



Hydrocarbon potential of the Espanola Basin--A progress report

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HYDROCARBON POTENTIAL OF THE ESPANOLA BASIN-A PROGRESS REPORT

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INTRODUCTION

In a series of earlier articles, Black (1979, 1982, 1984) discussed oil- and gas-exploration developments in the tectonic basins of the Rio Grande rift in central and north-central New Mexico. This article is a short progress report and an update on the most recent developments in the Espanola Basin portion of the rift.

DISCUSSION

The Espanola Basin, including the Hagan and Santa Fe embayments, is now the focus of active oil and gas exploration by at least two major and four smaller companies. Seismic programs and sporadic wildcat drilling are in progress, and a number of additional wells is planned for the summer of 1984.

Unlike the Albuquerque Basin to the south and the San Luis Basin to the north, the Espanola Basin lies directly on line with Cretaceous stratigraphic trends and with established production of the San Juan Basin in northwestern New Mexico. Figure 1 shows the major Creta-

ceous strandlines, as well as the producing areas of the San Juan Basin and their relationship to the Espanola Basin. It is obvious why the Espanola Basin is now the focus of a Cretaceous oil and gas play, a detailed discussion of which can be found in Black (1984).

Because of the somewhat different structural evolution of the Espanola Basin (Black, this guidebook), the basin also appears to have a different and perhaps greater potential for shallow oil and gas prospects in structures involving the Paleozoic and lower Mesozoic sections.

In virtually every well drilled to date in the Espanola Basin (Fig. 2) there have been oil and/or gas shows, the most recent of which were well-documented shows of live oil and gas. Several of the wildcat wells could have probably yielded commercial quantities of gas if there had been an existing pipeline system in the area. Up to 20 bbls of high-gravity oil per day, with no water, has reportedly been swabbed from the Cretaceous rocks in at least one recent well. There were collapsed casing problems with that hole, which now awaits a workover.

Only four of the 24 wells drilled since 1914 (Table 1) have penetrated

TABLE 1. Chronology of oil and gas tests in the Espanola Basin, including the Santa Fe and Hagan embayments.

Well	Section Township(N) Range	Total depth (ft)	Year completed	Deepest formation penetrated	Remarks
1. Tejon Oil & Develop. Co. No. 1	7-14-6	1850	1914	Santa Fe	Reported oil show at 1100 and 1087 ft.
2. Wood et al. Galisteo No. 1	7-12-10	3240	1921		Numerous oil and gas shows reported between 760 and 2715 ft.
3. Wood et al.	30-13-10	1540	1925		
4. E.M. Elliott No. 1	26-21-9	1760	1937	Penn.	Reported oil show at 775 and 1100-25 ft, gas shows at 1175-1200 ft.
5. Castle & Wigzell, Kelly Fed. No. 1	11-20-9	2703	1961	Penn.	Minor oil shows reported.
6. Eastland Oil Co., McKee No. 1	8-13-9	2092	1974	Morrison	Reported show of gas and oil.
7. CPGS Bicentennial No. 1 Federal	35-13-6	1416	1976	Morrison	Reported show of gas.
8. CPGS Bicentennial No. 2 Federal	35-13-6	1411	1976	Morrison	Reported show of gas.
9. CPGS Bicentennial No. 3 Federal	35-13-6	1112	1976	Morrison	Reported show of gas.
10. CPGS Bicentennial No. 4 Federal	35-13-6	1403	1976	Morrison	Reported show of gas.
11. Brent Exploration No. 1	29-13-6	1875	1978	Morrison	
12. Brent Exploration No. 3	19-13-6	2070	1978	Entrada	Reported show of oil.
13. Brent Exploration No. 5	19-13-6	769	1978	Dakota	Reported show of gas.
14. TransOcean Oil Co., McKee No. 1	4-13-9	8128	1978	Penn.	Reported show of gas; flared gas for Dakota test.
15. Whigham, Inc., Pinon-Davis No. 1	21-14-10	1514	1979	Dakota	Reported show of oil and gas.
16. Whigham, Inc., Pinon-Davis No. 2	21-14-10	1150	1979	Greenhorn	Reported show of oil and gas.
17. Pelto Oil Co., McKee No. 1	5-13-9	3100	1981	Morrison	Oil and gas shows in Cretaceous. Oil on ditch in Greenhorn. No tests.
18. Pelto Oil Co., Harmon No. 1	18-13-6	1398	1981	Entrada	Cored 50 ft of residual oil saturated sand in Dakota and spotty oil saturation in Entrada.
19. Pelto Oil Co., Ortiz No. 1	26-14-8	7450	1981	Morrison	Flared gas and recovered oil-cut mud on DST in Greenhorn. Ran casing and perforated Dakota - swabbed 20 bbls/day, 40° oil - no water. Plugged back to Greenhorn and perforated, swabbed 22 bbls/day 42° oil, no water. Now shut in.
20. Pelto Oil Co., Blackshare Federal No. 1	35-14-6	7018	1981	Chinle	Small gas shows in Mancos. Dakota faulted out. Cored spotty oil-stained sand in Entrada.
21. Pelto Oil Co., Pelto State No. 1	36-14-8	5504	1981	Morrison	Gas shows in Cretaceous.
22. CPGS Ferrill No. 1	7-13-9	3192	1981	Mancos	Large volumes of gas shows throughout Cretaceous Mancos, increasing to T.D. No DST's. Would probably be good gas well if pipeline were present.
23. CPGS Ferrill No. 2	5-13-9	1596	1982	Morrison	Numerous gas shows in Cretaceous. Large gas kick in Dakota. Well might be a small gas producer if pipeline were present.
24. CKS, Inc., Gianardi No. 1	22-15-8	7,000±	1983	Abo?	No data yet released.

