

DEPARTMENT OF THE INTERIOR
Bureau of Ocean Energy Management (BOEM)

2011 Annual Price Threshold Determination Technical Documentation

This documentation explains in detail how the BOEM calculates the annual oil and gas prices and applicable price thresholds used to determine whether royalty relief applies in calendar year 2011 for our various deepwater and deep drilling royalty relief programs. The data and methodology used for making the 2011 calculations and determinations, as well as additional information and notes to help understand this document, are included in the discussion below. The calculation for all years since 1996 is available at the Economics Division's Web site, <http://www.boem.gov/Oil-and-Gas-Energy-Program/Energy-Economics/Price-Thresholds/econPT.aspx>.

Methodology for Calculation of the Actual Annual Average New York Mercantile Exchange (NYMEX) Nearby Delivery Price

1. We use the NYMEX price for the nearby delivery month or front month. This is the price on that exchange for the first contract or earliest month that you can get the delivery/inventory for buying and selling today's product. For example, on October 1, 2011, the nearby delivery month was November 2011. There are prices for other delivery months that could have been bought and sold on October 1, 2011, such as December 2011, January 2012, etc., but the "nearby delivery month" would be November 2011. However, the nearby delivery month is not always the next month because near the end of the month, the earliest delivery date might extend into a subsequent month. Moreover, the nearby delivery month can differ between oil and gas futures contracts. For example, on October 24, 2011, the nearby delivery month for light sweet crude oil was December 2011, while for natural gas it was still November 2011.
2. The daily NYMEX closing price is listed as the settle price at the end of business trading hours for each commodity. These are listed at <http://www.nymex.com> and also summarized at <http://www.oilenergy.com>.
3. The daily closing average is used to calculate the monthly average. For holidays and weekends, we use the previous business day's closing average. For example, Table A illustrates the calculation of the average NYMEX oil price for the month of September 2011. Our analysis indicates that inclusion or exclusion of weekends and holidays does not bias the annual average price calculation in either direction. We chose to include the weekends and holidays, as highlighted in Table A, to avoid the necessity to keep track of actual trading days each month all year, and because the summary source cited in item No. 2 above reports the monthly average price data with the inclusion.

Table A—Example of Monthly Average Price Calculation

Day	Date	Daily closing price (\$/bbl)	Day	Date	Daily closing price (\$/bbl)
Thursday	9/1/2011	88.93	Friday	9/16/2011	87.96
Friday	9/2/2011	86.45	Saturday	9/17/2011	87.96
Saturday	9/3/2011	86.45	Sunday	9/18/2011	87.96
Sunday	9/4/2011	86.45	Monday	9/19/2011	85.70
Monday	9/5/2011	86.45	Tuesday	9/20/2011	86.89
Tuesday	9/6/2011	86.02	Wednesday	9/21/2011	85.92
Wednesday	9/7/2011	89.34	Thursday	9/22/2011	80.51
Thursday	9/8/2011	89.05	Friday	9/23/2011	79.85
Friday	9/9/2011	87.24	Saturday	9/24/2011	79.85
Saturday	9/10/2011	87.24	Sunday	9/25/2011	79.85
Sunday	9/11/2011	87.24	Monday	9/26/2011	80.24
Monday	9/12/2011	88.19	Tuesday	9/27/2011	84.45
Tuesday	9/13/2011	90.21	Wednesday	9/28/2011	81.21
Wednesday	9/14/2011	88.91	Thursday	9/29/2011	82.14
Thursday	9/15/2011	89.40	Friday	9/30/2011	79.20
				Average	\$85.58

4. The monthly average is used to calculate the annual average. For example, Table B illustrates the calculation of the NYMEX oil price for 2011. The dollar amount of the result is rounded to the nearest hundredth decimal point (i.e., cents). We do not weight the average each month by the number of days in that month, because our analysis indicates that this simplification does not introduce a systematic bias in the calculation.

