

# 3. Crude Oil Statistics

The United States had 21,757 million barrels of crude oil proved reserves as of December 31, 2005. Crude oil proved reserves rose for the first time in 3 years, increasing by 2 percent above the 2004 level. Reserves additions of crude oil in the United States replaced 122 percent of the 2005 production (Figure 15).

Boosted by reserves additions in many States, particularly Texas, Wyoming, Montana, Oklahoma, and California, the lower 48 States' crude oil proved reserves increased by 3 percent.

Despite significant new field discoveries in the Gulf of Mexico Federal Offshore and revision increases in Alaska, the proved reserves of these two areas declined in 2005 because reserves additions did not keep pace with production. The crude oil reserves of the Pacific Federal Offshore were revised downward in 2005. In August and September 2005, Hurricanes Katrina and Rita had major impacts on the Gulf Coast. The extensive storm damage to platforms, pipelines, and refining reduced U.S. annual oil production.

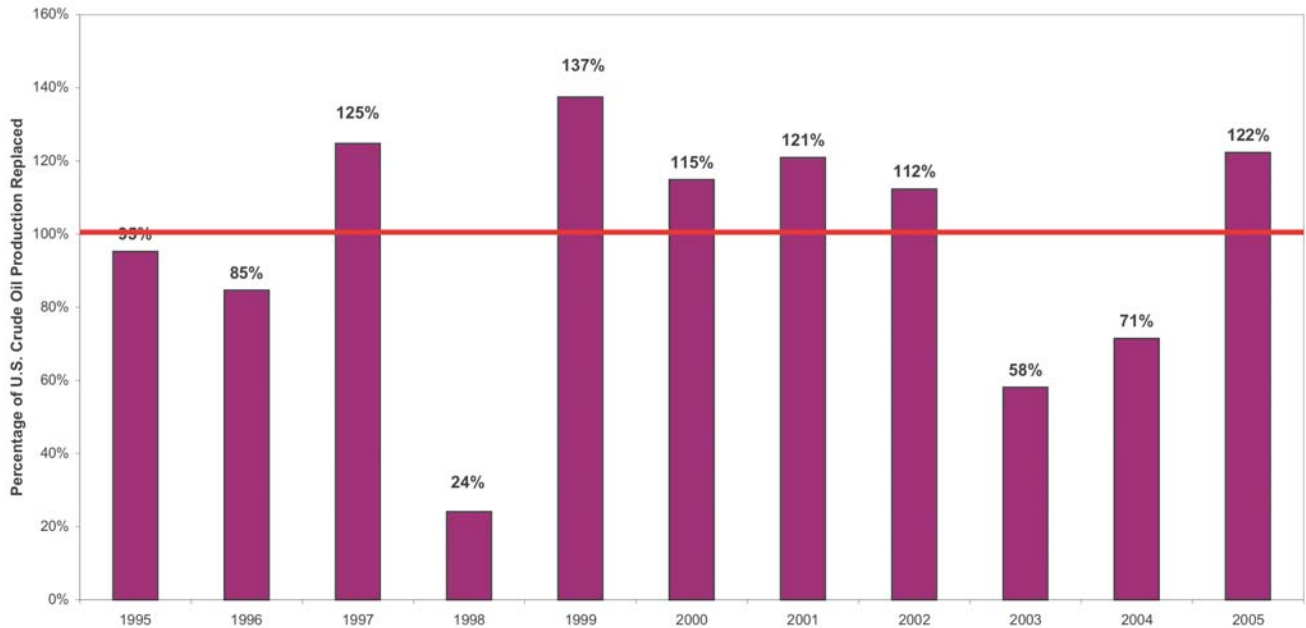
## Proved Reserves

Table 6 presents the U.S. proved reserves of crude oil as of December 31, 2005, by selected States and State subdivisions.

Figure 16 maps 2005 crude oil proved reserves by area. The following four areas account for 77 percent of U.S. crude oil proved reserves:

Area	Percent of U.S. Oil Reserves
Texas	23
Alaska	19
Gulf of Mexico Federal Offshore	19
California	16
<b>Area Total</b>	<b>77</b>

Figure 15. Replacement of U.S. Crude Oil Production by Reserves Additions, 1995-2005.



