deposited Granite Wash in these lower lying graben areas. This Granite Wash is indicated in the subsurface you'll see in the center of the photo, or diagram, by the orange area with the orange triangles.

Okay, going on to Exhibit Two-B, this is late Pennsylvanian time. As you can see in the Bravo Dome Area, we have lower relief as a result of the erosion that was going on.

Also you can see that the Granite Wash has begun to fill in the graben area. At this time you begin to have a reworking of the Granite Wash sediment by braided streams, but again, the main deposition at this time was the Granite Wash.

Moving to Exhibit Two-C --

Q Now that's a later time period.

A That is correct.

Q Okay.

A This is early Permian in Exhibit Two-C and at this time the Basement rock was well eroded or covered by Granite Wash. Now we see the dominant environment, an alluvial plain system, or reworking of Granite Wash by ephemeral streams. We've deposited fine grained sandstone, which is shown as the yellow area in the subsurface with crescent-shaped symbols in them. This fine grained sand developed good porosity and permeability and became the major contributor to the Tubb formation which is the reservoir in the Bravo Dome Unit.

Later in the Permian time we had a major transgression of the Palo Duro Basin Sea from the east and it transgressed up over the Bravo Dome Area. This was a very restricted shallow sea and deposited an evaporite of anhydrite, which is the Cimarron Anhydrite, which is shown as the gray area in the subsurface. This became the vertiseal for the Bravo Dome Unit in the Tubb formation.

Q Okay. This series, then gives us some background and perhaps understanding as to how this Tubb, which we -- from which we produce came to be deposited, is that correct?

A Yes, sir.

Q Now, have you a type log of the kind that is

normally run in drilling operations that depicts this Tubb formation?

A Yes, I do, in Exhibit Three-A and Three-B.

Q Now, this is two parts of the exhibit, A and B, but is this just one log that we're looking at here?

A That is correct.

Q Our Xerox just couldn't handle the whole thing on one piece of paper?

A That's correct, sir.

Q Okay. All right, tell us what's on the Three-A part of this exhibit, then.

A Okay. This is a type log of a typical well within the Bravo Dome Carbon Dioxide Gas Unit. The information that is shown here on this is the header information. On this particular header is the write-in compensated neutron formation density log, and that is the typical log that is run within the Bravo Dome Unit.

Q Okay, where -- where is this well located in the unit, just in general terms?

A In the west central portion of the unit.

Q All right. Anything else with respect to the header information?

A No, sir.

Q Let's move on down to the meat of the

log, the Three-B part of the exhibit.

A Okay. the curves that are shown on this exhibit are -- in the first track is the gamma ray curve, the track farthest to your left, and the other, the second track we have the porosity as determined by the compensated neutron density log.

The unitized interval of the Tubb formation is defined at the base of the Cimarron anhydrite or the top of the Tubb formation to the top of the PreCambrian Basement rock. And the PreCambrian Basement rock is shown here in this exhibit by the reddish area.

Lying unconformably above the PreCambrian Basement rock is the Tubb formation and the first thing that you encounter in the basal portion of the section is the Granite Wash, as I explained to you in the earlier exhibit, and this whole interval of the Tubb formation is colored in orange.

Within that Tubb formation, then, towards the top of the log, we have the fine grained sands which make up the major portion of the reservoir, the major contributor to the reservoir.

Above that, shaded in blue is the vertical seal, the Cimarron anhydrite.

Q Okay, is there any other particular that you care to point out with respect to Exhibit Three-A and

B?

Q No, sir.

Q Now, Mr. Wyles, I believe that you're familiar with or have read the transcript of the proceedings in the last of these hearings, the one we had four years ago reporting our progress at that time, is that correct?

A Yes, sir.

Q Do you recall whether or not we had obtained any seismic information at that time?

A Yes, sir. At that time we had shot 600 miles of seismic but not -- had not processed it.

Q Okay. So we had acquired data but hadn't had a chance to process it four years ago.

A That is correct.

Q Now, in the intervening time have we gathered any more geophysical information?

A Yes, we have. We have shot and processed another 800 miles of seismic, for a total of 1400 miles at a cost of approximately $3.5-million.

Q Okay, so we've got the additional 800 miles and we process the 600 we had before plus the 800 since then.

A Yes, sir.

Q Now, very broadly, has this seismic

coverage been pretty well throughout the unit area?

A Yes, sir.

Q Let's look at Exhibit Four and I think that we'll best work from one here we can put up on the easel.

And let me just ask you to tell us what's shown on Exhibit Four.

A The bold line around the seismic is the seismic is the Bravo Dome Unit boundary.

The lines that you are seeing within that unit boundary, then, are the seismic lines that were shot and processed, and again there were 1400 miles of total seismic in this area.

You'll note that we have a slight hole here in the south central portion of the unit and that's where we have most of our well control.

Over to the west we have a little bit sparse control there and that was mainly due to budgetary constraints when we shot the seismic.

Q Okay. Now, anything in particular further that you want to point out with respect to this?

A Just that the type log that we found in the previous exhibit is located approximately here.

Q Okay. The "here" being in the --

A West central portion of the unit.

Q Thank you, Mr. Wyles, as you well recognize, the record can't pick up your hand motion.

Now, you've mentioned the type log and you've mentioned the area it was in, what value does the geophysical information have to you as a geologist? How do you use it?

A Well, by working as a team, I get information from him on the approximate or the best top that he can give me from the seismic data on the top of the Tubb formation.

Q Is that coordinated with the results you've had from well logs and the drilling and samples and things of that nature?

A That is correct.

Q So in addition to the geophysical information, or the seismic information that you've gathered here, you've had other tools that you've been able to look at and study the geology and structure of this Bravo Dome.

A Yes, sir.

Q What would that be, primarily, wells?

A Yes, wells, seismic data, and making a Tubb structure map from them.

Q Okay, about how many wells have you looked at in conjunction with your work in this area?

A There are approximately 400 wells.

Q All right, and have you prepared a structure map?

A Yes, sir, I have.

Q Let's put that up as Exhibit Five.

Now, we've put Exhibit -- a copy of exhibit Number Five up on that easel. I believe you said that was a structure map you had prepared.

A Yes, sir. This is the Tubb structure map. The contour interval is 100 feet. The scale on the map is one inch equals 8000 feet. I'd like to point out to you that one of these square blocks is a township, we're dealing with 6 miles by 6 miles in this, so from the southern portion of the unit to the northern portion of the unit we're dealing with approximately 50 miles.

Q And from east to west?

A Is approximately 30 miles.

Q All right, sir, and also on this map are shown wells that are within the unit area, is that right?

A That's correct. Above the well symbols you will see the unit well number and below that symbol you will see the Tubb datum and you will note that that is a positive value; that is, the elevation is above sea level.

Q Okay. Now, were all the wells in the unit area a part of your study?

A No, sir. They are not shown on this

map. The only thing that is shown on this map are unit wells. To make this contour map I also did use wells that were outside the unit to the southwest, south, southeast, north, and northwest.

Q All right. Why don't you just give us a general rundown of what you've depicted by the structure map?

A Okay. There is a regional Tubb pinchout as we go towards the northwest. That is outside of the unit boundary.

Q Now, is that that wavy line in the upper left of this exhibit?

A Yes, sir. I've drawn a wavy line in this case because I'm indicating that the Tubb pinchout is somewhere in this band. The only thing I have to go by on that is three wells outside the unit that did not have Tubb present at all.

Q So you know there's no Tubb that far --

A That's correct.

Q -- to the northwest, but you don't know precisely where it pinches out.

A That is correct.

Q Okay, go ahead, don't let me interrupt so much.

A The regional dip of the Tubb formation

is towards the southeast. It is also towards the east toward the Palo Duro Basin. the Palo Duro Basin.

A You will notice that there is one major feature here. That's one major fault which cuts the top of the Tubb formation. The maximum displacement on this fault is approximately 300 feet. The "U" just above the fault line is an indication that that's the upthrown side, while the "D" is an indication that that is the downthrown side.

Now I will note, as we go down towards the southeast along this fault, we have a -- what I consider as a scissors fault, so now, this, the southern side is now the upthrown side and the northern side is the downthrown side, and you can see that from the contours.

Q Now, you've seen prior maps and interpretations of the structure in this are, have you not?

A Yes, I have.

Q And my recollection from a number of those was that there were indications of many more and more complex faulting than is depicted on your map, is that right?

A Yes, sir.

Q And what -- what -- to what to you attribute the difference in your current interpretation and those earlier interpretations?

A Basically an evolution of the data that

we've been able to have. The earlier work in that Tubb pressure map you were referring to, we had many less wells than what we have now and we did not have the seismic control that we have now, also.

Q In fact we didn't even have any seismic that had been processed four years ago, did we?

A That is correct.

Q Okay, now, I notice a few other little odd things on this structure map that you have. There appear to be some sort of egg-shaped areas that are stippled. What are those?

A There are three areas which you are referring to. That is the Basement subcrop area; there are three of them, two in the south and one in the northwest.

What I believe these to be are inselberg, or erosional remnants of that Basement rock. This were located by a drilling well. We have a P&A'd well, located here, which did not encounter any Tubb in the southernmost inselberg; however, we were able to produce in that same section to the southwest, to drill another well that did have Tubb present and was productive.

So we have wells all around this particular inselberg that we can define as to areal extent.

Q So with respect to these little features, I have difficult in pronouncing that word, with

respect to these, you have some idea of the areal extent of them by surrounding wells that did penetrate the Tubb, even though there would be a well that had no Tubb whatsoever in it?

A Yes, sir. The second one that we have up here only encountered 36 feet of Tubb and there was no porosity present in that wellbore, and from seismic we could also pick up this inselberg, or Basement subcrop, on the seismic.

Now, the well -- the inselberg up in the northwestern portion of the unit, we had a well drilled there that did not have Tubb present, so we do not have any immediate well control for the areal extent and that was based upon seismic.

