

Section 5. Crude Oil and Natural Gas Resource Development

The September 2004 rotary rig count was 1,240, slightly higher than the count in August 2004 and 13 percent higher than the count in September 2003. Of the total number of rigs in operation, 1,148 were onshore and 92 were offshore. For September 2004, the number of onshore rigs was up 17 percent but the number of offshore rigs was down 16 percent from the September 2003 count. Rotary rigs drilling for natural gas as a share of total rigs stood at 87 percent in September 2004.

Total footage drilled in September 2004 was 16.0 million feet, 6 percent lower than the footage drilled in August 2004 but up 1 percent from that drilled in September 2003.

The number of exploratory and development crude oil and natural gas wells drilled during September 2004 was 2,400, down 6 percent from the number drilled in August 2004 but up 6 percent from the number drilled in

September 2003. The number of crude oil wells drilled was 471, and the number of natural gas wells was 1,929, 2 percent higher and 8 percent higher, respectively, than their September 2003 levels.

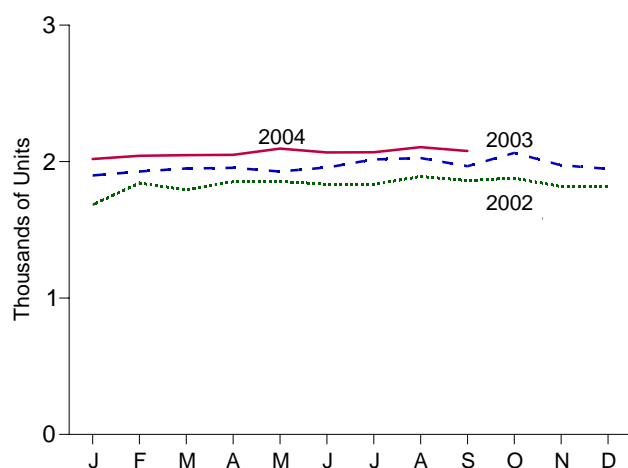
The number of dry holes drilled in September 2004 was 401, down 6 percent from the number drilled in August 2004 but up 4 percent from the number drilled in September 2003.

There were 2.1 thousand well service rigs active in September 2004, 1 percent lower than the previous month but 6 percent more than the count a year ago.

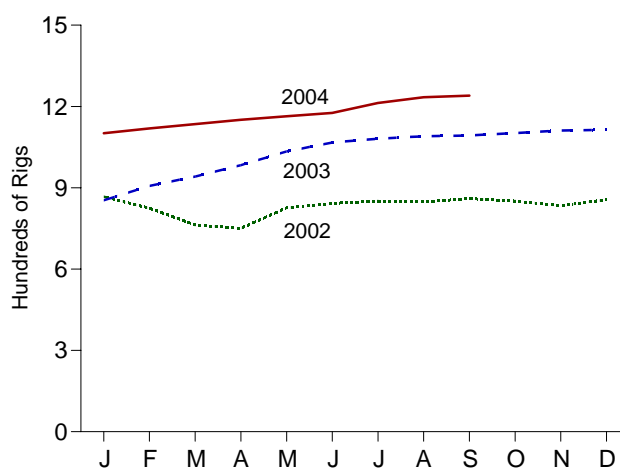
The number of seismic crews active in the 48 States onshore in September 2004 was 40, 10 more than a year earlier. The number of crews active in the 48 States offshore was 6, 3 fewer than a year earlier. Two crews were active in Alaska in September 2004, 2 more than a year ago.