Source: Energy Information Administration, Office of Oil and Gas.

**Table 6. Crude Oil Proved Reserves, Reserves Changes, and Production, 2005**  
(Million Barrels of 42 U.S. Gallons)

State and Subdivision	Published Proved Reserves 12/31/04	Changes in Reserves During 2005							New Field Discoveries (+)	New Reservoir Discoveries in Old Fields (+)	Estimated Production (-)	Proved Reserves 12/31/05
		Adjustments (+,-)	Revision Increases (+)	Revision Decreases (-)	Sales (-)	Acquisitions (+)	Extensions (+)					
Alaska	4,327	-2	188	86	37	37	56	0	0	312	4,171	
<b>Lower 48 States</b>	<b>17,044</b>	<b>223</b>	<b>1,356</b>	<b>889</b>	<b>786</b>	<b>1,064</b>	<b>749</b>	<b>205</b>	<b>41</b>	<b>1,421</b>	<b>17,586</b>	
Alabama	53	0	3	2	0	0	6	0	0	5	55	
Arkansas	51	-5	3	3	5	4	0	0	0	5	40	
California	3,376	16	177	70	4	23	147	0	0	230	3,435	
Coastal Region Onshore	380	3	12	15	2	1	10	0	0	15	374	
Los Angeles Basin Onshore	286	9	26	29	2	22	4	0	0	16	300	
San Joaquin Basin Onshore	2,523	4	95	13	0	0	131	0	0	184	2,556	
State Offshore	187	0	44	13	0	0	2	0	0	15	205	
Colorado	225	-1	33	5	54	55	16	0	0	19	250	
Florida	65	1	0	4	0	0	0	0	0	3	59	
Illinois	92	10	3	1	0	1	0	0	0	10	95	
Indiana	11	6	1	0	0	0	0	0	0	2	16	
Kansas	245	32	44	18	1	4	6	0	2	33	281	
Kentucky	27	-3	1	0	0	0	0	0	0	2	23	
Louisiana	427	23	54	44	21	26	19	0	3	55	432	
North	58	5	11	9	0	1	10	0	0	8	68	
South Onshore	304	18	36	31	19	19	8	0	3	39	299	
State Offshore	65	0	7	4	2	6	1	0	0	8	65	
Michigan	53	1	7	1	0	0	7	0	0	5	62	
Mississippi	178	2	25	8	1	11	0	0	0	18	189	
Montana	364	-1	24	23	2	7	87	0	1	30	427	
Nebraska	15	1	2	0	0	0	0	0	0	2	16	
New Mexico	669	9	52	40	29	44	43	0	0	58	690	
East	662	10	50	40	29	43	43	0	0	57	682	
West	7	-1	2	0	0	1	0	0	0	1	8	
North Dakota	389	-4	26	16	1	6	49	2	1	34	418	
Ohio	49	-4	5	4	0	0	3	0	1	4	46	
Oklahoma	570	54	86	61	71	80	22	0	1	51	630	
Pennsylvania	12	3	1	2	0	0	2	0	0	2	14	
Texas	4,613	64	455	229	520	723	163	2	3	355	4,919	
RRC District 1	58	-1	5	3	0	2	12	0	1	9	65	
RRC District 2 Onshore	56	2	5	2	2	3	7	0	0	7	62	
RRC District 3 Onshore	185	-2	19	11	2	5	9	0	1	25	179	
RRC District 4 Onshore	27	2	9	3	7	15	1	0	0	4	40	
RRC District 5	23	3	5	3	7	7	0	0	0	4	24	
RRC District 6	187	-1	6	12	2	1	4	0	0	15	168	
RRC District 7B	73	13	6	4	1	1	1	0	0	9	80	
RRC District 7C	206	6	16	10	56	63	36	1	0	17	245	
RRC District 8	1,552	11	172	96	193	325	70	0	0	110	1,731	
RRC District 8A	2,090	20	192	74	239	292	17	0	1	135	2,164	
RRC District 9	102	12	10	7	8	5	2	1	0	14	103	
RRC District 10	45	3	8	3	3	4	4	0	0	5	53	
State Offshore	9	-4	2	1	0	0	0	0	0	1	5	
Utah	215	7	65	35	0	0	19	0	0	15	256	
West Virginia	11	4	7	0	0	0	0	0	0	1	21	
Wyoming	628	8	28	17	35	56	81	0	0	45	704	
Federal Offshore	4,691	0	253	305	42	24	68	201	29	436	4,483	
Pacific (California)	547	-1	3	81	0	0	0	0	0	27	441	
Gulf of Mexico (Louisiana)	3,919	1	206	198	25	23	55	199	14	342	3,852	
Gulf of Mexico (Texas)	225	0	44	26	17	1	13	2	15	67	190	
Miscellaneous <sup>a</sup>	15	0	1	1	0	0	11	0	0	1	25	
<b>U.S. Total</b>	<b>21,371</b>	<b>221</b>	<b>1,544</b>	<b>975</b>	<b>823</b>	<b>1,101</b>	<b>805</b>	<b>205</b>	<b>41</b>	<b>1,733</b>	<b>21,757</b>	