Q All right. So you are discussing and illustrating the use of the wells actually drilled in the area and the geophysical, or seismic, information that you've obtained. Are there other tools that you geologists use in the study of the structure? Is there other information?

A Oh, yes, sir.

Q Is there other information such as data sources, such as --

A Oh, yes, sir, --

Q -- samples --

A -- cores.

Q -- cores?

A Yes.

Q Cores.

A And we've had 44 cored wells in the unit and if you stacked all of the cores on top of each other, you'd have over a mile of core, approximately 5,840 feet of core.

Q Do you have some particular familiarity with some of these cores?

A Yes, I do. As a matter of fact I sat one of the cored wells in the western portion of the unit.

Q You sat the coring of that particular well in the western part. You seem to have some particular reason that you have that one etched in your memory.

A Yes, it's a very vivid memory. It was on December 24th, 1984, Christmas Eve.

Q Not an unusual situation for geologists, is it?

A No, but at 2:00 a.m., also.

Q With respect to your Exhibit Five and your structure map, if I understand what you told me, this is your current interpretation of the structure, it being an evolutionary thing, and this is how far we've gotten at this time with the data that we have. Is that a fair sum

mary?

A Yes, sir, that's correct.

Q Is there anything else with respect to any of your exhibits that you'd care to cover, Mr. Wyles?

A Nothing.

MR. CURRENS: I would offer Exhibits One through Five and all of their parts, and Mr. Wyles for examination.

MR. LEMAY: Without objection, the exhibits will be entered in the record.

Anything further, Mr. Currens?

MR. CURRENS: No, I offered him for examination.

MR. LEMAY: Mr. Pearce?

MR. PEARCE: Thank you, Mr. Chairman.

CROSS EXAMINATION

BY MR. PEARCE:

Q Mr. Wyles, I'm Perry Pearce and I'm here representing Norman Libby and I've just got a couple of very quick ones, I think.

Do you -- well, first of all, which was the -- which well did you have the unfortunate experience of sitting?

A I believe it was the 21, 29, the one in the north -- northern portion.

Q The northwest of 21, 29?

A I believe so.

Q That well appears to have the number 2853 below it, is that -- and unfortunately I've got a crease on the upper number so I can't --

A Yes, that would be the sub-datum below that well.

Q Do you have a list of all of the wells which have been cored in the Bravo Dome?

A Yes, I do.

Q Do you happen to have that with you, sir?

A Yes, I do.

MR. PEARCE: Mr. Currens, I'd like a copy of that. I do not have any questions for him on that list at this time, but if I could have a --

MR. CURRENS: We'd be happy to furnish that to you in the next several days, Mr. Pearce.

MR. PEARCE: Okay, fine.

Nothing further, Mr. Chairman.

MR. LEMAY: Are there additional questions of the witness?

QUESTIONS BY MR. LEMAY:

Q Only for the record's sake, I'd like to ask you, Mr. Wyles, on your Exhibit Number -- the cross section, Exhibit Two -- the type log.

MR. CURRENS: The type log is Exhibit Three-A and Three-B.

Q Exhibit Three-B, do you want to identify that formation above the Cimarron anahydrite? Is that Yeso?

A Yes, sir.

Q For the record, what kind of lithology, generally?

A Sand.

MR. CARR: I have no questions.

MR. LEMAY: The witness may be excused.

MR. CURRENS: My next witness will be Mr. Collier.

JAMES W. (JIM) COLLIER, JR.,

being called as witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CURRENS:

Q Will you state your name, please?

A My name is James W. Collier.

Q By whom are you employed, Mr. Collier?

A I'm employed by Amoco Production Company in Houston, Texas.

Q And in what capacity?

A I'm employed as a Senior Petroleum Engineering Associate in our Region Office.

Q Now, Mr. Collier, I know you've testified before the Division before but have you ever testified before the Commissioners?

A No, sir, I have not.

Q Let's then briefly go through your background, education and work experience.

What is your educational background, Mr. Collier?

A Okay, I graduated from Texas A & M University in May of 1972 with a Bachelor of Science degree in petroleum engineering.

Q And upon graduation what did you do?

A At that time I was employed by Amoco as a production engineer in west Texas, and for the next five years following that I was assigned various engineering

duties in operations and in the reservoir aspects of our industry.

Q And after that five year period?

A Following that I then served two years as an engineering supervisor at a district office, followed by a year in our Chicago general office, Planning and Economics Department, assigned as the Coordinator of DOE regulations within our company.

Q All right, after your work with the DOE regulations in Chicago, what was your next assignment?

A Okay, following that, for a period of two years I was assigned as a Division Reservoir Engineer supervising a group of engineers handling joint geological engineering exploitation efforts of our reservoirs in west Texas and in eastern New Mexico.

Q And subsequent to that?

A That was followed by a four years as Division Reservoir Engineer supervising engineering duties over our west Texas secondary waterfloods and our enhanced recovery feasibility studies, as well as our west Texas, eastern New Mexico operations.

Q And subsequent to that assignment.

A Okay, for the past two years I've been assigned as a Senior Petroleum Engineering Associate in our Regulatory Affairs Group, handling regulatory affairs in

New Mexico and Texas.

Q Now, Mr. Collier, in conjunction with this hearing today have you had occasion to make a study looking at the activities that Amoco as unit operator of this unit had performed over the life of the unit?

A Yes, sir, I have.

Q And have you prepared or had prepared under your direction and supervision certain exhibits to be used in your testimony today?

A Yes, sir, I have.

MR. CURRENS: Mr. Chairman, I would submit his qualifications as an expert petroleum engineer.

MR. LEMAY: His qualifications are accepted.

Q Mr. Collier, let's turn our attention to Exhibit Number Six. I think we have a big copy of that, don't we?

A Yes, we do.

Q Tell us, please, what's shown on Exhibit Six.

A All right. Exhibit Six is a map that in this mapped area shows the current Bravo Dome Carbon Dioxide Gas Unit. That is outlined with a heavy, solid border.

Q And what else is shown there?

A Also shown by the cross hatched area is the area that was proposed back in 1980 to be in the original area but which did not qualify to be in the unit; therefore it is not in the unit.

Q Okay, as I understand it, the large outline, including all the cross hatched area, is the initial unit proposal that was made for the formation of this voluntary unit back in 1980, is that right?

A That's right.

Q And that as a result of the approval of this unit those who committed their interest to it gave us the resulting unit of being the un-cross hatched area within that big outline.

A That's correct. The un-cross hatched area, which is the current unit, consists of the voluntary participants to the unit and the total commitment of acreage to that unit was approximately 1,035,000 acres.

Q So that's about 1,036,000-acre unit at this time and how large was the unit when it was originally proposed?

A Approximately 1,174,000 acres.

Q Now, why -- there seems to be a rather large area in the southwest portion that has bee cross hatched there that's not part of the unit.

Why is that large -- area so large?

A The unit agreement that was reached between the parties in this unit stipulated that in order for tract to qualify it had to be contiguous with the remaining acreage.

There were leases and tracts along a present border of the unit which -- these interests were not committed; therefore it technically served to make this large area noncontiguous with the main body of the present unit; therefore, all of this cross hatched area became disqualified.

Q So by the terms of the agreement itself it could not be included in the unit that we had initially proposed.

A That's correct.

Q Do you know what has happened with respect to that area or a substantial portion of it since then?

A Yes, a very major portion of this area has since that time been formed into another unit.

Q And do you know the name of that other unit?

A Yes, that's called the West Bravo Dome CO_2 Gas Unit.

Q And do you know its operator?

A It's operated by OXY USA.

Q And that would have been by some other name at the time it apparently --

A I believe at the time it was Cities Service.

Q All right. I have trouble getting name changes straight sometimes.

A Now, are there some well symbols shown on that map?

A Yes, sir, there are.

Q And what are those?

A Okay, we've shown three different symbols. First the conventional gas well symbol. There are symbols both inside the present unit and outside in the cross hatched area.

Q Uh-huh.

Q Secondly there's the conventional P&A well symbol. Again there are some of those inside the present unit and some outside the present unit.

And thirdly, there's an open circle which indicates an incomplete well.

Q Okay. Now, they're fairly widely scattered and not too many. What's the advantage of those wells?

A All these wells were in existence as of

the effective date of the Bravo Dome, so these were all drilled prior to 1980.

Q Or prior to November 1, 1980, when the unit became --

A Prior to November 1st.

Q -- effective.

All right, anything else that you want to cover in this exhibit?

A No, sir, I don't believe so.

Q Okay, since that time have a large number of wells been drilled since the unit became effective?

A Yes, they have.

Q Do we have exhibits that depict the development history of the unit to this point?

A Yes, sir, we do.

Q Well, let's look at Exhibit Seven, which is in five parts.

Let me refer you to Exhibit Seven-A and ask you the time frame depicted on that exhibit.

A Again, this time frame of this exhibit is the status as of November 1st of 1980.

Q Okay, and that shows the wells that are within the existing unit area that were there at that time.

A Yes, sir, this shows the wells that had penetrated and had been completed in the Tubb formation as of November 1st of 1980.

Q All right, sir. When did the next drilling activity take place?

A The next major drilling was at the tail end of 1980 and continued on through 1981.

Q All right. Does Seven-B show that activity?

A Yes, sir, it does.

Q Okay, by -- on Exhibit Seven-B you show the wells that were drilled in '80 and '81. How are they depicted?

A These are depicted on this overlay, which is Exhibit Seven-B as solid square symbols.

Q And they seem to be widely spread throughout the unit area?

A Yes, sir, that's correct, they are.

Q How many were drilled in that drilling program, approximately.

A Approximately 170 wells.

Q Now, this is in the period immediately after the unit became effective that these wells were drilled?

A Yes, sir, that's correct. This is late

1980 and going on in through 1981.

Q Were we in anticipation that production from this are would commence so soon after unitization?

A No, sir.

Q Why did we drill so many wells right after the unit was put together before it was ready to be produced?

