The State of the Offshore U.S. Oil and Gas Industry

An in-depth study of the outlook of the industry investment flows offshore

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Key Findings

Deepwater permits in the Gulf of Mexico are currently being issued at less than half the rate compared with pre-moratorium levels, and shallow water permits are being issued at rates 40 percent lower. In 2011, the U.S. is projected to account for only 6 percent, or $8.9 billion, of global offshore oil and gas investment valued at $146 billion. Considering the discovered and undiscovered resources in place in the Gulf of Mexico, this figure of 6 percent is far lower than would be expected. Prior to the moratorium, the U.S. was projected to account for 12 percent of worldwide offshore oil and natural gas investment in 2011, which is much more in-line with the offshore resource base in the Gulf of Mexico.

Lost Investment and Jobs in 2010 and 2011

The effects of the deepwater drilling moratorium and subsequent permit slowdown have already reduced total capital and operating expenditures in the Gulf of Mexico by a combined $18.3 billion for 2010 and 2011 relative to pre-moratorium plans.

Since April 2010, eleven deepwater drilling rigs have left the Gulf of Mexico. These rigs have gone to countries such as Brazil, Egypt and Angola. Through 2015, the investment in other regions instead of the U.S. associated with these rigs is estimated to be over $21.4 billion including drilling spending and associated project equipment orders, even accounting for the portion of equipment that will likely be manufactured in the United States. As a result of decreases in investment due to the moratorium, total U.S. employment is estimated to have been reduced by 72,000 jobs in 2010 and approximately 90,000 jobs in 2011.

Putting the Gulf of Mexico Back to Work -- A Return to Pre-Moratorium Permitting Rates

If drilling permits going forward were to be issued at pre-moratorium rates, the number of shallow water projects delayed could be significantly reduced from 85 under the current path to 37 over the 2012 to 2015 period, and from 48 to 9 for the deepwater.

The increased number of projects would increase investment in the Gulf of Mexico offshore oil and gas industry by over $15.6 billion dollars from 2012-2015. This additional investment would increase average annual U.S. employment between 17,000 and 49,000 thousand jobs per year over that time period. Offshore oil production would be higher over the next decade, for example, by 2017 offshore oil production would rise by approximately 13 percent relative to its current projected path.

A regulatory environment that eliminates unnecessary permitting delays and maintains competitiveness with development opportunities in other regions of the world would provide a first step to revitalizing the offshore oil and gas industry. Additional access to offshore areas currently off-limits remains a key missing component of U.S. energy policy, and would provide substantial additional gains to the nation in terms of energy security, employment and government revenue.

Executive Summary

The offshore oil and natural gas industry in the Gulf of Mexico is a crucial component of the nation's energy supply[1]. In 2010, over 28 percent of the oil and 15 percent of the natural gas produced in the United States was produced in the Gulf of Mexico. Offshore oil and natural gas development is also very capital intensive. In 2010, total capital expenditures were estimated at $8 billion, with $5 billion in deep water in excess of 500 feet alone. Total 2010 Gulf of Mexico expenditures, including operating expenses, exceeded $25 billion. This investment provides much needed employment throughout the country, with 2010 total employment supported by the offshore oil and natural gas industry estimated at 230,000[2].

Prior to the deepwater drilling moratorium, the U.S. oil and natural gas offshore industry was forecasted to grow significantly due to identified prospects, mostly in the deep water. With the establishment of the moratorium and the subsequent slowdown in the issuance of drilling permits at all water depths, an estimated $18.3 billion of previously planned capital and operational expenditures did not occur in 2010 and 2011 (Figure 1). In addition, the U.S. offshore oil and natural gas industry competes globally with other regions for operator investment, drilling rigs, and construction vessels that are essential to the development of oil and natural gas resources. U.S. investment capital moved to other growing supply regions in the world such as Brazil, Asia, and parts of Africa that are currently experiencing rapid growth in their offshore oil and gas industry (Figure 1).

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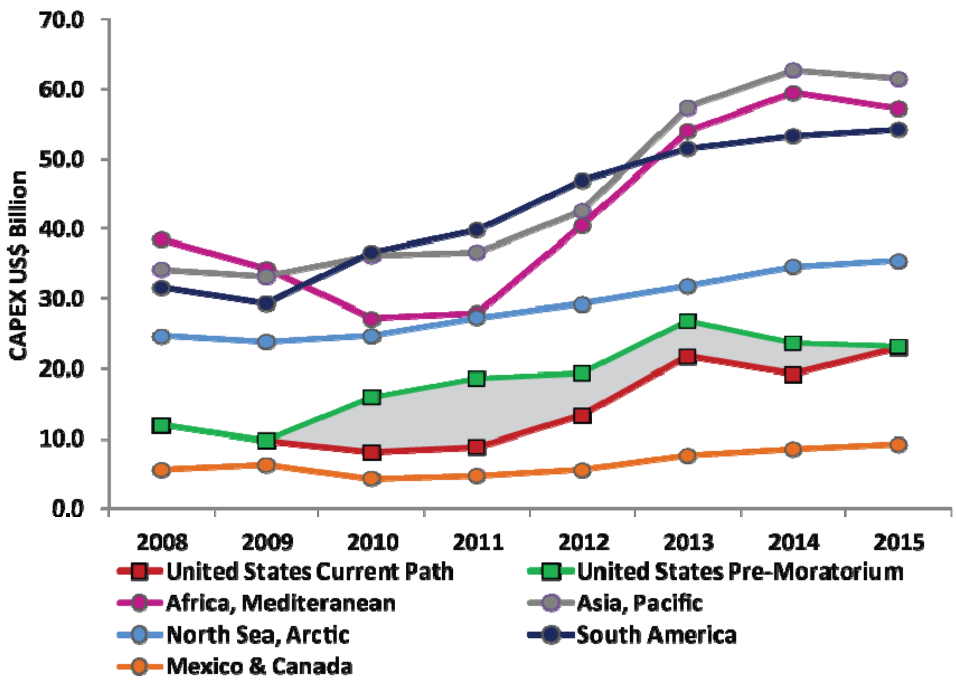
[1]Over 99 percent of U.S. offshore oil and natural gas production is from the Gulf of Mexico. Offshore production off of the Pacific Coast of California accounts for 0.25 percent. Within the next several years there is potential for oil and natural gas production off of the northern coast of Alaska.

[2]Employment calculated using 8.88 jobs per $million of spending as calculated in Quest Offshore Resources, Inc. The United States Gulf of Mexico Oil and Natural Gas Industry Economic Impact Analysis: *The Economic Impacts of GoM Oil and Natural Gas Development on the U.S. Economy.* June 2011.

Figure 1: Estimated Historical and Projected World Offshore Capital Expenditure 2008-2015($Billions) (All Water Depths)



	2010	2015	Projected Cumulative 2010-2015	Cumulative Difference
Asia, Pacific	$36.2	$61.6	$297.4	
South America	$36.7	$54.3	$282.9	
Africa, Mediterranean	$27.2	$57.3	$266.6	
North Sea, Arctic	$24.7	$35.5	$183.3	
U.S. Pre-Moratorium Case	$16.0	$23.2	$127.7	
U.S. Current Path Case	$8.1	$23.0	$94.2	$33.5
Mexico & Canada	$4.3	$9.2	$39.8	
Total (Current Path)	$137.2	$240.9	$1,164.2	
Total (Pre-Moratorium)	$145.1	$241.0	$1,197.7	

Source: Quest Offshore Resources 2011

Even mature regions such as the North Sea are experiencing a resurgence of growth. Since oil is a globally traded commodity and the primary target of global deepwater developments is oil, the location of production is considered less important than field economics, political stability or the regulatory environment. If current trends continue, investment in the offshore oil and gas industry in the United States is expected to see growth, but at lower rates than seen in South America, Asia, and parts of Africa.

This study quantifies the investment and production impacts of the continued slowdown in offshore permitting as well as the upside potential under a more balanced regulatory environment that restores permitting rates back to their pre-moratorium levels. The *Current Path Case* projects offshore investment and production levels using permitting rates reflective of those in existence from the end of the deepwater drilling moratorium to the present. The *Best Post-Moratorium Case* assumes a return to pre-moratorium permitting rates going forward. The *Pre-Moratorium Case* describes potential offshore investment and production levels had the moratorium never been established and is used to provide additional perspective on the above two policy cases examined.

A unique feature and strength of this study is the primary nature of the capital investment data. Quest Offshore Resources, Inc. (Quest), drawing on its proprietary database of suppliers of capital equipment and intermediate goods to Gulf of Mexico oil and natural gas operations, is able to bring primary, project-level data to bear on the issues of importance to this study.

Table 1 shows historical permit rates from 2008 to the end of November, 2011 providing the most recently available multiyear data. Despite the end of the drilling moratorium in October of 2010, drilling permit rates remain at historically low levels, with deepwater permits currently being issued at less than half the rate compared with pre-moratorium levels. The data reveals that an average of 0.190 permits have been issued per day since the end of the moratorium to end of November, 2011 compared to 0.396 on average per day from the beginning of 2008 to the start of the moratorium. Shallow water permits are being issued at rates 40 percent lower, with permits being issued at an average rate of 0.487 permits per day as compared to an average of 0.802 per day prior to the beginning of the moratorium. If permits continue to be issued at this lower rate, it will continue to hamper the offshore oil and gas industry's ability to develop offshore oil and gas resources (Table 1).

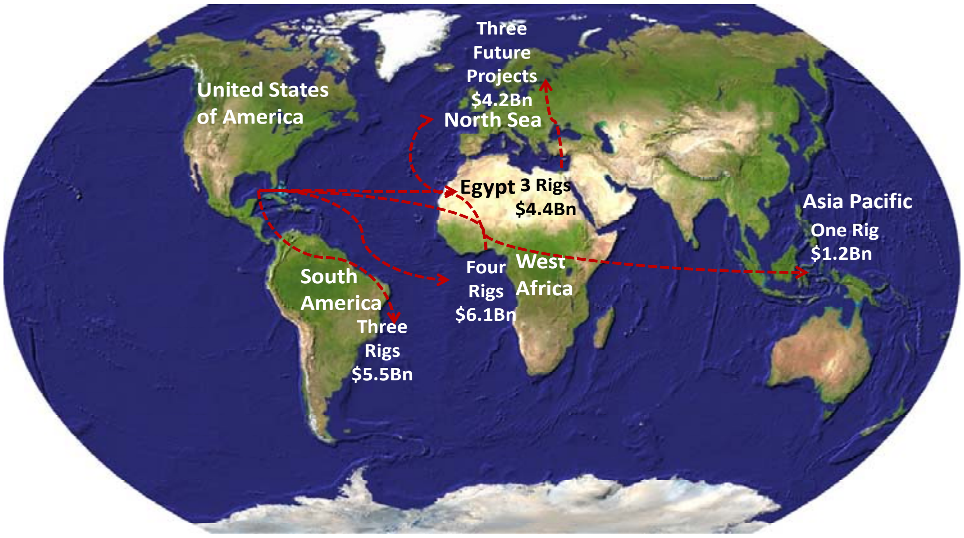
Table 1: New Well Drilling Permit Approval: January 2008 – Start of Drilling Moratorium, Drilling Moratorium, and End of Drilling Moratorium – November 2011 by Water Depth

New Well Drilling Permit Approval	Deepwater (> 500 FSW)	Shallow Water (<= 500 FSW)	Deepwater Average per Day	Shallow Water Average per Day
January 2008 - June 8, 2010	352	713	0.396	0.802
Deepwater Drilling Moratorium	0	57	0	0.456
October 12, 2010 - November 2011	79	202	0.190	0.487

Source: Bureau of Safety and Environmental Enforcement.

With 40 to 50 percent less drilling permits being issued, the demand for drilling rigs in the U.S. has declined. One of the fastest ways for operators to shift their offshore oil and natural gas investments to other regions in the world is to relocate mobile drilling rigs. Since April 2010, eleven drilling rigs have left the Gulf of Mexico. These rigs have gone to countries such as Brazil, Egypt, and Angola, with some rigs later relocating to the North Sea. From 2010 to 2015, the investment in other regions instead of the U.S. associated with these rigs is estimated to be over $21.4 billion including drilling spending and associated project equipment orders even accounting for the portion of equipment for development in other regions that would be spent in the United States (Figure 2).

Figure 2: Deepwater Drilling Rig Movements and Associated Displaced Investment ($Billions)



Source: Quest Offshore Resources, Inc. 2011

The drilling moratorium and slowdown in the issuance of permits has caused significant delays in project development, affecting both independent operators and major oil companies. If current trends continue (*Current Path Case*), it is estimated that 85 shallow water projects will be delayed over the 2010-2015 period with major oil company projects being delayed on average 0.9 years and independent oil company's projects delayed on average 1.4 years. On the current path, 48 deepwater projects are projected to be delayed with projects by major operators delayed on average 1.69 years and projects by independent operators delayed on average 1.95 years (Table 2).

Table 2: Estimated and Projected Project Delays Pre-Moratorium vs. Current Path and Best Post-Moratorium Cases, by Water Depth and Operator Type (2010-2015)

	Pre-Moratorium to Current Path Case		*Pre-Moratorium to Best Post-Moratorium Case*	
Project Type	**Number of Projects Delayed**	**Average Delay (Years)**	**Number of Projects Delayed**	**Average Delay (Years)**
Shallow Water - Independent	51	1.4	20	1.15
Shallow Water - Major	34	0.9	17	0.6
Shallow Water Total	85	1.15	37	0.88
Deepwater - Independent	19	1.95	6	1.83
Deepwater - Major	29	1.69	3	1.15
Deepwater Total	48	1.82	9	1.49
All Water Depths Total	133	1.49	46	1.18

Source: Quest Offshore Resources, Inc. 2011

If drilling permits going forward were to be issued at pre-moratorium historical rates beginning in 2012 (*Best Post Moratorium Case*), the number of projects delayed could be significantly reduced (85 to 37 for shallow water, 48 to 9 deepwater). In addition, the average delay for currently planned projects that are postponed would be shorter. Project delays due to an inability to drill exploration, appraisal, and production wells will decrease the net present value of oil and naturals gas developments, making the U.S. offshore a less competitive region for offshore oil and gas investment and encouraging the prioritization of foreign investment by operators.

As projects are delayed, the slowdown has and is expected to continue to affect annual investment in the offshore Gulf of Mexico. The effects of the deepwater drilling moratorium and subsequent permit slowdown have already reduced total capital and operating expenditures by a combined $18.3 billion for 2010 and 2011 relative to pre-moratorium plans (Table 3).

Table 3: Estimated and Projected Total Capital and Operating Expenditures Offshore Gulf of Mexico Pre-Moratorium, Current Path, and Best Post Moratorium Cases 2010-2015 ($ Billions)

Total Investment (US$ Billion)	2010	2011	2012	2013	2014	2015	Total
Pre-Moratorium Case	$ 34.1	$ 37.6	$ 39.1	$ 48.0	$ 46.1	$ 46.7	$ 251.6
Best Post-Moratorium Case	$ 26.0	$ 27.4	$ 37.0	$ 44.7	$ 45.6	$ 46.8	$ 227.5
Difference: Projected Lost Investment	$ 8.1	$ 10.2	$ 2.0	$ 3.3	$ 0.4	$ (0.1)	$ 24.1

Total Investment (US$ Billion)	2012	2013	2014	2015	Total
Best Post-Moratorium Case	$ 37.0	$ 44.7	$ 45.6	$ 46.8	$ 174.1
Curent Path Case	$ 32.2	$ 41.3	$ 40.1	$ 44.9	$ 158.5
Difference: Projected Lost Investment	$ 4.8	$ 3.4	$ 5.5	$ 1.9	$ 15.6

Source: Quest Offshore Resources, Inc. 2011

As a result of decreases in investment due to the moratorium, total U.S. employment is estimated to have been reduced by 72,000 jobs in 2010 and approximately 91,000 jobs in 2011.[3] A return to a more balanced regulatory regime that encourages growth (difference between *Best Post-Moratorium* and *Current Path*) could increase investment in the offshore oil and gas industry by over $15 billion dollars from 2012-2015. It is estimated that this additional investment would increase average annual U.S. employment between 17,000 and 49,000 thousand jobs per year, with an average increase of 35,000 jobs annually from 2012 to 2015. (Table 4) Of course, this study is focused only upon the economic impacts of more optimal development of Gulf of Mexico oil and natural gas resources currently assessable under current law. Additional access to offshore and onshore areas currently off-limits would provide large gains to the nation in terms of energy security, employment and government revenue.[4]

[3]See Quest Offshore Resources, Inc. The United States Gulf of Mexico Oil and Natural Gas Industry Economic Impact Analysis: *The Economic Impacts of GoM Oil and Natural Gas Development on the U.S. Economy.* June 2011, This figure was calculated using an assumption of 8.88 jobs per million dollars of investment as described in this report.

[4]See Wood Mackenzie, *U.S. Supply Forecast and Potential Jobs and Economic Impacts*, September 2011, for a detailed characterization of the economic impacts of increased access.

Table 4: Estimated and Projected Employment Comparison: Best Post-Moratorium and Current Path Case 2008-2015

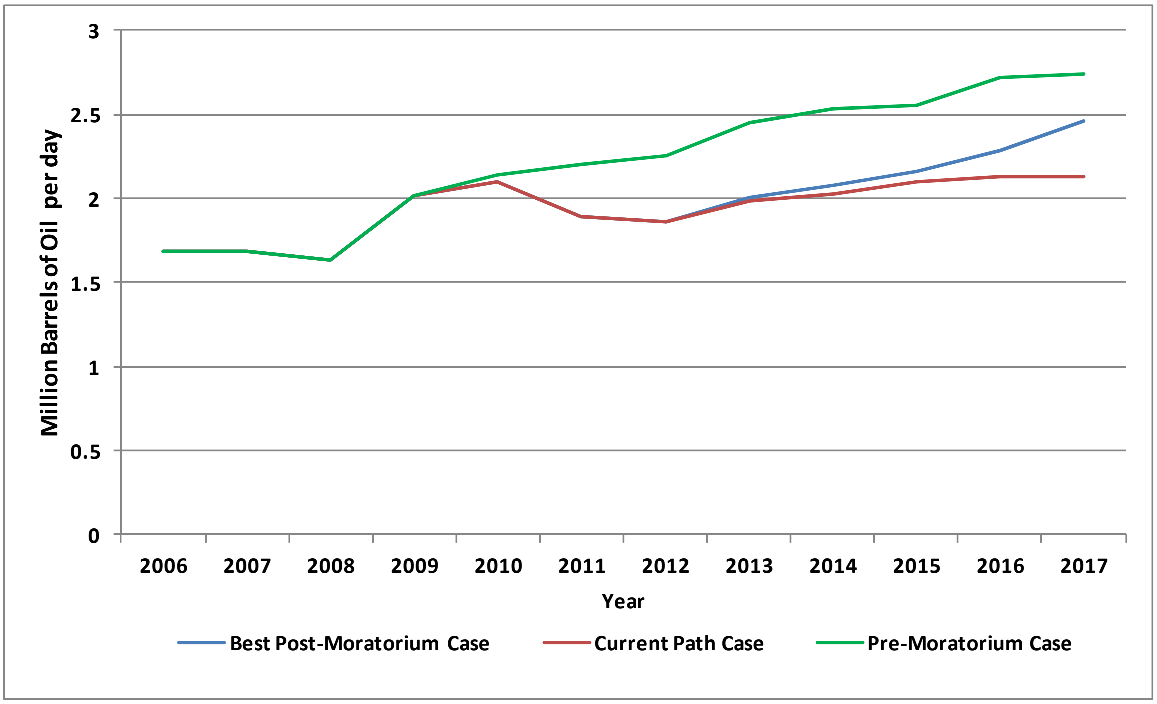
Investment Case 2008-2015	2008	2009	2010	2011	2012	2013	2014	2015
Best Post-Moratorium Case	255,569	240,935	230,773	243,592	328,919	397,205	405,690	415,762
Curent Path Case	255,569	240,935	230,773	243,592	285,958	367,391	356,545	398,798
Difference: Possible Job Creation					**42,961**	**29,814**	**49,146**	**16,963**

Employment includes Direct, Indirect, and Induced jobs.

Source: Quest Offshore Resources, Inc. 2011

The effects of the drilling moratorium and the subsequent slow issuance of drilling permits have had a chilling effect on offshore oil and natural gas production. The halt in deepwater drilling due to the drilling moratorium is expected to affect both near and long-term offshore oil production, both through delaying the drilling of production wells as well as setting back larger projects due to delays in exploration and appraisal drilling. Offshore oil production in 2017 is projected to be approximately 22 percent lower on the *Current Path Case* than was projected prior to the deepwater drilling moratorium. However, a return to pre-moratorium permitting rates would result in 2017 offshore oil production being approximately 13 percent higher on the *Best Post-Moratorium Case* compared to the current path case due to increased offshore oil and gas drilling (Figure 3).

Figure 3: Estimated and Projected Average Annual Offshore Oil Production, Pre-Moratorium Case vs. Best Post-Moratorium Case vs. Current Path Case (Million Barrel of Oil per day)

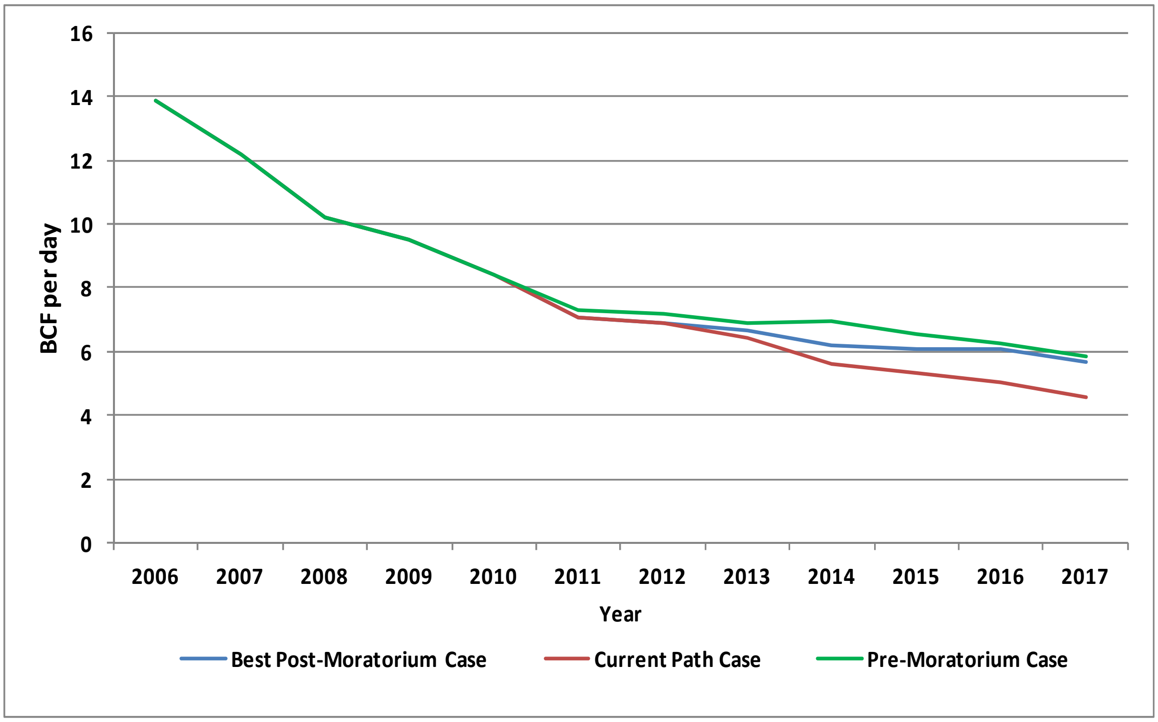


Source: Quest Offshore Resources, Inc. 2011

The 330,000 barrels per day of increased offshore oil production in 2017, due to an increase in permitting levels, would alone account for over $12 billion less in oil imports in that year at current market rates, significantly affecting the nation's trade balance and improving its energy security.

Offshore natural gas production has been on a long-term declining trend mainly due to the maturity of the gas-rich regions of the Gulf. This highlights the importance of the expansion of onshore shale gas developments. However, offshore gas will still continue to contribute to the nation's natural gas needs both through dedicated natural gas projects as well as the production of associated gas from oil projects. The halt in deepwater drilling during the moratorium and the continued slowdown in shallow and deepwater drilling are expected to account for more than a 22 percent decline in offshore natural gas production by 2017 under the *Current Path Case* from the *Pre-Moratorium Case*. However, under a more balanced regulatory regime reflecting the *Best Post-Moratorium Case*, offshore natural gas production could be near the levels forecasted within the *Pre-Moratorium Case* by 2017 (Figure 4).

Figure 4: Estimated and Projected Average Annual Offshore Natural Gas Production, Pre-Moratorium Case vs. Best Post-Moratorium Case vs. Current Path Case (Billion Cubic Feet per day)



Source Quest Offshore Resource, Inc. 2011

Despite the recent relocation of drilling rigs outside of the Gulf of Mexico and a slowdown in drilling activity, a return to historical permitting rates going forward would move offshore investment closer to its optimum potential. The United States remains an attractive location for investment as no other country possesses the combination of high impact resource plays, an educated and skilled workforce, and existing high technology oil and gas assets already in-place. Additionally, political stability coupled with a well-developed, technologically advanced offshore oil and gas supply chain suggest that the United States' offshore oil and gas industry can effectively compete with other world regions. However, this outcome is predicated on domestic energy policy that reflects the reality of the international market and the mobility of capital. A regulatory environment that eliminates unnecessary permitting delays and maintains competitiveness with development opportunities in other regions of the world would provide a first step to revitalizing the offshore oil and gas industry, improving the nation's energy security, and creating thousands of needed jobs at a time of historic high unemployment. Expanding access to promising areas currently off-limits to development, in an environmentally responsible manner, remains a key missing component of U.S. energy policy that would go a long ways towards securing America's energy future.

1. Introduction

A shift is occurring in oil and natural gas industry investment away from areas with perceived high geopolitical risk to areas with typically higher project development costs (e.g., deepwater offshore and shale plays) many of which are located in the Western Hemisphere.[5] Geopolitical risks in many traditional oil and gas production regions, coupled with International oil companies being shut out of areas due to resource nationalism, has increased operators appetites for more expensive and technologically complex developments in stable regions such as the United States and Europe. This shift presents tremendous opportunity for the development of U.S. energy resources – both unconventional (shale oil and gas) and offshore projects – the latter of which is the subject of this report. The U.S., more so than any other area, possesses a large domestic resource base, world class infrastructure and an advanced oil and gas supply chain which should allow it to benefit from this trend.

Quest Offshore Resources, Inc. (Quest) was commissioned by the American Petroleum Institute (API) to provide an evaluation of the impacts of the ongoing slow issuance of offshore drilling permits at all water depths in the Gulf of Mexico following the lifting of the deepwater drilling moratorium. The key impacts assessed include investment levels, including lost investment to areas outside of the U.S., employment and the implications for oil and natural gas production over time. Also developed herein is a development path that would move the Gulf of Mexico closer to its optimal utilization of resources assuming a regulatory structure that returned permitting rates back to their historical norms and restored a sense of regulatory certainty going forward.

Quest is a full-service market research and consulting firm focused on the global oil and natural gas industry. Much of the analysis in this report relies upon project level data from the Quest Enhanced Deepwater Database, primary information provided by operators, equipment manufacturers, and contractors active in the U.S. Gulf of Mexico, as well as public information derived from the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and the U.S. Energy Information Administration (EIA).

This report is structured as follows. Preceding this introductory section is the Key Findings and Executive Summary outlining all principal results and

[5] Wall Street Journal, December, 5 2011. Big Oil Heads Back Home

conclusions of this report. Immediately following this section is the Data Development section outlining how Quest gathers data on projects and creates projections of future offshore industry spending. This section also develops the three investment scenarios undertaken in this report. The scenario results section provides an overview of the U.S. offshore oil and gas industry relative to the rest of the world, explains drilling permit rates and how these affect the number of wells drilled and the rig fleet. This section also explains how projects in the United States have been affected by the drilling moratorium and slow issuance of permits. In the results section, the effects of the different scenarios on capital investment, employment and oil and natural gas production are discussed. This report closes with the conclusions section.

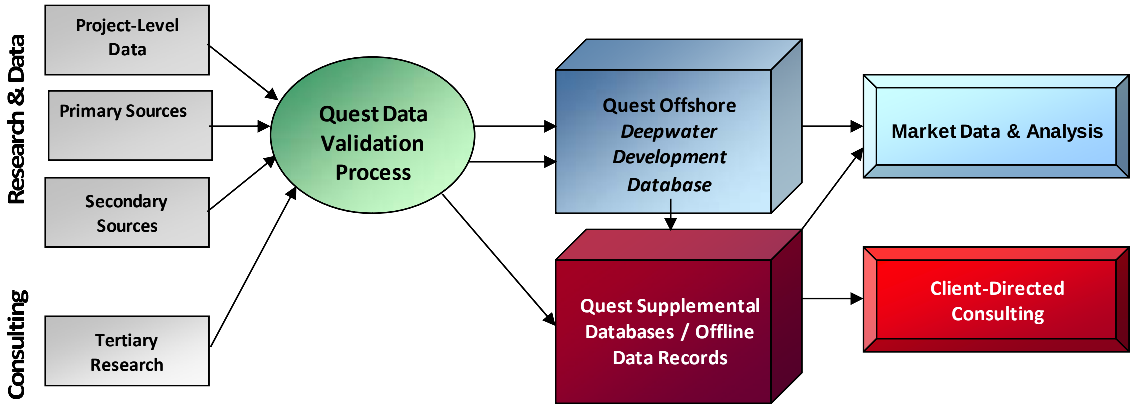
This report has nine appendices; the first appendix contains the detailed spending tables for the three scenarios as well as other regions. The second appendix provides the detailed employment numbers for the three scenarios. The third appendix contains the detailed oil and natural gas production data by scenario. The next appendix is a brief section detailing some of the major oil and natural projects that have been delayed in the U.S. The fifth appendix provides a detailed look at some key project indicators in the U.S. under the three different scenarios and explains how these compare to the rest of the world. The sixth appendix explains how drilling delays affect projects, while the next appendix is a detailed overview of offshore project development in the Gulf of Mexico. The eighth appendix provide a reference point on which provinces are included within each rest of world region, while the ninth appendix delineates how operators who operate in the U.S. offshore areas are classified as either a major or independent operator.

2. Data and Scenario Development

2.1 Overview of Quest Offshore Data

Quest Offshore Resources, Inc. is a full-service market research and consulting firm focused on the global deepwater oil and natural gas industry. As a function of Quest's core business, the company is engaged daily in the collection and analysis of data as it relates to the offshore oil and natural gas industry. Quest serves the global community of operating oil and natural gas companies, their suppliers, financial firms, and many others by providing detailed data and analysis on capital investment and operational spending undertaken by the offshore industry. Quest collects and develops market data from a variety of sources at the project level for projects throughout the world (Figure 5).

Figure 5: Generalized Quest Offshore Data Gathering Methodology



Source: Quest Offshore Resources, Inc. 2011

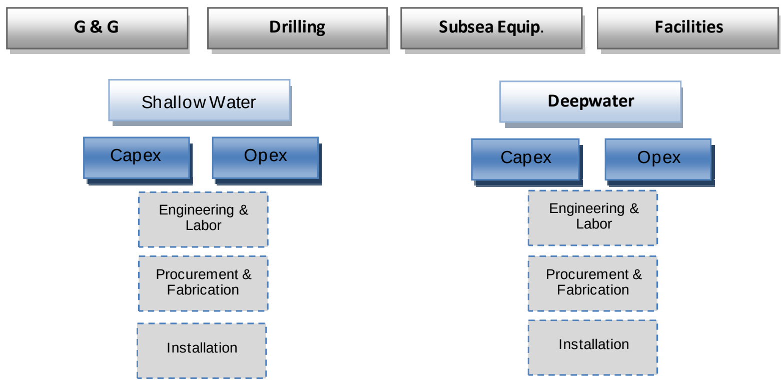
A unique feature of this analysis, which lends it high credibility, is its reliance on primary data through direct contact with the industry's supply chain. This connection with operating oil and natural gas companies through to the smallest of equipment and service providers throughout the world imparts a high quality and degree of accuracy to the data. This data is tracked in Quest's proprietary *Quest Enhanced Deepwater Development Database* as well as other proprietary databases related to shipyards and other facets of the global supply chain worldwide. Quest aggregates capital and operating expenditures on a project by project basis for projects worldwide, with detailed information recorded on the supply of the equipment and services necessary to develop offshore oil and natural gas projects. Quest Offshore tracks not only existing or historical projects, but also projects that are in all stages of development from the prospect (or undrilled target) stage through to producing and decommissioned projects. For projects without firm development information, Quest utilizes benchmarking based on Quest's proprietary databases to forecast development timing and scenarios appropriate to the type of development and region. This information, coupled with operators expected exploration and appraisal programs, is used to take into account yet to be discovered and delineated fields that may be developed in the forecast time frame. Secondary data development was also undertaken in this analysis and refers to any source of information and data that is not collected via direct contact with the industry, such as press releases, financial reports, other SEC filings, industry white papers, industry presentations, and other publicly available sources.