Figure 5.1 Crude Oil and Natural Gas Resource Development Indicators

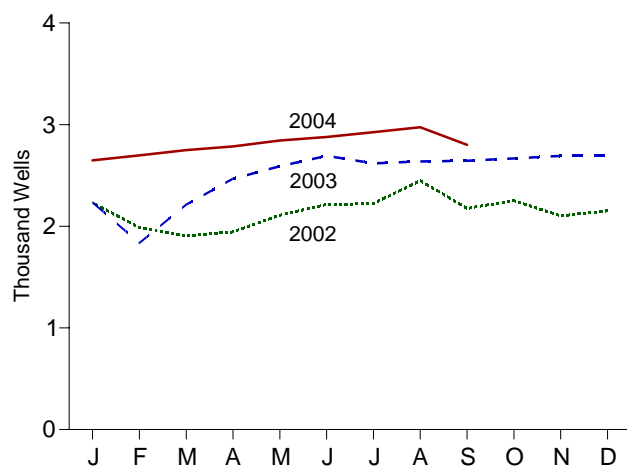
Active Well Service Rig Count



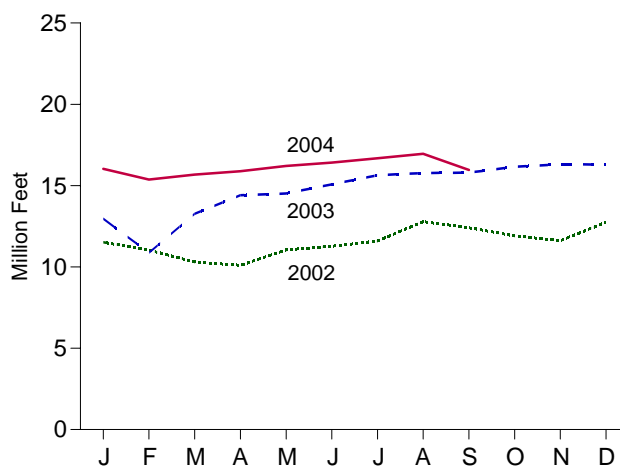
Rotary Rigs in Operation



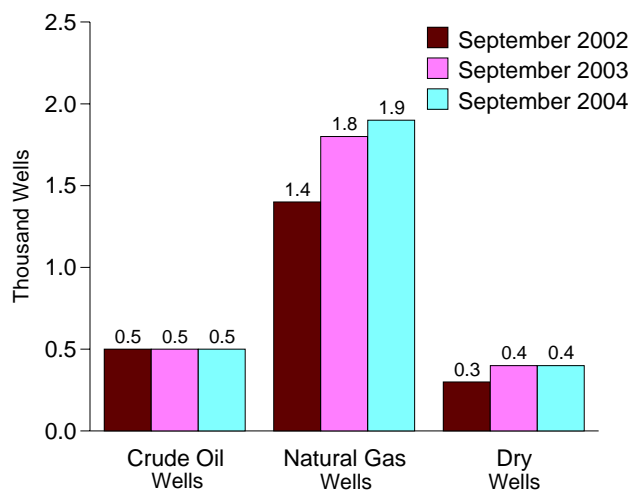
Wells Drilled



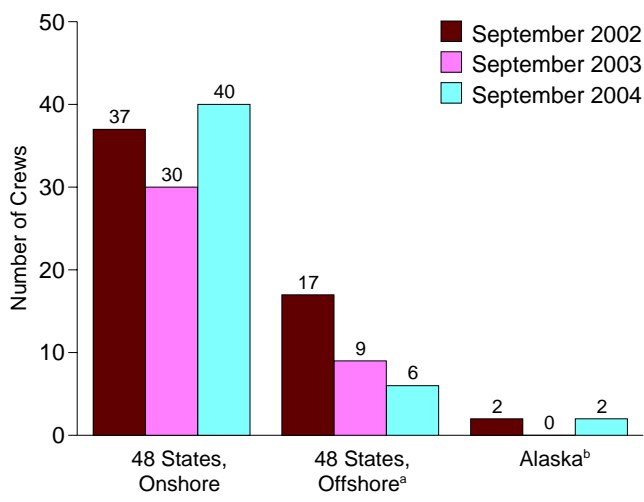
Footage Drilled



Wells Drilled by Type



Maximum U.S. Active Seismic Crew Counts



^aFederal and State Jurisdiction waters of Gulf of Mexico.

^bAll onshore.

Web Page: <http://www.eia.doe.gov/emeu/mer/resource.html>.

Sources: Tables 5.1-5.3.