A The majority of these 170 wells in this program were drilled to protect expiring leases.

Q Underlying lease obligations, then.

A That's correct.

Q All right, and that dictated where the wells were drilled.

A Yes, sir.

Q Underlying lease obligations.

A Almost exclusively that was the reason.

Q When was the next drilling program?

A The next drilling program was in 1982 and the major part followed into 1983.

Q And that's Exhibit Seven-C?

A Yes, sir.

Q The Commissioners will note that we just put a piece of white paper behind this. We'll take it off in just a second, but with the cumulative nature of these exhibits it's a little easier to see what happened in

this program.

With respect to Exhibit Seven-C, about how many wells were drilled at that time?

A In the years '82 and '83 we drilled approximately 95 wells and these are shown by the diamond symbols on Exhibit Seven-C.

Q And at that time in '82 and '83 were we in contemplation of production beginning?

A Yes, sir, we were at that time.

Q And did that affect the reason for the drilling of these wells at these locations?

A Yes, sir, at that time, as I'll show you later, we had designed a gas processing facility and a gas gathering facility, so the location of these wells was (unclear) so as to feed that delivery system and supply that planned gas processing plant with CO_2 gas.

Q Yeah, Well, why don't we take the white sheet off the back there and we'll see how it all fits into the wells that already exist?

So that gives us a rather dense area sort of in the east central part of the unit --

A Correct.

Q -- of development, and is that where the plants were planned to be located initially?

A Yes, sir.

Q Okay. Anything else with respect to Seven-C?

A No, sir, I don't believe so.

Q Okay. Let's move on then to Exhibit Seven-D. That would be our next drilling program.

A That's correct.

Q Now when did the drilling in this program occur?

A This occurred in the year 1984.

Q It appears to me that there are a fair number of wells that will just sort of add on that plant area that we had awhile ago.

A That's correct. You'll notice that there is a concentration by the way the symbols here are solid circles for the 1984 wells drilled. Approximately 40 wells were drilled into the program. The majority of them again were in this south central region, southeast central region, again in anticipation of production coming on stream in 1984. These wells were drilled to supply additional gas to meet the design specifications of our processing facilities.

Q Okay, so they were designed to feed into the plants that were either under construction or had been built already at that time.

A Correct.

Q Now, I see scattered around, particularly to the north and south, sort of some stray dots. What are those?

A Okay, in conjunction with this plan, or program in the productive area, or the connected area, we drilled wells that were remote to this connected area.

Q Uh-huh.

A And you notice those are generally in the northwest part of the unit and also down along the southern portion of the unit.

Q Now, were those wells going to be connected to the plants, then?

A Not in any near term time frame, no, sir.

Q Well, why did we want to drill those wells?

A For additional data. As we've already stated, this is a large unit. We had to get some sort of data to evaluated the reservoir to get the reservoir parameters and to help us to plan future expansion programs when the time came to make that necessary.

Q Okay. Why don't we take the white off there?

So in addition to the immediate need or utility of wells to be drilled in the area and be connected

to the plants, Amoco and the other working interest owners in the unit made investments, drilled wells remote from that area, so that they could be in a position to expand, as necessary, is that right?

A That's correct.

Q All right. Was there another drilling program?

A Yes, sir, there was one major drilling program following this one.

Q Let's look at it. I believe that will Seven-E. How many wells in this program?

A Again, approximately 40 to 50 wells in this program.

Q Again do I see a dual purpose drilling activity here like we did on the last exhibit?

A Yes, sir. Again the well symbols in the 1985 drilling program are depicted as downward pointed triangles --

Q Okay.

A -- in that particular exhibit. Some wells were drilled around the outlying area of the connected CO_2 area. In other words, the area connected to our gathering facilities.

Q And again I see apparently a scattering of wells north and west and south from there.

A Yes. Again those were drilled for the same purpose as the remote wells in 1984, that being to cover the unit as best we could to get additional reservoir data for future production planning purposes.

Q Okay. Why don't we take the white off there?

Now, in those last two programs you had additional wells that were drilled to feed the two plants that were built in the area. Did we need those wells from the standpoint of deliverability at that time? Did we have to have it? Were we running short of gas or what?

A Well, at the time we were selling all the gas that we could produce but the design conditions of the processing facilities were such that a range of suction pressures with about 100 pounds, 200 pounds, was the optimum range in which to operate that plant.

But what we did by drilling these expansion wells was to keep the conditions at that plant inlet more towards the higher range, thereby increasing the efficiency of that processing facility.

Q So they were primarily drilled for increased plant efficiency.

A That's correct.

Q As opposed to their immediate need for deliverability.

A Correct.

Q Gave us another deliverability (unclear), didn't it?

A Yes, sir, it did.

Q Why would we want to make the investment to drill things just to make -- to drill wells just to make the plant more efficient?

A Well, the primary reason is with increased efficiency of the plant we, on a per unit basis, reduce operating costs, mainly in the form of reduced electrical power usage, and this results in a higher settlement price at the wellhead, which benefits both the royalty owners as well as the working interest owners in the unit.

Q Okay. Anything else with respect to Seven-A through E?

A No, sir.

Q Okay, let's -- perhaps you might want to return to your seat up there, and let's look at Exhibit Eight, and tell me what you've shown on Exhibit Eight.

A Exhibit Eight is a bar chart showing the cumulative number of wells existing in the Bravo Dome Unit by years with the time scale across the bottom and number of wells on the Y axis on the left.

Q How many wells altogether have been

drilled in the unit area?

A 390.

Q Now how many wells are connected to those plants?

A At the present time 260 wells are connected.

Q And when did the first plant, first production start to operate out there?

A In April of 1984.

Q Okay, how many wells did we have at the end of 1983?

A Approximately 304.

Q Okay, so we have wells scattered throughout the unit that were not connected to the plant even at the time of first production.

A Correct.

Q Anything else with respect to Exhibit Eight?

A No, sir.

Q We've been talking about the wells. Is this a complex operation from the standpoint of the surface facilities involve at the individual wellsites?

A No, sir, in fact it's quite a simple, straightforward design.

Q I believe you prepared Exhibit Nine to

illustrate the fairly simple nature of that exhibit and I'll ask you to turn to it.

A Okay.

Q I'll further ask you not to talk about it in great detail since there's a legend there that labels the parts, but give us just a rough flow diagram here.

A Okay.

Q What happens?

A Well, this is just simply a schematic drawing of a typical wellhead, meter run, and flow line installation in Bravo Dome Unit. All of our producing wells connected to the system look like this.

On the lefthand side of the schematic, of course, is the wellhead coming off a tee. Just to the right there is a shut-off valve. That's labeled number 3 in this schematic drawing. That is connected to our remote telemetry system and can be shut in through computer telemetry.

Q Okay, and then the gas flows through that metering system and on into what, a gathering system?

A Yes. It goes through the meter run, which is the long horizontal section of pipe to a differential pressure meter, then down through a flow line down underground into a trunk line system.

Q Now you mentioned a remote telemetry

arrangement. Explain that to us.

A Okay. If you notice in the upper righthand corner of the schematic drawing there is what appears to be an antenna. That's what it is, it's an antenna unit. This system is a solar -- well, it's run by batteries which are solar charged. Each well has one of these installations and this serves the purpose of data transmission as well -- to the central plant, as well as accepting commands and activation of various systems at the wellhead.

Q If we turn to Exhibit Ten will be get a little better visual image of what this looks like?

A Yes, sir, I believe so.

Q Let's turn to Exhibit Ten and tell me what that -- that's a photograph of.

A Yes. It's a photograph of a typical well installation in Bravo Dome. I might point out that the view of this is reversed from the schematic such that the wellhead is actually over on the righthand side of the location. You can see the wellhead coming up out of the ground and then the horizontal line, which is the meter run, and then further on the left going -- the flow line going down into the subsurface where it connects to the trunk line system.

Q Very compact and straightforward ar-

rangement, isn't it?

A Yes, sir, I believe so. Further, you can see the mast on the far left, which contains the antenna, the solar collectors, this is part of the automation system which I described earlier.

Q Okay. Let's -- unless you have something else on that one, let's flip over and look at Exhibit Eleven, and tell me what you're showing with that photograph.

A Okay, again this is another view of a typical installation, well installation. The only difference here, the reasons we're showing this is to show that this particular well is equipped with an automatic chemical feed which is over on the righthand side of the location. The yellow drum contains corrosion inhibition chemicals, which again are introduced into the flow line system for protection of -- of the metal.

Q Okay. Anything else on Eleven?

A No, sir.

Q Now, we've drilled wells; we have wellheads; we have measuring systems; we've got to get this to a plant someway or another, so what's the next step in the sequence?

A Well, the next step is to gather the gas into some sort of system.

Q Let's look at Exhibit Twelve-A, then, and see if we can learn a little bit more about that gathering system.

Now again on Exhibit Twelve you've shown the -- outlined the exterior boundary of the unit and the wells that exist there and now we've added something to it. Looks like a bunch of veins or something.

A All right, this Exhibit Twelve-A shows our first -- what we call Phase One. The reason we call it Phase One is connected to the Phase One Plant. We have two plants, so each system that leads into a respective plant is referred to the Phase One Gathering System or the Phase Two Gathering System.

Q Okay.

A And this overlay depicts the Phase One system. This was the original delivery system in the field with the subsequent expansion that was made to it to gather gas from the drilling expansions that I've described earlier.

Q Okay, so that the gathering system that you show here on this exhibit is as it exists today.

A That's correct.

Q How many wells are connected to that gathering system?

A At the present time there are 68 wells

in the system.

Q And initially in 1984 when we first kicked off?

A Approximately 50 wells.

Q How long is that system?

A At the present time it's about 70 miles with buried pipelines, ranging in size from about 4 inches -- well, from 4 inches in diameter up to 28 inches in diameter, with the larger diameter pipes being closer to the central processing facility and then tapering out toward the ends to smaller diameter pipe.

Q Okay, now you said we have two plants out there so I take it -- and that we have two gathering systems.

