

**STATE OF SOUTH DAKOTA**  
Frank Farrar, Governor

**SOUTH DAKOTA GEOLOGICAL SURVEY**  
Duncan J. McGregor, State Geologist

**Circular 41**

**RESULTS FROM DRILL STEM TESTS OF OIL TESTS IN  
SOUTH DAKOTA DRILLED BEFORE JULY 1, 1970**

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## INTRODUCTION

The drill stem test data contained in this circular were compiled in order to make material in the South Dakota Geological Survey oil and gas files more readily available to interested parties. In many cases the information obtained from these drill stem test records is incomplete; however, the later records are more complete and informative since the adoption of progressively more stringent requirements of oil and gas regulations and in part by advanced technology. In all cases, this circular presents the drill stem test results as detailed as possible from reports in the oil and gas files.

The terms employed in this circular are self-explanatory and require no additional elucidation for persons who are casually acquainted with the oil industry.

Legal descriptions of well locations have been abbreviated. For instance, a well located in the area of the Black Hills and designated as being in the SW $\frac{1}{4}$  of the NW $\frac{1}{4}$  of Section 3, Township 9 North, Range 8 East appears as SWNW 3-9-8. Where the township designation varies from north and the range designation varies from east, the number designation is followed by an "S" for south and a "W" for west. For example, a well located in the SE $\frac{1}{4}$  of the SE $\frac{1}{4}$  of Section 9, Township 120 North, Range 71 West is described as being in the SESE 9-120N-71W.

Circular 35 of the South Dakota Geological Survey lists formation tops of oil tests drilled in South Dakota before 1965 and may be considered a companion to this circular. If one desires to correlate drill stem test results with individual formations the two circulars may be used advantageously to this end.

## DRILL STEM TESTS—BUTTE COUNTY

Well Name	Location	Interval	Results/Recovery
Amerada No. 1 State	NWNW 4-14-4	5827-5848	Recovered 2730 feet of fresh water. No oil or gas.
Harmon No. 1 Fishel	NESW 19-8-1	1213-1250	Open 45 minutes, closed 15 minutes. Fair to strong blow in 3 minutes, flowed to surface in 12 minutes. Recovered a little muddy water, then clear fresh water, flowed throughout test.
Harrison No. 1-17 Federal	SESE 17-13-5	2942-2992	Open 10 minutes, closed 32 minutes, open 14 minutes, closed 59 minutes. Tool opened with very strong blow for 10 minutes, reopened tool for 14 minutes with very strong blow throughout. Recovered 90 feet of slightly gas cut drilling mud, 240 foot of slightly gas cut and mud cut water, 1813 feet of slightly gas cut formation water (chloride content 6000 ppm). Initial hydrostatic pressure 1490 lbs., final hydrostatic pressure 1368 lbs., initial flow pressure 584 lbs., final flow pressure 947 lbs., initial closed in pressure 947 lbs., final closed in pressure 950 lbs.
Koch No. 1 Aztec-State	NWNW 2-13-7	3276-3314	Tool open 78 minutes, closed 45 minutes. Tool opened with weak blow, bypassed tool after 5 minutes. Reopened with weak blow for 5 minutes and died. Bypassed tool after 10 minutes, died in 5 minutes. Bypassed tool after 20 minutes, died in 5 minutes. Bypassed tool after 13 minutes, died in 5 minutes. Bypassed tool in 10 minutes, blow died in 5 minutes and remained dead for rest of test. Recovered 140 feet of drilling mud. Tool was spudded 9 stands to bottom. Initial hydrostatic pressure 1658 lbs., final hydrostatic pressure 1633 lbs., initial flow pressure 68 lbs., final flow pressure 151 lbs., initial shut in pressure not taken, final shut in pressure 1254 lbs. Test is questionable.
Koch No. 1 Olson	NESE 14-14-6	3213-3276	Open 10 minutes, closed 20 minutes, open 20 minutes, closed 20 minutes. Tool opened with a good blow, decreased to weak at end of test. Recovered 495 feet of muddy water, 1930 feet of water—no show. Initial hydrostatic pressure 1664 lbs., final hydrostatic pressure 1625 lbs., initial flow pressure 917 lbs., final flow pressure 1091 lbs., initial shut in

Well Name	Location	Interval	Results/Recovery
Koch No. 1 Richards-Federal	SWSW 25-10-6	2553-2626	pressure 1097 lbs., final shut in pressure 1109 lbs. Open 20 minutes, closed 20 minutes, open 10 minutes, closed 45 minutes. Tool opened with weak blow—died in 7 minutes. Bypassed tool after 20 minutes. Tool opened with weak blow—died in 4 minutes, dead for 16 minutes. Bypassed tool for second time. Tool opened with weak blow—died in 2 minutes. Dead for 8 minutes. Recovered 40 feet of drilling mud. Initial hydrostatic pressure 1318 lbs., final hydrostatic pressure 1300 lbs., initial flow pressure 27 lbs., final flow pressure 36 lbs., final shut in pressure 66 lbs.
Mobil No. 1 Mickelson	NENE 7-9-9	2754-2879	Open 5 minutes, closed 30 minutes, open 35 minutes, closed 30 minutes. Recovered 30 feet of drilling mud. Initial hydrostatic pressure 1445 lbs., final hydrostatic pressure 1429 lbs., initial flow pressure 31 lbs., final flow pressure 150 lbs., initial shut in pressure 168 lbs., final shut in pressure 196 lbs.
		4610-4723	Open 1 hour, closed 30 minutes. Weak blow increased to strong blow in 2 minutes, slightly decreasing to weak at end of test. Recovered 4160 feet of slightly mud cut water. Initial hydrostatic pressure 2413 lbs., final hydrostatic pressure 2382 lbs., initial flow pressure 748 lbs., final flow pressure 1872 lbs., final shut in pressure 1986 lbs.
		5420-5480	Open 40 minutes, shut in 30 minutes. Good blow throughout test. Recovered 488 feet of mud, 184 feet of muddy water, 550 feet of water. Initial hydrostatic pressure 2703 lbs., final hydrostatic pressure 2687 lbs., initial flow pressure 418 lbs., final flow pressure 605 lbs., final shut in pressure 2331 lbs.
		6068-6135	Open 5 minutes, shut in 30 minutes, open 3 hours, shut in 90 minutes. Tool reopened with very weak blow that continued throughout test. Recovered 1104 feet of muddy fresh water. Initial hydrostatic pressure 3194 lbs., final hydrostatic pressure 3152 lbs., initial flow pressure 17 lbs., final flow pressure 446 lbs., initial closed in pressure 2555 lbs., final closed in pressure 2524 lbs. Temperature 186°F.

Well Name	Location	Interval	Results/Recovery
		6633-6657	Open 3 minutes, closed 30 minutes, open 30 minutes, closed 1 hour. Reopened tool with strong blow decreasing to weak at end of test. Recovered 540 feet of slightly mud cut water, 5990 feet of water. Initial hydrostatic pressure 3529 lbs., final hydrostatic pressure 3534 lbs., initial shut in pressure 2889 lbs., final shut in pressure 2901 lbs., initial flow pressure 2653 lbs., final flow pressure 2867 lbs. Temperature 180°F.
		6707-6727	Open 5 minutes, closed 30 minutes, open 1½ hours, closed 1 hour. Weak blow throughout test. Recovered 906 feet of muddy water. Initial hydrostatic pressure 3542 lbs., final hydrostatic pressure 3530 lbs., initial shut in pressure 2916 lbs., final shut in pressure 2921 lbs., initial flow pressure 41 lbs., final flow pressure 425 lbs. Temperature 182°F.
Mobil No. 1 Sipila	NWNW 14-9-8	2780-2910	Open 5 minutes, closed 30 minutes, open 30 minutes, closed 30 minutes. Tool reopened with strong blow decreasing to very weak at end of test. Recovered 2630 feet of muddy water. Initial hydrostatic pressure 1658 lbs., final hydrostatic pressure 1519 lbs., initial shut in pressure 1128 lbs., final shut in pressure 1133 lbs., initial flow pressure 450 lbs., final flow pressure 1121 lbs. Temperature 120°F.
		4010-4025	Open 3 minutes, closed 30 minutes, open 45 minutes, closed 45 minutes. Immediate strong blow, water to surface in 17 minutes. Flowed water at 50 barrels/hour. Initial hydrostatic pressure 2047 lbs., final hydrostatic pressure 2038 lbs., initial flow pressure 1521 lbs., final flow pressure 1815 lbs., initial shut in pressure 1834 lbs., final shut in pressure 1835 lbs. Temperature 152°F.
		4203-4219	Open 5 minutes, closed 30 minutes, open 2 hours, closed 1 hour. Good initial blow, reopened tool with a weak blow increased to good blow after 5 minutes. Recovered 1376 feet of slightly mud cut water. Initial hydrostatic pressure 2135 lbs., final hydrostatic pressure 2118 lbs., initial flow pressure 56 lbs., final flow pressure 635 lbs., initial closed in pressure 1902 lbs., final closed in pres-

Well Name	Location	Interval	Results/Recovery
		4697-4841	sure 1840 lbs. Temperature 153°F. Open 3 minutes, closed 30 minutes, open 1 hour, closed 1 hour. Good initial blow, tool reopened with immediate strong blow decreasing to weak after 15 minutes to dead at end of test. Recovered 210 feet of mud cut water, 4481 feet of fresh water. Initial hydrostatic pressure 2446 lbs., final hydrostatic pressure 2413 lbs., initial flow pressure 1112 lbs., final flow pressure 2012 lbs., initial shut in pressure 2019 lbs., final shut in pressure 2016 lbs.
Murfin No. 1-23 Richards-Federal	SWSW 23-10-7	2646-2665	Tool open 5 minutes, closed 20 minutes, open 40 minutes, closed 20 minutes. Tool opened with good blow for 6 minutes. Tool reopened with strong blow for 25 minutes, gradually decreasing. Recovered 1368 feet of water (chloride content 8750 ppm). Initial hydrostatic pressure 1434 lbs., final hydrostatic pressure 1432 lbs., initial flow pressure 93 lbs., final flow pressure 618 lbs., initial shut in pressure 831 lbs., final shut in pressure 828 lbs.
Pure No. 1 Government	SWNW 27-14-2	6948-7032	Shut in 30 minutes, open 30 minutes, shut in 30 minutes. Opened with very strong blow, decreased to weak blow in 20 minutes, died in 28 minutes. Recovered 120 feet of mud, 180 feet of water cut mud, 90 feet of mud cut water, 6398 feet of fresh water. Initial flow pressure 2421 lbs., final flow pressure 2908 lbs., initial shut in pressure 2929 lbs., final shut in pressure 2908 lbs., initial hydrostatic pressure 3693 lbs., final hydrostatic pressure 3624 lbs. Temperature 151°F.
Shell No. 23-23 Johnson	NESW 23-10-1	2650-2690 2866-2882	Recovered 120 feet of fresh muddy water. Recovered 5 barrel/minute water flow.
TGEC No. 1-29 Duncan Federal	NWNW 29-14-4	3174-3241	Open 15 minutes, closed 30 minutes, open 1 hour, closed 1 hour. Opened with weak blow decreasing in 10 minutes to weak intermittent blows. Recovered 160 feet of rat hole mud. Initial hydrostatic pressure 1592 lbs., final hydrostatic pressure 1557 lbs., initial shut in pressure 894 lbs., final shut in pressure 858 lbs., initial flow pressure 14 lbs., final flow pressure 92 lbs. Temperature 117°F.



Well Name	Location	Interval	Results/Recovery
TGEC No. 1-16 Stevenson-State	NENE 16-14-3	3041-3155	Open 15 minutes, closed in ½ hour, open 1 hour, closed 1 hour. Tool re-opened with good to strong blow, decreasing to good blow in 35 minutes. Recovered 437 feet of slightly salty formation water, 496 feet of mud cut water. Initial hydrostatic pressure 1569 lbs., final hydrostatic pressure 1558 lbs., initial shut in pressure 865 lbs., final shut in pressure 857 lbs., initial flow pressure 21 lbs., final flow pressure 360 lbs. Temperature 105°F.

#### DRILL STEM TESTS—CORSON COUNTY

Well Name	Location	Interval	Results/Recovery
Cayman Murphy No. 1 State "B"	SESE 12-21-24	1531-1551	Open 2 minutes, closed ½ hour, open 3 hours, closed ½ hour. Tool opened dead for 5 minutes, bubbles in 15 minutes, increased to strong blow at 105 minutes, remained strong for the balance of test. Recovered 1221 feet of mud. No show of gas or oil. Lost 45 feet of mud last 30 minutes of test. Initial hydrostatic pressure 700 lbs., final hydrostatic pressure 700 lbs., initial flow pressure 15 lbs., final flow pressure 525 lbs., initial shut in pressure 569 lbs., final shut in pressure 547 lbs.
Kilroy No. 1 Scholl	NENW 26-18-21	4470-4558	Open 2 minutes, closed 30 minutes, open 2 hours, closed 135 minutes. Tool open with immediate blow and increased to strong blow in 22 minutes until end of test. Recovered 945 feet of muddy water—no oil or gas show. Initial hydrostatic pressure 2506 lbs., final hydrostatic pressure 2492 lbs., initial shut in pressure 2024 lbs., final shut in pressure 1954 lbs., initial flow pressure 126 lbs., final flow pressure 452 lbs.
		4583-4743	Open 2 minutes, closed ½ hour, open 1 hour, closed 1 hour. Tool opened with immediate blow, increased to strong in 1 minute, remained strong until end of test. Recovered 2737 feet of muddy black sulphur water. Initial hydrostatic pressure 2565 lbs., final hydrostatic pressure 2577 lbs., initial shut in pressure 2065 lbs., final shut in pressure 2024 lbs., initial flow pressure 353 lbs., final flow pressure 1217 lbs.
		5873-5897	Open 2 minutes, closed ½ hour, open

Well Name	Location	Interval	Results/Recovery
Koch No. 1 Bickel	SWSE 4-18-23	2760-2833	<p>1 hour, closed 1½ hours. Tool opened with immediate blow, increased to strong within 3 minutes, remained strong until shut in. Recovered 600 feet of water cut mud and 2060 feet of black sulphur water. Initial hydrostatic pressure 3286 lbs., final hydrostatic pressure 3258 lbs., initial shut in pressure 2287 lbs., final shut in pressure 2482 lbs., initial flow pressure 248 lbs., final flow pressure 1049 lbs.</p>
Koch No. 1 Green	SESE 31-22-24	2746-2803	<p>Open 10 minutes, closed 20 minutes, open 45 minutes, closed 30 minutes. Tool opened with a good blow, decreased to weak blow in 30 minutes and remained weak throughout test. Fluid reversed out. Initial hydrostatic pressure 1396 lbs., final hydrostatic pressure 1386 lbs., initial flow pressure 453 lbs., final flow pressure 1079 lbs., initial shut in pressure 1107 lbs., final shut in pressure 1114 lbs.</p>
Koch No. 1 Richter	SESE 4-19-25	2541-2612	<p>Open 10 minutes, closed 20 minutes, open 20 minutes, closed 20 minutes. Opened with good blow and declined to weak at end of test. Recovered 2560 feet of gas cut water. Gas was flammable. Initial hydrostatic pressure 1414 lbs., final hydrostatic pressure 1381 lbs., initial flow pressure 1039 lbs., final flow pressure 1163 lbs., initial shut in pressure 1161 lbs., final shut in pressure 1163 lbs.</p>
Koch No. 1 Schott	NWNW 35-21-26	2544-2593	<p>Open 10 minutes, closed 20 minutes, open 20 minutes, closed 20 minutes. Tool opened with good blow, decreased in 12 minutes and died in 20 minutes. Recovered 2260 feet of slightly gas cut salty water. Initial hydrostatic pressure 1276 lbs., final hydrostatic pressure 1257 lbs., initial flow pressure 747 lbs., final flow pressure 1026 lbs., initial shut in pressure 1042 lbs., final shut in pressure 1048 lbs.</p>
			<p>Open 10 minutes, closed 20 minutes, open 20 minutes, closed 20 minutes. Tool opened with good blow, decreased to weak in 15 minutes, died in 20 minutes. Recovered 2315 feet of water. Initial hydrostatic pressure 1295 lbs., final hydrostatic pressure 1276 lbs., pre-flow pres-</p>

