



## *Exploration for oil and gas in the Chama basin*

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## Exploration for Oil and Gas in the Chama Basin

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Exploration for oil and gas in the Chama Basin began in 1901. On May 27 of that year a report by Arthur Lakes, entitled "Report of the Oil Fields of Archuleta County, Colorado," was published in The Pagosa Springs Sun.

Lakes examined the general possibilities of the area, reported petroliferous residues in dikes near Pagosa Springs, and noted an oil seep on the Navajo River east of the Chromo anticline. Perhaps on the basis of this report, B. T. Smith drilled a well on the Little Blanco River in 1901, which produced small quantities of oil. Smith also obtained small production from a well southeast of Pagosa Springs. Sporadic drilling, during the next 34 years, including a number of tests on the Chromo anticline, failed to find oil or gas in commercial quantities.

In 1935 a well was drilled on the Price anticline,  $3\frac{1}{2}$  miles north of the oil seep on the Navajo River. The location was selected by W. A. Waldschmidt following a study of the area made at the request of Lafayette M. Hughes. The well found oil in the Dakota sandstone and was completed as the discovery well of the Gramps field.

The oil being produced from the Gramps field has accumulated against an east-west fault crossing a north-south anticlinal axis. Production is restricted to that part of the structure which lies south of the fault. The average thickness of the Dakota pay is 152 feet, and the average well depth is 1,250 feet. The producing area of the field is 127 acres. Total production to January 1, 1959 has been 4,711,578 barrels.

Although a number of dry holes had been drilled on the Chromo anticline, the Florance Drilling Co. found production on the west flank in 1947. The oil in the Chromo field is produced from fractures in the Mancos shale. The Dakota sandstone contains water. The depth of oil production ranges from 400 to 700 feet. Total production to January 1, 1959, has been 120,620 barrels.

Table 1 is an attempt to list all the wells that have been drilled in the New Mexico portion of the Chama Basin. However, this list may be far from complete. Records on many of the wells listed are incomplete, and some of the information that is given may be in error. Most of the drilling that has taken place has been done on various land grants which have not been subdivided into section, township, and range. The township and range locations given in Table 1 for wells located within grants are based upon projections of township and range lines into the grant areas. These locations are, therefore, highly inaccurate and at best give a general idea as to the location of the well within the grant. Because of the lack of information, no attempt was made to list the wells that have been drilled in the Colorado portion of the basin.

Prior to the discovery of the Gramps field in 1935, some 18 dry holes had been drilled in the New Mexico portion of the Chama Basin. The anticlinal theory was in vogue,

and all these wells were located on anticlinal or domal structures. The Azotea anticline, Chromo anticline, and Monero dome received the most attention.

The discovery of the Gramps field apparently did not cause any unusual interest in the New Mexico portion of the basin. Only 9 tests were made between the discovery of this field in 1935 and the discovery of the Chromo field in 1947. No doubt, the reason for this was that the Gramps field was a highly secret operation and practically no information pertaining to the field was made public until 1946.

Since the release of information on the Gramps field in 1946 and the discovery of the Chromo field in 1947, 21 test wells have been drilled. All of these wells were dry.

Stratigraphic and structural conditions within the area are favorable for the occurrence of oil. Although none of the 48 test wells drilled in the New Mexico portion of the Chama Basin have been successful, a number of interesting possibilities still exist.

Additional areas of fractured Mancos shale production may be present, but a large element of chance is present in prospecting for this type of production. Success will depend upon very careful geological analysis and a large number of holes.

In general, the Dakota sandstone has been found to contain water over most of the area. However, the Dakota may be found to be productive in fault-bounded or fault-closed structures such as at Gramps. It is possible that dikes may act in a manner similar to faults in controlling the movements of fluids.

Although the Mancos shale and Dakota sandstone have been tested in most of the wells that have been drilled in the area, very few wells have penetrated the pre-Dakota section. The deeper formations in a large number of surface structures remain untested. Deeper possibilities exist in the Entrada sandstone and in the overlying Todilto formation. The wedge edges of Permian and Pennsylvanian rocks believed to underlie much of the western part of the area also offer significant possibilities.