A Correct.

Q Let's look at Twelve-B and tell me what you're showing with the material you've added in Twelve-B.

A All right, Twelve-B is -- the overlay shows the Phase Two gathering system which ties to the Phase Two Gas Processing System. This came on stream after the Phase One Processing System.

Q And both those plants then are located on the tract around where all of these legs come into a central point?

A Yes. You can see that the system is

formed by a series of measured components coming in in radial fashion to the central facility with spokes or laterals coming off of those to connect to individual wells.

So the gas processing plants are located centrally right here where the trunklines come in.

Q Okay, right there being the central point where all of those meet.

A That's correct. sir.

Q Now, does that depict the Phase Two system as it now exists?

A Yes, sir, it does.

Q And how many wells, about, are connected to that, just approximately?

A About 170 wells.

Q And about how many miles of pipe in there?

A Let me amend that answer. It's really closer to 200 wells; about 190 wells. There's roughly --

Q Okay.

A -- roughly 200 miles of pipe in the Phase Two system.

Q Starting out and building up through those --

A It started out around 150 or 152. It's

now up to about 200 wells, with the drilling expansions.

Q All right. That then depicts our two gathering systems feeding our two plants, if I understand it correctly.

A That's correct.

Q Okay, now we've got wells; we've got gathering systems; we've been talking about plants; let's look at Exhibit Thirteen.

What are we showing on Exhibit Thirteen? I'm sorry, you're not to it, yet.

A Exhibit Thirteen is a schematic plan -- view of the Phase One facilities, the gas processing plant that we call the Phase One Plant.

Q Now this, too, is a rather simply and straightforward operation, is it not?

A Yes, sir, it is.

Q Just very briefly tell us the elements in it.

A Okay. in the upper lefthand corner of the schematic we have two plant inlet lines, or trunk lines, coming into the Phase One facility. The gas, which has entrained water in it must go through an inlet separation process to remove the majority of that free water before it moves into the various stages of compression.

At the lower, in the lower third of the

schematic you see the word "compression". This is actually a building housing three 6000 horsepower compressors, so there are three stages of compression and between each stage, or prior to and between each stage the gas must be additionally dehydrated and cooled before it goes to the next stage of compression.

Q Okay, and then when it's compressed and dry it leaves the plant and goes where?

A Okay, it goes, as shown here, through a metering station and then it's discharged to a transmission line.

Q Okay, so there's delivery to a line that takes the gas from this area.

A That is correct.

Q From this plant.

A Correct.

Q Now, is there more than one line that leaves the Bravo Dome Area going to alternate users of this gas?

A Yes, sir, there is.

Q Which of those transmission lines does this line connect to?

A Okay, this plant connects to the Rosebud Line, which is an east/west line roughly about 20 miles long, which ultimately connects to the Sheep Mountain CO_2

line.

Q And that goes on down to the Permian Basin?

A Yes, sir, it does.

Q Generally what are the outlet conditions on this, just broadly?

A Roughly 2100 psi.

Q And the conditions that the plant conditions the gas to with respect to whatever the pipeline specifications are for gas for that particular pipeline, is that right?

A Yes. Specifications include both pressure as well as water content.

Q Okay. Mr. Collier, you have included, oh, roughly a half a dozen pictures in here as the next exhibits. Why don't you just identify them and very briefly tell the Commissioners what you're showing there?

A Okay. Exhibit Fourteen is a shot of construction operations. This is the Phase One Compressor Building.

Q Okay, what's Fifteen?

A Fifteen is a shot of a glycol reboiler skid mounted before it was installed in the Phase One plant back in 1984.

Q And the next one?

A Exhibit Sixteen is inside the Phase One Compressor Building. This shows one of the -- one of the three 6000-horsepower compressors I mentioned earlier. The white cylinder on top is simply a second stage suction bottle.

Q Okay, and what's the next one? That would be what, Seventeen?

A Seventeen is a photograph showing a close-up view of a second stage scrubber. This is between the two stages of compression and this removes any additional water that's not removed when the gas first comes into the plant initially.

Q Okay, what's Exhibit Eighteen?

A Exhibit Eighteen is a -- one member of a bank of ten fan coolers. The gas must be cooled between stages. This is simply a fan mechanism, gas-to-air heat exchanger, where the heat is dispersed out the top through a series of fans.

Q And what's Exhibit Nineteen?

A Exhibit Nineteen is elevation view of the Phase One Plant facility. You can see the compressor building in the background and the various dehydration vessels and storage vessels in the front.

Q Okay, Now, let me ask you to turn to Exhibit Twenty and tell me what we're showing on Exhibit

Twenty, what you're showing there, please.

A Well, Exhibit Twenty is again a plant view schematic only this time it's the Phase Two gas processing facility.

Q Same nature as the Phase One Plant but just different equipment.

A That's correct.

Q Without going into great detail here, is the principal difference just the size?

A That is the only difference. Say we have six 8000 horsepower compressors in the Phase Two facility as compared to the three 6000 horsepower compressors in Phase One. There are five plant inlet lines in this facility as compared to two in the Phase One facility. Of course this reflects the nature of the -- just a bigger delivery system connected to Phase Two as compared to Phase One.

Q Now, where does the gas that leaves this plant principally go? To whom is it delivered?

A Okay, this gas is delivered to the Bravo pipeline system.

Q Let's look at Exhibit Twenty-one and tell me what you're showing there.

A This again is a planned view schematic simply -- very simply showing the relative location of the

two plants. They are on the same 80-acre tract. You can see an east/west highway -- state highway, I think it's labeled 65 on this exhibit, and the Phase One Plant is closer to the highway; the Phase Two Plant is behind the Phase One Plant.

Q So it's just kind of a general layout.

A That's correct.

Q Would Exhibit Twenty-two give us a better picture of that?

A Yes. Exhibit Twenty-two again is a photograph, this time taken from the aerial vantage point.

You can see the state highway running at an angle across the -- about the top third of the photograph. Again this is an east/west highway. And then coming down from that towards the left, or in this case towards the the south, you can see the Phase One facility with the compressor building, and then you can see a road with a -- looks like a turn-around or a cul-de-sac, and then on the other side of that is the Phase Two compressor building and then the associated dehydrating and cooling equipment behind that.

Q This is our field operations headquarters as well as the plant location, is it not?

A That's correct.

Q And the computer information all comes

in here and work is directed from this location, and so on.

A Yes, sir.

Q What are -- what are these big white things down in the foreground of this picture?

A Well, these are caliche-covered staging areas and our pipe storage yards which at the present time this picture was taken, it doesn't look like they were being used except for future activity.

Q So that is during the period of construction and building the, oh, 250 or 300 miles of gathering system that we have out there and all of the activity in the plant construction, this is the area where the material, supplies, are kept.

A That's correct.

Q What are these little boxy things down here in the most -- the lower foreground of one of these pads?

A Well, those appear to me to be trash receptacles which to my understanding, these are stored there and then during periods of active drilling and/or construction activity, these are transported to the remote sites for refuse disposal.

Q Okay, so we don't throw trash on the ground.

A That's correct.

Q All right. Mr. Collier, in your background and experience and your study of the activities that have been conducted in the Bravo Dome Carbon Dioxide Gas Unit, is it your opinion that the activities in which we've engaged and the things that we have done and the things that we are doing are of the nature that they have and will continue to result in the prevention of waste and the protection of correlative rights?

A Yes, sir, in my opinion they have done that.

Q Do you have anything further with respect to your testimony?

A No, sir, I do not.

MR. CURRENS: I would offer Exhibits Six through Twenty-two and all of their parts.

MR. LEMAY: Without objection those exhibits will be entered into evidence.

MR. CURRENS: And I would offer Mr. Collier for any questions you may have.

MR. LEMAY: Fine. Mr. Pearce, any questions for Mr. Collier?

MR. PEARCE: Yes, just a few.

Mr. Currens, could we pull Exhibit Six back out, please?

That's the big one, isn't it?

CROSS EXAMINATION

BY MR. PEARCE:

Q Mr. Collier, looking at Exhibit Six, when you discussed that earlier you indicated that the area to the southwest of the Bravo Dome Area was not included because it was not contiguous with the other acreage, is that correct?

A That's correct.

Q What that means is there are leases all along the this boundary which prevent that connection.

A That's correct.

Q I also notice there are some hachured areas throughout the unit which show as not being part of the unit.

What's the situation with regard to that acreage?

A Those acres or tracts also did not qualify for a different reason.

Q And what is that reason, if you know?

A Lack of sufficient committals of that -- those tracts to the unit agreement.

Q Does the unit agreement provide for a specific percentage of interest to commit?

A I'm sure it does. I do not know that number.

Q If acreage within the present Bravo Dome Unit boundary is leased to Amoco but the royalty owner has not agreed to have his acreage unitized, do you know how that acreage is reflected on this exhibit? Is that acreage hachured or do you know?

A It's in the unit.

Q So it is not hachured.

A That's correct.

Q Mr. Collier, are you the gentleman who's familiar with the producing ability of the unit at this time?

A I guess you'll have to define the term "ability".

Q Well, how much gas is being produced on an average daily basis now?

A I can answer that question or we'll have another witness that will go through that.

MR. CURRENS: We are going to cover that with our next witness, Mr. Pearce.

MR. PEARCE: And in the summary of the next witness marketing was discussed and I assume if I ask him any questions with regard to that he will defer to that next witness?

A Yes, sir, I would.

Q I'd like for you, if you would, please,

sir, to refer to what we marked -- you marked as Exhibit Number Eight, which is the bar graph of cumulative well development. Just to make sure I understand, that shows no additional wells added to the unit since 1985, is that correct?

A That's correct.

Q Are you familiar with Amoco's future development plans for the unit?

MR. CURRENS: I believe those are going to be covered by our next witness.

MR. PEARCE: Fine.

MR. CURRENS: If you want to answer, you may, of course.

A I'll defer to the next witness.