Well Name	Location	Interval	Results/Recovery
Koch No. 1 State	SWSE 32-23-27	2660-2717	<p>sure 865 lbs., initial flow pressure 963 lbs., final flow pressure 1038 lbs., initial shut in pressure 1040 lbs., final shut in pressure 1038 lbs. Open 10 minutes, shut in 20 minutes, open 20 minutes, shut in 20 minutes. Tool opened with good blow. Started declining in 12 minutes, died in 20 minutes. Recovered 2313 feet of water. Initial hydrostatic pressure 1340 lbs., final hydrostatic pressure 1323 lbs., pre-flow pressure 764 lbs., initial flow pressure 946 lbs., final flow pressure 1047 lbs., initial shut in pressure 1056 lbs., final shut in pressure 1058 lbs.</p>
Shell No. 1 Winter	NWSW 11-22-19	3160-3185	<p>Open 1 hour. Blow dead in 10 minutes. Recovered 10 feet of drilling mud. Initial flow pressure 0 lbs., final flow pressure 0 lbs., 60 minutes shut in bottom hole pressure 0 lbs., hydrostatic pressure 1650 lbs.</p>
		3793-3825	<p>Open 30 minutes. Strong blow throughout test. Recovered 1800 feet of fresh water. Initial flow pressure 220 lbs., final flow pressure 800 lbs., 30 minute shut in pressure 1370 lbs., hydrostatic pressure 2020 lbs.</p>
		5116-5143	Mis-run.
		5126-5143	<p>Open 1 hour with weak blow, died in 10 minutes. Recovered 275 feet of drilling mud. Initial flow pressure 200 lbs., final flow pressure 200 lbs., final shut in pressure (75 minutes), 2050 lbs., hydrostatic pressure 2600 lbs. (mis-run?).</p>
		5175-5197	<p>Open 1½ hours with strong blow decreasing to medium blow after 10 minutes. Recovered 4820 feet of gas (air?) cut salt water. Initial flow pressure 1800 lbs., final flow pressure 2400 lbs., final shut in pressure 2500 lbs., hydrostatic pressure 2850 lbs.</p>
		5413-5472	<p>Open 2 hours with weak blow throughout test. Recovered 570 feet of drill mud. Initial flow pressure 75 lbs., final flow pressure 290 lbs., 30 minute shut in pressure 1975 lbs., hydrostatic pressure 2765 lbs.</p>
		5578-5610	<p>Open 2 hours with steady fair blow. Recovered 39 gallons of drilling mud with pin points of brown oil. Initial flow pressure 90 lbs., 60 minute shut in pressure 2330 lbs., hydro-</p>

Well Name	Location	Interval	Results/Recovery
		5606-5659	static pressure 2695 lbs. Open 3 hours with immediate strong blow, diminished to fair blow in 150 minutes and continued throughout test. Recovered 4325 feet of black sulphur water. Initial flow pressure 75 lbs., final flow pressure 1830 lbs., 60 minute shut in pressure 2405 lbs., hydrostatic pressure 2785 lbs.
		5758-5820	Open 1 hour with strong initial blow decreased to fair blow in 30 minutes. Flowed mud cut sulphur water in 51 minutes at rate of 15 gallons/minute. Initial flow pressure 800 lbs., final flow pressure 2515 lbs., 30 minute shut in pressure 2545 lbs., hydrostatic pressure 2910 lbs.
		7182-7305	Open 60 minutes with strong blow throughout test. Recovered 5470 feet of air cut salt water. Initial flow pressure 1550 lbs., final flow pressure 2600 lbs., 30 minute shut in pressure 3100 lbs.
		7980-8010	Open 60 minutes with initial strong blow decreased to zero in 28 minutes. Recovered 7880 feet of salt water with sulphur odor. Air pocket at 7310-7880 feet. Pressure gauges failed.
Wilhite No. 1 State	SESW 36-22-21	6464-6494	Open 5 minutes, closed 30 minutes, open 2 hours, closed in ½ hour. Good blow throughout test. Recovered 3510 feet of slightly gas cut brackish water. Initial hydrostatic pressure 3415 lbs., final hydrostatic pressure 3404 lbs., initial closed in pressure 2867 lbs., final closed in pressure 2840 lbs., initial flow pressure 52 lbs., final flow pressure 1595 lbs. Temperature 154°F.
		6518-6535	Open 15 minutes, closed 30 minutes, open 90 minutes, closed 30 minutes. Reopened tool with weak blow throughout test. Recovered 410 feet of slightly muddy salt water. Initial hydrostatic pressure 3453 lbs., final hydrostatic pressure 3445 lbs., initial shut in pressure 2822 lbs., final shut in pressure 2614 lbs., initial flow pressure 90 lbs., final flow pressure 221 lbs. Temperature 154°F.
Youngblood No. 1 Draskovich	SESE 20-23-22	5118-5145	Open 1 hour, closed 15 minutes. Weak blow throughout test. Recovered 95 feet of slightly gas cut muddy salty water with black oil specks,

Well Name	Location	Interval	Results/Recovery
Youngblood No. 1 Macheel	SWSW 8-21-19	5410-5430	180 feet of slightly gas cut salt water, 90 feet of black sulphur water. Initial flow pressure 90 lbs., final flow pressure 235 lbs., closed in pressure 1950 lbs., initial hydrostatic pressure 2775 lbs., final hydrostatic pressure 2730 lbs. Open 1 hour, shut in ½ hour. Fair blow throughout test. Recovered 140 feet of mud cut water with black oil specks, 80 feet of mud cut, slightly sulphurous water with pin points of oil. Initial flow pressure 30 lbs., final flow pressure 96 lbs., shut in pressure 2404 lbs., hydrostatic pressure 2988 lbs.
Youngblood No. 1 Winter	SWSW 23-22-19	5295-5329	Open 1 hour, shut in 1 hour. Weak blow throughout test. Recovered 35 feet of drilling mud, 55 feet of muddy water. Initial flow pressure 35 lbs., shut in pressure 2100 lbs., hydrostatic pressure 2900 lbs.
		5455-5479	Open 1 hour, shut in 30 minutes. Fair blow for 30 minutes increasing to good blow for remainder of test. Recovered 33 feet of mud cut water with oil specks, 90 feet of very slightly gas cut water, 450 feet of black sulphur water. Initial flow pressure 80 lbs., shut in pressure 2350 lbs., hydrostatic pressure 3025 lbs.

#### DRILL STEM TESTS—CUSTER COUNTY

Well Name	Location	Interval	Results/Recovery
Kucera No. 1 Coffing	NENW 34-6S-2E	1370-1377	Bailing test—bailed oil for one week.
Ozark No. 1 Coffing	SENEW 34-6S-2E	1365-1414	Open 3 minutes, initial shut in 30 minutes, open 1 hour, final shut in 33 minutes. Recovered 350 feet of oil, 60 feet of oil and gas cut mud, 300 feet of oil and gas cut water. Initial hydrostatic pressure 729 lbs., final hydrostatic pressure 710 lbs., initial flow pressure 90 lbs., final flow pressure 278 lbs., initial shut in pressure 350 lbs., final shut in pressure 352 lbs. Tool opened with fair blow decreasing to weak at end of test.
Ozark No. 2 Coffing	SENEW 34-6S-2E	1338-1375	Open 5 minutes, shut 30 minutes, open 1 hour, shut ½ hour. Reopened tool with fair blow decreasing to weak at end of test. Recovered 30 feet of oil, 150 feet of oil and mud cut water, 90 feet of muddy water, 340 feet of water. Initial

Well Name	Location	Interval	Results/Recovery
			hydrostatic pressure 723 lbs., final hydrostatic pressure 655 lbs., initial closed in pressure 298 lbs., final closed in pressure 299 lbs., initial flow pressure 30 lbs., final flow pressure 299 lbs.
Samedan No. 1 Norris	NESE 19-3S-11E	2642-2700	Open 5 minutes, shut 30 minutes, open 30 minutes, shut 15 minutes. Very strong initial blow—reopened tool with very strong blow for 10 minutes. Recovered 437 feet of slightly muddy water, 2200 feet of fresh water. Initial hydrostatic pressure 1385 lbs., final hydrostatic pressure 1317 lbs., initial flow pressure 1000 lbs., final flow pressure 1011 lbs., initial shut in pressure 1003 lbs., final shut in pressure 1011 lbs. Temperature 79°F.
Seppala No. 1 Government	NENW 34-6S-2E	1350-1408	Open 5 minutes, shut 30 minutes, open 2 hours, shut ½ hour. Tool opened with a few bubbles and died. Recovered 10 feet of drilling mud. Initial hydrostatic pressure 744 lbs., final hydrostatic pressure 744 lbs., initial shut in pressure 17 lbs., final shut in pressure 12 lbs., initial flow pressure 12 lbs., final flow pressure 12 lbs.
Shell No. 1 Engelbrecht	NWNW 24-6S-8E	2565-2605	Open 55 minutes, shut in 30 minutes. Immediate strong blow—blew dead in 30 minutes. Recovered 2270 feet of fresh water. Initial shut in pressure after 15 minutes 900 lbs., final shut in pressure at 30 minutes 890 lbs., initial flow pressure 860 lbs., final flow pressure 890 lbs., hydrostatic pressure 1210 lbs.
Shell No. 1 Flier	NESW 5-3S-11E	2074-2103	Open 30 minutes, shut in 15 minutes. Recovered 1526 feet of muddy water. Initial shut in pressure (15 minutes) 690 lbs., final shut in pressure (30 minutes) 674 lbs., initial flow pressure 360 lbs., final flow pressure 660 lbs., hydrostatic pressure 1026 lbs.
		2241-2256	Open 1 hour, shut in 30 minutes. Tool opened with strong blow, declined to weak at end of test. Recovered 1660 feet of fresh water. Initial shut in pressure (15 minutes) 710 lbs., final shut in pressure (30 minutes) 696 lbs., initial flow pressure 342 lbs., final flow pressure 696 lbs.
		2740-2757	Open 22 minutes. Immediate strong blow—died in 17 minutes. Recovered 2525 feet of fresh water. Initial shut in pressure (15 minutes) 1080 lbs., final shut in

Well Name	Location	Interval	Results/Recovery
South Dakota Development Company No. 1 Hey	SWSE 35-6S-2E	1193-1219	pressure (15 minutes also) 1080 lbs., initial flow pressure 1080 lbs., final flow pressure 1080 lbs., hydrostatic pressure 1451 lbs. Open 5 minutes, closed 30 minutes, open 1 hour, closed ½ hour. Reopened tool with weak blow, increased to strong blow in 4 minutes and lasted for 20 minutes. Decreased gradually for remainder of test. Recovered 60 feet of slightly oil and water cut mud, 120 feet of muddy sulphur water, 180 feet of black gassy sulphur water. Initial hydrostatic pressure 619 lbs., final hydrostatic pressure 619 lbs., initial flow pressure 8 lbs., final flow pressure 158 lbs., initial shut in pressure 276 lbs., final shut in pressure 254 lbs.

#### DRILL STEM TESTS—DEWEY COUNTY

Well Name	Location	Interval	Results/Recovery
Bueno No. 1 State	NWNW 4-12-22	5021-5056	Open 5 minutes, closed 1 hour, open 1 hour, closed 1 hour. Tool reopened with strong blow throughout test. Recovered 98 feet of oil, 720 feet of water cut oil (80%), 90 feet of oil cut water, 929 feet of fresh water. Initial hydrostatic pressure 2564 lbs., final hydrostatic pressure 2546 lbs., initial shut in pressure 2230 lbs., final shut in pressure 2201 lbs., initial flow pressure 54 lbs., final flow pressure 877 lbs. Temperature 150°F.
Kerr-McGee No. 1 Government	NWSW 32-13-22	4310-4375	Open 35 minutes. Tool opened with immediate good blow—water flowed at surface in 19 minutes. Shut in pressure 1990 lbs., initial flow pressure 1070 lbs., final flow pressure 1935 lbs., hydrostatic pressure 2320 lbs. Bottom hole pressure 1990 lbs.
		5035-5080	Open 50 minutes, closed 15 minutes. Slight blow throughout test. Recovered 10 feet of oil, 100 feet of oil and gas cut mud. Flow pressure 0 lbs., shut in pressure 2100 lbs., hydrostatic pressure 2750 lbs.
		5150-5230	Open 1 hour and 15 minutes. Flowed muddy fresh water in 55 minutes. Initial flow pressure 760 lbs., final flow pressure 2160 lbs., 15 minutes shut in pressure 2235 lbs., initial hydrostatic pressure 2550 lbs., final hydro-

Well Name	Location	Interval	Results/Recovery
		5682-5722	static pressure 2460 lbs. Open 1 hour, shut 15 minutes. Good blow throughout test. Flowed muddy fresh water in 45 minutes. Shut in pressure 2560 lbs., initial flow pressure 1130 lbs., final flow pressure 2440 lbs., hydrostatic pressure 3020 lbs.
Pendak No. 1 Cowan	SESE 21-13-22	5015-5030	Open 5 minutes, shut in 30 minutes, open 30 minutes, shut in 30 minutes. Strong blow in 3 minutes, decreasing to fair at end of test. Recovered 90 feet of mud cut fresh water with slight trace of oil, 1520 feet of fresh water with slight sulphur odor. Initial hydrostatic pressure 2627 lbs., final hydrostatic pressure 2619 lbs., initial flow pressure 259 lbs., final flow pressure 665 lbs., initial shut in pressure 2246 lbs., final shut in pressure 2206 lbs. Bottom hole temperature 162 °F.
		5051-5071	Open 5 minutes, shut 15 minutes, open 30 minutes, shut in 15 minutes. Strong blow throughout test. Recovered 1410 feet of 17° gravity oil @ 82°F, grind out 20% B.S., 1261 feet of clear fresh water. Initial hydrostatic pressure 2599 lbs., final hydrostatic pressure 2571 lbs., initial shut in pressure 2186 lbs., final shut in pressure 1882 lbs., initial flow pressure 571 lbs., final flow pressure 1082 lbs.
Youngblood No. 1 Galvin	SESE 25-16-22	4391-4568	Tool open 30 minutes, closed 1 hour. Tool opened with strong blow increased to very strong blow. Recovered 4267 feet of fresh water. Initial flow pressure 155 lbs., shut in pressure 2055 lbs., initial hydrostatic pressure 2360 lbs., final hydrostatic pressure 2310 lbs.

#### DRILL STEM TESTS--FALL RIVER COUNTY

Well Name	Location	Interval	Results/Recovery
Amerada No. 1 Moody	SWNE 8-12S-6E	4520-4625	Swab test with casing shut off. Well made sulphur water--bailed for 19 hours.
Amerada No. 85 Strat.	NESE 13-10S-6E	1640-1660	Open 1 hour. Blew strong in 3 minutes and fairly strong for additional 5 minutes. Recovered 123 feet of drilling mud, 432 feet of mud cut water, 287 feet of gas cut water.
Cramer No. 1 Wilkinson	NENE 27-10S-6E	1586-1633	Open 5 minutes, closed in 15 minutes,



Well Name	Location	Interval	Results/Recovery
			open 15 minutes, closed 30 minutes. Initial tool opened with strong blow for 3 minutes, reopened with weak blow for 3 minutes, then died. Recovered 200 feet of drilling mud, 100 feet of mud cut water. Initial hydrostatic pressure 537 lbs., final hydrostatic pressure 666 lbs., initial flow pressure 81 lbs., final flow pressure 146 lbs., initial closed in pressure 146 lbs., final closed in pressure 146 lbs.
Conroy No. 1 Federal	SWSW 15-9S-2E	2692-2707	Open 45 minutes, shut in 35 minutes, final shut in 32 minutes. Tool opened with strong blow after 30 minutes, decreased to good blow until end of test. Recovered 120 feet of oil and gas cut water, 1292 feet of gas cut water. Initial hydrostatic pressure 1462 lbs., final hydrostatic pressure 1183 lbs., initial flow pressure 238 lbs., final flow pressure 636 lbs., initial shut in pressure 1201 lbs., final shut in pressure 1183 lbs. Bottom hole temperature 120°F.
		2230-2232½	Wire line test. Recovered .2 cubic feet of gas, 20,400 cubic centimeters of water.
		955-957½	Wire line test. Recovered .3 cubic feet of gas, 10,200 cubic centimeters of water.
Conroy No. 1 State	NWSW 24-7S-1E	2095-2105	Open 3 minutes, closed ½ hour, open 1 hour, closed ½ hour. Good blow through-out test. Recovered 7 feet of drilling mud. Initial hydrostatic pressure 1148 lbs., final hydrostatic pressure 1090 lbs., initial flow pressure 19 lbs., final flow pressure 352 lbs., initial shut in pressure 354 lbs., final shut in pressure 20 lbs.
		2089-2091½	Wire line test—no recovery.
Conroy No. 1 Trotter-Federal	SWNE 21-7S-2E	1415-1417½	Wire line test. Recovered 20,400 cubic centimeters of water and .3 cubic feet of shot gas. Initial shut in pressure 590 lbs. (2½ minutes), sampling pressure 50 lbs. (5 minutes), final shut in pressure 575 lbs. (5 minutes), hydrostatic pressure 710 lbs.
Conroy-Sun-Frost No. 1 U.S.A.	NENE 15-8S-2E	2152-2154½	Wire line test. Initial shut in 40 minutes, open 30 minutes, final shut in 20 minutes. Recovered .55 cubic feet of shot gas, 2000 cubic centimeters of water with rainbow of oil. Initial shut in pressure 1150 lbs., sample pressure 0 lbs., final shut in pressure 1125 lbs., hydrostatic pressure 1262 lbs.
		1086	Wire line test, open 8 minutes, shut in

