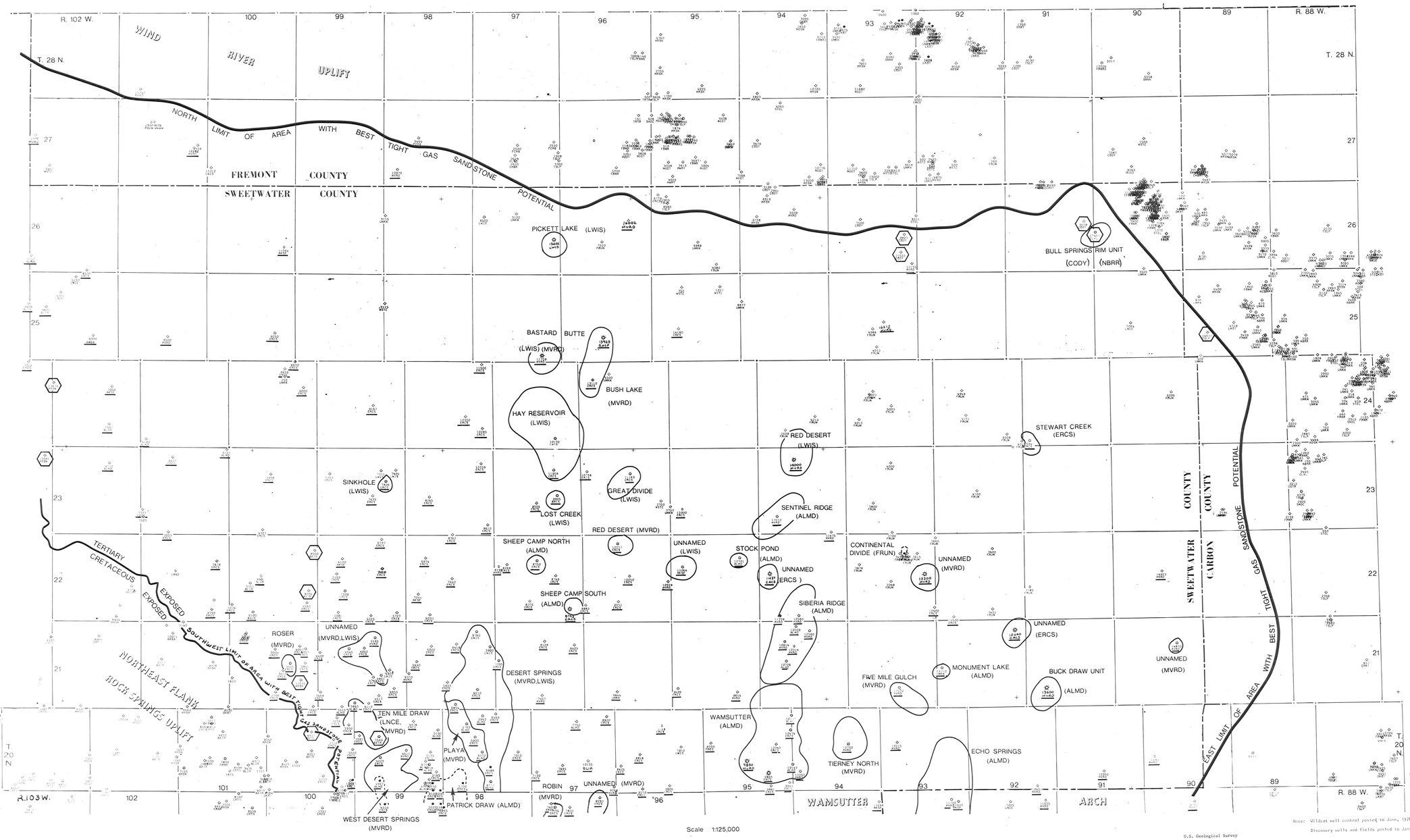

Scale 1:125,000

0 10 20 Mi
0 16 32 Km

WILDCAT WELL PENETRATION MAP SHOWING WELLS DRILLED INTO AND THROUGH POTENTIALLY GAS-BEARING, LOW-PERMEABILITY UPPER CRETACEOUS AND TERTIARY RESERVOIRS, GREAT DIVIDE BASIN, SOUTHWEST WYOMING

By
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DISCUSSION

The Great Divide basin is an area that has good potential for the exploitation of low-permeability, gas-bearing sandstone reservoirs. Such reservoirs are known as "tight gas sandstones." The U.S. Geological Survey is investigating the reservoir characteristics and gas resources of tight reservoirs within this basin and in other basins in the Western United States. The location of wells shown on this map were obtained from the Petroleum Information Inc., Well History Control System (WHCS) computer file. The formations reported at the total depth of the wells were furnished to Petroleum Information by various well operators. The author has changed some of the names of formations reported at total depth based on correlation of borehole geophysical logs.

