

**Estimating the Economic Effects of the Deepwater Drilling  
Moratorium on the Gulf Coast Economy**

**Inter-Agency Economic Report**

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## Executive Summary

The BP Deepwater Horizon drilling rig, situated about 50 miles off the coast of southern Louisiana, exploded on April 20, 2010, resulting in 11 deaths, 17 injuries, and one of the worst environmental disasters in U.S. history. In response, the Secretary of the Interior exercised his authority to suspend certain deepwater drilling activities. Given uncertainty about the adequacy of existing safety regulations, the moratorium provided time to determine whether and how deepwater drilling could continue in a safe and environmentally-sound manner. The current moratorium is in effect until November 30, 2010. This report estimates the economic consequences of this moratorium in the five Gulf Coast states.

Evidence on employment, unemployment and unemployment insurance (UI) claims in the parishes most affected by the deepwater drilling moratorium indicates that there have not been large increases in unemployment or decreases in employment in these parishes. These data do not indicate that there has been no employment impact associated with the drilling moratorium, but they do suggest that any losses have not been large to date, since significant losses would have shown up in the employment, unemployment and UI claim activity data.

Based on conversations with a number of rig operators along with other publicly-available information, we estimate that during the six-month period of the moratorium average employment of rig workers in the Gulf of Mexico fell by about 2,000. Total spending by drilling operators is estimated to decline \$1.8 billion over the six-month period. This direct reduction in spending by the rigs impacts employment in the industries that supply the Gulf drilling industry and then in all other industries affected by declines in consumer and business spending. To capture all of these related employment changes, we apply a multiplier to the direct reduction in spending in order to estimate the total decline in Gulf Coast employment as a result of the moratorium.

We estimate that the six-month moratorium may temporarily result in up to 8,000 to 12,000 fewer jobs in the Gulf Coast. These jobs would not be permanently lost as a result of the moratorium; most would return following the resumption of deepwater drilling in the Gulf of Mexico.

For reasons described in the report, we expect this impact to be more heavily concentrated in smaller businesses than in the larger companies operating in the Gulf Coast. These estimates are lower than estimates from earlier studies. There are several reasons for the difference, but a primary reason is that many deepwater drilling operators and contractors have retained most of their employees. Earlier studies assumed that all employees would be let go.

The other primary economic consequence of the moratorium is delayed oil production. Consistent with other studies, we estimate that the moratorium will reduce Gulf of Mexico oil production by about 31,000 barrels per day in the fourth quarter of 2010 and by roughly 82,000 barrels per day in 2011. These are small reductions compared to world production, and are occurring at a time when both crude oil and product inventories and global spare oil production capacity are at high levels, hence they are not expected to have a discernable effect on the price of oil.



# **Estimating the Economic Effects of the Deepwater Drilling Moratorium on the Gulf Coast Economy**

## **1. Introduction**

The BP Deepwater Horizon drilling rig, situated about 50 miles off the coast of southern Louisiana, exploded on April 20, 2010, resulting in 11 deaths, 17 injuries, and one of the worst environmental disasters in U.S. history. This disaster happened after the oil and gas industry had repeatedly assured the American public that such a disaster was not possible.

In response, the Administration acted to ensure that safety regulations were in place to minimize the likelihood of future similar events. On May 28, 2010, the Secretary of the Interior directed the Minerals Management Service, now the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEM) to exercise its authority to suspend certain deepwater drilling activities. This decision was challenged in court and was preliminarily enjoined. The Secretary immediately complied with the court's preliminary injunction. To address the continuing risk posed by certain drilling operations, the Secretary examined the options available for managing the Outer Continental Shelf ("OCS") in a safe and environmentally sound manner and ultimately issued a new suspension decision on July 12, 2010. The current moratorium is in effect until November 30, 2010.

The suspension was imposed at a time when there was little understanding of the cause of the BP Deepwater Horizon explosion. It has provided time to ensure that the appropriate workplace and drilling safety measures are in place, and to develop strategies for the containment of wild wells in deepwater. The long-term safety of the drilling industry in the Gulf is important to its economic viability as well as to the Gulf Coast environment. (Throughout this report, "Gulf Coast" refers to the five Gulf Coast states of Texas, Louisiana, Mississippi, Alabama, and Florida.)

During the crisis, the Administration has closely monitored the deepwater drilling industry and the Gulf of Mexico's coastal community and has been able to update and refine its estimates of the economic impacts of a temporary deepwater drilling moratorium. For this report, we talked with several of the deepwater rig operators and contractors who operate in the Gulf of Mexico to ascertain how their firms have responded to the moratorium. At this time, employment effects from the moratorium appear to be limited. Almost all of the deepwater rigs in the Gulf of Mexico at the time of the first moratorium remain in the Gulf of Mexico; drilling contractors have decided, to date, to retain most of their crews; rig operators have implemented only minimal layoffs; and well servicing firms have largely retained their employees, though some have been deployed to work in regions outside of the Gulf of Mexico. Aggregate employment data do not show a meaningful adverse effect in the five Louisiana parishes that support most deepwater drilling activities. The total number of workers employed in Terrebonne, Lafourche, Lafayette, Iberia, and St. Mary parishes was higher in July, two months into the moratorium, than in April. Also, these five parishes' share of Louisiana unemployment insurance claims has declined from April through August.

Using information from our conversations with deepwater rig operators and contractors, coupled with information from a variety of other sources, this report provides updated estimates of the potential economic effects of the moratorium on employment. We estimate that the six-month moratorium may temporarily result in up to 8,000 to 12,000 fewer jobs in the Gulf Coast. These jobs would not be permanently lost as a result of the moratorium; most would return following the resumption of deepwater drilling in the Gulf of Mexico.

This study, like previous studies, assumes that normal drilling operations would have been in place in the absence of the moratorium. In reality, the safety concerns generated by the BP Deepwater Horizon oil spill would have almost surely resulted in some short-term drilling slowdown due to safety concerns and the development of new regulations. This suggests that our estimates likely overstate the true job reductions due to the moratorium itself.

For reasons described below, we expect employment effects to fall more heavily on smaller businesses than on the larger companies operating in the Gulf Coast. We have heard repeatedly about the problems facing small businesses in the Gulf Coast that depend on the drilling industry for their survival, and this finding reinforces those concerns.

The reduced employment estimates here are lower than those of earlier studies. There are many reasons for this difference, which we detail in section 6, but one of the primary reasons is that contrary to the worst-case assumptions in prior studies, many deepwater drilling operators and contractors have kept most of their employees on payroll. Earlier studies assumed that these employees would have been let go. One of those earlier studies was a preliminary analysis by the Department of the Interior that estimated that 23,000 jobs in the Gulf Coast region could be lost temporarily as a result of the moratorium.

In addition to the job reductions due to reduced spending during the moratorium, the other primary economic consequence of the moratorium is a reduction in oil exploration and production over the period of the moratorium. Consistent with other studies, we estimate that the moratorium would reduce Gulf of Mexico oil production by about 31,000 barrels per day in the fourth quarter of 2010 and by roughly 82,000 barrels per day in 2011. However, none of this production is permanently lost as a result of the moratorium; instead the production is simply delayed as these resources will be available for production following the resumption of deepwater drilling in the Gulf of Mexico. Given that these are small reductions compared to world production, and are occurring at a time when both crude oil and product inventories and global spare oil production capacity are at high levels, they are not expected to have a discernable effect on the price of oil.