Well Name	Location	Interval	Results/Recovery
		1686-1687	3 minutes. Recovered .09 cubic feet of shot gas, 2500 cubic centimeters of water with faint rainbow of oil. Initial shut in pressure not taken, sample pressure 0 lbs., final shut in pressure 790 lbs., hydrostatic pressure 1000 lbs.
			Wire line test. Shut in 8 minutes, open 30 minutes, final shut in 11 minutes. Recovered .43 cubic feet of shot gas, 20,400 cubic centimeters of water. Initial shut in pressure 825 lbs., sample pressure 0 lbs., final shut in pressure 790 lbs., hydrostatic pressure 1000 lbs.
Dolezal No. 1 Darrow	SESE 2-7S-1E	1688-1690½	Wire line test. Open ½ hour, closed 23 minutes. Recovered 600 cubic centimeters of mud. No pressures.
Echo No. 1-34 State	SWSW 34-11S-4E	1152-1168	Open 10 minutes, closed 20 minutes, open 3 hours, closed 2 hours. Tool opened with weak blow and died immediately. Recovered 180 feet of drilling mud. Initial hydrostatic pressure 599 lbs., final hydrostatic pressure 578 lbs., initial flow pressure 51 lbs., final flow pressure 51 lbs., initial shut in pressure 58 lbs., final shut in pressure 49 lbs. Lost 25 feet of mud in first opening.
Echo No. 1-3 Federal Indian Creek	NENW 3-12S-4E	1268-1358	Open 5 minutes, closed 30 minutes, open 118 minutes, closed 1 hour. Tool opened with strong blow, decreased to good in 15 minutes, remained good for 41 minutes, decreased gradually 5 minutes from the end of test. Recovered 538 feet of drilling mud (chloride content 200 ppm). Initial hydrostatic pressure 630 lbs., final hydrostatic pressure 610 lbs., initial shut in pressure 488 lbs. (building), final shut in pressure 358 lbs. Initial flow pressure 78 lbs., final flow pressure 258 lbs.
Fremont No. 1 Jones	NWNE 26-10S-6E	1546-1578	Open 6½ hours, shut in 1 hour. Swabbed through drill pipe—swabbed 40 barrels of water in 6½ hours, recovered 470 feet of muddy water. Initial hydrostatic pressure 546 lbs., final hydrostatic pressure 496 lbs., initial flow pressure 156 lbs., final flow pressure 173 lbs., final shut in pressure 161 lbs.
Fremont No. 1 Muhm	SWSE 24-10S-6E	1645-1671	Open 4 minutes, closed 30 minutes, bypassed mud after 35 minutes. Recovered 621 feet of water cut drilling mud. Tool opened with fair blow decreasing to weak, dead after 4 minutes. Initial hydro-

Well Name	Location	Interval	Results/Recovery
Gary No. 17-2 Bell	NWNE 17-8S-3E	2251-2303	static pressure 806 lbs., final hydrostatic pressure 787 lbs., initial flow pressure 166 lbs., final flow pressure 241 lbs., initial shut in pressure 195 lbs., final shut in pressure 213 lbs. Open 1 minute, shut in 30 minutes, open 60 minutes, shut in 60 minutes. Tool reopened with good blow, remained steady with very slight decrease at end of test. Recovered 300 feet of muddy water, 1200 feet of slightly salty water. Initial hydrostatic pressure 1130 lbs., final hydrostatic pressure 1121 lbs., initial flow pressure 208 lbs., final flow pressure 680 lbs., initial shut in pressure 982 lbs., final shut in pressure 967 lbs.
		1668	Wire line test. Recovered .52 cubic feet of shot gas, 22,165 cubic centimeters of water. Initial shut in pressure 460 lbs. (4 minutes), sampling pressure 190 lbs (10½ minutes), final shut in pressure 630 lbs. (1½ minutes), hydrostatic pressure 770 lbs.
Gary No. 16-15 State	SWSE 16-12S-4E	1365-1458	Open 8 minutes, closed ½ hour, open ½ hour, shut in 35 minutes. Tool opened with very weak blow—died almost immediately. Dead for remainder of test. Recovered 12 feet of heavy mud. Initial hydrostatic pressure 637 lbs., final hydrostatic pressure 634 lbs., pre-flow pressure 55 lbs., initial flow pressure 92 lbs., final flow pressure 92 lbs., initial shut in pressure 90 lbs., final shut in pressure 94 lbs.
Gary No. 17-11 Cleveland Quarries	NESW 17-8S-3E	2215-2270	Open 5 minutes, shut in 30 minutes, open 60 minutes, shut in 60 minutes. Tool opened with good blow for 15 minutes, decreased to fair blow for the rest of test. Recovered 240 feet of mud cut water, 1120 feet of slightly brackish water. Initial hydrostatic pressure 1075 lbs., final hydrostatic pressure 1075 lbs., initial flow pressure 196 lbs., final flow pressure 607 lbs., initial shut in pressure 997 lbs., final shut in pressure 995 lbs.
Ohio No. 1 Hedrick	SENE 25-9S-7E	4027-4042	Open 1½ hours, shut in ¾ hour. Tool opened with fair blow and increased to a maximum of 7000 CF/D (air), decreasing to very weak at end of test. Recovered 218 feet of muddy fresh water, 3000 feet of fresh water. Initial flow pressure 1200 lbs., final flow pressure 1360 lbs.,

Well Name	Location	Interval	Results/Recovery
			shut in pressure 1380 lbs., initial hydrostatic pressure 1975 lbs., final hydrostatic pressure 1925 lbs. Temperature 138°F.
		4022-4026	Swab test. Bailed at rate of 15-20 barrels per hour. Could not lower fluid level below 700 feet. Bailed total of 91 barrels of clear fresh water—no shows.
Pacific-Western No. 1 Christiana	NWSW 10-11S-1E	3540-3562	Tool open 10 minutes, slight blow for 5 minutes. Recovered 20 feet of drilling mud. No show. Bottom hole pressure 750 lbs.
		3594-3657	Tool open 36 minutes. Light color diminished entirely in 16 minutes. Recovered 45 feet of drilling mud.
		3926-4080	Open 10 minutes, closed 10 minutes. Blew hard entire test. Recovered 270 feet of mud, 2440 feet of hot water. Bottom hole pressure 1700 lbs., flowing pressure 1600 lbs. to 1650 lbs.
Pan Am No. 1 Dorough	NWNW 6-12S-1E	3660-3739	Open 5 minutes, closed ½ hour, open 100 minutes, closed 1 hour. Very weak blow for 5 minutes and died. Recovered 10 feet of drilling mud. Initial hydrostatic pressure 1901 lbs., final hydrostatic pressure 1901 lbs., initial closed in pressure 629 lbs., final closed in pressure 257 lbs., initial flow pressure 19 lbs., final flow pressure 19 lbs. Bottom hole temperature 124°F.
		4000-4055	Initial shut in 30 minutes, open 90 minutes, final shut in 60 minutes. Good blow in 3 minutes and continued for 1 hour, then decreased to weak blow at end of test. Recovered 2620 feet of fresh water. Initial hydrostatic pressure 2104 lbs., final hydrostatic pressure 2085 lbs., initial flow pressure 215 lbs., final flow pressure 1165 lbs., initial shut in pressure 1582 lbs., final shut in pressure 1569 lbs. Bottom hole temperature 136°F.
Pan Am No. 1 Socony Mobil	NWNW 29-11S-1E	3585-3613	Open 5 minutes, shut in 30 minutes, open 1½ hours, closed 1 hour. Tool opened with immediate fair blow and continued for 1 hour—gradually decreasing for remainder of test. Recovered 110 feet of highly gas cut drilling mud with trace of oil. Initial hydrostatic pressure 1658 lbs., final hydrostatic pressure 1647 lbs., initial closed in pressure 256 lbs., final closed in pressure 746 lbs., initial flow pressure 28 lbs., final flow pressure 52 lbs. Bottom hole temperature 118°F.

Well Name	Location	Interval	Results/Recovery
		3687-3710	Open 4 minutes, closed ½ hour, open 1½ hours, closed 1 hour. Reopened tool with weak blow throughout test. Recovered 150 feet of slightly mud cut water with a small trace of oil in the top 50 feet. Initial hydrostatic pressure 1744 lbs., final hydrostatic pressure 1726 lbs., initial closed in pressure 1358 lbs., final closed pressure 1358 lbs., initial flow pressure 12 lbs., final flow pressure 77 lbs. Bottom hole temperature 120°F.
		4037-4060	Open 4 minutes, closed ½ hour, open ¾ hour, closed 1 hour. Opened tool with weak blow for 5 minutes and died. Bypassed tool after 30 minutes with few bubbles and died. Recovered 90 feet of drilling mud. Initial hydrostatic pressure 1919 lbs., final hydrostatic pressure 1919 lbs., initial shut in pressure 1526 lbs., final shut in pressure 1493 lbs., initial flow pressure 19 lbs., final flow pressure 59 lbs. Temperature estimated to be 120°F.
Shell No. 1 Sides	SENW 32-8S-9E	2553-2580	Recovered 970 feet of fresh water only.
Sun No. 1 Nelson	NESE 21-7S-1E	2315-2333	Initial shut in ½ hour, open 1 hour, final shut in 40 minutes. Tool opened with very slight blow and died. Recovered 15 feet of drilling mud. Initial shut in pressure 15 lbs., final shut in pressure 27 lbs., initial flow pressure 15 lbs., final flow pressure 27 lbs., initial hydrostatic pressure 1211 lbs., final hydrostatic pressure 1143 lbs. Bottom hole temperature 67°F.
		2390-2400	Initial shut in 30 minutes, open 1 hour, final shut in pressure ½ hour. Tool opened with a good blow for 30 minutes, decreased to fair blow at end of test. Recovered 2036 feet of slightly gas cut black sulphur water. Initial shut in pressure 1026 lbs., final shut in pressure 1026 lbs., initial flow pressure 144 lbs., final flow pressure 884 lbs., initial hydrostatic pressure 1341 lbs., final hydrostatic pressure 1242 lbs. Bottom hole temperature 84°F.
Voss-Mars No. 1 Porter	NESE 20-9S-2E	2772-2865	Open 30 minutes, shut in 15 minutes. Fluid rise—none, flow pressure 0 lbs., bottom hole pressure 1450 lbs.
Woodward No. 4 Schmidt	NENW 4-12S-4E	1720-1805	Swab test. Test made water.

## DRILL STEM TESTS—FAULK COUNTY

Well Name	Location	Interval	Results/Recovery
Hunt No. 1 Gutenkauf	NENE 20-118N-72W	2334-2418	Open 1 hour, closed 15 minutes. Strong blow immediately—water to surface in 22 minutes. Recovered 2418 feet of fresh water—no oil or gas. Initial flow pressure 1100 lbs., final flow pressure 1100 lbs., bottom hole pressure 1250 lbs., hydrostatic pressure 1500 lbs.
		2500-2575	Open 45 minutes, closed 15 minutes. Immediate strong blow—water flowed in 27 minutes. Recovered 2575 feet of fresh water—no show of oil or gas. Initial flow pressure 250 lbs., final flow pressure 800 lbs., 15 minute bottom hole pressure 950 lbs., hydrostatic pressure 1250 lbs.
		1180-1210	Open 45 minutes. Immediate weak blow and had gradual decline throughout test. Recovered 15 feet of drilling mud. Initial flow pressure 0 lbs., final flow pressure 0 lbs., 15 minute bottom hole pressure 350 lbs., hydrostatic pressure 1150 lbs.

## DRILL STEM TESTS—HAAKON COUNTY

Well Name	Location	Interval	Results/Recovery
Carter No. 1 Danielson	SEnw 5-3-22	1598-1634	Open 1 hour. Weak blow for 5 minutes, very weak blow for 15 minutes and then died. Recovered 300 feet of slightly gas cut drilling mud. Initial flow pressure 10 lbs., final flow pressure 240 lbs., shut in pressure 490 lbs., hydrostatic pressure 750 lbs.
		3986-4038	Test tool opened with a strong blow and well started flowing fresh water in 25 minutes. Initial flow pressure 1800 lbs., final flow pressure 1800 lbs.
Exeter No. 28-3 Williams	NENw 28-4-19	2657-2691	Open 10 minutes, closed 45 minutes, open 1 hour, closed 1 hour. Recovered 45 feet of drilling mud, 2105 feet of water—no shows. Initial hydrostatic pressure 1383 lbs., final hydrostatic pressure 1320 lbs., initial shut in pressure 951 lbs., final shut in pressure 954 lbs., initial flow pressure 655 lbs., final flow pressure 953 lbs.
Kerr-McGee No. 1 Chute	SWSw 33-3-19	4394-4404	Open 1 hour, shut in 15 minutes. Good blow, decreasing to fair blow at

Well Name	Location	Interval	Results/Recovery
			end of test. Recovered 120 feet of muddy water, 4164 feet of fresh water. Initial flow pressure 1650 lbs., final flow pressure 1700 lbs., shut in pressure 1700 lbs., hydrostatic pressure 2400 lbs.
		4832-4882	Open ½ hour, shut in ½ hour. Opened with very strong blow—died in 18 minutes. Recovered 4732 feet of fluid which was 120 feet of water cut mud, 4582 feet of fresh water. Initial flow pressure 2250 lbs., final flow pressure 2250 lbs., shut in pressure 2250 lbs., hydrostatic pressure 2400 lbs.
Plum Creek No. 1 Berry	SWSW 1-6-21	4001-4083	Open 18 minutes, shut 30 minutes, open 50 minutes, shut in 30 minutes. Tool opened with very weak blow—died in 10 minutes. Recovered 30 feet of drilling mud. Initial hydrostatic pressure 2238 lbs., final hydrostatic pressure 2188 lbs., initial flow pressure 30 lbs., final flow pressure 31 lbs., initial shut in pressure 1248 lbs., final shut in pressure 962 lbs. Bottom hole temperature 142°F.
Pohle No. 1 May	NESE 21-4-18	4039-4069	Open 90 minutes. Recovered 3 stands (180 feet) of gas and oil cut mud. Initial flow pressure 50 lbs., shut in pressure 590 lbs., hydrostatic pressure 2185 lbs.
		5354-5360	Swab test. Casing shot with 6 perforations. Recovered fresh water flow.
Texaco No. 1 State "B"	NWSE 36-6-21	2100-2125	Open 15 minutes, closed 45 minutes, open 30 minutes, closed 60 minutes. Reopened tool with strong blow, blowing weak in 12 minutes. Recovered 240 feet of mud cut fresh water and 1670 feet of slight gas cut fresh water. Initial hydrostatic pressure 1086 lbs., final hydrostatic pressure 1074 lbs., initial closed in pressure 822 lbs., final closed in pressure 823 lbs., initial flow pressure 422 lbs. (?), final flow pressure 822 lbs. Bottom hole temperature 73°F.
		3084-3184	Open 15 minutes, closed 45 minutes, open 30 minutes, closed 1 hour. Tool opened with weak blow—died in 6 minutes. Recovered 10 feet of drilling mud. Initial hydrostatic pressure 1744 lbs., final hydrostatic pressure 1744 lbs., initial shut in pressure 683 lbs., final shut in pressure 597 lbs., initial flow pressure 23 lbs., final flow pressure 27 lbs. Temperature 132°F.

Well Name	Location	Interval	Results/Recovery
		4224-4302	Open 15 minutes, closed 45 minutes, open 10 minutes, closed 45 minutes. Initial tool opening—mud to surface in 12 minutes, fresh water in 15 minutes. Initial hydrostatic pressure 2289 lbs., final hydrostatic pressure 2255 lbs., initial closed in pressure 1965 lbs., final closed in pressure 1963 lbs., initial flow pressure 1612 lbs., final flow pressure 1934 lbs. Bottom hole temperature 157°F.
		4620-4650	Open 15 minutes, closed 48 minutes, open 90 minutes, closed 60 minutes. Tool opened with good blow throughout test. Recovered 360 feet of muddy water and 2014 feet of very slightly gas cut fresh water. Initial hydrostatic pressure 2595 lbs., final hydrostatic pressure 2546 lbs., initial shut in pressure 2130 lbs., final shut in pressure 2124 lbs., initial flow pressure 33 lbs., final flow pressure 1208 lbs. Bottom hole temperature 167°F.

#### DRILL STEM TESTS—HARDING COUNTY

Well Name	Location	Interval	Results/Recovery
Amerada No. 1 Govt.	NENE 31-16-2	3341-?	Recovered 1800 feet of slightly salty water—no shows.
Amerada No. 1 Govt.- Ellis	SESE 24-17-1	7944-7956	Recovered 1000 feet of water cushion—525 feet of mud.
Amerada No. 1 Govt.- Holland	SWSW 8-15-2	3068-3124	Immediate strong blow, decreased to weak in 10 minutes, died in 1 hour. Recovered 1875 feet of mud cut salty water—no shows.
Amerada No. 1 State "A"	NENE 1-16-1	3694-3749	Recovered 180 feet of drilling mud and 1730 feet of salt water.
Cardinal No. 1 Travers	SESE 17-22-5	8924-8965	Shut in ½ hour, open 2 hours, closed ½ hour. Recovered 2970 feet gas, 555 feet total fluid rise, 15 feet oil and gas cut mud, 90 feet of highly gas and mud cut black oil (50% oil), 90 feet of very slightly oil and mud cut salt water, 360 feet of salt water. Initial flow pressure 22 lbs., final flow pressure 205 lbs., initial shut in pressure 3654 lbs., final shut in pressure 3149 lbs., initial hydrostatic pressure 4940 lbs., final hydrostatic pressure 4940 lbs. Temperature 218°F.
		8967-9005	Shut in ½ hour, open 2 hours, shut in ½ hour. Initial weak blow, continued weak throughout test. Recovered



Well Name	Location	Interval	Results/Recovery
Cardinal-Sun-Clarkson No. 1 State	SWNW 6-21-4	8659-8667	90 feet of muddy salt water with few oil flecks. Initial flow pressure 15 lbs., final flow pressure 15 lbs., initial shut in pressure 3419 lbs., final shut in pressure 125 lbs., initial hydrostatic pressure 4940 lbs., final hydrostatic pressure 4665 lbs. Bottom hole temperature 219°F. Shut ½ hour, open 2 hours, shut in ½ hour. Tool opened with immediate strong blow—continued throughout test. Recovered 8650 feet of gas in drill pipe, 500 feet of gassy oil, 180 feet of slightly salty water. Initial hydrostatic pressure 4608 lbs., final hydrostatic pressure 4608 lbs., initial flow pressure 78 lbs., final flow pressure 300 lbs., initial shut in pressure 3645 lbs., final shut in pressure 2940 lbs.
		8457-8565	Recovered 10 feet of heavily oil cut muddy fresh water (25% oil cut), 90 feet of slightly oil cut fresh water, 360 feet of slightly gas cut muddy fresh water. Initial hydrostatic pressure 4630 lbs., initial flow pressure 30 lbs., final flow pressure 270 lbs., bottom hole shut in pressure 2760 lbs., final hydrostatic pressure 4605 lbs. Open 4 hours, shut in 20 minutes, weak blow throughout test. Recovered 720 feet of slightly oil cut brackish water. Initial flow pressure 70 lbs., final flow pressure 290 lbs., shut in bottom hole pressure 2800 lbs., initial hydrostatic pressure 4600 lbs., final hydrostatic pressure 4500 lbs.
Carter No. 1, 1 "A" Hendriks	SWSW 2-20-3	6733-6788	Open 1 hour, fair blow throughout test. Recovered 85 feet water cut mud, and 1100 feet of salt water. Initial flow pressure 260 lbs., final flow pressure 610 lbs., 15 minute shut in pressure 2600 lbs., hydrostatic pressure 3660 lbs.
		6969-7026	Open 1 hour, good blow throughout. Recovered 2670 feet sulphur water. Initial flow pressure 180 lbs., final flow pressure 1270 lbs., 15 minute shut in pressure 3130 lbs., hydrostatic pressure 3730 lbs.
		6240-6254	Open 1 hour, very weak blow for 5 minutes. Recovered 20 feet of drilling mud—no oil or gas. Initial, final and shut in pressures were zero, hydrostatic pressure 3500 lbs.