This proprietary approach allows Quest to ensure a comprehensive "canvassing" of the industry worldwide, which in turn facilitates a high level of validation and quality control needed to produce accurate analysis and forecasts. Once collected and verified, the data is housed and maintained in Quest Offshore's Deepwater Development Database. The primary components of this proprietary database are the numerous pieces of offshore oilfield equipment and services that are used in the development of an offshore project.

2.2 Data Development

Quest Offshore's estimate of offshore spending was delineated into four primary categories for all regions: Geoseismic and Geophysical (G&G), Drilling, Subsea Equipment and Facilities. These categories were further delineated by water depth, utilizing those projects in less than 500 FSW (feet of salt water) as Shallow water and greater than 500 FSW as deepwater. Furthermore, these categories were further divided into the capital and operational spending components of engineering and labor, procurement, and installation spending where applicable (Figure 7).

Figure 6: Quest Spending Categories



Source: Quest Offshore Resources, Inc. 2011

These categories represent the four main expenditure classes of offshore oil and natural gas production, and roughly follow the life cycle of a field described in more detail in Appendix 7, "Life-Cycle of a Field Development". G&G, or geological and geophysical, describes the work done before drilling to identify drilling prospects, drilling constitutes the actual drilling of the wells, while subsea equipment and facilities constitutes the two major capital expenditures related to the equipment needed to bring the field into production. Facilities are platforms and floating production units that act as the physical location where oil or natural gas is initially produced as well as drilling and control centers. Subsea equipment includes subsea trees, pipelines, umbilicals and other associated equipment.

Information on the number of historical shallow water platforms, pipelines wells, and permitting for the United States was confirmed from the Bureau of Ocean Energy

Management and Bureau of Safety and Environmental Enforcement and was combined with Quest's forecast of shallow water platforms and wells worldwide to provide information on the number of shallow water developments for historical and forecast years. This information was then combined with estimated costs for the various equipment pieces to provide estimates of capital investment. Operational costs were based on known operating costs for facilities and were extrapolated for unknown facilities based on benchmarks according to facility type, facility size, production, and age.

2.3 Scenario Development

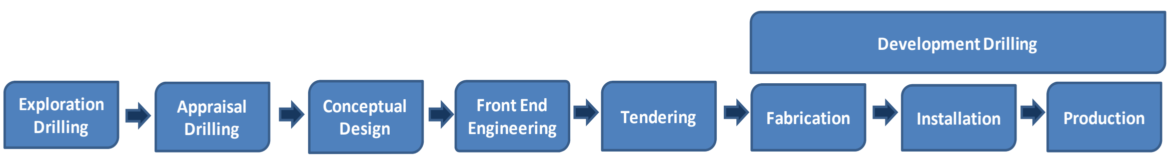
In the wake of the Macondo tragedy of April 2010, a deepwater drilling moratorium was imposed shortly thereafter in the Gulf of Mexico halting all deepwater drilling. Additionally, during the four months of the deepwater drilling moratorium, the rate of shallow water drilling permits fell by approximately 50 percent compared to the previous four months.

After the official end of the moratorium in October 2010, deepwater drilling permits began to be issued, albeit at a much slower rate than prior to the moratorium, with 55 percent fewer permits per month being issued on up to November, 2011 than in 2010 prior to the moratorium. Shallow water permitting has recovered to a greater extent than deepwater permitting, yet in water depths less than 500 feet permitting remains 30 percent lower, on average, than from the January 2008 until the beginning of the moratorium.

Without the timely issuance of drilling permits, the ability of operators to develop offshore oil and natural gas resources is severely curtailed. Not only does a lack of permits leave drilling rigs idling either offshore or in coastal waters, but even for rigs which are receiving permits, delays cause uncertainty in the next drilling location which causes difficulties for operators in planning and decreases the number of wells a rig can drill in any given period. Without a sufficient inventory of approved, permitted drilling opportunities, operators have increased incentives to relocate drilling rigs to other regions outside the U.S thereby decreasing the long-term prospects of the offshore U.S. oil and natural gas industry.

A lack of drilling impacts all stages of offshore oil and natural gas project developments. The first step in producing offshore oil and natural gas is discovering resources through the drilling of exploration wells. Until an exploration well is actually drilled, there is no way to accurately determine the presence and scale of hydrocarbon reserves. Once an exploration well is drilled, appraisal drilling is carried out to determine the size and nature of the reserves in place, sometimes referred to as the delineation phase. After an operator determines a plan to produce oil and natural gas resources, development drilling ensues in order to drill and complete wells for production. From the initial discovery of oil and natural gas, eight years passes, on average, before initiating oil and natural gas production for deepwater projects. To achieve production, oil and natural gas projects pass through various stages of development (Figure 7) and an inability to drill the necessary wells can significantly delay project development.

Figure 7: Generalized Project Development Time Line



Source: Quest Offshore Resources, Inc. 2011

Three scenarios were developed in this study reflecting project development under different rates of permitting based upon recent and historical rates. To develop these scenarios, Quest utilized current permit and investment data, data from before the drilling moratorium, as well as projections of permitting rates and investment levels. Using this data, Quest determined varying development paths reflecting how project developments have been affected by the drilling moratorium and permit slowdown. The first scenario, the *Pre-Moratorium Case*, is used for reference purposes only as this case is no longer a possible path for the offshore oil and natural gas industry. This scenario reflects Quest's estimate of the most likely path the offshore oil and gas industry would have taken had the drilling moratorium imposed in 2010 not been implemented and if permits had continued to be issued at historical rates throughout 2010 and into the future. The second scenario, or *Current*

Path Case, is Quest's estimate of the current path of the offshore oil and gas industry, under current regulations and permitting rates. The third case, or *Best Post-Moratorium Case*, projects the most likely scenario for the offshore oil and gas industry if a return to pre-moratorium permitting rates under a balanced regulatory[6] regime were to take place in 2012. Capital investment, oil and natural gas production, and employment levels are developed for each of these scenarios.

[6] Defined as permits being issued in a timely manner under all new safety requirements to allow operators to build an inventory of permits to flexibly and efficiently develop oil and natural gas resources.

2.4 Global Scenario Development

There is only one forecast for other regions of the world and it is based on Quest's most current projections. Investment levels in other regions are projected in a similar way to Gulf of Mexico, with projects tracked at an individual level to form overall forecasts. These regions, which were developed by grouping countries into five major offshore oil and gas production regions, are composed of geographically close countries described in Appendix 8. Similar spending benchmarks as those used to develop the U.S. offshore spending were developed for the region in question. Spending for projects in other countries is inclusive of the same components as spending for the U.S. and is expected to follow similar investment patterns. For the rest of the world, only one investment case was developed, corresponding to the current most likely path for that area as multiple cases were beyond the scope of this report. It should be noted that under the *Best Post-Moratorium Case* other regions would likely see a decline in spending as investment and assets return to the U.S. The spending for the rest of the world was delineated in the same categories as the spending for the United States.

2.5 Uncertainty and Assumptions in Data Collection and Forecasting

As with any market forecast, the projections provided herein are subject to change according to the dynamics of the offshore oil and natural gas industry and macroeconomic conditions. While Quest has provided the investment outlook according to a sound forecasting methodology that has been widely accepted throughout the industry, there remains some margin of error (or uncertainty) when assessing long-term activity for individual companies.

3. Scenario Results

Even though the U.S. offshore oil and natural gas industry operates in a global competitive environment, the U.S. is a relatively attractive country for oil and natural gas company investment. This is due to its political stability, advanced oil and natural gas supply chain and well developed oil and gas infrastructure.

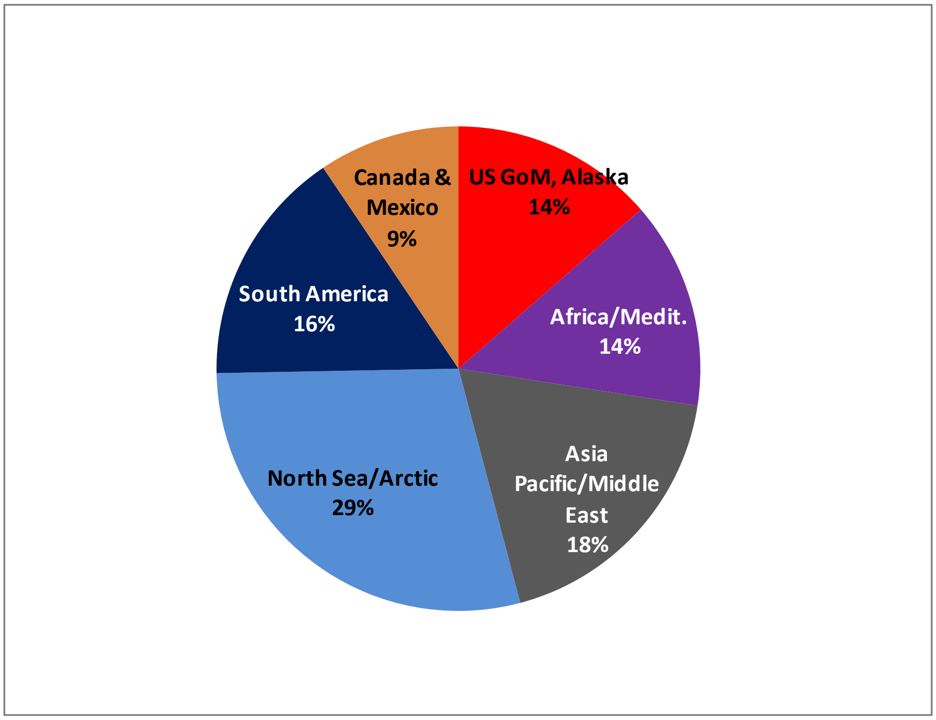
This section provides the basis for the *Current path Case*, *Best Post-Moratorium* and *Pre-Moratorium Case* of the U.S. offshore oil and natural gas industry in terms of permitting and number of wells drilled over the 2010 to 2015 time period. The section commences with a short overview of the size of the U.S. industry relative to the global market and briefly describes major competing regions. This is followed by a characterization of the scenario projections for permits, drilling rig activity, wells drilled, and the number of projects developed.

3.1 Overview U.S. Offshore Oil and Natural Gas Industry Relative to Rest of the World

The U.S. Gulf of Mexico is only one of the many areas of the world where oil and natural gas production takes place offshore. Since many operators active in the U.S. Gulf of Mexico operate globally, a continued slowdown in permits being issued in the U.S. could result in investment shifting to other regions. In 2010, 2.1 million barrels of oil per day were produced offshore in the United States that accounted for 14 percent of global offshore production (Figure 8). Offshore U.S. natural gas production was 2.4 percent of global offshore production for the same year.

Figure 8: Estimated 2010 Global Offshore Oil Production by Region (Percent)

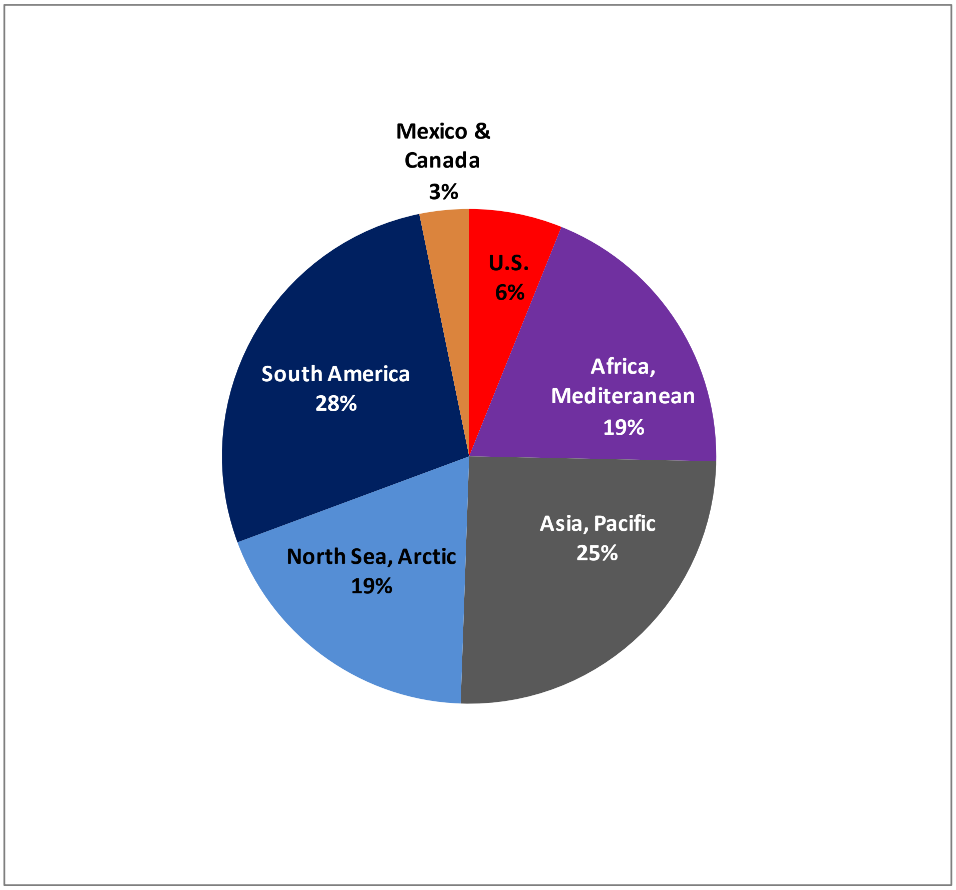
(Total Global Offshore Production = 15.4 Million BBl per day)



Source: Quest Offshore Resources, Inc. 2011

Without growing investment, the U.S. market share of offshore global oil and natural gas production could decrease from its already depressed level as investment in the U.S. falls relative to other regions. In 2011, the U.S. is projected to account for only 6 percent, or $8.9 billion, of global offshore oil and gas investment valued at $146 billion (Figure 9).

Figure 9: Projected 2011 U.S. vs. Other Region Offshore Oil and Natural Gas Capital Investment Projections (All Water Depths) (Total Global Capital Expenditures= $145.7 Billion)



Source: Quest Offshore Resources, Inc. 2011

Considering the discovered and undiscovered resources in place in the Gulf of Mexico, this figure of 6 percent is far lower than would be expected. Prior to the moratorium, the U.S. was projected to account for 12 percent of worldwide offshore oil and natural gas investment, which is much more in-line with the offshore resource base in this country.[7] The competition for scarce capital and human resources means that changes to the regulatory environment and an inability to efficiently drill when required can, and will, cause operators and service companies to

[7] Discussed in 4.1 Investment Impacts by Scenario below

shift resources away from the U.S. to other regions. For the U.S. to increase its share of global investment and production, a key first step is to restore drilling permits back to pre-Moratorium levels.

In recent years, huge new resource basins have been discovered in other supply regions which will compete for investment with the United States. In Brazil, the national oil company Petrobras, which is also active in the Gulf of Mexico, has discovered tens of billions of barrels of oil reserves in Brazilian deepwater areas which will now compete for the same development resources as U.S. projects.[8] In the Eastern Mediterranean, many trillions of cubic feet of natural gas have been discovered in deepwater in areas with little history of oil or natural gas production.[9] In West Africa, countries with relatively little history of offshore oil and natural gas development such as Ghana, the Ivory Coast and Sierra Leone have begun to discover large oil reserves. Throughout Asia, countries such as China, Vietnam, Malaysia, India, Indonesia and Australia are attempting to rapidly grow their offshore oil and natural gas production. These countries will compete for the same investment dollars as the United States. In the face of such increased competition by other countries, the offshore U.S. oil and natural gas industry will find it increasingly difficult to compete without a balanced regulatory regime and timely permitting process.

[8] Brazilian "pre-salt" discoveries include Lula, Guara, Carioca, Cernambi, and Carioca among others. According to Petrobras, the Lula accumulation alone has recoverable volumes estimated at 5 to 8 billion barrel oil equivalent.

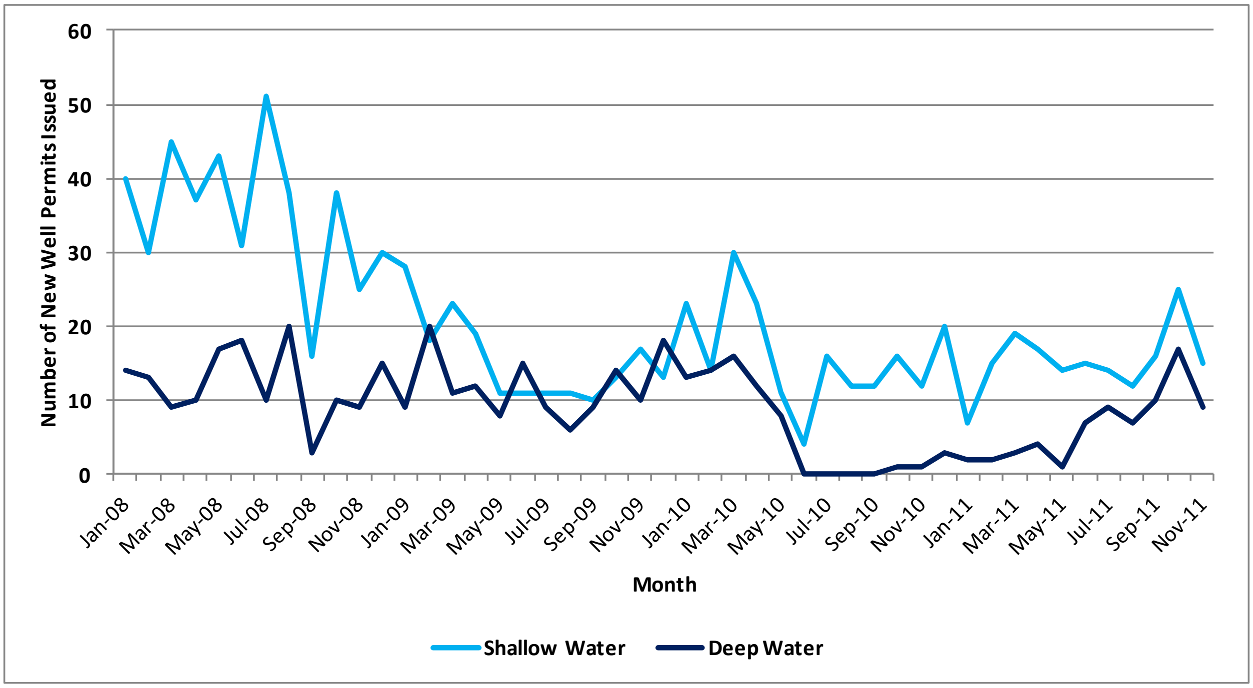
[9] See Noble Energy Operated Tamar, Leviathan, and Aphrodite (Cyprus A)

3.2 Drilling Permit Issuance Rates

This section will discuss current, historical, and projected trends for permitting for the offshore oil and natural gas industry in the U.S. Drilling permits are required for all drilling activity offshore of the United States. Without these permits operators cannot drill oil and natural gas wells and thus cannot proceed with most oil and natural gas development activities. The Bureau of Ocean Energy Management (BOEM) as well as the Bureau of Safety and Environmental Enforcement (BSEE) are responsible for permitting offshore drilling and development in the United States. The BOEM is primarily responsible for the approval of exploration and development plans. The BSEE is responsible for approval of permits for drilling including the environmental and oil spill response plans, as well as inspecting drilling rigs, and other facilities.

The deepwater drilling moratorium that began in May of 2010 halted all drilling in greater than 500 feet of water in the off-shore U.S. and halted the issuance of further deepwater drilling permits. At the same time, the number of approvals of shallow water drilling permits fell far below historical rates. While the drilling moratorium ended in October of 2010, the rate of issued drilling permits has remained below historical levels (Figure 10). Even though the end of the drilling moratorium was in October of 2010, drilling permit rates remain at historically low levels, with deepwater permits currently being issued at less than half the rate compared with pre-moratorium levels. An average of 0.190 deepwater permits have been issued per day since the end of the moratorium to present compared to 0.396 on average per day from the beginning of 2008 to the start of the moratorium. Shallow water permits are being issued at rates 40 percent lower, with permits being issued at an average rate of 0.487 permits per day as compared to an average of 0.802 per day prior to the beginning of the moratorium. If permits continue to be issued at this slower rate the offshore oil and natural gas industry will be unable to develop oil and natural gas resources in an efficient manner (Table 5).

Figure 10: Deepwater and Shallow Water New Well Drilling Permits 2008-November 2011



Source: Bureau of Ocean Energy Management, Bureau of Safety and Environmental Enforcement

Table 5: Average New Well Drilling Permit Approval: January 2008 – Start of Drilling Moratorium, Drilling Moratorium, and End of Drilling Moratorium – November 2011 by Water Depth

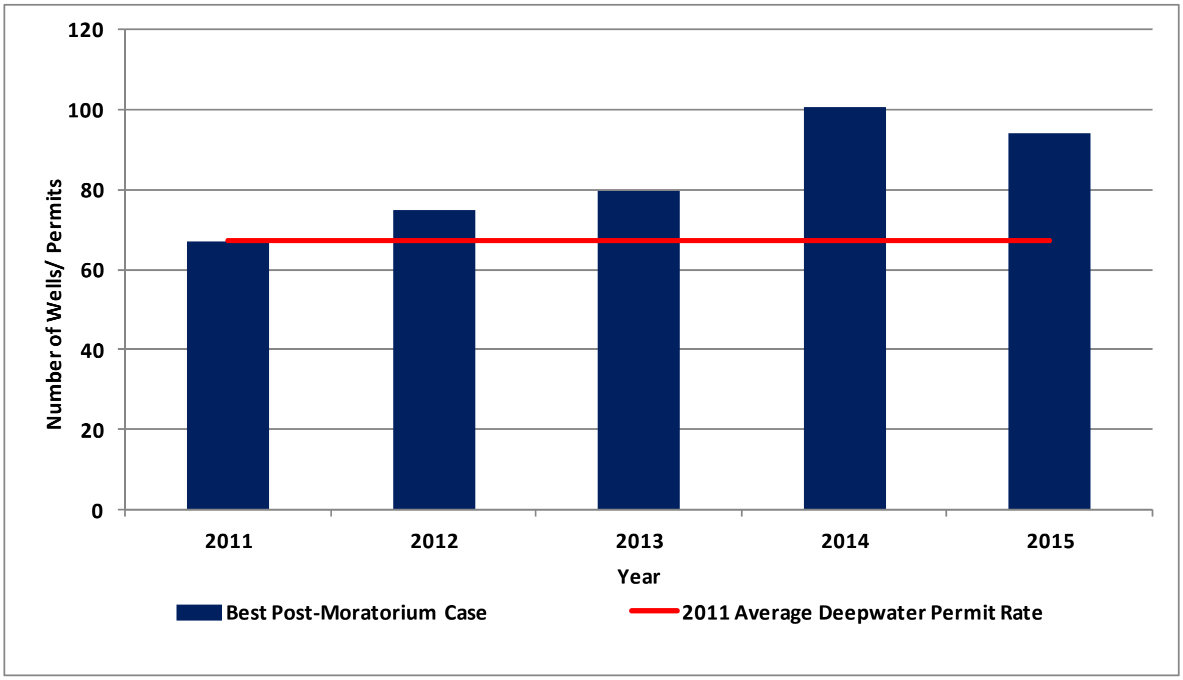
New Well Drilling Permit Approval	Deepwater (> 500 FSW)	Shallow Water (<= 500 FSW)	Deepwater Average per Day	Shallow Water Average per Day
January 2008 - June 8, 2010	352	713	0.396	0.802
Deepwater Drilling Moratorium	0	57	0	0.456
October 12, 2010 - November 2011	79	202	0.190	0.487

Source: Bureau of Safety and Environmental Enforcement.

3.3 Drilling Rigs and Wells Drilled

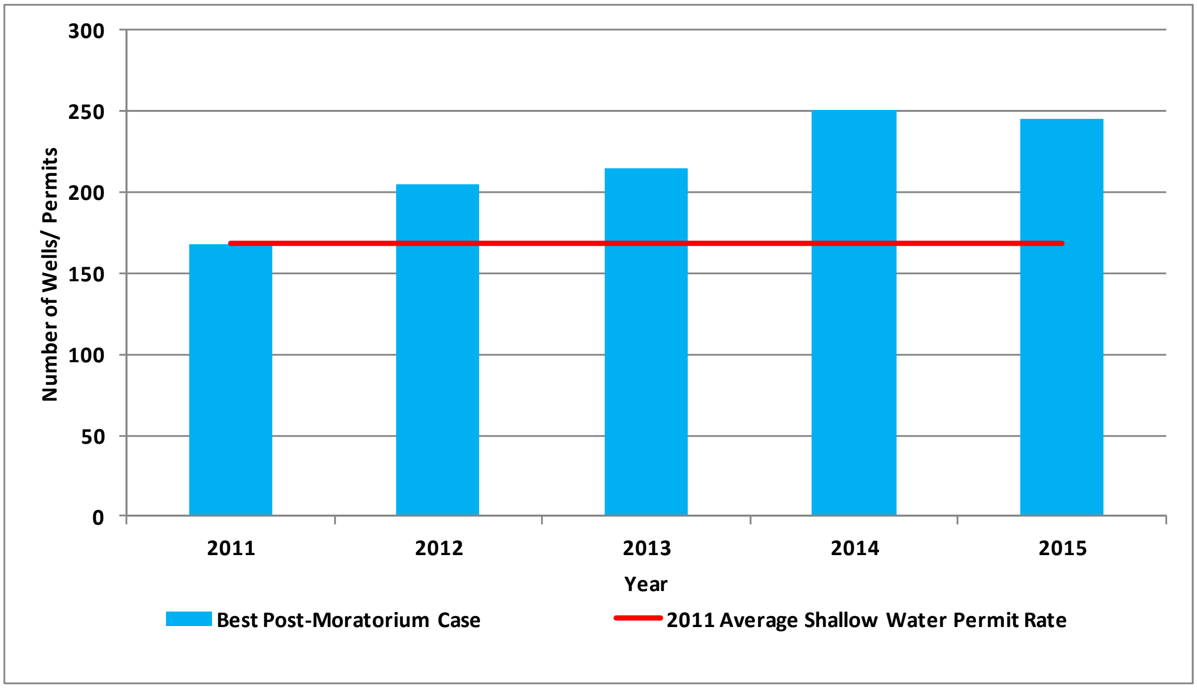
If the 2011 trend in permitting rates continues, the ability of the offshore oil and natural gas industry to drill wells and develop resources will be greatly hindered, leading to lower levels of investment, employment and production. Current permitting rates for new wells would indicate reduced activity as the most likely outcome as the number of wells expected to be drilled to meet the *Best Post-Moratorium Case* is far above the average number of permits issued in 2011 for both deepwater and shallow water wells (Figure 11 and Figure 12).

Figure 11: Projected Deepwater Number of New Wells 2011-2015 and 2011 Average New Well Permits



Source: Quest Offshore Resources, Inc. 2011

Figure 12: Projected Shallow Water Number of New Wells 2011-2015 and 2011 Average New Well Permits



Source: Quest Offshore Resources, Inc. 2011

Even if the number of permits issued just equaled the number of wells to be drilled, this would not completely meet the needs of the industry, as it would not allow operators to change plans based on the results of their drilling program and efficiently schedule drilling. To maximize drilling efficiency extra drilling permits beyond the numbers of wells expected to be drilled are needed as not all drilling permits are used.

The current rate of permit approvals is not sufficient to meet the demand of forecasted wells. It is important to note that not all drilling permits are used. Operators need excess permits to operate flexibly and efficiently due to the large capital commitments and forward planning required to drill offshore oil and natural gas wells. While operators can estimate the length of time required to drill offshore wells, there is no way to complete drilling exactly on schedule for all wells, especially for operators with multiple drilling rigs in different areas. It is much more efficient and cost effective to have multiple approved permits ready to drill when a well is completed than to complete a well and wait either on the previous location or in port to receive another permit. With rates for deepwater drilling rigs often exceeding

$500,000 a day, the lack of a drilling permit inventory can drastically increase costs for operators in the U.S. and make the U.S. less competitive relative to other regions.

3.3.1 Exploration, Appraisal, and Development Drilling

To efficiently develop offshore oil and gas resources, drilling permits must be available in a timely manner throughout the three major stages of an offshore project; exploration, appraisal, and development. This section explains the importance of different types of drilling to oil and natural gas development and how a lack of drilling permits in these stages would be expected to affect oil and natural gas development. The first stage discussed is exploratory drilling of leased but undrilled oil and gas targets. Prior to drilling exploration wells, operators must first submit and receive approval from BOEM of an exploration plan which is a document normally covering multiple wells and including surveys, spill response plans and other information depending on the water depth and type of well. After the approval of the exploration plan each individual well must be permitted by the BSEE before drilling.

While seismic technology has been greatly improved in identifying potentially economic prospects, the only way to definitively confirm whether oil and gas is in place is through drilling. When operators determine possible drilling targets, it is necessary to prioritize these targets based upon many factors including the estimated cost of development and the estimated amount of recoverable reserves in place. When an operator "spuds," or begins drilling an exploration well, the operator normally has in place various targets at estimated drilling depths at which they expect to encounter oil and natural gas. Often, a sidetrack, or the drilling of another short well bore on the side of the main bore which needs its own permit is needed to further understand the reservoir**.** This process is normally repeated at various depths depending on the operators drilling plan.

Many exploration wells find no oil or natural gas, or only find small non-commercial quantities. Failure in exploration drilling is common and expensive; drilling a deepwater exploration well in the Gulf of Mexico normally costs over $100 million. Operators must drill many wells to identify a portfolio of commercial production prospects necessary to maximize their investments in drilling rigs as well as meet strategic exploration and production goals. Due to the time required to analyze the results of exploration drilling, it is important for operators to have an inventory of oil and natural gas discoveries. Many factors affect how operators prioritize discoveries for development. Some discoveries can only be developed in tandem with other nearby resources, which may or may not be owned by the same groups of operators. Additionally, the existence of available infrastructure including facilities and pipelines can affect the economics and timing of projects. An inability to drill enough exploration wells within a certain region, whether due to a drilling moratorium, a permit slowdown or other reason, causes the exploration and production of hydrocarbons to be less attractive to operators relative to other regions where this is not the case, if everything else remains equal.

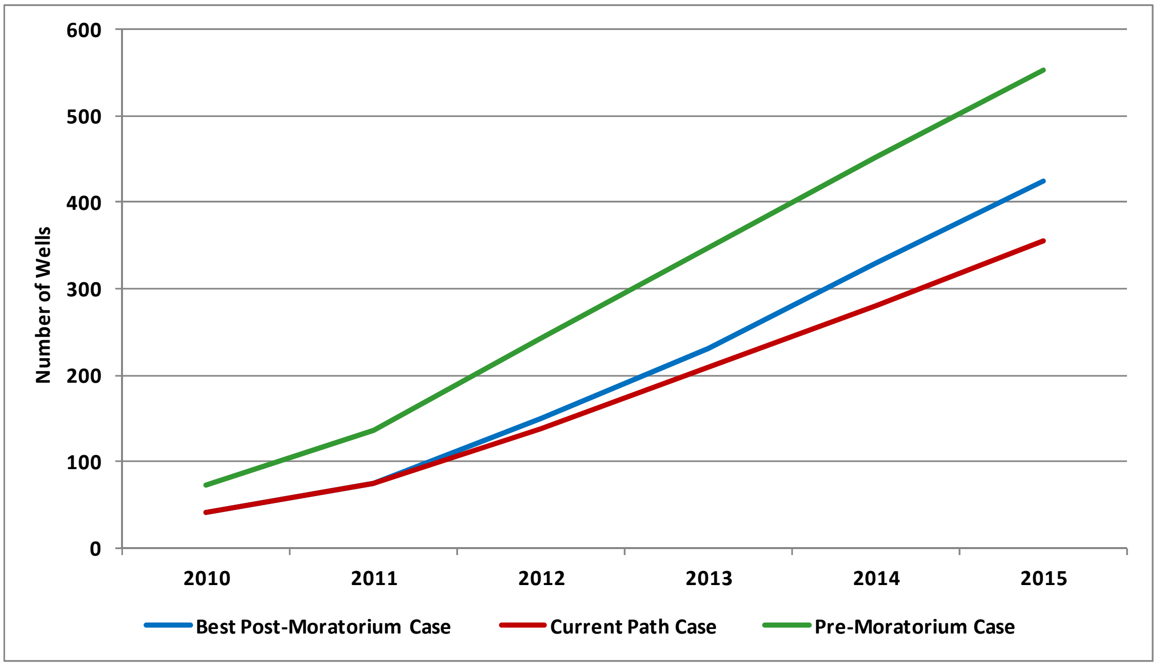
After analysis of the exploration drilling is complete, operators normally undertake what is known as appraisal drilling. Appraisal drilling is undertaken to confirm the results of the initial exploration drilling and delineate the resources in place as best as possible. Appraisal wells are drilled up to the point that the operator has enough understanding of the size and nature of the oil and gas reservoir to proceed with the development decision.