Table 5.1 Crude Oil and Natural Gas Drilling Activity Measurements

	Rotary Rigs in Operation ^a					Total Footage Drilled ^c	Active Well Service Rig Count ^d
	By Site		By Objective		Total ^b		
	Onshore	Offshore	Crude Oil	Natural Gas			
	Average					Thousand Feet	Number
1973 Average	1,110	84	NA	NA	1,194	138,223	NA
1974 Average	1,378	94	NA	NA	1,472	153,374	NA
1975 Average	1,554	106	NA	NA	1,660	180,494	NA
1976 Average	1,529	129	NA	NA	1,658	186,982	NA
1977 Average	1,834	167	NA	NA	2,001	215,866	NA
1978 Average	2,074	185	NA	NA	2,259	238,669	NA
1979 Average	1,970	207	NA	NA	2,177	244,798	NA
1980 Average	2,678	231	NA	NA	2,909	314,654	NA
1981 Average	3,714	256	NA	NA	3,970	413,112	NA
1982 Average	2,862	243	NA	NA	3,105	378,295	NA
1983 Average	2,033	199	NA	NA	2,232	317,986	NA
1984 Average	2,215	213	NA	NA	2,428	371,392	NA
1985 Average	1,774	206	NA	NA	1,980	313,045	NA
1986 Average	865	99	NA	NA	964	181,856	NA
1987 Average	841	95	NA	NA	936	162,178	NA
1988 Average	813	123	554	354	936	156,354	NA
1989 Average	764	105	453	401	869	134,439	NA
1990 Average	902	108	532	464	1,010	153,701	NA
1991 Average	779	81	482	351	860	143,021	NA
1992 Average	669	52	373	331	721	121,124	NA
1993 Average	672	82	373	364	754	135,118	NA
1994 Average	673	102	335	427	775	124,809	NA
1995 Average	622	101	323	385	723	117,832	NA
1996 Average	671	108	306	464	779	129,045	NA
1997 Average	821	122	376	564	943	156,661	NA
1998 Average	703	123	264	560	827	143,454	NA
1999 Average	519	106	128	496	625	99,410	NA
2000 Average	778	140	197	720	918	141,392	NA
2001 Average	1,003	153	217	939	1,156	189,967	NA
2002 January	741	126	141	725	867	11,513	1,683
February	702	123	144	679	825	11,031	1,843
March	649	114	144	617	763	10,303	1,791
April	645	105	136	612	750	10,102	1,852
May	721	105	134	690	826	11,039	1,856
June	732	110	138	704	842	11,274	1,832
July	740	111	133	716	851	11,590	1,832
August	737	111	125	721	848	12,782	1,891
September	746	114	122	736	860	12,410	1,861
October	740	111	140	709	851	11,907	1,878
November	725	109	146	683	834	11,612	1,817
December	742	114	137	714	856	12,747	1,821
Average	717	113	137	691	830	138,310	1,830
2003 January	743	111	132	718	854	12,962	1,898
February	797	110	153	750	907	10,866	1,928
March	836	105	171	767	941	13,269	1,950
April	877	106	185	795	983	14,409	1,954
May	921	113	167	864	1,034	14,515	1,927
June	958	109	152	910	1,067	15,080	1,957
July	974	107	153	924	1,081	15,637	2,016
August	979	111	153	932	1,090	15,776	2,026
September	984	109	154	936	1,093	15,796	1,966
October	997	105	158	941	1,102	16,156	2,064
November	1,005	106	158	952	1,111	16,307	1,973
December	1,010	104	153	959	1,114	16,301	1,946
Average	924	108	157	872	1,032	177,074	1,967
2004 January	1,001	100	143	955	1,101	16,035	2,019
February	1,020	99	153	961	1,119	15,373	2,043
March	1,041	94	164	968	1,135	15,675	2,047
April	1,058	93	154	996	1,151	15,880	2,050
May	1,068	96	156	1,007	1,164	16,206	2,095
June	1,080	96	164	1,011	1,176	16,411	2,067
July	1,116	97	170	1,041	1,213	16,679	2,068
August	1,139	95	170	1,063	1,234	16,958	2,106
September	1,148	92	166	1,073	1,240	15,967	2,078
9-Month Average ...	1,075	96	160	1,009	1,171	145,184	2,064
2003 9-Month Average ...	896	109	157	844	1,004	128,310	1,958
2002 9-Month Average ...	712	113	135	688	825	102,044	1,827

^a Rotary rigs in operation are reported weekly. Monthly data are averages of 4- or 5-week reporting periods, not calendar months. Multi-month data are averages of the reported data over the covered months, not averages of the weekly data. Annual data are averages over 52 or 53 weeks, not calendar years. Published data are rounded to the nearest whole number.