The structure of this report is as follows. Section 2 describes the history of the moratorium. Section 3 lays out evidence that the impact of the moratorium on employment has been less than anticipated by initial studies. Section 4 follows with a description of the deepwater drilling industry and estimates of how much the deepwater drilling industry has reduced its employment. Section 5 describes our estimate of reduced spending during the length of the moratorium. Section 6 delves into the issue of how to appropriately translate this direct reduction in spending into changes to the broader economy using multiplier analysis. Another economic cost is the

delay in oil production as a result of the moratorium, and those results are discussed in section 7. Section 8 concludes.

## 2. Description and History of the Moratorium

On May 28, 2010, the Secretary of the Interior directed the Minerals Management Service, now BOEM, to exercise its authority under the Outer Continental Shelf Lands Act (OCSLA) and its implementing regulations to suspend certain deepwater drilling activities.<sup>1</sup> Accordingly, BOEM issued a Notice to Lessees and Operators (“NTL”) suspending most new drilling operations in the Gulf of Mexico and the Pacific region for operations in water depths greater than 500 feet for a period of six months.

The NTL did not apply to drilling and extraction activity in water depths less than 500 feet or to producing wells in deeper water.<sup>2</sup> According to the Louisiana Mid-Continent Oil and Gas Association, the moratorium does not affect the 591 producing deepwater wells or the over 4,500 shallow water wells in the Gulf of Mexico.<sup>3</sup> The Department of the Interior estimates that there are a total of 80,000 offshore oil and gas production, construction, and drilling workers in the Gulf of Mexico. As described below, fewer than 10,000 of these workers were employed on rigs affected by the moratorium.

On June 7, certain providers of support services to offshore oil and gas operations in the Gulf of Mexico filed a lawsuit in the Federal District Court for the Eastern District of Louisiana seeking to invalidate the May 28 suspension (the “*Hornbeck* litigation”). On June 22, the Court preliminarily enjoined enforcement of the suspension. The Department of the Interior appealed the Court’s decision and requested that the U.S. Court of Appeals for the Fifth Circuit stay the injunction pending appeal. On July 8, the Fifth Circuit denied the stay motion on the grounds that the Department had not shown irreparable harm because there was no indication that the drilling activities subject to the suspension were likely to resume, but made clear that the government could seek emergency relief if such activities did resume or were imminent.

On July 12, the Secretary of the Interior issued a decision memorandum imposing a second suspension of drilling operations in deep water. The July 12 suspension decision defined the drilling operations subject to the suspension based on the equipment configuration used in conducting the operation. Specifically, the July 12 suspension applies, with certain exceptions,

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<sup>1</sup> OCSLA authorizes the promulgation of regulations for the “suspension or temporary prohibition of any operation or activity, including production, pursuant to any lease or permit . . . if there is a threat of serious, irreparable, or immediate harm or damage to life (including fish and other aquatic life), to property, . . . or to the marine, coastal, or human environment . . .” 43 U.S.C. § 1334(a)(1). Bureau of Ocean Energy Management, Regulation and Enforcement (BOEM) regulations provide that the agency may order suspensions of operations when activities “pose a threat of serious, irreparable, or immediate harm or damage” to human or animal life, property, any mineral deposit, or the marine, coastal, or human environment as described in Section 1334(a)(1) above or “[w]hen necessary for the installation of safety or environmental protection equipment.” 30 C.F.R. §§ 250.172(b)-(c).

<sup>2</sup> The specific NTL was No. 2010 N-04.

<sup>3</sup> “Impacts of President Obama’s Order Halting Work on 33 Exploratory Wells in the Deepwater Gulf of Mexico,” May 28, 2010.

to the drilling of wells using subsea blowout preventers (BOPs) or surface BOPs on a floating facility.

Similar to the May 28 suspension, the July 12 suspension does not apply to production activities; drilling operations that are necessary to conduct emergency activities, such as the drilling operations related to the BP Deepwater Horizon event; drilling operations necessary for completions or workovers (where surface BOP stacks are installed, they must be utilized during these operations); abandonment or intervention operations; or waterflood, gas injection, or disposal wells. BOEM ordered any current drilling operations covered by the suspension to proceed to the next safe opportunity to secure the well and take all necessary steps to cease operations and temporarily abandon or close the well. Thus drilling activity in deepwater did not immediately stop on May 28, given the excepted activities and the need to reach a safe opportunity in the drilling horizon before temporarily abandoning a given well.

As detailed in the Secretary's July 12 Decision Memorandum, there are three primary reasons for a temporary pause in certain deepwater drilling operations. First, the suspension allows time to review existing safety activities and to implement appropriate new workplace and drilling safety measures. Second, the suspension provides BOEM, industry, and other participants time to develop strategies for the containment of wild wells in deepwater. Third, given that all available spill response and containment resources were occupied with the BP Deepwater Horizon spill, the pause in drilling ensures that appropriate and sufficient response resources would be available in the event of another major oil spill.

The current suspension of new deepwater drilling activity is effective until November 30, 2010. However, the July 12 Decision Memorandum makes clear that the suspension could be lifted earlier than November 30 if "the safety, containment and response issues that have created the need for a suspension have been resolved, or if those three issues are addressed to a degree that can be determined upon further study to ensure an acceptable margin of safety." The Secretary of the Interior directed BOEM to continue collecting and analyzing information – including information obtained through public forums and outreach involving members of industry, academia, non-governmental organizations, elected officials, and the general public – regarding each of the three primary reasons underlying the temporary suspension of deepwater drilling. BOEM is required to report its findings and recommendations regarding whether modification to the scope or duration of the deepwater drilling moratorium would be appropriate by no later than October 31, 2010, and earlier than that if possible.

### **3. Employment in Louisiana Parishes that Support Deepwater Drilling**

Observed changes in employment in those Gulf Coast areas that support deepwater drilling can provide an initial sense of the possible magnitude of the impact of the deepwater drilling moratorium. In contrast to early studies that made assumptions about the number of rig workers laid off and subsequent impacts on economic activity, in this study we have surveyed a number of rig operators about their personnel and rig decisions and reviewed the regularly collected data on unemployment insurance and employment activity by parish/county and by state. In this section we present these aggregate employment data. In the following two sections we discuss

the economics of offshore drilling and describe our estimates of the changes in employment and spending on the rigs following the moratorium.

We look at employment and unemployment data in the five contiguous Louisiana parishes widely believed to be heavily dependent on the deepwater drilling industry. If there are noticeable labor market effects from the drilling moratorium, these parishes should be among the areas most affected. As this section indicates, based on the most recently available data, these five parishes have yet to experience significant changes in their overall labor markets, and that conclusion holds when they are compared to the rest of Louisiana or to the entire country.