MR. CURRENS: Okay.

Q At the conclusion of your testimony, Mr. Collier, you expressed your professional opinion that unit operations had been and were currently operating in the best interest of the prevention of waste and the protection of correlative rights, is that correct?

A Yes, sir, that is my opinion.

Q I'd like to get a little more deeply into that opinion and try to determine exactly what you mean by that.

When you say that the unit has in the

past and is presently operating to prevent waste, what do you mean by the terms?

A Simply that this unit coming together has upgraded the vehicle for gas to be developed, to be gathered, to be processed, and to be delivered to a gathering system. I feel that in the absence of such a unit those processes would not have taken place.

Q What effect -- in the regard to the prevention of waste, what effect have those operations had on the areas which are not now connected to the Phase One or Two -- or Phase Two system?

A Well our operations to date, as Mr. Currens, or Mr. Carr, I believe, said, we've been before the Commission many times in the last ten years to talk about different phases of this unit. Among those are spacing.

We have come before this Commission on several occasions to show that we feel that one well in this unit will drain a specified amount of acreage and we feel that that's about 640 acres.

So in the process of developing the unit, producing in the last four years, we have gathered the needed information to be able to plan additional expansions in the unit.

So it's been an evolutionary process

over the last, well, I guess, 7-1/2 years since the unit was formed and the last four years since production commenced.

We are producing gas economically, efficiently, and we continue to do that.

Q My question was going more toward the area from which you are not producing gas and how the operations of Amoco in the Bravo Dome Unit over the last 7-1/2 years or so have acted to prevent waste in those areas if there has been an effect.

A As I showed you before, we have covered the unit with a very dense coverage of seismic information. We have been able to tie in that seismic by drilling additional wells, even in areas that are not connected to the gathering system, so we have made the financial commitment to drill wells, even though we knew for the time being there would be no financial advantage to do so.

We have processed the geophysical and geological data. We have reconciled it with additional well control information and as we expand, as the market, hopefully, continues to develop, we'll be able with a minimum, you know, delay to expand into those areas, because we do have that information.

Q All right, sir, let's turn our attention now, if you would, please, to the portion of the opin

ion you expressed relating to the protection of correlative rights. Could you describe for me what you mean by that?

A Simply that this is a voluntary unit, that the participants in this agreement took the burden of commitment to commit their acreage to this unit for the purpose of giving them the opportunity to have those reserves produced, to have their fair share produced.

And that's strictly what I mean.

Q Does the -- do the operations of the unit in the past and at the present, in your opinion, have any impact upon the correlative rights of individuals who have not agreed to participate in the unit?

A Yes, they could.

Q Would you explain to me how they could have an impact on those?

A Now, are you talking about royalty owners who have not committed to the unit? Is that what you're saying?

Q All right, sir, let's start with that. You described that there -- I think I understood you to describe that there are areas which are not hachured on Exhibit Number Six, tracts in which the lessee has agreed to participate in the unit and the lessor has not agreed. Is that what you were describing to me?

A Yes, sir.

Q All right, let's discuss the protection of correlative rights with regard to interest owners in those tracts.

A Okay, and what -- what is your specific --

Q My question is how have unit operations in the past and how do they at the present operate to protect the correlative rights of those interest owners who did not agree to participate?

A Simply that the commitment of that acreage again goes towards a group of operators or a group of companies willing to take the financial burden to drill vast numbers of wells, to invest multi-million of dollars to develop this resource, to gather it, to process it, and to deliver it to a collection system, to give everybody in this unit the opportunity to have their fair share of CO_2 produced.

Q As I understand it, the individuals who are not participating in the unit have not participated in funding those operations, nor do they participate in the proceeds of those operations, is that correct?

A That's not correct. They are paid on -- rather than on a unit basis, they are paid on a tract or a lease basis.

Q And if their acreage is not developed

or produced?

A Then they'll be paid reflective of how much production, if any, is coming from that tract.

Q And if no production is coming from that tract.

A Well, then there's no revenue.

Q Mr. Collier, if I may, let me go back briefly, you indicated when we were discussing Exhibit Number Thirteen, which is a Phase One facility layout, that the outlet of that plant was connected to the Sheep Mountain Line through the Rosebud lateral, is that correct?

A Yes, that's correct.

Q And what is the ultimate destination of that gas?

A That gas, in my understanding, is delivered to the Permian Basin of west Texas, about 200+ miles away from here.

Q You indicated that the gas flowing into the Rosebud lateral and then the Sheep Mountain Line had to meet those pipeline specifications, is that correct?

A That's correct.

Q Are those pipeline specifications different than the pipeline specifications on what I believe you referred to out of the Phase Two facility as the Bravo pipeline?

A Yes, sir, they are different, slightly different.

Q Do you -- can you describe for me how those pipeline specs differ?

A I can't speak to the pressure requirement, although I think it's on the order of 200 and 300 psi difference. The --

Q With Sheep -- I'm sorry for interrupting, but with Sheep Mountain being higher or lower than Bravo?

A I can't -- I don't know.

The other specification is the water content. There is a specification in the Rosebud line into the Sheep Mountain line of a maximum water content of 15 pounds of water per million cubic feet of gas.

The specification for the Bravo pipeline is 25 pounds of water per million cubic feet of gas.

Q Mr. Collier, I believe you were not at least a witness and probably not present at the 1984 review hearing of that matter, is that correct?

A That's correct, I was not.

Q Have you reviewed the order which the Commission entered as a result of that hearing?

A Yes, sir, I have.

MR. PEARCE: Nothing further,

Mr. Chairman. Thank you.

Q Thank you, Mr. Collier.

MR. LEMAY; Are there additional questions of the witness?

MR. BROSTUEN: I have a question.

MR. LEMAY: Mr. Brostuen.

QUESTIONS BY MR. BROSTUEN:

Q Just for clarification, referring back to your Exhibit Number Six, I'm not sure if I understood correctly a question you were asked by Mr. Pearce.

In regards to royalty owners, or working interest owners as well, to wells which are not connected to either Phase One or Phase Two plant, are they receiving revenue during the -- as CO_2 is being produced from the unit?

A Yes, sir, they are.

Q The -- the tract that are within the unit boundary but are hachured and not participating in the unit, are they a part of the West Bravo Dome Unit? You referred to the wells in -- in the hachured portion of the map in the southwestern portion of the map, lower right -- lower lefthand corner as being a part, I believe, of the West Bravo Dome Unit.

A That's correct.

Q Are there other tracts also included in the unit, the ones that are within the boundary of the -- of the Bravo Dome Unit?

A No, sir, the West Bravo Dome Unit is all contained within the large cross hatched area in the southwest part of this map.

Q Is there any royalty paid from production within the unit to those working interest owners or royalty interest owners within the hachured zones, areas within the outline of the Bravo Dome Unit?

A No, sir. Those -- those hachured areas do not participate in the unit at all. They're not in the unit.

Q Thank you very much.

MR. LEMAY: If there are no additional questions, the witness will be excused and we'll take a fifteen minute break.

(Thereupon a recess was taken.)

MR. LEMAY: Reconvene. Third witness, Mr. Currens?

MR. CURRENS: Thank you, Mr. Chairman.

JAMES DAVID McELHANEY,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CURRENS:

Q Will you state your name, please?

A James David McElhaney.

Q By whom are you employed, Mr. McElhaney?

A Amoco Production Company.

Q And in what capacity?

A As the Manager of Carbon Dioxide Sales and Supply.

Q Mr. McElhaney, have you ever testified before this Commission before?

A No, I have not.

Q Would you briefly tell us your educational background?

A I received a Bachelor of Science in petroleum engineering from the University of Oklahoma in May of 1975.

Q And upon graduation what did you do?

A I was employed by Amoco Production Company in Oklahoma City.

Q And what was the nature of your duties

at that time?

A During the first six to seven years with Amoco I worked at a number of assignments involving production, operations and reservoir engineering in a number of locations, including Oklahoma, Alaska, Colorado and Wyoming.

At that time, it was about the end of 1981, I was transferred to our Houston general office in the position of Enhanced Oil Recovery Coordinator for our general office.

Q And that's for all of Amoco Production's operations?

A Yes, sir, it is.

Q All right, sir, and after that assignment what did you do?

A In March of 1983 I was transferred to the Houston Region and was assigned as the Division Reservoir Engineer over a reservoir engineering group that had responsibilities for southeastern New Mexico and the Bravo Dome Unit.

Q And how long did you occupy that?

A I had that assignment for a little over two years.

Q And what happened next?

A In August of 1986 I was named the

Manager of Carbon Dioxide Sales and Supply.

Q With respect to this hearing here today, have you had occasion to prepare certain exhibits either by yourself or under your direction and supervision for presentation here?

A Yes, I have.

MR. CURRENS: I'll submit his qualifications as an expert on Bravo Dome.

MR. LEMAY: His qualifications are acceptable.

Q Let's look at Exhibit Number Number Twenty-three, Mr. McElhaney, and please tell us what's depicted on that exhibit.

A This is a production history curve for the Bravo Dome Carbon Dioxide Gas Unit, with a number of curves here reflecting different production components in the unit.

Q Okay, let's just start with the bottom curve and identify what the various data shown here are. The lowermost one is green. What is that?

A That is green and that reflects unit water production. It's scale is on the righthand side of the curve in 1000 barrels of water per day. You can see that the current rate in 1988 is approximately 450 barrels of water per day in the unit.

Q What's the next curve above that?

A That's the purple curve. That is the sales production figures for the Phase One facility. Its scale is the inner left scale at gross CO_2 rate in million cubic feet per day at 14.65 atmospheric pressure.

Q And what's a recent value appropriate to that curve?

A Recently that facility has averaged 106-million cubic feet per day.

Q Now, that's 106-million cubic feet a day at 14.65 or --

A No, sir, it's not. I have to apologize to the Commission. The engineer that prepared this exhibit for me prepared the numbers from our pipelines, who measure at a 14.65 pressure base. State of New Mexico, of course, is at 15025, and the numbers I'm quoting are the New Mexico numbers and are those that are recorded with the state.