^b Sum of rigs drilling for crude oil, rigs drilling for natural gas, and other rigs (not shown) drilling for miscellaneous purposes, such as service wells, injection wells, and stratigraphic tests.

^c Values shown are totals.

^d See Glossary.

NA=Not available.

Note: Geographic coverage is the 50 States and the District of Columbia.

Web Page: <http://www.eia.doe.gov/emeu/mer/resource.html>.

Sources: • **Rotary Rigs in Operation:** By Site - Baker Hughes, Inc., Houston, Texas, *Rotary Rigs Running--by State*. By Type - Baker Hughes, Inc., Houston, Texas, weekly phone recording. • **Total Footage Drilled:** Energy Information Administration computations, which are based on well reports submitted to the American Petroleum Institute by the Petroleum Information Corporation, Denver, Colorado. • **Active Well Service Rig Count:** Weatherford International, Inc., Houston, Texas.

Table 5.2 Crude Oil and Natural Gas Wells Drilled
(Number of Wells)

	Exploratory				Development				Total			
	Crude Oil	Natural Gas	Dry	Total	Crude Oil	Natural Gas	Dry	Total	Crude Oil	Natural Gas	Dry	Total
1973 Total	642	1,067	5,952	7,661	9,525	5,866	4,368	19,759	10,167	6,933	10,320	27,420
1974 Total	859	1,190	6,833	8,882	12,788	5,948	5,283	24,019	13,647	7,138	12,116	32,901
1975 Total	982	1,248	7,129	9,359	15,966	6,879	6,517	29,362	16,948	8,127	13,646	38,721
1976 Total	1,086	1,346	6,772	9,204	16,602	8,063	6,986	31,651	17,688	9,409	13,758	40,855
1977 Total	1,164	1,548	7,283	9,995	17,581	10,574	7,702	35,857	18,745	12,122	14,985	45,852
1978 Total	1,171	1,771	7,965	10,907	18,010	12,642	8,586	39,238	19,181	14,413	16,551	50,145
1979 Total	1,321	1,907	7,437	10,665	19,530	13,347	8,662	41,539	20,851	15,254	16,099	52,204
1980 Total	1,764	2,081	9,039	12,884	30,875	15,252	11,599	57,726	32,639	17,333	20,638	70,610
1981 Total	2,636	2,514	12,349	17,499	40,962	17,652	15,440	74,054	43,598	20,166	27,789	91,553
1982 Total	2,431	2,125	11,247	15,803	36,768	16,854	14,972	68,594	39,199	18,979	26,219	84,397
1983 Total	2,023	1,593	10,148	13,764	35,097	12,971	14,005	62,073	37,120	14,564	24,153	75,837
1984 Total	2,198	1,521	11,278	14,997	40,407	15,606	14,403	70,416	42,605	17,127	25,681	85,413
1985 Total	1,679	1,190	8,924	11,793	33,439	12,978	12,132	58,549	35,118	14,168	21,056	70,342
1986 Total	1,084	793	5,549	7,426	18,013	7,723	7,129	32,865	19,097	8,516	12,678	40,291
1987 Total	925	754	5,049	6,728	15,239	7,301	6,063	28,603	16,164	8,055	11,112	35,331
1988 Total	855	743	4,693	6,291	12,781	7,812	5,348	25,941	13,636	8,555	10,041	32,232
1989 Total	607	705	3,924	5,236	9,597	8,834	4,264	22,695	10,204	9,539	8,188	27,931
1990 Total	654	689	3,715	5,058	11,544	10,355	4,598	26,497	12,198	11,044	8,313	31,555
1991 Total	592	534	3,314	4,440	11,178	8,992	4,282	24,452	11,770	9,526	7,596	28,892
1992 Total	493	423	2,513	3,429	8,264	7,786	3,605	19,655	8,757	8,209	6,118	23,084
1993 Total	502	548	2,469	3,519	7,905	9,469	3,959	21,233	8,407	10,017	6,328	24,752
1994 Total	570	726	2,405	3,701	6,151	8,812	2,802	17,865	6,721	9,538	5,307	21,566
1995 Total	542	570	2,198	3,310	7,085	7,784	2,877	17,746	7,627	8,354	5,075	21,056
1996 Total	483	570	2,136	3,189	7,831	8,732	3,146	19,709	8,314	9,302	5,282	22,898
1997 Total	428	536	2,110	3,074	10,008	10,791	3,592	24,391	10,436	11,327	5,702	27,465
1998 Total	291	504	1,647	2,442	6,773	10,640	3,193	20,606	7,064	11,144	4,840	23,048
1999 Total	157	539	1,195	1,891	4,019	10,338	2,217	16,574	4,176	10,877	3,412	18,465
2000 Total	264	602	1,288	2,154	7,094	15,853	2,737	25,684	7,358	16,455	4,025	27,838
2001 Total	322	988	1,669	2,979	7,738	21,095	2,415	31,248	8,060	22,083	4,084	34,227
2002 January	15	60	108	183	513	1,328	207	2,048	528	1,388	315	2,231
February	16	72	103	191	418	1,231	148	1,797	434	1,303	251	1,988
March	19	62	96	177	416	1,126	185	1,727	435	1,188	281	1,904
April	29	39	94	162	459	1,142	182	1,783	488	1,181	276	1,945
May	24	48	103	175	447	1,287	199	1,933	471	1,335	302	2,108
June	18	49	86	153	529	1,310	222	2,061	547	1,359	308	2,214
July	22	45	97	164	522	1,323	214	2,059	544	1,368	311	2,223
August	14	59	105	178	540	1,530	200	2,270	554	1,589	305	2,448
September	18	61	106	185	440	1,349	203	1,992	458	1,410	309	2,177
October	13	58	123	194	572	1,300	186	2,058	585	1,358	309	2,252
November	23	56	97	176	516	1,252	158	1,926	539	1,308	255	2,102
December	20	50	122	192	455	1,318	187	1,960	475	1,368	309	2,152
Total	231	659	1,240	2,130	5,827	15,496	2,291	23,614	6,058	16,155	3,531	25,744
2003 January	23	49	106	178	528	1,326	202	2,056	551	1,375	308	2,234
February	27	35	68	130	434	1,113	157	1,704	461	1,148	225	1,834
March	22	46	68	136	493	1,423	160	2,076	515	1,469	228	2,212
April	21	65	92	178	621	1,458	211	2,290	642	1,523	303	2,468
May	22	53	91	166	627	1,601	197	2,425	649	1,654	288	2,591
June	35	53	98	186	632	1,690	184	2,506	667	1,743	282	2,692
July	17	76	133	226	444	1,694	255	2,393	461	1,770	388	2,619
August	17	77	134	228	444	1,708	257	2,409	461	1,785	391	2,637
September	17	77	131	225	447	1,716	256	2,419	464	1,793	387	2,644
October	18	78	132	228	458	1,724	258	2,440	476	1,802	390	2,668
November	18	78	134	230	458	1,745	260	2,463	476	1,823	394	2,693
December	17	79	134	230	444	1,758	260	2,462	461	1,837	394	2,692
Total	254	766	1,321	2,341	6,030	18,956	2,657	27,643	6,284	19,722	3,978	29,984
2004 January	16	79	132	227	415	1,750	256	2,421	431	1,829	388	2,648
February	17	79	134	230	444	1,762	261	2,467	461	1,841	395	2,697
March	21	80	136	237	473	1,774	266	2,513	494	1,854	402	2,750
April	17	82	138	237	453	1,826	270	2,549	470	1,908	408	2,786
May	20	81	137	238	487	1,848	270	2,605	507	1,929	407	2,843
June	20	81	139	240	511	1,855	273	2,639	531	1,936	412	2,879
July	20	83	141	244	493	1,911	278	2,682	513	1,994	419	2,926
August	20	85	144	249	493	1,951	282	2,726	513	2,036	426	2,975
September	18	81	135	234	453	1,848	266	2,567	471	1,929	401	2,801
9-Month Total	169	731	1,236	2,136	4,222	16,525	2,422	23,169	4,391	17,256	3,658	25,305
2003 9-Month Total	201	531	921	1,653	4,670	13,729	1,879	20,278	4,871	14,260	2,800	21,931
2002 9-Month Total	175	495	898	1,568	4,284	11,626	1,760	17,670	4,459	12,121	2,658	19,238

Notes: • These well counts include only the original drilling of a hole intended to discover or further develop already discovered crude oil or natural gas resources. Other drilling activities, such as drilling an old well deeper, drilling of laterals from the original well, drilling of service and injection wells, and drilling for resources other than crude oil or natural gas are excluded. Due to the methodology used to estimate ultimate well counts from the available partially reported data, the counts shown on this page are frequently

revised. See notes at end of section. • Geographic coverage is the 50 States and the District of Columbia.

