

**Estimated Petroleum Spillage from Facilities Associated with  
Federal Outer Continental Shelf (OCS) Oil and Gas Activities  
Resulting from Damages Caused by Hurricanes Rita and Katrina in 2005**

## SUMMARY

The loss of hydrocarbons from wells on the Federal OCS was minimal due to the successful operation of the safety valves that are required to be installed at least 100 feet below the mudline in each wellbore. All OCS facilities in areas threatened by the storms' approach were shut in prior to the hurricanes so that oil losses were mostly limited to the oil stored on the damaged structures or contained in the individual damaged pipeline segments. There were no accounts of spills from facilities on the Federal OCS that: reached the shoreline; oiled birds or mammals; or involved any discoveries of large volumes of oil to be collected or cleaned up.

As of January 25, 2007, MMS has identified 125 spills of petroleum products totaling 16,302 bbl that were lost from platforms, rigs, and pipelines on the Federal OCS as a result of damages from Hurricanes Katrina and Rita in 2005. Using the U. S. Coast Guard (USCG) size classifications for offshore spills, 112 of the spills or 90% were MINOR in size (less than 238 bbl), and 13 or 10% were MEDIUM in size (238 to 2,380 bbl). There were no MAJOR spills (2,381 bbl or greater). In some cases, the actual volume lost has been difficult to estimate, and where a range was developed, the high value is used in these calculations. MMS utilized the USCG definitions for MINOR, MEDIUM and MAJOR spills because it is the industry standard for oil spills in U.S. Waters. The terms MAJOR, MEDIUM, and MINOR are based on spill size only and do not reflect any level of impacts. There were no identified environmental impacts from any Federal OCS spills caused by Hurricanes Katrina and Rita.

The five largest spills were estimated between 1,000 and 2,000 bbl, two of which may have actually been as small as a couple of hundred bbl. These five spills represent only 4% of the number of spills and total to 8,428.5 bbl, 52% of the total estimated spillage. See Table 1 below.

Location	Structure	Operator	Spill Size	Product	Storm
EI 51	Segment #1844 14" x 4" Subsea Tie-in	Gulf South Pipeline	greater than 100 bbl to 1,812 bbl	Condensate	Rita
EI 95	Segment #4754 10" x 10" Subsea Tie-in	Gulf South Pipeline	greater than 100 bbl to 1,551 bbl	Condensate	Rita
EI 314	Platform J	Forrest Oil	2,000 bbl	Condensate	Rita
SM 146	Rowan Fort Worth Rig	Hunt Petroleum	1,494 bbl	Diesel	Rita
SS 250	Rowan Odessa Rig	Remington O & G	1,572 bbl	Diesel & Other	Rita

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There were 39 spills of 50 bbl or greater totaling 15,433 bbl, this accounts for 31% of the 125 spills and 95% of the estimated spill volume. Hurricane Katrina caused 23 of the spills of 50 bbl or greater totaling 4,006 bbl, and 16 were caused by Hurricane Rita totaling to 11,427 bbl. See "APPENDIX A: Petroleum Spills from Federal OCS Facilities of 50 bbl or Greater Resulting from Damages Caused by Hurricanes Katrina and Rita in 2005" listing individual petroleum spills of 50 bbl or greater.

Hurricane Katrina was responsible for 71 (57%) of the 125 spills of 1 bbl or greater, but only 4,530 bbl (31%) of the 16,302 bbl spilled as compared to Hurricane Rita's causing 54 spills totaling to 11,772 bbl. See Table 2 for more information of spills by storm and size categories. Platforms and Rigs were responsible for 53 or 42% of the 125 spills and 10,055 bbl spilled or 62% of the 16,302 bbl spillage. See Table 3 for more information spills from Platforms and Rigs vs. Pipelines.

The estimation of the total spillage associated with these hurricanes will not be complete until all operators have completed recovery efforts associated with the repair and/or have completed decommissioning of all the damaged structures. Some of the petroleum currently counted as spilled may yet be recovered from intact tanks, and additional damages may yet be discovered by the operators. These activities will continue through 2007 and possibly longer.

