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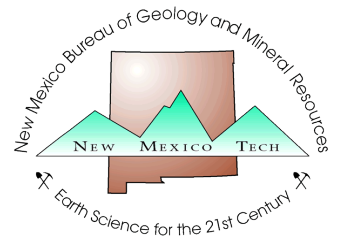
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Oil and gas discovery wells drilled in New Mexico in 1986

by Ronald F. Broadhead, New Mexico Bureau of Mines and Mineral Resources, Socorro, NM 87801

Introduction

Fewer wells were drilled for oil and gas in New Mexico in 1986 than in 1985. Data obtained from the New Mexico Oil Conservation Division indicate that 1,243 wells were completed in 1986, down 39% from the 2,047 wells completed in 1985 and down 57% from the record 2,867 wells completed in 1981. In the Permian Basin, southeast New Mexico, 838 wells were completed in 1986, down from 1,237 completions in 1985; 541 wells were completed as oil producers, 111 wells were completed as gas producers, and 186 wells were plugged and abandoned, resulting in a success rate of 78%. In the San Juan Basin, northwest New Mexico, 405 wells were completed in 1986, down from 863 completions in 1985; 151 wells were oil producers, 236 were gas producers, and 18 were plugged and abandoned, resulting in a success rate of 96%. In addition, 18 wells were completed in the Bravo dome carbon dioxide gas field. Despite the downturn in drilling, a high level of exploration and wildcat drilling activity continued in the frontier Tucumcari and Española Basins. Location for one exploratory well was staked in the Baca Basin (Fig. 1).

Total footage of hole drilled in 1986 was 6,756,266 ft, down from 10,955,593 ft drilled in 1985. The average depth of wells drilled in 1986 was 5,435 ft, 83 ft more than the average depth of wells drilled in 1985.

For purposes of this report, a *significant wildcat discovery* is defined as a well in which commercial amounts of oil or gas were discovered in a stratigraphic unit more than 5 miles from the limits of previously discovered pools with commercial production from that stratigraphic unit. A *significant wildcat dry hole* is defined as a dry hole drilled in a not-yet-productive basin or a part of a basin where petroleum reservoirs were evaluated. The locations of significant wildcat wells that were drilled in 1986 are shown in Figure 1. Table 1 summarizes the significant wildcat discoveries, and Table 2 summarizes the significant wildcat dry holes. Table 3 lists other significant wildcat wells that were being drilled, were not completed, or were held "tight" at the end of 1986.

Each well is designated by a number in parentheses that refers to its location in Fig. 1 and its description in Tables 1, 2, or 3.

Southeast New Mexico

Drilling activity declined in 1986 in the three geologic subdivisions of the Permian Basin: the Delaware Basin, the Central Basin platform, and the Northwest shelf. Drilling activity was light on the Roosevelt uplift. Despite the decline in drilling activity, however, the Permian Basin yielded several significant oil and gas discoveries in 1986 (Fig. 1; Table 1). Kinney (1967, pp. 26–27) presented stratigraphic charts of oil- and gas-producing rock units in southeast New Mexico.

The Delaware Basin, the deep-marine part of the Permian Basin, yielded five significant discoveries in 1986 (2, 3, 5, 6, 7). Oil was found in Permian basinal sandstones in two wells: the Harvey E. Yates No. 1 Loco Sand Hills Federal 9 (2) and the Mewbourne Oil No. 1 Federal I (6). Gas was found in Wolfcampian (Permian) reservoirs in the HNG Oil No. 1 Fate 34 (3). Gas was found in the Lower Pennsylvanian in the North American Royalties No. 1 Hudgens (5). Oil was found in the Grayburg Formation (Permian) in the Fred G. Yates No. 3 Reddy Gulf State (7). Because of the slack gas market, exploration in the Delaware Basin was concentrated on finding new oil reserves and not on finding new gas reserves. Major targets for exploration were basinal sandstones of the Bone Spring Formation and the Delaware Mountain Group (Permian), and Lower Permian and Upper

to Middle Pennsylvanian carbonate reservoirs. There was limited exploration for gas in the deep (10,000–14,000 ft) Atokan and Morrowan (Pennsylvanian) clastic units. Development drilling in the Delaware Basin was almost exclusively for oil in 1986. Major targets for development drilling were oil reservoirs in sandstones of the shallow (3,000–6,000 ft) Delaware Mountain Group (Permian) and the moderately deep (8,000–10,000 ft) Bone Spring Formation (Permian). Few development gas wells were drilled in 1986. Those wells were drilled mostly for gas reservoirs in the deep (10,000–14,000 ft) Atokan and Morrowan (Pennsylvanian) clastic units.