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TABLE 1. OIL TESTS IN THE NEW MEXICO PORTION OF THE CHAMA BASIN

Well	Location	Year comp.	Total depth	Bottom formation	Remarks
Watson #1 Salazar	Piedra Lumbre Grant 1-23N-3E	1956	1709	Permian	
Continental #1 French Mesa	25-24N-1E (French Mesa anticline)	1926	3355	Pennsylvanian	
Skelly #1 Crittenden	36-24N-1E	1948	4850	Precambrian	T. Pennsylvanian 3,500'
Watson #1 Pack	Piedra Lumbre Grant 35-24N-4E	1954	4205	Precambrian	
Lowry et al #1 Morton	J. J. Lobato Grant 24-24N-5E	1952	2160	Precambrian	
Hall #1 Silver	20-26N-2E (Gallina Mtn. anticline)	1952	2678	Precambrian	
Helmerich & Payne #1 El Vado	Tierra Amarilla Grant 3-27N-2E (South El Vado dome)	1943	2009	Precambrian	No Pennsylvanian
Pan States #1	Tierra Amarilla Grant 4-28N-2E (North El Vado dome)	1933	347	Morrison	No shows reported
Southwest #1 Penn Building Co.	Tierra Amarilla Grant 22-28N-2E	1948	2460	Precambrian	No shows reported
Southwest #1 Martinez	Tierra Amarilla Grant 14-28N-3E	1948	1902	Entrada	T. Dakota 560'
Continental & Hughes #1 Esquibel	Tierra Amarilla Grant 27-28N-4E	1938	1920	Dakota	T. Dakota 1689', water
Hamilton #1 Penn Building Co.	Tierra Amarilla Grant 33-28N-4E	1957	1332	Mancos	No shows reported
Hamilton #1 Spill Brothers	Tierra Amarilla Grant 33-28N-4E	1959	2659	?	Water in Dakota and Entrada Show of oil in Todilto
Southwest #1-B Penn Building Co.	Tierra Amarilla Grant 33-28N-4E	1948	1889	Morrison	T. Dakota 1470
Southwest #1 Sargent	Tierra Amarilla Grant 15-29N-2E	1949	1194	Entrada	No shows reported
Williams #1 Martinez	Tierra Amarilla Grant 3-30N-2E (Azotea anticline)	1925	1200	?	Show of oil 1050'
Williams #1 Willow Creek	Tierra Amarilla Grant 23-30N-2E (Willow Creek anticline)	1920	2054	Precambrian	No shows reported
Richmond #1	Tierra Amarilla Grant 31-30N-2E (Horse Lake anticline)	1920	465	?	Show of oil 90'
Richmond #2	Tierra Amarilla Grant 31-30N-2E (Horse Lake anticline)	1920	1783	Precambrian ?	No shows reported
Prairie #1 Gonzales	Tierra Amarilla Grant 1-31N-1E (Azotea anticline)	1926	1008	?	Water in Dakota
Sharples #1 Gonzales	Tierra Amarilla Grant 2-31N-1E (Azotea anticline)	1958	1096	Morrison	T. Dakota 710'
Sharples #2 Gonzales	Tierra Amarilla Grant 11-31N-1E (Azotea anticline)	1958	998	Morrison	T. Dakota 281'
Ache #1 Martinez	17-31N-1E (Monero Dome)	1926	1427	Dakota	T. Dakota 1417', water
Ache #1 Valdez	20-31N-1E (Monero Dome)	1926	350	?	

TABLE 1. OIL TESTS IN THE NEW MEXICO PORTION OF THE CHAMA BASIN (continued)

Well	Location	Year comp.	Total depth	Bottom formation	Remarks
Prairie Oil & Gas Co.	Tierra Amarilla Grant 2-31N-2E (Azotea anticline)	1925	1800	?	
Oil City #1 Wirt-Sanchez	Tierra Amarilla Grant 11-31N-2E (Azotea anticline)	1938	460	Dakota	T. Dakota 437', water
Oil City #2 Wirt-Sanchez	Tierra Amarilla Grant 12-31N-2E (Azotea anticline)	1939	478	?	
Azotea #1 Wirt-Garcia	Tierra Amarilla Grant 17-31N-2E (Azotea anticline)	1927	2300	?	Show of oil in Dakota at 1060'
Azotea #2 Wirt-Garcia	Tierra Amarilla Grant 17-31N-2E (Azotea anticline)	1927	510	?	
Azotea #3 Wirt-Garcia	Tierra Amarilla Grant 17-31N-2E (Azotea anticline)	1928	644	?	
Travis #1 Wirt	Tierra Amarilla Grant 21-31N-2E	1944	705	?	T. Dakota 430'
Carraco #1 Sargent	Tierra Amarilla Grant 19-31N-3E	1959	1214	Entrada	T. Entrada 1206'
Rhodes #1 Sargent	Tierra Amarilla Grant 23-31N-3E	1944	880	?	
Rhodes #2 Sargent	Tierra Amarilla Grant 23-31N-3E	1945	816	?	
Vaughn #1 Chama L & C	Tierra Amarilla Grant 25-31N-3E	1956	2025	Morrison	
Larrazolo #1 Chama L & C	Tierra Amarilla Grant 29-31N-4E	1950	585	Morrison	T. Dakota 130'
Larrazolo #2 Chama L & C	Tierra Amarilla Grant	1950	235	?	
Larrazolo #3 Chama L & C	Tierra Amarilla Grant 29-31N-4E	1950	360	Morrison	
Larrazolo #4 Chama L & C	Tierra Amarilla Grant 30-31N-4E	1951	716	Morrison	
Jarvis Bennet #1	8-31N-1W (Dulce Dome)	1930	2577	Dakota	T. Dakota 2470', water
Ache #1 Garcia	13-31N-1W (Monero Dome)	1925	1520	?	T. Dakota 1385', water
Continental & Hughes #1 Jicarilla	22-31N-1W (Dulce Dome)	1940	2373	Dakota	T. Dakota 2230', water
Axelind #1 Gonzales	Tierra Amarilla Grant 13-32N-1E (Chromo anticline)	1938	1022	Dakota	T. Dakota 930', water
Barnes et al #1	Tierra Amarilla Grant 13-32N-1E (Chromo anticline)	1924	725	Dakota	Water in Dakota at 725'
Crowley #1 Malstead-Dysart	Tierra Amarilla Grant 18-32N-2E (Chromo anticline)	Before 1924	567	?	
Prairie #1 Gonzales	Tierra Amarilla Grant 31-32N-2E (Chromo anticline)	Before 1923	1508	?	T. Dakota 1405'
Rhine #1 Sargent	Tierra Amarilla Grant 16-32N-3E	1959	3034	?	T. Dakota 1415'
Rhine #2 Sargent	Tierra Amarilla Grant 8-32N-3E	1959	3004	?	T. Dakota 1850'