## BACKGROUND

This discussion focuses on spillage from facilities associated with oil and gas activities that occurred in Federal OCS waters as a result of damages from Hurricanes Katrina and Rita in 2005. Specifically excluded from these estimates are: 191,000 barrels (8.0 million gallons) of oil released from nine onshore facilities located in the Louisiana Delta where large oil storage tanks were breached during Hurricane Katrina; approximately 75,000 bbl of heavy fuel oil spilled in West Cameron from a non-OCS related barge en route to Florida in November 2005; and any other inland or coastal spills including those associated with oil and gas leases in State waters.

Hurricanes Katrina and Rita each attained Category 5 strengths as they passed through Federal OCS oil and gas fields within 4 weeks of each other. Hurricane Katrina contacted the Louisiana coast near New Orleans as a Category 3 storm on August 29, 2005. Hurricane Rita contacted Louisiana near Morgan City as a Category 3 storm on September 24, 2005. Approximately 75% of the 4,000 Federal OCS oil and gas facilities in the Gulf of Mexico were subject to hurricane force winds (up to 175 mph over open water) from these two hurricanes. Hurricanes Katrina and Rita jointly destroyed or seriously damaged approximately 220 platforms and drilling rigs on the Federal OCS. There have also been reports of damage to more than 560 pipeline segments. The swath of damage extended over 100 miles offshore from Port Arthur, Texas to Gulfport, Mississippi. Over 166 million barrels of oil production were curtailed (almost 30% of annual OCS crude and condensate production).

The loss of hydrocarbons from the Federal OCS wells themselves was minimal due to the successful operation of the safety valves that are required to be installed at least 100 feet below the mudline in each wellbore, of which no failures have been identified as of January 2007. All OCS facilities in areas threatened by storms' approach were shut in prior to the hurricanes so that oil losses were mostly limited to the oil stored on the damaged structures or contained in the individual damaged pipeline segments. There were no accounts of spills from facilities on the Federal OCS that: reached the shoreline; oiled birds or mammals; or involved any discoveries of large volumes of oil to be collected or cleaned up.

The estimation of the total spillage associated with these hurricanes will not be complete until all operators have completed recovery efforts associated with the repair and/or have completed decommissioning of all the damaged structures. Some of the petroleum currently counted as spilled may yet be recovered from intact tanks, and additional damages may yet be discovered by the operators. These activities will continue through 2007 and likely into 2008.

All spills are required to be reported to the National Response Center (NRC) which is operated under the U.S. Coast Guard (USCG). The NRC Report is a “first report” at which time one or more key information elements may not yet be identified such as: the facility that is the source of the spill, the responsible party, the product spilled, and/or an estimate of the spill volume. NRC Reports are not corrected or updated. Spills related to Federal OCS oil and gas activities of 42 gallons (gal) or 1 barrel (bbl) or greater are required to be reported directly to the Minerals Management Service (MMS). Over 500 NRC Reports have been filed for spills from Hurricanes Katrina and Rita in Federal OCS waters for which almost 40% had no responsible party was identified. Approximately 77% of the 500 NRC Reports were for petroleum losses or sheen sightings of which about 45% had a volume estimate (many of the volume estimates were superseded at a later date with better information). The other NRC Reports were for natural gas, chemicals, and non-release events such as spill potentials (volumes on board not known to be released) or fires. Less than half of the petroleum reports included a volume estimate.

## SPILL COUNTS AND VOLUMES

The USCG defines offshore spills of less than 10,000 gal (238 bbl) as “MINOR”; offshore spills of 10,000 to 99,999 gal (238 to 2,380 bbl) as “MEDIUM”; and offshore spills of 100,000 gal, (2,381 bbl) and greater as “MAJOR”. The terms MAJOR, MEDIUM, and MINOR are based on spill size only and do not reflect any level of impacts.