Well Name	Location	Interval	Results/Recovery
		5283-5343	Open 1 hour, weak blow for 55 minutes and then died. Recovered 100 feet of water cut mud, 620 feet of salt water. Initial flow pressure 0 lbs., final flow pressure 350 lbs., 15 minute shut in pressure 1800 lbs., hydrostatic pressure 2800 lbs.
		1680-1812	Open 30 minutes, weak blow for 9 minutes and died. Recovered 145 feet of drilling mud—no show. All pressures held at 850 lbs. Charts believed to be inaccurate.
		2950-3085	Open 30 minutes, weak blow for 14 minutes and died. Recovered 110 feet of drilling mud—no show. Initial, final and shut in pressure were zero. Hydrostatic pressure 1750 lbs.
		3443-3479	Open 30 minutes, weak blow for 5 minutes. Recovered 120 feet of drilling mud—no show. Initial, final and shut in pressures were zero. Hydrostatic pressure 1900 lbs.
Champlin No. 1 Clarkson Est.	NWSE 22-21-3	6840-6910	Open 5 minutes, closed 1 hour, open 2 hours, closed 2 hours. Recovered 300 feet of water cut drilling mud, 470 feet of slightly muddy water. Initial hydrostatic pressure 3571 lbs., initial flow pressure 60 lbs., initial shut in pressure 3069 lbs., final flow pressure 360 lbs., final shut in pressure 2857 lbs., final hydrostatic pressure 3609 lbs.
		7110-7158	Open 5 minutes, closed 1 hour, open 2 hours, closed 90 minutes. Recovered 900 feet of water cut mud, 1620 feet of mud cut water, 4394 feet of sulphur water. Initial hydrostatic pressure 3604 lbs., initial flow pressure 758 lbs., initial shut in pressure 3195 lbs., final flow pressure 3149 lbs., final shut in pressure 3178 lbs., final hydrostatic pressure 3453 lbs.
		7330-7475	Open 5 minutes, closed 1 hour, open 1 hour, closed 30 minutes. Recovered 630 feet of mud cut water, 6845 feet of sulphur water. Initial hydrostatic pressure 3785 lbs., initial flow pressure 1424 lbs., initial shut in pressure 3292 lbs., final flow pressure 3254 lbs., final shut in pressure 3293 lbs., final hydrostatic pressure 3806 lbs.
		8574-8616	Open 10 minutes, closed 1 hour, open 1 hour, closed 2 hours. Recovered 196 feet of drilling mud, 82 feet slightly oil cut drilling

Well Name	Location	Interval	Results/Recovery
		8505-8555	mud (less than 1% oil). Initial hydrostatic pressure 4407 lbs., initial flow pressure 42 lbs., initial shut in pressure 3612 lbs., final flow pressure 152 lbs., final shut in pressure 3461 lbs., final hydrostatic pressure 4392 lbs. Open 10 minutes, closed 1 hour, open 1 hour, closed 2 hours. Recovered 250 feet oil and gas cut drilling mud, 175 feet slightly oil cut mud. Initial hydrostatic pressure 4367 lbs., initial flow pressure 47 lbs., initial shut in pressure 3423 lbs., final flow pressure 221 lbs., final shut in pressure 3306 lbs., final hydrostatic pressure 4380 lbs.
		8648-8720	Open 10 minutes, closed 30 minutes, open 1 hour, closed 1 hour. Recovered 651 feet of water cut mud, 465 feet mud cut water, 140 feet slightly mud cut water, 674 feet of water. Initial hydrostatic pressure 4504 lbs., initial flow pressure 102 lbs.
Clarkson-Schlaikjer No. 1 Govt.	SENE 23-21-3E	8460-8511	Open 3 hours, shut in 30 minutes. Weak blow in 5 minutes, fair blow in 10 minutes, strong blow in 20 minutes continued throughout test. Recovered 1890 feet of highly gas cut oil, 1200 feet of highly gas cut and oil cut water. Initial hydrostatic pressure 4570 lbs., initial flow pressure 495 lbs., final flow pressure 1265 lbs., final shut in pressure 3197 lbs., final hydrostatic pressure 4586 lbs. Temperature 200°F.
Clarkson-Schlaikjer No. 1 Graves	SWNE 23-21-3	8470-8512	Recovered 2720 feet of oil, 210 feet of mud cut oil, 90 feet of oil and gas cut mud, 240 feet of salt water.
Consolidated Oil and Gas No. 8 Federal	NWNE 8-22-3	7170-7326	Open 10 minutes, closed 30 minutes, open 150 minutes, closed 1 hour. Reopened tool with fair to strong blow throughout test. Recovered 1302 feet of mud cut sulphur water, 4370 feet of sulphur water. Initial hydrostatic pressure 3690 lbs., final hydrostatic pressure 3670 lbs., initial closed in pressure 3193 lbs., final closed in pressure 3140 lbs., initial flow pressure 206 lbs., final flow pressure 2479 lbs. Bottom hole temperature 230°F.
Harrison No. 1 Junek	SESE 29-15-5	3412-3425	Open 15 minutes, closed 30 minutes, open 30 minutes, closed 1 hour. Tool opened with strong blow for 15 minutes.

Well Name	Location	Interval	Results/Recovery
Harrison No. 15-4 State	NESE 36-15-4	3393-3444	<p>Reopened with fair blow—died in 23 minutes. Recovered 60 feet of drilling mud, 60 feet of water cut mud, 2400 feet of slightly gas cut water (chloride content 3800 ppm). Initial hydrostatic pressure 1871 lbs., final hydrostatic pressure 1862 lbs., initial flow pressure 897 lbs., final flow pressure 1098 lbs., initial shut in pressure 1098 lbs., final shut in pressure 1098 lbs.</p> <p>Open 10 minutes, closed 30 minutes, open 30 minutes, closed in 65 minutes. Tool opened with very strong blow, decreased to fair at end of test. Recovered 60 feet of drilling mud, 360 feet of mud cut water, 120 feet of slightly mud and gas cut water, 1960 feet of slightly gas cut water. Initial hydrostatic pressure 2005 lbs., final hydrostatic pressure 1751 lbs., initial flow pressure 614 lbs., final flow pressure 993 lbs., initial shut in pressure 1057 lbs., final shut in pressure 1084 lbs. (chloride content 3500 ppm).</p>
Hunt No. 1 Peterson	NWNW 7-20-3	7051-7160	Recovered 1080 feet of salty water, 1350 feet of muddy water, 2790 feet of black sulphur water—no show.
		7188-7300	Water to surface in 3 hours and 45 minutes, flowed 430 feet in 45 minutes. Recovered 1080 feet of water cushion, 1800 feet of drilling mud, 4769 feet of black sulphur water—no shows.
Jones No. 1 State	SWNE 35-18-1	7723-7910	Open 15 minutes, closed 15 minutes, immediate strong blow—continued throughout test—no gas. Recovered 4080 feet of mud and muddy fresh water (saline content 650 ppm).
		7838-7910	Open 30 minutes, closed 30 minutes, immediate strong blow—continued throughout test—no gas. Recovered 6050 feet of muddy fresh water. Initial hydrostatic pressure 4197 lbs., final hydrostatic pressure 4170 lbs., initial flow pressure 1459 lbs., final flow pressure 2662 lbs., initial shut in pressure 3356 lbs., final shut in pressure 3308 lbs., temperature 180°F.
Ladd Petroleum Company No. 1 Laflin	NENE 11-17-7	8200-8250	Open 10 minutes, shut in 30 minutes, open 90 minutes, shut in 90 minutes. Recovered 350 feet of drilling mud, 264 feet of fresh water. Initial hydrostatic pressure 4201 lbs., final hydrostatic pressure 4221 lbs., initial flow pressure 44 lbs., final flow pressure

Well Name	Location	Interval	Results/Recovery
Miami No. 1 Painters	NESE 26-21-2	8550-8580	285 lbs., initial shut in pressure 3277 lbs., final shut in pressure 3181 lbs. Open 10 minutes, closed 45 minutes, open 2 hours, closed in 1 hour. Tool opened with weak blow, increased to fair blow at end of test. Recovered 180 feet of water cut mud and 847 feet of water. Of this 650 feet was cushion water. Initial hydrostatic pressure 4522 lbs., final hydrostatic pressure 4232 lbs., initial flow pressure 241 lbs., final flow pressure 671 lbs., initial shut in pressure 3638 lbs., final shut in pressure 3334 lbs. Bottom hole temperature 184°F.
Mid-American No. 1 Gardner	SWNW 1-20-3	7157-7203	Open 90 minutes, closed 1 hour. Recovered 1440 feet of slightly mud cut fresh water, 5624 feet of fresh water. Initial flow pressure 570 lbs., final flow pressure 3035 lbs., shut in pressure at 45 minutes 3140 lbs., final shut in pressure (60 minutes) 3140 lbs., initial hydrostatic pressure 3860 lbs., final hydrostatic pressure 3860 lbs.
		8418-8445	Open 2 hours, closed 90 minutes. Recovered 1380 feet slightly mud cut water with scum of oil (oil was contamination from oil in the mud in the drill pipe). Initial hydrostatic pressure 4520 lbs., final hydrostatic pressure 4450 lbs., initial flow pressure 85 lbs., final flow pressure 630 lbs., shut in pressure at 90 minutes 3320 lbs., and still building. Water salinity 11,000 ppm.
		8414-8434	Open 4 hours. Recovered 1830 feet of water cut with spent acid. No shut in pressure taken. Initial flow pressure 145 lbs., final flow pressure 1045 lbs., initial hydrostatic pressure 4550 lbs., final hydrostatic pressure 4545 lbs.
Mid-American No. 1-17 State	NESE 17-21-4	6800-6845	Open 70 minutes. Weak blow to very weak in 30 minutes, died in one hour. Recovered 80 feet of water cut mud. Initial flow pressure 40 lbs., final flow pressure 55 lbs., shut in pressure (30 minutes) 2400 lbs., initial hydrostatic pressure 3950 lbs., final hydrostatic pressure 3825 lbs.
		8545-8580	Open 2 hours. Strong blow after 5 minutes, slightly diminished at end of 2 hours. Recovered 180 feet of

Well Name	Location	Interval	Results/Recovery
		8608-8630	90% oil and 10% gas cut mud, 940 feet fluid, 98% oil and 2% mud that was 90% gas cut. Initial shut in pressure 4875 lbs., initial flow pressure 140 lbs., final flow pressure 685 lbs. at end of 2 hours, shut in pressure (1 hour) 2715 lbs., hydrostatic pressure 4750 lbs. Bottom hole temperature 203° F. Open 1 hour, very weak blow died in 20 minutes. At 30 minutes equalized tool, with weak blow for 5 minutes and died. Recovered 90 feet of mud with scum of oil. Initial flow pressure 65 lbs., final flow pressure 70 lbs., shut in bottom hole pressure (30 minutes) 3080 lbs. Bottom hole temperature 206° F.
		8604-8632	Open 1 hour, very weak blow died in 25 minutes. Equalized tool after 30 minutes, died in 5 minutes. Recovered 190 feet of slightly water cut mud with trace of oil at bottom of tool. Initial flow pressure 85 lbs., final flow pressure 125 lbs., shut in pressure (15 minutes) 3500 lbs., hydrostatic pressure 4890 lbs. Bottom hole temperature 209° F.
Mid-American No. 2-16 State	SWNW 16-21-4	8553-8589	Open 2 hours, closed 90 minutes. Tool opened with weak blow increasing for 40 minutes to fairly strong blow and steady throughout test. Recovered 240 feet of mud cut water and 450 feet of mud cut oil. Initial hydrostatic pressure 4708 lbs., final hydrostatic pressure 4691 lbs., initial flow pressure 31 lbs., final flow pressure 280 lbs., final closed in pressure 2138 lbs., no initial closed in pressure reported.
Mobil No. F-21-9-G Dale	SEnw 9-22-1	8564-8641	Open 2½ hours. Recovered 3088 feet of muddy salt water. Stuck in key seat and dropped tool and recovered same.
Mule Creek No. 1 State	NWNW 16-22-3	8672-8715	Open 5 minutes, shut in 30 minutes, open 3 hours, shut in 60 minutes. Recovered 2070 feet of gas, 370 feet of heavily gas cut black oil, 270 feet of heavily gas and oil cut water, 180 feet of heavily gas and slightly oil cut water, 90 feet slightly oil and gas cut water, 90 feet of slightly gas cut muddy water, 360 feet slightly gas cut watery mud, 180 feet of moderately gas and oil cut mud. Initial flow pressure 383 lbs., final flow pres-

Well Name	Location	Interval	Results/Recovery
Northern Ordnance No. 1 Govt.	SESE 32-15-2	4400-4410	sure 619 lbs., initial shut in pressure 3707 lbs., final shut in pressure 3177 lbs. (building), initial hydrostatic pressure 4604 lbs., final hydrostatic pressure 4604 lbs. Recovered mud and water. Open 15 minutes. Recovered 37 stands of fresh water.
		5595-5650	
		5866-5890	
Ohio No. 1 Evenson	NWNW 28-21-1	7025-7038	Open 32 minutes, slight blow. Recovered 34 stands of sulphur water. Open 1 hour, closed 1 hour. Recovered 1200 feet of water without mud, 1050 feet of black sulphur water.
		8269-8281	Closed 30 minutes, open 2 hours, closed 45 minutes. Weak blow for 2 hours. Recovered 370 feet of muddy water. Hydrostatic pressure 4600 lbs., initial shut in pressure 3635 lbs., initial flow pressure 50 lbs., final flow pressure 50 lbs., final shut in pressure 3550 lbs. Temperature 185°F at 8281 feet.
Pennzoil No. 12-8 Graves	SWNW 8-21-4	8283-8305	Straddle test. Initial shut in 20 minutes, open 90 minutes. Very strong blow. Water to surface in 80 minutes. 20 minute shut in. Test results—hydrostatic mud pressure 4550 lbs., initial shut in pressure 3625 lbs., initial flow pressure 775 lbs., final flow pressure 3625 lbs., final shut in pressure 3625 lbs. Temperature 174°F at 8379 feet.
		8530-8560	Open 2 hours, closed 2 hours. Recovered 2500 feet of gas, 80 feet of oil, 180 feet of slightly mud and gas cut oil, 180 feet of mud and gas cut oil, 90 feet slightly oil and water cut mud, 162 feet of slightly mud and gas cut water. Initial flow pressure 112 lbs., final flow pressure 330 lbs., initial hydrostatic pressure 4830 lbs., final hydrostatic pressure 4757 lbs., final shut in pressure 1952 lbs.
Pennzoil No. 32-4 State-Clarkson	SWNE 4-21-4	8665-8680	Open 5 minutes, closed 30 minutes, open 90 minutes, closed 1 hour. Recovered 10 feet of free oil, 215 feet of oil and gas cut drilling mud, 90 feet of muddy water, 720 feet of water. Initial hydrostatic pressure 4408 lbs., initial shut in pressure 3039 lbs., initial flow pressure 44 lbs., final flow pressure 445 lbs., final shut in pressure