Q All right. There are a pair of curves that pretty well parallel each other in blue above that purple curve. What do they depict?

A Yes, those are the suction pressures for the two facilities. Their scale is to the far left in the pounds per square inch gauge.

You can see that the Phase One facility's blue curve is denoted with asterisks, and the Phase

Two facility suction pressure curve is denoted with squares.

Q And approximately what are those suction pressures now?

A They are both at approximately 150 pounds right now.

Q Now, what's the lower design limit on our plants with respect to suction?

A The design, lower design limit is 100 pounds suction.

Q So these are operating at a suction pressure above the lower design limits.

A Yes, they are.

Q Does that have some benefit?

A It certainly does; from an engineering standpoint at higher suction pressures you are able to get out more gas or even the same amount of gas with less work. So that means that your compressors are not having to work as hard, you're not using as much horsepower. This translates to direct reduction in electrical usage.

Q And I guess that has some attendant money savings with it.

A It certainly does.

Q Okay. The next curve above that one is red.

A Yes. These are the sales production figures for the Phase Two facility. Similarly reflected at the gross rate of a million cubic feet per day at 14.65.

The average rate in 1988 in New Mexico standards is 262-million cubic feet per day for the Phase Two facility.

Q You told me that the topmost curve was colored pink, so that does the pink curve show?

A Yes, the pink curve is the summation of the red and purple curves and is the total sales production rate for the unit.

In 1988 the total sales have averaged 368-million cubic feet per day.

Q Now, now that we know what the curves mean, let's look at this on a time basis. Does this show when production began?

A Yes. You'll see that the first production recorded is in April of 1984, and that was from the Phase One facility, which was the first one to come on line.

You'll see that the pink and purple curves override each other here in that time frame.

Then in 19 -- December of 1984, the Phase Two facility began production. You can see the jump in the red curve at that point, as well as the jump in the

total production curve.

With the Phase Two facility coming on in 1985, we first jumped to a total of around 250-million cubic feet a day and then eventually up to 340-million cubic feet a day by the end of that year.

Since that time we have continued to increase production sales from the unit in '86 and '87 to the present rate of 368-million cubic feet per day.

Q All right, any general comments that you care to make before we leave this curve?

A Yeah, there is one particular comment that we have been very encouraged with and in the light of the falling oil prices in 1986 and '87, you asked me the questions about what I thought would happen in 1985, I would have been concerned about a fall in our production, but we've been very pleased that the production has increased in both '86 and '87 despite that fall in oil prices.

Q So there's still been strong sales, even though what one would expect to be -- in the face of what one would expect to be a weak marketplace.

A Yes, sir, there have been.

Q Okay, anything else that you have on Exhibit Twenty-three?

A No, sir.

Q I'll ask you to turn to Exhibit Twenty-four and tell us what's shown on that exhibit.

A Yes. This is an annual spending profile bar chart for the Bravo Dome Carbon Dioxide Gas Unit. This reflects the spending of the working interest owners in various categories as the unit has evolved.

Q Okay, let's kind of go through that evolution. It seems to start out mostly purple. What's that?

A Yes. The purple depicts the drilling in the unit and as Mr. Collier presented to you earlier, the program was fairly aggressive at the beginning and somewhat continuous through the years 1985 (sic) and you can see that high level of expenditures from 1980 through 1985.

Q Okay. The next big blob is a yellow blob.

A Yes. The yellow depicts the expenditures for the plant gathering facilities and as I said, the first thing you would do in a unit would be to drill the wells and then install those necessary plant gathering facilities to initiate sales. You can see that those plant gathering expenditures occur over roughly a 2-1/2 year period, '83 and '84 and then some in 1985 as sales were initiated.

Q Okay, so we've evolved the drilling of

wells, building of gathering and plant facilities. After that comes what?

A The next large wedge you see would be in red and that reflects the operating costs associated with producing the CO_2, and (not understood) a natural evolution of the field after you've made the expenditures, investments to get sales on. Operating costs then dominate towards getting those -- that CO_2 into the market.

Q What's the green that's shown on this?

A The green is the maintenance wedge. It's more or less a continuous type of dollars that are put into maintaining your facilities, your operating centers, the offices, the computer, and so forth. This wedge has been rather continuous since 1982.

Q It's just something that's part of continued operations.

A Yes, sir, it is.

Q Now I notice in 1988 you have depicted the full year in -- in that column.

A Yes, sir, I have. We only have the first quarter performance so far for 1988 and I have estimated that by multiplying by four.

Q Okay. Anything else on this exhibit?

A No.

Q Let's turn to Exhibit Twenty-five then

and tell me what's shown here.

A This is the same data that was presented in the last exhibit only in a cumulative nature, and the wedges are stacked on top of each other so you can identify the spending of individual components.

Q Now, you said production and you showed on your Exhibit Twenty-three that production began in early '84 and then really came on stream strongly at the end of '84, or 1-1-85, is that right?

A Yes, sir, that's correct.

Q What was the investment that we had made prior to the time that we actually had any significant production from the unit?

A The working interest owners in the unit had actually spent roughly $130-to-150-million before any sales had occurred in the unit.

Q And that's out of a total of how much shown on this --

A Total spent through the first quarter of 1988 has been $282-million.

Q Let me ask you about the operating expense portion of this. What's the expense, the red portion of this (unclear)?

A Total operating costs here include the actual direct cost of operating the plant, for field facil-

ity people that are there, the road work, and what well work that's done in the unit. It totals a total of $111-million roughly by the first quarter of 1988.

Q Let me similarly ask you what it doesn't include that's ongoing in nature?

A These expenditures here do not include any of the monies paid to, say, surface owners for damages, or leasehold costs that are paid to the individual lease owners, nor does it include any costs for the royalties or taxes paid to the State.

Q Now when you've talked about the benefits of the efficiency by keeping higher suction pressures, is it this red wedge that that affects?

A Yes, sir, it is.

Q And you said that it's cut our electrical costs.

A Yes, sir.

Q Electrical costs make up approximately 80 percent of our operating costs; essentially all the work that is done is to take the gas from low pressure in the field, dehydrate it, and compress it up. So most of our operating costs can be directly related to that horsepower required to boost up the pressure.

Q Now, a reduction in this operating cost benefits the working interest owners, doesn't it? It

doesn't cost them as much money to operate the unit?

A There's no doubt.

Q I guess that would ultimately translate into anticipated additional recovery.

A Yes, sir, it would.

Q Are there other benefits that accrue besides those to the working interest owners and the potential increase in ultimate recovery?

A Actually, all parties will benefit from this because the compression costs are, of course, a reduction into the wellhead price which is the basis for royalty and taxes, and if those operating costs are down, those are passed on to all the unit members, as well as all royalty interest owners.

And so they're seeing the benefits as well.

Q All right. Anything else on Twenty-five?

A No, sir.

Q Let's go to Number Twenty-six. You said that royalty was not included in your prior charts. This one seems to deal with royalty, is that right?

A Yes, sir, this is to depict on an annual basis the estimated annual royalty payments made to all parties in the Bravo Dome Unit. We have also individual

ized and pointed out the royalties paid to the State as well as royalties paid to other parties.

Q What are those royalties to the State currently? Approximately?

A Approximately 2.4-million in 1987.

Q And the total royalty '87?

A Total is roughly around 9.4-million.

Q You have a purple line on here. What's that?

A Yes, that is the cumulative royalties paid since the start of sales from the unit and by the end of 1987 those totaled roughly $26-million.

Q Anything else on Exhibit Twenty-six?

A There is one point I would like to make. I, recently, in looking over these figures, looked over the information from the New Mexico Oil and Gas Association for 1987; indicated the total State royalties collected in that year were around $104.7-million from oil and gas operations. You can see, then, that the 2.4 from Bravo Dome is roughly a little over 2 percent of that total.

Q That's impressive. Anything else from Twenty-six?

A No, sir.

Q Let's move on to Twenty-seven. What's that?

A This depicts the annual direct taxes paid to the State in blue and there is a yellow curve that depicts similar information related to the information from the (unclear) on the percentage of total taxes collected by the State.

Q All right, now what taxes are we talking about?

A These taxes are the production severance taxes which include the severance tax, actual severance, the emergency school taxes, the conservation taxes and the ad vapored taxes.

Q All right, what did that total in 1987?

A That was roughly $5-million in 1987.

Q And about what share of those type taxes from the oil industry did this amount to?

A That is also roughly about 2 percent.

Q Anything else with Exhibit Twenty-seven?

A No, sir.

Q Let's move on then, and look at Exhibit Twenty-eight, which seems to be a summary table. Tell me what's on it.

A Yes, sir. This summarizes both the production data and some of the information previously presented by Mr. Collier and Mr. Wyles on the wells and the

activity in the unit.

Q Why don't you just go through that and point out the pertinent things?

A Okay. We reflect the first number there is the total cumulative production to date from the unit, which totals 427 BCF, or roughly a half trillion cubic feet.

Q And that's to what date?

A That is through May of 1988.

We also show the average producing rate for 1988 at 368-million cubic feet per day; and also, then, we reflect the peak producing rate we've experienced out there, which was 381-million cubic feet per day in February of 1987.

Q Okay, that's the production data, almost half a trillion cumulative.

A Yes, sir.

Q Let's move into the area of the wells.

A Yes. On the well summary there's been a total of 390 wells drilled in the unit. 260 of those are now currently producing. We have another 111 wells that have been drilled in the unit that will be available to us at which time that we can expand outward.

There have been 17 plugged and abandoned wells and 2 salt water disposal wells.

Q And what's in the bottom third of this exhibit?

A The bottom denotes the seismic that Mr. Wyles previously pointed out, the 1400 miles that have been run in the unit.

We also reflect something that we have not touched on and that's the roads that have either been built or improved in the unit. There are a total of 751 miles of roads that have either been actually built or taking old cattle roads and improved.