Development drilling continued at a strong, but diminished, pace on the Central Basin platform in 1986. No significant wildcat discoveries were made in this mature, densely drilled area. Development drilling was mostly

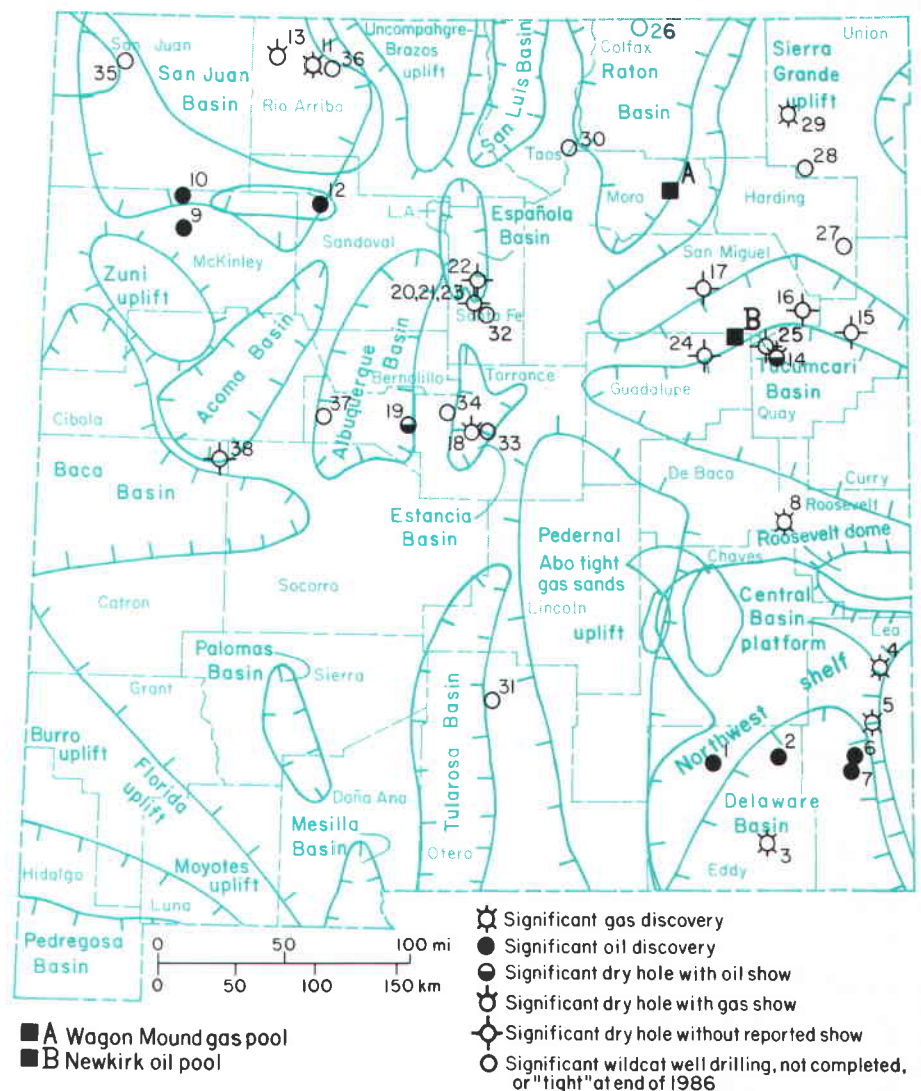


FIGURE 1—Significant oil and gas discoveries and wildcat wells drilled in New Mexico in 1986. Major geologic features are taken from Broadhead and King (1985), Cather and Johnson (1984), Kelley (1978), Kottowski and Stewart (1970), Meyer (1966), Molenaar (1977), Thompson and Jacka (1981), and Woodward et al. (1978).

for oil in the Yates, Seven Rivers, Queen, and Grayburg Formations (Permian) and in the Drinkard and Blinebry zones of the Yeso Formation (Permian).

Two significant wildcat discoveries were made on the Northwest shelf in 1986 (1, 4). Oil was found in the Wolfcampian (Permian) in the Marathon Oil Co. No. 1 Ralph Nix (1). Gas was found in the Morrowan (Pennsylvanian) in the John L. Cox No. 1 State 26 (4). Exploration on the Northwest shelf was limited in 1986.

Development drilling on the Northwest shelf was mostly for oil in 1986. Main targets were the shallow (less than 5,000 ft) Queen, Grayburg, and San Andres Formations (Permian) and shelf-edge reefal dolostones of the Abo Formation (Permian). Drilling for gas was mostly in the "tight" sands of the west Pecos Slope Abo pool of west-central Chaves County.