Well Name	Location	Interval	Results/Recovery
Pennzoil No. 12-17 Little Graves	SWNW 17-21-4	8575-8585	2876 lbs., final hydrostatic pressure 4311 lbs. Open 5 minutes, closed 1 hour, open 2 hours, closed 2 hours. Weak blow increased to fair at end of test. Recovered 563 feet of heavy gas and mud cut oil, 110 feet of slightly oil cut mud, 200 feet of slightly water and oil cut mud, 32 feet of heavy gas and oil cut mud. Initial hydrostatic pressure 4389 lbs., final hydrostatic pressure 4409 lbs., initial flow pressure 111 lbs., final flow pressure 456 lbs., initial shut in pressure 1592 lbs., final shut in pressure 1517 lbs. Bottom hole temperature 218°F.
		8361-8372	Open 5 minutes, closed 1 hour, open 3 hours, closed 2 hours. Tool opened with weak blow increased to good blow in 20 minutes and remained good through test. Recovered 479 feet of oil, 180 feet of oil cut muddy water, 314 feet of water (chloride content 1700 ppm). Initial hydrostatic pressure 4494 lbs., final hydrostatic pressure 4513 lbs., initial flow pressure 23 lbs., final flow pressure 376 lbs., initial shut in pressure 2854 lbs., final shut in pressure 2702 lbs. Bottom hole temperature 204°F.
		8330-8344	Open 10 minutes, closed 1 hour, open 1½ hours, closed 1 hour. Tool opened with very weak blow and died in 10 minutes. Recovered 25 feet of slightly oil cut mud. Initial hydrostatic pressure 4498 lbs., final hydrostatic pressure 4474 lbs., initial shut in pressure 3606 lbs., final shut in pressure 2914 lbs., initial flow pressure 22 lbs., final flow pressure 17 lbs. Bottom hole temperature 190°F.
Pennzoil No. 14-11A Tilus	SWSW 10-20-4	8425-8440	Open 10 minutes, closed 1 hour, open 1½ hours, closed 1½ hours. Tool opened with weak blow for 10 minutes and died. Recovered 224 feet of mud cut water (chloride content 2200 ppm). Initial hydrostatic pressure 4539 lbs., final hydrostatic pressure 4474 lbs., initial flow pressure 3 lbs., final flow pressure 75 lbs., initial shut in pressure 3641 lbs., final shut in pressure



Well Name	Location	Interval	Results/Recovery
		8372-8384	3365 lbs. Open ¼ hour, closed 1 hour, open 3 hours, closed 2 hours. Tool opened with weak blow and increased to strong in 45 minutes and remained throughout test. Recovered 280 feet of oil, 100 feet of heavy gas and mud cut oil, 660 feet of mud cut water (salt content 908 ppm). Initial hydrostatic pressure 4504 lbs., final hydrostatic pressure 4495 lbs., initial flow pressure 36 lbs., final flow pressure 430 lbs., initial shut in pressure 2821 lbs., final shut in pressure 2677 lbs. Bottom hole temperature 196°F.
Phillips No. 1A Njos	SWNW 34-23-3	8843-8883	Open 3 minutes, closed 45 minutes, open 1 hour, closed 90 minutes. Recovered 450 feet of water cushion, 480 feet of water with slight oil scum. Initial hydrostatic pressure 4513 lbs., initial flow pressure 269 lbs., initial shut in pressure 3866 lbs., final flow pressure 438 lbs., final shut in pressure 3693 lbs., final hydrostatic pressure 4495 lbs.
		8858-8853	Open 5 hours. Recovered 450 feet of water cushion with oil scum, 550 feet slightly salty, slightly gas cut muddy water with oil scum, 980 feet slightly salty, slightly gas cut water with oil scum. Initial hydrostatic pressure 4591 lbs., initial flow pressure 235 lbs., final flow pressure 871 lbs., final hydrostatic pressure 4382 lbs.
		8920-8947	Open 5 minutes, closed 45 minutes, open 30 minutes, closed 1 hour. Recovered 540 feet of water cushion, 60 feet of drilling mud. Initial hydrostatic pressure 4561 lbs., initial flow pressure 286 lbs., initial shut in pressure 3850 lbs., final flow pressure 298 lbs., final shut in pressure 3634 lbs., final hydrostatic pressure 4563 lbs.
Phillips No. 1 Thune	SWSE 5-21-4	8593-8614	Open 3 minutes, closed 57 minutes, open 51 minutes, closed 95 minutes. Recovered 540 feet of gassy oil, 30 feet of gas cut mud, 120 feet of muddy salt water, 215 feet of brackish water. Gas to surface in 27 minutes at initial rate of 25.1 MCF/day to 17.2 MCF/day after 20 minutes. Initial hydrostatic pressure 5034 lbs.,

Well Name	Location	Interval	Results/Recovery
Phillips No. 2 Thune	SWSW 5-21-4	8572-8600	initial shut in pressure 2638 lbs., initial flow pressure 109 lbs., final flow pressure 414 lbs., final shut in pressure 2482 lbs., final hydrostatic pressure 5032 lbs. Open 4 minutes, closed 45 minutes, open 60 minutes, closed 75 minutes. Recovered 250 feet of oil and gas cut mud, 480 feet of oil, 322 feet of water. Initial hydrostatic pressure 4719 lbs., initial shut in pressure 3077 lbs., initial flow pressure 133 lbs., final flow pressure 444 lbs., final shut in pressure 2953 lbs., final hydrostatic pressure 4719 lbs.
		8736-8748	Open 3 minutes, closed 45 minutes, open 60 minutes, closed 75 minutes. Recovered 2190 feet of water. Initial hydrostatic pressure 4824 lbs., initial closed in pressure 3855 lbs., initial flow pressure 35-155 lbs., final flow pressure 122-961 lbs., final shut in pressure 3714 lbs., final hydrostatic pressure 4824 lbs.
Richfield No. 1 State "A"	SENW 16-17-4	8725-3909	Flow died in 30 minutes. Recovered 2310 feet of salty water below 270 feet of drill mud. No pressures reported.
Schlaikjer-Clarkson No. 1 Clarkson	SWSE 23-21-3	8486-8526	Shut in 30 minutes, open 3 hours, shut in 30 minutes. Recovered 275 feet of free oil, 460 feet of salt water. Initial hydrostatic pressure 4800 lbs., initial flow pressure 72 lbs., final flow pressure 380 lbs., initial shut in pressure 3440 lbs., final shut in pressure 2790 lbs., final hydrostatic pressure 4800 lbs.
Shell No. 12-3B Brown	SWNW 3-20-5	8615-8644	Open 2 hours, shut in 90 minutes. Recovered 279 feet of mud cut water with trace of oil, 372 feet of mud cut water, 248 feet of slightly mud cut water. Initial flow pressure 85 lbs., final flow pressure 405 lbs., 30 minute shut in pressure 3603 lbs., final shut in pressure 3439 lbs., initial and final hydrostatic pressure 4673 lbs.
Shell No. 32-27 Govt.	SWNE 27-20-5	8315-8365	Open 2 hours, shut in, initial 30 minutes—final 90 minutes. Immediate weak blow increased to fair and to good after 105 minutes for remainder of test. Recovered 720 feet of water cut 24° oil, 705 feet of heavily oil cut water, 330 feet of slightly oil cut water. Initial hydrostatic pressure 4600 lbs., initial flow pressure 400 lbs., final flow pressure 750 lbs., initial shut

Well Name	Location	Interval	Results/Recovery
		8364-8461	in pressure 3800 lbs., final shut in pressure 3800 lbs., final hydrostatic pressure 4600 lbs. Open 2 hours, shut in 90 minutes. Weak blow for 15 minutes, very weak for rest of test. Recovered 155 feet of mud, 168 feet of water cut mud. Initial shut in pressure 120 lbs., initial flow pressure 70 lbs., final flow pressure 150 lbs., final shut in pressure 3185 lbs., hydrostatic pressure 4555 lbs.
		8458-8519	Open 2 hours, closed 90 minutes. Recovered 4160 feet of very slightly mud cut water. Initial shut in pressure 3795 lbs., initial flow pressure 620 lbs., final flow pressure 1895 lbs., final shut in pressure 3680 lbs., hydrostatic pressure 4515 lbs.
Shell No. 14-4 Johnson	SWSW 4-21-8	8684-8716	Open 2 hours, shut in 90 minutes. Immediate weak blow for 1 hour increased to moderate for rest of test. Recovered 900 feet of mud cut water with trace of oil. Initial shut in pressure 3850 lbs., initial flow pressure 130 lbs., final flow pressure 415 lbs., final shut in pressure 3445 lbs., hydrostatic pressure 4795 lbs.
		8786-8817	Open ½ hour, shut in 1½ hour. Momentary weak blow died in 20 minutes. Recovered 205 feet of slightly gas cut and mud cut water. Initial shut in pressure 3140 lbs., initial flow pressure 85 lbs., final flow pressure 120 lbs., final shut in pressure 3470 lbs., hydrostatic pressure 4630 lbs.
Shell No. 12-35 F State	SWNW 35-22-4	8887-8910	Open 2 hours, shut in 1½ hours. Recovered 60 feet slightly gassy oil and water cut mud (40% oil), 188 feet of slightly gas cut water with trace of oil, 1921 feet of water. Initial flow pressure 120 lbs., final flow pressure 940 lbs., initial shut in pressure (30 minutes) 3750 lbs., final shut in pressure 3481 lbs., hydrostatic pressure 4430 lbs. Bottom hole temperature 245°F.
Shell No. 14-4 State	SWSW 4-21-4	8570-8592	Open 2 hours, initial shut in 30 minutes. Recovered 1875 feet of heavily gas cut oil (90-100%) with trace (10%) of mud, 420 feet gas cut muddy water. Initial flow pressure 210 lbs., final flow pressure 835 lbs., initial shut in pressure (30 minutes) 3310 lbs., hydrostatic pressure 4350 lbs. Bottom hole temperature 220°F. No final shut in pressure—unable to close tool.

Well Name	Location	Interval	Results/Recovery
Shell No. 32-17 State	SWNE 17-21-5	8694-8724	Open 1 hour, shut in 1 hour. Recovered 630 feet oil cut mud (trace to 35% oil), 400 feet of slightly oil and water cut mud (trace oil and 25% to 45% water). Initial flow pressure 0 lbs., final flow pressure 460 lbs., initial shut in pressure (30 minutes) 3690 lbs., final shut in pressure 3490 lbs., hydrostatic pressure 4130 lbs. Bottom hole temperature 250°F.
Shell No. 41-23 State	NENE 23-18-8	8157-8214	Open 2 hours, very weak blow for 90 minutes. Recovered 330 feet slightly oil cut mud. Initial shut in pressure 4080 lbs., initial flow pressure 115 lbs., final flow pressure 170 lbs., no final shut in pressure—tool would not close, hydrostatic pressure 4350 lbs.
		8240-8340	Shut in 30 minutes, open 2 hours, shut in 90 minutes. Strong blow after 5 minutes and continued throughout test. Recovered 1100 feet of muddy water, 3470 feet of water, 30 feet of mud. Initial shut in pressure 3545 lbs., initial flow pressure 400 lbs., final flow pressure 2165 lbs., final shut in pressure 3420 lbs., hydrostatic pressure 4450 lbs.
Shell-Carter No. 1 Clarkson-Hansen	NENE 28-21-3E	4967-5052	Open 1½ hours. Recovered 4227 feet of fluid—watery mud, followed by water. Interval had a little staining.
		8151-8233 8260-8341	No record Recovered 92 feet of gassy, muddy oil, (60% oil, 40% mud), 273 feet of gassy oily mud (25% oil, 75% mud).
Shell No. 34-29 Johnson	SWSE 29-21-4	8602-8607	Production test. Swabbed 304 barrels (154 barrel load) in 16½ hours. Average rate last 6 hours 7 barrels/hour oil, 11.0 barrels/hour water—61% cut.
Shell No. 1 State "A"	SWSE 9-21-4	4473-4487	Recovered 815 feet of fresh muddy water.
		6561-6605	Recovered 1170 feet of fresh muddy water.
		6863-6882	Recovered 295 feet of fresh muddy water.
		6981-6996	Open 1 hour, recovered 150 feet of muddy water, 90 feet of salt water.
		7090-7114	Open 90 minutes. Recovered 2970 feet of black sulphur water, 15 feet of black residue with amber oil film.
Shell No. 32-16 State	SWNE 16-21-4	8589-8604 5930-5986	Open 90 minutes. Recovered 570 feet of 22° gravity oil. Open 2½ hours, shut in 1½ hours. Light blow increasing to medium blow after 15 minutes and then de-

Well Name	Location	Interval	Results/Recovery
			creasing to weak blow. Recovered 90 feet watery mud, 2105 feet of muddy water. Initial shut in pressure 2540 lbs., initial flow pressure 237 lbs., final flow pressure 1060 lbs., final shut in pressure 2320 lbs., hydrostatic pressure 3130 lbs.
		6110-6204	Open 2½ hours, shut in 1½ hours. Strong blow decreased to weak blow at end of test. Recovered 1035 feet of watery mud, 3230 feet of muddy water. Initial shut in pressure 2900 lbs., initial flow pressure 325 lbs., final flow pressure 2060 lbs., final shut in pressure 2790 lbs.
		6890-6920	Open 2½ hours, shut in 1½ hours. Strong blow throughout test. Recovered 282 feet of watery mud, 4024 feet of slightly muddy water. Initial shut in pressure 3005 lbs., initial flow pressure 150 lbs., final flow pressure 1800 lbs., final shut in pressure 2865 lbs., hydrostatic pressure 3675 lbs.
		8622-8646	Open 2½ hours, shut in 1½ hours. Weak blow died in 2 hours, no gas to surface. Recovered 690 feet of fluid, of which 240 feet was gassy, slightly watery, slightly oily mud (1% oil) and 450 feet of gassy, slightly muddy, oily water (10% oil). Initial shut in pressure 3420 lbs., initial flow pressure 0 lbs., final flow pressure 275 lbs., final shut in pressure 335 lbs., hydrostatic pressure 4840 lbs.
		8647-8668	Open 2½ hours, tool could not be shut in. Weak blow for 45 minutes, dead remainder of time. Recovered 30 feet of watery mud and 180 feet of muddy water. Initial flow pressure 35 lbs., final flow pressure 80 lbs., hydrostatic pressure 4690 lbs.
		8672-8689	Open 2½ hours, shut in 1½ hours. Weak blow died in one hour. Recovered 570 feet of fluid which included; 115 feet of gassy, oily mud (15% oil); 420 feet of gassy, oily, watery mud (20% oil), 35 feet of gassy, oily, muddy water (10% oil). Initial shut in pressure 3470 lbs., initial flow pressure 0 lbs., final flow pressure 250 lbs., final shut in pressure 3400 lbs., hydrostatic pressure 4660 lbs.
		8691-8719	Open 2½ hours, shut in 1½ hours.

Well Name	Location	Interval	Results/Recovery
			Good blow for 1 hour—decreased slightly at end of test. Recovered 395 feet of watery, gassy, slightly oily mud (10% oil), 1860 feet of gassy slightly oily muddy water (15% oil), 95 feet of water. Initial shut in pressure 3725 lbs., initial flow pressure 180 lbs., final flow pressure 1025 lbs., final shut in pressure 3520 lbs., hydrostatic pressure 4960 lbs.
Shell No. 12-11 Titus	SWNW 11-20-4	8359-8380	Open 2 hours, shut in 1½ hours. Recovered 570 feet slightly mud cut oil (97-99% oil), 90 feet of oil cut water (40% oil), 560 feet of mud cut water with trace of oil. Initial flow pressure 123 lbs., final flow pressure 488 lbs., initial shut in pressure (after 30 minutes) 3670 lbs., final shut in pressure 3442 lbs., hydrostatic pressure 4755 lbs. Bottom hole temperature 204°F.
Shell No. 12-17B Johnson	SWNW 17-20-5	8448-8473	Open 2 hours, closed 1½ hours. Recovered 1455 feet of mud cut water with trace of oil, 930 feet of mud cut water. Initial flow pressure 165 lbs., final flow pressure 1035 lbs., initial shut in pressure (30 minutes) 3632 lbs., final shut in pressure 3478 lbs., hydrostatic pressure 4645 lbs. Bottom hole temperature 216°F.
Shell No. 12-28 State	SWNW 28-21-4	8687-8710	Open 2 hours, closed 1½ hours. Recovered 130 feet of mud cut oil (72% oil), 45 feet of slightly oil and mud cut water (95% water), 1119 feet of water. Initial flow pressure 83 lbs., final flow pressure 570 lbs., initial shut in pressure (30 minutes) 3565 lbs., final shut in pressure 3368 lbs., hydrostatic pressure 4960 lbs. Bottom hole temperature 225°F.
Shell No. 32-17 Graves	SWNE 17-21-4	8607-8669	Open 2 hours, closed 90 minutes. Recovered 1390 feet of oil with trace of water, 270 feet of oil and water cut mud (25-30%), 90 feet of mud and oil cut water (65% water). Initial flow pressure 210 lbs., final flow pressure 740 lbs., initial shut in pressure (30 minutes) 3495 lbs., final shut in pressure 3100 lbs., hydrostatic pressure 4670 lbs. Bottom hole temperature 214°F.
		8669-8720	Open 50 minutes, closed 90 minutes. Recovered 210 feet of slightly gas cut mud with trace of oil. Initial flow pressure 75 lbs., final flow pressure 170 lbs., initial shut in pressure (30 minutes) 2285 lbs., final shut in pres-