There is no universally accepted definition of a tight gas sandstone. For the purposes of this study, a tight gas sandstone is a gas-bearing reservoir that has such low permeability that it will not produce presently commercial volumes of natural gas. Generally these reservoir permeabilities are less than 0.1 millidarcies as measured by conventional methods or less than 0.05 millidarcies at in-situ confining pressures. Strata, in the basin, with the best potential for tight gas reservoirs are sandstones within the Upper Cretaceous Mesaverde Group, Lewis Shale, and Lance Formation. Sandstones within the Tertiary Fort Union Formation are potential tight gas reservoirs in the structurally deeper parts of the basin.

The map highlights wells that have been drilled into or through the Mesaverde within the area shown as having potential for tight gas-bearing reservoirs. There is a moderate density of drilling into the Mesaverde except in the northern and eastern parts of the map. It can be readily seen that only a few wells have fully penetrated the Mesaverde in spite of the apparent relatively high-density of drilling. The presence of a dry hole does not mean tight gas sandstones were not encountered, since by definition, these reservoirs are presently noncommercial objectives.

Many gas fields are shown on the map. Generally, these fields are producing from commercial to marginally commercial (near tight) Upper Cretaceous sandstones. In the southern part of map area most of the fields produce from marginal marine and lower deltaplain sandstones in the upper part of the Upper Cretaceous Mesaverde Group. In the middle part of the map area most of the present fields are completed in stray marine sands within the Lewis Shale.

There are no gas fields presently producing from Tertiary rocks within the map area. However the nonmarine Tertiary Fort Union Formation has yielded free gas and gas shows.

EXPLANATION

WELL SYMBOLS--Numbers indicate depth of well in ft. Letters are code name (where available) of strata reported at total depth from Petroleum Information Well History Control System (see table 1); underlining of code name indicates well spud in Tertiary rocks and penetrating part of the Upper Cretaceous Mesaverde Group within the area of best potential for tight gas sandstones. Only wildcat well locations shown

- Abandoned wildcat well
- Gas discovery well
- Oil discovery well
- Oil and gas discovery well
- Shutin or temporarily abandoned well
- Well spud in Tertiary rocks and penetrating all of the Mesaverde Group reservoirs. These wells provide subsurface control for evaluation of most of the interval containing potentially gas-bearing low-permeability (tight) sandstone reservoirs

ROSER (MVRD) NAME OF GAS OR OIL FIELD--Letters in parentheses indicate WHCS code name of producing reservoir

GAS FIELD

OIL FIELD

Table 1.--WHCS code names used on this map[1/]

TERTIARY		Wasatch Formation	WSTC
		Fort Union Formation	FRUN
UPPER CRETACEOUS		Cretaceous, undivided	CRCS
		Lance Formation	LNCE
		Lewis Shale (or stray sandstone reservoir in Lewis Shale)	LWIS
	Mesaverde Group	Mesaverde, undivided	MVRD
		Almond Formation	ALMD
		Ericson Sandstone	ERCS
		Rock Springs Formation	RKSP
		Blair Formation	BLIR
		Cody Shale	CODY
		Baxter Shale	BXTR
		Steele Shale	STEL
		Shannon Member (of Cody Shale)	SNNN
		Niobrara Formation	NBRR
		Frontier Formation	FRNR
		Fifth Frontier[2/]	FRNR 5
LOWER CRETACEOUS		Dakota Sandstone	DKOT
		Fuson Shale	FUSN
		Lakota Sandstone	LKOT
		Cloverly Formation	CLVL
JURASSIC		Morrison Formation	MRSN
		Curtis Formation	CRTS
		Sundance Formation	SNDC
		Nugget Sandstone	NGGT
TRIASSIC		Chugwater Formation	CGTR
PENNSYLVANIAN		Tensleep Sandstone	TSLP
MISSISSIPPIAN		Madison Limestone	MDSN
CAMBRIAN		Cambrian, undivided	CMBR
PRECAMBRIAN		Precambrian, undivided	PCMB
		Precambrian granite	GRNT
		Rocks of unknown age or formation at total depth not reported	UNKN

1/Code names listed in approximate order of increasing geologic age but not intended as a correlation chart

2/Of subsurface usage

Note: Wildcat well control posted to June, 1978
Discovery wells and fields posted to January, 1979

U.S. Geological Survey

OPEN-FILE REPORT

INDEX MAP