Once a development decision is made a development plan must be approved by the BOEM outlining the planned development. Upon obtaining approval, a sufficient number of drilling permits to start drilling must be approved by BSEE, then development drilling, or the drilling of oil and natural gas production wells can begin. The length of time before expected project startup varies depending upon the number of wells planned as well as the availability of drilling rigs. These varying issues drive drilling schedules which could begin to take place immediately after sanction and continue past initial project production. Also, in some cases, exploration and appraisal wells are reopened and completed into production wells, all which need the necessary permits. Development drilling is needed not only for new fields, but also to continue and enhance production on existing projects, as oil and natural gas production declines over time from existing wells.

3.3.2 Wells Drilled by Scenario

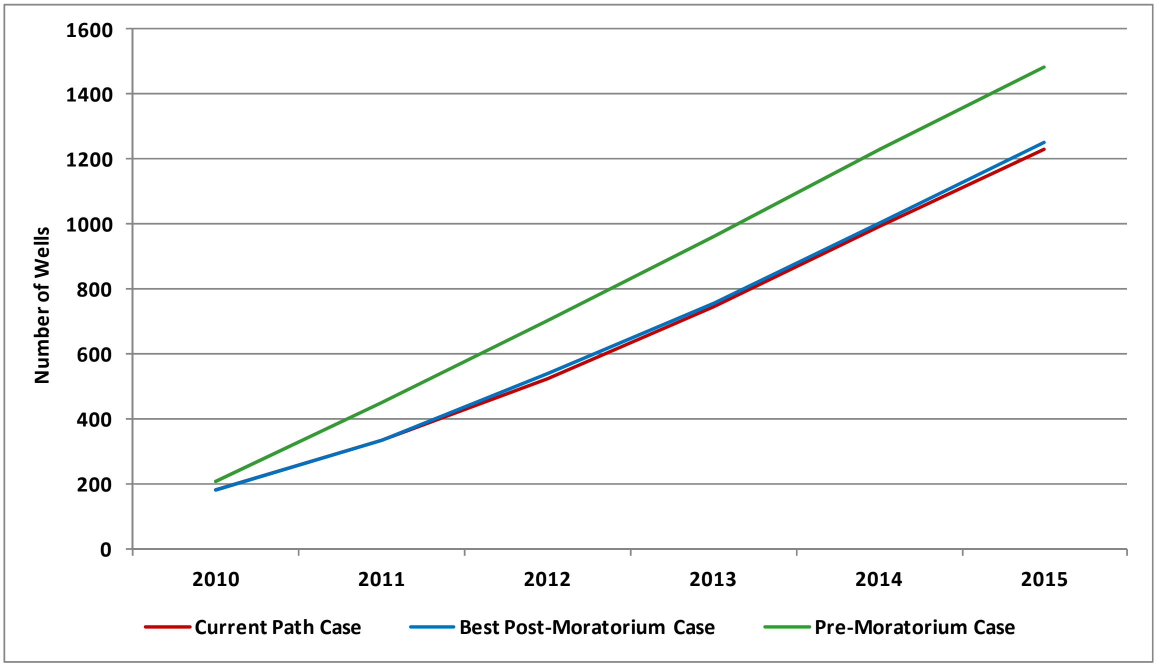
From 2010 through the end of 2011, 176 wells have not been drilled that were forecasted to be drilled pre-moratorium; 62 in the deepwater and 114 in the shallow water (Figure 13 and Figure 14). If permits to drill continue to be issued at below historical rates from 2010 to 2015, the number of wells drilled relative to pre-moratorium forecasts will decrease by 447, with 196 of these wells in deep water and 251 in shallow water. Drilling activity has already been delayed beyond the direct effects of the moratorium. The current drilling rate is far below the levels needed to maximize investment in the offshore oil and gas industry. The number of wells drilled could improve if permits are issued at a rate assumed in the *Best Post-Moratorium Case*. The 2012 through 2015 total number of wells drilled projected in *the Best Post-Moratorium Case* is 1,265 wells, 67 deepwater wells and 20 shallow water wells more than the *Current Path Case*, but still 184 total wells less than the *Pre-Moratorium Case*. Cumulative wells drilled are not expected to reach pre-moratorium forecasts by 2015 under any reasonable scenario.

Figure 13: Projected Cumulative Number of Deepwater Wells Drilled 2010-2015



Source: Quest Offshore Resources, Inc. 2011

Figure 14: Projected Cumulative Number of Shallow Water Wells Drilled 2010-2015



Source: Quest Offshore Resources, Inc. 2011

3.3.3 Global Wells Drilled

On the current path, the total number of offshore wells drilled in the U.S. is expected to be 41 percent higher in 2015 than was seen in 2010, compared to the rest of the world where the total number of wells drilled is expected to be 53 percent higher on average, with Africa expected to increase 92 percent and South America expected to increase 86 percent. If the U.S. were to see an increase in the number of drilling permits issued, the number of wells drilled in 2015 is expected to increase 53 percent from what was seen in 2010 (Table 6). While this is lower than the 350 projected wells within *the Pre-Moratorium Case*, it is still a significant increase.

Table 6: U.S. Current Path Case and Best Post-Moratorium Case and Rest of World Number of Wells Projected to be Drilled 2010-2015 Projected (All Water Depths)[10]

Well Count Forecast	2008	2009	2010	2011	2012	2013	2014	2015	2010-2015 Growth
US GoM Current Path Case	458	232	222	185	254	292	318	314	41%
US GoM Best Post-Moratorium Case	458	232	222	186	280	295	351	339	53%
Africa / Mediterranean	368	380	440	528	656	816	832	844	92%
Asia / Pacific	456	484	520	492	496	520	592	604	16%
North Sea / Arctic	564	568	636	632	680	684	724	732	15%
South America	780	752	760	1060	1156	1392	1400	1416	86%
Mexico & Canada	11	17	22	28	28	34	34	34	55%

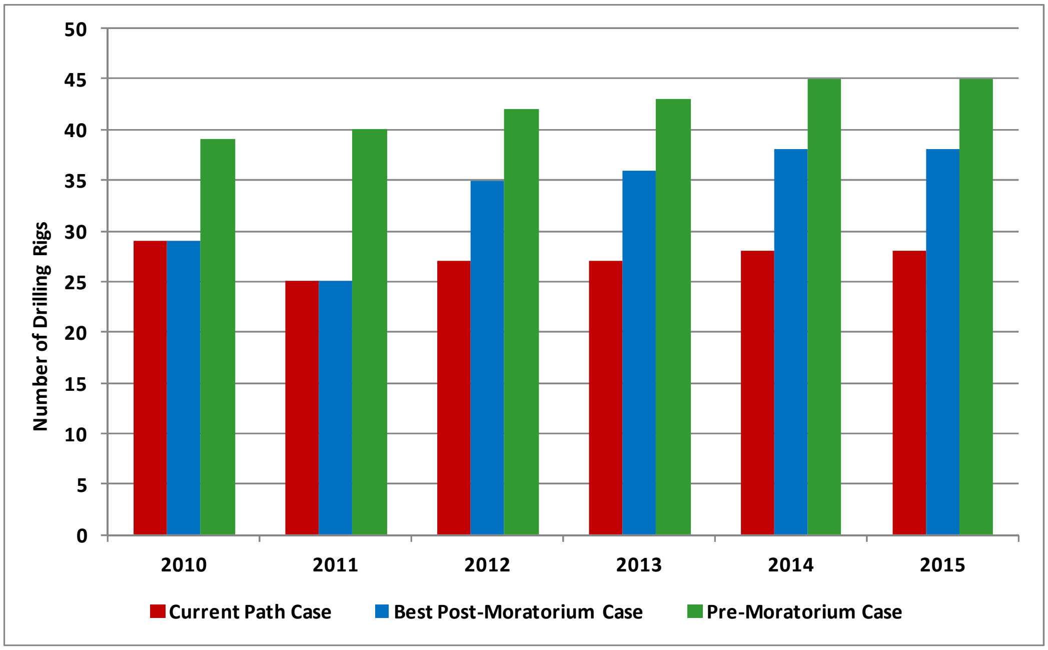
Source: Quest Offshore Resources, Inc. 2011

[10] Rest of World investment scenarios correspond to the U.S. Current Path Case. Best Post-Moratorium Case realization would alter the Rest of World investment scenarios shown above by primarily decreasing investment levels as drilling rigs and development activity increased in the Gulf of Mexico in the Best Post-Moratorium Case.

3.3.4 Drilling Fleet Gulf of Mexico and Rest of the World

The decline in well drilling permits and the subsequent decline in the number of wells drilled will inevitably lead to a lower number of rigs operating in the Gulf of Mexico, especially in deep waters. Deep water rigs can have rates that average as high as $500,000 a day. Rigs will not be kept in the region if they are unable to remain operating (with sufficient back-up work scheduled). While a number of rigs have already left the Gulf of Mexico some are planning to return. If permitting trends continue as in the *Current Path Case*, the number of deepwater rigs in the Gulf of Mexico is expected to be 28 in 2015, only one lower than the average in 2010 but 37 percent lower than was expected prior to the moratorium (Figure 15). In the *Best Post-Moratorium Case* however, deep water rig supply is expected to reach 38 by 2015 which is lower than pre moratorium forecasts but higher than the number of rigs in 2010 in the *Current Path Case* and *Best Post-Moratorium Case*.

Figure 15: Projected Deepwater Drilling Rigs Operating in the Gulf of Mexico 2010-2015



Source: Quest Offshore Resources, Inc. 2011

While in the rest of the world the number of deepwater drilling rigs operating is expected to increase by 55 percent from 2010 to 2015, the number of deepwater drilling rigs operating in the Gulf of Mexico is expected to be down by one rig or a reduction of 3 percent in 2015 compared to 2010 on the current path. With a return to historical permitting levels however, the number of rigs operating in the Gulf of Mexico is expected to increase 31 percent in the *Best Post-Moratorium Case*. The rest of the world will see an average increase of 55 percent in the number of deepwater rigs working, with the largest increases coming in Africa/Mediterranean (92 percent) and South America (86 percent) (Table 7).

Table 7: Projected Number of Deepwater Drilling Rigs: Rest of World, U.S. Current Path Case and Best Post-Moratorium Case

Deepwater Drilling Rig Forecast	2010	2011	2012	2013	2014	2015	2010-2015 Growth
US GoM Current Path Case	29	25	27	27	28	28	-3%
US GoM Best Post-Moratorium Case	29	25	35	36	38	38	31%
Africa / Mediterranean	31	38	47	58	59	60	92%
Asia / Pacific	46	44	44	46	53	54	16%
North Sea / Arctic	40	40	43	43	45	46	15%
South America	70	98	107	129	130	131	86%
Mexico & Canada	7	9	9	11	11	11	57%

Source: Quest Offshore Resources, Inc. 2011

To date, 11 deepwater rigs have already left the Gulf of Mexico for at least some period of time due to the drilling moratorium and permit slowdown. These rigs, which have left to countries such as Brazil, Ghana, Egypt and Vietnam, are directly associated with the loss of 103 U.S. wells through 2015. These wells, which prior to the moratorium would have been drilled in the United States, will now be drilled in areas such as West Africa (30 wells), South America (27 wells) and the Middle East (35 Wells) (Table 8).

From 2010 to 2015, the investment in other regions instead of the U.S. associated with these rigs is estimated to be over $21.4 billion including drilling spending and associated project equipment orders even accounting for the portion of equipment for development in other regions that would be spent in the United States (Figure 2). Gulf of Mexico and global investment projections are further discussed in section 4 below.

Table 8: Deepwater Drilling Rigs Which Have Left the GoM Due to Drilling Moratorium and Permit Slowdown: Rig Name, Departure Date, Destination and Projected Associated Lost Well Potential

Rig Name	Departure Date	Destination	Lost Well Potential
Discoverer Spirit	Jun-11	Liberia	3
Ensco DS-3 (Ascension)	Nov-11	Angola	10
Ensco DS-4 (Clarion)	May-11	Brazil	12
Ensco 8503	Mar-11	French Guiana	2
Ocean Endeavor	Jul-10	Egypt	14
Transocean Marianas	Sep-10	Nigeria - Ghana	13
Transocean Amirante	Jul-11	Egypt	11
Noble Paul Romano	Nov-11	Egypt	10
Ocean Monarch	Oct-11	Vietnam	11
Ocean Confidence	Sep-10	Congo - Angola	4
Noble Clyde Boudreaux	Jan-11	Brazil	13
Total Lost Wells			103

Source: Quest Offshore Resources, Inc. 2011

3.4 Projects in the Gulf of Mexico

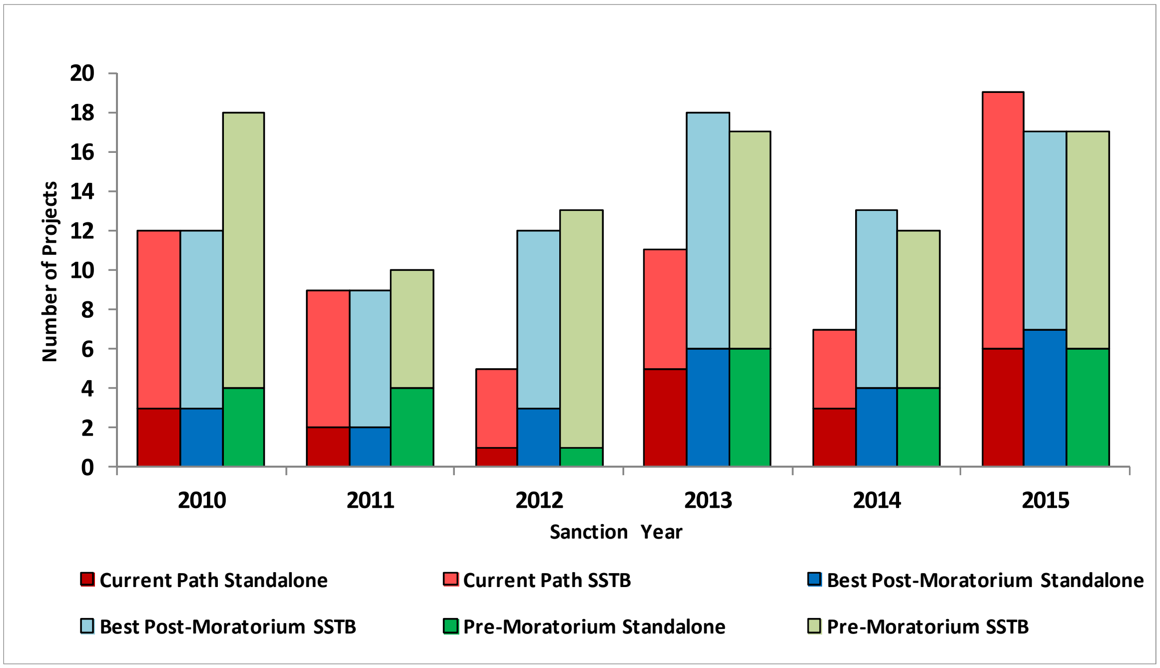
By impacting drilling rates, the drilling moratorium as well as past and future permitting rates has and will continue to affect all project development activities such as the manufacturing of hardware, the fabrication of platforms and the installation of pipelines. Projects are often categorized based on water depth, company type ("major" multinational oil company or "independent") and whether the project has its own platform or floating production unit (stand alone), or utilizes umbilicals and subsea flowlines to transport hydrocarbons to an existing platform (subsea tie back or SSTB).

3.4.1 Deep Water Projects by Scenario

If current trends continue, total cumulative number of deepwater projects from 2010 to 2015 is expected to be 63 or a 28 percent decline from the expected 87 projects anticipated before the moratorium. The number of large standalone projects is projected to be down only 20 percent due to the long lead times associated with these projects. Subsea tiebacks are expected to be down 31 percent, as the shorter turnaround times between exploration drilling and project development makes subsea tiebacks more sensitive to delays.

With a return to historical permitting rates under a balanced regulatory regime, total deepwater project executions could increase significantly to 81 projects, or only down 7 percent from the pre-moratorium projections through 2010. Large standalone projects would be flat, though many of these projects would be executed in later years of the 2010-2015 period. Subsea tiebacks would be down only 10 percent under the *Best Post-Moratorium Case* from 2010 to 2015. (Figure 16)

Figure 16: Projected Deepwater Project Executions 2010-2015 by Scenario

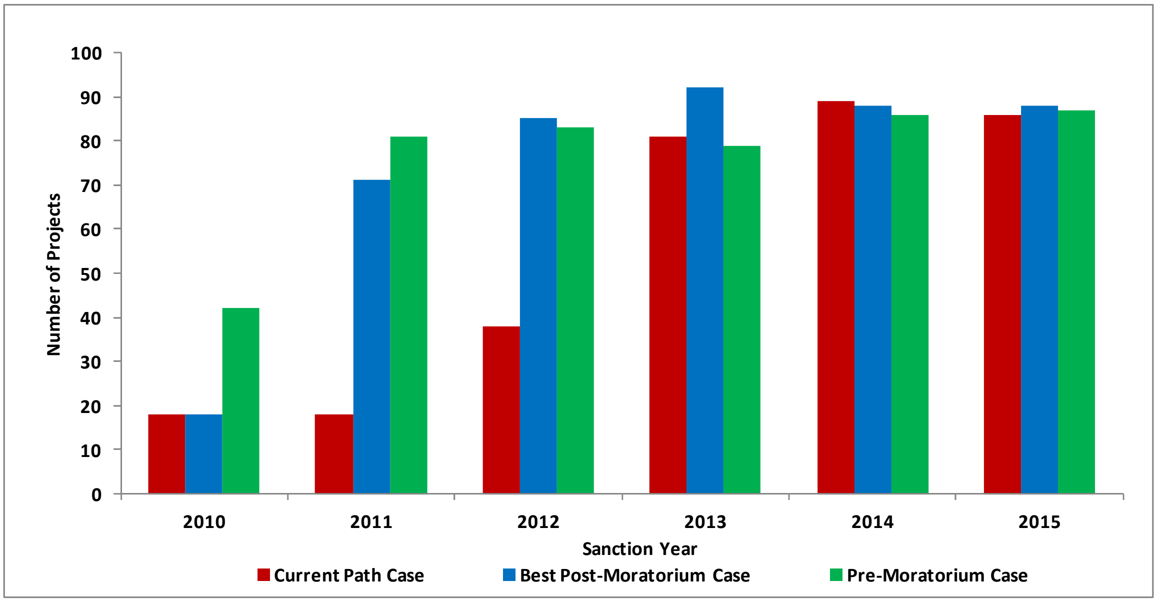


Source: Quest Offshore Resources, Inc. 2011

3.4.2 Shallow Water Projects by Scenario

In the *Current Path Case*, shallow water projects in water depths below 500 feet, are expected to see the cumulative number of projects between 2010-2015 fall 27 percent from what was projected prior to the moratorium (Figure 17). This is primarily due to delays in receiving shallow water drilling permits. With a return to historical permitting rates assumed in the *Best Post-Moratorium Case*, a cumulative 107 more shallow water projects could be achieved by 2015. If this number of shallow water projects were executed, it would only be a decline of 4 percent from pre-moratorium expectations.

Figure 17: Projected Shallow Water Project Executions 2010-2015 Pre-Moratorium Case, Current Path Case and Best Post-Moratorium Case



Source: Quest Offshore Resources, Inc. 2011

3.4.3 Project Delays

The deepwater drilling moratorium and permit slowdown has delayed projects throughout the Gulf of Mexico. Not all operators have been impacted equally. While all companies abide by the same framework of laws and regulation, major operators, who have thousands of employees, significant financial resources, and geographically diverse operations, are possibly better equipped to respond to changing regulation and uncertain regulatory conditions. So, while all types of operators have seen delays, smaller independent operators have been most adversely affected. These operators, who normally are less geographically diversified, are expected to see 70 total projects delayed on the current path relative to the *Pre-Moratorium Case*, with the average delay for shallow water projects expected to be 1.4 years and the average delay for deepwater projects expected to be 1.95 years. In comparison, major operators are expected to see 63 projects delayed of only 0.9 years on average in shallow water, and 1.69 years on average in deepwater (Table 9).

Table 9: Projected Project Delays by Operator Type and Water Depth

	Pre-Moratorium to Current Path Case		*Pre-Moratorium to Best Post-Moratorium Case*	
Project Type	Number of Projects Delayed	Average Delay (Years)	Number of Projects Delayed	Average Delay (Years)
Shallow Water - Independent	51	1.40	20	1.15
Shallow Water - Major	34	0.90	17	0.60
Shallow Water Total	85	1.15	37	0.88
Deepwater - Independent	19	1.95	6	1.83
Deepwater - Major	29	1.69	3	1.15
Deepwater Total	48	1.82	9	1.49
All Water Depths Total	133	1.49	46	1.18

Source: Quest Offshore Resources, Inc. 2011

With a return to pre-moratorium historical permitting rates, delays for both independent and major operators in all water depths should be significantly reduced. In the *Best Post-Moratorium Case*, the total number of delayed independent operator projects is estimated at only 26 projects, with the average delay for shallow water projects falling to 1.15 years and the average delay for deepwater projects falling to 1.83 years. For major operators the number of delayed projects would fall to 20, with the average delay for shallow water projects falling to 0.6 years and the average delay for deepwater projects falling to 1.15 years.

3.4.4 Global Offshore Project Development

The U.S. is projected to see a declining percentage of global project executions on the current path with the U.S. share of standalone[11] projects projected to decline to 9 percent on the *Current Path Case* compared to 11 percent on the *Best Post-Moratorium Case,* and the U.S. share of subsea tiebacks[12] declining to 10 percent on the *Current Path Case* compared to seven percent in the *Best Post-Moratorium Case* (Table 10).

[11] Standalone projects are defined as projects with a new platform or floating production system host.

[12] Subsea Tiebacks are defined as projects without new platforms or floating production systems utilizing existing hosts.

Table 10: Projected Deepwater Project Executions 2010-2015 Worldwide Standalone Projects and Subsea Tiebacks

Deepwater Project Executions	Project Type	2010	2011	2012	2013	2014	2015
United States - Pre-Moratorium	Standalone	3	4	1	6	4	6
	Subsea Tie Back	6	6	12	11	8	11
	Total Projects	9	10	13	17	12	17
United States - Current Path	Standalone	2	2	1	5	3	6
	Subsea Tie Back	5	7	4	6	4	13
	Total Projects	7	9	5	11	7	19
United States - Best Post-Moratorium	Standalone	2	2	1	6	4	7
	Subsea Tie Back	5	7	9	12	9	10
	Total Projects	7	11	10	18	13	16
Africa, Mediteranean	Standalone	1	1	4	8	8	7
	Subsea Tie Back	3	7	9	10	6	11
	Total Projects	4	8	13	18	14	18
Asia, Pacific	Standalone	4	7	8	10	11	9
	Subsea Tie Back	8	12	9	11	10	16
	Total Projects	12	19	17	21	21	25
North Sea, Arctic	Standalone	1	6	2	3	5	4
	Subsea Tie Back	9	26	33	29	21	26
	Total Projects	10	32	35	32	26	30
South America	Standalone	12	13	13	14	17	22
	Subsea Tie Back	2	0	4	4	5	4
	Total Projects	14	13	17	18	22	26
North America - Other	Standalone	0	0	1	0	1	0
	Subsea Tie Back	1	2	3	3	5	7
	Total Projects	1	2	4	3	6	7
Global Total (Current Path)	Standalone	20	29	29	40	45	48
	Subsea Tie Back	28	54	62	63	51	77
	Total Projects	48	83	91	103	96	125

Source: Quest Offshore Resources, Inc. 2011

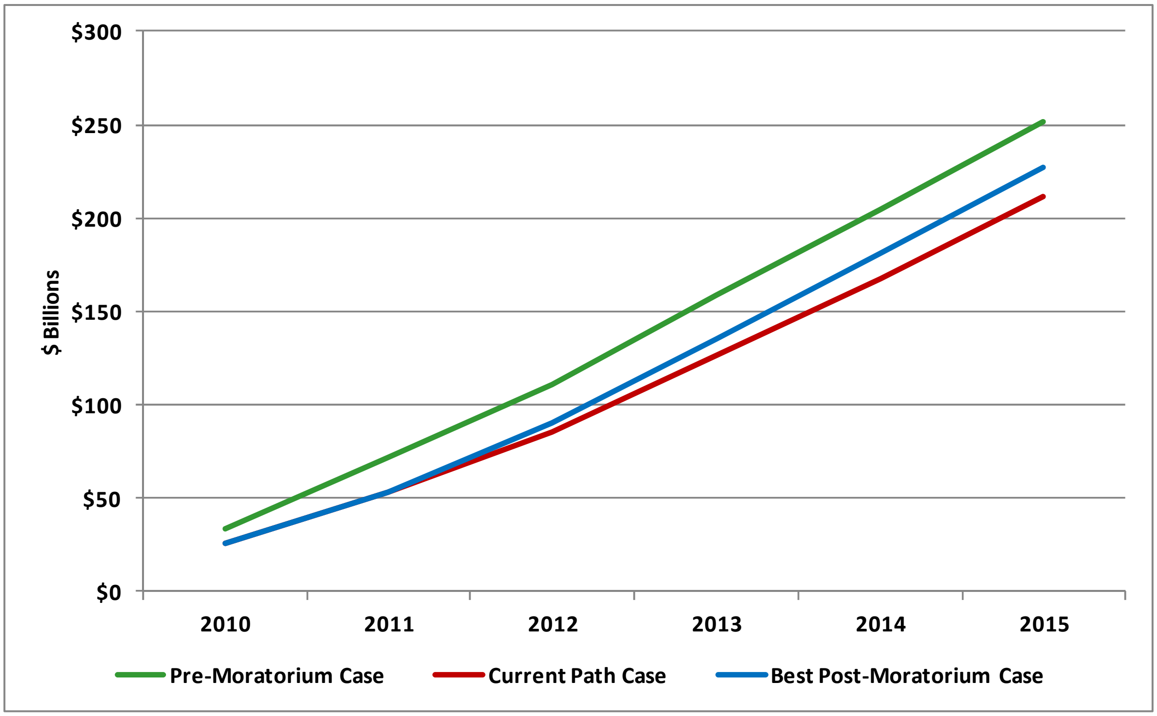
4. Investment, Production, and Employment Impacts by Scenario

The development of offshore oil and natural gas projects requires large capital investments to develop projects and ongoing spending to operate developments. This investment provides employment throughout the country as well as domestic production of oil and natural gas thereby improving energy security. This section first describes the expected investment levels by the offshore oil and natural gas industry in the U.S. under three different scenarios as described in previous sections of the report. All investment projections are reported in nominal dollars. Employment and oil and natural gas production impacts associated with these investment levels are then presented. Throughout the section, the U.S. is compared to other regions when appropriate.

4.1 Capital Investment and Operating Spending

If drilling permits continue to be issued at low rates on the current path, total capital and operational expenditures by the U.S. offshore oil and gas industry from 2010 to 2015 are expected to be $211.8 billion, which is 16 percent below the $251.5 billion expected prior to the drilling moratorium (Figure 18).

Figure 18: Total Estimated and Projected Cumulative Capital Investment and Operational Spending by Case $ Billions 2010-2015

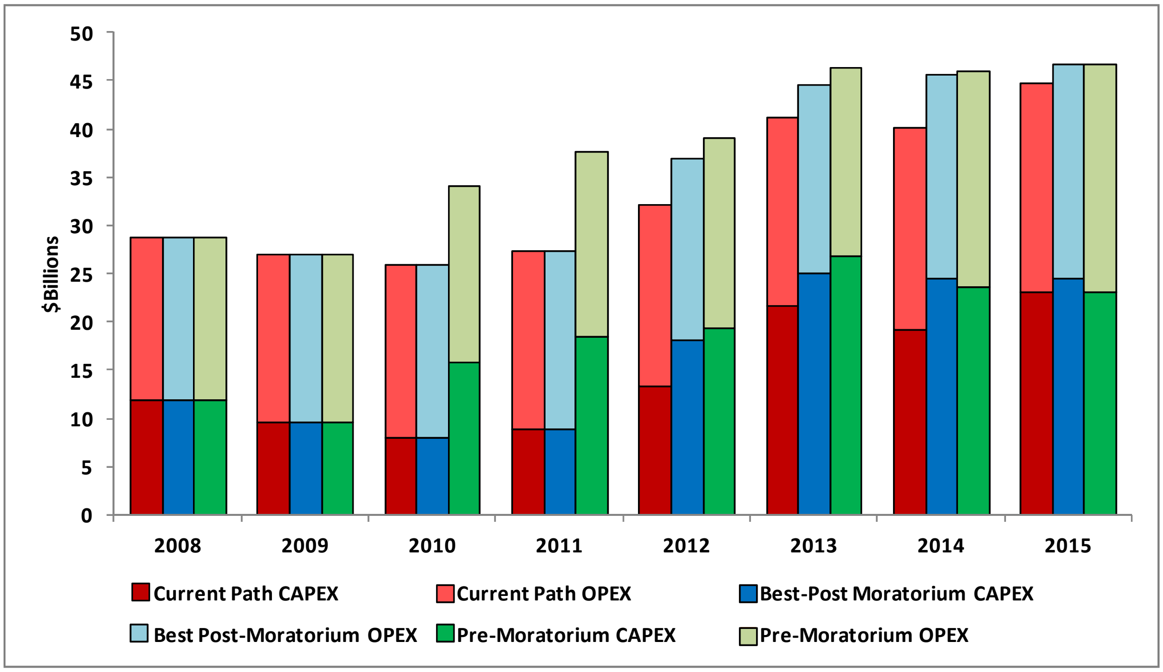


Source: Quest Offshore Resources, Inc. 2011

Capital expenditures show more variability and are a better longer term indicator of the future health of the U.S. offshore oil and gas industry than operational expenditures. From 2010 to 2015, U.S. offshore capital expenditures are projected to decrease 26 percent to $94.3 billion on the *Current Path Case* from $127.5 billion under the *Pre-Moratorium Case*. The decrease in capital expenditures encompasses not only the directly affected drilling spending, but also other project expenditures including procurement and installation of platforms, pipelines, and subsea equipment. Planned infrastructure will be delayed if drilling slows and operators are unable to discover new oil resources, appraise discovered resources, and drill production wells.

Despite the long-term impacts of the offshore deepwater drilling moratorium in 2010 and subsequent deep and shallow water permit slowdown, the U.S. offshore oil and gas industry has the potential to return to more efficient development and production with an improvement in permitting rates. According to Quest's projections, if drilling permit levels returned to pre-moratorium levels, total capital and operational expenditures in the offshore oil and natural gas industry from 2012 to 2015 could increase 9 percent from its current path from $158.4 billion to $174.1 billion under the *Best Post-Moratorium Case* (Figure 19).

Figure 19: Total Estimated and Projected Capital Investment and Operational Spending Projections by Scenario 2008-2015 ($Billions)



Source: Quest Offshore Resources, Inc. 2011

Capital investment, which is a better indicator of the long-term health of the U.S. offshore oil and natural gas industry, is projected to increase 19 percent from 2012 to 2015 to $92.3 billion under the *Best-Post Moratorium Case* from its current path of $77.4 billion due to an increase in drilling as well as stronger project development activity. Such capital investment would lead to an increase in procurement and installation spending on items such as pipelines, platforms and subsea equipment.

4.1.1 Drilling, Subsea, and Platform Investment

Over $21.4 billion of capital expenditure has already been lost due to rigs leaving the Gulf of Mexico. Due to the drilling moratorium and permit slowdown, overall offshore U.S. drilling spending is expected to be down 27 percent from 2011 to 2015 from $58.2 billion (*Pre-Moratorium Case*) to $42.4 billion (*Current Path Case*). If permit levels were to return to pre-moratorium levels however, Quest projects that overall drilling spending from 2011 to 2015 would be $48.9 billion under the *Best Post-Moratorium* Case (Table 11).