Well Name	Location	Interval	Results/Recovery
Shell No. 32-9 State	SWNE 9-21-4	8570-8595	sure 3550 lbs., hydrostatic pressure 4670 lbs. Bottom hole temperature 215°F. Open 2 hours, closed 1½ hours. Recovered 123 feet of oil, 139 feet of water cut oil (90% oil), 279 mud cut water with trace of oil, 140 feet of slightly mud cut water. Initial flow pressure 105 lbs., final flow pressure 328 lbs., initial shut in pressure (30 minutes) 3152 lbs., final shut in pressure 2932 lbs., hydrostatic pressure 4842 lbs. Bottom hole temperature 219°F.
Shell No. 32-27 Govt.	SENE 27-20-5	8315-8365	Open 2 hours, closed 1½ hours. Recovered 15 feet of oil (24° gravity) slightly mud cut, 190 feet of heavy mud and water cut oil, 705 feet of heavy oil cut muddy water, 330 feet of slightly oil cut water.
		8364-8461	Open 2 hours, closed 1½ hours. Recovered 320 feet of salt water cut mud.
		8458-8519	Open 2 hours, closed 1½ hours. Recovered 4160 feet of fresh water (salinity 2480 ppm).
Shell No. 32-31 Niemi	SWNE 31-20-5	8374-8376	Production test. Swabbed fluid down to 7500 feet. Acidized with 250 gallons of 7½% HCl acid. Swabbed 99 barrels of fluid (30 barrels of load). Average rate last 2 hours 5.3 barrels per hour of water—100 percent water cut. Salinity 6600 ppm.
		8376-8378	Production test. Acidized with 1000 gallons of 15% HCl acid. Swabbed 109 barrels of fluid (58 barrels load) in 7½ hours. Average rate last 2 hours, zero barrels of oil per hour and 18.1 barrels of water per hour (100% cut) (salinity 26,400 ppm).
Shell-Carter No. 1 Clarkson and Hanson	NENE 28-21-3	4967-5052	Tool opened 1½ hours. Recovered 4227 feet of fluid—watery mud followed by water.
		8151-8233	No record.
		? -8305	No record.
		? -8412	No record.
Signal No. 1 State	SESE 36-23-2	8414-8484	No record.
		6807-6873	Straddle test. Open 6 minutes, closed ½ hour, opened 2 hours, closed in 1 hour. Good to strong blow in 30 seconds, decreasing after 75 minutes with fair blow at end of test. Recovered 5600 feet of slightly mud cut brackish water. Initial shut in pressure 2953 lbs., final shut in pressure 3100 lbs., initial flow pressure

Well Name	Location	Interval	Results/Recovery
		6987-7054	386 lbs., final flow pressure 2627 lbs. Open 5 minutes, closed in ½ hour, open 2 hours, closed in 1 hour. Fair blow immediately increasing to strong blow in 11 minutes—remained strong throughout test. Recovered 2740 feet total fluid; 900 feet of mud cut salt water, 1840 feet of black brackish sulphurous water, very slightly mud cut. Initial shut in pressure 3209 lbs., final shut in pressure 3182 lbs., initial flow pressure 137 lbs., final flow pressure 1162 lbs., initial hydrostatic pressure 3815 lbs., final hydrostatic pressure 3760 lbs.
		8464-8479	Straddle test. Open 5 minutes, closed ½ hour, open 2 hours, closed 1 hour. Began with slight blow, decreased to weak in 15 minutes and remained weak throughout test. Recovered 35 feet of heavily oil cut mud, 270 feet of slightly oil cut and heavily mud cut water. Initial shut in pressure 3465 lbs., final shut in pressure 3110 lbs., initial flow pressure 30 lbs., final flow pressure 90 lbs., initial hydrostatic pressure 4550 lbs., final hydrostatic pressure 4390 lbs.
		8528-8550	Straddle test. Open 5 minutes, closed ½ hour, open 2 hours, closed 1 hour. Began with slight blow, increased to weak blow in 20 minutes, increased to fair blow at end of test. Recovered 100 feet of heavily oil cut mud, 180 feet of heavily oil and gas cut muddy water, 90 feet of slightly oil cut and heavily gas cut muddy water. Initial shut in pressure 3685 lbs., final shut in pressure 3360 lbs., initial shut in pressure 90 lbs., final flow pressure 325 lbs., initial hydrostatic pressure 3685 lbs., final hydrostatic pressure 3360 lbs. Temperature 245°F.
Signal Gulf No. 1 Olson	NWNE 23-20-7	8269-8310	Open 2 hours, closed ½ hour. Recovered 720 feet of water cushion, 180 feet slightly mud cut and very slightly oil cut cushion, 110 feet slightly water cut and very slightly oil cut mud. Initial shut in pressure 3598 lbs., final shut in pressure 3051 lbs., initial flow pressure 424 lbs., final flow pressure 452.6 lbs., initial hydrostatic pressure 4327.5 lbs.,



Well Name	Location	Interval	Results/Recovery
		8337-8388	final hydrostatic pressure 4318 lbs. Open 2½ hours, closed ½ hour. Recovered 680 feet of water cushion, 90 feet of mud cut cushion, 130 feet of very slightly oil and gas cut cushion, 320 feet of slightly oil and gas cut water. Initial shut in pressure 3579.9 lbs., final shut in pressure 2846.5 lbs., initial flow pressure 462.1 lbs., final flow pressure 566.8 lbs., initial hydrostatic pressure 4434.9 lbs., final hydrostatic pressure 4434.9 lbs.
Sinclair No. 1 White	SWNE 34-15-7	7560-7624	Open 5 minutes, closed 30 minutes, open 1 hour, closed ½ hour. Opened tool with fairly steady blow throughout test. Recovered 180 feet of drilling mud, 630 feet of mud cut water, 2375 feet of water. Initial hydrostatic pressure 3958 lbs., initial flow pressure 109 lbs., final flow pressure 1102 lbs., initial closed in pressure 3127 lbs., final closed in pressure 2951 lbs., final hydrostatic pressure 3897 lbs. Temperature 180°F.
Sun No. 1 Govt.- Gregg	NWSE 21-22-5	7380-7430	Open 4 hours, closed 1 hour. Fair blow to good blow in 15 minutes, good blow for one hour, decreasing to fair blow at end of test. Recovered 720 feet muddy salt water, 900 feet of very slightly gas cut salt water with scattered specks of black oil residue. Initial flow pressure 295 lbs., final flow pressure 930 lbs., shut in pressure 2760 lbs., initial hydrostatic pressure 4230 lbs., final hydrostatic pressure 4190 lbs.
		7430-7498	Open 75 minutes, closed 45 minutes. Good blow throughout test. Recovered 225 feet of slightly gas cut mud, 720 feet muddy salt water. Initial flow pressure 110 lbs., final flow 430 lbs., shut in pressure 2940 lbs., final hydrostatic pressure 4140 lbs.
		9220-9260	Open 3 hours, closed 45 minutes. Fair blow to good blow in 5 minutes, good blow for 2 hours, declined to fair blow at end of test. Recovered 2430 feet of gas, 30 feet of mud, 270 feet of oil (32° gravity), 180 feet oil cut water (50% oil), 90 feet oil cut water (25% oil), 180 feet oil cut water (10% oil), 1710 feet salt water. Initial flow pressure 25 lbs., final flow pres-

Well Name	Location	Interval	Results/Recovery
Texaco No. 1 State "A"	NENW 35-18-4	9261-9308	<p>sure 1090 lbs., shut in pressure 3380 lbs., hydrostatic pressure 4670 lbs. Bottom hole temperature 220°F. Open 3 hours, shut in 1 hour. Light to good blow 105 minutes, good blow remainder of test. Recovered 1820 feet of gas, 180 feet of heavily oil and gas cut mud (50% oil), 270 feet of oil and gas cut mud (25% oil), 270 feet of oil and gas cut muddy water (5% oil). Initial flow pressure 60 lbs., final flow pressure 360 lbs., shut in pressure 3320 lbs., hydrostatic pressure 4630 lbs.,</p>
		9308-9318	<p>Open 3 hours, closed 1 hour. Weak to fair blow for 45 minutes, died at end of test. Recovered 290 feet of muddy water. Initial hydrostatic pressure 4760 lbs., final hydrostatic pressure 4700 lbs., initial flow pressure 120 lbs., final flow pressure 120 lbs., shut in pressure 3200 lbs.</p>
		9345-9361	<p>Open 2½ hours, closed 1 hour. Recovered 345 feet of very slightly gas cut muddy water. Weak blow for 1¾ hours and died for remainder of test. Initial flow pressure 0 lbs., final flow pressure 125 lbs., initial hydrostatic pressure 5025 lbs., final hydrostatic pressure 4825 lbs., shut in pressure 3535 lbs.</p>
		7109-7184	<p>Open 15 minutes, closed 45 minutes, open 3 hours, closed 1 hour. Immediate weak blow, increased to fair blow in 75 minutes until end of test. Recovered 465 feet of muddy salt water, 1170 feet of salt water. Initial shut in pressure 3140 lbs., final shut in pressure 2930 lbs., initial flow pressure 195 lbs., final flow pressure 690 lbs., initial hydrostatic pressure 3955 lbs., final hydrostatic pressure 3895 lbs. Bottom hole temperature 160°F.</p>
		7221-7271	<p>Open 15 minutes, closed 45 minutes, open 3 hours, shut in 1 hour. Immediate good blow increased to strong blow in 3 minutes and remained strong throughout test. Recovered 6055 feet of salt water. Initial shut in pressure 3270 lbs., final shut in pressure 3255 lbs., initial flow pressure 570 lbs., final flow pressure 2665 lbs., initial hydrostatic pressure 4105 lbs., final hydrostatic pressure 4070 lbs. Bottom hole temperature 222°F.</p>
		7519-7579	<p>Open 15 minutes, closed 45 minutes,</p>

Well Name	Location	Interval	Results/Recovery
Texaco No. 1 Govt.- Saterdal	SWNW 12-15-6	7590-7615	<p>open 3 hours, shut in 1 hour. Immediate strong blow decreased to weak at end of test. Recovered 300 feet of slightly gas and water cut mud, 270 feet mud cut salt water, 795 feet of salt water. Initial shut in pressure 3700 lbs., final shut in pressure 2845 lbs., initial flow pressure 365 lbs., final flow pressure 645 lbs., initial hydrostatic pressure 4255 lbs., final hydrostatic pressure 4180 lbs. Bottom hole temperature 226°F.</p> <p>Open 15 minutes, shut in 45 minutes, open 3 hours, closed 1 hour. Immediate weak blow, increased to good blow in 45 minutes for remainder of test. Recovered 312 feet of muddy salt water, 1150 feet of salt water. Initial shut in pressure 3365 lbs., final shut in pressure 3255 lbs., initial flow pressure 150 lbs., final shut in pressure 645 lbs., initial hydrostatic pressure 4330 lbs., final hydrostatic pressure 4295 lbs. Bottom hole temperature 231°F.</p>
		8120-8180	<p>Open 15 minutes, closed 45 minutes, open 3 hours, closed 1 hour. Immediate very strong blow, died in 30 minutes. Recovered 200 feet of mud, 400 feet of muddy salt water, 7450 feet of salt water. Initial shut in pressure 3535 lbs., final flow pressure 3550 lbs., initial flow pressure 3535 lbs., final flow pressure 3535 lbs., initial hydrostatic pressure 4610 lbs., final hydrostatic pressure 4520 lbs. Bottom hole temperature 190°F.</p>
		6775-6810	<p>Open 5 minutes, closed 45 minutes, open 2 hours, closed 90 minutes. Recovered 390 feet of water cut mud, 360 feet of mud cut water, 1080 feet of brackish water (not salty), 790 feet of black sulphurous brackish water. Initial shut in pressure 2771 lbs., final shut in pressure 2771 lbs., initial flow pressure 1532 lbs., final flow pressure 2599 lbs., initial hydrostatic pressure 3383 lbs., final hydrostatic pressure 3369 lbs. Bottom hole temperature 181°F.</p> <p>Open 5 minutes, closed 45 minutes, open 2 hours, closed 90 minutes. Tool reopened with good blow to strong blow in 3 minutes—continued throughout test. Recovered 398 feet of mud cut water, 4644 feet of water. Initial hydro-</p>

Well Name	Location	Interval	Results/Recovery
		7000-7060	static pressure 3773 lbs., initial shut in pressure 3072 lbs., initial flow pressure 121 lbs., final flow pressure 2176 lbs., final shut in pressure 3023 lbs., initial hydrostatic pressure 3746 lbs. Temperature 190°F.
		7060-7140	Open 5 minutes, closed 45 minutes, open 2 hours, closed 1½ hours. Re-opened tool with very weak blow, died in 32 minutes. Recovered 60 feet of drilling mud. Initial hydrostatic pressure 3889 lbs., initial closed in pressure 1940 lbs., final closed in pressure 1625 lbs., initial flow pressure 32 lbs., final flow pressure 39 lbs., final hydrostatic pressure 3872 lbs. Temperature 150°F.
		7140-7190	Open 5 minutes, closed 45 minutes, open 2 hours, closed 1½ hours. Tool reopened with weak blow, increased to strong blow by end of test. Recovered 30 feet of drilling mud with slight show of oil, 1060 feet of slightly salty water with scum of oil. Initial hydrostatic pressure 3954 lbs., final hydrostatic pressure 3930 lbs., initial shut in pressure 3172 lbs., final shut in pressure 2941 lbs., initial flow pressure 34 lbs., final flow pressure 543 lbs. Temperature 150°F.
		7190-7250	Open 5 minutes, shut 45 minutes, open 2 hours, closed 1½ hours. Re-opened tool with fair blow increasing to strong blow the last 105 minutes of test. Recovered 60 feet of water cut mud with slight trace of oil, 4390 feet of slightly muddy water with slight trace of oil. Initial hydrostatic pressure 4020 lbs., final hydrostatic pressure 3965 lbs., initial closed in pressure 3239 lbs., final closed in pressure 3159 lbs., initial flow pressure 106 lbs., final flow pressure 2078 lbs. Bottom hole temperature 186°F.
			Open 5 minutes, closed 45 minutes, open 2 hours, closed 1½ hours. Re-opened tool with good blow increasing to strong blow throughout entire flow test. Recovered 1440 feet of muddy water, 5508 feet of water with very slight trace of oil. Initial hydrostatic pressure 4179 lbs., final hydrostatic pressure 4031 lbs., initial flow pressure 491 lbs., final flow pressure 3094 lbs., initial shut in pressure 3267

Well Name	Location	Interval	Results/Recovery
			lbs., final shut in pressure 3265 lbs. Temperature 190°F.

#### DRILL STEM TESTS—HYDE COUNTY

Well Name	Location	Interval	Results/Recovery
Hunt-Lakota No. 1 State	SWNW 31-116N-73W	2339-2420	Recovered 2420 feet of water—to surface in 11 minutes. Bottom hole pressure 1300 lbs. (15 minutes), hydrostatic pressure 1500 lbs.
		2542-2460	Recovered 20 feet of mud. Bottom hole pressure 225 lbs., hydrostatic pressure 1600 lbs.

#### DRILL STEM TESTS—JACKSON COUNTY

Well Name	Location	Interval	Results/Recovery
Campbell No. 1 Dale	SWSW 1-1S-22E	3910-3930	Open 50 minutes, shut in 20 minutes. Recovered flow of fresh water—no show.
		3350-3372	Open 1 hour, shut in ½ hour. Recovered 1 joint (30 feet) of water cut mud.
Cities Service No. 1 Phipps "A"	NWSW 4-2S-23E	3356-3410	Shut in ½ hour, open 1 hour, shut in ½ hour. Opened with strong blow—gradually decreased to weak at end of test. Recovered 1648 feet of brackish (salty taste) water. Initial flow pressure 268 lbs., final flow pressure 714 lbs., initial shut in pressure 1498 lbs., final shut in pressure 1444 lbs., initial hydrostatic pressure 1765 lbs., final hydrostatic pressure 1658 lbs.
		3370-3378	Straddle test. Shut in ½ hour, open 1½ hours, shut in ½ hour. Opened with fair blow, decreased to weak in one hour and remained to end of test. Recovered 774 feet of brackish water. Initial flow pressure 66 lbs., final flow pressure 332 lbs., initial shut in pressure 1496 lbs., final shut in pressure 1488 lbs., initial hydrostatic pressure 1739 lbs., final hydrostatic pressure 1712 lbs.
		3801-3838	Straddle test. Shut in ½ hour, open 1½ hours, shut in 30 minutes. Very weak blow throughout test. Recovered 70 feet of water cut drilling mud. Initial flow pressure 39 lbs., final flow pressure 53 lbs., initial shut in pressure 1725 lbs., final shut in pressure 1672 lbs., initial hydrostatic pressure 2008 lbs., final hydrostatic pressure 1967 lbs.
		4367-4420	Shut in 30 minutes, open 72 minutes,

Well Name	Location	Interval	Results/Recovery
Cities Service No. 1 Renning	SEnw 5-2S-23E	3290-3312	shut in 30 minutes. Very weak blow throughout test. Recovered 90 feet of water cut mud. Initial flow pressure 26 lbs., final flow pressure 53 lbs., initial shut in pressure 1940 lbs., final shut in pressure 1973 lbs., initial hydrostatic pressure 2417 lbs., final hydrostatic pressure 2335 lbs. Open 30 minutes, shut 75 minutes, open 30 minutes, shut 30 minutes. Tool opened with good blow throughout test. Recovered 950 feet of slightly mud cut water. Initial hydrostatic pressure 1736 lbs., final hydrostatic pressure 1729 lbs., initial closed in pressure 1509 lbs., final closed in pressure 1707 lbs. (packer seat failed), initial flow pressure 43 lbs., final flow pressure 414 lbs.
Cities Service No. 1 Vilhauer "A"	NESW 17-2S-25E	4172-4180	Shut in ½ hour, open ½ hour, shut in 30 minutes. Tool opened with very weak blow for 5 minutes and died. Recovered 3 feet of drilling mud. Initial flow pressure 26 lbs., final flow pressure 28 lbs., initial shut in pressure 1860 lbs., and building, initial hydrostatic pressure 2131 lbs., final hydrostatic pressure 2117 lbs.
Sorelle No. 1 State	NENW 16-1S-22E	3537-3557	Open 1½ hours, shut in 20 minutes. Weak blow for 10 minutes. Recovered 480 feet of drilling mud. Tool plugged—was spudded in 42 stands of pipe.