The Roosevelt uplift was drilled sparsely in 1986. Development drilling was mostly for oil in the San Andres (Permian) and Pennsylvanian reservoirs on the south flank of the uplift. One significant wildcat discovery was made on the Roosevelt uplift in 1986; that discovery was gas in the Montoya Formation (Ordovician) in the Marshall Pipe & Supply No. 1 Best Wendell (8); nearest Ordovician production is approximately 25 miles southwest in the Dos Ranchos Montoya gas pool.

Elsewhere in southeast New Mexico, Cibola Energy staked a location in the Sacramento Mountains for their No. 1 Ysletano Canyon Federal (31) near the end of 1986. That well is scheduled to drill to a total depth of 3,800 ft in Devonian strata.

Northwest New Mexico

In 1986, 405 wells were completed in northwest New Mexico; 863 wells were completed in 1985. Almost all of the wells were drilled in the San Juan Basin. The diminished rate of drilling has been caused by a depressed market for gas, which is the primary petroleum product of the San Juan Basin, and by depressed oil prices.

Four significant wildcat discoveries (9, 10, 11, 12) were made in 1986. Oil discoveries were made in the Gila Exploration No. 2 Hogan State (9), the Black Oil No. 1 NMALO-Gurley (10), and the Gary-Williams No. 7 San Isidro 26 (12) in Upper Cretaceous sandstones. Gas was discovered in the Robert L. Bayless No. 1Y Jicarilla 452 (11) in the Fruitland Formation (Cretaceous). Exploration in the San Juan Basin in 1986 was concentrated mostly on finding oil reservoirs in the Gallup Sandstone (Cretaceous).

Noncommercial quantities of gas were discovered in the Barker Creek Formation (Pennsylvanian) in the Meridian Oil No. 112-Y San Juan 30-6 (13); that well has been converted to a water injection well. Two Upper Paleozoic tests (35, 36) were drilled in the San Juan Basin during 1986 but remained "tight" and uncompleted. These Paleozoic tests are significant because only approximately 30 wildcat wells have tested the Paleozoic section in the New Mexico part of the

TABLE 1—Significant wildcat discoveries in New Mexico in 1986; the term formation is used in an informal sense. **BOPD**, barrels of oil per day; **BWPD**, barrels of water per day; **BCPD**, barrels of condensate per day; **MCFGPD**, thousand ft³ of gas per day; **owwo**, old well worked over.

Number on Fig. 1	Location (section-township-range, county)	Operator, well number, and lease	Completion date (month/year)	Total depth (ft)	Formation at total depth	Producing formation	Producing interval (ft)	Initial potential	Oil gravity (degrees API)
1	29-18S-26E, Eddy	Marathon Oil Co. No. 1 Ralph Nix	10/86	10,190	Devonian	Wolfcampian (Permian)	6,349-6,399	8 BOPD + 442 MCFGPD	58.4
2	9-18S-30E, Eddy	Harvey E. Yates No. 1 Loco Sand Hills Federal 9	2/86	9,250	Wolfcampian (Permian)	Bone Spring (Permian)	7,142-8,220	130 BOPD + 107 MCFGPD + 170 BWPD	34
3	34-23S-28E, Eddy	HNG Oil No. 1 Fate 34	6/86	12,355	Atokan (Pennsylvanian)	Wolfcampian (Permian)	10,606-10,655	870 MCFGPD	
4	26-12S-36E, Lea	John L. Cox No. 1 State 26	6/86	14,104	Devonian	Morrowan (Pennsylvanian)	12,674-12,696	750 MCFGPD + 30 BCPD	
5	11-16S-36E, Lea	North American Royalties No. 1 Hudgens	9/86	12,000	Atokan (Pennsylvanian)	Atokan (Pennsylvanian)	11,792-11,817	1031 MCFGPD	
6	14-18S-35E, Lea	Mewbourne Oil No. 1 Federal I	5/86	12,130	Devonian	Delaware (Permian)	6,080-6,106	58 BOPD + 24 MCFGPD + 125 BWPD	36
7	18-19S-35E, Lea	Fred G. Yates No. 3 Reddy Gulf State	6/86	5,950	Grayburg (Permian)	Grayburg (Permian)	5,646-5,692	14 BOPD + 56 BWPD	
8	27-2S-29E, Roosevelt	Marshall Pipe & Supply No. 1 Best Wendell	5/86	7,155	Granite (Precambrian)	Montoya (Ordovician)	7,006-7,042	2,805 MCFGPD	
9	16-18N-12W, McKinley	Gila Exploration No. 2 Hogan State	4/86	1,195	Crevasse Canyon (Cretaceous)	Crevasse Canyon (Cretaceous)	1,142-1,147	10 BOPD + 23 BWPD	
10	9-20N-12W, McKinley	Black Oil Co. No. 1 NMALO-Gurley	5/86	2,260	Hospah (Cretaceous)	Hospah (Cretaceous)	2,180-2,186	82 BOPD	35
11	6-29N-3W, Rio Arriba	Robert L. Bayless No. 1Y Jicarilla 452	9/86	3,935	Pictured Cliffs (Cretaceous)	Fruitland (Cretaceous)	3,644-3,743	191 MCFGPD	
12	26-20N-3W, Sandoval	Gary-Williams Oil No. 7 San Isidro 26 (owwo)	2/86	4,210	Gallup (Cretaceous)	Menefee (Cretaceous)	2,272-2,282	119 BOPD	39.8
29	36-26N-29E, Union	Sofia Exploration No. 1 Roxana State	2/87	3,764	Precambrian	Glorieta (Permian) Yeso (Permian)	1,652-1,744, 1,880-1,892	700 MCFGPD, CO ₂	

San Juan Basin; most wells stop in the shallower, prolific Cretaceous and Jurassic pay zones. Production from Paleozoic reservoirs has been limited to nine small, structurally controlled fields in western San Juan County. Paleozoic reservoirs are Devonian, Mississippian, and Pennsylvanian. Because the Paleozoic section of the San Juan Basin has been drilled sparsely, it remains a frontier for petroleum exploration.

Development drilling for oil in the San Juan Basin was concentrated in the Gallup and Dakota Sandstones (Cretaceous). Several development oil wells were completed in two or more of the following stratigraphic units: Gallup Sandstone, Dakota Sandstone, Mancos Shale, Graneros Shale, or Greenhorn Limestone (Cretaceous). The thickness of each completion zone is typically 300-500 ft. Stone

et al. (1983) summarized the stratigraphy of Cretaceous rocks in the San Juan Basin.

Most development drilling for gas in the San Juan Basin was in sandstone reservoirs in the Mesaverde Group, Graneros Shale, and Dakota Sandstone (Cretaceous). El Paso Natural Gas Company continued its extensive infill drilling of the Basin Dakota gas pool. Other targets of gas drilling were the Pictured Cliffs Sandstone and the Chacra zone (Cretaceous).

The Española Basin is a frontier basin in which two marginally commercial oil discoveries were made in Upper Cretaceous strata in 1985 (Broadhead, 1986). Three confirmation wells were completed in 1986 (20, 21, 23) but did not encounter commercial quantities of petroleum. North of the discoveries made in 1985, the Yates Petroleum Corp. No.

3 La Mesa Unit (22) was abandoned in Triassic sedimentary rocks with no reported shows of oil or gas. One significant additional well (32) was scheduled to be drilled in the Española Basin at the end of 1986.

One significant wildcat well was completed in the Albuquerque Basin in 1986. The C. R. Robinson No. 1 Baca (19) was drilled in 1983 and abandoned in 1986 after encountering a show of oil in the Pennsylvanian section. The Robinson well was drilled on the Hubbell bench, a fault block in the eastern part of the basin. The New Mexico & Arizona Land Company No. 5 Penteco Trinity (37) was drilled to a total depth of 1,650 ft on the west flank of the Albuquerque Basin, but had not been completed at the end of 1986. Petroleum has not been produced commercially from the Albuquerque Basin, but wells drilled in past years have encountered encouraging shows of oil and gas (Black, 1982). Some of the most promising shows of oil and gas have been encountered from Cretaceous sedimentary units in the deep central part of the basin.

Northeast New Mexico

Several petroleum exploration wells were drilled in northeast New Mexico in 1986. Petroleum has not been produced in this area except for a brief period in the 1970's when marginally commercial amounts of gas were produced from the Morrison Formation (Jurassic) and the Dakota Sandstone (Cretaceous) at the currently inactive Wagon Mound field in Mora County (Fig. 1, letter A). In the 1980's, the Newkirk pool (Fig. 1, letter B) produced 455 bbls heavy oil from the Santa Rosa Sandstone (Triassic) with the aid of a pilot steamflood project.

Five significant wildcat wells were completed in the Tucumcari Basin in 1986 (14, 15, 16, 24, 25). The JNC Resources No. 1 Johnson (14) was drilled to total depth in Permian sedimentary rocks; shows of oil and gas were encountered in carbonates and sandstones of the San Andres Formation and Glorieta Sandstone (Permian). The Tempo Energy No. 1 Hudson (15), Tom L. Ingram No. 1 Gihon (16), and JNC Resources No. 2 Johnson (25) were drilled to test the San Andres and Glorieta, but there were no reported shows of oil or gas from any of these three wells. The Gila Exploration No. 1 Latigo Ranch Block D (24) was drilled in 1983 as an offset of a marginally commercial gas discovery in Middle Pennsylvanian sandstones, but was abandoned in 1986 with no reported shows. The Wet Hole No. 1 LTD Partnership No. 1 Ben Lujan (17) was drilled and abandoned on the south flank of the Sierra Grande uplift with no reported shows.

In the Raton Basin, the Perma Energy No. 1 Kaiser Eustace (26) was drilled to a total depth of 2,500 ft to test Cretaceous sandstones and shales; the No. 1 Kaiser Eustace is a "tight" hole that was reported to be shut in at the end of 1986. Although the New Mexico part of the Raton Basin is not yet productive of oil and gas, gas has been produced from small fields in the Colorado part

of the basin. Several wells drilled in past years in the New Mexico part of the basin have encountered promising shows of oil and gas in Cretaceous sandstones (Speer, 1976).

The Bravo dome carbon dioxide gas field continued to be developed, and 18 wells were completed in 1986. The main reservoir is the Tubb sand (Permian). Amoco drilled two significant wildcat wells (27, 28) in an attempt to extend the productive limits of the Bravo dome carbon dioxide field. In Union County, the Sofia Exploration No. 1 Roxana State (29), is a carbon dioxide exploration well that was drilled to a total depth of 3,764 ft on the Sierra Grande uplift; the Roxana State well was completed as a new field discovery in the Glorieta Sandstone and Yeso Formation (Permian). Most carbon dioxide produced from the Bravo dome field is used for enhanced oil recovery in the Permian Basin of west

Texas. The carbon dioxide is transported by pipeline to the Permian Basin. A relatively minor amount of carbon dioxide produced from the Bravo dome field is converted into dry ice and bottled, liquid forms.

Southwest New Mexico

No exploratory wells were drilled in southwest New Mexico in 1986, but geologic and geophysical exploratory studies continued. The location for one wildcat well (38) was staked in the sparsely drilled Baca Basin. In the last three years approximately 3 million acres of land have been leased in the Baca Basin by several firms, including Shell, Elf Aquitaine, Standard Oil Co. (Sohio), Hunt Oil Co., High Plains Petroleum Corp., Monarch Petroleum Corp., Leed Petroleum Corp., Zimmerman Resources, Love Oil Co., the New Mexico and Arizona Land Co., and Sam

TABLE 2—Significant wildcat dry holes in New Mexico in 1986; the term formation is used in an informal sense. D&A, dry and abandoned; MCFGPD, thousand ft³ gas per day.

Number on Fig. 1	Location (section-township-range, county)	Operator, well number, and lease	Completion date (month/year)	Total depth (ft)	Formation at total depth	Status	Comments
13	26-30N-6W Rio Arriba	Meridian Oil No. 112-Y San Juan 30-6	9/86	14,026		D&A	Perforated 13,195-13,214 ft (Barker Creek), flowed 350 MCFGPD. Converted to water injection well. Operator changed from Phillips Petroleum.
14	26-10N-28E, Quay	JNC Resources No. 1 Johnson	10/86	5,504	Cimarron (Permian)	D&A	Perforated 3,096-3,118 ft (Glorieta), slight gas show; perforated 2,978-3,000 ft (San Andres), slight oil and gas show; perforated 2,782-2,790 ft (San Andres), oil and gas show.
15	14-11N-33E, Quay	Tempo Energy No. 1 Hudson	7/86	1,900	Permian	D&A	Perforated 1,800-1,837 ft (San Andres), no show.
16	31-13N-30E, San Miguel	Tom L. Ingram No. 1 Gihon	10/86	2,579	Yeso (Permian)	D&A	Glorieta-San Andres (Permian) test. Will re-enter and drill to Precambrian.
17	1-14N-23E San Miguel	Wet Hole No. 1 LTD Partnership No. 1 Ben Lujan	6/86	1,140		D&A	No reported show. Completed as water well.
18	35-5N-8E, Torrance	Mar Oil & Gas No. 1 Estes	6/86	2,913	Upper Paleozoic or Precambrian	D&A	Perforated 2,100-2,110 ft (Pennsylvanian), no show; perforated 2,252-2,258 ft (Pennsylvanian), show of gas with CO ₂ ; perforated 2,582-2,612 ft (Pennsylvanian), show of gas with CO ₂ ; perforated 2,624-2,646 ft (Pennsylvanian), flowed CO ₂ and N ₂ .
19	3-5N-4E, Valencia	C. R. Robinson No. 1 Baca	2/86	2,360	Pennsylvanian	D&A	Perforated 1,830-1,850 ft (Pennsylvanian), oil show.
20	1-13N-8E Santa Fe	Black Oil Co. No. 5 Ferrill	3/86	4,252	Morrison (Jurassic)	D&A	Offset to 1985 oil discovery (Broadhead, 1986). Upper Cretaceous test.
21	5-13N-9E, Santa Fe	Black Oil Co. No. 1 Cash	4/86	2,600		D&A	Perforated 1,290-1,358 ft (Morrison), no reported show.
22	13-15N-8E, Santa Fe	Yates Petroleum Co. No. 3 La Mesa Unit	1/86	4,755	Chinle (Triassic)	D&A	Drilled to total depth in Chinle Formation (Triassic).
23	1-13N-8E, Santa Fe	Black Oil Co. No. 6 Ferrill	12/86	2,400		D&A	Offset to 1985 oil discovery (Broadhead, 1986). Upper Cretaceous test.
24	26-10N-23E, Guadalupe	Gila Exploration No. 1 Latigo Ranch Block D	5/86	7,836	Precambrian	D&A	Drilled in 1983. Perforated, acidized, and fractured 7,395-7,414 (Pennsylvanian) with no show.
25	23-10N-28E, Quay	JNC Resources No. 2 Johnson	12/86	3,324	Glorieta (Permian)	D&A	Glorieta-San Andres (Permian) test.
38	21-3N-9W, Catron	Black Oil Co. No. 6 Santa Fe Pacific Railroad	6/87	680	Cretaceous	D&A	Upper Cretaceous test.

Gary and Greg Merrion. No wells have been drilled in the Baca Basin since 1979. In 1986, Shell, Standard Oil, and Elf Aquitaine formed an exploration and development unit on 3.5 million acres of federal land in Catron and western Socorro Counties. The unit has been termed the "Magic Area." According to a contract signed with the U.S. Bureau of Land Management, the consortium of Shell, Standard Oil, and Elf Aquitaine must drill one well by the end of 1987. A second well must be drilled by the end of 1988 and a third well must be drilled by the end of 1989.

No exploration wells were drilled in the Pedregosa Basin in 1986. However, the Paleozoic and Lower Cretaceous sections in that basin are promising (Thompson, 1980, 1981).

Effect of discoveries on oil and gas production

In 1985, New Mexico was the seventh largest producer of crude oil and the fourth largest producer of natural gas in the United States (Energy Information Administration, 1986). Production of crude oil and condensate in 1986 was 75.5 million bbls, a decrease of 3.9% from the 78.5 million bbls produced in 1985 (New Mexico Oil Conservation Division data). Production of natural gas in 1986 was 698 billion ft³, a decrease of 21.8% from the 893 billion ft³ produced in 1985 (New Mexico Oil Conservation Division data). In 1986, 89% of the state's oil and 56% of the state's gas were produced from the Permian Basin; 11% of the state's oil and 44% of the state's gas were produced from the San Juan Basin. As of December 31, 1985, New Mexico had oil reserves of 967 million bbls, an increase of 29 million bbls from December 31, 1984. As of December 31, 1985, New Mexico had gas reserves of 14,762 billion ft³, a decrease of 586 billion ft³ from December 31, 1984 (New Mexico Energy and Minerals Department, 1986).

The decrease in oil production in 1986 can be attributed to the declining price of oil. The price of west Texas intermediate crude oil with a gravity of 40° API in 1986 fell 55% from a high of \$27.25/bbl in January 1986 to a low of \$12.25/bbl in July 1986 (Fig. 2); the price of west Texas intermediate crude oil subsequently rose to \$16.50/bbl in January 1987. The sharp decline in oil prices was due to a sudden rise in oil production by several countries (notably Britain, Latin American, and Middle Eastern countries) in an effort to increase income from oil revenues. The rise in oil production created an oversupply of oil and caused prices to plummet. A gradual reduction of world petroleum stocks and partially successful attempts by OPEC nations to reinstate production ceilings caused prices to rise to \$16.50/bbl in January 1987. Because of the decrease in oil prices, many marginal and stripper wells were shut in or plugged, and their production may never be regained unless prices increase sufficiently to justify the expense of re-opening such wells. Stripper wells are defined as wells that produce less than 10 bbls oil per day. Approximately 20% of oil production in New Mexico is from stripper wells.

TABLE 3—Significant wildcat wells that were being drilled, not completed, "tight," or planned at the end of 1986 in New Mexico.

Number on Fig. 1	Location (section-township-range, county)	Operator, well number, and lease	Comments
26	36-32N-19E, Colfax	Perma Energy No. 1 Kaiser Eustace	Cretaceous test. Drilled to total depth of 2,500 ft. Temporarily abandoned. "Tight hole."
27	30-17N-33E, Harding	Amoco Production Co. No. 301 BDCDGU 1733	CO ₂ exploration well south of Bravo Dome CO ₂ field. Drilled to total depth of 2,987 ft. Perforated 2,540-2,590 ft (Tubb). Temporarily abandoned.
28	22-22N-30E, Union	Amoco Production Co. No. 221 BDCDGU 2230	CO ₂ exploration well northwest of Bravo Dome CO ₂ field. Drilled to total depth of 2,589 ft. Perforated 2,486-2,524 ft (Tubb). Temporarily abandoned.
30	35-24N-14E, Taos	Leonard Minerals No. 1 Taos Trough Unit	Location staked. Scheduled to be drilled to 6,000 ft to test Pennsylvanian section.
31	7-14S-11E, Otero	Cibola Energy No. 1 Ysletano Canyon Federal	Location staked. Scheduled to be drilled to 3,800 ft in Devonian strata.
32	7-13N-9E, Santa Fe	Black Oil Co. No. 2 Leigh	Location staked. Scheduled to be drilled to 4,200 ft to test Upper Cretaceous section.
33	18-5N-9E, Torrance	Benz, Lyle, & Curtis No. 1 Benz	Drilled to total depth of 796 ft in Yeso Formation (Permian). Oil and gas show in Yeso. To be completed as water well.
34	12-6N-6E, Torrance	John Aday No. 2 D'Spain	Drilled to total depth of 1,900 ft. Shut in.
35	7-29N-16W, San Juan	Amoco Production Co. No. 47 USG Section 18	Drilled to total depth of 7,160 ft. Perforated and fractured 6,439-6,521 ft (Upper Paleozoic). "Tight hole."
36	9-29N-2W, Rio Arriba	Union Oil of California No. 1 Jicarilla H-9	Drilled to total depth of 10,130 ft in Pennsylvanian strata. Perforated 3,687-3,700 (Pictured Cliffs) and 3,612-3,628 (Fruitland) with no show.
37	35-6N-3W, Valencia	New Mexico & Arizona Land Co. No. 5 Penteco Trinity	Drilled to total depth of 1,650 ft in Pennsylvanian strata. Perforated 1,425-1,438 ft, 1,458-1,474 ft, 1,484-1,490 ft, 1,524-1,528 ft (Pennsylvanian) with no reported shows.

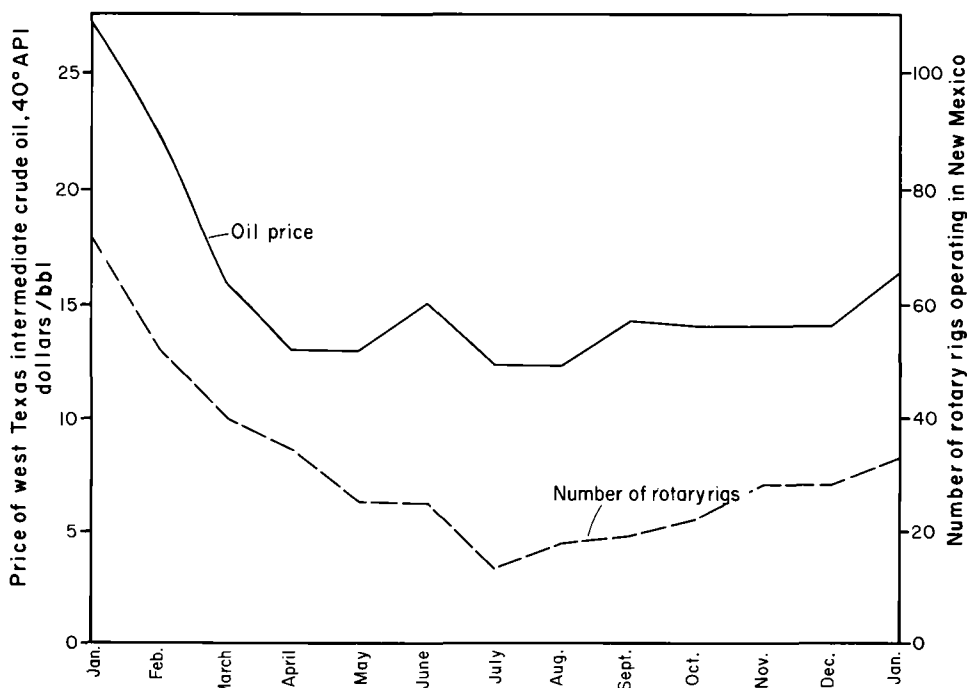


FIGURE 2—Monthly crude oil prices and number of active rotary drilling rigs in New Mexico during 1986 and the first month of 1987. Data from Oil and Gas Journal (1986a, b, 1987a, b).

Declining oil prices have also resulted in a dramatic decrease in drilling activity, which is reflected in the rig count for the state (Fig. 2). Oil reserves found and developed during the "boom" drilling years of 1980–1982 reached peak development and production in 1983 and 1984. Because of the drilling slump of 1983–1985 and the almost catastrophic decrease in drilling in 1986, reserves in larger pools have not been developed quickly enough to supplant previously discovered and developed reserves that were depleted by production. As a result, production has declined.