Table 11: Projected Drilling Spending 2011-2015: Pre-Moratorium, Current Path, and Best Post Moratorium Cases $Billions

Drilling Expenditures ($ Billions)	**2011**	**2012**	**2013**	**2014**	**2015**	**Total**
Current Path Case	$4.9	$8.2	$9.6	$9.8	$9.9	$42.4
Best Post-Moratorium Case	$4.9	$9.1	$10.3	$12.9	$11.7	$48.9
Pre-Moratorium Case	$8.8	$11.6	$12.6	$12.8	$12.3	$58.2

Source: Quest Offshore Resources, Inc. 2011

The increase in subsea tree awards from a return to historical permitting rates coupled with other increases in subsea equipment and development activity under the *Best Post-Moratorium Case* would be expected to result in an 11 percent increase in subsea, or SURF[9], procurement capital expenditure from the *Current Path Case* from $17.8 billion to $20.1 billion over the 2012 to 2015 period. While this is still an 11 percent decrease from what was expected prior to the moratorium, on the current path SURF procurement spending is expected to be 21 percent below the *Pre-Moratorium Case* as development activity is delayed to an even greater extent due to the slowdown in exploration and appraisal drilling activities (Table 12).

[9] SURF is defined as Subsea, Umbilicals, Risers, and Flowlines, which are the major components of deepwater developments utilizing subsea production systems. For a more complete description of SURF components, please see Appendix 7: Life Cycle of a U.S. Offshore Field Development.

Table 12: Subsea, Umbilical, Riser and Flowline Procurement Projected Capital Expenditures 2010-2015 $Billions

SURF Expenditures ($ Billions)	2010	2011	2012	2013	2014	2015	Total
Current Path Case	$1.4	$1.5	$3.3	$5.1	$4.2	$5.2	$20.7
Best Post-Moratorium Case	$1.4	$1.5	$4.7	$6.3	$5.4	$3.7	$23.0
Pre-Moratorium Case	$2.6	$4.2	$5.2	$5.9	$4.7	$3.7	$26.3

Source: Quest Offshore Resources, Inc. 2011

The decrease in floating production system (FPS) and platform awards due to the deepwater drilling moratorium and permit slow down on the current path is expected to result in a 22 percent decrease in facilities capital spending from $33.5 billion to $25.9 billion over the 2010-2015 period. A return to pre-moratorium permitting rates, however, could drive a 19 percent increase in facilities spending from the *Current Path Case* to the *Best Post-Moratorium Case* of $31.9 billion, only a 4 percent decrease from the *Pre-Moratorium Case* (Table 13).

Table 13: FPS Procurement Projected Capital Expenditures by Scenario 2010-2015 ($Billions)

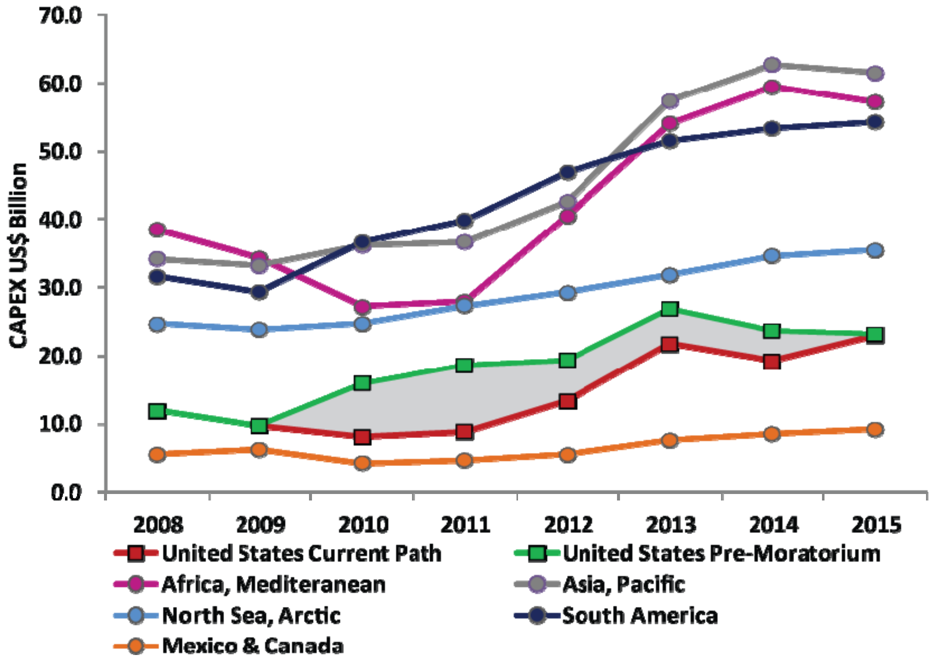
FPS Expenditures ($ Billions)	2010	2011	2012	2013	2014	2015	Total
Current Path Case	$2.2	$2.3	$1.6	$6.9	$5.0	$7.8	$25.9
Best Post-Moratorium Case	$2.2	$2.3	$4.2	$8.3	$6.0	$8.9	$31.9
Pre-Moratorium Case	$4.8	$5.3	$2.4	$8.2	$5.9	$6.9	$33.5

Source: Quest Offshore Resources, Inc. 2011

4.1.2 Global Offshore Oil and Natural Gas Investment

The U.S. offshore oil and natural gas industry competes globally with other regions for operator investment, drilling rigs, and construction vessels that are essential to the development of oil and natural gas resources. The U.S. offshore oil and natural gas industry has seen slower growth over the last couple of years due to the deepwater drilling moratorium imposed after the Macondo tragedy and the subsequent slowdown in the issuance of drilling permits at all water depths. Other regions in the world such as Brazil, Asia, and parts of Africa are currently experiencing rapid growth in their offshore oil and gas industries (Figure 20).

Figure 20: Estimated Historical and Projected World Offshore Capital Investment 2008-2015 ($Billions) (All Water Depths)



	2010	2015	Projected Cumulative 2010-2015	Cumulative Difference
Asia, Pacific	$36.2	$61.6	$297.4	
South America	$36.7	$54.3	$282.9	
Africa, Mediterranean	$27.2	$57.3	$266.6	
North Sea, Arctic	$24.7	$35.5	$183.3	
U.S. Pre-Moratorium Case	$16.0	$23.2	$127.7	
U.S. Current Path Case	$8.1	$23.0	$94.2	$33.5
Mexico & Canada	$4.3	$9.2	$39.8	
Total (Current Path)	$137.2	$240.9	$1,164.2	
Total (Pre-Moratorium)	$145.1	$241.0	$1,197.7	

Source: Quest Offshore Resources, Inc. 2011

Even mature regions such as the North Sea are experiencing a resurgence of growth. Since oil is a globally traded commodity and the primary target of global deepwater developments is oil, the location of production is considered less important than field economics, political stability or the regulatory environment. On the current path, investment in the offshore oil and gas industry in the United States is expected to see growth, but at lower levels than the rates seen in South America, Asia, and parts of Africa.

In addition to drilling rigs (discussed above in section 3.3.4), high-specification marine construction vessels are also mobile assets. These vessels command high levels of day rates, engineering expertise, and labor in order to support the offshore oil and gas industry's marine construction and installation needs. A fraction of these construction vessels are also likely to relocate from the Gulf of Mexico due to the continued activity slowdown in order to realize a return on the immense capital investments and substantial operating expenditures they require. Unlike drilling rigs, offshore construction vessels are less likely to be operating on long-term contracts and are thus relocated more often. The projected depression in the *Current Path Case* in development activity through 2015, primarily as it relates to the installation of flowlines, floating production systems, and associated subsea hardware will likely result in lower numbers of these vessels operating in the U.S. through 2015. On the current path, a minimum of five less high-end construction vessels are expected to be working in the U.S. through 2015 as compared to *the Pre-Moratorium Case*. If activity levels rise to the *Best Post-Moratorium Case*, only two less high-end construction vessels on average are expected to be working in the United States (Table 14).

Table 14: 2010-2015 Projected U.S. High-Specification Marine Construction Vessel Losses and Associated Capital and Operating Expenditure

Marine Construction Vessel Departures	Number of Vessels	Associated Investment ($Billions)
Current Path Case	5	$2.8
Best Post-Moratorium Case	2	$1.1

Source: Quest Offshore Resources, Inc. 2011

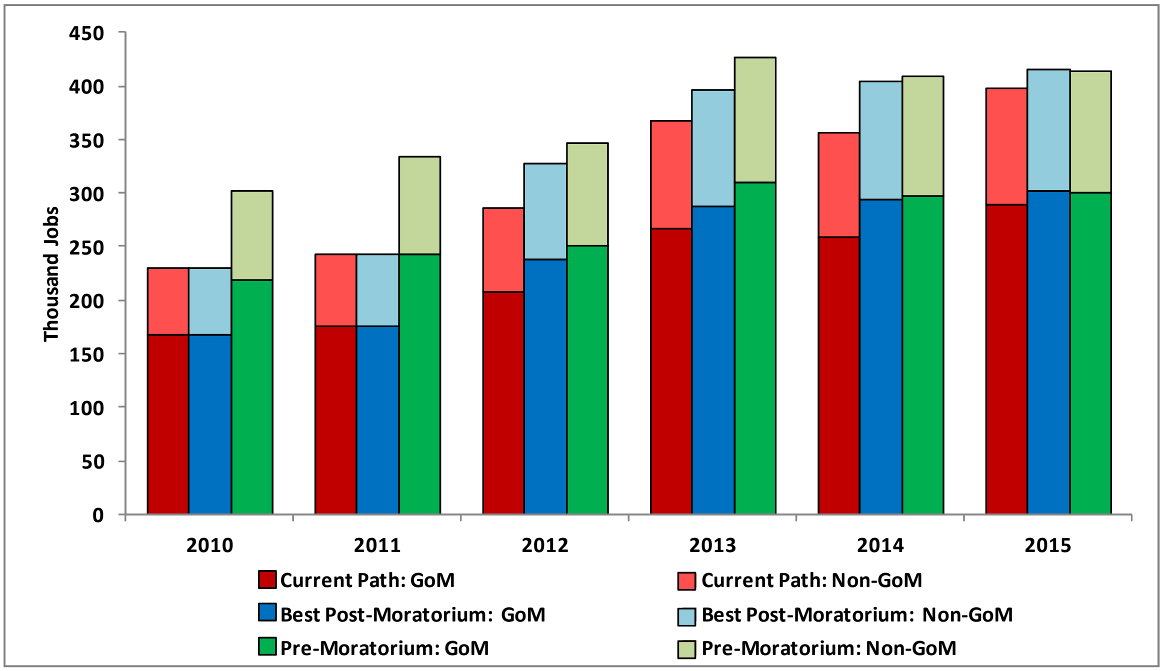
While the day rates of high-specification offshore construction vessels vary between vessels and projects, day-rates including labor, fuel and other supplies average approximately $500,000. Using this benchmark to estimate the impact of lost investment, the loss of these vessels which work 275 days a year on average, will be associated with a decrease in investment of approximately $2.8 billion under the *Current Path Case* relative to the *Pre-Moratorium Case* through 2015, and a loss of $1.1 billion on the *Best Post-Moratorium Case.*

4.2 Employment Impacts by Scenario

In a time of high unemployment in the United States and despite the drilling moratorium and subsequent shallow and deepwater permit slowdown, investment by the offshore oil and natural gas industry nevertheless results in significant employment in the country. A return to pre-moratorium permitting levels would be projected to result in significant employment growth. Utilizing the spending associated with the cases, Quest Offshore employed RIMS II employment multipliers to project the employment impacts associated with the three investment profiles.

On the current path, total employment supported by the U.S. offshore oil and natural gas industry is expected to be down 16 percent, on average, annually from 2010-2015 from the *Pre-Moratorium Case*. In 2015, total employment is expected to reach 399,000 jobs, a 16,500 job decrease from the *Pre-Moratorium Case*. It is estimated that the Gulf region will account for 290,000 of these jobs while non-Gulf State employment is expected to reach 109,000 (Figure 21).

Figure 21: Estimated and Projected Associated Gulf of Mexico State and Non-Gulf of Mexico State Employment Thousands of Jobs by Case (2010-2015)



Source: Quest Offshore Resources, Inc. 2011

Prior to the drilling moratorium and shallow and deepwater permit slowdown, total employment in the offshore oil and gas industry was expected to grow 37 percent from 2010 to 2015 to 415,000 from 303,000. Total Gulf state employment was expected to grow from 220,000 to 302,000, while total non-Gulf state employment was expected to grow to 113,000 jobs from 83,000 jobs in the *Pre-Moratorium Case*.

Quest projects that under the *Best-Post Moratorium Case,* employment supported by the offshore oil and gas industry will be able to reach levels expected prior to the moratorium by 2015 as development activity returns to a normal cycle not hindered by a lack of exploration, appraisal, and development drilling. Under the *Best Post-Moratorium Case*, employment supported by the offshore oil and natural gas industry in 2015 is expected to reach 416,000 jobs, while average annual employment from 2010-2015 is expected to be down only 10 percent from projected employment had the moratorium and subsequent permit slowdown not been imposed. Under the *Best Post-Moratorium Case* Gulf of Mexico coastal states are expected to account for 302,000 jobs in 2015, while non-Gulf states are expected to account for 114,000 jobs (Table 15).

Table 15: Estimated and Projected Best Post-Moratorium Case Employment, Gulf States vs. Non-Gulf States, Direct vs. Indirect and Induced Thousands of Jobs (2010-2015)

Pre-Moratorium Case Employment	2010	2011	2012	2013	2014	2015
GoM Direct Employment	52	58	60	74	71	72
GoM Indirect and Induced Employment	168	185	192	236	227	230
Other States Direct Employment	23	25	26	33	31	32
Other States Indirect and Induced Employment	60	66	68	84	81	82
Total GoM Employment	220	243	252	310	298	302
Total Other States Employment	83	91	95	117	112	113
Total U.S. Employment	303	334	347	427	409	415

Source: Quest Offshore Resources, Inc. 2011

The additional investment associated with a return to pre-moratorium permitting conditions, would increase average annual U.S. employment between 17,000 and 49,000 jobs per year, with an average increase of 35,000 jobs over that time period (Table 16).

Table 16: Projected Employment Comparison: Best Post-Moratorium and Current Path Case Thousand of Jobs (2010-2015)

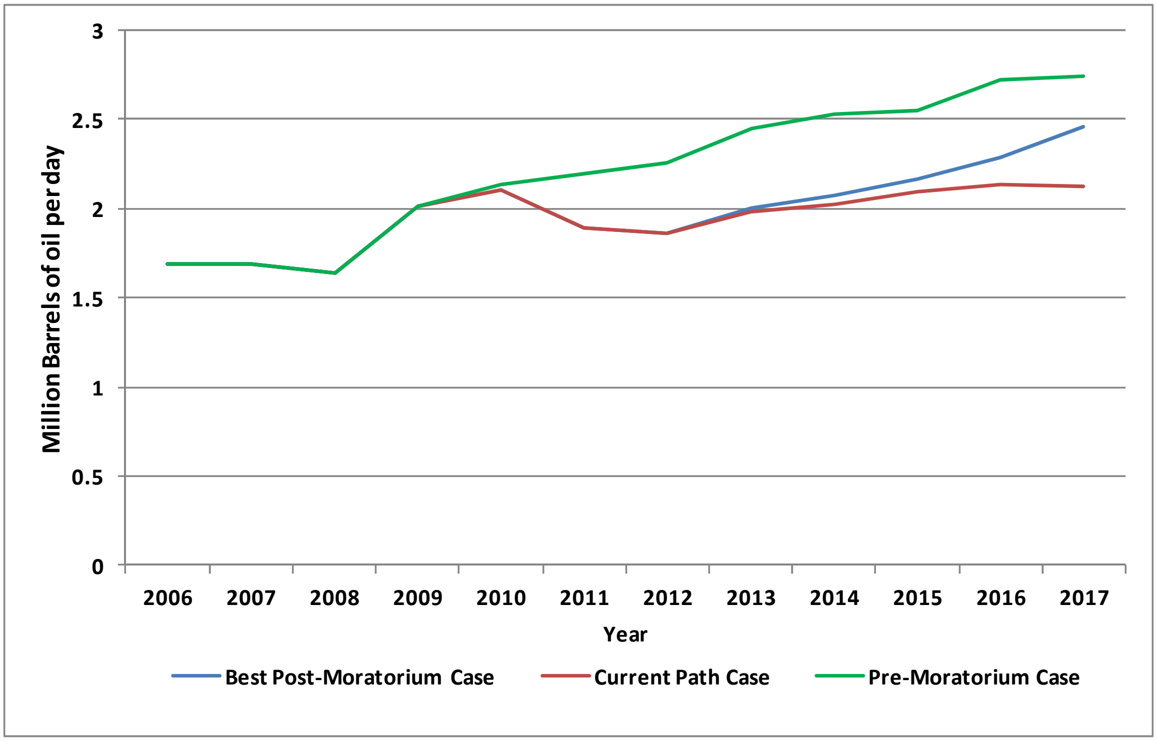
Investment Case 2008-2015 Thousands of Jobs	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Best Post-Moratorium Case	231	244	329	397	406	416
Curent Path Case	231	244	286	367	357	399
Difference: Possible Job Creation			**43**	**30**	**49**	**17**

Source: Quest Offshore Resources, Inc. 2011

4.3 Production Impacts by Scenario

The effects of the deepwater drilling moratorium and the subsequent slow issuance of drilling permits at all water depths have had a significant effect on oil and natural gas production. The halt in deepwater drilling due to the drilling moratorium is expected to affect both near and long-term offshore oil production both through delaying the direct effects of drilling production wells as well as setting back the start up or sanctioning of larger projects due to delays in exploration and appraisal drilling. In 2017, offshore oil production is expected to be around 13 percent lower under the *Current Path Case* from the *Best Post-Moratorium Case* due to the continued slow issuance of drilling permits. In 2017, offshore oil production is expected to be around 10 percent lower under the *Best Post-Moratorium Case* relative to the *Pre-Moratorium Case* (Figure 22).

Figure 22: Estimated and Projected Daily Average Offshore Oil Production: Pre-Moratorium Case vs. Best Post-Moratorium Case vs. Current Path Case (Million Barrels of oil per day)

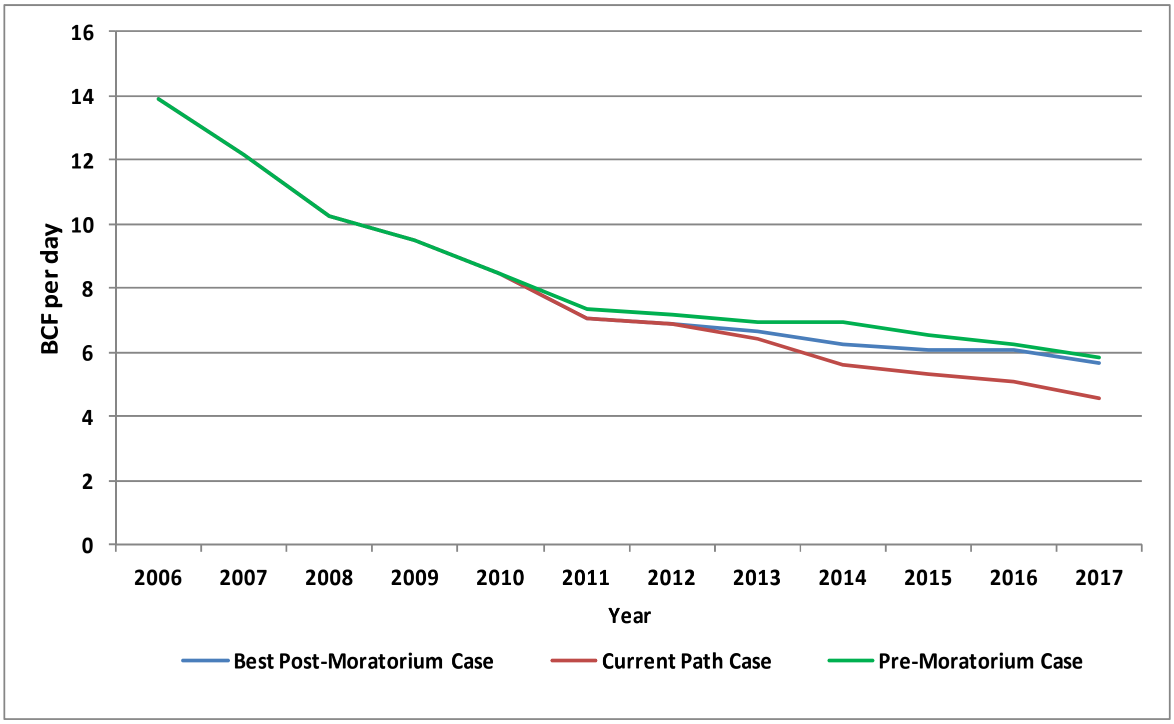


Source: Quest Offshore Resources, Inc. 2011

The 330,000 barrel decrease in daily oil production in 2017 on the *Current Path Case* from the *Best Post-Moratorium Case* would mean yearly U.S. oil production would fall by over 120 million barrels. At November,2011 oil prices of slightly over $100 a barrel this alone would contribute over $12 billion dollars to the U.S. trade deficit.

While offshore natural gas production has been on a long-term declining trend, especially due to the increase in production from new onshore shale gas plays, offshore gas will continue to contribute to the nations natural gas needs both through dedicated natural gas projects as well as through the production of associated gas from large oil projects. The continued slow issuance of permits is expected to account for around a 21 percent decline in offshore natural gas production in 2017 in the *Current Path Case* compared to *the Pre-Moratorium Case*. Under the Best Post-Moratorium Case only a 3 percent decline in offshore natural gas production through 2017 would be projected (Figure 23).

Figure 23: Estimated and Projected Daily Average Offshore Natural Gas Production: Pre-Moratorium Case vs. Best Post-Moratorium Case vs. Current Path Case (Billion Cubic Feet per day)



Source Quest Offshore Resource, Inc. 2011

5. Conclusions

The offshore U.S. oil and natural gas industry is a vital component to the nation's energy supply, currently providing more than one-quarter of U.S. oil production. However, deepwater permits in the Gulf of Mexico are currently being issued at less than half the rate compared with pre-moratorium levels, and shallow water permits are being issued at rates 40 percent lower. Not surprisingly, this report finds significant adverse impacts of the permit slowdown on investment, employment, and oil and natural gas production.

While the U.S. is still an attractive destination for investment, there is competition for financial and other resources between the U.S. and other regions. A lack of an appropriate numbers of drilling permits could decrease the competitiveness of the U.S. and cause operators to shift additional investment to other regions. In 2011, the U.S. is projected to account for only 6 percent, or $8.9 billion, of global offshore oil and gas capital investment valued at $146 billion. Considering the discovered and undiscovered resources in place in the Gulf of Mexico, this figure of 6 percent is far lower than would be expected. Prior to the moratorium, the U.S. was projected to account for 12 percent of worldwide offshore oil and natural gas investment, which is much more in-line with the offshore resource base in the Gulf of Mexico.

- The permit slowdown has caused significant delays in project development, with deepwater projects and projects developed by independent operators most affected.
- Billions of dollars of capital investment have been delayed and tens of thousands of jobs have been lost.
- Development of offshore oil and natural gas reserves has been adversely impacted.

Restoring permitting rates to pre-moratorium levels would be a first step towards a more efficient utilization of offshore resources over the 2012 to 2015 period.

- Capital and operational spending would rise by billions of dollars relative to current trends.
- Tens of thousands of jobs would be created relative to current trends.
- The competitiveness of domestic offshore oil and natural gas development would be increased relative to the rest of the world.
- Offshore Oil production in the U.S. in 2017 would rise to approximately 2.5 million barrels a day from 1.9 million barrels per day in 2011.

Investment and operational spending by the Gulf of Mexico oil and natural gas industry supports hundreds of thousands of jobs across multiple sectors and regions, enhances energy security, spurs economic growth, and generates significant tax revenue at all levels of government. It is therefore crucial that the U.S. has in place a regulatory environment that eliminates unnecessary permitting delays and maintains competitiveness with development opportunities in other regions of the world. This would provide a first step to revitalizing the offshore oil and natural gas industry in the U.S. Additional access to offshore areas currently off-limits remains a key missing component of U.S. energy policy, and would provide substantial additional gains to the nation in terms of energy security, employment and government revenue.

Appendices

Appendix 1: Detailed Spending Tables

Table 17: Estimated and Projected United States Pre-Moratorium Case Spending Table $Millions

Capital Expenditures *(US$ millions)*

	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation
Deepwater																								
G&G	$21.4	$121.5		$20.8	$117.9		$7.8	$44.3		$12.2	$69.6		$18.4	$104.3		$13.9	$79.1		$19.4	$110.3		$16.7	$94.9	
Drilling	$394.3	$2,234.2		$518.1	$2,936.1		$751.2	$4,267.9		$751.2	$4,267.9		$1,073.1	$6,097.0		$1,230.5	$6,991.2		$1,185.1	$6,733.8		$1,197.1	$6,801.5	
Facilities	$7.1	$0.0	$40.0	$5.3	$0.0	$30.0	$899.7	$3,466.8	$51.0	$846.3	$3,261.2	$0.0	$213.6	$823.1	$68.0	$1,429.6	$5,508.8	$68.0	$926.5	$3,570.3	$68.0	$1,117.4	$4,305.6	$85.0
SURF	$455.1	$948.9	$1,629.9	$431.4	$549.4	$1,895.2	$786.2	$1,286.4	$293.9	$1,065.9	$1,744.2	$773.0	$1,169.3	$1,913.4	$1,092.9	$1,316.5	2154.3	$1,187.6	$1,054.7	$1,725.8	$789.1	$577.5	$945.0	$1,060.5
	$5,852.4			**$6,504.2**			**$11,855.2**			**$12,791.5**			**$12,573.1**			**$19,979.5**			**$16,183.1**			**$16,201.2**		
Shallow Water																								
G&G	$21.4	$121.5		$20.8	$117.9		$7.8	$44.3		$12.2	$69.6		$18.4	$104.3		$13.9	$79.1		$19.4	$110.3		$16.7	$94.9	
Drilling	$600.4	$3,402.2		$359.2	$2,035.3		$507.0	$2,880.7		$570.7	$3,242.8		$660.0	$3,750.0		$662.2	$3,762.5		$731.7	$4,157.4		$649.6	$3,690.6	
Facilities	$165.0	$635.9	$299.2	$61.9	$238.5	$112.2	$52.7	$203.1	$95.6	$185.7	$715.4	$336.6	$190.2	$733.0	$344.9	$181.1	$697.7	$328.3	$197.1	$759.5	$357.4	$208.6	$803.7	$378.2
SURF	$120.9	$255.9	$429.4	$35.2	$20.2	$179.5	$68.7	$112.4	$81.5	$156.5	$277.3	$203.3	$242.7	$430.0	$315.8	$292.9	$518.9	$381.9	$274.5	$486.2	$357.9	$283.1	$501.5	$369.1
	$6,052.0			**$3,180.7**			**$4,053.8**			**$5,770.1**			**$6,789.3**			**$6,918.5**			**$7,451.4**			**$6,996.0**		
	$11,904.4			**$9,684.9**			**$15,909.0**			**$18,561.6**			**$19,362.4**			**$26,898.0**			**$23,634.5**			**$23,197.2**		

Operating Expenditures *(US$ millions)*

	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation
Deepwater																								
Facilities	$536.7	$3,041.3		$581.4	$3,294.7		$580.4	$3,297.7		$625.1	$3,551.7		$625.1	$3,551.7		$684.6	$3,889.7		$744.1	$4,227.7		$788.8	$4,481.7	
SURF	$325.2	$1,842.6		$351.1	$1,989.7		$412.1	$2,341.7		$452.8	$2,572.7		$492.9	$2,800.7		$593.1	$3,369.7		$676.3	$3,842.7		$738.4	$4,195.7	
	$5,745.8			**$6,216.9**			**$6,631.9**			**$7,202.3**			**$7,470.4**			**$8,537.0**			**$9,490.8**			**$10,204.6**		
Shallow Water																								
Facilities	$1,385.2	$8,042.1		$1,397.9	$8,113.9		$1,458.0	$8,283.9		$1,487.9	$8,453.9		$1,518.5	$8,627.9		$1,547.7	$8,793.9		$1,579.6	$8,974.9		$1,613.2	$9,165.9	
SURF	$251.5	$1,425.1		$254.1	$1,439.9		$268.7	$1,526.9		$288.3	$1,637.9		$310.5	$1,763.9		$333.7	$1,895.9		$357.3	$2,029.9		$379.6	$2,156.9	
	$11,103.9			**$11,205.8**			**$11,537.5**			**$11,868.0**			**$12,220.8**			**$12,571.2**			**$12,941.7**			**$13,315.6**		
	$16,849.7			**$17,422.8**			**$18,169.5**			**$19,070.3**			**$19,691.2**			**$21,108.3**			**$22,432.5**			**$23,520.3**		
TOTAL SPEND	**$28,754.1**			**$27,107.7**			**$34,078.5**			**$37,631.9**			**$39,053.6**			**$48,006.3**			**$46,067.0**			**$46,717.4**		

Source: Quest Offshore Resources, Inc. 2011

Note: For a Complete Listing of the Provinces Associated with Each Region Please See Appendix 8

Table 18: Estimated and Projected United States Best Post-Moratorium Case Spending Table $Millions

	2008			2009			2010			2011			2012			2013			2014			2015		
Capital Expenditures *(US$ millions)*																								
Deepwater																								
	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
G&G	$21.4	$121.5		$20.8	$117.9		$7.8	$44.3		$7.0	$39.7		$15.3	$86.9		$13.3	$75.4		$18.8	$107.0		$15.3	$86.7	
Drilling	$394.3	$2,234.2		$518.1	$2,936.1		$272.4	$1,543.7		$405.4	$2,303.3		$810.8	$4,606.6		$925.2	$5,256.9		$1,151.7	$6,544.0		$1,118.4	$6,354.4	
Facilities	$7.1	$0.0	$40.0	$5.3	$0.0	$30.0	$274.5	$1,515.8	$40.0	$427.2	$1,646.3	$0.0	$632.7	$2,438.1	$17.0	$1,429.6	$5,508.7	$85.0	$926.5	$3,570.3	$85.0	$1,544.6	$5,951.9	$85.0
SURF	$455.1	$948.9	$1,629.9	$431.4	$549.4	$1,895.2	$192.0	$314.1	$773.7	$420.1	$687.4	$224.0	$1,465.4	$2,397.8	$308.2	$1,582.0	$2,588.6	$1,163.1	$1,067.1	$1,746.1	$1,360.5	$748.6	$1,224.9	$1,094.0
	$5,852.4			**$6,504.2**			**$4,978.4**			**$6,160.2**			**$12,778.8**			**$18,627.7**			**$16,577.0**			**$18,223.7**		
Shallow Water																								
	2008			2009			2010			2011			2012			2013			2014			2015		
G&G	$21.4	$121.5		$20.8	$117.9		$7.8	$44.3		$7.0	$39.7		$15.3	$86.9		$13.3	$75.4		$18.8	$107.0		$15.3	$86.7	
Drilling	$600.4	$3,402.2		$359.2	$2,035.3		$242.1	$2,272.5		$331.8	$1,885.5		$545.9	$3,101.7		$615.2	$3,495.6		$785.3	$4,462.1		$633.6	$3,600.2	
Facilities	$165.0	$635.9	$299.2	$61.9	$238.5	$112.2	$52.7	$203.1	$95.6	$41.3	$159.0	$74.8	$162.7	$627.0	$295.0	$194.8	$750.7	$353.2	$210.9	$812.5	$382.3	$201.7	$777.2	$365.7
SURF	$120.9	$255.9	$429.4	$35.2	$20.2	$179.5	$20.9	$37.1	$81.5	$43.9	$77.7	$57.0	$127.4	$225.7	$165.8	$240.5	$426.0	$313.6	$289.4	$512.7	$377.3	$159.4	$282.4	$207.8
	$6,052.0			**$3,180.7**			**$3,057.8**			**$2,717.6**			**$5,353.5**			**$6,478.2**			**$7,958.3**			**$6,330.0**		
	$11,904.4			**$9,684.9**			**$8,036.2**			**$8,877.8**			**$18,132.2**			**$25,105.9**			**$24,535.4**			**$24,553.6**		
Operating Expenditures *(US$ millions)*																								
Deepwater																								
	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
Facilities	$536.7	$3,041.3		$581.4	$3,294.7		$626.1	$3,548.2		$654.2	$3,717.2		$654.2	$3,717.2		$669.2	$3,802.2		$713.9	$4,056.2		$758.6	$4,310.2	
SURF	$325.2	$1,842.6		$351.1	$1,989.7		$373.2	$2,114.9		$410.2	$2,330.9		$432.6	$2,457.9		$474.3	$2,694.9		$603.3	$3,427.9		$670.9	$3,811.9	
	$5,745.8			**$6,216.9**			**$6,662.4**			**$7,112.5**			**$7,261.9**			**$7,640.5**			**$8,801.2**			**$9,551.5**		
Shallow Water																								
	2008			2009			2010			2011			2012			2013			2014			2015		
Facilities	$1,385.2	$8,042.1		$1,397.9	$8,113.9		$1,405.1	$8,154.9		$1,442.0	$8,192.9		$1,456.0	$8,272.9		$1,486.0	$8,442.9		$1,518.9	$8,629.9		$1,552.5	$8,820.9	
SURF	$251.5	$1,425.1		$254.1	$1,439.9		$255.8	$1,449.8		$266.6	$1,514.8		$281.9	$1,601.8		$301.5	$1,712.8		$323.1	$1,835.8		$344.0	$1,954.8	
	$11,103.9			**$11,205.8**			**$11,265.7**			**$11,416.3**			**$11,612.7**			**$11,943.1**			**$12,307.7**			**$12,672.2**		
	$16,849.7			**$17,422.8**			**$17,928.1**			**$18,528.8**			**$18,874.5**			**$19,583.6**			**$21,108.9**			**$22,223.8**		
TOTAL SPEND	**$28,754.1**			**$27,107.7**			**$25,964.3**			**$27,406.6**			**$37,006.7**			**$44,689.6**			**$45,644.3**			**$46,777.4**		