#### DRILL STEM TESTS—JONES COUNTY

Well Name	Location	Interval	Results/Recovery
Shell No. 1 Herman	SWSW 15-1-29	2339-2385	Shut in 1 hour, open 50 minutes. Fresh water surfaced in 40 minutes, flowed 180 barrels per day. Initial flow pressure 175 lbs., final flow pressure 1050 lbs., shut in pressure 1150 lbs. Bottom hole temperature 118°F.
Shell No. 2 Herman	NWNE 3-1-29	2868-2969	Open 2 hours. Firm blow immediately—increased to strong in 3 minutes. Water to surface in 75 minutes. Flowed fresh water at rate of 75 barrels per day. Initial flow pressure 410 lbs., final flow pressure 1290 lbs., shut in pressure 1380 lbs., hydrostatic pressure 1600 lbs.
		3050-3210	Open 1 hour, shut in 45 minutes. Immediate strong blow—water surfaced

Well Name	Location	Interval	Results/Recovery
Shell No. 1 Olson	NWSW 8-2-26	2514-2619	in 14 minutes and flowed at rate of 1100 barrels per day. Initial flow pressure 1570 lbs., final flow pressure 1580 lbs., shut in pressure 1590 lbs. Open 2 hours, shut in 30 minutes. Slight blow increased to fair blow in 5 minutes to good blow in 45 minutes—decreased to fair blow in 90 minutes. Recovered 300 feet of drilling mud, 630 feet of muddy water with 7,840 ppm NaCl. Initial flow pressure 300 lbs., final flow pressure 480 lbs., final bottom hole shut in pressure 1180 lbs., initial hydrostatic pressure 1375 lbs., final hydrostatic pressure 1350 lbs.
		3480-3522	Open 4 hours, closed 30 minutes. Fluid surfaced in 10 minutes. Recovered fresh water flowing at rate of 2000 barrels of water per day. Initial flow pressure 1508 lbs., final flow pressure 1675 lbs., shut in pressure 1730 lbs., initial hydrostatic pressure 1845 lbs., final hydrostatic pressure 1836 lbs. Temperature of water 140°F in the tool.
Tenneco No. 1 Herman Estate	SWSE 10-1-29	1390-1443	Open 5 minutes, closed 30 minutes, open 30 minutes, closed 60 minutes, open 60 minutes, closed 90 minutes. Recovered 410 feet of muddy water. Initial flow pressure 72 lbs., second flow pressure 150 lbs., final flow pressure 390 lbs., initial shut in pressure 490 lbs., second shut in pressure 479 lbs., final shut in pressure 489 lbs., initial hydrostatic pressure 859 lbs., final hydrostatic pressure 719 lbs. Bottom hole temperature 86°F.

#### DRILL STEM TESTS—LYMAN COUNTY

Well Name	Location	Interval	Results/Recovery
Gulf No. 1 Wolf-State	SWSW 16-104N-78W	1810	Hit water flow at 1810 feet. Estimated flow of 250 barrels per hour and bottom hole pressure of 1000 lbs.

#### DRILL STEM TESTS—MEADE COUNTY

Well Name	Location	Interval	Results/Recovery
Lion No. 1 Government	SWNE 9-4-11	1576-1593	Open 1 hour, shut in 20 minutes. Weak blow throughout test. Recovered

Well Name	Location	Interval	Results/Recovery
Morton No. 1 Snyder	SESE 20-5-9	2080-2110	175 feet of very slightly gas cut mud. Flow pressure 0 lbs., shut in pressure 0 lbs., hydrostatic pressure 800 lbs. Open ½ hour. Reported "no results, sand apparently tight." However, water analysis by the S. D. Chemical Laboratory indicates water recovered from Newcastle interval contained 3728 ppm total solids, 1557 ppm of chloride, very small amount of sulfate, and sodium chloride equivalent to all chlorine was 2565 ppm.
Phillips No. 1 Ferguson	NESE 34-7-13	4797-4814	Open 2 hours, closed 30 minutes. Tool opened with weak blow, increased to medium blow in 25 minutes for the remainder of test. Recovered 540 feet of fresh water with show of oil. Initial hydrostatic pressure 2529 lbs., final hydrostatic pressure 2430 lbs., initial flow pressure 40 lbs., final flow pressure 269 lbs., final closed in pressure 1702 lbs. Estimated bottom hole temperature 130°F.
		6266-6288	Closed 30 minutes, open 60 minutes, closed 30 minutes. Tool opened with a strong blow—decreased to weak blow at end of test. Recovered 6155 feet of water. Initial hydrostatic pressure 3264 lbs., final hydrostatic pressure 3264 lbs., initial shut in pressure 2623 lbs., final shut in pressure 2624 lbs., initial flow pressure 886 lbs., final flow pressure 2624 lbs. Bottom hole temperature calculated 140°F.
Phillips No. 2 Harrington	NWSW 24-3-8	1670-1704	Open 1 hour, shut in 30 minutes. Recovered 1040 feet of water. Tool opened with immediate weak blow, increased to strong in 2 minutes. Initial hydrostatic pressure 800 lbs., final hydrostatic pressure 775 lbs., initial flow 125 lbs., final flow 425 lbs., final shut in pressure 425 lbs. Temperature 100°F.

#### DRILL STEM TESTS—MELLETTTE COUNTY

Well Name	Location	Interval	Results/Recovery
Gulf No. 1 Olson	NENW 14-43N-29W	3133-3196	Open 5 minutes, shut in 30 minutes, open 70 minutes, shut in 30 minutes. Opened tool with weak blow increased to strong blow immediately—fluid to surface in 60 minutes, flowed clear water for 10 minutes. Initial hydrostatic pressure 1661 lbs., final hydro-



Well Name	Location	Interval	Results/Recovery
			static pressure 1594 lbs., initial shut in pressure 1539 lbs., final shut in pressure 1532 lbs., initial flow pressure 121 lbs., final flow pressure 1351 lbs. Bottom hole temperature 164°F.

#### DRILL STEM TESTS—PENNINGTON COUNTY

Well Name	Location	Interval	Results/Recovery
Gypsy No. 1 Hunter	NESW 28-3-16	3041-?	Open 1 hour. Recovered 1400 feet of fresh water.
		3325-?	Open 1 hour. Recovered 2300 feet of fresh water.
		3461-?	Open 15 minutes. Recovered 3000 feet of fresh water.

#### DRILL STEM TESTS—PERKINS COUNTY

Well Name	Location	Interval	Results/Recovery
Hunt No. 1 Government	NWSE 8-22-11	8765-8880	Open 4 hours, closed 30 minutes. Recovered 660 feet of very salty water.
Mule Creek No. 41-33 State	NENE 33-13-10	4653-4730	Open 5 minutes, closed 30 minutes, open 32 minutes. Tool opened with immediate very strong blow. Flowed water to surface in 7 minutes at rate of 4 barrels per hour. Initial hydrostatic pressure 2585? lbs., final hydrostatic pressure 2805 lbs., initial flow pressure 2135 lbs., final flow pressure 2165 lbs., initial shut in pressure 2190 lbs., final shut in pressure 2190 lbs.
Shell No. 22-7 Bastian	SENW 7-15-16	5124-5250	Shut in 30 minutes, open 2 hours, shut in 90 minutes. Tool open with immediate medium strong blow which decreased to a good blow in 1 hour—continued through rest of test. Recovered 2475 feet of water (NaCl 59,000 ppm). Initial hydrostatic pressure 2860 lbs., final hydrostatic pressure 2760 lbs., initial shut in pressure 2325 lbs., final shut in pressure 2230 lbs., initial flow pressure 150 lbs., final flow pressure 1205 lbs.
		5278-5325	Shut in 30 minutes, open 2 hours, shut in 90 minutes. Tool opened with strong blow, decreased to medium strong blow in 75 minutes and remained medium strong throughout test. Recovered 1100 feet of mud cut water and 3335 feet of sulphurous water. Initial hydrostatic pressure

Well Name	Location	Interval	Results/Recovery
		6576-6617	2880 lbs., final hydrostatic pressure 2780 lbs., initial shut in pressure 2340 lbs., final shut in pressure 2340 lbs., initial flow pressure 100 lbs., final flow pressure 1970 lbs. Shut in ½ hour, open 2 hours, shut in 1½ hours. Opened with strong blow—increased slightly and continued through-out test. Recovered 2700 feet of water (660 ppm NaCl). Initial hydrostatic pressure 3620 lbs., final hydrostatic pressure 3620 lbs., initial shut in pressure 2850 lbs., final shut in pressure 2730 lbs., initial flow pressure 80 lbs., final flow pressure 1220 lbs.
Shell No. 1 Homme	NWSE 13-20-12	3440-3457	Open 1 hour, shut in ½ hour. Tool opened with fair blow—died in 8 minutes. Recovered 25 feet of drilling mud (600 ppm NaCl). Hydrostatic pressure 1950 lbs.
		3425-3457	Open 60 minutes, shut in 30 minutes. Fair initial puff—died in 4 minutes. Recovered 15 feet of drilling mud. Gas—high 10, low 2. Chlorine 500 ppm. Hydrostatic pressure 1850 lbs.
		4276-4305	Open 60 minutes, shut in 60 minutes. Tool opened with good blow and remained for 45 minutes, then decreased to fair. Recovered 200 feet of mud cut water. Chlorine 1050 ppm. Gas—high 46, low 0, 3000 feet of water, chlorine 1450 ppm. Gas—high 60, low 0. Initial flow pressure 850 lbs., final flow pressure 1400 lbs., shut in pressure 1600 lbs., hydrostatic pressure 2300 lbs.
		4940-4965	Open 1 hour, shut in 1 hour. Tool opened with intermittent blow for 5 minutes. Recovered 15 feet of drilling mud. Chlorine in mud equaled 1500 ppm. Shut in pressure 1800 lbs., hydrostatic pressure 2630 lbs.
		6260-6290	Open 75 minutes, shut in 1 hour. Tool opened with weak initial puff—died in 15 minutes. Recovered 370 feet of water cut mud. Chlorine 60,000 ppm. Gas high 200-500, low 110-480 (H <sub>2</sub> S). Scattered pin points of oil. Initial bottom hole formation pressure 85 lbs., final bottom hole formation pressure 330 lbs., bottom hole shut in pressure 2432 lbs. and building, hydrostatic pressure 3595 lbs.

Well Name	Location	Interval	Results/Recovery
		6460-6483	Open 1 hour, shut in 1 hour. Faint air blow decreased in 4 minutes. Recovered 275 feet of drilling mud. Gas—high 120, low 100. 270 feet of black sulphur water. Gas in water, high 100, low 100 (H <sub>2</sub> S). Chlorine 1900 ppm. Initial bottom hole pressure 85 lbs., final bottom hole pressure 295 lbs., final shut in pressure 2270 lbs., hydrostatic pressure 3345 lbs.
		6652-6802	Open 1 hour, shut in 1 hour. Tool opened with very strong blow which died in 50 minutes. Recovered 6410 feet of fluid. Chlorine 1300 ppm. Of recovery 840 feet was drilling mud, 5570 feet was fresh water. Gas in fluid was 2.2V-12-8, 1.4V-4-8. Initial bottom hole flow pressure 1600 lbs., final bottom hole flow pressure 2830 lbs., bottom hole shut in pressure 2865 lbs., hydrostatic pressure 3430 lbs.
		7596-7660	Open 2 hours, shut in (failed to close). Initial puff increased to strong blow for 110 minutes. Recovered 1000 feet of water cushion, 1500 feet of water cut mud. Chlorine 3400-14,000 ppm. Sp.Gr.-1.014 at 72°F. Initial flow pressure 405 lbs., final flow pressure 1125 lbs.
		7666-7894	Mis-run.
		7666-7894	Open 1 hour. Strong initial puff decreased to weak in 8 minutes and died in 45 minutes. Recovered 1000 feet of water cushion. Chlorine 500 ppm, 560 feet of drilling mud. Chlorine 1600 ppm. Initial bottom hole pressure 805 lbs., final bottom hole pressure 805 lbs., bottom hole shut in pressure 1385 lbs., hydrostatic pressure 3910 lbs.
		8069-8134	Open 1½ hour, shut in 60 minutes. Fair initial puff decreased to weak in 40 minutes. Recovered 1000 feet of water cushion, 450 feet of mud cut salt water (average salinity 45,000 ppm Cl). Initial bottom hole flow pressure 605 lbs., final bottom hole flow pressure 785 lbs., shut in pressure 3300 lbs., hydrostatic pressure 4210 lbs.
		8141-8194	Open 1 hour, shut in 1 hour. Fair continuous blow. Recovered 660 feet of mud and gas cut salt water. Salinity—top 3200 ppm, middle 132,000 ppm, bottom 191,000 ppm. Initial bottom hole flow pressure 85 lbs., final bottom hole flow pressure 290 lbs., shut in pres-

Well Name	Location	Interval	Results/Recovery
Shell No. 1 Veal	SESE 7-17-15	3855-3885	sure 3185 lbs., hydrostatic pressure 4185 lbs. Open 1 hour, shut in 1 hour. Recovered 780 feet of fresh water. Final flow pressure 370 lbs., shut in bottom hole pressure 1390 lbs., hydrostatic pressure 2035 lbs.
		5368-5418	Open 75 minutes, shut in ½ hour, strong blow for 1 hour. Recovered 5060 feet of salt water. Initial flow pressure 1500 lbs., final flow pressure 2300 lbs., shut in bottom hole pressure 2335 lbs., hydrostatic pressure 2950 lbs.
		5479-5655	Open 2 hours, shut in 1 hour. Recovered 1695 feet of mud and air cut salt water. Initial flow pressure 400 lbs., final flow pressure 850 lbs., shut in bottom hole pressure 2250 lbs.
		5752-5798	Open 2 hours, shut in 1 hour. Strong blow throughout. Recovered 5540 feet of sulphur water. Initial flow pressure 200 lbs., final flow pressure 2250 lbs., shut in bottom hole pressure 2300 lbs., hydrostatic pressure 2900-2750 lbs.
		5949-5973	Open 1 hour, shut in ½ hour. Strong blow throughout test. Recovered 4880 feet of sulphur water. Initial flow pressure 1000 lbs., final flow pressure 2100 lbs., shut in bottom hole pressure 2425 lbs.
		6569-6633	Open 1 hour, shut in 1 hour. Recovered 545 feet of salty water cut mud. Initial flow pressure 0 lbs. final flow pressure 500 lbs., shut in bottom hole pressure 2700 lbs.
		6703-6713	Open 1 hour, shut in 1 hour. Recovered 60 feet of water cut mud. No show (38,000 ppm-salinity). Initial flow pressure 0 lbs., final flow pressure 50 lbs., shut in bottom hole pressure 2800 lbs.
		6851-6895	Open 1 hour, shut in ½ hour. Recovered 6050 feet of slightly salty water. Final flow pressure 2750 lbs., shut in bottom hole pressure 2950 lbs.
		7131-7166	Open 1 hour, shut in ½ hour. Recovered 6850 feet of salt water. Initial flow pressure 2100 lbs., final flow pressure 3150 lbs., shut in bottom hole pressure 3150 lbs.
		7207-7233	Open 2 hours, shut in 1 hour. Recovered 690 feet of salt water cut mud. Initial flow pressure 50 lbs.,

Well Name	Location	Interval	Results/Recovery
		7901-7977	final flow pressure 375 lbs. Open 1 hour, shut in ½ hour. Recovered 6350 feet of fresh water.
Youngblood No. 1 Anderson	NENE 26-21-14	6227-6250	Initial flow pressure 1300 lbs., final flow pressure 2400 lbs., shut in bottom hole pressure 3400 lbs. Open 1 hour, closed 1 hour. Tool opened with good blow to strong in 3 minutes and continued throughout test. Recovered 1620 feet of drilling mud, 360 feet of mud cut water, 810 feet of slightly salty water. Initial flow pressure 545 lbs., final flow pressure 1185 lbs., shut in pressure 2635 lbs., hydrostatic pressure 3450 lbs.

#### DRILL STEM TESTS—POTTER COUNTY

Well Name	Location	Interval	Results/Recovery
California No. 1 Hinkley	NWNW 7-120N-75W	2630-2660	Straddle test. Open 1 hour, shut in 15 minutes. Flowed fresh water. Initial flow pressure 0 lbs., final flow pressure 1050 lbs., hydrostatic pressure 1280 lbs.
		2722-2760	Straddle test. Open 2 hours, shut in 15 minutes. Recovered 1280 feet of water cut drilling mud.
		2758-2860	Open 1 hour, shut in 15 minutes. Flowed muddy fresh water in 22 minutes.

#### DRILL STEM TESTS—SHANNON COUNTY

Well Name	Location	Interval	Results/Recovery
Amerada No. 1 Red Eagle	NWNE 25-36N-48W	3291-3367	Open 3 hours. Recovered 48 feet of drilling mud with no shows of oil or gas.