As of January 24, 2007 MMS provides the following estimates for petroleum spills of 1 bbl or greater in from oil and gas facilities in Federal OCS waters in 2005 as a result of Hurricanes Katrina and Rita:

- 125 spills totaling 16,302 bbl from both hurricanes
- 71 of the spills totaling 4,530 bbl were from Hurricane Katrina
  - 54 of the spills totaling 11,772 bbl were from Hurricane Rita
- 53 of the spills totaling 10,055 bbl were from Platforms and Rigs
  - 72 of the spills totaling 6,247 bbl were from Pipelines
- 112 or 90% of the spills were MINOR in size
  - None of the spills were MAJOR in size
  - 13 or 10% of the spills were MEDIUM in size\*
- 8 of the MEDIUM spills were between 238 and less than 1,000 bbl
  - 5 of the MEDIUM spills were between 1,000 and 2,000 bbl\*  
(no spills were estimated to be greater than 2,000 bbl)
  - \* 2 of the 5 spills estimated as 1,000 bbl or greater may actually have been much smaller
- See Table 2 for a breakdown of counts and volumes by Spill Size and Storm
- See Table 3 for counts and volumes by Platforms and Rigs vs. Pipelines by Storm

MMS’s petroleum spill volume estimates initially relied on: estimates from the operators provided to MMS in early 2006, USCG estimates as of April 2006, and rely on the NRC Report volume only if it was the only information available. As operators have continued their recovery efforts many have updated MMS with reduced loss estimates based on products actually recovered, and newly identified losses. Spill size estimation has proven problematic in some instances and frequently “worst case” estimates have been used. If the operators are able to develop more precise estimates in the future, MMS will incorporate the new information at that time.

**Table 2. Petroleum Spills from Federal OCS Facilities of 1 bbl Or Greater Resulting from Damages Caused by Hurricanes Katrina and Rita in 2005 By Size Intervals and U.S. Coast Guard (USCG) Size Categories By Storm**

Storm	USCG Size* Category	Total Petroleum	Crude Oil & Condensate	Refined Petroleum	Counts
<b>COMBINED</b>	<b>Total</b>	<b>16,302.1</b>	<b>12,115.8</b>	<b>4,186.3</b>	<b>125</b>
<b>MINOR</b>	<b>1 - 9 bbl</b>	201.9	159.0	43.0	56
	<b>10 - 49 bbl</b>	667.2	491.5	175.7	30
	<b>50 - 99 bbl</b>	905.3	753.6	151.7	14
	<b>100 - 237 bbl</b>	1,749.4	1,534.5	214.9	12
<b>MEDIUM</b>	<b>238 - 999 bbl</b>	4,349.8	3,814.4	535.4	8
	<b>1,000 - 2,380 bbl</b>	8,428.5	5,362.8	3,065.7	5
<b>MAJOR</b>	<b>≥ 2,381 bbl</b>	-	-	-	-
<b>KATRINA</b>	<b>Total</b>	<b>4,530.1</b>	<b>3,940.0</b>	<b>590.1</b>	<b>71</b>
<b>MINOR</b>	<b>1 - 9 bbl</b>	107.3	95.7	11.7	27
	<b>10 - 49 bbl</b>	416.5	416.5	-	21
	<b>50 - 99 bbl</b>	620.5	568.1	52.4	10
	<b>100 - 237 bbl</b>	1,171.6	1,025.7	145.9	8
<b>MEDIUM</b>	<b>238 - 999 bbl</b>	2,214.2	1,834.0	380.2	5
	<b>1,000 - 2,380 bbl</b>	-	-	-	-
<b>MAJOR</b>	<b>≥ 2,381 bbl</b>	-	-	-	-
<b>RITA</b>	<b>Total</b>	<b>11,772.0</b>	<b>8,175.8</b>	<b>3,596.2</b>	<b>54</b>
<b>MINOR</b>	<b>1 - 9 bbl</b>	94.6	63.3	31.3	29
	<b>10 - 49 bbl</b>	250.7	75.0	175.7	9
	<b>50 - 99 bbl</b>	284.8	185.5	99.3	4
	<b>100 - 237 bbl</b>	577.8	508.8	69.0	4
<b>MEDIUM</b>	<b>238 - 999 bbl</b>	2,135.6	1,980.4	155.2	3
	<b>1,000 - 2,380 bbl</b>	8,428.5	5,362.8	3,065.7	5
<b>MAJOR</b>	<b>≥ 2,381 bbl</b>	-	-	-	-