<sup>a</sup>Includes Arizona, Missouri, Nevada, New York, South Dakota, Tennessee, and Virginia.

Note: The production estimates in this table are based on data reported on Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves." They may differ from the official Energy Information Administration production data for crude oil for 2005 contained in the *Petroleum Supply Annual 2005*, DOE/EIA-0340(05).

Source: Energy Information Administration, Office of Oil and Gas.

Figure 16. Crude Oil Proved Reserves by Area, 2005

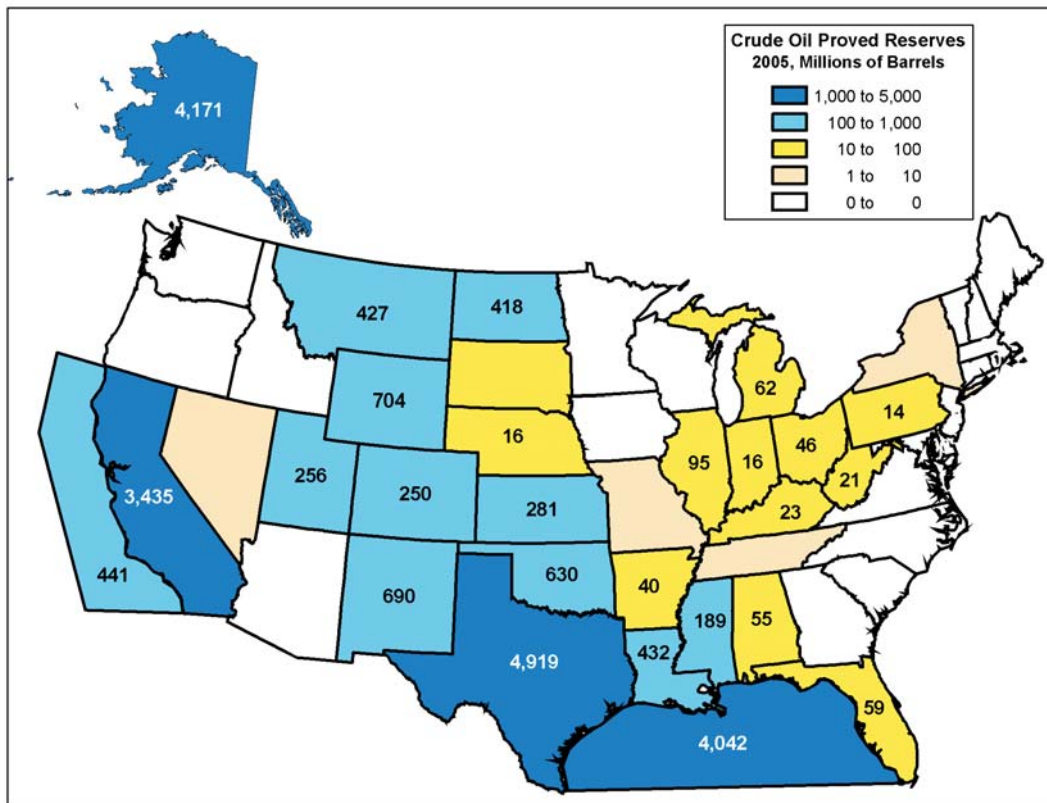
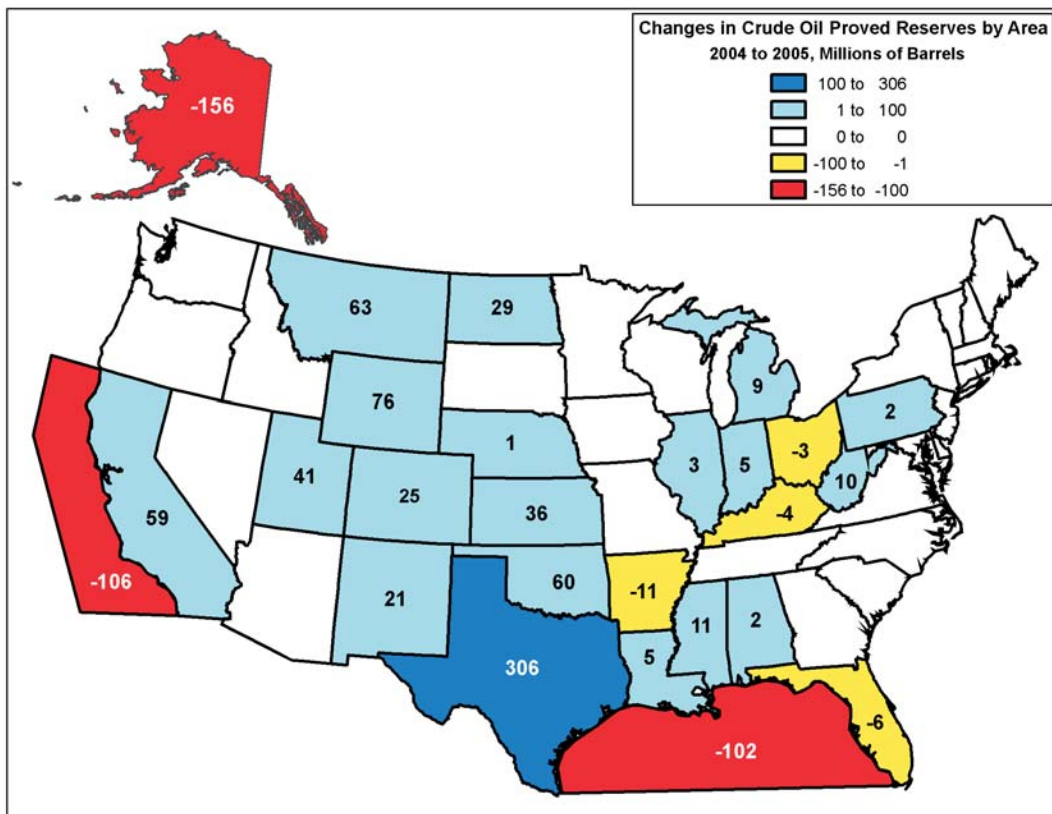


Figure 17. Changes in Crude Oil Proved Reserves by Area, 2004 to 2005



Source: Energy Information Administration, Office of Oil and Gas.

## Discussion of Reserves Changes

Figure 17 maps the change in crude oil proved reserves from 2004 to 2005 by area. Here's how the top four areas fared compared to the total United States:

Area	Change in U.S. Oil Reserves (million barrels)
Texas	+306
Alaska	-156
Gulf of Mexico Federal Offshore	-102
California	+59
<b>Area Total</b>	<b>+107</b>
<b>U.S. Total</b>	<b>+386</b>

Texas had a 7 percent increase in crude oil proved reserves in 2005 and California had a 2 percent increase. The Gulf of Mexico reported a 2 percent decrease and Alaska declined 4 percent.

Figure 2 in Chapter 2 shows the components of the changes in crude oil proved reserves for 2005 and the preceding 10 years.