375 miles of those area actual lease roads and 376 are county roads.

Q About half of the roadwork out there has been a direct benefit of county roads, and about half individuals.

A Yes, sir, it is.

Q Anything else on Twenty-Seven?

A No, sir.

Q Turn to Exhibit Twenty-eight then, please, and tell us what's shown on that exhibit.

A This somewhat summarizes the physical summary of the unit, both in expenditures and in direct taxes and royalties paid out.

As I mentioned previously, through March of 1988 the working interest owners in the Bravo Dome

Unit had spent a total of $282-million on direct expenditures. That involves roughly $97-million on drilling, $58.8-million on plant gathering facilities; $15.3-million on maintenance expenditures for just to run our offices and to initially install our computer telemetry system, and another $110.8-million in operating expenses.

On the other hand, some of the other expenditures that the working centers have incurred have been direct taxes and royalties and through March of 1988 the total direct tax bill has totaled $15.2-million.

On royalties we have paid roughly $7.6-million to the State; an additional $20-million to individual owners in the unit, for a total of $26 -- $27.6-million.

Q All right, anything else on Exhibit Twenty-nine?

A No, sir.

Q Mr. McElhaney, with your familiarity with our operations in the unit, is it your opinion that the activities that we have conducted in the past and are conducting now and prepared to conduct, such that they will result in the prevention of waste in the past and on an on-going basis, and then the protection of correlative rights?

A Yes, we have. In addition, I would say

we've spent a considerable amount of money to insure that they will in the future.

Q Okay, Mr. McElhaney, up to this point we're pretty well walked the paths in fulfilling our obligation of showing the Commission the activity that we've had since this unit has been effective.

You stated your position was Manager of CO_2 Sales and Supply. Let me ask you in broad terms what you see for the future.

A We are very encouraged at the outlook for Bravo Dome based on a number of items.

The first is one I mentioned earlier, it's the fact that even during the oil price slide of the last two years, that our sales have actually increased each year, meaning that the demand has stayed up, not fallen during the time the oil prices have dropped.

I've also been very encouraged by my talks with other operators in the Permian Basin, who seem to be re-looking at CO_2 projects and there seems to be a renewed interest in that area.

I recently attended the SPE DOE Tertiary EUR Symposium in Tulsa and a number of operators presented their projects there and showed some very significant results and it was very encouraging to all.

In addition to that, in talking with

the other working interest owners in Bravo Dome, we have also heard that they may be interested in expanding their operations and also requesting more CO_2, and even though those demands are not firm right now, it's definitely left a very encouraging note for the future.

Q Okay, so you don't have a firm increase in demand at this moment, but you are optimistic that it will occur in the near term?

A Yes, sir, I am.

Q Well, what have you done, what are you doing to be in a position to respond if additional demand does develop, as you expect that it will?

A At Amoco we have evaluated a number of alternatives for additional development in the Dome; not necessarily tied to specific demand but to see what can be done by expanding outward.

Those have included some additional out- field drilling as we've done in the past to load the Phase One and Phase Two facilities; to continue to expand and maintain those facilities and also cut costs.

We've also looked at additional plants in other areas of the unit, and have evaluated what costs will be required to put those in place.

In a nutshell, I would say that Bravo Dome has established itself as a very competitive, stable,

reliable source of CO_2 in the industry today, and we are in a very good position to be able to react to when that demand occurs.

Q Thank you, Mr McElhaney.

MR. CURRENS: I would offer Exhibits Twenty-three through Twenty-nine.

MR. LEMAY: Without objection those exhibits will be entered into the record.

MR. CURRENS: And I would offer Mr. McElhaney for your questions.

MR. PEARCE: Thank you, Mr. Chairman.

CROSS EXAMINATION

BY MR. PEARCE:

Q Mr. McElhaney, just a few. I believe you were in the room when I broached a subject to Mr. Collier which he deferred to you.

(Not clearly understood) -- Phase One and Phase Two facilities?

A If we talk about design capacity, the current production rate represents roughly 110 percent of design capacity.

Q That's an interesting design. How much above 110 percent do you think you could go?

A I think we are very, very close to our limits. Different days you might be able to do a little better than that, but as I said, we've been able to primarily get there by operating above the, you know, we're basically above the mid-range of the design plan.

Q And your exhibit showed that your peak day so far was 381-million?

A Yes, sir.

Q You believed that was threatening your facilities?

A I believe that we were able to meet the demand that was called upon that day and we were basically about as far as we could go.

Q Okay. You indicated that in terms of planning for the future and meeting future increased demand, you had several scenarios. One of those was additional I believe you referred to it as out drilling to further load Phase One and Phase Two facilities. Could you explain how you're going to do that after the discussion we just had?

A Yes, I can. I think you can see back on the production curve, I believe that's Exhibit Twenty-three, that there has been a little decline in the suction pressure in the past two years as we've increased rates.

I would anticipate that we could get

these -- maintain these facilities at at least this level, and maybe increase them slightly by continuing to drill wells on the outer edges of development and to put additional gas into the facility. Now that does not mean I think I could increase the rate much more today, but for future planning and, say, we would like to have a market that says we need 368-million for the next three years, then that would be a way we would try to meet that.

Q I'm sorry, I didn't understand that. If we -- if we have a current average rate of 368, which is 110 percent of design, a former peak day of 381, my question involves what happens if the market goes to 400 or 425?

A Okay, I guess the way I can try to clarify this is facilities -- the 381 is probably the best you're ever going to do for those compressors. That was at a point when we had them stacked, I think you can look back and we had pressures in the neighborhood of 180 pound suction at that point, and to build up that kind of well volume to deliver that suction pressure, that's about the best you're going to do.

If you're going to need more than 400 -- 420-million cubic feet a day, you're probably talking about new compressors and new additional development.

Does that clarify it?

A It would take additional compression either in Phase One, Phase Two, or some Phase Three.

A Or a new plant, yes, sir.

Q You indicated that additional plants had been discussed and that you had looked at the cost of those facilities, let's hypothesize a market which jumps to 425. How -- how would you expect what you know now to meet that additional demand?

A You're asking a very tough question. Timing is important. Can you be more specific?

Q Well, let's -- let's say you get a call and somebody says that they want to purchase CO_2 which would raise the requirements on the Bravo Dome Unit to 425-million a day six months from today.

Would you -- would you accept that offer or purchase?

A We would most likely have to qualify it. Six months is a very short time frame. We do more in planning for a year from now and two years from now.

Q Okay, if -- if the demand went to 425, would you expect to ultimately meet that by increasing the compression in Phase One and Phase Two or by building a third facility, and I'm trying to judge at what point of demand --

A What point a new facility?

Q -- you've got to have a new facility.

A 425-million a day would probably -- probably be tied more into this facility at Phase One and Phase Two with additional compression there.

Q Can you give me some idea of what range of demand would require an additional facility?

A When you look in terms of, say, maybe another additional 100-million cubic feet a day, that is at the point that additional facilities begin to look more and more attractive.

Q In terms of planning for Bravo Dome operations, let's continue to hypothesize an increase in market.

A I'd like to do that a lot.

Q I was sure you did. What sort of development plans do you have to meet an increase in demand?

A We have no specific development plans at this point.

Q The wells that are currently connected to Phase One and Phase Two, I assume those wells are experiencing some natural decline as reserves are produced?

A Yes, they are.

Q Could you give me some indication of, for instance, percentage decline as results of producing those wells?

A You're going to get a -- I'll have to give you something on the average rate because obviously the wells closer to the plant are being -- will decline faster than the ones out far away, but it's been roughly on the average of around 7 to 10 percent.

Q 7 to 10?

A 7 to 10, yes.

Q Do you have an estimate of what the current producing capacity of the wells connected is now? Your average production is 368, as I understand it.

A Yes.

Q If those wells could -- could flow at maximum capacity, how much would they produce?

A I haven't seen a number on that in, say, the last two years, but it's obviously much higher than 368-million.

Q Well, last time you looked at that two years ago, or so, how much higher than --

A It was in the 400 - 420 range.

Q That was the same set of wells that are presently connected, is that right?

A We actually have tied in some expansion wells since that point in time and I'm afraid I've not seen numbers since that time.

Q You indicated, Mr. McElhaney, that you

and Amoco were encouraged looking at the broad view of the future of CO_2 production and utilization.

Have you used your intuition to try to predict what the market is likely to be two years from now?

A We have made numerous projections both from the down side situation and an up side situation. You naturally cannot look at or focus in on one particular situation.

We think that the markets two years from now will lie in the neighborhood of staying flat where they are to possibly as much as 150 to 200-million more.

Now that is industry-wide. That may not necessarily be the Bravo Dome's share.

Q What's Bravo Dome's current share of the market?

A At the present time we are supplying, based on what I've seen in industry-type of reports, a little over a third of the CO_2 that's being supplied in the Permian Basin.

Q Okay. Without careful thought I asked that question based on a 2-year period and that seems to coincide with something that you had looked at. Do you have other projections of what the market might be further into the future than 2 years?

A Primarily we look at 2 years. That is

the one that you can perhaps impact or should be shooting for.

Basically, yes, we carry those on out beyond the two years from what those things, you know, what the peaks we look for, and what those are going to do. The market, you have to understand, is very, very dependent on oil price, and I only would like to stick my neck out as far as -- I won't even stick my neck out on oil price.

Q Okay, you -- you've indicated that in your 2-year look, I think what you're telling me was that an optimistic projection might be 150 to 200-million MCF a day increase industrywide.

Assuming Amoco's one-third share would hold through that time period, and Amoco therefore --

A That's not Amoco's share, that's the Bravo Dome Unit's share.

Q I apologize then. That was not intentional. Bravo Dome's share of that market, Bravo Dome, then, if the average today is 368, with 50 or 60 additional two years from now, we're looking in the 420-million cubic feet a day range. Do you suspect that could be serviced through the present Phase One and Phase Two facilities?