\* USCG Size Categories:

Columns may not add due to rounding

MINOR: Under 10,000 gal (< 238 bbl)

MEDIUM: 10,000 gal to < 100,000 gal (238 bbl to < 2,381 bbl)

MAJOR: 1100,000 gal (2,381 bbl) and Greater

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**Table 3. Petroleum Spills from Federal OCS Facilities of 1 bbl or Greater Resulting from Damages Caused by Hurricanes Katrina and Rita in 2005 By Source, Platforms And Rigs vs. Pipelines By Storm**

Storm	Source	Total Petroleum	Crude Oil & Condensate	Refined Petroleum	Counts
<b>COMBINED</b>	<b>Total</b>	<b>16,302.1</b>	<b>12,115.8</b>	<b>4,186.3</b>	<b>125</b>
	<b>Platforms &amp; Rigs</b>	10,054.9	5,868.6	4,186.3	53
	<b>Pipelines</b>	6,247.2	6,247.2	-	72
<b>KATRINA</b>	<b>Total</b>	<b>4,530.1</b>	<b>3,940.0</b>	<b>590.1</b>	<b>71</b>
	<b>Platforms &amp; Rigs</b>	2,860.5	2,270.4	590.1	28
	<b>Pipelines</b>	1,669.6	1,669.6	-	43
<b>RITA</b>	<b>Total</b>	<b>11,772.0</b>	<b>8,175.8</b>	<b>3,596.2</b>	<b>54</b>
	<b>Platforms &amp; Rigs</b>	7,194.4	3,598.2	3,596.2	25
	<b>Pipelines</b>	4,577.6	4,577.6	-	29

Columns may not add due to rounding

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This ongoing reporting has made it difficult for MMS to provide 2005 Hurricanes Katrina and Rita spill information to the public. Since MMS released preliminary spill totals in April 2006:

- Operators have recovered enough petroleum products in the interim to remove one platform and one rig from the 1,000 bbl and greater category as a result of the reductions in the estimated volume of unrecovered hydrocarbons (Chevron's Typhoon platform in GC 237 and the Rowan Halifax in EC 346)
- One rig which has not been found to date has been added to the 1,000 bbl and greater category (Rowan Fort Worth last seen at SM 146)
- A pipeline was just discovered in late July 2006 and is estimated to have lost 200 to 2,000 bbl of which the 2,000 bbl is being used as the estimate until the operator can provide better information (BP E & P Segment #9347 in MC 109).
- Two pipeline segments in Eugene Island were originally estimated in April 2006 based on "worst case" estimates (on the order of 3,000 bbl each) have been reduced to 50% of the "worst case" estimate. These reductions were based on professional judgment; the fact that the damages involved cracks, not breaks; and the lack of sightings of any condensate or sheens in the area of the cracks immediately after Hurricane Rita. It is likely that these 50% of "worst case" estimates still overestimate the actual spillage. These volumes may be revised further if new information becomes available. (Gulf South Pipeline Segment #1844 in EI 51 and Segment #4754 in EI 95)
- One pipeline spill at MC 109 caused by Hurricane Katrina was initially estimated as 200 to 2,000 bbl in August 2006, but as a result of additional investigation was revised downward to between 600 and 960 bbl by January 2007.
- Ten additional spills totaling 247 bbl of petroleum occurred in 2006 as a result of damage from the 2005 Hurricanes Katrina and Rita – these 10 spills are not included in the previous tables and discussions.