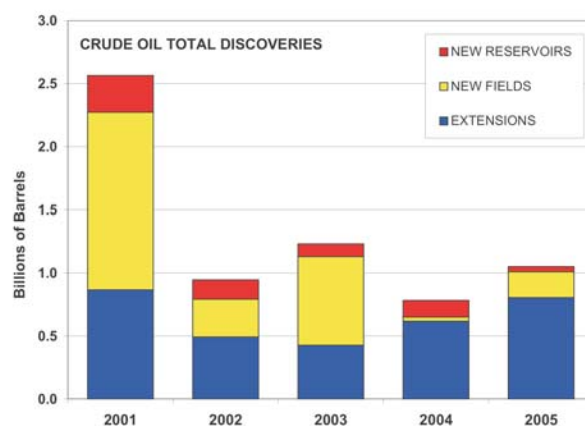
### Total Discoveries

Total discoveries are those new reserves attributable to extensions of existing fields, new field discoveries, and new reservoir discoveries in old fields. They result from the drilling of exploratory wells.

Total discoveries of crude oil were 1,051 million barrels in 2005, 34 percent more than those of 2004 (782 million barrels). Only seven areas had total discoveries exceeding 50 million barrels in 2005:

Area	Percent of U.S. Oil Total Discoveries
Federal Offshore Gulf of Mexico	28
Texas	16
California	14
Montana	8
Wyoming	8
Alaska	5
North Dakota	5
<b>Area Total</b>	<b>84</b>

The United States discovered an average of 1,126 million barrels of new crude oil proved reserves per year in the prior 10 years. Total discoveries in 2005 were 7 percent lower than that average.



### Extensions

Operators reported 805 million barrels of extensions in 2005, 30 percent more than in 2004. The highest volume of extensions was reported in Texas (163 million barrels). The second highest volume of extensions in 2005 was in California with 147 million barrels. Montana was third with 87 million barrels and Wyoming was fourth with 81 million barrels of extensions.

In the prior 10 years, U.S. operators reported an average of 527 million barrels of extensions per year. The 2005 extensions were 53 percent more than that average.

### New Field Discoveries

New field discoveries accounted for 205 million barrels of crude oil reserves additions. Almost all of these discoveries (201 of 205 million) were in the Gulf of Mexico Federal Offshore. This was 6 times greater than the new field discoveries of 2004.

In the prior 10 years, U.S. operators reported an annual average of 419 million barrels of reserves from new field discoveries. Reserves from new field discoveries in 2005 were 51 percent less than that average.

### New Reservoir Discoveries in Old Fields

Operators reported 41 million barrels of crude oil reserves from new reservoir discoveries in old fields in 2005. This is 69 percent less than in 2004. Most of the new reservoir discoveries in old fields (29 of 41 million barrels) came from the Gulf of Mexico Federal Offshore.

In the prior 10 years, U.S. operators reported an annual average of 180 million barrels of reserves from new reservoir discoveries in old fields. Reserves from new reservoir discoveries in old fields in 2005 were 77 percent less than that average.

## Revisions and Adjustments

Operators report thousands of positive and negative revisions to proved reserves each year as development wells are drilled, well performance is analyzed, new technology is applied, or economic conditions change. Adjustments are the annual changes in the published reserve estimates that cannot be directly attributed to the estimates for other reserve change categories because of the survey and statistical estimation methods employed.

There were 1,544 million barrels of revision increases, 975 million barrels of revision decreases, and 221 million barrels of adjustments in 2005. Combined, there were 790 million barrels of net revisions and adjustments for crude oil in 2004.

In the prior 10 years, net revisions and adjustments added an annual average of 795 million barrels. The 2005 net revisions and adjustments were 1 percent less than that average.

## Sales and Acquisitions

Sales represents that volume of crude oil proved reserves deducted from an operator's total reserves by selling or transferring operations of existing oil fields or properties to another operator (not a volume of production "sold" at the wellhead). Similarly, acquisitions are that volume of proved reserves added to an operator's total reserves through purchase or operations transfer of an existing oil field or properties.