Source: Quest Offshore Resources, Inc. 2011

Note: For a Complete Listing of the Provinces Associated with Each Region Please See Appendix 8

Table 19: Estimated and Projected United States Current Path Case Spending Table $Millions

Capital Expenditures *(US$ millions)*

Deepwater

	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation
G&G	$21.4	$121.5		$20.8	$117.9		$7.8	$44.3		$7.0	$39.7		$12.4	$70.7		$11.5	$65.6		$18.3	$103.8		$15.4	$87.5	
Drilling	$394.3	$2,234.2		$518.1	$2,936.1		$272.4	$1,543.7		$405.4	$2,303.3		$715.3	$4,064.4		$851.3	$4,836.9		$791.7	$4,498.2		$863.2	$4,904.7	
Facilities	$7.1	$0.0	$40.0	$5.3	$0.0	$30.0	$274.5	$1,515.8	$40.0	$427.2	$1,646.2	$0.0	$209.6	$807.5	$17.0	$1,162.6	$4,480.0	$51.0	$739.5	$2,849.4	$51.0	$1,304.3	$5,026.0	$68.0
SURF	$455.1	$948.9	$1,629.9	$431.4	$549.4	$1,895.2	$192.0	$314.1	$773.7	$420.1	$687.4	$224.0	$973.5	$1,593.0	$310.6	$1,119.6	$1,832.0	$1,236.4	$835.2	$1,366.7	$925.5	$1,198.7	$1,961.5	$996.5
	$5,852.4			$6,504.2			$4,978.4			$6,160.2			$8,774.0			$15,646.9			$12,179.2			$16,425.9		

Shallow Water

	2008			2009			2010			2011			2012			2013			2014			2015		
G&G	$21.4	$121.5		$20.8	$117.9		$7.8	$44.3		$7.0	$39.7		$12.4	$70.7		$11.5	$65.6		$18.3	$103.8		$15.4	$87.5	
Drilling	$600.4	$3,402.2		$359.2	$2,035.3		$242.1	$2,272.5		$331.8	$1,885.5		$512.9	$2,914.4		$583.1	$3,313.0		$679.0	$3,857.7		$618.4	$3,513.8	
Facilities	$165.0	$635.9	$299.2	$61.9	$238.5	$112.2	$52.7	$203.1	$95.6	$41.3	$159.0	$74.8	$87.1	$335.6	$157.9	$185.6	$715.3	$336.6	$204.0	$786.0	$369.9	$208.6	$803.7	$378.2
SURF	$120.9	$255.9	$429.4	$35.2	$20.2	$179.5	$20.9	$37.1	$81.5	$43.9	$77.7	$57.0	$106.5	$188.6	$138.5	$227.4	$402.9	$296.5	$254.6	$451.0	$332.0	$249.5	$442.0	$325.4
	$6,052.0			$3,180.7			$3,057.8			$2,717.6			$4,524.6			$6,137.5			$7,056.2			$6,642.5		
	$11,904.4			$9,684.9			$8,036.2			$8,877.8			$13,298.6			$21,784.4			$19,235.3			$23,068.5		

Operating Expenditures *(US$ millions)*

Deepwater

	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation	Eng & Labor	Procurement	Installation
Facilities	$536.7	$3,041.3		$581.4	$3,294.7		$626.1	$3,548.2		$654.2	$3,717.2		$654.2	$3,717.2		$669.2	$3,802.2		$713.9	$4,056.2		$758.6	$4,310.2	
SURF	$325.2	$1,842.6		$351.1	$1,989.7		$373.2	$2,114.9		$410.2	$2,330.9		$432.6	$2,457.9		$469.4	$2,666.9		$569.0	$3,232.9		$607.5	$3,451.9	
	$5,745.8			$6,216.9			$6,662.4			$7,112.5			$7,261.9			$7,607.6			$8,571.9			$9,128.2		

Shallow Water

	2008			2009			2010			2011			2012			2013			2014			2015		
Facilities	$1,385.2	$8,042.1		$1,397.9	$8,113.9		$1,405.1	$8,154.9		$1,442.0	$8,192.9		$1,456.0	$8,272.9		$1,486.0	$8,442.9		$1,518.9	$8,629.9		$1,552.5	$8,820.9	
SURF	$251.5	$1,425.1		$254.1	$1,439.9		$255.8	$1,449.8		$266.6	$1,514.8		$281.9	$1,601.8		$301.5	$1,712.8		$323.1	$1,835.8		$344.0	$1,954.8	
	$11,103.9			$11,205.8			$11,265.7			$11,416.3			$11,612.7			$11,943.1			$12,307.7			$12,672.2		
	$16,849.7			$17,422.8			$17,928.1			$18,528.8			$18,874.5			$19,550.7			$20,879.6			$21,800.4		
TOTAL SPEND	$28,754.1			$27,107.7			$25,964.3			$27,406.6			$32,173.2			$41,335.2			$40,114.9			$44,868.9		

Source: Quest Offshore Resources, Inc. 2011

Note: For a Complete Listing of the Provinces Associated with Each Region Please See Appendix 8

Table 20: Estimated and Projected Africa Mediterranean Spending Table $Millions

Capital Expenditures *(US$ millions)*

Deepwater

	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
G&G	$31.4	$178.7		$33.7	$191.5		$18.6	$105.8		$18.6	$105.8		$23.1	$131.5		$31.8	$180.7		$40.9	$232.4		$39.3	$223.1	
Drilling	$1,482.9	$8,425.5		$1,531.2	$8,700.3		$1,773.0	$10,074.0		$2,127.6	$12,088.8		$2,643.4	$15,019.4		$3,288.2	$18,682.7		$3,352.6	$19,049.0		$3,401.0	$19,323.8	
Facilities	$904.4	$3,485.0	$87.5	$554.1	$2,135.0	$17.5	$270.5	$1,042.2	$52.5	$103.0	$396.9	$52.5	$761.8	$2,935.4	$0.0	$1,310.2	$5,048.5	$70.0	$1,228.5	$4,733.8	$140.0	$927.7	$3,574.8	$122.5
SURF	$1,995.4	$3,265.1	$912.9	$563.9	$922.7	$653.6	$791.0	$1,294.3	$1,254.7	$851.6	$1,393.5	$334.0	$1,992.0	$3,259.6	$657.2	$2,290.4	$3,747.9	$1,471.0	$2,076.1	$3,397.1	$2,145.4	$2,097.3	$3,431.9	$1,955.5
	$20,769			$15,303			$16,677			$17,472			$27,423			$36,121			$36,396			$35,097		

Shallow Water

	2008			2009			2010			2011			2012			2013			$2,014			$2,015		
G&G	$31.4	$178.7		$33.7	$191.5		$18.6	$105.8		$18.6	$105.8		$23.1	$131.5		$31.8	$180.7		$40.9	$232.4		$39.3	$223.1	
Drilling	$1,760.7	$10,003.9		$1,887.1	$10,722.3		$1,043.1	$5,926.6		$1,043.1	$5,926.6		$1,295.9	$7,363.1		$1,781.2	$10,120.3		$2,289.8	$13,010.0		$2,198.2	$12,489.6	
Facilities	$497.0	$1,915.0	$901.2	$532.7	$2,052.5	$965.9	$294.4	$1,134.5	$533.9	$294.4	$1,134.5	$533.9	$365.8	$1,409.5	$663.3	$502.8	$1,937.3	$911.7	$646.3	$2,490.5	$1,172.0	$620.5	$2,390.9	$1,125.1
SURF	$435.1	$770.8	$1,293.2	$466.3	$826.1	$1,386.1	$257.8	$456.6	$766.1	$257.8	$456.6	$766.1	$320.2	$567.3	$951.8	$440.2	$779.7	$1,308.3	$565.8	$1,002.4	$1,681.8	$543.2	$962.3	$1,614.5
	$17,786.9			$19,064.2			$10,537.5			$10,537.5			$13,091.6			$17,994.0			$23,131.9			$22,206.6		
	$38,555.8			$34,367.6			$27,214.1			$28,010.0			$40,515.1			$54,115.4			$59,527.7			$57,303.5		

Operating Expenditures *(US$ millions)*

Deepwater

	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
Facilities	$490.9	$2,789.0		$505.6	$2,873.0		$550.3	$3,126.5		$594.9	$3,380.0		$594.9	$3,380.0		$654.4	$3,718.0		$773.3	$4,394.0		$877.4	$4,985.5	
SURF	$458.7	$2,606.0		$495.5	$2,815.4		$528.6	$3,003.2		$542.6	$3,083.0		$560.8	$3,186.3		$611.1	$3,472.0		$687.3	$3,905.0		$752.7	$4,276.5	
	$6,344.5			$6,689.6			$7,208.5			$7,600.5			$7,722.0			$8,455.4			$9,759.6			$10,892.1		

Shallow Water

	2008			2009			2010			2011			2012			2013			2014			2015		
Facilities	$1,044.1	$5,932.5		$1,075.7	$6,112.2		$1,093.2	$6,211.4		$1,110.7	$6,310.7		$1,132.4	$6,434.0		$1,162.2	$6,603.5		$1,200.6	$6,821.5		$1,237.4	$7,030.7	
SURF	$174.0	$988.5		$178.1	$1,012.1		$180.4	$1,025.1		$182.7	$1,038.2		$185.6	$1,054.4		$189.5	$1,076.7		$194.6	$1,105.4		$199.4	$1,132.9	
	$8,139.1			$8,378.2			$8,510.1			$8,642.3			$8,806.4			$9,031.9			$9,322.0			$9,600.4		
	$14,483.6			$15,067.7			$15,718.7			$16,242.8			$16,528.3			$17,487.4			$19,081.7			$20,492.5		
TOTAL SPEND	$53,039.4			$49,435.3			$42,932.7			$44,252.8			$57,043.4			$71,602.8			$78,609.4			$77,796.0		

Source: Quest Offshore Resources, Inc. 2011

Note: For a Complete Listing of the Provinces Associated with Each Region Please See Appendix 8

Table 21: Estimated and Projected Asia Pacific Spending Table $Millions

Capital Expenditures *(US$ millions)*

	2008			2009			2010			2011			2012			2013			2014			2015		
Deepwater	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
G&G	$33.6	$190.9		$30.8	$174.8		$22.5	$127.6		$22.5	$127.6		$28.8	$163.8		$41.0	$232.9		$49.2	$279.3		$47.8	$271.5	
Drilling	$1,846.5	$10,491.7		$1,959.9	$11,135.9		$2,105.7	$11,964.2		$1,992.3	$11,320.0		$2,008.5	$11,412.0		$2,105.7	$11,964.2		$2,397.3	$13,620.8		$2,445.8	$13,896.9	
Facilities	$44.1	$170.0	$52.5	$115.5	$445.0	$35.0	$1,173.0	$4,520.1	$70.0	$1,000.7	$3,856.1	$52.5	$1,155.9	$4,454.2	$87.5	$2,415.4	$9,307.2	$87.5	$1,803.4	$6,949.1	$157.5	$1,602.6	$6,175.4	$175.0
SURF	$297.1	$486.1	$1,639.9	$559.0	$914.7	$442.3	$1,064.8	$1,742.3	$731.7	$1,469.4	$2,404.4	$1,786.6	$2,012.6	$3,293.3	$1,745.5	$2,085.2	$3,412.0	$2,560.2	$2,560.6	$4,190.0	$3,015.4	$2,224.4	$3,639.9	$4,081.6
	$15,252.4			**$15,812.9**			**$23,521.9**			**$24,032.1**			**$26,362.2**			**$34,211.2**			**$35,022.4**			**$34,561.0**		
Shallow Water	2008			2009			2010			2011			2012			2013			2014			2015		
G&G	$33.6	$190.9	$0.0	$30.8	$174.8	$0.0	$22.5	$127.6		$22.5	$127.6		$28.8	$163.8		$41.0	$232.9		$49.2	$279.3		$47.8	$271.5	
Drilling	$1,881.3	$10,689.3	$0.0	$1,722.8	$9,788.7	$0.0	$1,257.8	$7,146.8		$1,257.8	$7,146.8		$1,614.7	$9,174.5		$2,294.7	$13,038.2		$2,752.1	$15,637.0		$2,676.0	$15,204.3	
Facilities	$531.0	$2,046.2	$962.9	$486.3	$1,873.8	$881.8	$355.0	$1,368.1	$643.8	$355.0	$1,368.1	$643.8	$455.8	$1,756.2	$826.5	$647.7	$2,495.9	$1,174.5	$776.8	$2,993.4	$1,408.6	$755.3	$2,910.5	$1,369.7
SURF	$464.9	$823.6	$1,381.8	$425.7	$754.2	$1,265.4	$310.8	$550.6	$923.9	$310.8	$550.6	$923.9	$399.0	$706.9	$1,186.0	$567.1	$1,004.5	$1,685.5	$680.1	$1,204.8	$2,021.4	$661.3	$1,171.4	$1,965.5
	$19,005.6			**$17,404.4**			**$12,707.1**			**$12,707.1**			**$16,312.2**			**$23,181.9**			**$27,802.6**			**$27,033.3**		
	$34,258.0			**$33,217.3**			**$36,229.0**			**$36,739.1**			**$42,674.4**			**$57,393.1**			**$62,825.0**			**$61,594.3**		

Operating Expenditures *(US$ millions)*

	2008			2009			2010			2011			2012			2013			2014			2015		
Deepwater	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
Facilities	$951.8	$5,408.0		$981.6	$5,577.0		$1,041.0	$5,915.0		$1,085.7	$6,168.5		$1,160.0	$6,591.0		$1,234.4	$7,013.5		$1,368.2	$7,774.0		$1,516.9	$8,619.0	
SURF	$424.9	$2,414.0		$436.8	$2,481.6		$462.8	$2,629.8		$514.6	$2,923.9		$566.3	$3,217.5		$650.8	$3,697.5		$755.0	$4,290.0		$878.6	$4,992.0	
	$9,198.7			**$9,476.9**			**$10,048.7**			**$10,692.7**			**$11,534.8**			**$12,596.1**			**$14,187.3**			**$16,006.5**		
Shallow Water	2008			2009			2010			2011			2012			2013			2014			2015		
Facilities	$1,638.9	$9,312.0		$1,667.8	$9,476.0		$1,688.8	$9,595.4		$1,709.9	$9,715.4		$1,736.9	$9,869.0		$1,775.4	$10,087.5		$1,821.5	$10,349.4		$1,866.3	$10,604.0	
SURF	$300.2	$1,705.5		$304.0	$1,727.0		$306.7	$1,742.8		$309.5	$1,758.5		$313.1	$1,778.8		$318.1	$1,807.5		$324.2	$1,841.9		$330.1	$1,875.4	
	$12,956.6			**$13,174.7**			**$13,333.7**			**$13,493.3**			**$13,697.8**			**$13,988.5**			**$14,337.0**			**$14,675.8**		
	$22,155.3			**$22,651.7**			**$23,382.4**			**$24,186.0**			**$25,232.6**			**$26,584.7**			**$28,524.2**			**$30,682.3**		
TOTAL SPEND	**$56,413.3**			**$55,869.0**			**$59,611.4**			**$60,925.1**			**$67,907.0**			**$83,977.7**			**$91,349.3**			**$92,276.6**		

Source: Quest Offshore Resources, Inc. 2011

Note: For a Complete Listing of the Provinces Associated with Each Region Please See Appendix 8

Table 22: Estimated and Projected North Sea Arctic Spending Table $Millions

Capital Expenditures *(US$ millions)*

	2008			2009			2010			2011			2012			2013			2014			2015		
Deepwater	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
G&G	$16.4	$93.1		$15.5	$88.3		$14.0	$79.4		$14.0	$79.4		$16.2	$91.8		$19.7	$112.1		$21.9	$124.2		$22.6	$128.4	
Drilling	$1,651.0	$9,380.7		$1,662.7	$9,447.2		$1,861.8	$10,578.2		$1,850.1	$10,511.7		$1,990.6	$11,310.0		$2,002.3	$11,376.6		$2,119.4	$12,041.8		$2,142.8	$12,174.9	
Facilities	$140.4	$541.2	$35.0	$0.0	$0.0	$17.5	$165.6	$638.2	$52.5	$554.3	$2,135.7	$17.5	$145.2	$559.6	$35.0	$198.7	$765.8	$122.5	$406.4	$1,566.2	$52.5	$427.5	$1,647.4	$87.5
SURF	$1,171.9	$1,917.7	$421.0	$1,159.1	$1,896.7	$814.7	$902.2	$1,476.3	$1,052.0	$1,301.0	$2,128.8	$892.8	$1,811.4	$2,964.1	$1,218.7	$1,369.4	$2,240.8	$2,445.0	$1,694.2	$2,772.3	$1,474.9	$1,565.9	$2,562.4	$1,902.6
	$15,368.4			$15,101.8			$16,820.2			$19,485.1			$20,142.5			$20,653.0			$22,273.7			$22,662.0		
Shallow Water	2008			2009			2010			2011			2012			2013			2014			2015		
G&G	$16.4	$93.1		$15.5	$88.3		$14.0	$79.4		$14.0	$79.4		$16.2	$91.8		$19.7	$112.1		$21.9	$124.2		$22.6	$128.4	
Drilling	$917.9	$5,215.3		$870.0	$4,943.4		$782.1	$4,443.9		$782.1	$4,443.9		$904.3	$5,138.2		$1,104.5	$6,275.8		$1,224.1	$6,955.2		$1,265.7	$7,191.6	
Facilities	$259.1	$998.3	$469.8	$245.6	$946.3	$445.3	$220.8	$850.7	$400.3	$220.8	$850.7	$400.3	$255.3	$983.6	$462.9	$311.8	$1,201.4	$565.3	$345.5	$1,331.4	$626.5	$357.3	$1,376.7	$647.8
SURF	$226.8	$401.8	$674.2	$215.0	$380.9	$639.0	$193.3	$342.4	$574.5	$193.3	$342.4	$574.5	$223.5	$395.9	$664.2	$273.0	$483.5	$811.3	$302.5	$535.9	$899.1	$312.8	$554.1	$929.7
	$9,272.8			$8,789.3			$7,901.3			$7,901.3			$9,135.8			$11,158.3			$12,366.3			$12,786.8		
	$24,641.1			$23,891.1			$24,721.5			$27,386.4			$29,278.3			$31,811.4			$34,640.1			$35,448.7		

Operating Expenditures *(US$ millions)*

	2008			2009			2010			2011			2012			2013			2014			2015		
Deepwater	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
Facilities	$416.4	$2,366.0		$416.4	$2,366.0		$416.4	$2,366.0		$416.4	$2,366.0		$431.3	$2,450.5		$431.3	$2,450.5		$431.3	$2,450.5		$446.2	$2,535.0	
SURF	$409.7	$2,327.7		$415.7	$2,362.2		$417.5	$2,372.0		$417.6	$2,373.0		$417.8	$2,374.0		$418.3	$2,376.5		$419.6	$2,384.2		$421.6	$2,395.3	
	$5,519.8			$5,560.4			$5,571.9			$5,573.1			$5,673.6			$5,676.6			$5,685.6			$5,798.0		
Shallow Water	2008			2009			2010			2011			2012			2013			2014			2015		
Facilities	$1,438.3	$8,172.4		$1,446.4	$8,217.9		$1,450.8	$8,243.4		$1,455.3	$8,268.9		$1,461.3	$8,302.7		$1,468.6	$8,344.5		$1,478.1	$8,398.2		$1,488.0	$8,454.7	
SURF	$330.3	$1,876.8		$331.4	$1,882.8		$332.0	$1,886.2		$332.6	$1,889.5		$333.3	$1,893.9		$334.3	$1,899.4		$335.5	$1,906.5		$336.8	$1,913.9	
	$11,817.9			$11,878.4			$11,912.4			$11,946.3			$11,991.2			$12,046.8			$12,118.3			$12,193.5		
	$17,337.7			$17,438.8			$17,484.3			$17,519.3			$17,664.8			$17,723.4			$17,803.9			$17,991.5		
TOTAL SPEND	$41,978.8			$41,329.9			$42,205.8			$44,905.8			$46,943.1			$49,534.7			$52,444.0			$53,440.2		

Source: Quest Offshore Resources, Inc. 2011

Note: For a Complete Listing of the Provinces Associated with Each Region Please See Appendix 8

Table 23: Estimated and Projected South America Spending Table $Millions

	2008			2009			2010			2011			2012			2013			2014			2015		
Capital Expenditures *(US$ millions)*																								
Deepwater																								
	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
G&G	$14.3	$81.0		$13.5	$76.7		$17.3	$98.2		$17.3	$98.2		$17.8	$100.9		$26.9	$153.1		$34.4	$195.2		$35.0	$199.1	
Drilling	$2,997.2	$17,029.3		$2,889.6	$16,418.0		$2,920.3	$16,592.6		$4,073.1	$23,142.4		$4,441.9	$25,238.3		$5,348.8	$30,390.7		$5,379.5	$30,565.4		$5,441.0	$30,914.7	
Facilities	$1,238.2	$4,771.0	$122.5	$960.9	$3,702.5	$87.5	$2,346.1	$9,040.2	$52.5	$1,454.5	$5,604.5	$52.5	$2,066.5	$7,962.7	$122.5	$1,219.8	$4,700.2	$262.5	$826.6	$3,185.3	$332.5	$918.0	$3,537.4	$245.0
SURF	$1,166.9	$1,909.5	$872.6	$1,208.3	$1,977.2	$760.6	$1,111.0	$1,818.0	$996.3	$1,257.7	$2,058.1	$456.6	$1,250.5	$2,046.3	$2,019.8	$2,210.7	$3,617.4	$939.1	$2,673.1	$4,374.1	$2,437.3	$2,123.1	$3,474.0	$3,950.5
	$30,202.4			**$28,094.7**			**$34,992.5**			**$38,214.9**			**$45,267.2**			**$48,869.2**			**$50,003.4**			**$50,837.8**		
Shallow Water																								
	2008			2009			2010			2011			2012			2013			2014			2015		
G&G	$14.3	$81.0		$13.5	$76.7		$17.3	$98.2		$17.3	$98.2		$17.8	$100.9		$26.9	$153.1		$34.4	$195.2		$35.0	$199.1	
Drilling	$133.0	$755.7		$125.9	$715.6		$161.3	$916.7		$161.3	$916.7		$165.8	$941.9		$251.4	$1,428.6		$320.7	$1,821.9		$327.1	$1,858.4	
Facilities	$37.5	$144.7	$68.1	$35.5	$137.0	$64.5	$45.5	$175.5	$82.6	$45.5	$175.5	$82.6	$46.8	$180.3	$84.8	$71.0	$273.5	$128.7	$90.5	$348.8	$164.1	$92.3	$355.7	$167.4
SURF	$32.9	$58.2	$97.7	$31.1	$55.1	$92.5	$39.9	$70.6	$118.5	$39.9	$70.6	$118.5	$41.0	$72.6	$121.8	$62.1	$110.1	$184.7	$79.2	$140.4	$235.5	$80.8	$143.2	$240.2
	$1,422.9			**$1,347.5**			**$1,726.1**			**$1,726.1**			**$1,773.6**			**$2,690.0**			**$3,430.7**			**$3,499.3**		
	$31,625.3			**$29,442.2**			**$36,718.6**			**$39,940.9**			**$47,040.8**			**$51,559.1**			**$53,434.2**			**$54,337.1**		
Operating Expenditures *(US$ millions)*																								
Deepwater																								
	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
Facilities	$565.1	$3,211.0		$639.5	$3,633.5		$684.1	$3,887.0		$728.7	$4,140.5		$832.8	$4,732.0		$1,055.9	$5,999.5		$1,338.5	$7,605.0		$1,546.7	$8,788.0	
SURF	$223.1	$1,267.5		$245.3	$1,393.7		$272.3	$1,547.0		$286.4	$1,627.4		$339.0	$1,926.1		$354.7	$2,015.4		$420.6	$2,390.0		$527.7	$2,998.4	
	$5,266.7			**$5,912.0**			**$6,390.4**			**$6,783.1**			**$7,829.9**			**$9,425.5**			**$11,754.1**			**$13,860.8**		
Shallow Water																								
	2008			2009			2010			2011			2012			2013			2014			2015		
Facilities	$1,124.0	$6,386.3		$1,127.5	$6,406.5		$1,132.1	$6,432.4		$1,136.7	$6,458.3		$1,141.3	$6,484.9		$1,148.4	$6,525.2		$1,157.5	$6,576.7		$1,166.7	$6,629.1	
SURF	$237.3	$1,348.0		$238.8	$1,356.7		$240.7	$1,367.8		$242.7	$1,378.9		$244.7	$1,390.3		$247.7	$1,407.6		$251.6	$1,429.7		$255.6	$1,452.2	
	$9,095.6			**$9,129.5**			**$9,173.0**			**$9,216.5**			**$9,261.2**			**$9,329.0**			**$9,415.5**			**$9,503.6**		
	$14,362.3			**$15,041.5**			**$15,563.4**			**$15,999.6**			**$17,091.2**			**$18,754.5**			**$21,169.6**			**$23,364.4**		
TOTAL SPEND	**$45,987.6**			**$44,483.7**			**$52,282.0**			**$55,940.5**			**$64,131.9**			**$70,313.6**			**$74,603.8**			**$77,701.5**		

Source: Quest Offshore Resources, Inc. 2011

Note: For a Complete Listing of the Provinces Associated with Each Region Please See Appendix 8

Table 24: Estimated and Projected North America Mexico and Canada Spending Table $Millions

	Capital Expenditures (US$ millions)																							
	Deepwater																							
	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
G&G	$7.2	$40.9		$8.5	$48.6		$4.8	$27.2		$4.8	$27.2		$6.3	$36.0		$7.8	$44.6		$10.1	$57.3		$10.6	$60.2	
Drilling	$108.2	$614.7		$162.3	$922.0		$216.4	$1,229.3		$270.5	$1,536.7		$270.5	$1,536.7		$324.5	$1,844.0		$324.5	$1,844.0		$324.5	$1,844.0	
Facilities	$0.0	$0.0		$0.0	$0.0	$17.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$168.7	$650.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$17.5
SURF	$246.8	$403.9	$8.7	$39.9	$65.4	$172.8	$29.4	$48.2	$37.5	$57.3	$93.8	$16.3	$13.8	$22.5	$6.9	$47.6	$77.9	$35.8	$192.5	$315.0	$96.1	$240.8	$394.0	$296.6
	$1,430.4			$1,436.9			$1,592.7			$2,006.4			$1,892.7			$3,200.9			$2,839.6			$3,188.3		
	Shallow Water																							
	2008			2009			2010			2011			2012			2013			2014			2015		
G&G	$7.2	$40.9		$8.5	$48.6		$4.8	$27.2		$4.8	$27.2		$6.3	$36.0		$7.8	$44.6		$10.1	$57.3		$10.6	$60.2	
Drilling	$403.5	$2,292.4		$478.6	$2,719.3		$267.7	$1,521.1		$267.7	$1,521.1		$354.9	$2,016.5		$439.4	$2,496.8		$564.7	$3,208.7		$593.0	$3,369.2	
Facilities	$113.9	$438.8	$206.5	$135.1	$520.6	$245.0	$75.6	$291.2	$137.0	$75.6	$291.2	$137.0	$100.2	$386.0	$181.7	$124.0	$478.0	$224.9	$159.4	$614.2	$289.1	$167.4	$645.0	$303.5
SURF	$99.7	$176.6	$296.3	$118.3	$209.5	$351.5	$66.2	$117.2	$196.6	$66.2	$117.2	$196.6	$87.7	$155.4	$260.7	$108.6	$192.4	$322.8	$139.6	$247.2	$414.8	$146.5	$259.6	$435.5
	$4,075.9			$4,835.0			$2,704.6			$2,704.6			$3,585.3			$4,439.3			$5,705.2			$5,990.4		
	$5,506.3			$6,271.9			$4,297.3			$4,711.0			$5,478.0			$7,640.2			$8,544.8			$9,178.7		
	Operating Expenditures (US$ millions)																							
	Deepwater																							
	2008			2009			2010			2011			2012			2013			2014			2015		
	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation	Eng. & Labor	Procurement	Installation
Facilities	$89.2	$507.0		$104.1	$591.5		$148.7	$845.0		$163.6	$929.5		$193.3	$1,098.5		$297.4	$1,690.0		$342.1	$1,943.5		$416.4	$2,366.0	
SURF	$45.1	$256.2		$65.0	$369.5		$99.4	$565.0		$133.3	$757.2		$170.2	$967.0		$249.1	$1,415.4		$289.6	$1,645.5		$354.2	$2,012.4	
	$897.5			$1,130.1			$1,658.2			$1,983.6			$2,429.0			$3,652.0			$4,220.7			$5,149.0		
	Shallow Water																							
	2008			2009			2010			2011			2012			2013			2014			2015		
Facilities	$744.7	$4,231.4		$759.3	$4,314.2		$772.4	$4,388.6		$785.5	$4,463.0		$800.6	$4,549.0		$819.1	$4,654.2		$839.6	$4,770.7		$860.9	$4,891.2	
SURF	$141.4	$803.4		$143.3	$814.3		$145.0	$824.0		$146.8	$833.9		$148.8	$845.2		$151.2	$859.0		$153.9	$874.3		$156.7	$890.2	
	$5,920.9			$6,031.1			$6,130.0			$6,229.2			$6,343.6			$6,483.5			$6,638.5			$6,798.9		
	$6,818.4			$7,161.3			$7,788.2			$8,212.7			$8,772.6			$10,135.5			$10,859.2			$11,947.9		
TOTAL SPEND	$12,324.7			$13,433.2			$12,085.5			$12,923.7			$14,250.7			$17,775.7			$19,404.0			$21,126.6		

Source: Quest Offshore Resources, Inc. 2011

Note: For a Complete Listing of the Provinces Associated with Each Region Please See Appendix 8

Appendix 2: Employment Projections by Case

Table 25: Estimated and Projected Pre-Moratorium Case Employment 2008-2015

Pre-Moratorium Case Employment	2008	2009	2010	2011	2012	2013	2014	2015
GoM Direct Employment	44,287	41,751	52,488	57,961	60,151	73,940	70,953	71,954
GoM Indirect and Induced Employment	141,463	133,363	167,657	185,139	192,134	236,179	226,637	229,838
Other States Direct Employment	19,480	18,364	23,087	25,494	26,457	32,522	31,208	31,649
Other States Indirect and Induced Employment	50,340	47,457	59,661	65,882	68,371	84,044	80,649	81,788
Total GoM Employment	185,750	175,114	220,145	243,100	252,284	310,118	297,590	301,792
Total Other States Employment	69,819	65,821	82,747	91,376	94,828	116,566	111,857	113,437
Total U.S. Employment	255,569	240,935	302,892	334,476	347,112	426,685	409,447	415,229

Employment above is total supported employment and includes direct, indirect and induced employment.

Source: Quest Offshore Resources. Inc. 2011

Table 26: Estimated and Projected Current Path Case Employment 2008-2015

Current Path Case Employment	2008	2009	2010	2011	2012	2013	2014	2015
GoM Direct Employment	44,287	41,751	39,990	42,212	49,553	63,665	61,785	69,107
GoM Indirect and Induced Employment	141,463	133,363	127,738	134,833	158,284	203,358	197,355	220,743
Other States Direct Employment	19,480	18,364	17,590	18,567	21,796	28,003	27,176	30,397
Other States Indirect and Induced Employment	50,340	47,457	45,455	47,980	56,325	72,365	70,229	78,551
Total GoM Employment	185,750	175,114	167,728	177,045	207,837	267,023	259,140	289,850
Total Other States Employment	69,819	65,821	63,045	66,547	78,121	100,368	97,405	108,948
Total U.S. Employment	255,569	240,935	230,773	243,592	285,958	367,391	356,545	398,798

Employment above is total supported employment and includes direct, indirect and induced employment.