#### DRILL STEM TESTS—STANLEY COUNTY

Well Name	Location	Interval	Results/Recovery
Benedum No. 1 Shaffner	NWNW 26-6-27	3178-3208	Tool open 30 minutes. Good blow for 30 minutes. Initial shut in bottom hole pressure 1490 lbs., final bottom hole pressure 1245 lbs., hydrostatic pressure (?) 1600 lbs.
Cities Service No. 1 Barrick	NWNE 18-7-28	3350-3461	Open 5 minutes, closed 30 minutes, open 1 hour, closed ½ hour. Tool opened with strong blow, water to surface in 20 minutes—flowed for 40 minutes at rate of 1000 barrels per day. Initial hydrostatic pressure 1841 lbs., final hydrostatic pressure 1806

Well Name	Location	Interval	Results/Recovery
		3574-3660	lbs., initial shut in pressure 1669 lbs., final shut in pressure 1669 lbs., pre flow pressure 1193 lbs., initial flow pressure 1306 lbs., final flow pressure 1591 lbs. Bottom hole temperature 111°F.
		3848-3906	Open 5 minutes, shut in 30 minutes, open 30 minutes, shut in 30 minutes. Tool opened with strong blow. Water flowed to surface in 13 minutes at rate of 85+ barrels per hour. Initial hydrostatic pressure 1965 lbs., final hydrostatic pressure 1946 lbs., pre flow pressure 1645 lbs., initial flow pressure 1685 lbs., final flow pressure 1741 lbs., initial shut in pressure 1758 lbs., final shut in pressure 1758 lbs. Temperature 114°F.
		3932-3988	Tool open 5 minutes, closed 30 minutes, open 1 hour, closed 30 minutes. Tool opened with strong blow in 3 minutes and continued throughout test. Recovered 364 feet of muddy water, 1751 feet of water. Initial hydrostatic pressure 2041 lbs., final hydrostatic pressure 2035 lbs., pre flow pressure 186 lbs., initial flow pressure 253 lbs., final flow pressure 949 lbs., initial shut in pressure 1860 lbs., final shut in pressure 1889 lbs. Temperature 116°F.
Gulf No. 1 Stanley-Federal	SENW 22-8-26	3932-3988	Open 5 minutes, shut in 31 minutes, open 90 minutes, shut in 30 minutes. Tool opened with good blow throughout test. Recovered 120 feet of watery mud, 2967 feet of fresh water. Initial hydrostatic pressure 2690 lbs., final hydrostatic pressure 2568 lbs., initial closed in pressure 2063 lbs., final closed in pressure 2044 lbs., initial flow pressure 167 lbs., final flow pressure 1357 lbs. Temperature 127°F.
Phillips No. 1 State-Stanley	NWSE 36-5-27	2565-2767	Tool open 26 minutes. Drilling mud flowed for 11 minutes, then cleared in next 5 minutes. Clear water flowed for 10 minutes. Bottom hole pressure 900 lbs.
Shell No. 1 Abbot	NENE 9-4-27	2637-2740	Open 35 minutes, shut in 30 minutes. Tool opened with immediate strong blow—increased to very strong blow in 1 minute. Flowed fresh water in 8 minutes at rate of 1300 barrels per day. Initial flow pressure 1380 lbs., final flow pressure 1390 lbs., initial hydrostatic pressure 1505 lbs., final hydrostatic

Well Name	Location	Interval	Results/Recovery
Shell No. 1 McCrone	NENE 9-4-27	766-870	pressure 1500 lbs., shut in bottom hole pressure 1390 lbs. Open 1 hour, shut in 15 minutes. Opened with very weak blow for 2 minutes and died. Bypassed after 30 minutes and recovered fair blow—dead in 1 minute. Recovered 50 feet of slightly gas cut mud. Initial flow pressure 0 lbs., final flow pressure 0 lbs., bottom hole pressure 0 lbs., hydrostatic pressure 420 lbs.
		2700-2720	Open 90 minutes, shut in 1 hour. Weak initial blow died in 5 minutes, intermittent weak blow for 15 minutes. Recovered .05 barrels of drilling mud. Salt in pits=800 ppm, salt in tool=2000 ppm. Initial flow pressure 0 lbs., final flow pressure 0 lbs., bottom hole pressure 1226 lbs., hydrostatic pressure 1464 lbs.
Tenneco No. 1 Hall	SWNE 11-3-27	1158-1182	Open 5 minutes, closed 30 minutes, open 30 minutes, closed 1 hour, open 1 hour, closed 90 minutes. Recovered 90 feet of mud cut water. Initial hydrostatic pressure 571 lbs., final hydrostatic pressure 572 lbs., initial flow pressure 44 lbs., final flow pressure 87 lbs., initial shut in pressure 472 lbs., 2nd shut in pressure 466 lbs., final shut in pressure 453 lbs. Bottom hole temperature 88°F.
		2598-2630	Open 1 minute, closed 30 minutes, open 18 minutes, closed 30 minutes. Flowed fresh water to surface in 6 minutes at a rate of 2000 barrels per day. Initial hydrostatic pressure 1604 lbs., final hydrostatic pressure 1591 lbs., initial flow pressure 1310 lbs., final flow pressure 1384 lbs., initial shut in pressure 1420 lbs., final shut in pressure 1420 lbs. Bottom hole temperature 115°F.
		2733-2743	Open 3 minutes, closed 30 minutes, open 10 minutes, closed 30 minutes. Flowed fresh water to surface in 7 minutes at a rate of 2000 barrels per day. Initial hydrostatic pressure 1662 lbs., final hydrostatic pressure 1656 lbs., initial flow pressure 1230 lbs., final flow pressure 1433 lbs., initial shut in pressure 1483 lbs., final shut in pressure 1508 lbs. Bottom hole temperature 129°F.
Tenneco No. 1 Rankin Trust	NWNW 10-4-28	1104-1192 1181-1310	Mis-run. Open 5 minutes, shut in 45 minutes,

Well Name	Location	Interval	Results/Recovery
		2695-2733	<p>open 30 minutes, shut in 1 hour, open 1 hour, shut in 1½ hours. Recovered 2 barrels of muddy water. Initial hydrostatic pressure 685 lbs., final hydrostatic pressure 644 lbs., initial shut in pressure 513 lbs. (building), second shut in pressure 507 lbs. (building), final shut in pressure 508 lbs., initial flow pressure 117 lbs., second flow pressure 143 lbs., final flow pressure 214 lbs. Bottom hole temperature 83°F.</p> <p>Open 5 minutes, shut in 30 minutes, open 30 minutes, shut in 1 hour, open 1 hour, shut in 1½ hours. Recovered 412 feet of mud cut water (1.7 barrels). Initial hydrostatic pressure 1763 lbs., final hydrostatic pressure 1627 lbs., initial flow pressure 1471 lbs., second flow pressure 1503 lbs., final flow pressure 1503 lbs., initial shut in pressure 1503 lbs., second shut in pressure 1503 lbs., final shut in pressure 1515 lbs. Bottom hole temperature 112°F.</p>

#### DRILL STEM TESTS—ZIEBACH COUNTY

Well Name	Location	Interval	Results/Recovery
Amerada No. 1 Briscoe	NWNE 33-16-18	2581-2658	<p>Open 90 minutes, closed 90 minutes. Tool opened with strong blow—decreased to weak at the end of test. Recovered 2280 feet of drilling mud, 90 feet of water cut drilling mud. Initial hydrostatic pressure 1299 lbs., final hydrostatic pressure 1247 lbs., initial shut in pressure 0 lbs., final shut in pressure 1138 lbs. (building), initial flow pressure 805 lbs., final flow pressure 1100 lbs. Bottom hole temperature 101°F.</p>
		3970-4005	<p>Open 75 minutes, closed 90 minutes. Weak blow for 15 minutes and died. Recovered 632 feet of drilling mud. Initial hydrostatic pressure 2095 lbs., final hydrostatic pressure 2066 lbs., initial shut in pressure 0 lbs., final shut in pressure 1046 lbs. (building), initial flow pressure 390 lbs., final flow pressure 400 lbs.</p>
		4780-4810	<p>Open 1½ hours, closed 1½ hours. Strong blow in 8 minutes—continued throughout test. Recovered 60 feet of drilling mud, 490 feet of black brackish</p>



Well Name	Location	Interval	Results/Recovery
Amerada No. 1 Cheyenne Agency	SESW 20-14-18	2982-3147	water, 540 feet of fresh muddy water. Initial hydrostatic pressure 2771 lbs., final hydrostatic pressure 2745 lbs., initial shut in pressure 0 lbs., final shut in pressure 2110 lbs. (building), initial flow pressure 50 lbs., final flow pressure 557 lbs. Bottom hole temperature 138°F.
		3232-3303	Open 7 minutes, closed 15 minutes, open 95 minutes, closed 30 minutes. Tool opened with a weak blow for 7 minute first flow. Reopened tool with no blow. Bypassed tool and reopened—no blow. Recovered 70 feet of drilling mud. Initial hydrostatic pressure 1472 lbs., final hydrostatic pressure 1446 lbs., initial closed in pressure 67 lbs., final closed in pressure 64 lbs., initial flow pressure 14 lbs., final flow pressure 37 lbs.
			Open 40 minutes, closed 140 minutes. Opened tool with weak blow—died in 1 minute. Recovered 60 feet of drilling mud. Mixed up on rotation of tool and missed initial closed in pressure and flow test of 2 hours which was desired. Initial hydrostatic pressure 1649 lbs., final hydrostatic pressure 1546 lbs., initial flow pressure 38 lbs., final flow pressure 45 lbs.
Amerada No. 1 Trent	SWNE 26-16-18	2600-2650	Open 1 hour, closed ½ hour. Weak blow for 6 minutes and died. Recovered 10 feet of drilling mud. Initial hydrostatic pressure 1345 lbs., final hydrostatic pressure 1322 lbs., initial flow pressure 36 lbs., final flow pressure 37 lbs., final shut in pressure 37 lbs.
		2650-2725	Open 2 hours, closed 65 minutes. Blew for 2 hours. Recovered 808 feet of drilling mud. Initial hydrostatic pressure 1335 lbs., final hydrostatic pressure 1213 lbs., initial flow pressure 249 lbs., final flow pressure 481 lbs., final shut in pressure 978 lbs.
		4840-4871	Open 2 hours, closed 1 hour. Strong blow for 90 minutes, decreased to fair blow for remainder of test. Recovered 177 feet of drilling mud, 1607 feet of water (25,000 ppm chloride). Initial hydrostatic pressure 2612 lbs., final hydrostatic pressure 2528 lbs., initial flow pressure 76 lbs., final flow pressure 827 lbs., final shut in pressure 1983 lbs. (building). Bottom hole temperature 145°F.

Well Name	Location	Interval	Results/Recovery
		4970-5000	Open 2 hours, closed 1 hour. Increased to strong blow after 6 minutes and remained for end of test. Recovered 295 feet of heavily water cut drilling mud, 2374 feet of black sulphur water. Initial hydrostatic pressure 2583 lbs., final hydrostatic pressure 2570 lbs., initial flow pressure 146 lbs., final flow pressure 1177 lbs., final shut in pressure 2154 lbs. (building). Bottom hole temperature 147°F.
		5344-5376	Open 2 hours, closed 1 hour. Weak blow for 2 hours. Recovered 177 feet of water cut drilling mud, 1297 feet of fresh water (chlorides 5000 ppm). Initial hydrostatic pressure 2711 lbs., final hydrostatic pressure 2714 lbs., initial flow pressure 111 lbs., final flow pressure 631 lbs., final shut in pressure 2367 lbs. Bottom hole temperature 148°F.
		5710-5735	Tool open 3 hours, closed ½ hour. Weak steady blow throughout test. Recovered 177 feet of heavily water cut mud, 238 feet of salt water (chlorides 75000 ppm). Initial hydrostatic pressure 2889 lbs., final hydrostatic pressure 2891 lbs., initial flow pressure 34 lbs., final flow pressure 223 lbs., final shut in pressure 2094 lbs. (building). Bottom hole temperature 149°F.
		6162-6190	Open 1 hour, closed ½ hour. Tool opened with weak blow and died after 10 minutes. Recovered 15 feet of drilling mud. Initial hydrostatic pressure 3261 lbs., final hydrostatic pressure 3218 lbs., initial flow pressure 44 lbs., final flow pressure 49 lbs., final shut in pressure 2075 lbs. (building). Bottom hole temperature 144°F.
		6240-6285	Open 130 minutes, closed ½ hour. Tool opened with immediate strong blow, after 1 hour gradually decreased to weak at end of test. Recovered 472 feet of water cut drilling mud, 5678 feet of black sulphur water (chlorides 8000 ppm). Initial hydrostatic pressure 3291 lbs., final hydrostatic pressure 3271 lbs., initial flow pressure 227 lbs., final flow pressure 2722 lbs., final shut in pressure 2752 lbs. Bottom hole temperature 164°F.
Cities Service No. 1 Jensen	NWNE 21-12-22	5031-5081 5041-5079	Mis-run. Open 5 minutes, closed 30 minutes,

Well Name	Location	Interval	Results/Recovery
			open 1 hour, closed ½ hour. Tool opened with strong blow, increased to very strong in 3 minutes and decreased to strong at end of test. Recovered 30 feet of drilling mud, 180 feet of mud cut fresh water, 2218 feet of fresh water. Initial hydrostatic pressure 2649 lbs., final hydrostatic pressure 2622 lbs., initial flow pressure 252 lbs., final flow pressure 933 lbs., initial shut in pressure 2240 lbs., final shut in pressure 2226 lbs. Bottom hole temperature 160°F.
Dayton No. 1 Rural Credit	NESE 35-12-20	3095-3162	Open 52 minutes. Good blow for 30 minutes, then died. Recovered 3026 feet of fresh water. Hydrostatic pressure 1460 lbs., initial flow pressure 450 lbs., final flow pressure 1260 lbs., bottom hole pressure 1260 lbs.
		4312-4420	Open 1 hour. Blew, strong for 45 minutes, weak for 10 minutes, dead for 5 minutes. Recovered 4420 feet of fresh water. Initial hydrostatic pressure 2300 lbs., final hydrostatic pressure 2200 lbs., initial flow pressure 900 lbs., final flow pressure 1900 lbs., shut in pressure 1900 lbs.
		5290-5310	Open 1 hour. Good blow, died in 1 hour. Recovered 450 feet of mud, 90 feet of muddy fresh water, 3620 feet of fresh water. Initial hydrostatic pressure 2900 lbs., final hydrostatic pressure 2600 (?) lbs., initial flow pressure 1010 lbs., final flow pressure 1795 lbs., 15 minute shut in pressure 1795 lbs.
Kerr McGee No. 1 Brammer	SENE 20-13-20	4599-4674	Open 1 hour, closed 15 minutes. Tool opened with fair blow and decreased throughout test. Recovered 2040 feet of muddy sulphur water. Initial hydrostatic pressure 2350 lbs., final hydrostatic pressure 2330 lbs., initial flow pressure 68 lbs., final flow pressure 790 lbs., closed in pressure 1759 lbs. Estimated temperature 100°F.
		5595-5615	Tool open 1 hour and 19 minutes. Slight blow throughout test. Recovered 181 feet of water and mud.
		4599-4671	Straddle test. Open 1 hour. Good blow throughout test. Recovered 2034 feet of slightly muddy sulphurous water. Bottom hole pressure 1705 lbs., initial flow pressure 60 lbs., final flow pressure 715 lbs.
Phillips No. 1 Nelson	NWSE 18-13-18	2914-2952	Open 2 hours, shut in ½ hour. Tool opened with immediate good blow

Well Name	Location	Interval	Results/Recovery
Phillips No. 1 State	NENW 20-11-23	1660-1775	changing to weak in 45 minutes for duration of test. Recovered 2654 feet of slightly salty water. Initial hydrostatic pressure 1520 lbs., final hydrostatic pressure 1400 lbs., initial flow pressure 230 lbs., final flow pressure 1180 lbs., shut in pressure 1190 lbs.
		2690-2754	Open 2 hours, shut 45 minutes. Very weak blow throughout test. Recovered 218 feet of slightly gas and water cut drilling mud. Initial hydrostatic pressure 795 lbs., final hydrostatic pressure 770 lbs., initial flow pressure 0 lbs., final flow pressure 85 lbs., shut in pressure 300 lbs.
Shell No. 14-18 Dreis	SWSW 18-17-18	5488-5600	Open 2 hours, shut in 30 minutes. Tool opened with strong blow, died in 45 minutes. Initial hydrostatic pressure 1400 lbs., final flow pressure 1350 lbs., initial flow pressure 380 lbs., final flow pressure 1000 lbs., shut in pressure 1000 lbs. Tool open 1 hour, shut in 1 hour. Immediate weak blow increased to strong in 1 minute—decreased gradually to very weak blow in 1 hour. Recovered 5290 feet of slightly mud cut water with slight sulphur odor (maximum salinity 2310 ppm). Lost mud—bypassed shaker. Hydrostatic pressure 2790 lbs., initial flow pressure 1170 lbs., final flow pressure 2465 lbs., shut in pressure 2600 lbs.

### **About the South Dakota Geological Survey**

The South Dakota Geological Survey is a research and public service agency for the State of South Dakota. Since 1893 the State Geologist has been authorized to "make an actual geological survey of the lands, the earth, and the area beneath the surface of the lands . . . ." of the State. The purpose of the State Geological Survey is to conduct field and laboratory studies of South Dakota's geology and mineral deposits, which are the metals and non-metals, the mineral fuels including oil and gas, and ground water. The results of these studies are published in reports such as this.

The work of the South Dakota Geological Survey is continuous – its research and services are adjusted to the changing economy in order to serve South Dakota most effectively.

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