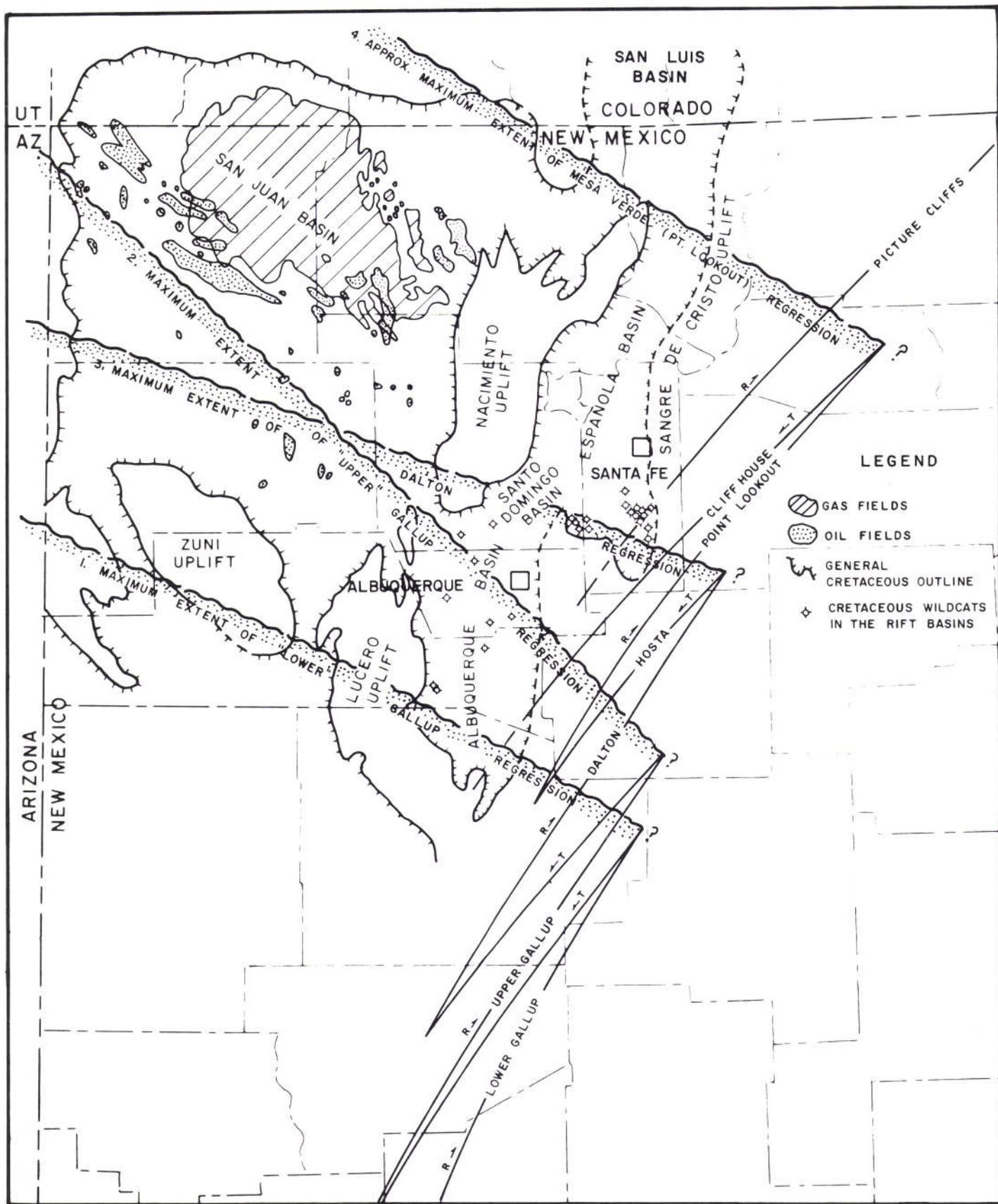


FIGURE 1. Strand lines in the San Juan Basin and in the Rio Grande rift basins.