Source: Quest Offshore Resources. Inc. 2011

Table 27: Estimated and Projected Best Post-Moratorium Case Employment 2008-2015

Best Post-Moratorium Case Employment	2008	2009	2010	2011	2012	2013	2014	2015
GoM Direct Employment	44,287	41,751	39,990	42,212	56,998	68,831	70,302	72,047
GoM Indirect and Induced Employment	141,463	133,363	127,738	134,833	182,063	219,861	224,558	230,133
Other States Direct Employment	19,480	18,364	17,590	18,567	25,070	30,275	30,922	31,690
Other States Indirect and Induced Employment	50,340	47,457	45,455	47,980	64,787	78,238	79,909	81,893
Total GoM Employment	185,750	175,114	167,728	177,045	239,061	288,692	294,860	302,179
Total Other States Employment	69,819	65,821	63,045	66,547	89,858	108,513	110,831	113,582
Total U.S. Employment	255,569	240,935	230,773	243,592	328,919	397,205	405,690	415,762

Employment above is total supported employment and includes direct, indirect and induced employment.

Source: Quest Offshore Resources. Inc. 2011

Appendix 3: Oil and Natural Gas Production Projections by Case

Table 28: Estimated and Projected Pre-Moratorium Case and Current Path Case Oil and Natural Gas Production Comparison 2006-2017

Pre-Moratorium Case	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Gas (BCF per day)	14	12	10	9	8	7	7	7	7	7	6	6
Oil (Million Barrels per day)	1.7	1.7	1.6	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.7
Current Path Case	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Gas (BCF per day)	14	12	10	9	8	7	7	6	6	5	5	5
Oil (Million Barrels per day)	1.7	1.7	1.6	2.0	2.1	1.9	1.9	2.0	2.0	2.1	2.1	2.1
Difference	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Gas (BCF per day)						0	0	1	1	1	1	1
Oil (Million Barrels per day)						0.3	0.4	0.5	0.5	0.5	0.6	0.6

Source: Quest Offshore Resources, Inc. 2011

Table 29: Estimated and Projected Best Post Moratorium Case and Current Path Case Oil and Natural Gas Production Comparison 2006-2017

Best Post-Moratorium Case	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Gas (BCF per day)	14	12	10	9	8	7	7	7	6	6	6	6
Oil (Million Barrels per day)	1.7	1.7	1.6	2.0	2.1	1.9	1.9	2.0	2.1	2.2	2.3	2.5
Current Path Case	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Gas (BCF per day)	14	12	10	9	8	7	7	6	6	5	5	5
Oil (Million Barrels per day)	1.7	1.7	1.6	2.0	2.1	1.9	1.9	2.0	2.0	2.1	2.1	2.1
Difference	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Gas (BCF per day)								0	1	1	1	1
Oil (Million Barrels per day)								0.0	0.1	0.1	0.2	0.3

Source: Quest Offshore Resources, Inc. 2011

Appendix 4: Major Project Delays

While hundreds of projects have been delayed by the drilling moratorium and permit slowdown, the effect of project delays on investment, production and employment are not equal for all projects. While any offshore oil and gas development activity requires significant capital expenditures, some projects, primarily major deepwater standalone projects, require billions of dollars of investment and provide tens of thousands of barrels of production per day. Some of the most notable projects delayed include projects such as British Petroleum's Kaskida development, Chevron's Buckskin, Anadarko's Heidelberg, Noble Energy's Gunflint and Deep Blue and Exxon's Hadrian development. Many of these large projects account for billions of dollars of investment, which can be delayed or lost if drilling cannot take place in a timely manner (Table 30).

Table 30: Selected Major Projects, Operators and Associated Projected Capital Expenditure $Billions

Major Project Delays and Associated Investment	**Operator**	**Associated Capital Expenditure ($Billions)**
Kaskida	bp	$3.3
Buckskin	Chevron	$3.1
Heidelberg	Anadarko	$3.1
Pony	Hess	$2.9
Gunflint	Noble Energy	$2.5
Hadrian	ExxonMobil	$2.1
Deep Blue	Noble Energy	$1.3
Moccasin	Chevron	$1.0

Source: Quest Offshore Resources, Inc. 2011

Appendix 5: Development Indicators

The development of these large offshore oil and natural gas projects requires significant investments throughout the supply chain. One large project often accounts for 15 plus trees, multiple manifolds and other subsea equipment, hundreds of miles of pipelines and a newly constructed host facility.

Subsea Trees, which are used to control the production of oil and gas from wells and distribute production to manifolds and pipelines, account for over $7 million dollars each on average. Subsea tree awards from 2010-2015 are expected to be down 16 percent on the *Current Path Case* from what was expected before the moratorium. If drilling permit rates return to historical averages in 2012, awards are only expected to decrease 4 percent in the *Best Post-Moratorium* case relative to the *Pre-Moratorium Case*. (Table 31).

Table 31: Estimated and Projected Subsea Tree Awards: Pre-Moratorium Case, Current Path Case, and Best Post Moratorium Case 2010-2015

Subsea Tree Awards (2010-2015)	2010	2011	2012	2013	2014	2015	Total
Current Path Case	62	33	30	79	46	117	367
Best Post-Moratorium Case	62	33	82	91	79	71	418
Pre-Moratorium Case	79	50	75	110	70	52	436

Source: Quest Offshore Resources, Inc. 2011

Floating production systems, which are floating deepwater production platforms used to produce oil and gas offshore, are expected to see a 17 percent decrease in awards on the *Current Path Case* compared with what was expected prior to the drilling moratorium. However, the resumption in the issuance of drilling permits to historical rates would allow major recent oil and gas discoveries to be appraised and thus allow major projects to begin development faster. This would cause a 13 percent increase in FPS awards from the *Current Path Case* to the *Best Post-Moratorium*, leading to only a modest 4 percent decrease from the *Pre-Moratorium Case* (Table 32).

Table 32: Estimated and Projected FPS Awards: Pre-Moratorium Case and Current Path Case, and Best Post-Moratorium Case 2010-2015

FPS Awards (2010-2015)	2010	2011	2012	2013	2014	2015	Total
Current Path Case	3	2	1	5	3	6	20
Best Post-Moratorium Case	3	2	3	5	4	6	23
Pre-Moratorium Case	4	4	1	6	4	5	24

Source: Quest Offshore Resources, Inc. 2011

Another product development indicator significantly affected by the drilling moratorium and permit slowdown is the installation and procurement of flowlines and pipelines. Flowlines, which are normally classified as smaller diameter pipelines used to produce oil and natural gas from wells to their hosts, and pipelines, which transport produced oil and natural gas to shore, are expected to see a significant decrease in installed miles per year under the *Current Path Case* compared to the *Pre-Moratorium Case* with installations down 12 percent from 3,114 miles to 2,741 miles. With an increase in permitting rates, however, pipeline installations are expected to increase 6 percent. In the Best Post-Moratorium case, this would only amount to 6 percent less than the pre-moratorium case, with 2,923 miles being installed from 2010-2015 instead of 3,114 (Table 33).

Table 33: Estimated and Projected Deepwater Pipeline Installation Miles: Pre-Moratorium Case, Current Path Case, and Best Post-Moratorium Case 2010-2015

Deepwater Pipeline Miles (2010-2015)	2010	2011	2012	2013	2014	2015	Total
Current Path Case	147	137	197	884	638	739	2741
Best Post-Moratorium Case	147	131	192	836	932	685	2923
Pre-Moratorium Case	164	175	774	831	488	683	3114

Source: Quest Offshore Resources, Inc. 2011

Compared to the rest of the world, the U.S. on the current path is expected to see numbers significantly lower than other regions on key development indicators such as the number of subsea tree awards, floating production system awards, and pipeline installations. On the current path the U.S. is expected to account for only 12 percent of worldwide subsea tree awards, 11 percent of worldwide FPS awards, and 10 percent of pipeline installations. With a return to historical permitting rates, the U.S. would be expected to account for to 14 percent of worldwide subsea tree awards, 12 percent of worldwide FPS awards and 12 percent of pipeline installations (Table 34).

Table 34: Estimated and Projected Key Development Indicators 2010-2015, U.S. Cases & Rest of World

Key Development Indicators (2010-2015)	Subsea Tree Awards	FPS Awards	Deepwater Pipeline Installation (Miles)
U.S. GoM, Alaska - Current Path Case	367	20	2741
U.S. GoM, Alaska - Best Post-Moratorium Case	418	23	2923
U.S. GoM, Alaska - Pre-Moratorium Case	436	24	3114
Africa, Mediterranean	753	28	4007
Asia, Pacific	471	45	8095
North Sea, Arctic	489	20	4937
South America	1,023	68	4158
North America - Canada & Mexico	49	1	108

Source: Quest Offshore Resources, Inc. 2011

Appendix 6: How Drilling Affects Project Development

To efficiently develop offshore oil and gas resources, drilling permits must be available in a timely manner throughout the three major stages of an offshore project; exploration, appraisal, and development. The first stage is exploratory drilling of leased but undrilled oil and gas targets.

While seismic technology has greatly improved in identifying potentially economic prospects, the only way to definitively confirm whether oil and gas is in place is by drilling. When operators determine possible drilling targets, it is necessary to prioritize these targets based upon many factors including the estimated cost of development and the estimated amount of recoverable reserves in place. When an operator "spuds," or begins drilling an exploration well, the operator normally has in place various targets at estimated drilling depths at which they expect to encounter oil and natural gas. Often, a sidetrack, or the drilling of another short well bore on the side of the main bore is needed to further understand the reservoir. Sidetracks need their own separate permit. This process is normally repeated at various depths depending on the operators drilling plan.

Many exploration wells find no oil or natural gas, or only find small non-commercial quantities. Failure in exploration drilling is common and expensive; drilling a deepwater exploration well in the Gulf of Mexico normally costs over $100 million. Operators must drill many wells to identify a portfolio of commercial production prospects necessary to maximize their investments in drilling rigs as well as meet strategic exploration and production goals. Due to the time required to analyze the results of exploration drilling, it is important for operators to have an inventory of oil and natural gas discoveries. Many factors affect how operators prioritize discoveries for development. Some discoveries can only be developed in tandem with other nearby resources, which may or may not be owned by the same groups of operators. Additionally, the existence of available infrastructure including facilities and pipelines can affect the economics and timing of projects. An inability to drill enough exploration wells within a certain region, whether due to a drilling moratorium, a permit slowdown or other reason, causes the exploration and production of hydrocarbons to be less attractive to operators relative to other regions.

After analysis of the exploration drilling is complete, operators normally undertake what is known as appraisal drilling.

Appraisal drilling is undertaken to confirm the results of the initial exploration drilling and delineate the resources in place as best as possible. Appraisal wells are drilled up to the point that the operator has enough understanding of the size and nature of the oil and gas reservoir to proceed with the development decision.

Once a development decision is made, the development plan is approved, and a sufficient number of drilling permits are approved, development drilling, or the drilling of oil and gas production wells, can begin. The length of time before expected project startup varies depending upon the number of wells planned as well as the availability of drilling rigs. These varying issues drive drilling schedules which could begin to take place immediately after sanction and continue past initial project production. In some cases, exploration and appraisal wells are reopened and completed into production wells, all which need the necessary permits. Development drilling is needed not only for new fields, but also to continue and enhance production on existing projects, as oil and natural gas production declines over time from existing wells.

Appendix 7: Life Cycle of A U.S. Offshore Field Development

The domestic offshore oil and natural gas industry provides vital energy for the U.S. economy. However, developing offshore oil and natural gas resources is significantly more challenging than their land-based counterparts. These challenges only increase with increasing water depth. The purpose of this section is to give the reader a better understanding of the necessary activities and practices the industry must engage in to provide offshore oil and natural gas production.

This section outlines all of the major steps that a typical project must go through from initial resource appraisal to production (Figure 24). The review also discusses the relevant pieces of equipment at the reservoir level, the sea floor, and at the water surface.

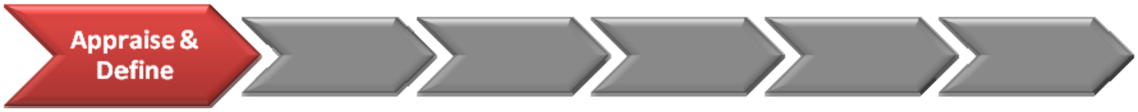
Figure 24: Typical Development Timeline for Offshore Oil and Natural Gas Developments

Source: Quest Offshore Resources, Inc.

Every potential offshore oilfield development project goes through a “life-cycle”. What follows is a walk-through of this cycle to provide an understanding of the functioning and process of the offshore oil and natural gas industry via a typical offshore oilfield development plan. This plan essentially involves deciding the equipment pieces and infrastructure that will be needed to produce the wells and transport resources back to shore, and where these pieces of equipment will be placed to optimize production.

The typical field development plan moves through predetermined stages – the terminology may vary from operator to operator, but the steps are generally the same. These six stages outline the main processes every offshore oil and natural gas development goes through in order to become a producing asset. A review of what actions are undertaken during each stage provides insight into the operational plans of offshore oil companies operating in the United States.

Stage 1: Assessment, Exploration, Appraisal and Definition



During the "Assessment, Exploration, Appraisal and Definition" stage, oil companies engage in the evaluation and appraisal of potential oil and natural gas targets. Seismic surveys must be conducted to locate promising areas. Exploration wells must be drilled to further determine the size and extent of the potential field.

G&G Assessment

The first stage in developing an offshore oil and natural gas field is finding out where these resources may be present. To do this, the industry relies on specialized seismic contractors who provide imaging and data of the geologic formations below the GoM's seafloor.

Figure 25: Seismic Vessel

Source: Quest Offshore Resources, Inc.

These seismic contractors own and operate a fleet of boats that use acoustic imaging techniques to assess the geological formations lying beneath the seafloor (Figure 25). Operations typically involve a vessel towing "streamers" which are sensors used to send and receive electromagnetic waves in a set pattern throughout a defined area which normally encompasses a group of standardized "blocks" which operators have leased. These boats, or vessels, are highly specialized pieces of equipment that play a pivotal role in the acquisition of this information.

The seismic images and data captured by these vessels provide critical information to properly trained personnel. According to the physical composition of these formations, geologists, geoscientists, and other experts will then determine the areas in which oil and natural gas may be present. If a potential oil or natural gas target looks promising, the oil company that owns the federal offshore lease will create an exploration plan which involves the scheduling of exploration wells.

Exploration Drilling

Direct physical evaluation of formations, or reservoirs, is accomplished by drilling exploration wells. In general terms, an exploration well is viewed as a "sample" production well. This exploration well will allow companies to determine [1]if oil or natural gas is present, [2]the quality of the product and the potential size of the formation (or "drilling target"). Offshore drilling contractors have been vital to the industry since the first underwater well was drilled beneath a lake in Louisiana in the 1910s. These contractors own and operate a sophisticated fleet of offshore drilling rigs whose equipment specifications are relevant to the intended water depth in which these drilling rigs will be used.

In general, the industry's fleet of offshore drilling rigs can subdivided between shallow water rigs (often referred to as "Jackups") and deepwater rigs (floating Mobile offshore drilling units, or MODUs).

Jack-up Drilling Rig

A jack-up rig is a combination of a drilling rig and floating barge, fitted with long support legs that can be raised or lowered independently of each other (Figure 26).

The jack-up is towed onto location with its

Figure 26: Jack-up Drilling Rig

Source: Quest Offshore Resources, Inc.

legs up and the barge section floating on the water. Upon arrival at the drilling location, the legs are jacked down onto the seafloor, preloaded to securely drive them into the sea bottom, and then all three legs are jacked further down. Since the legs have been preloaded and will not penetrate the seafloor further, this jacking down of the legs has the effect of raising the jacking mechanism, which is attached to the barge and drilling package. In this manner, the entire barge and drilling structure are slowly raised above the water to a predetermined height above the water. Wave, tidal and current loading acts only on the relatively small legs and not the bulky barge and drilling package.

Drillship

A drillship is a maritime vessel modified to include a drilling rig and special station-keeping equipment. The vessel is typically capable of operating in deep water. A drillship must stay relatively stationary on location in the water for extended periods of time. This positioning may be accomplished with multiple anchors, dynamic propulsion (thrusters) or a combination of these. Drillships typically carry larger payloads than semisubmersible drilling vessels (discussed below), but their motion characteristics are usually inferior.

Semisubmersible Drilling Rig

A semisubmersible drilling rig is a particular type of floating vessel that is supported primarily on large pontoon-like structures submerged below the sea surface. The operating decks are elevated perhaps 100 or more feet above the pontoons on large steel columns. This design has the advantage of submerging most of the area of components in contact with the sea and minimizing loading from waves and wind. Semisubmersibles can operate in a wide range of water depths, including ultra deep water. They are usually anchored with six to twelve anchors tethered by strong chains and wire cables, which are computer controlled to maintain station keeping (mooring systems). Semisubmersibles (called semi-subs or simply semis) can be used for drilling, work over operations, and production platforms, depending on the equipment with which they are equipped.

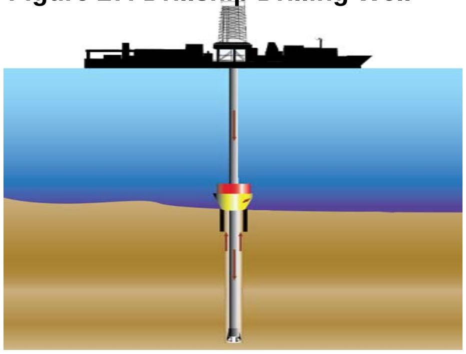
Drilling the Well

Once the appropriate drilling target has been located, and a suitable drilling rig has been contracted, the operator will then engage in a drilling campaign to explore the potential formation found in the G&G process. This process is performed under some of the most technically advanced and challenging conditions in the world. Whether drilling a well in shallow waters or the ever complex deepwater, drilling contractors are aiming at a target that is often many miles from the drilling rig; averaging between 15 thousand and 30 thousand feet below the subsurface (beneath the ocean floor).

A drill bit surrounded by an outer pipe is sent thousands of feet below the waterline to penetrate the Earth's surface at the sea floor (Figure 27). The drilling contractor continues to feed more and more pipe through the rig, while the drill bit churns deeper and deeper, until the targeted depth is reached.

Approximately 125 crew are on the rig at any given time. The crew consists of a mixture of personnel from the drilling contractor such as rough necks (manual laborers), drillers, and support staff and people from the operating oil company and

Figure 27: Drillship Drilling Well



Source: Quest Offshore Resources, Inc.

other various contractors. Most employees work on a rotational schedule with two weeks offshore followed by two weeks off.

Products consumed in this period include drill pipe, drilling mud, and other supplies such as food and fuel which are transported by specialized supply ships from shore bases located along the Gulf Coast.

Once the target depth is reached, the drilling contractor will allow the well to flow briefly in order to collect some oil for further assessment (a drill stem test). Once an adequate quantity is produced, the drilling contractor will then temporarily plug the well until the operator is able to make a decision on the commerciality of the well.

Field Definition

The "define" stage is very important, as it sets the foundation for if and how a field is developed. The operating company uses data and information collected during exploration and appraisal drilling to define the layout and physical composition of the oil and natural gas resources in place.

Flow tests during exploration drilling are very important because they determine how easily oil and natural gas flows throughout the reservoir. Operators consider the estimated recoverable amount of resource in place and apply financial models to determine the commercial viability of the field. If the field is deemed economic, further development plans are made in the “concept selection" phase of field development.

Stage 2: Concept Selection

During the “concept selection” stage, the operating oil company and its partners work together to develop an optimal plan for developing an offshore field or well. During this stage, the companies will consider different concepts for how to best develop the field in a manner that adheres to any and all regulations and is efficiently profitable to all parties.

Often included in this stage are discussions around whether or not the field is large enough to require its own in-field host / processing facility (a stand alone, fixed platform, or floating platform). This stage is also where the companies will decide how many wells to drill offshore, optimize well placement, the pipeline needs and designs, as well as determining the quantity and location of other equipment to be placed on the seafloor.

What follows is a concise overview of the various equipment and oil field infrastructure components that are used in the development of these resources. This stage of development is primarily undertaken by engineers and their support staff working in both the major oil and natural gas centers such as Houston, Texas or in the headquarters location of the company. Contract engineers also contribute to this process as do contractors throughout the country who provide information to the oil companies on the products they can supply and how these could fit into the development.

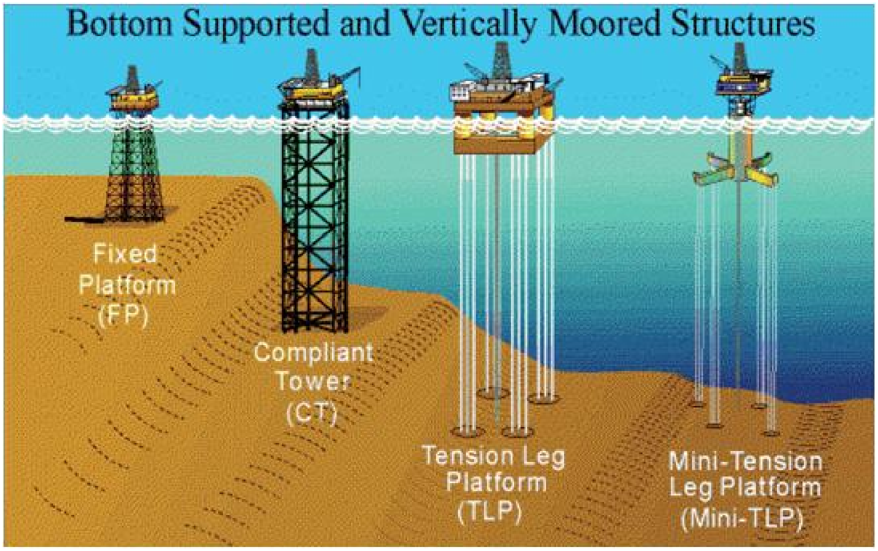
Shallow Water Fields

In general, there are few options available to fields that will require a host facility. For shallow water fields, the primary choice is the employment of a fixed platform – or a steel jacketed structure that is physically attached to the seafloor. While these fields require less technical difficulty than their deepwater counterparts, they account for a very large portion of the GoM's production. Most of the Gulf's fixed platforms consist of the fixed platform, surface wells and export pipeline. The surface wells are all controlled from the platform topsides and allow for easier access to the reservoir to ensure the field maintains its desired production rates. Once production reaches the platform, the processed liquid is then transported via underwater pipeline (export pipeline) back to shore to be refined into the multitude of components for which the final product is used.

Most of the platforms utilized in the Gulf of Mexico are fabricated in shipyards along the gulf coast. Being near to the water allows for ease of transportation as these are often either towed out or placed on barges. In the shipyards workers such as welders and machinists assemble steel into the sections of the hull according to the engineered design using heavy equipment such as cranes.

A platform's weight can vary widely from a few thousand tons to tens of thousands of tons depending on the size of the field and amount of production expected. The "topsides" are where the actual processing of the produced fluids (which normally includes water, oil and natural gas in addition to other impurities) takes place, as well as the drilling in the case of most fixed platforms. These are assembled in shipyards from steel, piping, and other components such as separation units, power supply units, and drilling equipment which are sourced from throughout the country.

Figure 28: Types of Production Platforms / Floating Production Units Used in the Gulf of Mexico



Source: Quest Offshore Resources, Inc.

Deepwater Fields: Facilities

In deepwater environments, the application of a fixed platform is unfeasible. The practical limit is 1,000 feet. Therefore in deep water, operators must use floating hosts or "floating production systems" (FPS's). The FPS solutions that are currently available are the Tension-Leg Platform (TLP), the spar, the Semi-Submersible platform, and in specific instances a Floating Production Storage and Offloading (FPSO) vessel (Figure 28).

Tension-Leg Platforms are very buoyant platforms either with three or four columns which are moored to the sea bottom via multiple steel tendons. These tendons are shorter than the distance the platform would settle at if it was not moored to the sea floor; this leads the platform to be very stable and prevents vertical and horizontal movement thus allowing drilling operations to be conducted from the platform.

Spar platforms are long cylindrical hulled platforms with the length and weight of the hull providing enough stability necessary to conduct drilling operations. Due to the length of the hull, the hull must be towed out to the field horizontally and righted at the field. Therefore, topsides must be lifted and integrated onto the platform offshore.

Semi-submersible platforms, which are often utilized for the largest projects in the offshore Gulf of Mexico, normally consist of four columns on pontoons with a large deck built on top. The arrangement leads to a large topside area. The lower part of the hull sits below the water level while the upper part sits above the waterline, this can be actively adjusted via the movement of water into and out of the tanks which are inside the pontoons at the bottom of the hull.

Floating production storage and offloading units (FPSO) are a technology that is rare in the Gulf, with only one existing unit which is due to start up this year. These are of a simpler design, which basically constitutes a strengthened oil tanker with production topsides. This allows for the export of oil without a pipeline and thus makes it more common in less developed regions where less infrastructure is in place.

Most hulls for floating production units are fabricated in foreign shipyards due to the lack of suitable facilities in the United States. Fabrication of Topsides for floating platforms is done almost exclusively in Shipyards in the United States. The topsides are more complex and highly engineered than the platform hulls though, leading to more spending from floating production platforms in the country versus overseas.

Deepwater Fields: SURF Equipment

Equipment below the water line and at the seafloor is generally referred to as the "SURF" market, where SURF stands for **S**ubsea, **U**mbilicals, **R**isers and **F**lowlines. These technologically advanced components tie together to power and transport the production back to the surface facility for processing and delivery. A thorough review of each of these components is provided below.

Subsea

While subsea equipment is used as a "catch all" for a large portion of the equipment on the sea floor, the most critical component of subsea production equipment is the subsea "Christmas tree," or tree. The tree and control pod are highly technical pieces of equipment that sit on top of the well and allows for the control of each well's production and performance (Figure 29).

Figure 29: Subsea Christmas Tree

Source: Quest Offshore Resources, Inc.

These pieces of equipment are of a fairly standard composition from a general standpoint, but differ greatly from oilfield to oilfield. However, all trees serve as the primary access point to the reservoir(s) being produced on a field. Operating oil companies often access a well via the subsea tree to performing operating maintenance operations to ensure a safe and productive flow of liquids from the well.

Other components included in the broader “subsea” equipment category include the various pieces of connection machinery.

These include:

- **Manifold:** A central collection point for multiple subsea wells. A manifold is then connected to a pipeline to transport production to the host location

- **Pipeline End Termination (PLET):** a connection point between a pipeline and a subsea tree or manifold

- **Jumper:** short, pipeline-like link connecting a PLET or manifold to a pipeline

- **Flying Lead:** short-range connector of power (electric or hydraulic) to subsea tree(s)

Whatever the specific component, the pieces of equipment in the "Subsea" category of SURF all serve to connect and control production from the well to the infrastructure and equipment that will transport the produced product.

Subsea equipment utilized in the U.S. Gulf of Mexico is almost exclusively manufactured inside the Unites States, with all the contractors involved (including foreign companies) maintaining factories and shore bases to serve the U.S. Gulf of Mexico. This activity provides large levels of spending due to their high value and complexity into not only the key states where these are primarily physically located (Texas, Louisiana, and Alabama) but also throughout the country due to companies which as subcontractors supply components to the industry.

Umbilicals

The umbilical performs functions that are required to provide power and fluids to the entire subsea production system. These "cables" are often very complex and technologically advanced containing multiple functions in a single umbilical (Figure 30).

Figure 30: Umbilical Cross Section

Source: Quest Offshore Resources, Inc.

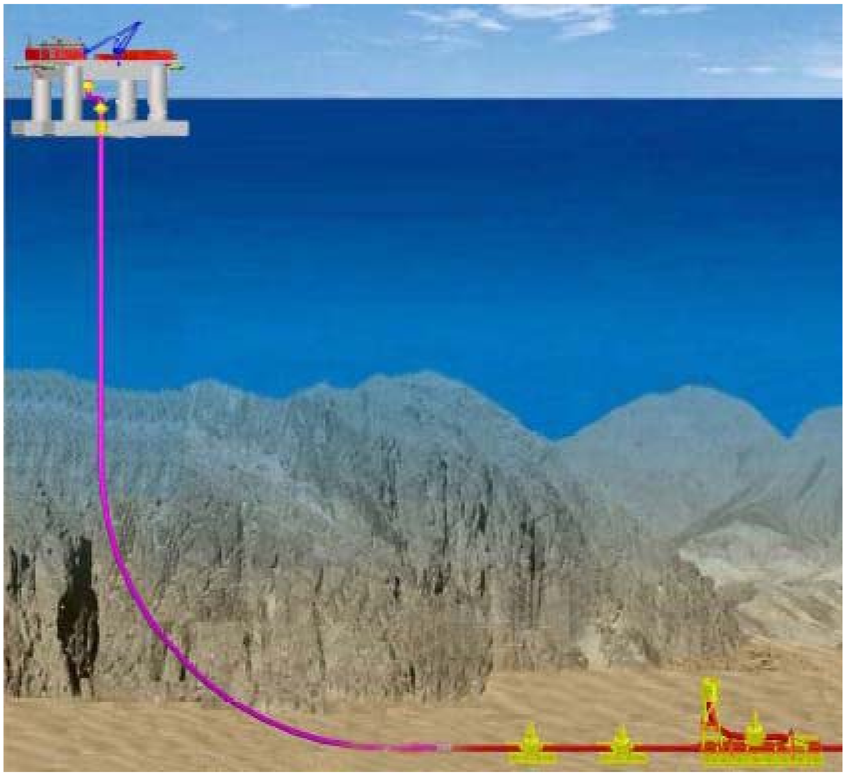
Moreover, in addition to providing the electrical or hydraulic power for the subsea trees, these cables also carry various chemicals that are injected into a well to enhance production and inhibit the formation of hydrates that can block the flow of liquids through the well. This optimization is called flow assurance.

The umbilicals often require a large amount of engineering to ensure there is no negative interaction between the power and other functions in a single umbilical. Additionally, as umbilicals increase in the number of functions contained in a single line, the installation of that line becomes increasingly difficult – requiring extensive installation engineering to ensure that the unit is not damaged before coming online. These installation operations also require specialized and expensive marine construction and installation equipment.

Risers & Flowlines

The "R" (risers) and "F" (flowlines) portions of the SURF market refer to the pipelines needed for any offshore oilfield (the term flowlines is used interchangeably with pipelines). Both segments refer to the pipeline transportation system of an oilfield (Figure 31).

Figure 31: The Purple Line Shows a Riser and the Red Shows Flowlines

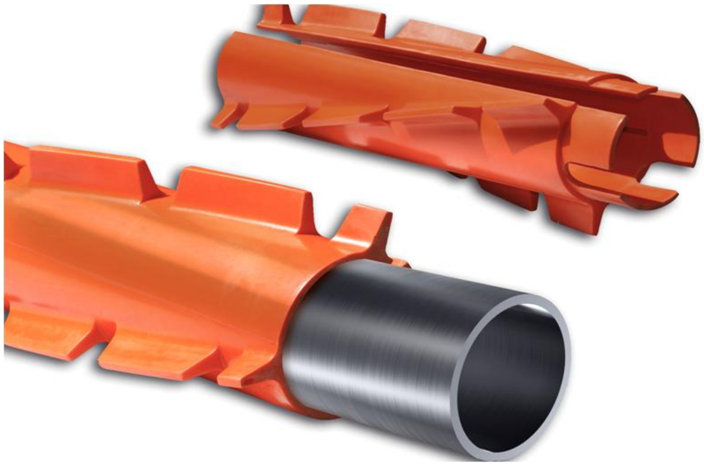


Source: Quest Offshore Resources, Inc.

The risers are pipelines that are run vertically to connect the production facility at the surface with the subsea hardware and equipment on the seafloor. While at first glance the riser pipelines may seem fairly rudimentary in terms of technology, these pieces of equipment are actually very highly engineered. Since risers run through the entire depth of the water column, these lines are subject to a great deal of environmental conditions. This is especially true in the Gulf of Mexico as the region is home to the current-induced phenomenon known as "loop currents." In simple terms, these loop currents create excess force in underwater currents, which often hit riser pipelines directly. As these forces exert themselves on the riser, the pipeline has no choice but to experience some movement as a result.

The industry has – through exhaustive and ongoing research and technology development efforts – essentially solved this problem. Special pieces of equipment, called "strakes," are typically added to a riser to serve as a deflector for these environmental conditions such as vortex induced vibration (Figure 32). In effect, these strakes allow the riser to "shed" the force of the loop currents and maintain a reliable position in relation to the surface and subsea equipment being connected.

Figure 32: Riser Pipe with Anti Vortex Induced Vibration Strakes



Source: Quest Offshore Resources, Inc.

Additionally, risers are still evolving as oil companies and equipment providers strive to refine and perfect these technologies. A few added benefits of increasingly new riser technologies will be the ability to quickly disconnect a surface facility in the event of a hurricane, reduce the weight of the riser to allow for smaller facilities, and many other technological advances that will increase the efficiency by which produced liquids flow through the pipeline system. Pipelines are used to transport material both to and from a producing well(s). While it is generally understood what these lines are used for the technology being used in many of the Gulf's subsea pipelines is leading edge and incorporates space age materials.

As with risers, the primary purpose of an offshore, subsea flowline is to transport liquids either from the well back to the host facility, or from the host facility back to shore.

In every project development plan, pipeline routes from the production platform to onshore must be determined. This is done with the aid of additional services from "G&G" or seismic companies. Through the use of acoustic imaging technology, these companies can create a detailed map of the seafloor. This allows companies to visually map the best route for a subsea pipeline, ensuring the safe and efficient transportation of produced oil and natural gas. While conceptually fairly straightforward, the risers and flowlines of an oilfield are some of the most critical components that employ a high degree of technical complexity and subsequently high capital cost. To install offshore risers and flowlines, the offshore oil and natural gas industry utilizes a of fleet specialized offshore installation vessels. The fleet is

Figure 33: Marine Construction Vessel Installing Flowlines

Source: Quest Offshore Resources, Inc.

operated by a very capable group of companies with a very long history of successfully installing the multitude of equipment pieces needed to produce the offshore natural resources of the U.S.

These vessels are large and expensive pieces of equipment, ranging from US$150 million to more than US$1 billion to design and build. For this reason, installation contractors are very selective when deciding whether or not to build any new vessels.

Once the partners for a given field have determined which solution best suits the field, and provides the most effective use of all parties' capital expenses, a field development plan is presented to the relevant decision makers for the companies involved. When the plan has been thoroughly reviewed, and the potential economic value of the project has been determined, the company(s) will then proceed to the "project sanctioning" phase of development wherein an offshore oilfield receives ultimate approval to proceed with the final investment decision.

Stage 3: Project Sanctioning

Once the proposed concept for developing a field has been presented, a decision is made whether or not to sanction, or give the go-ahead to, the field in question. The decision to sanction a project given a suitable development plan has been presented – is largely a consideration of the profitability of the field.

Moreover, the companies involved in developing and producing the field must be assured that each will receive a company-specific return on the capital investment that must be made. A field may cost as much as $10 billion and make take several years to fully develop. The project sanctioning decision is crucial decision and must ensure that the owners in a project remain financially healthy and are able to maintain a long-term competitive position.

Stage 4: FEED (Front-End Engineering & Design) & Detailed Engineering

Once sanctioned, the project moves into the engineering and design phase. During this time, the oil companies, their suppliers and third-party support organizations work together to design the highly technical pieces of equipment and installation methods that will be needed according to the concept chosen in the "Concept Selection" phase of development. This process can vary in duration depending on the overall size of the project being considered, but generally takes more than a year to complete.

This phase of the project development life cycle is a critical source of creation for jobs, as much of the engineering work that is to be done is contracted to third parties – namely engineering firms. While the vast majority of oil companies have their own engineers to carryout design and development plans, many contract to highly specialized engineering firms as an added measure of safety and quality assurance. Many of these engineering firms have grown fairly large over the last decade, with many employing upwards of 200 employees. Additionally, many of these firms serve as a great entry point into the industry for young college graduates.

Specific tasks in this stage are to take the concept created in stage 2 and sanctioned in stage 3, and compile the designs that will guide the companies through the actual building and acquiring of the materials to create the equipment that is needed. Engineers spend many hours pouring over technical specifications and designs to ensure that the minute details of each piece of equipment are built exactly to specification. As such, this stage of work employs the use of many highly trained and highly skilled engineers.

At present, there is a large deficit of qualified, young engineers to continue this work when their more experienced counterparts move towards retirement. While this poses a large threat to the industry, it is one that is being addressed through university partnerships, public relations campaigns, early career engineer programs, and other mediums. Regardless, this generational gap presents a great opportunity for young engineers and other business students to fill a growing, critical role in the energy supply chain.

Stage 5: Execute

The “execute” phase is the stage during which the field is “put together,” so to speak. Consequently, this stage is also the primary point during which the bulk of capital spending takes place. The execute phase sees the installation of the physical equipment that will be used to produce the oil and / or natural gas from a field. A vital component of this stage is ensuring that companies contracted by the oil company to perform various scopes of work have been fully vetted and meet company safety and quality requirements.

During an oil company’s execute cycle; the wells for the field are completed and finished with control modules (called subsea trees). The wells are then tied together via pipelines, and powered by subsea cables or “umbilicals.” Pipelines carry the produced product either straight back to shore, or to an offshore fixed or floating platform production facility.

The general stages of the Execute Phase are development drilling, materials and equipment procurement, facility fabrication and SURF fabrication.

Development Drilling

As the name suggests, development drilling simply refers to the process by which the wells that will produce the field are drilled and completed.

The primary costs incurred during these activities are the contracting of an offshore drilling rig and the supporting services that accompany these assets. By and large, these rigs are contracted under long-term, multi-year agreements ensuring that operators have access to a rig when needed, as well as providing an added measure of financial assurance to the rig operators. Aside from the actual cost of the rig and its crew, the operator must also pay for the support boats that transport all drilling fluids and other supplies to the rig, as well as paying for helicopter transportation for personnel. Additionally, the operator will incur costs related to the physical materials used during drilling operations (pipe, drilling mud, etc.) which all must be procured and physically transported to the field.

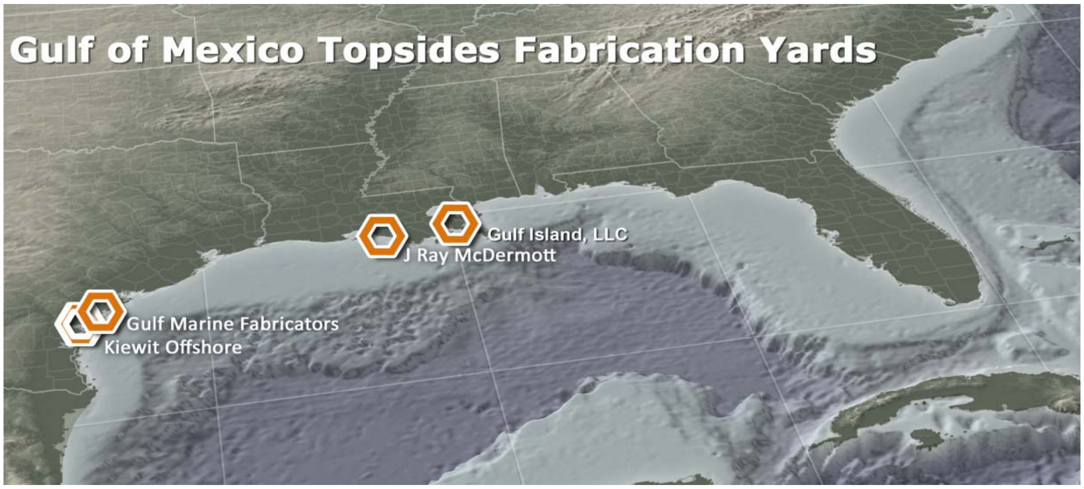
Materials & Equipment Procurement/ Fabrication

Simultaneous to the beginning of development drilling (and often even before development drilling begins), the oil company will begin the process of sourcing all of the materials needed for the subsea and facility equipment. During these activities, oil companies rely on supply chain management professionals to negotiate mutually beneficial terms for all parties involved, while ensuring that the project schedule is maintained.

Facility Fabrication

Often, the most critical component to be fabricated is the host facility for the field. These units represent a large portion of capital costs to the oil company, and can take upwards of three years to complete depending on the size of the unit.

Figure 34: Gulf of Mexico Topside Fabrication Yards



Source: Quest Offshore Resources, Inc.

When contracting for a facility in the GoM, operators will often seek to separate the hull (base of the structure that supports the weight of the topsides processing equipment) and topsides (above-water processing equipment) portion of the facility. This is due to the region's fortunate position of having multiple fabrication yards along the Gulf Coast that are specially geared to providing topsides fabrication services (Figure 34). This provides an added value of allowing the oil company to maintain a presence at the construction yard – ensuring that designs and plans are carried out per specifications.

This separation in the construction of the hull and topsides of a facility is an important distinction for the Gulf, as nearly 60 percent of facilities spending are allocated to the topsides. The existence of local fabrication yards for these services provides a large amount of jobs to the nation, as well as ensuring that a majority of the facility (often the most expensive piece of equipment) is purchased and manufactured domestically.

Once fabrication is completed, the hull and topsides are "mated" either just offshore from the fabrication yard, or the topsides are transported to the field and lifted onto the hull for final commissioning in preparation for production.

SURF Fabrication: Subsea Systems

The company must also take the designs and plans previously developed for the subsea production systems and contract for the fabrication and delivery of these technologically advanced equipment pieces that will control the production of each well. The contracts are often quite large compared to other SURF equipment pieces, with an average control system (subsea tree plus control package) costing between $9 million to $15 million. A great advantage the U.S. has in terms of these systems is that Gulf of Mexico subsea production systems are largely built and assembled domestically.

Once fabricated and delivered, the oil company will employ the use of the drilling rig working on the development wells to install the system on each completed well. The control systems are connected and controlled at the surface by the use of subsea umbilicals.

SURF Fabrication: Subsea Umbilicals

To ensure proper control and powering of the well, subsea umbilicals are employed. As mentioned above, these units are essentially long underwater cables used to provide power (electric or hydraulic) to subsea systems, as well as providing essential fluids and chemicals to maintain production.

Similar to subsea production systems, a large majority of these units are manufactured domestically. Similar to subsea trees and control systems, the umbilical is a highly engineered piece of equipment that requires a fair amount of engineering work to safely employ on a field. The costs for this piece of equipment can be generally categorized as: Engineering / Design, Raw Materials, Fabrication, and Delivery & Installation.

Once the umbilical has been delivered, the oil company will contract for the installation of this equipment using one of the industries highly capable installation boats. While costs for these assets can reach rather large numbers of a “cost-per-day” basis, it is important to note that the industry’s highly skilled contractors have created large efficiencies in the installation of these cables, reducing the total time required for installation significantly.

SURF Fabrication: Risers & Flowlines

While subsea umbilicals are highly specialized units, offshore pipelines (and pipelines in general) are essentially a global commodity. Even though there are added complexities with the fabrication of subsea pipelines, generally speaking, a pipeline is a pipeline. Moreover, steel is traded globally across a multitude of industries.

This means that for every pipeline that needs to be purchased, the oil company is competing for the raw materials, whose cost is dependent on global demand for steel, on a global inter-industry scale. Additionally, the cost of all pipelines needed for a field can see volatile shifts across the life of the project’s development cycle, making costs harder to control.

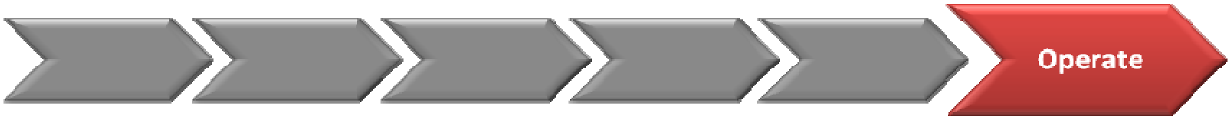
Once the amount of material needed has been determined, and suitable pipeline manufacturing has been contracted, the operator begins the process of contracting for the installation of these pipelines typically through a competitive tendering process. This can primarily be attributed to the migration of heavy industrial activities to developing countries. India, for example, is home to many of the world’s largest pipeline fabrication companies.

Like the subsea umbilical, the installation of pipelines relies on the industry’s fleet of offshore installation vessels to complete these activities. However, a key difference for these pieces of equipment is seen in the type of boat needed.

Given that pipelines weigh a significant amount more than an umbilical, the assets that install these flowlines and / or risers are often noticeably more expensive. This increase in boat cost reflects the larger, more highly rated equipment needed on the boat to ensure that these lines can be safely installed.

Once the flowlines and risers are installed, the lines are tested to ensure there was no damage during installation. Provided that these tests produce positive results, the transportation system of the oilfield is ready for use. While conceptually fairly straightforward, the risers and flowlines of an oilfield are some of the most critical components that employ a high degree of technical complexity and subsequently high capital cost.

Stage 6: Operate



The “Operate” phase is generally used as a generic description for the activities that are undertaken once a field is brought on to production. The actual tasks required to maintain safe and efficient production are extremely vast in quantity. The general categories include all activities that maintain a suitable flow of material through the infrastructure and systems installed during the “execute” phases. Operations must ensure that production levels are capable of continuing at levels that are sufficient to ensure a financial return to the parties involved.

Operating activities range from continuously supplying food and fuel to the platform, repairing damage caused by the wear and tear associated with full time exposure to the elements, performing routine maintenance to ensure continued safe operations, and ensuring safe transportation of produced fluids.

All these activities require continued employment of not only a large crew on the production platform itself, but also require support staff onshore. The operating company requires onshore administrative, management, and engineering support. Onshore suppliers must provide the necessary equipment and supplies. Boats and helicopters are needed to transfer crew and supplies back and forth. Wells must be monitored and worked over when necessary.

Appendix 8: List of Provinces by Region

List of Provinces by Region

Region	Province
Africa/Medit.	Egypt
Africa/Medit.	Israel
Africa/Medit.	Mozambique
Africa/Medit.	South Africa
Africa/Medit.	Adriatic
Africa/Medit.	Morocco
Africa/Medit.	Nigeria
Africa/Medit.	Equatorial Guinea
Africa/Medit.	G of Toranto
Africa/Medit.	Caspian
Africa/Medit.	Angola
Africa/Medit.	Sicily
Africa/Medit.	Spanish Med.
Africa/Medit.	G of Suez
Africa/Medit.	Ivory Coast
Africa/Medit.	Ghana
Africa/Medit.	CONGO
Africa/Medit.	Black Sea
Africa/Medit.	Libya
Africa/Medit.	Cameroon
Africa/Medit.	Tunisia
Africa/Medit.	Cyprus
Africa/Medit.	Guinea Bissau
Africa/Medit.	Gabon
Africa/Medit.	Namibia
Africa/Medit.	Italian Med.
Africa/Medit.	Albania
Africa/Medit.	Mauritania
Africa/Medit.	Algeria
Africa/Medit.	Tanzania
Africa/Medit.	Spain
Africa/Medit.	Saudi Arabia
Africa/Medit.	Cote D'Ivoire
Africa/Medit.	Kenya
Africa/Medit.	Madagascar
Africa/Medit.	Portugal
Africa/Medit.	Turkey
Africa/Medit.	Sierra Leone
Africa/Medit.	Liberia
Africa/Medit.	Senegal
Africa/Medit.	Benin
Africa/Medit.	Togo
Asia Pacific/Middle East	Sakhalin
Asia Pacific/Middle East	Thailand
Asia Pacific/Middle East	Pakistan
Asia Pacific/Middle East	Sarawak
Asia Pacific/Middle East	Philippines
Asia Pacific/Middle East	Australia
Asia Pacific/Middle East	Taiwan
Asia Pacific/Middle East	Vietnam
Asia Pacific/Middle East	Brunei
Asia Pacific/Middle East	S. China Sea
Asia Pacific/Middle East	Abu Dhabi
Asia Pacific/Middle East	Iran
Asia Pacific/Middle East	India
Asia Pacific/Middle East	Indonesia
Asia Pacific/Middle East	Qatar
Asia Pacific/Middle East	Oman
Asia Pacific/Middle East	Iraq
Asia Pacific/Middle East	Malaysia
Asia Pacific/Middle East	Korea
Asia Pacific/Middle East	UAE
Asia Pacific/Middle East	China
Asia Pacific/Middle East	New Zealand
Asia Pacific/Middle East	Myanmar-Burma
Asia Pacific/Middle East	Arabian Sea
Asia Pacific/Middle East	Azerbaijan
Asia Pacific/Middle East	Japan
Asia Pacific/Middle East	Malaysia/Thailand JDA
Asia Pacific/Middle East	Cambodia
Asia Pacific/Middle East	Bangladesh
Asia Pacific/Middle East	Burma Bay of Bengal
Asia Pacific/Middle East	Sabah
Asia Pacific/Middle East	South Korea
Asia Pacific/Middle East	Sri Lanka
Asia Pacific/Middle East	Papua New Guinea
Asia Pacific/Middle East	Singapore
North Sea/Arctic	Barents Sea
North Sea/Arctic	N Sea, Irish
North Sea/Arctic	N Sea, Dutch
North Sea/Arctic	West of Shetlands
North Sea/Arctic	N Sea, Danish

Region	Province	Region	Province
North Sea/Arctic	N Sea, UK	North America	GOM-Mexico
North Sea/Arctic	N Sea, Norway	North America	Bahamas
North Sea/Arctic	Pechora Sea	North America	Cuba
North Sea/Arctic	Baltic Sea	North America	Newfoundland
North Sea/Arctic	Azov Sea	North America	Nova Scotia
North Sea/Arctic	Ireland	North America	South Island
North Sea/Arctic	Bulgaria	South America	Trinidad & Tobago
North Sea/Arctic	France	South America	Argentina
North Sea/Arctic	N Sea Other	South America	Brazil
North Sea/Arctic	Sea of Okhotsk	South America	Caribbean Sea
North Sea/Arctic	Faroes	South America	Ecuador
North Sea/Arctic	Beauford Sea	South America	Venezuela
North Sea/Arctic	Greenland	South America	Peru
North Sea/Arctic	Russia	South America	Chile
North Sea/Arctic	Barrow/Dampier	South America	Colombia
North America	Canada NE	South America	Falkland Island
North America	US Pacific	South America	Guyana
North America	Arctic/Canada NE	South America	Suriname
North America	GOM-US	South America	French Guiana
North America	US Atlantic		

Appendix 9: List of Gulf of Mexico Operators by Operator Type

Note: Operators and Operator Subsidiaries classified as "Majors" are differentiated by bold text**.** Operators not differentiated by bold text are classified as "Independents."

STEA Limited
TEAI Limited
Offshore Limited
Income Program
Energy, Ltd.
3DX Technologies, Inc.
3TEC Energy Corporation
A B C
A.M.E. Petroleum Corp.
A&T OFFSHORE VENTURES
Aaera Energy LLC
Abandonment Program Management
Aberdeen Petroleum (USA)
Acadian Oil and Gas
Access Exploration Corp.
Accruit EAT36 LLC
ACE Energy Development
ACE Energy, Ltd.
Ace Exploration, Inc.
Adobe Oil & Gas
Adobe Resources Corporation
AE Investments, Inc.
AEDC (USA) INC.
Aegis Energy, Inc.
AES Ocean Express
AGH Energy, LLC
Agincourt, Inc.
Agricultural Methane, L.P.
Akela Exploration Company
Alamo-Palace MP
Alan Bates, Inc.
Albion International Resources
Alcazar Corp
Alfred Management, Inc.
Algonquin Gas Transmission
ALITHEIA RESOURCES INC.
All Aboard Development
All American Pipeline
Allard Offshore Management
Alliance Limited
Allied Corporation
Allied Natural Gas
Alma Energy Corp.
Alminex (U.S.) Inc.
Alminex U.S.A., Inc.
Almond Equity Exchange
Alpine Gas WRO
AMAX Petroleum Corporation
AmBrit Energy Corp.
AMCO Energy, Inc.
Amerac Energy Corporation
American Coastal Energy
American Cometra, Inc.
American Energy, Inc.
American Exploration Acquisition
American Exploration Company
American Explorer, Inc.
American Hunter Exploration
American Independent Oil
American Midstream (Midla)
American Midstream Offshore
American National Petroleum
American Petrofina Exploration
American Production Partnership
American Resources Offshore
American Royalty Producing
American Shoreline, Inc.
American Trading and
Ameriplor Corp.
Ameritex Minerals, Inc.
Aminoil Inc.
Aminoil International, Inc.
Amoco Corporation
AmPac Oil & Gas
Ampetrol, Inc.,
Ampolex (Texas), Inc.
Amsearch, Inc.,
Anadarko E&P Company
Anadarko Petroleum Corporation
Anadarko Production Company
AnaTexas Offshore, Inc.
Anderson Offshore Exploration
Andex Resources, L.L.C.
Andromeda Resources, LLC
Anglo-Suisse Development Partners
Anglo-Suisse Offshore Partners
Anglo-Suisse Offshore Pipeline
ANKOR E&P Holdings
ANKOR Energy LLC
Anne Dice Interests
ANR Production Company
The Anschutz Corporation
Antara Resources, Inc.
Antego Investment Corporation
Apache Clearwater Operations
Apache Corporation,
Apache Deepwater LLC
Apache Gathering Company
Apache GOM Pipeline
Apache Offshore Holdings
Apache Oil & Gas
Apache Oil Corporation
APD Company
Apex Exploration Company
Apex Offshore Wind
Apex Oil & Gas
Apex Royalties, Inc.
APP Production Inc.
Applied Drilling Technology
APX Corporation
Aquantis, Inc.
Aquila Energy Corporation
Aquila Energy Resources
Aquila Offshore Gas
Aquilonia Energy E
Arcadia Oil, Inc.
ARCO Pipe Line

Ardeel Oil & Gas
Arena Energy, LP
Arena Exploration LLC
Arena Offshore, LP
Arena Offshore Operating
Argo, L.L.C.
Arguello, Inc.
Aries Resources, LLC
Armada Production Company
Armada Resources, Inc.
Armstrong Oil & Gas
ARNO INC.
Arnold 1975 Exploration
Antonette Tilley Arnold
Isaac Arnold, Jr.
Arrowhead Offshore Pipeline
Asalyn Resources, Inc.
Asamera Oil (U.S.)
Ashland Exploration Holdings
Ashland Oil, Inc.
Ashlawn Energy, Inc.
ASR 1980 Exploration
Asset Energy, Inc.
Atlantic Grid Holdings
Atlantic Pacific Marine
Atlantic Richfield Company
ATOFINA Petrochemicals, Inc.
ATP Oil & Gas
Aures Energy, L.L.C.
AURORA EXPLORATION, L.L.C.
Austral Oil Company
Aviva America, Inc.
Aviva Offshore, Inc.
Avon Energy Corporation
Axem Resources Incorporated
Ayco Energy, LLC
Azar Energy, Inc.
B T Operating
B. E. Quinn
BA502-FALCON PARTNERS, LTD.
Badger Oil and
Badger Oil Corporation
Ballard Petroleum LLC

Bandera Oil & Gas
Bandon Oil and Gas
Baralonco Exploration, Inc.
Barber Oil Exploration
Barcoo Exploration Inc.
Bargo Energy Company
Barnhart 1975 Exploration
Baron Petroleum Company
Barrett Resources Corporation
BASF Corporation
Basin Exploration, Inc.
Bass Enterprises Production
Bastian Bay Pipeline
BATELEUR EXPLORATION AND PRODUCTION
Bates Oil Corporation
Baxter Drilling & Production
Baylon Oil Corporation
Bayou Bend Offshore
Bayou City Pipelines
Bayou Hydrocarbons, Inc.
Bayou Interstate Pipeline
BCS Natural Resources
Beacon Exploration, LLC
Bechtel Energy Partners
Bechtel Investments, Inc.
John A. Been
Belco Development Corporation
Belco Petroleum Corporation
Belle Energy, Inc.
Bellwether Exploration Company
BelNorth Petroleum Corporation
Bentel Partners
Bernard A. Tower
Beryl Resources LP
Beta Oil & Gas
Beta Operating Company
BetsWest Interests, L.P.
Bever Investments, Inc.
BFW, LLC
BG Exploration America
BGI Gulf Coast
BHB Petroleum, Ltd.
BHP Billiton Petroleum

Bisso Exploration & Production
Black Elk Energy
Black Hawk Oil
Black Hills Exploration
Black Marlin Pipeline
Blackbird Co.
Blake Production Company
Blazer Energy Corp.
Block 561, LLC
Blocker Exploration Company
Blue Dolphin Petroleum
Blue Heron Petroleum
Blue Ocean Operating
Bluebird Energy, Inc.
Bois d'Arc Offshore
BONITA TRANSMISSION COMPANY
Bonray, Inc.
Boston Oil & Gas
Bounty Group, Inc.
Box Exploration, L.L.C.
BP Exploration & Production
Brannigan Resources, Inc.
Breitburn Energy Company
BREPS Petroleum LLC
Breton Energy, LLC
Bridge Oil Production
Bridgeport Exploration Limited
Bright & Company
Bris-Tex Financial Enterprises
Bristol Partners
British Acadian Ltd.
British Gas US
British-Borneo Petroleum, Inc.
Brock Minerals Corporation
Brock Oil and Gas
Broussard Brothers, Inc.
Brown Angus Properties
BROWN GULF PROPERTIES
Brown Offshore Holdings
BROWN SOUTH PELTO
Browning Offshore, Inc.
The Brownland Corporation
BRT Properties, Inc.

Bryson Oil & Gas
BTA Oil Producers
BUCCANEER RESOURCES,LLC.
Bula Oil America
Bulldog One Oil
Bundy Partners,
Bunker Exploration Company
Bunker-Gulf, Inc.
Burke Oil Co.
Burlington Resources Inc.
Burmah Oil Development
Burnett Oil Company
Howard L. Burris
Burrwood Gathering Company
Bushhill, L.P.
Buttes Resources Company
Byron Energy Inc.
Bristol Resources Corporation
C & K
Cabot Oil & Gas
Cade Oil Investments
Caesar Oil Pipeline
Caillou Boca Gathering
Cairn Energy USA
CAL International Operations
Callon Entrada Company
Callon Petroleum Company
Callon Petroleum Operating
Calpine Corporation
Calpine Natural Gas
Canadian Superior Oil
CanadianOxy Offshore Production
Cano Energy Corporation
Canon Minerals, Inc.
Canyon Energy, Inc.
Canyon/Vermilion 392, Ltd.
Cape Wind Associates
Captiva Energy, Inc.
Carden Oil & Gas
Cardinal Creek Corporation
Carl Herrin Oil
Carrizo Oil & Gas
Case-Pomeroy Oil Corporation
Casex Co.
Cashco Energy Corporation
Caspen Oil, Inc.
Castex Offshore, Inc.
Catapult Exploration,LLC
Cathexis Oil & Gas
Catlin Energy Corporation
Cavalla Energy Exploration
CBL Capital Corporation
CBW Energy, Inc.
CCNW, Ltd.
C.E. North America
CEC Exploration Corporation
Cedar Gas Company
Cedyco Corporation
CEL Properties, LLC
CELERON Oil and
Cenergy Exploration & Production
Cenote Oil Company
CENOTE RESOURCES PARTNERSHIP
Centana Gathering, LLC
Central Crude, Inc.
Centran Corporation
Century Assets Corporation
Century Chartering Co.
Century Exploration Company
Century Oil Company
CEU Offshore I
CEVS Inc.
CGM, L.P.
CH4 Resources L.L.C.
Chalaco, Ltd.
Challenger Minerals Inc.
Chambers Offshore Exploration
Jerry Chambers Exploration
Champion Exploration, LLC
CHANDELEUR LTD.
Chandeleur Corporation
Chanex, LLC
Charter II,Inc.
Chateau Oil and Gas
Chenault Partners
Cheniere Energy, Inc.
Chet Morrison Contractors
Chevron Corporation
Cheyenne International Corporation
Chieftain International (U.S.)
Donald L. Childress
Choctaw II Oil
Choice Exploration, Inc.
Christeve Oil Company
Chroma Exploration & Production
Chroma Oil & Gas
Chroma Operating, Inc.
CIECO Energy (Entrada)
CILCO Exploration and
CIMA ENERGY, L.L.C.
Cimarex Energy Co.
Cities Energy, LLC
Cities Energy Offshore
City Oil Corporation
CL&F Resources LP
Clark Oil & Gas
Clayton Williams Energy
Cleopatra Gas Gathering
Click, Corp.
Cliffs Drilling Company
Cliffs Oil and Gas
CLK Oil & Gas
CLK Producing
CMA Pipeline Partnership
CNG Pipeline Company
Coastal Bend Offshore
Coastal Field Services
Coastal States Gas
Cobalt GOM
Cobalt International Energy
Cockrell Exploration L.L.C.
Cockrell Group, L.P.
Cockrell Oil and Gas
Cody Energy, Inc.
CoEnergy Central Exploration
Cogen Technologies Brazos
Coho Resources, Inc.
Colanco, Inc.
Colonial Drilling

Colorado Energy Minerals
Colton Gulf Coast
Columbia Production Company
Columbus Mills, Inc.
Comanche Oil, LLC
Cometra Oil & Gas
Comstock Offshore, LLC
Comstock Resources, Inc.
Conn Energy, Inc.
ConocoPhillips Company
Conquest Exploration Company
Consolidated Natural Gas
Contango Offshore Exploration
Contango Oil & Gas
Continental Land & Minerals
Continental Resources, Inc.
Contran Corporation
Convest Energy Corporation
Coquina Petroleum Inc.
Coquina Petroleum U.S.
Cord Energy Resources
Cordova Resources, Inc.
Coriolis Offshore Inc
Cornell Oil Company
Cornerstone Energy Corporation
Corpus Christi Hydrocarbons
COSCO Oil & Gas
Coscol Marine Corporation
Costilla Energy, Inc.
Cottesloe Oil & Gas
Cotton Petroleum Corporation
Couch Oil & Gas
Covington Energy Corporation
Cowboy Pipeline Company
Cox Oil Offshore
CRA, Inc.
Crab Run Gas
Crain Energy, Ltd.
Crone, LLC,
Creek Resources, LLC
Crescent Drilling & Production
Crescent-Graham Exploration Company
Crescent Investment Co.
Crimson Exploration Inc.
Cronus Offshore, Inc.
Cross Energy Corporation
Cross Timbers Oil
Cross Timbers Production
Crown Central Petroleum
Crutcher Oil and Gas
Crystal Oil Company
Cs Solutions, Inc.
CSP Pipeline, L.L.C.
CSX Oil & Gas
Cut Off Corporation
Cutter Energy, LLC
CV Energy Corporation
Cypher Energy Corporation
CYPRESS GULF LLC
D & E
D & G
D & V
DALEN Resources Oil
Darcy Exploration, Inc.
DAUBERT-HOWELL ENERGY, LTD.
Dauphin Island Gathering
Davis Petroleum Corp.
Day Exploration, Inc.
Dayfar Pty. (U.S.)
DCOR, L.L.C.
DCP Midstream, LLC
DDD Energy, Inc.
Decalta International Corporation
Deep Gulf Energy
DEKALB Energy Company
Delano Energy Ventures
Delhi Oil Corporation
DelMar Operating, Inc.
Delta Drilling Company
Delta Exploration, Inc.
Deminex U.S. Oil
Denbury Resources Inc.
Denny Offshore Exploration
Denver American Petroleum, a
DEPCO, Inc.
Derby Refining Company
Destin Pipeline Company
Destin Resources LLC
Devon Energy Corporation
Diamond A Exploration
Diamond Chemicals Company
Diamond Shamrock Offshore
Discovery Gas Transmission
Diverse Exploration L.P.
Dixilyn-Field Drilling Company
Dixon Royalty, Ltd.
DKM Offshore Resources
Domain Energy Production
Dominion Exploration & Production
Dorado Deep GP
Dorchester Exploration, Inc.
Dorchester Master Limited
Dover Energy, Inc.
Drillamex, Inc.
Dunhill Exploration & Production
Dunoak, Inc.
Dynamic Offshore Resources
Dynegy Energy, Inc.
Eagle Eye Energy
Eason Oil Company
East Cameron, Inc.
East Timbers Limited
Eastern Energy, Inc.
EC Offshore Properties
Ecopetrol America Inc.
EcoRigs, L.L.C.
Edisto Exploration & Production
EEX E&P Company
El Paso E&P
El-Can Exploration, Inc.
Eland Energy, Inc.
Elf Aquitaine Exploration
Elf Aquitaine, Inc.
Elf Aquitaine Oil
Elim Corporation
Elite Enterprises, Inc.
Elizabethtown Gas Company
Ellwood Pipeline, Inc.
Elysium Energy, L.L.C.