Oil discoveries made in the last five years in the Delaware Mountain Group (Delaware Basin), Bone Spring Formation (Delaware Basin), and Gallup Sandstone (San Juan Basin) provide major new exploration targets and have added new oil reserves and production that have supplanted declining production from older pools. Continued oil discoveries in the Permian and San Juan Basins will encourage exploratory drilling and development. However, the number of active rotary rigs in the state is tied to the price of oil (Fig. 2) and future reserve and production declines will probably be halted only if oil prices rise enough to substantially increase the number of active rigs. Until that time, exploratory discoveries will not keep pace with production and reserves will decline, unless a major field is discovered by one of the few rigs drilling currently.

The decrease in gas production in 1986 was caused by a decreased demand for gas, rather than a decreased capability to produce gas. The large decline in gas production has been caused primarily by a poor market for gas in California, the chief consumer of New Mexico gas. Many utilities and industries in California have switched from using New Mexico gas to using currently cheaper fuel oil and Canadian gas. The short-term demand for gas is not expected to increase (Oil and Gas Journal, 1987b), but the long-term demand for gas is predicted to increase (American Gas Association, 1984).

Decreased demand for gas has caused a marked decrease in exploration. Most of the produced gas reserves were not replaced by new discoveries in 1986, and reserves declined accordingly. Generally, only the very best gas prospects, or those gas prospects required to hold leases, were drilled in 1986. The larger, existing gas pools in the San Juan Basin continued to be developed in 1986, but at a slower pace than in previous years.

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Geographic Names

U. S. Board on Geographic Names

- Lower North Star Tank**—reservoir, 107 m (350 ft) long, in Mule Canyon, 43 km (27 mi) south-southeast of the locality of Old Horse Springs; Catron County, NM; sec. 9, T9S, R12W, NMPM; 33°32'58" N, 108°05'24" W; *not*: Lower Mule Tank.
Magnum Spring—spring, along upper course of Cave Creek, in the Black Range, 56 km (35 mi) west-southwest of Truth or Consequences; Sierra County, NM; 33°00'53" N, 107°43'27" W; *not*: Magner Spring.
Middle North Star Tank—reservoir, 61 m (200 ft) long, in Mule Canyon, 43 km (27 mi) south-southeast of the locality of Old Horse Springs; Catron County, NM; sec. 4, T9S, R12W, NMPM; 33°33'21" N, 108°04'49" W; *not*: North Star Tank.
Mule Tank—reservoir, 31 m (100 ft) long, in Mule Canyon, midway between Middle North Star and North Star Tanks, 42 km (26 mi) south-southeast of the locality of Old Horse Springs; Catron County, NM; sec. 3, T9S, R12W, NMPM; 33°33'43" N, 108°04'13" W; *not*: Homestead Tank.
North Star Tank—reservoir, 46 m (150 ft) long, at the upper end of Mule Canyon, 43 km (27 mi) south-southeast of locality of Old Horse Springs; Catron County, NM; sec. 34, T8S, R12W, NMPM; 33°34'05" N, 108°03'49" W; *not*: Upper Mule Tank.

- Peaks Tank**—reservoir, 31 m (100 ft) across, at the upper end of Bear Canyon, in the Indian Peaks, 40 km (25 mi) northwest of Winston; Catron County, NM; sec. 32, T8S, R11W, NMPM; 33°34'23" N, 107°59'44" W; *not*: Dons Dump Tank.
Railroad Tank—reservoir, 31 m (100 ft) across, in Railroad Canyon, 39 km (24 mi) south-southeast of the locality of Old Horse Springs; Catron County, NM; sec. 22, T8S, R12W, NMPM; 33°35'56" N, 108°03'27" W; *not*: Whiskey Tank.
Rocky Tank—reservoir, 53 m (175 ft) long, on an unnamed tributary of Stone Canyon and 0.48 km (0.3 mi) south of Stone Canyon, 39 km (24 mi) north-northwest of Winston; Catron County, NM; sec. 21, T7S, R9W, NMPM; 33°40'54" N, 107°45'57" W; *not*: Rock Tank.
Upper Spring Tank—reservoir, 23 m (75 ft) across, at the head of Kennedy Canyon, 47 km (29 mi) south-southeast of the locality of Old Horse Springs; Catron County, NM; sec. 7, T9S, R11W, NMPM; 33°32'38" N, 108°01'01" W; *not*: Long Day Tank.
Valley Tank—reservoir, 61 m (200 ft) long, at the west end of an unnamed valley along Railroad Canyon, 31 km (19 mi) south-southeast of the community of Old Horse Springs; Catron County, NM; sec. 23, T8S, R12W, NMPM; 33°36'35" N, 108°02'20" W; *not*: Line Gap Tank.