There are several reasons why sales and acquisitions volumes are not equal. Since operators have different engineering staffs and resources, or different development plans or schedules, the estimate of proved reserves for a field can change with a change in operatorship. Timing of the transfer of operations can also impact these values.

In 2005, there were 823 million barrels of sales transactions between operators and 1,101 million barrels of acquisitions yielding a net difference of +278 million barrels.

## Production

U.S. production of crude oil in 2005 was an estimated 1,733 million barrels. This volume, which does not include lease condensate, was 5 percent lower than 2004's production of 1,819 million barrels.

In August and September 2005, hurricanes Katrina and Rita caused extensive damage on the Gulf Coast disrupted production operations in the Gulf of Mexico by damaging or destroying platforms, surface facilities, and pipelines. Crude oil production from the Gulf of Mexico Federal Offshore dropped 12 percent from 2004 to 2005. Despite this, the Gulf remained the largest producing area in the United States with 24 percent of the National total (409 million barrels of production). Texas and Alaska were second and third, with 20 and 18 percent of the National production total, respectively. California was fourth with 13 percent.

The 2005 Form EIA-23 National production estimates (1,733 million barrels of crude oil and 174 million barrels of lease condensate) are 1 percent higher than the comparable Petroleum Supply Annual (PSA) 2005 volumes for crude oil and lease condensate production combined (1,890 million barrels).

## Areas of Note: Large Discoveries and Reserves Additions

The following State and area discussions summarize notable activities during 2005 concerning expected new field reserves, development plans, and possible production rates as reported in various trade publications. The citations do not necessarily reflect EIA's concurrence, but are considered important enough to be brought to the reader's attention.

The following areas were the major success stories for crude oil reserves and production for 2005.

### Texas

Texas reported the largest increase (306 million barrels of proved oil reserves) in 2005 and had the largest volume of extensions in 2005 (163 million barrels). The majority of these extensions were to fields located in the Permian Basin.

- **SACROC and Yates Fields:** Kinder Morgan's carbon dioxide (CO<sub>2</sub>) flooding operations increased oil production at both the SACROC and the Yates Fields in west Texas, which together have more than 5 billion barrels of oil



remaining in place. Kinder Morgan's CO<sub>2</sub> business produced over 56,000 barrels a day at SACROC and Yates in 2005. {40}

## Wyoming

Wyoming reported a net increase of 76 million barrels of crude oil proved reserves in 2005. Wyoming's production also increased by 5 percent from 43 million barrels in 2004 to 45 million barrels in 2005.

- **Salt Creek Field:** Anadarko Petroleum Corporation has increased oil production at its Salt Creek Field using CO<sub>2</sub> injection for enhanced oil recovery. CO<sub>2</sub> injection is predicted to boost Salt Creek's production from about 5,000 barrels a day now to 30,000 barrels a day by 2010. {41}

## Montana

Montana reported a net increase of 63 million barrels of crude oil proved reserves in 2005. Montana's production also increased by 37 percent from 22 million barrels in 2004 to 30 million barrels in 2005.

- **Elm Coulee Field:** Montana reports that the Elm Coulee Field, which is completed in the middle member of the Bakken Formation, has doubled its oil production for the third year in a row in 2005. Discovered in 2000 and now grown to 529 square miles, the Elm Coulee Field produced 15 million barrels of oil in 2005. It now accounts for almost 50,000 barrels of oil per day, about half of Montana's crude oil production. {42}

## Other Gain Areas

**Oklahoma:** Oklahoma reported a net increase of 60 million barrels of crude oil proved reserves in 2005.

**California:** California reported a net increase of 59 million barrels of crude oil proved reserves in 2005.

## Areas of Note: Large Reserves Declines

The following areas had large declines in crude oil proved reserves due to downward revisions or unreplaced production.

## Alaska

Alaskan crude oil proved reserves declined 4 percent (-156 million barrels) in 2005. No new field discoveries were reported in Alaska in 2005 and despite notable net revision increases in Alaska's proved reserves, the additions did not offset its oil production. Alaska's estimated 2005 production of 312 million barrels decreased 7 percent from the 2004 level (334 million barrels).