The labor market data available at the parish level include monthly estimates of employment and unemployment from the Department of Labor's Bureau of Labor Statistics as well as continuing and initial unemployment insurance (UI) claims provided by the state of Louisiana through the Department of Labor's Employment and Training Administration.<sup>4</sup> The five parishes that we focus on are:

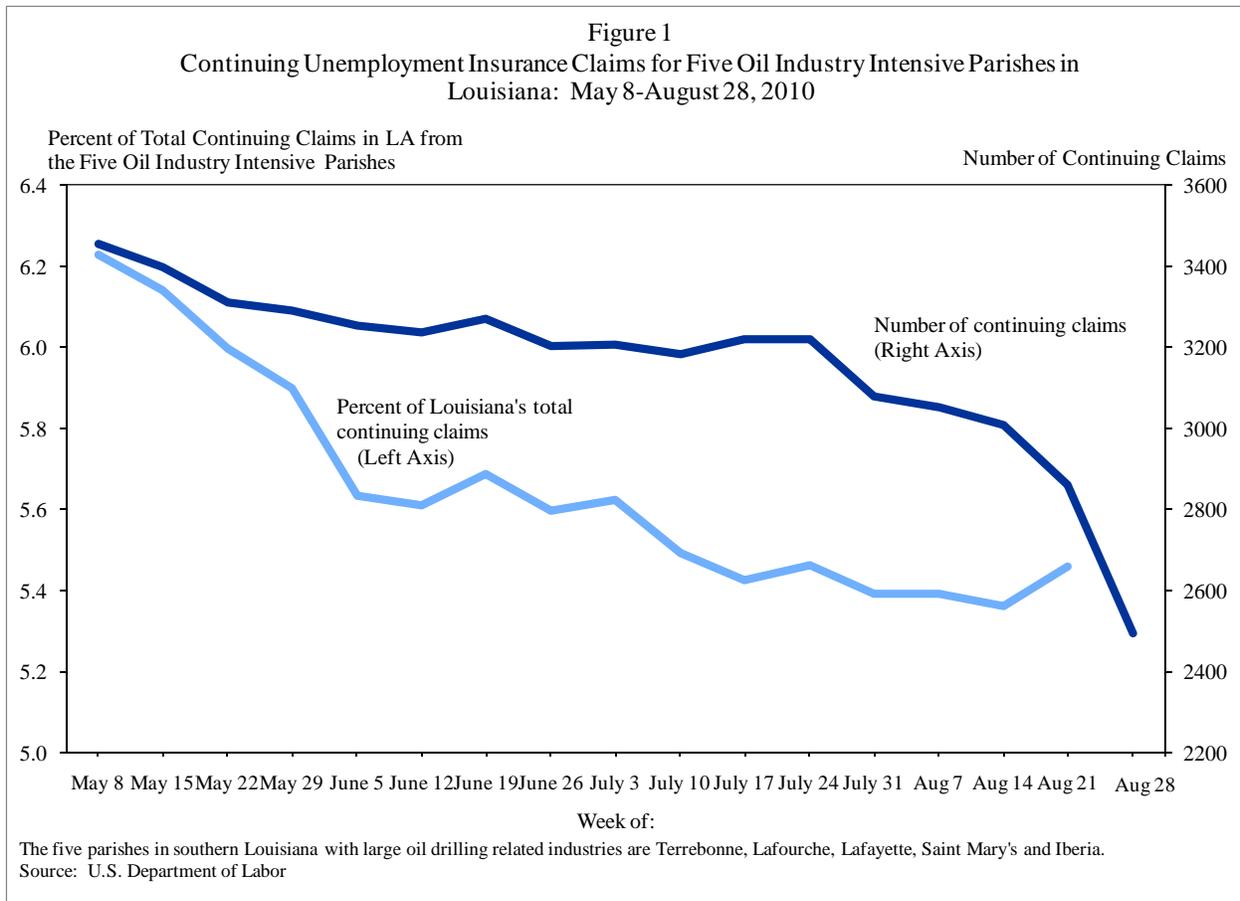
- Lafourche (home to Port Fourchon);
- Lafayette (home to about one-third of Louisiana's oil and gas drilling industry);
- St Mary's (home to Morgan City);
- Terrebonne (home to Houma); and
- Iberia (home to about 10 percent of Louisiana's oil and gas drilling industry).

Weekly UI data can illustrate whether a parish or region has experienced a recent increase in workers losing their jobs. Figure 1 shows the number of continuing UI claims in these five parishes and also their share of statewide continuing UI claims through August. Both measures have trended down during the summer, indicating that the number of continuing UI claims has fallen in these parishes, both in absolute terms and relative to the rest of Louisiana. Of course, the number of continuing claims does not measure the flow of workers into the UI program but only measures the number of eligible workers receiving their weekly benefit at a given point in time. Initial (new) UI claims provide a better measure of the number of workers entering unemployment. At the national level, let alone the parish level, the initial claims data exhibit great week-to-week volatility, which makes them difficult to interpret. Nonetheless, there appears to be little trend up or down in initial UI claims in these five parishes.

Further evidence on UI claims comes from data in three states—Louisiana, Mississippi, and Texas—that ask UI recipients whether their claims are related to the moratorium. The number of UI recipients who have responded positively to this question is but a sliver of the total claims activity in each state. Based on the responses through September 13, 2010, only 734 moratorium-related continuing claims have been filed to date in Louisiana, 22 in Mississippi, and 64 in Texas. In contrast to these 820 claims, total continuing claims in those three states currently number in excess of 300,000.

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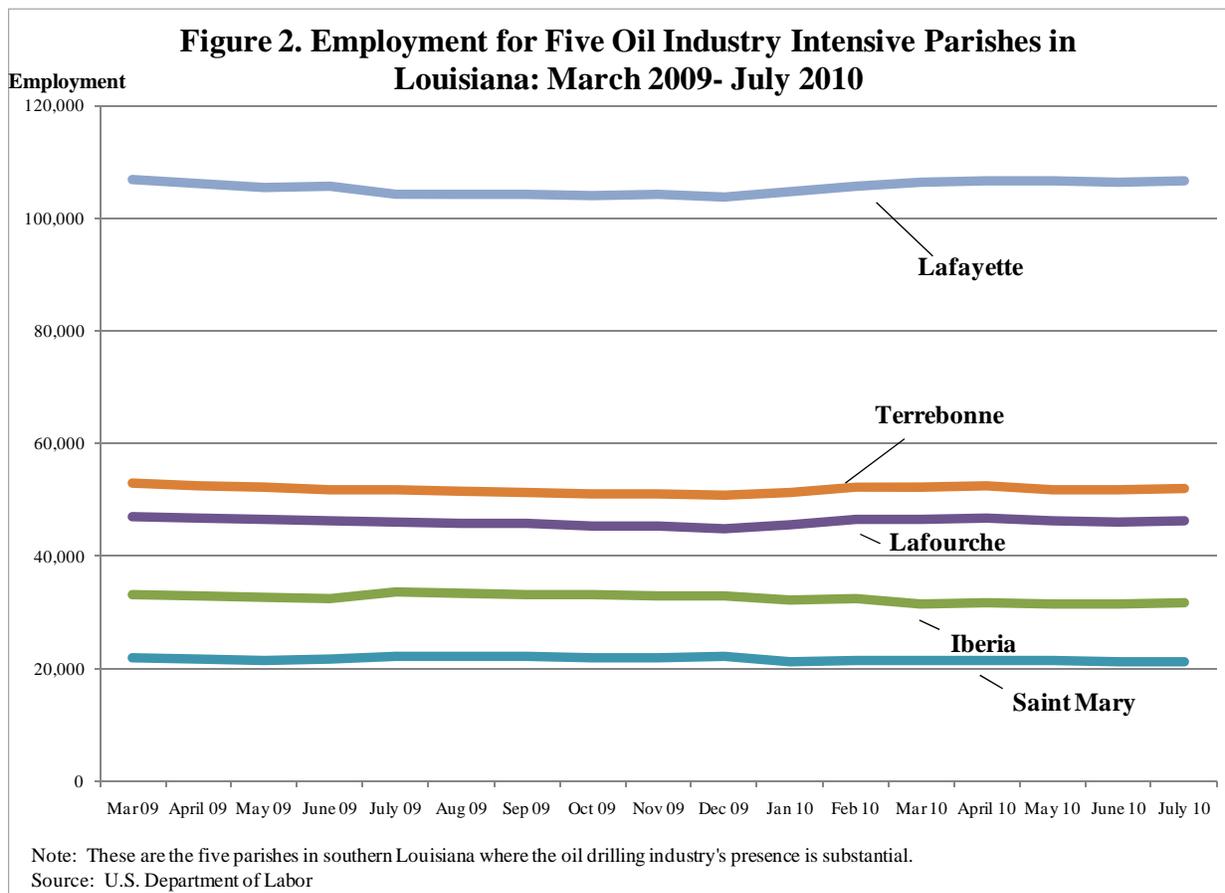
<sup>4</sup> Local area estimates of persons employed are published by the Bureau of Labor Statistics' Local Area Unemployment Statistics program and are available online at [www.bls.gov/lau](http://www.bls.gov/lau). Nonfarm payroll job estimates for states and metropolitan areas are published by the Bureau of Labor Statistics' Current Employment Statistics program and are available online at [www.bls.gov/sae](http://www.bls.gov/sae).