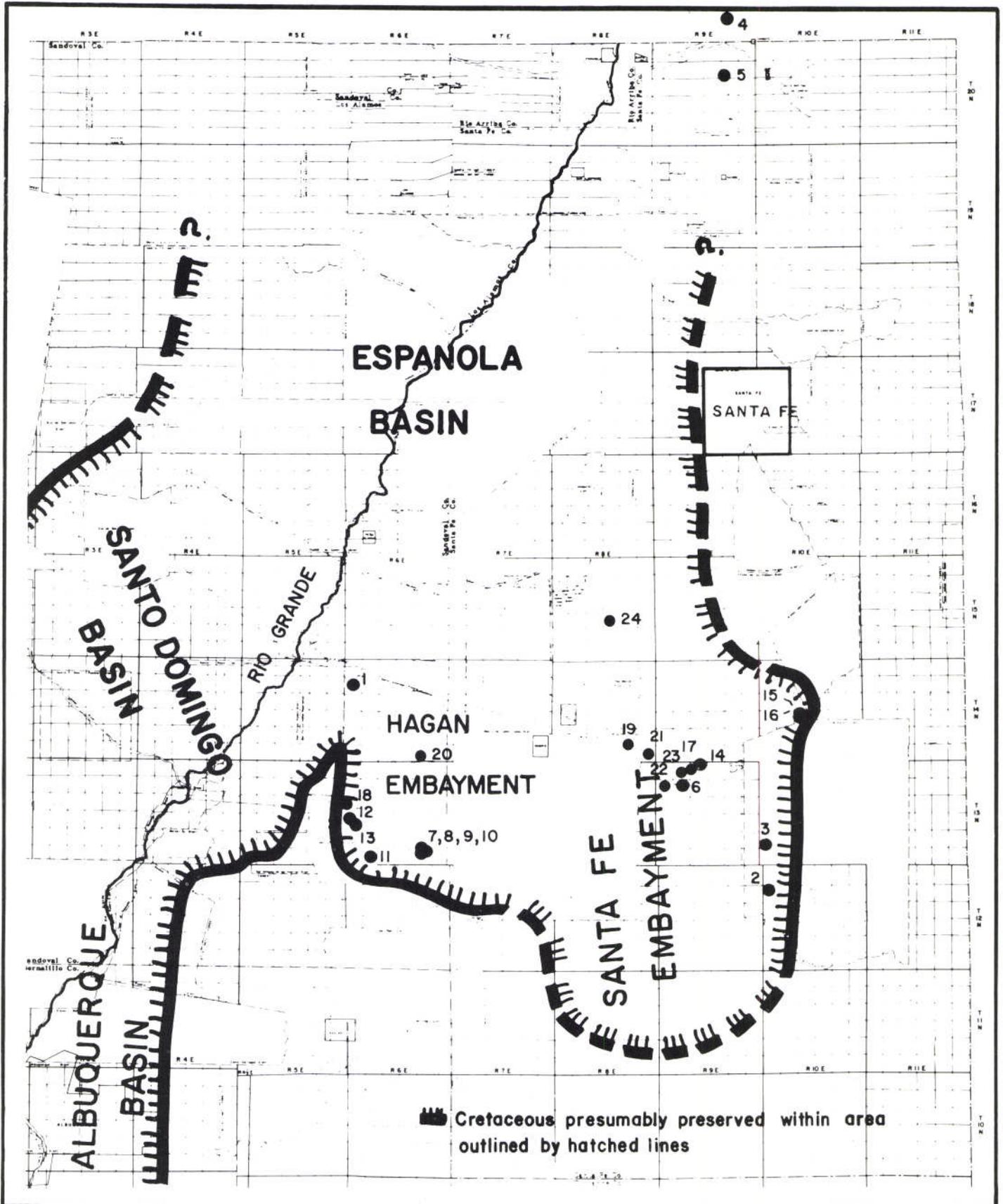


FIGURE 2. Location map showing oil and gas tests in the Española Basin. Numbers are keyed to Table 1.

Paleozoic rocks in the basin. Two of these are old wells and two are recent tests. Records from both old tests reported oil and gas shows from the Paleozoic section and at least one of the recent tests encountered gas shows.

CONCLUSIONS

Oil and gas exploration in the Espanola Basin will continue, and the primary objective will probably continue to be the Cretaceous section. Source-rock potential and maturation history for Paleozoic rocks—unlike those for the Cretaceous section—are still unknown; however, the potential for oil and gas structurally trapped in Paleozoic rocks

appears to be significant and that concept will also be tested further.

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