Web Page: <http://www.eia.doe.gov/emeu/mer/resource.html>.

Sources: • **1973-1994:** Energy Information Administration (EIA), computations based on well reports submitted to the American Petroleum Institute. • **1995 forward:** EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc.

Table 5.3 Maximum U.S. Active Seismic Crew Counts
(Number of Crews)

	48 States, Onshore				48 States, Offshore ^a				Alaska ^b				Total	
	Dimensions ^c			Total ^d	Dimensions ^c			Total ^d	Dimensions ^c			Total ^d		
	2	3	4		2	3	4		2	3	4			
2000	March	4	36	1	41	7	11	0	19	1	1	0	2	62
	April	4	36	1	41	7	11	0	19	1	2	0	3	63
	May	3	34	1	38	6	11	0	18	1	2	0	3	59
	June	5	37	1	43	7	9	0	17	1	2	0	3	63
	July	4	39	1	44	6	6	0	13	0	1	0	1	58
	August	4	40	1	45	7	7	0	15	0	1	0	1	61
	September	3	39	1	43	7	8	0	16	0	0	0	0	59
	October	4	41	1	46	7	9	0	17	0	0	0	0	63
	November	4	40	1	46	7	8	0	16	0	0	0	0	62
	December	5	41	1	48	8	8	0	17	0	0	0	0	65
2001	January	5	38	1	44	9	7	0	17	0	0	0	0	61
	February	6	38	1	45	8	7	0	16	0	0	0	0	61
	March	6	38	1	45	9	9	0	18	0	0	0	0	63
	April	7	39	1	47	9	9	0	18	0	0	0	0	65
	May	7	37	1	45	9	8	0	17	1	1	0	2	64
	June	6	35	1	42	9	7	0	16	1	1	0	2	60
	July	6	35	1	42	8	8	0	16	0	0	0	0	58
	August	8	32	1	41	7	8	0	15	0	0	0	0	56
	September	8	30	1	39	6	9	0	15	0	0	0	0	54
	October	5	33	1	39	9	10	0	19	0	0	0	0	58
	November	7	34	1	42	7	10	0	17	0	0	0	0	59
	December	7	33	1	41	8	9	0	17	0	0	0	0	58
2002	January	6	32	0	38	8	6	0	14	1	1	0	2	54
	February	9	31	0	40	9	6	0	15	1	1	0	2	57
	March	9	26	0	35	10	7	0	17	1	1	0	2	54
	April	7	25	0	32	9	7	0	16	1	1	0	2	50
	May	8	24	0	32	9	8	0	17	1	1	0	2	51
	June	9	23	0	32	9	7	0	16	1	1	0	2	50
	July	8	26	0	34	8	8	0	16	1	1	0	2	52
	August	7	26	0	33	8	7	0	15	1	1	0	2	50
	September	9	28	0	37	10	7	0	17	1	1	0	2	56
	October	8	30	0	38	10	7	0	17	1	1	0	2	57
	November	8	27	0	35	8	5	0	13	1	1	0	2	50
	December	8	22	0	31	7	4	0	11	1	0	0	1	43
2003	January	8	19	1	28	8	4	0	12	0	0	0	0	40
	February	9	20	0	29	8	4	0	12	0	0	0	0	41
	March	8	20	0	28	7	4	0	11	1	1	0	2	41
	April	7	20	0	27	7	4	0	11	1	1	0	2	40
	May	7	17	0	24	8	4	0	12	1	1	0	2	38
	June	7	18	0	25	8	4	0	12	1	1	0	2	39
	July	7	21	0	28	7	4	0	11	1	1	0	2	41
	August	8	22	0	30	7	4	0	11	1	1	0	2	43
	September	8	22	0	30	7	2	0	9	0	0	0	0	39
	October	7	24	0	31	5	3	0	8	0	0	0	0	39
	November	7	24	0	31	4	3	0	7	0	0	0	0	38
	December	7	25	0	32	5	5	0	10	0	0	0	0	42
2004	January	8	25	0	33	5	5	0	10	0	0	0	0	43
	February	8	27	0	35	5	5	0	10	0	0	0	0	45
	March	8	27	0	35	5	5	0	10	0	0	0	0	45
	April	9	27	0	36	5	4	0	9	0	0	0	0	45
	May	9	26	0	35	5	4	0	9	0	0	0	0	44
	June	9	30	0	39	4	4	0	8	0	2	0	2	49
	July	8	30	0	38	4	4	0	8	0	2	0	2	48
	August	8	31	0	39	4	4	0	8	0	2	0	2	49
	September	8	32	0	40	4	2	0	6	0	2	0	2	48