Table B—Example of Annual Average Price Calculation

Month	Average closing price (\$/bbl)
January	89.74
February	88.64
March	102.99
April	110.41
May	101.19
June	96.19
July	97.09
August	86.00
September	85.58
October	86.27
November	97.10
December	98.57
Average	94.98

Methodology for Calculation of the Applicable Oil and Natural Gas Price Thresholds

1. The price thresholds are estimates until they are locked-in based on complete inflation data for a calendar year which is not available until several months after the close of the year. In conjunction with the calculation of the annual market prices for

oil and gas above, once the price thresholds are “locked in,” the BOEM makes an official determination regarding whether these market prices have exceeded the applicable price thresholds for the calendar year for a given vintage of lease and royalty relief program. This locked-in price threshold also becomes the base from which we calculate the price threshold for the next year for each vintage of leases. After this official BOEM determination is made, any subsequent revisions in the underlying source of the inflation figures will not affect the locked-in price thresholds or the determination of eligibility for royalty relief for that calendar year. We lock in the price threshold determination using the best information available before March 31 of the following year because that is the date by which lease documents and regulations stipulate that make-up royalty payments are due if prices exceed the threshold. This procedure prevents subsequent revisions of the inflation measure for the year from altering the royalty payment obligation.

2. The source for inflation data is the Department of Commerce, Bureau of Economic Analysis (BEA) <http://www.bea.gov>: The U.S. Economic Accounts—Gross Domestic Product (GDP), National Income and Products Account (NIPA) Table 1.1.9. The 4th quarter implicit price deflator is not available from BEA until late March of the subsequent calendar year.
3. The BOEM uses the implicit price deflator for GDP to calculate the applicable annual inflation rate, as illustrated in Table C. This is the inflation measure the Deep Water Royalty Relief Act directs be used to adjust its price thresholds and we have adopted it for use with other price thresholds for consistency purposes. We calculate the inflation rate by dividing the deflator from the applicable year by the deflator from the previous year and subtract one. For example, the inflation rate used to set the 2011 price threshold is calculated as $\{(113.361 / 110.992) - 1 = 2.1\%$.

**Table C—Inflation Rates (Current and Locked-in)
[Derived from BEA Data]**

Calendar year	Current Implicit price deflator for GDP (base = 2005)	Current annual inflation rate (%)	Locked-in annual inflation rate (%)
1994	79.94		
1995	81.61	2.1	2.6
1996	83.16	1.9	2.0
1997	84.63	1.8	2.0
1998	85.58	1.1	1.0
1999	86.84	1.5	1.5
2000	88.72	2.2	2.1
2001	90.73	2.3	2.2
2002	92.20	1.6	1.1
2003	94.14	2.1	1.7
2004	96.79	2.8	2.1
2005	100.00	3.3	2.8
2006	103.23	3.2	2.9
2007	106.23	2.9	2.7

Calendar year	Current implicit price deflator for GDP (base = 2005)	Current annual inflation rate (%)	Locked-in annual inflation rate (%)
2008	108.58	2.2	2.2
2009	109.73	1.1	1.2
2010	110.99	1.2	1.0
2011	113.36	2.1	2.1

4. Because BEA periodically updates its estimates of previous years' rates of inflation, the levels of inflation from those years as currently shown on the BEA Web site will diverge somewhat from the original inflation rates posted by BEA and used by the BOEM to lock in the updated price thresholds (see Table C above). For example, the GDP deflator posted on the BEA Web site in March 2011 shows an inflation rate for 2004 of 2.8 percent. However, back in March 2005, when the BOEM chose to lock in the 2004 price threshold to avoid subsequent recalculations that might change the determination of whether certain royalties were due and payable for 2004, the BEA Web site showed an inflation rate of 2.1 percent. The BOEM used that level of the inflation rate in making the annual change in the deepwater oil price thresholds. This can be seen in the first price threshold column of the Deepwater Table on the Web site, in which the threshold price for selected leases increased from \$32.81/bbl in 2003 to \$33.50/bbl in 2004, equal to 2.1 percent.

In summary, the BOEM uses the figures that were originally shown on the BEA Web site in March of each year to make the adjustments and reach finality in the price thresholds from year to year. Rounding explains any remaining small differences between calculated locked-in inflation rates and those rates depicted on the BOEM Web site. Therefore, except for minor rounding considerations, the BOEM's actual price thresholds for previous years derive directly from the locked-in inflation rates. The estimated price thresholds depicted on the BOEM Web site, prior to March of the subsequent year, rely on an estimate of the current inflation rate but do not become official until BEA releases its annual measure of inflation for the entire year at the end of March of the subsequent year.