Emerald Coast Energy
Empire Exploration, Inc.
Enbridge Offshore
EnCana, Inc.
EnCap Energy L.C.
The Encore Company
Endeavor Exploration and Production
Endymion Oil Pipeline
Ener Exploration Limited
Energen Resources Corporation
Energy Virtual Partners
Energy XXI GOM
EnerMark, Inc.
EnerQuest Oil & Gas
EnField Operating, L.L.C.
ENGAS XP, LLC
ENGY, Inc.,ENGY INC
Enhanced Energy Partners
Eni Oil US
Enron Corp.
ENSCO International Company
ENSERCH Corporation
Ensource Inc.
ENSTAR Corporation
Entech Enterprises, Inc.
Entek Energy USA
Enterprise Resources, Incorporated
Entex Petroleum, Inc.
Entre Energy Corporation
enXco Development Corporation
EOG Resources, Inc.
EOG Resources Omega
EP Operating Limited
EPEC Offshore Gathering
Epic Natural Gas
EPL Pipeline, L.L.C.
Equitable Production Company
ERMAQ Offshore, LLC
Erskine Energy Corporation
Esenjay Petroleum Corporation
Essex Offshore, Inc.
Etroa Offshore LLC
Eugene Island Oil
Eugene Shoal Oil
Evergreen Resources, Inc.
Ewing Bank Gathering
Excel Resources, Inc.
Exchange Oil & Gas
EXCO Resources, Inc.
Exeter Exploration Company
Exploration Service, Inc.
Exploration Ventures, L.L.C.
Explore Offshore LLC
Express Acquisition Company
Exxon Mobil Corporation
F-Wade Holdings, Ltd.
F-W Oil and Gas Interests
FAIRFIELD ROYALTY CORP.
Fairways Offshore Exploration
Fairwinds International, Inc.
Falcon Oil & Gas
Fannin Properties Company
Farrar Oil Company
FB Energy Corp.
F.C.H. Operating Company
FEC Offshore
Fidelity Exploration & Production
Field Gas Gathering
Fin-Oil, Inc.
Fina E&P, Inc.
Finadel Exploration, Inc.
First Energy Corporation
First Matagorda Corporation
First Southern Reserve
Firstland Offshore Exploration
Fishermen's Energy
Flash Gas & Oil
FLEX Fund Oil
Flextrend Development Company
Flores & Rucks
Florida Exploration Company
Florida Gas Transmission
Flowood Exploration Company
Fluor Oil and Gas
FM Properties Operating
FMP Operating Company
Focus Exploration, LLC
Force Nine Exploration
Forest Oil Corporation
Fortune Natural Resources
FOSSIL BAY OPERATING
Foster-Brown Company
Four M Properties
Four Star Oil
FPCO Oil & Gas
Frankel Offshore Energy
Franks Petroleum Inc.
Free Flow Power
Freeport-McMoRan Energy LLC
Freeport Minerals Company
Fremont Energy Resources
French Petroleum Corporation
Frontier Natural Gas
FURTH OIL CO.
FWOE Partners L.P.
Gainco, Inc.
Galaxy Oil Company
Galveston Offshore Group
Galvez Energy Corporation
Garden Banks Gas
Gardner Offshore Corporation
The Garex Corporation
Gas Transportation Corp.
Gasdel Pipeline System
Gasper Rice
Gateway Offshore Pipeline
GayLyn Exploration, Inc.
GCER Offshore, LLC
GDF SUEZ Exploration
GEM Exploration
Gemsquare Corporation
General Atlantic Energy
General Energy Corporation
General Producing Company
General Sandefer Offshore
Genesis Resources Corporation
GEO-West, Inc
GeoNet Offshore Exploration
GeoPetra Partners, LLC

Georgia Power Company
Gerig Exploration, Ltd.
Getty Reserve Oil
GID Oil Company
GIL Energy, Inc.
Ginger Oil Company
GLG Energy, L.P.
Global Industries, Ltd.
Global Natural Resources
GMT Exploration Company
GNC Operating Company
Golden Engineering, Inc.
Goldking Energy Corporation
Goliad Oil & Gas
GoMex Energy Offshore
Gomez Pipeline GP
Good Hope Refineries
Gordy Oil Company
Grace Petroleum Corporation
Graham Royalty, Ltd.
Graig International, Inc.
Granberry Petroleum, Inc.
Grand Isle Corporation
Grand Oil & Gas
The Gray Exploration
Great Bay Operations
Great GulfCan Energy
Great River Oil
Green Canyon Pipe
Green Oil, Inc.
Greenbrier Operating Co.
Greystone Petroleum, Inc.
Grigsby Petroleum Inc.
Grimes Energy Company
Griner Energy, Inc.
Gryphon Exploration Company
GSOE I, LLC
G.T.B., Inc.
Gulf Coast Acquisition
Gulf Coast Package
Gulf Energy Exploration
Gulf Gateway Energy
Gulf Oil Corporation
Gulf South Operators
Gulfsands Petroleum USA
Gulfshore Midstream, L.L.C.
Gulfstar Energy, Inc.
Gulfstream Energy Services
Gulfstream Resources, Inc.
GulfX, LLC,GULFX LLC
GW Petroleum Inc.
GWR Oil & Gas
H. B. Joint
H J Holding
Hall-Houston Exploration, L.P.
Hamilton Brothers Corporation
Hammett Offshore, Inc.
Hanover Partners
Hanwha Resources (USA)
Hap Hederman Oil
Harbert Energy Corporation
Harbor Hill Interests
HARO INVESTMENTS, LLC
Harris Production Partnership
Harvest Natural Resources
Harvest Operating, LLC
Hastings Resources, Inc.
Hat Creek Energy
HC Resources, LLC
HCW-DELHI, INC.,HCW-DELHI INC
HDO Gulf Energy
HE&D Offshore, L.P.
Helis Oil & Gas
Helix Energy Solutions
Helmerich & Payne
Hess Corporation.
HHE Energy Company
HI Production Company
HI-BOL Pipeline Company
Hickory Development, Inc.
HIGH ALTITUDE INVESTMENTS
High Island Oil
High Seas Exploration
Highbaugh Field Corporation
Highland Resources, Inc.
Hilcorp Energy GOM
Hill Pipeline Company
HNG Fossil Fuels
Hoactzin Partners, L.P.
HOC-2000 Drilling Partnership
Holly Corporation.
Holt Petroleum Corporation
Home Petroleum Corporation
Homestake Sulphur Company
Hondo Petroleum Corporation
Hou-Tex, Inc.
Houston Energy, L.P.
The Houston Exploration
Houston Oil & Gas
Howard Energy Co.
Howell Corporation
HPC, Inc.
HRB Oil & Gas
HRM 1976 Exploration
HS Resources, Inc.
Hudson Energy, Inc.
Huffco Petroleum Corporation
Hughes Eastern Petroleum
Hughes-Rawls, L.L.C.
Hughes-Denny Offshore Exploration
Hunt Chieftain Development
Hunt Energy Corporation
Hassie Hunt Exploration
Hunter Resources, Inc.
Hunter Trading Company
Huntington Beach Company
Husky Oil Company
Hyundai Petroleum U.S.A.
Idemitsu Oil Exploration
IMC Global Inc.
Imperial Resources, Inc.
Implicit Oil & Gas
Index Offshore, LLC
Indexgeo & Associates
Inexco Oil Company
Ingram Exploration Company
INPEX Gulf of Mexico
Inter-Continental Energy, Inc.
International Minerals & Land

Interpel Corp.
Interstate Investment Company
Invent Incorporated.
Iowa Power Resources
Iowa-Illinois Energy Co.
IP Petroleum Company
IPR USA Corp.
ISCO, Inc.
ITR Petroleum, Inc.
Ivory Production Co.
Jaguar Oil & Gas
James Resources, Inc.
JAON, LLC.
Japex Gulf Coast
Jath Oil Co.
Jay Petroleum
Jazira USA, Inc.
Jenco Petroleum, Inc.
Jenney Oil Company
Jerrick Oil & Gas
Jet Oil Company
JFD, Inc.
J.F.P. Well Service
JGC Energy Development
J.G.F. Incorporated.
JGF No.
JKR Energy, Inc.
JN Exploration & Production
JO Arc Resources
Jobe Oil & Gas
JOC Venture.
JOG Corporation.
Johnson & Lindley
Joint Energy Development
Jordan Oil & Gas
Journey's End, Inc.
JRF II, L.L.C.
Juneau Exploration, L.P.
Juniper Energy L.P.
Jupiter Energy Corporation
Jurasin Oil & Gas
JX Nippon Oil
K.E. Resources, Ltd.
K-Mc Venture I
Kaneb Exploration, Inc.
Kanter Exploration Company
Kayd Energy, LLC
KCS Resources, Inc.
Keangnam USA Corporation
KEC Acquisition Corp.
Kegley Oil & Gas
KENNEDY MINERALS, LTD.
Kerr-McGee Oil & Gas
Kewanee Industries, Inc.
Key Production Company
Kidde Credit Corporation
KILGORE EXPLORATION, INC.
The Kilroy Company
Kimberlee International Energy
Kinetica Partners, LLC
King Ranch Oil
Kirby Petroleum Co.
Kirkpatrick Oil & Gas
KLABZUBA OIL AND GAS
KMI Continental Offshore
KNIGHT RESOURCES, INC.
Knob Hill Oil
KOA Energy LP
Koch Industries, Inc.
Kona Ltd.
Kraker Petroleum Corporation
Krescent Energy Company
Kriti Exploration, Inc.
KTI Energy Corp.
L. S. Holding
Labrador One Oil
Ladd Petroleum Corporation
LAE Energy, Inc.
Lake Ronel Oil
LAKEVIEW EXPLORATION, INC.
Lamar Oil & Gas
Lance Exploration Company
The Largo Company
Las Colinas Energy
Laser Oil Co.
LASMO Energy Corporation
LaTex Petroleum Corporation
Lava Exploration, Inc.
Lawco Offshore, Inc.
LCX Energy, L.L.C.
LEDCO, LTD.,LEDCO LTD
Leed Petroleum LLC
Legacy Resources Co.
Leni Gas & Oil
Leviathan
LFL Joint Venture
Liberty Energy Gulf
Lignum Oil Company
Linder-Doughtie Energy, Inc.
LLECO Oil & Gas
LLOG Energy, L.L.C.
LMD OFFSHORE, INC.
Lobo Operating, Inc.
LoIn Energy Corporation
Long Resources
Longboat Energy Corporation
Longhorn Oil and Gas
Louis Dreyfus Natural Gas
Louisiana Energy Production
Louisiana General Oil
Louisiana Tidewater Exploration
Lovera Pipeline Co.
Loyal Trusts
LPCR Investment Group
Luxor Energy Corporation
Lyco Energy Corporation
Lymac Exploration and Production
LYRIK ENERGY, L.L.C.
Mack Energy Co.
Maersk Oil America
Magellan Exploration, LLC
Magnolia Oil and Gas
Magnum Hunter Production
Main Energy, Inc.
Mako Offshore Exploration
Manta Ray Offshore
Manti Resources, Inc.
MAPCO Oil & Gas
Marathon Energy Corporation

Marconi Exploration, Inc.
Marine Exploration Company
Mariner Energy, Inc.
Maritech Resources, Inc.
Mark Producing, Inc.
Marlin Energy, L.L.C.
Marquis Oil & Gas
Marshall Exploration
Martin Exploration Company
Marubeni Oil & Gas
Mast Energy Company
The Master Drilling
Matagorda L.L.C.
Matrix Energy- Limited
Matrix Northstar LLC
Matrix Oil & Gas
Maxim Petroleum Corporation
Maxus (U.S.) Exploration
May Petroleum Inc.
MBA INDUSTRIES, INC.
MC Exploration Corporation
McCombs Energy, L.L.C.
McCormick Operating Company
MCKELLER LLC.
McMoRan Oil & Gas
MCNIC Oil & Gas
MCO Resources (Integrated)
MCX Gulf of Mexico
MD Oil Co.
MDM OFFSHORE, INC.
MDOI, Inc.,MDOI INC
MEA OFFSHORE, INC.
Mecom Offshore Company
Medallion California Properties
Medco Energi US
Meera Petroleum, Inc.
Mega Petroleum Inc.
MEGS, L.L.C.
Melrose Energy Company
Melton Petroleum LLC
MEP III GOM
Meridian Oil Inc.
Merit Energy Company
Merit Management Partners
Meritus Resources, Inc.
Merrico
MESA Inc.
Metrow Energy, LLC
Metsis, Inc.
MG Oil & Gas
MGF Oil Corporation
MHA Energy Corporation
MIC Petroleum Inc.
Mid-Continent Energy, Inc.
Mid-Gulf Drilling Corp.
Mid-Continent Resources, Inc.
Midcon Energy, Inc.
Midgard Energy Company
Mike Mullen; Energy
Milagro Producing, LLC
Millennium Offshore Group
Millico Energy, Inc.
Minden Oil and Gas
Mineral Resources, Inc.
Mineral Ventures, Inc.
Minor Resources, Inc.
Miss-Lou Petroleum LLC
Mission Resources Corporation
Mississippi Canyon Gas
Mitchell Energy
Mitco Pipeline Company
MitEnergy Upstream LLC
Mitsubishi International Corporation
MKJ Xploration, Inc.
MNR Exploration and
MOEX Oil & Gas
Momentum Energy Resources
Moncrief Offshore LLC
Monforte Exploration L.L.C.
Mono Power Company
Monsanto Company,
Montclare Oil, Ltd.
Montecito Offshore L.L.C.
Moreno Offshore Resources
Morgan Associates, Inc.
Moriah Resources, Inc.
Morrison Energy Group
Mosbacher Energy Company
Mountain Energy, LLC
MTS Limited Partnership
Betsy Mecom Mullins
Murchison Oil and Gas
Murphy Exploration & Production
Murphy Oil USA
Mustang Fuel Corp.
NACRA
NAGIT (USA) INC.
National Cooperative Refinery
National Fuel Gas
Natomas Offshore Exploration
NATRESCO INCORPORATED.
Natural Gas Pipeline
Nautilus Pipeline Company
NBH Liquidating Trust
NCX Company, Inc.
Nemo Gathering Company
Neomar Resources, Inc.
Neptune LNG LLC
NERCO Energy Corporation
Neumin Production Company
NEW ENERGY, L.L.C.
New England Energy
New Jersey Offshore
Newfield Exploration Company
Nexen Petroleum Offshore
NI-Gas Exploration, Inc.
Ninian Oil Company
Nippon Oil Exploration
NIPSCO Exploration Company
Nist Corporation,
NMC Offshore Oil
NML Development Corporation
Noble Energy, Inc.
NOEX (Viking) Inc.
Nor-Tex Gas Corporation
Norcen Explorer, Inc.
Norcen Petroleum Inc.
Nordstrand Engineering, Inc.

Norfolk Energy Inc.
Norse Petroleum (U.S.)
Nortex Corporation.
North American Royalties
North Atlantic Pipeline
North Central Oil
North Central P.N.G.
North Shore Exploration
North Timbers Limited
Northern Natural Gas
Northport Production Company
Northstar Offshore Energy
Northwind Exploration Partnership
The Norwegian Oil
NRG Bluewater Wind
NRM Operating Company
NSP Acquisition Corporation
NT Corporation,NT .
Nuevo Energy Company
O'Sullivan Oil & Gas
Oak Hill Energy
Occidental Petroleum Corporation
Ocean Breeze Pipeline
Ocean Energy, Inc.
Ocean Front Oil
Ocean Oil & Gas
OCFOGO, Inc.
OCS Operators, Inc.
Odeco Oil & Gas
ODY Oil Corporation
OEDC, Inc.
Offset Leo LLC
Offshore Bechtel Exploration
The Offshore Company
Offshore Development Interests
Offshore Energy Development
Offshore Energy
Offshore Exploration, LTD.
Offshore International Group
Offshore MW LLC
Offshore Paragon Petroleum
Offshore Producing Properties
OFFSHORE PROPERTIES, LLC
Offshore Resources, LLC
Offshore Shelf LLC
OGA I, L.P.
Ogle Production Corporation
Oil Acquisitions, Inc.
Oil Investments, Ltd.
OKC Exploration, Inc.
Okeanos Gas Gathering
Oklahoma Gas Pipeline
Olympic Energy Partners
Omega Pipeline Company
Omimex Petroleum, Inc.
Omni Operating Company
On Board Properties
ONEOK Exploration Company
ONLINE RESOURCE EXCHANGE
Online Resources, L.L.C.
OOGC AMERICA, INC.
OPEN CHOKE ENERGY
OPEX Energy, LLC
OPICOIL AMERICA, INC.
OPUBCO Resources, Inc.
Orca Energy, L.P.
ORGERON ENERGY, INC.
Orion-Smith Oil Properties
Orisol Energy US
Orlando Oil Co.
ORYX ENERGY COMPANY
Osprey Petroleum Company
Osyka Producing Company
Otis Petroleum Corporation
Outer Banks Ocean
OXOCO Woodway Tower
P&P Producing, Inc.
P-H Energy, LLC
Pacific Energy Resources
Pacific Enterprises Oil
Pacific Enterprises Royalty
Pacific Minerals, L.L.C.
Pacific Oil, Inc.
Pacific Petroleums, Inc.
Pacific Rim Enterprises
Pakenham, Inc.
PALACE EXPLORATION COMPANY
Palace Operating Company
Palm Energy Offshore
PALOMA RESOURCES, LLC
Pan-Am Oil Properties
PAN ENERGY Resources
Pan Petroleum Master
PANACO, INC.
PanCanadian Petroleum Company
Pancontinental Energy Corporation
Panhandle Eastern Pipe
Panther Resources Corporation
Paramax Resources (US)
Paramount Petroleum Co.
Parawon Corporation
Park Oil & Gas
Parker & Parsley
Patco, Inc.
Patrick Petroleum Corporation
Patriot Exploration Co.
Peak Petroleum Company
Pearl Exploration and Production
Pearson Petroleum Corporation
Pecos Oil & Gas
PeDex NV, Inc.
Pegasus Energy LLC
Pel-Tex Oil Company
Pelican Exploration, Ltd.
Pelto Oil Company
Pemeta Oil Company
Pend Oreille Oil
Pengo Petroleum, Inc.
Pennzoil Exploration and Production
Pentad Offshore Corporation
Peoples Gas Light
Peregrine Oil & Gas
Peregrinus Properties
Perenco Inc.
Pesca Drilling, L.L.C.
Petro-Hunt, L.L.C.
Petro Ventures, Inc.
Petro-Guard Company, Inc.

Petro-Lewis Funds, Inc.
Petrobras America Inc.
PetroChief International Inc.
PetroCorp Acquisition Company
Petrodel Exploration, Inc.
Petrodome Energy, LLC
Petrofina Exploration, Inc.
Petrohawk Energy Corporation
PETROLEUM FUELS OFFSHORE
Petroleum Strategies, Inc.
PETROLEUM VENTURES, L.L.C.
PetroPacific Resources, Inc.
PetroPro Energy Partners
PetroQuest Energy, Inc.
PetroReal Main Pass
Petrorep of Texas
PetroVal, Inc.
Petsec Energy Inc.
PexTech Energy Co.
PG&E Resources Offshore
PHEASANT OIL & Gas
Phillips Oil Company
Phoenix Exploration Company
Pickens Energy Corporation
Pierce Junction Petroleum
Pilgrim Exploration Corp.
Pine Curtain Production
Pingora Exploration Copmpany
Pinto, Inc.
Pioneer Natural Resources
Piquant, Inc.
Pisces Energy LLC
PITTSBURGH CORPORATION, INC.
Placid International Oil
Plains Exploration & Production
Playa Oil & Gas
Plumb Offshore, Inc.
Polaris Oil Company
Polfam Exploration Company
Polo Energy Corporation
Pond Energy, LLC
Pond Exploration Company
Port Dolphin Energy
Poseidon Pipeline Company
Potential Energy Limited
Prairie Producing Company
Preussag Energy Venture
Primary Fuels, Inc.
Prime Natural Resources
Prime Offshore L.L.C.
Princeton Energy Group
Probe Resources, Inc.
Producers Pipeline Corporation
Production Network, Inc.
Program Acquisition Company
Proserv Energy, L.L.C.
Prospect Exploration and Production
Prosper Energy Corporation
Proteus Oil Pipeline
Proven Properties, Inc.
Providence Energy Corp.
PRS Offshore, L.P.
Prudential Petroleum Company
Pruet Offshore Company
PSI Midstream Partners
Pure Energy Company
PXP Resources LLC
Pryamid Energy, Inc.
QEC OIL & Gas
Quaker Coal Company
QUANTUM EARTH CORPORATION
Questar Oil and Gas
Quintana Energy Corporation
Quintana Oil & Gas
Quivira Gas Company
R.Z., Inc.
R&B Falcon Subsea
RAAM Global Energy
Race Holding Co.
Raintree Resources, Inc.
Rampant Lion Energy
Range Resources Corporation
Ranger Oil Company
Rayme Offshore, Inc.
RB Operating Company
RBP Offshore, L.L.C.
RCWI, L.P.
Reading & Bates
Red Willow Offshore
Reeder Energy Partners
Reef Exploration, L.P.
REGAL OFFSHORE, LLC
Regina Resources, Inc.
Reidy International, Inc.
Remington Oil and Gas
Repsol E&P USA
Republic Petroleum, LLC
RES America Developments
Reserves Management, L.C.
Resource Production, Inc.
Resources Liquidating Corp.
Ressie Oil & Gas
Rialto Energy, Inc.
Rialto Production Company
Sid Richardson Carbon
Richey Oil & Gas
Ridgelake Energy, Inc.
Ridgewood Energy
Ridgewood Energy
RIM Offshore, Inc.
RIMCO Production Company
RIMROCK EXPLORATION, L.L.C.
Rio Bravo Oil
Rio Grande, Inc.
Rise Energy Beta
River Oaks Exploration
RMP Energy, LLC
Robert Street Energy
Roberts Petroleum Company
Robertson Hastings Royalties
Rocket Oil Company
Rockport Resources Capital
Rocksource Gulf of Mexico
RoDa Drilling, LP
Roemer Interests, Ltd.
Roil Production Company
Rooster Oil & Gas
Rosetta Resources Offshore
Rosewood Resources, Inc.

Rosley Corporation.
Rowan Petroleum, Inc.
Royal Energy Partners
Royal Exploration Company
Royal International Petroleum
Royal Offshore, LLC
Royal Production Company
Royale Energy, Inc.
Rozel Energy, L.L.C.
RSEC, LLC
Rutherford Oil Corporation
S. Parish Oil
S2 Energy
S3 Exploration and Production, Ltd.
Saba Offshore, Inc.
Sabco Oil and Gas
Sabine Corporation
SAG Ventures Penna.
Sage Energy Company
St. Joe Minerals
SaltGrass Petroleum, Inc.
SAM Group
SAMCHULLY ENERGY
Samedan Oil Corporation
Samson Resources Company
Samsung Oil & Gas
San Jacinto Properties
San Salvador Development
San Tome' Venture
San'Doil Operating Corporation
Sandalwood Exploration, L.P.
Sandefer Oil & Gas
Sandpoint Petroleum, Inc.
SandRidge Energy, Inc.
Santa Fe Energy
Saratoga Resources, Inc.
SASI Minerals Company
Saturn Energy Company
SB Offshore Co.
SB Special Investments
SBM Operating Company
SCANA Petroleum Resources
SCHALIP MARINE, INCORPORATED
Schenley Capital, Inc.
Schneider Energy Exploration
Schroder Oil Financing
The Scotia Group
Scott 1977 Exploration
Scrouge Out Ranch
SE USA Operating
Sea Drilling Corporation
Sea Harvester Energy
Sea Robin Pipeline
Seadrift Management L.L.C.
Seafarer US Pipeline
Seafield Resources, Inc.
Seagull Energy E&P
Seahawk Oil International
Seashell Pipeline Company
Seashore Investments Management
Seastar Energy Corporation
Seavest Partners
Seawind Renewable Energy
Secured Energy Corporation
Seisgen Exploration, Inc.
SEKCO Energy, Inc.
Seminole Resources, Inc.
Seneca Resources Corporation
Sequel Energy Ventures
Sequoia Petroleum Inc.
Serendipity Exploration Corporation
Settle Oil and Gas
Seven D Oil
SEWWOT, Inc.
SF Exploration, Inc.
Sharoil, Ltd.
Sharpe Energy Company
Sharpet, Inc.
Shelby Engineering, Inc.
Shell Oil Company
Shelley Bates Investments
Shepherd Offshore Ventures
Sheridan Production Company
Shield Resources, Inc.
Shiloh Oil and Gas
SHJR Partnership
Shonk Land Company
Shore Energy Management
Shore Oil Corporation
Shoreline Offshore LLC
SHV Energy Corp.
SIDCO, Inc.
Sierra Pine Resources
Signal Oil & Gas
Sinclair Oil Corporation
Sita Energy, LLC
SJM Oil & Gas
SK Gas America
Skidmore Energy, Inc.
SM Energy Company
Smackco, Ltd.
Smith Offshore Exploration
Snyder Oil Corporation
So-He Drilling, Inc.
SOCO Offshore, Inc.
Sohio Alaska Petroleum
SOI Corporation,
Sojitz Gulf Exploration
The Solomon Corp.
Sommer Exploration Corporation
Sonat Gathering Company
Source Energy Corporation
South Coast Exploration
South Dauphin Partners
South Marsh, Inc.
South Pass Properties
South River Oil
Southbound, Inc.
Southdown, Inc.
Southeast Offshore, Inc.
Southern Gas Co.
Southern Minerals, Inc.
Southern Natural Gas
Southern Union Exploration
Southland Royalty Company
Southport Exploration, Inc.
Southwest Gas Supply
Southwestern Energy Production

SP Beta Properties
Spartan Resources Inc.
Spirit Energy Partners
SPN Resources, LLC
SPRING CREEK EXPLORATION
St. Mary Energy
St. Paul Oil
Stable Energy Corporation
The Standard Oil
Stanford Offshore Energy
Starfish Pipeline Company
States Petroleum, Inc.
Statewide Minerals, Inc.
Statex Petroleum, Inc.
Statoil USA E&P
Stauros Partners, Inc.
Stealth Oil & Gas
Steeple Court Associates
Stellor Resources, L.L.C.
Stephens Production Company
Sterling Energy, Inc.
Stingray Pipeline Company
STL Pipeline, LLC
Stock Energy, Inc.
Stone Energy Corporation
The Stone Petroleum
Stover Properties, L.P.
STRASSNER MANAGEMENT, L.L.C.
Strata Energy, Inc.
Stratco Operating Company
Strategic Energy Development
Strategic Petroleum Corporation
Strong Corporatio.
Studley Resources Corporation
Success Energy, LLC
Summit Gulf Venture
Sun Operating Limited
Sun Pipe Line
Sundown Energy, Inc.
Sunset Services L.L.C.
Superior Energy Services
Superior Resources Corporation
SWEPI LP.
Swift Energy Operating
Sydson Energy, Inc.
SynthIntel Corporation.
T N Corporation
Tammany Oil & Gas
Tana Oil and Gas
Tarpon Offshore, L.P.
Tatham Offshore, Inc.
Tauber Exploration & Production
Taurus Exploration, Inc.
Taylor Energy Company
TBG Offshore Properties
TBI Exploration, Inc.
TBP Offshore Co.
TDC Energy Corporation
TDT Diverse L.P.
Teal Exploration Company
TECO Oil & Gas
Teikoku Oil
Tejas Gas Corp.
Tengasco, Inc.
Tenkay Resources, Inc.
Tenneco Exploration, Ltd.
TEPCO Offshore, Inc.
Terra Resources, Inc.
Tesoro Petroleum Corporation
TETRA Technologies, Inc.
Texaco Exploration and Production
TEXANA PETROLEUM CORPORATION
Texas Eastern Exploration
Texas General Petroleum
Texas International Petroleum
Texas Longboat Energy
Texas Meridian Resources
Texas Oil & Gas
Texas Oil Distribution
Texas Pacific Oil
Texas Petroleum Investment
Texas Production Company
Texas Ranger, Inc.
Texas Standard Oil
Texas-Ohio Producing Company
Texas/Arkansas Petroleum Company
Texasgulf Inc.
Texfel Petroleum Corporation
Texican Energy Corporation
Texon Energy Corporation
Texona Associates Limited
TexStar North America
The Beach Energy
THE POSTON MINERAL
Thistlewood Energy, L.L.C.
Thompson Brothers Ventures
Thompson Gas Corporation
Three R Limited
Thunder Resources, L.L.C.
Tidal, Inc.,
TINCO, LTD.
Titan Offshore, Inc.
TOC-Gulf of Mexico
TOGCO Offshore Inc.
Tomkat Energy, Inc.
Tomlinson Offshore, Inc.
Torch E & P
TOTAL E&P USA
Toyota Tsusho E&P
TPC Corporation
Tractebel Calypso Pipeline
TransAtlantic Petroleum (USA)
Transco Exploration Company
Transcontinental Minerals Corporation
TransTex Resources, Inc.
Transworld Exploration and Production
Trek Resources, Inc.
Trend Exploration Limited
Trendsetter Resources, LLC
Tri-C Resources, Inc.
Tri-Union Development Corporation
Triangle Oil & Gas
Tricentrol United States
Trifecta Oil & Gas
Trinity Offshore Corporation
Trion Resources Corporation
Triton Gathering, LLC
TRIUMPH ENERGY, L.L.C.
TRT Holdings, Inc.

TRUE Oil Company
Trustee Investments, Inc.
Tsar Energy, LLC
TTAM Corporation.
Tufts Oil and Gas
TXO Production Corp.
TXP Operating Company
UEG DEEPWATER PRODUCTION
UI Energy USA
UKP Oil Inc.
Ultramar Production Company
UMC Petroleum Corporation
Unidel Oil Corporation
Union Oil Company
Unit Petroleum Company
United Meridian Corporation
United Trans-Western, Inc.
Universal Resources Corporation
Unocal Exploration Corporation
UPSTREAM ENERGY, INCORPORATED
US Mainstream Renewable
Utah International Inc.
The V-25 Company
V. S. Industries
V. Saia Energy
VAALCO Energy, Inc.
Vale & Company
Vale Energy Corporation
Valero Energy Corporation
VALEX PETROLEUM INC.
Valhi, Inc.
VALIANT ENERGY, L.L.C.
Valkyries U.S.A. Limited
Valso Investment Company
Van Petroleum, Inc.
Vanguard Offshore Corporation
Varez Exploration Company
Vastar Offshore, Inc.
Velocity Energy Offshore
Velocity Energy Partners
Venoco, Inc.
Ventura Resources, Inc.
Venture Exploration Corporation
Vermilion Bay Land
Victoria Gas Corporation
Victory Enterprises, Ltd.
Vinland Energy Capital
Vinland Energy Operations
Vintage Petroleum, Inc.
Virgin Offshore U.S.A.
Vivienne Petroleum Company
VOI, LLC.
Volvo Petroleum, Inc.
Vsea, Inc.,
W.B. Offshore, Inc.
W B Oil
W. P. Properties
Wacker Oil Inc.
Wade Offshore L.L.C.
Wadi Petroleum, Inc.
Wages Gas, LLC
Wagner Oil Company
WAH Royalty Company
Wainoco Oil & Gas
Walker Ridge Company
Walter Oil & Gas
Warren American Offshore
The Watermark Corporation
WATSON ENERGY, L.L.C.
Wentworth Energy, Inc.
Wesco Pipe Line
Wesdel 20, L.L.C.
WesPac Energy, LLC
Wessely Energy Company
West Delta Corporation
West India Line
West Lake Arthur
West Timbers Limited
Westar Drilling Venture
Westdelta Production Corporation
Western Oceanic Services
Westgate Partners.
WestHall Associates, Inc.
Westmount Resources, Inc.
Westover Oil Company
Westport Oil and Gas
Westran Corporation,WESTRAN CORPORATION
Wewoka Exploration Company
WEXCO of Delaware
WFS - Offshore
Wheatley Offshore, Inc.
Wheless Anderson L.L.C.
WHH Liquidating Trust
Whistler Energy, LLC
White Lake, Inc.
White Marlin E&P
White Oak Holdings
White Shield Exploration
White Shoal Pipeline
Whiting Oil and Gas
WHK, Inc.
WI, Inc.
Wichita Partnership, Ltd.
Willbros Energy Services
Williams Exploration Company
WillSource Enterprise, L.L.C.
Windstar Energy, LLC
Winnie Oil & Gas
Wintershall Corporation.
Winwell L.L.C.
WINWELL RESOURCES, INC.
W.O.G.C. Company.
Wolf Resources, L.P.
Wood Energy Corporation
Woodbine Investment Corporation
Woodlands Oil & Gas
Woods Petroleum Corporation
Woodsfield Exploration Inc.
Woodside Energy (USA)
Worldwide Exploration & Production
WRIGHT'S OIL & Gas
WYNN-CROSBY PARTNERS I
XH, LLC,XH LLC
XTO Energy Inc.
Yarbco, Inc.
York Resources Inc.
YPF Exploration and Production
Yuma Petroleum Corporation
Zapata Corporation

Zeneco, Inc.

Zenergy, Inc.,

Zilkha Energy Company

ZPZ Acquisitions, Inc.

Zydeco Exploration, Inc.