## Pacific Federal Offshore

There was a 19 percent decline (-106 million barrels) in the crude oil proved reserves of the Pacific Federal Offshore in 2005. Crude oil reserves in 2005 were revised significantly downward. Crude oil production from this area declined 4 percent from its 2004 level.

## Gulf of Mexico Federal Offshore

The Gulf of Mexico Federal Offshore crude oil proved reserves declined 2 percent (-102 million barrels) in 2005. Crude oil production declined 12 percent from 467 million barrels in 2004 to 409 million barrels in 2005, due to damaged platforms, pipelines, and surface facilities caused by the hurricanes of 2005.

## Other Decline Areas

Discovery and development of new or existing oil fields was also outpaced by crude oil production in the following areas of the United States:

**Arkansas:** Proved oil reserves decreased by 22 percent (-11 million barrels).

**Florida:** Proved oil reserves decreased by 9 percent (-6 million barrels).

## Reserves in Nonproducing Status

Not all proved reserves of crude oil reported in 2005 were producing. Operators reported 5,691 million barrels of proved reserves in nonproducing status, 11 percent more than reported in 2004 (5,143 million barrels). Nonproducing crude oil reserves (not including lease condensate) are listed in **Table 7**.

Nonproducing reserves are those awaiting well workovers, the drilling of extensions or additional development wells, installation of production or pipeline facilities, and depletion of other zones or reservoirs before recompletion in reservoirs not currently open to production.

**Table 7. Reported Reserves in Nonproducing Status for Crude Oil, 2005<sup>a</sup>**  
(Million Barrels of 42 U.S. Gallons)

State and Subdivision	Nonproducing Crude Oil Reserves	State and Subdivision	Nonproducing Crude Oil Reserves
Alaska . . . . .	595	Oklahoma . . . . .	101
<b>Lower 48 States . . . . .</b>	<b>5,096</b>	Pennsylvania . . . . .	0
Alabama . . . . .	2	Texas . . . . .	828
Arkansas . . . . .	2	RRC District 1 . . . . .	15
California . . . . .	455	RRC District 2 Onshore . . . . .	16
Coastal Region Onshore . . . . .	70	RRC District 3 Onshore . . . . .	19
Los Angeles Basin Onshore . . . . .	112	RRC District 4 Onshore . . . . .	17
San Joaquin Basin Onshore . . . . .	238	RRC District 5 . . . . .	1
State Offshore . . . . .	35	RRC District 6 . . . . .	3
Colorado . . . . .	74	RRC District 7B . . . . .	3
Florida . . . . .	2	RRC District 7C . . . . .	31
Kansas . . . . .	16	RRC District 8 . . . . .	333
Kentucky . . . . .	5	RRC District 8A . . . . .	374
Louisiana . . . . .	193	RRC District 9 . . . . .	9
North . . . . .	17	RRC District 10 . . . . .	6
South Onshore . . . . .	148	State Offshore . . . . .	1
State Offshore . . . . .	28	Utah . . . . .	52
Michigan . . . . .	17	Virginia . . . . .	0
Mississippi . . . . .	87	West Virginia . . . . .	0
Montana . . . . .	88	Wyoming . . . . .	249
New Mexico . . . . .	171	Federal Offshore . . . . .	2,687
East . . . . .	171	Pacific (California) . . . . .	32
West . . . . .	0	Gulf of Mexico (Louisiana) <sup>c</sup> . . . . .	2,591
New York . . . . .	0	Gulf of Mexico (Texas) . . . . .	64
North Dakota . . . . .	56	Miscellaneous <sup>d</sup> . . . . .	4
Ohio . . . . .	7	<b>U.S. Total . . . . .</b>	<b>5,691</b>

<sup>a</sup>Includes only those operators who produced 400,000 barrels of crude oil or 2 billion cubic feet of natural gas, or both, during the report year (Category I or Category II operators).

<sup>b</sup>Includes Arizona, Illinois, Indiana, Maryland, Missouri, Nebraska, Nevada, Oregon, South Dakota, and Tennessee.

<sup>c</sup>Includes Federal Offshore Alabama.

Source: Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves," 2005.

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