Not all persons who lose their employment are eligible for UI. Self-employed persons, for example, are not eligible. Thus, self-employed persons who lost their job because of the moratorium are unlikely to be reflected in the UI data. The Administration proposed in its May legislative package to extend UI coverage to such workers who lose their jobs as a result of a Spill of National Significance.

At the same time as the moratorium has been in effect, there have also been significant resources devoted to oil spill containment and clean-up in Louisiana. Monthly employment data for these parishes can illustrate the net effect of all changes (including other economic factors not related to the oil spill). Employment levels and unemployment rates by parish are summarized in Figure 2 and Table 1. Figure 2 indicates that employment as of mid-summer was at about the same level as at the beginning of 2009. There is no evidence of declining employment after the moratorium was announced.

As Table 1 shows, employment in these five parishes actually increased from April to July by 0.7 percent, nearly identical to the rate of increase for the nation and the state of Louisiana. A similar story holds for the unemployment rate: The unemployment rate increased 0.9 percentage points in the oil industry-intensive parishes, compared to a 1.4 percentage point increase for the state as a whole, and a 0.2 percentage point increase across the United States.



**Table 1: Employment Changes from April 2010 to July 2010 for Five Oil Industry Intensive Parishes in Louisiana**

*(Not Seasonally Adjusted)*

	-----Employment Level (in thousands)-----				--Unemployment Rate--		
	April	July	Change	%Change	April	July	Change
<b>U.S. total</b>	139,302	140,134	832	0.6%	9.5	9.7	0.2
<b>Louisiana</b>	1,958.6	1,971.9	13.3	0.7%	6.2	7.6	1.4
<b>Total for 5 parishes</b>	259.5	261.2	1.7	0.7%	5.2	6.1	0.9
<b>Iberia</b>	31.4	31.9	0.5	1.6%	6.8	7.7	0.9
<b>Lafayette</b>	107.2	108.1	0.9	0.8%	4.7	5.7	1.0
<b>Lafourche</b>	46.8	47	0.2	0.3%	4.4	5.0	0.6
<b>Saint Mary</b>	21.4	21.5	0.1	0.5%	8.0	9.3	1.3
<b>Terrebonne</b>	52.6	52.8	0.2	0.4%	4.8	5.3	0.5

Source: Author's calculations using data from the Bureau of Labor Statistics, Current Population Survey (U.S. total) and Local Area Unemployment Statistics program (statewide and parish).

These data do not indicate that there has been no employment impacts associated with the drilling moratorium, but they do suggest that any losses have not been large to date, since significant losses would have shown up in the employment, unemployment and UI claim activity data. The data also suggest that the net employment effect of the moratorium and spill response – from hiring coastline clean-up workers to deploying vessels of opportunity for skimming to supporting the well containment efforts at the MC252 site – does not appear to be large.

#### **4. The Economics of Deepwater Drilling**

This section lays out some of the basic parameters of the Gulf of Mexico deepwater drilling industry as it operated in April 2010, including estimates of the industry’s employment and spending on personnel, supplies, and materials. In addition to tapping traditional sources of information about the industry, we spoke at length with a number of firms involved in drilling operations in the Gulf of Mexico to fill in gaps that traditional sources could not address. These firms included drilling contractor, operator and well service firms. Our conversations were conditioned on a promise of confidentiality to help ensure candid responses to our questions. As a result, to the extent we rely on information from these conversations, we use only summary-level information rather than firm-specific information, and we do not identify any of these firms by name. Because it was not practical to speak with every firm involved in drilling operations in the Gulf of Mexico, we arranged to speak with firms that could provide information about a large portion of the rigs and employees. Taken together, the firms we spoke with had direct knowledge of over 50 percent of the semisubmersibles and drillships and their associated workers in the Gulf of Mexico at the time the first moratorium began.

Although definitions vary, drilling is generally considered “deepwater” if it is in water depths of more than 500 or 1,000 feet. There are basically three kinds of deepwater drilling rigs: semi-submersible drilling rigs, drillships, and platform rigs.<sup>5</sup> To reduce confusion, in this report “rig” refers to any of these three types of vessels.

To obtain employment estimates of rig workers, several analysts have computed the average employment by type of vessel and the depth of water in which it is working. For instance, the number of rig workers can range from approximately 50 for platforms up to 300 for drill ships and semi-submersibles. For the set of deepwater rigs active in the Gulf of Mexico at the time the first moratorium was announced, the average number of rig workers employed on semi-submersibles and drill ships was about 260 per rig. Deepwater drilling employment before the BP Deepwater Horizon explosion is estimated to total about 9,700, an estimate very close to those used by earlier studies.

A complicating factor is the complex employment arrangements for these rig workers. Only a portion work directly for the drilling operators (for instance, only a few of the workers on the BP Deepwater Horizon rig were BP employees). Drilling operations also include rig workers

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<sup>5</sup> The BP Deepwater Horizon, for example, was an ultra-deepwater semi-submersible drilling rig.

employed by the drilling contractor, the company that leases the drilling rig to the operator. There are also usually a number of well service rig workers who are hired on a contract basis by the operator to perform services like well logging, well testing, operations monitoring, and drilling fluid and cementing services. All of these workers work on the rig and are considered “rig workers” in this report.

Although most economic studies of the moratorium focus on employment, employment is only one component of rig spending. Another important aspect of deepwater drilling is the large amounts spent on leasing the vessels, supplies, services, and materials. These expenditures support a network of onshore businesses that serve the deepwater drilling economy.

The costs of leasing and operating a deepwater rig are estimated to average about \$720,000 per day for semi-submersibles and drill ships. Adding in an estimate for platforms, spending for deepwater rigs operating in the Gulf of Mexico prior to the April 2010 explosion is estimated to have totaled about \$800 million per month. Spending to operate these same rigs for six months would total close to \$5 billion.

## **5. Changes in Rig Employment and Spending as a Result of the Moratorium**

There are a number of factors that influence employment and spending by deepwater drilling rigs during the moratorium located in the Gulf of Mexico. These factors include the number of rigs still working, the number of rigs that have left the Gulf of Mexico, and the activity levels on the remaining rigs. Based on a variety of reports and industry contacts, the following facts describe the situation following the announcement of a temporary suspension of deepwater drilling:

- Even though many deepwater rigs have discontinued drilling operations, almost all of the deepwater rigs in the Gulf of Mexico at the time of the first moratorium remain in the Gulf of Mexico: As of September 10, 2010, 41 out of the 46 rigs in the Gulf as of April 20 have remained in the region.
- Even though many deepwater rigs that remain in the Gulf of Mexico are not currently working, drilling contractors have decided, to date, to retain most of their crews. Similarly, rig operators have implemented only minimal layoffs, and well servicing firms have largely retained their employees, though some have been deployed to work in regions outside the Gulf of Mexico. The primary reason for retaining these employees, based on our conversations with rig contractors and operators, is that it would be expensive to rehire or replace these highly skilled and specialized employees in the near future. Furthermore, many of the rig owners have found ways to avoid costly temporary layoffs by redeploying some of these workers temporarily into non-drilling activities such as equipment maintenance and upgrading.
- Industry participants acknowledged that their current business decisions pertaining to rig departures and worker layoffs could not be sustained during a longer moratorium, but for now they are taking a wait-and-see approach. As long as it appears that the moratorium

will end within the announced six-month period or sooner, it is unlikely that workers who have been retained through early September will be laid off in the next few months.

- Although rig worker employment has not fallen a great deal, a large number of rigs are no longer conducting operations. As a result, operator spending has declined. Since most operators maintain long-term deepwater rig leases, they must continue to pay their leasing commitments, but they have reduced their other spending by substantially lowering their other costs (such as for supplies, materials, and services) which are more discretionary.

When the first moratorium was announced, many commentators and local political leaders worried that the predicted that operators would move many, if not most, deepwater rigs out of the Gulf of Mexico and rig workers would quickly be laid off.<sup>6</sup> Three months into the moratorium, those predictions have not proven true.

Based on conversations with industry participants and publicly available information, we estimate that during the six-month period an average of about 2,000 rig workers will have been laid off or left the Gulf Coast, or about 20 percent of the 9,700 rig workers employed in the Gulf of Mexico in April 2010. To the extent that there are larger employment effects on the Gulf Coast economy from the moratorium, they will likely come from the reduction in operator spending, particularly the costs related to drilling supplies, services and materials. To estimate the magnitude of this potential reduction we assume:

- Spending per rig remains the same for any rigs that continue working.<sup>7</sup>
- The reduction in the number of working rigs from the Gulf of Mexico since April 2010 was a result of the moratorium and that all spending in the Gulf Coast associated with those rigs has ceased.
- For rigs that remain in the Gulf of Mexico, but are idle, half of average spending per rig goes into leasing the rig itself (which includes the payments to the drilling contractor workers who remain on the rig) and this spending is unaffected by the moratorium.<sup>8</sup> We assume a small share of the non-leasing costs continue to be paid, to cover basic supplies and equipment for the crew remaining on the rig. The remaining non-leasing costs, which typically go to support drilling operations, are set to zero.

Based on these assumptions, we estimate that over the six months of the deepwater moratorium, total operator spending will be reduced by about \$1.95 billion. However, this estimate does not

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<sup>6</sup> One such article that highlighted large potential job losses to the state of Louisiana was “Obama’s Drill Ban May Trigger Job Losses, Slow Gains (Update1),” June 4, *Businessweek*, <http://www.businessweek.com/news/2010-06-04/obama-s-drill-ban-may-trigger-job-losses-slow-gains-update1-.html>

<sup>7</sup> This assumption is based on conversations with rig operators and contractors.

<sup>8</sup> As a result of the moratorium, some of the leasing agreements may have been modified to lower the payments. However, as these reduced payments reflect changes in financial transfers between large companies, these reduced leasing payments are assumed to have no direct impact on employment in the Gulf Coast.

account for the fact that the reductions in operator spending are partially offset by wage replacement (\$141 million) for some of the rig workers.<sup>9</sup> Although many well service rig workers will no longer be hired by the operators, conversations with several industry participants indicate that most well service rig workers remain employed and are still being paid. In addition, we anticipate the Rig Worker Assistance Fund established by BP will partially compensate well service rig workers and drilling contractor rig workers who are laid off.<sup>10</sup> In short, while the rig operators may be spending less money for drilling operations, not all of this reduced spending is lost to the economy or the workers. Greater details behind this calculation are provided in the Appendix.

Table 2 summarizes the basic features and changes in the deepwater drilling economy. The results in the final row present our estimate that direct spending on deepwater drilling will be reduced by \$1.8 billion as a result of the moratorium.

Table 2. Summary of the Change in the Deepwater Drilling Economy During the Moratorium

	As of April 2010	During 6 Month Moratorium	Difference
Number of rig workers	9,660	7,700*	-1,960
Spending (\$ billions)**			
Gross operator spending	4.82	2.87	-1.95
Wage replacement offset		0.14	0.14
Total change in costs			-1.81

\* Estimated six-month average. \*\* Estimated six-month total.

## 6. Using the Appropriate Multiplier to Measure the Full Effect of Spending Reductions on Gulf Coast Employment

This section addresses how the estimated \$1.8 billion reduction in direct spending during the six months of the moratorium affects employment in the Gulf Coast. A decline in spending by the drilling industry can affect many parts of the economy because many businesses in the Gulf Coast, and throughout the rest of the country, are directly or indirectly supported by the Gulf of Mexico offshore drilling industry. As an example, suppose that the demand for drill pipe falls as a result of the moratorium. That reduction in demand for drill pipe would then reduce the demand for services of supply vessels, which would in turn reduce the demand for diesel fuel

<sup>9</sup> Of this \$141 million, we estimate that \$40 million will come from the Rig Worker Assistance Fund. The remaining \$101 million comes from the firms retaining workers.

<sup>10</sup> We assume workers who remain employed will receive six months of wages. Workers paid out of the Rig Worker Assistance Fund can receive a maximum of \$30,000.

and dock workers. Additionally, if the pipe is trucked to Port Fourchon, then the demand for trucking services would also be affected. If this reduced demand results in fewer hours or lower employment, then this can reduce earnings among any of the workers who are involved, from the production of the pipe to its delivery at the final destination. These reduced earnings will then lower consumer spending, which yields another cascade of effects through the production and distribution chain for consumer goods. This one limited example demonstrates that many industries and parts of the country can be impacted by changes in the drilling industry.

We start with a multiplier that is based on empirical evidence of how changes in spending affect the entire economy.<sup>11</sup> There are two factors, however, that make the estimates from a standard full multiplier analysis too large when used to analyze the effects of the drilling moratorium.

The first factor is that the drilling moratorium is a temporary and not a permanent policy change. The results from a standard multiplier analysis assume that the change being analyzed is long lasting. An important reason why a temporary moratorium will have a smaller effect is that firms are likely to be reluctant to lay off workers when they know the suspension is temporary. For instance, as described in the previous section, nearly all of the rig operators and contractors we spoke with stated that they have retained most of their workforce during the moratorium. One might expect that supplier firms may engage in similar behavior. Large firms that have ample access to financial capital will be better able to pay their employees during the moratorium than more financially constrained firms. Large companies with multiple clients will also be more likely to switch workers into temporary work of another sort while waiting for drilling operations to start again. At the same time, small firms with less financial capital will likely experience relatively larger employment losses. This is consistent with anecdotal evidence from small businesses in the Gulf Coast region who have testified about the substantial impact of the moratorium on their business.

A second problem with standard multiplier analysis is that it assumes the policy change being analyzed is the only change occurring, with no other offsetting activities. In the case of the drilling moratorium, it was put in place at the same time that a substantial amount of money was being spent in the Gulf Coast on spill response and cleanup activities. Reduced spending from deepwater drilling may be offset by the increased spill response and cleanup spending. BP has publicly stated that it spent over \$8 billion on spill response and cleanup during the first three months of the moratorium.<sup>12</sup> In contrast, we estimate that overall spending on deepwater drilling fell about \$1.0 billion during the first three months of the moratorium. Although not all spill response and cleanup dollars may be spent in the Gulf Coast, the impact of the moratorium could have been at least partially offset by this surge in other spending. Additionally, some operators we spoke with suggested they have partially shifted some of their reduced deepwater spending to onshore drilling operations or forward-shifted maintenance and upgrade activities. This spending could also have a similar offsetting effect.

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<sup>11</sup> The multiplier we use is described in more detail in <http://www.whitehouse.gov/administration/eop/cea/Estimate-of-Job-Creation/>

<sup>12</sup> BP press release, September 3, 2010:

<http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7064849>

In summary, we do not believe that the use of a full multiplier will result in a reasonable estimate of the Gulf Coast employment impact of reduced spending due to the drilling moratorium. Multipliers are designed to measure the impact of a permanent spending shock. In this case, the temporary nature of the moratorium, combined with the increased spending on other activities, means that using a full multiplier will result in an inaccurate and overly large estimate.

We do not know with precision exactly how much smaller the economic effect might be, relative to the standard multiplier. Because of this, we use a range of multipliers, producing a range of possible job impacts. Specifically, we assume that the appropriate multiplier with which to analyze the impact of the deepwater drilling moratorium will be between 40 and 60 percent of the effect estimated by a full multiplier.

For this analysis, we take the estimated reduction in spending from Table 2 (\$1.8 billion) and divide by a multiplier that indicates how spending translates into jobs. We use an estimate of dollars per job of \$92,136.<sup>13</sup> We adjust these results using the range of 40 to 60 percent. We estimate that the six-month moratorium may temporarily result in up to 8,000 to 12,000 fewer jobs in the Gulf Coast. These jobs would not be permanently lost as a result of the moratorium; most would return following the resumption of deepwater drilling in the Gulf of Mexico.<sup>14,15</sup>

Our estimates, like those in earlier studies, assume that normal drilling operations would have taken place in the absence of the moratorium. The “counterfactual” – that is, the comparison against which these moratorium effects are generated – assumes no change in drilling operations from the prior period. In reality, the BP Deepwater Horizon oil spill generated widespread concern about the safety regulations in effect for deepwater drilling in the Gulf region. This concern is likely to have reduced short-term drilling activities even without a moratorium, as rig operators and contractors reviewed their safety procedures and as regulators examined the effectiveness of existing safety regulations and the feasibility of additional requirements.

If the true counterfactual is a world in which Gulf Coast drilling activity was substantially reduced for a period of months following the BP Deepwater Horizon oil spill, then our estimates (and those of all studies) overstate the impact of the moratorium. While the moratorium is likely to have reduced drilling more than might otherwise have occurred, it was not imposed arbitrarily but followed an event that greatly affected the Gulf Coast economy and environment and would have impacted Gulf Coast drilling in any case.

Comparison to other studies. A number of earlier studies have produced estimates of the impact of the deepwater drilling moratorium. Table 3 lists those studies most comparable to our analysis, that is, studies that focus primarily on the employment impacts associated with the decrease in offshore drilling activity as a result of the moratorium.

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<sup>13</sup> See Table 4 of “Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009.”

<sup>14</sup> An alternative approach, used in many of the prior studies, would be to use regional input-output multipliers (RIMS II) produced by the Bureau of Economic Analysis. Using the RIMS II approach with multipliers for the Gulf Region and a similar set of assumptions as those used in the analysis presented in the main text, we get nearly identical results, estimating that there may be up to 8,000 to 11,000 fewer jobs.

<sup>15</sup> The estimated impacts are in job-years. In this analysis, like others that have been done for the Gulf Coast, we do not estimate when the impacts will occur.

The projected employment impacts vary greatly across the studies, with estimates from 10,000 to 46,000 jobs lost. These differences stem from differences in a number of assumptions. However, one of the primary reasons why our estimates differ from many of the estimates in Table 3 is that we have updated information not available to these earlier reports. More specifically, we have learned that many of the deepwater drilling rig workers have kept their jobs whereas almost all of the earlier studies assumed that virtually all of these rig workers would have been let go.

Table 3: Comparison of Selected Moratorium Employment Impact Estimates

	Total Jobs Potentially Impacted (in thousands)
Impacts Estimated for State of Louisiana only	
Louisiana State University (Dismukes)	-10 to -16
Louisiana State University (Richardson)	-17
Louisiana Department of Economic Development	-10 to -20
Impacts Estimated for Gulf Coast	
Minerals Management Service	-23
Louisiana State University (Dismukes)	-35
Louisiana Mid-Continent Oil and Gas Association	-30 to -46

Additionally, there are two other differences between this study and those conducted by others, and one of those differences would tend to inflate our employment impacts relative to other studies while the other would reduce our estimates. The aspect which would tend to inflate our estimates is the emphasis we place on the reduction in spending on drilling supplies and services on the offshore rigs, which is sizable. Most of the earlier studies looked only at employment loss and the resulting reduction in wage and salary income. We have estimates that suggest substantial declines in spending on a host of other rig-related activities. The aspect which lowers our estimates is that we adjust our multiplier for the fact that this is a temporary policy change and not a permanent change. Many other studies used full multipliers, which erroneously embed the assumption that these effects are permanent.

## 7. Estimated Production Impact of the Six-Month Moratorium

So far, we have focused on one of the primary effects of the moratorium, namely, reduced spending on drilling which can impact Gulf Coast employment. The other first order effect of the moratorium is on oil production. The suspension might be expected to delay future oil production in the Gulf of Mexico, by delaying both development and exploration activities. However, these delays are not expected to reduce long-term cumulative oil and gas production on the Gulf Coast, since by itself, the moratorium does not change the size of the estimated oil resource in the Gulf of Mexico.

While near-term Gulf of Mexico deepwater production is expected to be reduced relative to a "no moratorium" baseline projection, cumulative Gulf of Mexico deepwater production over an extended time period is not expected to fall, as increases above the baseline in future years are projected to offset near-term losses. Because production is delayed rather than permanently foregone, the value of near-term production losses is likely to significantly overstate impacts on the present value of cumulative future Gulf of Mexico deepwater production. In fact, depending on the discount rate applied and the patterns of oil prices and Gulf of Mexico oil production over time, the present value of cumulative Gulf of Mexico deepwater production could either increase or decrease relative to its baseline level.

Following the initial suspension of deepwater drilling activities, the Energy Information Administration (EIA) prepared an assessment of the impact of this moratorium on the 2010 and 2011 U.S. crude oil supply. Since the moratorium affected rigs that were involved in both exploration and development activities at various water depths and stages of completion, this estimate was based on a variety of assumptions related to success rate, production rates, and timing. Those assumptions are outlined in the Appendix.

Based on these assumptions, we estimate:

- The reductions in crude oil production resulting from the moratorium will increase from a monthly average of about 10,000 barrels per day (bbl/d) in September 2010 to nearly 100,000 bbl/d by December 2011, averaging about 31,000 bbl/d in the fourth quarter of 2010 and roughly 82,000 bbl/d in 2011.
- The total cumulative reductions in the output of crude oil from the deepwater Gulf of Mexico will be about 3.1 million barrels in 2010 and 30 million barrels in 2011. This represents about 0.2 percent and 1.5 percent of total U.S. crude oil production in each of these years.

While published EIA estimates have focused on production impacts in 2010 and 2011 relative to a no-moratorium baseline, the analysis suggests that the production impact directly attributable to the six-month moratorium will peak in 2013 and then slowly decline. This time pattern reflects several competing factors. For example, there is a significant time lag between completing development wells and connecting some of them to the undersea pipeline network, which means that some wells impacted by the moratorium would not have entered production until late 2012 or 2013 under baseline conditions. On the other hand, the flow rate of each individual well typically declines significantly as production occurs, so that the amount of production expected from each moratorium-impacted well generally declines over time. Beyond 2013, the latter effect seems likely to dominate.

To put these production impact estimates into perspective, it is important to keep in mind that there are currently over 4,500 producing wells in the Gulf of Mexico. Although new deepwater wells are generally much more productive than the average of existing wells in the Gulf of Mexico, the moratorium is delaying a relatively small number of new wells. Finally, notwithstanding the impacts of the six-month drilling moratorium on Gulf of Mexico production, EIA continues to expect that total U.S. crude oil production will increase in both 2010 and 2011.

At least two other organizations have made estimates of the impact of the moratoria on deepwater production, resulting in estimates very similar to those made here. A Bureau of Ocean Energy Management, Regulation and Enforcement study (using different assumptions) predicts a cumulative loss of 30.5 million barrels of oil (83,600 bbl/d) in 2011. Wood Mackenzie estimates a 93,000 barrel of oil equivalent per day (boe/d) deferral as a direct effect of the six-month moratorium.

There is little evidence of any price impact due to the moratorium. During the week following the announcement of the moratorium in late May, both West Texas Intermediate (WTI) crude oil spot prices and NYMEX light sweet crude oil futures contract prices fell by about \$2 per barrel. WTI crude oil spot prices during May 2010 averaged \$73.74 per barrel, and averaged \$75.34 per barrel in June, \$76.32 per barrel in July, and \$76.81 per barrel in August. Spot and futures market price movements following the announcement of the moratorium were primarily attributed to changing economic conditions and changes in expectations of world economic and oil demand growth. The moratorium has not been cited in market reports as a significant driver of oil prices.

Oil is a highly fungible commodity traded on a world market. The projected reduction relative to baseline in Gulf of Mexico deepwater production of 31,000 bbl/d in the 4<sup>th</sup> quarter of 2010 and an average 82,000 bbl/d in 2011 represent, respectively, 0.04 percent and 0.09 percent of a world demand for oil and other liquid fuels of roughly 87 million bbl/d. Beyond the small size of the reduction relative to the overall market, several factors suggest very limited prospects for a discernible impact on crude oil or product prices due to the six-month drilling moratorium. Notably, both crude oil and petroleum product stocks and global spare crude oil production capacity are currently at very high levels.

## **8. Conclusions**

This report estimates that the six-month moratorium may temporarily result in up to 8,000 to 12,000 fewer jobs in the Gulf Coast. These jobs would not be permanently lost as a result of the moratorium; most would return following the resumption of deepwater drilling in the Gulf of Mexico. This employment impact needs to be weighed against the longer term economic benefits from assessing the causes of the recent oil spill and designing and implementing adequate safety provisions, following the economic and environmental disaster that resulted from the explosion of the BP Deepwater Horizon rig in April 2010. The evidence suggests that job impacts among workers in larger companies, particularly the drilling rigs in the Gulf of Mexico, may be relatively limited because these companies have chosen to retain their skilled labor. Most of the potential employment impacts may be in businesses that provide supplies and support to the drilling industry in the Gulf Coast. The data suggest that the magnitude of the spill response and cleanup spending in the Gulf Coast is large enough so that some of these businesses may have been able to replace some of their lost earnings by serving other customers. Importantly, these estimates assume that normal drilling operations would have occurred in the absence of the moratorium; the true effects of the moratorium are likely to be somewhat smaller

given that some short-term drilling slowdown would have been likely following the BP Deepwater Horizon explosion and the increased safety concerns generated by this disaster.

While any job loss due to the moratorium, even temporary, is deeply regrettable, it is important to place these effects in the context of the economic, environmental and safety threat that the BP Deepwater Horizon explosion created. Given uncertainty about the adequacy of existing safety regulations, the moratorium was designed to provide greater certainty that deepwater drilling in the Gulf Coast is being conducted in a safe manner, with effective safeguards and responses in place should problems arise. These safeguards are highly important given the expectation that Gulf Coast oil and gas will continue to provide a significant share of domestic energy production.

## APPENDIX

### I. Appendix to Section 5: Changes in Rig Employment and Spending as a Result of the Moratorium

Table A1 summarizes the underlying estimates of changes in deepwater rig employment and spending used in this study. This Appendix section explains the components reported in that table.

The first part of the table, labeled “Rig Assumptions,” lists the estimates used for the number of rigs, employment per rig, and average spending per rig. The information on the number of working rigs comes from Rig Data, a private company. We assume for the counterfactual scenario (what would have happened in the absence of a moratorium) that the number of working rigs would be the same as the number of working rigs as of April 2010, which was 46. For the actual scenario, we assume the same number of working and non-working rigs in August also applies for September, October, and November. The estimates of workers per rig and spending per rig prior to the moratorium come from the Department of the Interior, and these estimates closely align with those appearing in other studies and reported by industry participants. We further assume that the number of rig workers and daily spending on the rigs affected by the moratorium are higher than the pre-moratorium average for all rigs to allow for the possibility that drillships and semi-submersibles (which are larger and more expensive to operate) are more likely to be affected by the moratorium than platforms. As Table A1 indicates, we assume that an average rig affected by the moratorium employed 233 workers and generated total spending of \$643,595 per day prior to the moratorium.

Based on this information, we next compute the six-month total amount of spending and number of rig workers under the counterfactual scenario in which there is no moratorium. These results are under the “No Moratorium (counterfactual)” heading of the table. In the absence of the six-month moratorium, we estimate operator spending on deepwater drilling would have been just under \$5 billion during those months (about \$800 million per month) and that there would have been about 9,700 rig workers employed on these rigs, which is how many were estimated to be employed in the month prior to the moratorium.

We next compute the average number of rigs that would not be working as a result of the moratorium relative to the counterfactual scenario. Over the six-month period, an average of 15 out of the 46 rigs continued to work during the moratorium and 31, on average, were idled. We also report that an average of four deepwater rigs exited the Gulf of Mexico over the six months of the moratorium (we assume any rigs that left did so as a result of the moratorium). These figures are under the heading, “With Moratorium.”

Based on the number of rigs no longer working and those that left the Gulf of Mexico, we also compute the average number of lost rig worker jobs during the six-month moratorium. For this calculation we assume that 50 percent of the rig workers are drilling contractor employees and the other 50 percent are well service company employees (the number of operator employees per rig is typically very small).

- For rigs that remain working in the Gulf of Mexico, we assume no jobs are lost.
- Based on information gathered from industry participants, we assume that for non-working rigs that remain in the Gulf of Mexico, 15 percent of the drilling contractor employees are laid off and 20 percent of the well service employees are laid off or redeployed outside of the Gulf of Mexico region.
- Finally, for any rigs that have departed the Gulf of Mexico, we assume all rig worker jobs are lost. While we have learned that numerous rig workers are likely to keep their jobs by moving with a drilling rig that exits the Gulf of Mexico, we conservatively treat these as job losses because they represent job losses to the Gulf of Mexico region.

In total, we estimate an average of 1,962 rig workers will be laid off or leave the Gulf Coast during the six-month moratorium.

Using the average number of rigs no longer working, those that left the Gulf of Mexico, and our average job loss estimates, we next compute the amount of lost spending.

- We assume that no spending is lost for rigs that remain at work.
- Based on information gathered from industry participants, we assume that spending related to non-working rigs that remain in the Gulf of Mexico is reduced by 47.5 percent. To understand this number it is useful to know something about the cost structure of the rigs. Rig spending is typically divided between “day rates” (the daily charge to lease the drilling rig from the drilling contractor, which includes paying for a number of workers who oversee rig operations) and “spread costs” (the expenses necessary to supply the rig with the additional well service labor and supplies needed to conduct drilling operations). A rule-of-thumb in the industry is that day rates and spread costs each comprise about half of the operator’s total expenses incurred in drilling operations. We assume that the day rates are unaffected on idled rigs and that all of the spending reductions during the moratorium come out of the spread costs. Because some workers remain on these rigs and some maintenance work is being done on them, we do not reduce the spread costs to zero, but reduce them by 95 percent. If day rates and spread costs each constitute half of the rig’s normal operations spending, a 95 percent reduction in spread costs results in a 47.5 percent reduction in total rig spending on idle rigs.
- We further assume that spending for any rigs that have departed the Gulf of Mexico drops to zero. The latter assumption was made to reflect the idea that even though spending on these rigs continues, that spending has largely left the Gulf of Mexico region.

With these assumptions, we estimate the total gross spending reduction from the 6 month moratorium to be \$1.95 billion.

As mentioned in the main body of the report, part of the gross spending reduction calculated above is offset due to the fact that some workers affected by the moratorium may still receive compensation. While the rig operators may no longer be paying these workers, their wages can come from alternative sources. First, we assume that all drilling rig workers who are laid off can receive compensation from the \$100 million Rig Worker Assistance Fund, which is designed to cover 100 percent of their lost wages (up to \$30,000) in the short run. Second, there are some rig

workers who are no longer hired by the drilling operators but continue to be paid by their employer. For these workers, we assume they will be paid wages averaging \$80,000 annually (or \$40,000 over six months). The section under the heading “Wage Replacement Offsets” provides more detail on these numbers. Our estimate of the total amount of deepwater drilling spending lost due to the moratorium, is about \$1.81 billion, representing the difference between the gross spending reduction (about \$1.95 billion) and the offsets (about \$141 million) just described.

Table A1

<b><u>Rig Assumptions</u></b>	
Average number of working deepwater rigs prior to the moratorium	46
Average number of working deepwater rigs during the moratorium	15
Estimate of average number of rig workers per all deepwater rigs (pre-moratorium)	210
Estimate of average number of rig workers per all deepwater rigs affected by moratorium	233
Estimate of average daily spending per all deepwater rigs (pre-moratorium)	\$572,480
Estimate of average daily spending per all deepwater rigs affected by moratorium	\$643,595
<b><u>No Moratorium (counterfactual)</u></b>	
Total operator spending for deepwater rigs during 6 months in millions (counterfactual)	\$4,819
Average number of deepwater rig workers during 6 months (counterfactual)	9,660
<b><u>With Moratorium</u></b>	
Average number of non-working deepwater rigs during 6 months (actual)	31
Average number deepwater rigs exited from GOM during 6 months (actual)	4
<b><u>Average Number of Rig Worker Losses During 6 Months</u></b>	1,962
<b><u>Gross Spending Reduction From Moratorium During 6 Months (in millions)</u></b>	\$1,952
<b><u>Wage Replacement Offsets (in millions)</u></b>	
Drilling contractor rig workers laid off but compensated by BP fund	\$27
Well service rig workers laid off due to rigs exiting GOM, but compensated by BP fund	\$13
Well service rig workers still employed	\$101
<b><u>Total Spending Reduction Including Wage Replacement Offsets During 6 Months (in millions)</u></b>	<b>\$1,811</b>

## **II. Appendix to Section 7: Estimated Production Impact of the Six-Month Moratorium**

The EIA impact analysis made the following assumptions in order to estimate the short-term production loss due to the moratorium:

- Thirty-four development wells would not get drilled during the six-month moratorium. This estimate reflects the number of rigs affected by the moratorium, the time period typically required to drill a well, and the split between exploration and development drilling.
- The 34 development wells were assumed to have been drilled at a rate of six per month for the first four months and then five per month for the last two months.
- Six wells would have begun producing by the end of November 2010. This estimate reflects the fact that the amount of time required to connect development wells to the undersea pipeline network varies, with a considerable lag before some wells are connected.
- The weighted average initial production rate from the wells not drilled would have been 5,300 bbl/d.
- Operators would be able to obtain the necessary equipment and permits to restart drilling operations immediately following the lifting of the moratoria.
- Following the lifting of the moratorium, Gulf of Mexico drilling activity would resume at the prevailing pace prior to its imposition. However, all future planned development wells would also be delayed by six months.
- No impact of new legislation, regulatory requirements or other permitting delays on future drilling in the Gulf of Mexico. Such changes could have a much larger long term impact than the moratorium, and could affect potentially drilling activity and production levels in all depths of water.
- No potential impact of the hurricane season or actions other than the moratorium in response to the BP Deepwater Horizon oil spill. It is likely that some Gulf of Mexico drilling activities could have been delayed by these factors.
- No impact of the movement of drilling rigs from the Gulf of Mexico. There were initial concerns that there could be an exodus of deepwater drilling rigs to other parts of the world and that operators would utilize force majeure provisions to cancel existing contracts. The EIA estimate assumed that current drilling activity would resume at the prevailing pace prior to the imposition of the moratorium after it is lifted.