^a Federal and State Jurisdiction waters of the Gulf of Mexico.

^b All onshore.

^c In **two-dimensional** (2D) reflection seismic surveying both the sound source and the sound detectors (numbering up to a hundred or more per shot) are moved along a straight line. The resultant product can be thought of as a vertical sonic cross-section of the subsurface beneath the survey line. It is constructed by summing many compressional (pressure) wave reflections from the various sound source and sound detector locations at the halfway sound path points beneath each location (common depth point stacking). In **three-dimensional** (3D) reflection seismic surveying the sound detectors (numbering up to a thousand or more) are spread out over an area and the sound source is moved from location to location through the area. The resultant product can be thought of as a cube of common depth point stacked reflections. Advantages over 2D include the additional dimension, the fact that many more reflections are available for stacking at each point, which provides greatly improved resolution of subsurface features, and elimination of the "ghost" or "side swipe" reflections from

nearby offline features that 2D surveys are prone to (except, of course, along the outer faces of the cube). **Four dimensional** (4D) reflection seismic surveying is the exact repetition of a 3D survey at two or more time intervals. The primary application of 4D is mapping the movement of fluid interfaces in producing oil and gas reservoirs.

^d Includes crews with unknown survey dimension.

Notes: • A "seismic crew" is a group of people, of varying number, engaged in a seismic surveying job. • "48 States" is the United States excluding Alaska and Hawaii. • Data are reported on the first and fifteenth of each month, except January when they are reported only on the fifteenth. When semi-monthly values differ for the month, the larger of the two values is shown here. Consequently this table reflects the maximum number of crews at work at any time during the month.

Web Page: <http://www.eia.doe.gov/mer/mer/resource.html>.

Source: *World Geophysical News*, IHS Energy Group, Denver, CO. used with permission.

Crude Oil and Natural Gas Resource Development

Table 5.2 Notes

Three well types are considered in the *Monthly Energy Review (MER)* drilling statistics: “completed for crude oil,” “completed for natural gas,” and “dry hole.” Wells that productively encounter both crude oil and natural gas are categorized as “completed for crude oil.” Both development wells and exploratory wells (new field wildcats, new pool tests, and extension tests) are included in the statistics. All other classes of wells drilled in connection with the search for producible hydrocarbons are excluded.

Prior to the March 1985 *MER*, drilling statistics consisted of completion data for the above types and classes of wells as reported to the American Petroleum Institute (API) during a given month. Due to time lags between the date of well completion and the date of completion reporting to the API, as-reported well completions proved to be an inaccurate indicator of drilling activity. During 1982, for example,

as-reported well completions rose, while the number of actual completions fell. Consequently, the drilling statistics published since the March 1985 *MER* are Energy Information Administration (EIA) estimates produced by statistically imputing well counts and footage based on the partial data available from the API. These estimates are subject to continuous revision as new data, some of which pertain to earlier months and years, become available. Additional information about the EIA estimation methodology may be found in “Estimating Well Completions,” the feature article published in the March 1985 *MER*.

Users of the well completion and footage figures published by the Energy Information Administration (EIA) prior to August 1998 should be aware that these data have been revised. The published well completion and footage figures are produced by the Well Completion Estimation Procedure (WELCOM) based on drilling records provided under contract to the EIA. Problems in the files received by EIA necessitated revision of the historical series for well completions and footage drilled. Queries regarding this matter may be directed to William Trapmann (202-586-6408 or william.trapmann@eia.doe.gov).