A No, you will have to add compression to get that amount out.

Q And you suspect that in time --

A We will --

Q -- that you would add compression to Phase One and Phase Two to meet that market rather than going with a third plant.

A I suspect at this time.

Q Do you know whether or not that hypothesized 420 - 430-million cubic feet a day market could be met through wells currently connected to Phase One and Phase Two?

A Meaning can I install compression with the wells that are there?

Q Do you have to connect more wells to meet that market?

A We'll most likely connect more wells.

Q Do you have wells drilled and waiting connection now or would you be faced with drilling additional wells?

A More than likely it would involve some drilling and connection of existing wells, the combination.

Q However, as I understand -- understood an answer earlier to one of my questions, you don't have a development plan to meet that hypothesized market, is that --

A The specifically 425? Not specifically 425-million a day.

Q Okay, I may have missed --

A I think what I said was that we have a plan to react to whatever the market may do. I think that we can modify many of our plans we have looking at moderate expansions to big expansion to meet a 425 for two years down the road.

Q Did I understand you to testify that you did not currently have a future development plan for the Bravo Dome Unit?

A We do not have a specific plan for development of the unit.

Q Looking, Mr. McElhaney, at your Exhibit Number Twenty-four, the yellow area plant and gas gathering facilities, that is only the cost of installing the gathering system as opposed to any cost associated with operating it, is that --

A It's the cost of the pipe and installation of the gathering system.

Q And the day-to-day operational expense of that gathering system is shown in the red --

A Yes, sir.

Q -- red area as operating expense.

A Yes.

Q Okay. Looking Mr. McElhaney, again at Exhibit Number Twenty-four, it appears from that graphic

display as if the green area, Maintenance Investments, is expected to be smaller in 1988 than 1987.

A Yes, sir, it is.

A Can you explain what's having a difference in the maintenance area?

A Both from a standpoint of -- of controlling operating costs and trying minimize those expenditures that don't have to be made in this particular year, and as of the standpoint that, obviously, in the set-up of the office and set-up the computer system, you have a lot more expenditures earlier and those would tend to taper off as you tend to get more and more in your operating phase. We anticipate those to be down in 1988.

MR. PEARCE: One moment, please, Mr. Chairman.

Nothing further, Mr. Chairman. Thank you. Thank you, Mr. McElhaney.

MR. LEMAY: Additional questions of the witness?

Mr. Brostuen.

QUESTIONS BY MR. BROSTUEN:

Q Mr. McElhaney, unless I've misunderstood Mr. Collier, I believe that he stated that there have been no new wells drilled since 1985, in referring to

Exhibit Number Seven, I believe.

And your Exhibit Number Twenty-four does show a small amount of expenditure for -- for drilling costs.

Could you explain as to what costs of going into (not clearly understood)?

A Yes, I can. What's involved in a drilling cost, both starts from the day that you set the location, make the location, drill the well, and then as you complete the well you have expenditures all the way up to that point.

Mr. Collier reflected the actual drilling and the wells getting to TD and the last well reached the TD in 1985; however, in 1986 we did do some additional work on some of those wells in the completion phase to test additional horizons, to frac, so on and so forth, and that's where those expenditures came from .

Q Thank you, very much.

QUESTIONS BY MR. LEMAY:

Q Mr. McElhaney, are you familiar with the nature of the water in the area, produced water?

A Somewhat familiar with it, yes, sir.

Q Are you familiar with any corrosion problems you might have out there in terms of your casing,

tubing?

A I'm not familiar with corrosion in the casing and tubing.

Q In the realm of waste, we understand that there is some problem because of the corrosive nature of carbon dioxide and water, protecting fresh waters, that there's -- I guess what I'm trying to get at, do you have program out there to insure the fresh water is protected in the area?

A I can comment on the program both that was reviewed in the casing programs, reviewed with the State, to put in out there, which is basically to cement to surface, or to the surface casing, and in all wells tubing is run with a packer with inhibited fluid on the annulus side to protect against any leaks that come back through that area.

We have an alarm system in the telemetry system to measure casing pressures and if we do have a leak or indication of pressure on the casing, we can detect it. Those can come and stem from packer leaks, tubing leaks, as well as casing leaks.

I'm not -- I'm not familiar that we've had a lot of casing leaks or casing problems out there.

We have had some tubing problems and packer problems.

Q But you do have a system that monitors that type of corrosion if it does occur?

A Yes, sir, we do.

Q Thank you.

MR. LEMAY: Any additional questions?

MR. CURRENS: No additional direct or redirect.

MR. LEMAY: The witness may be excused.

Is that all you have, Mr. Currens?

MR. CURRENS: That's all I have in the way of a direct case.

MR. LEMAY: I've forgotten, Mr. Pearce, do you have any witnesses or were you just --

MR. PEARCE: I do not, Mr. Chairman.

MR. LEMAY: That's fine. Let's wind this up with anything additional from you in the way of --

MR. CARR: I have a very brief statement.

MR. LEMAY: We'll take some statements, I think, in the case now and then we'll close

with that.

For Occidental and Cities Service?

MR. HOCKER: May it please the Commission, I'm Richard L. Hocker, representing OXY USA, formerly Cities Service Oil and Gas Corporation.

OXY has an interest in the Bravo Dome Unit operating plan. OXY recommends the Commission approve continued operations of the unit. We believe that the unit operations have continued to prevent waste and protect correlative rights, and that in our understanding of the order is a necessary finding.

Well, we concur, really, in Amoco's application.

MR. LEMAY: Thank you, Mr. Hocker.

Additional statements in the case?

If not, we shall take -- I'm sorry, we will have a brief closing statement by Mr. Carr, and Mr. Pearce, if he so desires.

MR. PEARCE: Thank you, Mr. Chairman, I will be very brief.

As I said when we started, I'm appearing in this matter on behalf of Normal W. Libby.

Mr. Libby owns some of that area, as you may have guessed, which is leased to Amoco under the terms of a lease which does not provide for unitization.

My client is not participating in royalty from unit operations.

We've had a discussion of what Amoco has done in the past; what they're doing presently; and we've been told that they do not have specific future development plans for the Bravo Dome Carbon Dioxide Gas Unit.

I would like to point out to the Commission that when this matter was heard previously in 1984 for a review, the Commission at that time specifically made a finding and it is Finding Number Eleven, and that finding says that for the interest owners in the unit area, not the unit, the unit area, to derive the benefits of unitization and for their correlative rights to be protected, Amoco, as unit operator, must develop the carbon dioxide throughout the unit area in a prudent and expeditious manner. Prudent and expeditious.

We are concerned that there is not a development plan. We are concerned when projections of future market can be met with modifications to current facilities when our acreage is not connected to any facility.

Thank you, Mr. Chairman.

MR. LEMAY: Thank you, Mr. Pearce.

Mr. Carr?

MR. CARR: May it please the Commission, you have now received our 4-year review of the Bravo Dome Unit. You've received our progress report.

For eight years we have been working in close association with this Commission as we've developed the carbon dioxide in this area and we hope to continue to do that with your support and in cooperation with you, meeting your concerns and desires as we move forward.

We believe today we can tell you that the benefits of unitization are being attained; that while the industry is down, while smaller units are not producing, Bravo Dome is producing and selling carbon dioxide gas in substantial quantities, and these sales are being affected in an efficient and we believe effective manner; that drilling is being done in an efficient way; that the resource is being processed and treated and marketed with state of the art equipment; and that we're doing what we purported we could do in 1980. We're maximizing the benefits of this production for all interest owners in the unit, and I think the best example given today,

perhaps, of what unit development means is, you saw it when Mr. Collier showed you that in 1985 there was a drilling program and it really wasn't designed for the current market but it was designed to enable Amoco to operate their plant most efficiently, reduce costs, and those costs then result in benefits to all interest owners in the unit.

We have an effective unit operation here and what it really boils down to is simply we're producing this resource and we're producing it without waste.

Now as to correlative rights, and as to the comments made by Mr. Pearce, I think it's important for you to remember this is a voluntary unit. We have had over 1500 interest owners in this area voluntarily commit their lands to this unit and Mr. Pearce's client did not. He could have but he did not, and he shares none of the risks or burdens of unit operation and he doesn't get the benefit of royalty from unit production. He could, but he elected not to.

Mr. Pearce talks to you about the unit area, well, I will tell you that the unit area is defined in the unit agreement and if you're not in, you're not in. In a voluntary agreement, if you elect to stay out, that's where you are, and your acreage is developed under your lease; it is not part of the unit operation.

And that is an election that Mr. Libby made while thousands -- or hundreds of other people decided not to go that way, but to come into the unit and operate under unitized operations, and when they came in their objective was to obtain production, production that could be obtained because of the size and the efficiencies that result from unit operation.

Those have been obtained. Now correlative rights is an opportunity to produce your share of the reserves. You can do that by leasing to somebody and standing on your lease. You can do that by coming into a unit and take advantage of the opportunities that unitized development presents, and that's what 1500 people have done and they are sharing in the proceeds and the results of this operation and their correlative rights are being protected.

Now, this is a big unit. There are not wells all over this map and this is nothing new. We didn't tell the Commission in 1980, we never purported to have full development in 1988, but I can tell you our goal is exactly what it was in 1980 and it's a goal we believe we are moving toward and will attain and that is that we will have fully developed the Tubb formation that can produce CO_2 in the Bravo Dome Area, and that we will do it as efficiently and as effectively and as quickly as the

market for CO_2 permits, and that's what we're doing. We believe we have presented to you today evidence of a project that's working; a project where our mutual goals of developing a resource efficiently, with concerns for the rights of all the interest owners, for that's being accomplished, we're now before you asking for your continued approval so we can go forward with these efforts that are, yes, in fact part drilling, others part research and studying the reservoir, but efforts which we believe are directed at the most efficient and effective production of this resource.

MR. LEMAY: Thank you, Mr. Carr.

Is there anything further in Case 9428?

If not, we shall take that case under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C. S. R. DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR