

**REPORT OF THE  
SECRETARY OF COMMERCE AND TRADE**

**Study of the Possibility of Exploring  
for Natural Gas in the Coastal Areas  
of the Commonwealth**

**TO THE GOVERNOR AND  
THE GENERAL ASSEMBLY OF VIRGINIA**



**HOUSE DOCUMENT NO. 22**

**COMMONWEALTH OF VIRGINIA  
RICHMOND  
2006**

January 10, 2006

The Honorable Mark Warner  
Governor of Virginia

The Honorable William J. Howell  
Speaker, Virginia House of Delegates

The Honorable John H. Chichester  
President Pro Tempore, Senate of Virginia

Dear Sirs:

This letter transmits the report of the study of the potential for natural gas development offshore of Virginia completed under House Joint Resolution 625 from the 2005 General Assembly. The report outlines the process used to study this issue, the issues raised, and recommendations for state action.

I would like to thank the members of the advisory group that assisted with this report. Although their assistance has been invaluable in understanding issues related to offshore natural gas development, the report is mine alone. The advisory group will not have seen the report until its submission to you. Accordingly, the concurrence of the advisory group should not be assumed because of their participation.

If you have any questions, please contact me at 804-225-4516 or [Michael.Schewel@governor.virginia.gov](mailto:Michael.Schewel@governor.virginia.gov).

Yours very truly,

Michael J. Schewel

Attachment

c: The Honorable Christopher B. Saxman  
Patron, HJR 625

**House Joint Resolution 625**  
**Study of Offshore Natural Gas Drilling**  
**Report of Secretary of Commerce and Trade Michael J. Schewel**  
January 10, 2006

**Executive Summary**

The Virginia General Assembly, in House Joint Resolution 625 directed the Secretary of Commerce and Trade to study the possibility of exploring for natural gas in the coastal areas of the Commonwealth. The Secretary convened an advisory group representing the natural gas industry, environmental advocacy groups, and the General Assembly to assist with this study. Although HJR 625 called for a study only of exploration for natural gas, the evidence presented to the advisory group made clear that if commercially recoverable reserves of natural gas *or oil* were found in the gas exploration process, then those reserves would in all likelihood be commercially developed. Accordingly, this report is written as if the Secretary was asked to study the possibility of the exploration, development, and production of natural gas and oil in the coastal areas of Virginia.

Natural gas supply and demand

Development of offshore energy resources is being proposed to increase domestic supplies of natural gas and petroleum in response to demand growth and diminishing production in other areas. World and domestic demands for natural gas have grown steadily over the past few decades. Natural gas consumption is projected to increase by approximately 2-3% per year into the future. Supplies of natural gas have not grown on pace with demand. This has caused the price of natural gas to increase in the United States from around \$2-4 per thousand cubic feet during the 1990s to \$8-12 per thousand cubic feet today and into the near future. The price is expected to remain high until demand is lessened or supplies are increased.

These supply and demand problems should be addressed as part of a comprehensive energy policy for Virginia and the nation. Increased energy efficiency offers the only realistic short-term opportunity to bring supply and demand into better balance. In contrast, new offshore energy exploration will not yield additional energy supplies to Virginia or the nation for at least another decade, and probably longer. Nevertheless, the diversification of our energy supplies through development of new and enhanced sources of natural gas and other fossil fuels, and research and development of new clean and alternative energy supplies must be critical parts of our long-term approach to energy problems.

## Virginia's offshore petroleum resources

The areas in Virginia being considered for offshore development are on the outer continental shelf, continental slope and continental rise. The areas are located about 50 miles offshore and beyond in the federal Exclusive Economic Zone. The area is in the United State's Minerals Management Service (MMS) Mid-Atlantic Planning Area. This area has been prohibited from development since 1990 through congressional and presidential moratoria. The Minerals Management Service manages outer continental shelf natural gas and oil development under 5-year leasing plans. The MMS is now developing the 2007-2012 leasing plan.

Virginia's outer continental shelf (OCS) areas have been subject to limited federal, state, and industry resource assessments. These studies show the geology in Virginia's OCS area to be gas prone, although the presence of economically recoverable supplies is not assured. In addition, the presence of oil cannot be ruled out. Further geophysical exploration and drilling will be necessary to determine affirmatively whether economically recoverable natural gas or oil exists. The federal MMS estimates that there may be 33.3 trillion cubic feet of natural gas and 3.5 billion barrels of oil (called undiscovered conventionally recoverable hydrocarbon resources) in the Atlantic OCS. On a *pro rata* basis, this would total to about 11.7 trillion cubic feet of gas and 1.2 billion barrels of oil in the mid-Atlantic area. Based on MMS's January 3, 2006, identification of offshore administrative boundaries, Virginia's OCS area makes up about 11% of the mid-Atlantic OCS prospective production area. This percentage is considerably less than the percentage of the OCS area that was anticipated during the advisory group discussions. Royalty estimates depend on the amount of resources recoverable and the cost of gas or oil. There could be from zero to over \$10 billion in total value of natural gas in the MMS's Virginia offshore administrative boundary areas.

## The offshore development process

Exploration and development of OCS resources takes place in four phases:

- Five-year leasing program.
- Individual lease sales.
- Exploration plan.
- Development and production plan.

Under current law, coastal states have the opportunity for input into each phase of the development process through the National Environmental Protection Act (NEPA) reviews and through Coastal Zone Management Act consistency reviews. The public also has the opportunity for comment and involvement at each of the four phases of the development process. Each phase typically takes from one to two years to complete. There are proposals being considered in the federal Congress to allow states to opt out of the federal moratorium on offshore drilling and receive a percentage of federal revenues from any resulting development.

## Environmental impact of offshore exploration and development

The Virginia Coastal Program agencies identified potential environmental impacts from natural gas exploration and development. Existing Virginia Coastal Program goals include providing for the appropriate extraction of energy and mineral resources consistent with proper environmental practices. Coastal Program agencies identified environmental issues related to exploration, offshore drilling and associated large vessel traffic, and new infrastructure and pipelines (offshore and onshore). They also identified state needs for assessment of the impact from development under the NEPA and Coastal Zone Management Act reviews. Lastly, the agencies identified data gaps to be addressed during any evaluation of offshore exploration and development.

## Other issues

Offshore exploration and development could spur increased economic activity in the Hampton Roads area. Local governments would have to address the effects of near and onshore development associated with the offshore activities, including potential impacts on tourism. Any development would need to account for impacts on civilian and military shipping. Virginia would need to be particularly careful that offshore development would not negatively affect military facilities in Hampton Roads.

## Experience in other areas with offshore natural gas development

Analysis of experience with offshore hydrocarbon exploration and development in other areas may help Virginia assess potential impacts on the Commonwealth. In 1990, North Carolina completed an extensive environmental impact review of the Manteo, North Carolina proposed exploration well. North Carolina found the development to be inconsistent with its Coastal Zone Management Plan.

There is a mixed history of environmental protection and local economic impact from development in the U.S. Gulf of Mexico waters and in other countries. In recent times, the industry has been able to operate safely in areas with harsh weather, such as the North Sea and Georges Bank, with a very low incidence of environmental impacts. There were only a limited number of incidents causing minor environmental damage from the 2004 and 2005 Gulf of Mexico hurricanes.

## Conclusions and Recommendations

The current market conditions for natural gas show there is an imbalance between natural gas demand and the supplies needed to support Virginia's and the nation's economy. While this study finds that Virginia OCS offshore exploration of natural gas and, perhaps, other hydrocarbon resources can be safely undertaken with the proper controls, such activity must be one part of a comprehensive response to our energy needs. Improved energy efficiency – better and more prudent use of our existing energy resources -- is our only viable short-term means of reducing our nation's need for new energy supplies. In the medium to long term, we must supplement our drive for greater

efficiency with a continued effort to diversify and enhance our energy supplies through development of new environmentally responsible sources of and distribution infrastructure for natural gas, electricity and other fossil fuels, and the development of alternative energy sources that do not rely on fossil fuels.

Therefore, Virginia, if given the opportunity, should allow exploration of natural gas in its OCS areas contingent on the conditions set forth below being satisfied. This recommendation is being made in full recognition that recoverable reserves of gas and oil may never be found in Virginia's OCS areas. Accordingly, the Commonwealth should not have unrealistic expectations about the likelihood or the amount of potential revenue or economic activity to be derived from the development of such potential reserves.

- Virginia and the nation develop a broad-based energy policy with energy efficiency as the backbone of our response to energy problems, coupled with increasing supplies of conventional and alternative energy resources.
- Ample opportunity is provided for public involvement in the environmental assessment process for offshore energy development. The environmental impact assessment process for the initial exploration efforts in Virginia OCS areas should follow the process used to evaluate environmental issues related to the Manteo, North Carolina proposed exploration well to allow adequate time to evaluate issues related to such development. Any such environmental assessment should assume exploration and development of both natural gas and oil.
- If commercially recoverable reserves of oil are discovered, Virginia must more carefully consider the increased risk of a large oil spill. Therefore, additional environmental assessment, with appropriate opportunities for public involvement, of the potential for and consequences of oil spills and ways to mitigate the risk of spills must be completed. This should include assessment of the oil spills arising from Hurricanes Katrina and Rita and other incidents in the Gulf of Mexico and from offshore oil production in the North Sea, Australia, and Nova Scotia. This analysis should be an integral part of the environmental assessments in phase 4 of the OCS development process.
- The final decision whether to allow exploration and production of hydrocarbons in Virginia OCS areas must be contingent on the MMS and lease holders showing that the development will be undertaken in a manner protective of the environment and public safety.
- Any offshore operations must use best available technologies and practices to control operations and minimize risks to the environment and public safety.
- No wells should be drilled closer than 50 miles to the Virginia shoreline.
- Any development of pipelines or support facilities in state waters or onshore areas must be consistent with Virginia's Coastal Zone Program requirements.
- No onshore facilities should be located on Virginia's Eastern Shore.
- All facilities located on- or near-shore must be consistent with local zoning and land use plans and not conflict with other land uses near the facilities. Facilities should not be located to intrude on areas critical for tourism or military operations in the region.

- Revenue from OCS leases must be shared with the Commonwealth and affected localities. Revenues should support state response to other energy and environmental impacts, such as the cleanup of Chesapeake Bay and research into alternative energy sources.

## Introduction

The Virginia General Assembly, in House Joint Resolution 625 introduced by Delegate Christopher B. Saxman, directed the Secretary of Commerce and Trade to study the possibility of exploring for natural gas in the coastal areas of the Commonwealth. The resolution is included as attachment 1.

This study resolution was the result of the deliberations of the Joint Subcommittee Studying Manufacturing Needs and the Future of Manufacturing in Virginia. This Joint Subcommittee addressed the effects of high natural gas costs on manufacturers. They heard that one possible way to mitigate the high costs would be to develop new, nearby sources of supply. Offshore development, if natural gas is found and could be economically produced, could provide such a new source of supply.

Secretary of Commerce and Trade Michael Schewel convened an advisory group to assist with identification and assessment of issues related to offshore natural gas development. The advisory group included:

- The Honorable Tayloe W. Murphy Jr., Secretary of Natural Resources
- The Honorable Frederick M. Quayle, Senate of Virginia
- The Honorable Mary Margaret Whipple, Senate of Virginia
- The Honorable Kirkland M. Cox, Virginia House of Delegates
- Dr. Annette Guiseppi-Elie, DuPont, representing the Virginia Chemistry Council
- James R. Kibler, AGL Resources
- Ari Lawrence, Surfrider Foundation
- Bruce McKay, Dominion Resources
- Nikki Rovner, The Nature Conservancy
- Michael Town, Virginia Chapter, Sierra Club
- Brett Vassey, Virginia Manufacturing Association

The advisory group met three times to consider issues related to offshore natural gas development. The advisory group heard presentations from both outside experts and members of the group. Meeting agendas are included in attachment 2. The presentations covered the following topics:

- Natural gas supply and demand.
- Previous studies of Virginia offshore petroleum resources.
- Legal authority for offshore development.
- State, federal, and private roles in the exploration and development process.
- Environmental impact assessments of offshore exploration and development – process and content of reviews.
- Environmental impact review of the Manteo, North Carolina proposed well.
- The Virginia Coastal Program – Agency-identified issues.
- Civilian and military shipping.
- Tourism.
- Local government/community development impacts.



- Potential royalties.
- Experience in other areas with offshore natural gas development.
- Lessons from Gulf of Mexico hurricanes.

Although the advisory group met and discussed these and other issues, this report was prepared by Secretary Schewel and the concurrence of the members of the advisory group should not be assumed because of their participation in this advisory group.

## **Assessment of Issues by the Advisory Group**

### Natural Gas Supply and Demand

Questions about drilling for hydrocarbons in outer continental shelf waters are often raised when assessing the need for natural gas and oil to support our nation's economy. World natural gas use has more than doubled from 1970 through 2001, from about 36 trillion cubic feet per year to over 89 trillion cubic feet per year. The U.S. Department of Energy, Energy Information Administration, estimates that world use of natural gas will grow by an average of 2.2% per year into the future.<sup>1</sup>

United States natural gas consumption trends have differed from international trends. Consumption in the United States lessened through the 1970s and 1980s, then grew through the 1990s and 2000s from 19.2 trillion cubic feet to 23.3 trillion cubic feet per year.<sup>2</sup> The Energy Information Administration estimates natural gas consumption will grow by 2-3% per year through 2020.<sup>3</sup>

Domestic production was able to supply approximately 92% of natural gas used in the United States in 1990. Demand growth has outstripped production, so that domestic production was able to supply only 83% of demand by 2001.<sup>4</sup> Imports more than doubled over this time. Most imports come via pipeline from Canada. In recent years, there has been an increasing amount of liquefied natural gas (LNG) imported from Caribbean, African, and Middle Eastern countries.<sup>5</sup>

---

<sup>1</sup> Source: U.S. Department of Energy, Energy Information Administration, International Energy Outlook, 2004 ([http://www.eia.doe.gov/pub/pdf/international/0484\(2004\).pdf](http://www.eia.doe.gov/pub/pdf/international/0484(2004).pdf))

<sup>2</sup> Source: U.S. Department of Energy, Energy Information Administration, International Natural Gas Consumption. (<http://www.eia.doe.gov/emenue/international/gasconsumption.html>)

<sup>3</sup> Estimate is derived from U.S. Department of Energy, Energy Information Administration, Annual Energy Outlook, 2005, Market Trends, Natural Gas Demand and Supply (<http://eia.doe.gov/oiaf/archive/aeo05/gas.html>)

<sup>4</sup> Source: U.S. Department of Energy, Energy Information Administration, U.S. Dry Natural Gas Production (MMcf), annual table. (<http://tonto.eia.doe.gov/dnav/ng/hist/n9070us2a.htm>) and U.S. Natural Gas Imports (MMcf), annual table (<http://tonto.eia.doe.gov/dnav/ng/hist/n9100us2a.htm>)

<sup>5</sup> Source: U.S. Department of Energy, Energy Information Administration, U.S. Natural Gas Imports by Country, ([http://tonto.eia.doe.gov/dnav/ng/ng\\_move\\_imp\\_c\\_s1\\_a.htm](http://tonto.eia.doe.gov/dnav/ng/ng_move_imp_c_s1_a.htm))

In Virginia, natural gas consumption followed a similar trend, growing from 137 trillion cubic feet in 1970 to 238 trillion cubic feet in 2001.<sup>6</sup> Natural gas provides approximately 11% of total energy use in Virginia.<sup>7</sup> While Virginia now produces over 85 billion cubic feet of natural gas per year from the Southwestern Virginia coalfield counties, this is equal to only 32% of state use.<sup>8</sup> Virginia is a net importer of natural gas.

The increase in demand for natural gas coupled with limited growth in domestic supplies has led to an increase in costs of natural gas. Prices averaged from \$2-4 per million BTUs (thousand feet of natural gas) through the 1990s. Prices peaked to approximately \$9 per million BTUs in the winter of 2001 before settling back to the \$2-4 per million BTU range in 2002. Since then the price has steadily risen. Prices were running \$6-8/million BTUs from 2003 through early 2005. After gas supply interruption caused by hurricanes in the Gulf of Mexico, prices climbed to over \$14 per million BTUs before recently settling down to the \$9-11 per million BTU range. Natural gas is estimated to range from \$9-12 per million BTUs for the next few years.<sup>9</sup>

Natural gas prices differ in regions of the United States. Prices are generally lower close to production areas. Prices are generally higher in areas at the end of pipeline systems. This has led to prices being higher in the Mid-Atlantic and Northeast United States than in the Gulf of Mexico and mid-continent regions. In 2004 and 2005, natural gas in the Mid-Atlantic region was priced 5% to 10% higher than at the Henry Hub in Louisiana, and 20% to 50% higher than in the Rocky Mountain and Mid-Continent regions.<sup>10</sup>

High prices of natural gas could be mitigated by decreased demand or increased supply. These supply and demand problems should be addressed as part of a comprehensive energy policy for Virginia and the nation. Increased energy efficiency offers the best short-term opportunity to bring supply and demand back in balance. For the longer term, options include increased energy efficiency and diversification of energy supplies through development of alternative non-fossil fuel sources of energy, increased supplies of domestic natural gas, increased imports of natural gas or liquefied natural gas, increased development of other traditional energy sources, and improvements to our energy delivery infrastructure. This study looks at the potential to increase domestic supplies.

---

<sup>6</sup> Source: U.S. Department of Energy, Energy Information Administration, Natural Gas Consumption by End Use, Virginia, annual. ([http://tonto.eia.doe.gov/dnav/ng/ng\\_cons\\_sum\\_dcu\\_SVA\\_a.htm](http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_SVA_a.htm))

<sup>7</sup> Source: Calculated from data on U.S. Department of Energy, Energy Information Administration, Natural Gas Summary, annual ([http://tonto.eia.gov/dnav/ng/ng\\_sum\\_lsum\\_dcu\\_SVA\\_a.htm](http://tonto.eia.gov/dnav/ng/ng_sum_lsum_dcu_SVA_a.htm))

<sup>8</sup> Source: Annual natural gas production data reported by Virginia natural gas operators to the Department of Mines, Minerals and Energy.

<sup>9</sup> Natural gas prices are spot prices at the Henry Hub, data from Reuters, Wall Street Journal, Oil and Gas Journal, various tables.

<sup>10</sup> Source: Calculated from data presented to the advisory group to the HJR 625 study by Jim Kibbler, AGL Resources, October 26, 2005.

## Outer Continental Shelf Geographic Scope

House Joint Resolution 625 (2005) instructs the Secretary of Commerce and Trade to “study the possibility of exploring for natural gas in the coastal areas of the Commonwealth.” Existing state legislation prohibits drilling for oil or gas in the Chesapeake Bay and its tributaries; furthermore, studies have shown that geologic conditions are unfavorable for oil or gas in other state waters,<sup>11</sup> which extend seaward for three miles from Virginia’s coastline. Therefore, for the purposes of this study, “coastal areas” are considered to be federal waters beyond the three-mile state limit.

As for state lateral boundaries between Virginia and neighboring states, there are currently no formal divisions of Atlantic federal waters into state areas. Approximate acreage calculations in this report are based on the assumption that state offshore boundaries will extend east along lines of latitude.

## Virginia’s Outer Continental Shelf

The seafloor off of Virginia’s coast slopes gently eastward for about sixty miles at an average gradient of about ten feet per mile. This area is called the “continental shelf.” At a water depth of 650 feet, the slope of the seafloor steepens rapidly to a gradient of about 200 feet per mile. This area is called the “continental slope”. At a water depth of about 10,000 feet, the slope becomes gentle again, forming the “continental rise” (Figure 1).

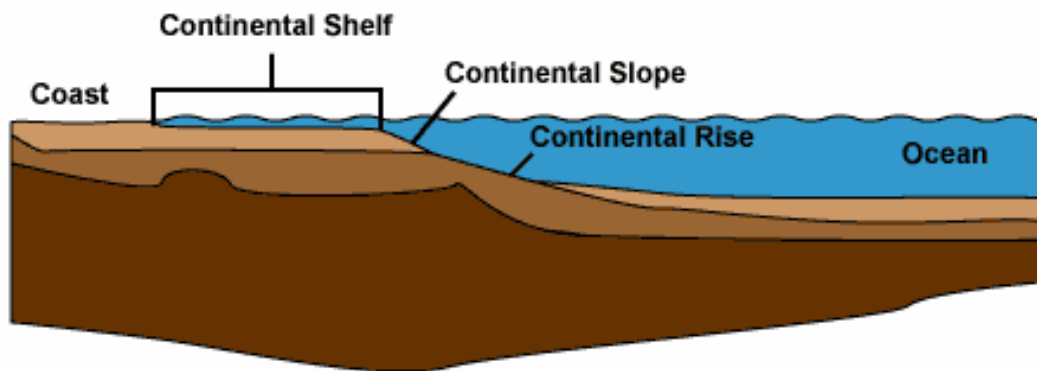


Figure 1. Schematic cross section showing the continental shelf, slope, and rise. Source: <http://www.onr.navy.mil/focus/ocean/regions/oceanfloor2.htm>, Office of Naval Research, U.S. Navy, Science & Technology Focus.

<sup>11</sup> Virginia Division of Mineral Resources Publication 73, *Geology and Petroleum Potential of Mesozoic and Cenozoic Rocks, Offshore Virginia*, by Kenneth C. Bayer and Robert C. Milici, 1987; and U.S. Department of Interior, Minerals Management Service, 2000 *Assessment of Conventionally Recoverable Hydrocarbon Resources of the Gulf of Mexico and Atlantic Outer Continental Shelf as of January 1, 1999*. Both of these sources indicate that strata with potential for hydrocarbon resources terminate westward before they reach state waters.

Mineral interests in offshore waters beyond the state's three-mile limit are managed by the Minerals Management Service (MMS) in the U.S. Department of the Interior. Created in 1982, the MMS performs studies, leases mineral rights, and enforces federal regulations dealing with mining and drilling. The offshore area managed by the MMS covers the physical continental shelf, the continental slope and parts of the continental rise, but for regulatory purposes the entire area is termed the "Outer Continental Shelf" (OCS). The MMS has divided the OCS into twenty-six planning areas. Virginia's offshore comprises approximately 25% of the Mid-Atlantic Planning Area.

### Legal and Regulatory Status<sup>12</sup>

#### *International Law*

As early as the 17<sup>th</sup> Century, civilized nations attempted to reach agreement on the control of the seas. The "freedom of the seas" doctrine held that ships of any nation might travel through international waters unhampered; it also guaranteed the right of neutral shipping in wartime except where blockades were established. Coastal nations' sovereign rights to control offshore waters extended only to three miles, approximately the range a cannon could fire from a coastal fort.

After World War II, nations' individual territorial claims ranged from 12 to 200 miles offshore. In 1958, the international Convention on the Continental Shelf introduced a broad definition of "continental shelf" and granted to coastal countries "sovereign rights for the purpose of exploring it and exploiting its natural resources." The question of offshore sovereignty wasn't settled until the Third U.N. Conference on Law of the Sea (1982), which limited territorial waters to 12 miles. It also defined "Exclusive Economic Zones", extending out to 200 miles, for the control and exploitation of natural resources. Beyond 200 miles, coastal nations can petition a United Nations commission for use of resources out to a limit of 350 miles.

#### *U.S. Law*

In 1945, President Truman unilaterally claimed all natural resources on the U.S. continental shelf. In 1953, in response to overtures from coastal states, Congress passed the U.S. Submerged Lands Act, which limited state waters to three miles; the federal government would control resources beyond three miles. That same year, Congress also passed the U.S. Outer Continental Shelf Lands Act (OCSLA), in recognition of the need for expeditious and orderly development of offshore resources. It encouraged the use of technology to minimize wasteful and damaging incidents, such as fires, blowouts, and spills. It also assigned responsibility for offshore minerals management to the Secretary of Interior.

Responding to environmental concerns and the energy crisis of the early 1970s, Congress made significant amendments to OCSLA in 1978. The new provisions expedited development to reduce dependence on foreign oil, added environmental

---

<sup>12</sup> Much of the information in this section is derived from U.S. Department of Interior, Minerals Management Service, OCS Lands Act History (<http://www.mms.gov/aboutmms/OCSLA/ocslahistory.htm>)

protection requirements, and assured that coastal states had an opportunity to participate in OCS policy decisions. The amendments also established the Oil Spill Liability Fund. Funded by a five-cents-per barrel fee on domestic and imported oil, the fund is designed to pay for spill cleanups when responsible parties are unknown or refuse to pay. In 1985, OCSLA underwent another round of amendments which provided for sharing of a portion of receipts from OCS leasing and production with coastal states.

A partial list of other federal laws governing offshore operations includes the National Environmental Policy Act (NEPA), the Endangered Species Act, the Coastal Zone Management Act, the Clean Water Act, the Ports and Waterways Act, the Clean Air Act, the Marine Mammal Protection Act, the Fishery Conservation and Management Act, and the National Historic Preservation Act.

### Moratoria on Leasing and Drilling

In 1969, drillers lost control of a well off the coast of Santa Barbara, California, resulting in the release of 200,000 gallons of oil. The oil slick washed up along 35 miles of coastline, raising environmental concerns about offshore drilling nationwide.<sup>13</sup> Partly in response to these concerns, Congress enacted the first moratorium on offshore leasing and drilling in 1982 to protect certain areas offshore of California. Two years later, the moratorium was expanded to include the North Atlantic and parts of the eastern Gulf of Mexico. In 1990, President George H.W. Bush issued an executive order to the Department of the Interior barring any further preleasing or leasing activity on the entire Outer Continental Shelf, except for certain parts of the Gulf of Mexico and Alaska. Originally set to expire in the year 2000, President Clinton extended the moratorium to 2012.<sup>14</sup> The Mid-Atlantic Planning Area, which includes Virginia, is covered by this moratorium, as well as annual budgetary prohibitions implemented through Congressional appropriations to the Department of Interior.

### Energy Policy Act of 2005 Resource Assessment Report

A provision of the Energy Policy Act of 2005 requires the Department of the Interior to produce an analysis and inventory of oil and natural gas resources of the Outer Continental Shelf. The Act was passed in August 2005, and required DOI to complete the study within six months. The Act did not, however, provide for appropriation of additional funds to carry out the study. The MMS was already mandated to produce such an assessment every five years and was planning to release one based on existing data at the end of 2005 or early in 2006. It is anticipated that this planned release will fulfill the mandate of the Energy Policy Act.

---

<sup>13</sup> Source: Proceedings, 64<sup>th</sup> Annual Meeting of the Association of Pacific Coast Geographers ([http://www.geog.ucsb.edu/~jeff/sb\\_69oilspill/69oilspill\\_articles2.html](http://www.geog.ucsb.edu/~jeff/sb_69oilspill/69oilspill_articles2.html))

<sup>14</sup> Source: Congressional Research Service Issue Brief for Congress, Outer Continental Shelf: Debate Over Oil and Gas Leasing and Revenue Sharing ([http://www.opencrs.com/rpts/IB10149\\_20051027.pdf](http://www.opencrs.com/rpts/IB10149_20051027.pdf))

## MMS 5-year plan for 2007-2012

Prior to 1978, OCS leasing programs were issued at the discretion of the Secretary of the Interior, generally in response to industry interest. The 1978 amendments to OCSLA specified the development of systematic five-year leasing programs. Each five-year program consists of a schedule of offshore lease sales including the scope and timing of leasing activity that is determined to best meet national energy requirements.

The five-year programs are developed by the MMS, subject to federal policy and regulations, with input from government agencies, industry, and the public. Because of the moratoria in place, the current program, which expires in 2007, does not include any lease sales in the Atlantic OCS. Recently the MMS requested scoping comments for consideration in preparation of its 2007-2012 five-year program. The MMS invited comments on a variety of issues, including the possibility of gas-only leasing and whether existing moratoria should be modified.

The MMS received over 12,000 comments on the proposed five-year program: 67 from federal, state and local government agencies; 90 from environmental and special interest groups; 45 from the gas and oil industry; and over 11,000 from citizens.<sup>15</sup> Public comments were received from all fifty states; most coastal state governments also commented. A MMS summary indicates that 77% of the comments were in favor of expanded offshore drilling. The petroleum industry came out strongly in favor of lifting the moratoria and including larger areas of the OCS in future lease sales. They also commented strongly against the possibility of gas-only leasing, citing both technical and economic concerns.

Comments by Virginia state agencies were compiled and submitted by the Department of Environmental Quality (DEQ). The comments noted that the Virginia Coastal Program contains a goal “To ... provide for appropriate extraction of energy and mineral resources consistent with proper environmental practices.” Agencies also expressed concern about potential impacts on the environment, fishing, maritime shipping, air quality, and endangered species. Concerns were also expressed about the adequacy of the existing environmental review process to fully address issues raised by coastal states. Some felt that the existing process did not allow adequate time for state agencies to develop the required expertise needed to consider the impacts of an industry that would be completely new to Virginia. Some agencies provided lists of existing research that could be used in environmental reviews and identified gaps in existing knowledge that called for future research. Agency comments also noted that, while the MMS is required to consider and address recommendations from the states, they are not required to implement those recommendations. The role of states in the environmental review process is described below under the heading, “Exploration and Development Process”.<sup>16</sup>

---

<sup>15</sup> Source: Presentation by Renee Orr, MMS Five-Year Program Manager, to OCS Policy Committee, November 16, 2005.

<sup>16</sup> Letter from Ellie Irons, Virginia Department of Environmental Quality to Renee Orr, MMS, October 6, 2005.

## Geology and Resources: Petroleum Systems

In order to understand the nature and origin of a natural gas deposit, we must understand the elements and processes of a petroleum system. A petroleum system is a geologic environment in which oil and or gas is formed and trapped. A typical petroleum system is a thick section of sedimentary rocks that has experienced geologically mild deformation and burial. A generic petroleum system model is shown in Figure 2. Required elements include an organic-rich source rock, a permeable reservoir rock, an impermeable seal above the reservoir rock, a migration path, and a trap within which a significant volume of gas can accumulate.

Black shale is the most common source rock because it is rich in organic material, the precursor of fossil fuels. Sandstone and limestone are common reservoir rocks because they are commonly porous and permeable, both necessary attributes for a reservoir rock. Shale also commonly provides the impermeable seal. With the appropriate elements in place, the following processes must occur. Oil and/or gas must be generated in the source rock formation. The temperature under the earth's surface increases the deeper one goes underground. Depending on the type of organic material within the source rock, oil typically is generated within a window of about 120 degrees Fahrenheit (F) to 350 degrees F. Above 350 degrees F, oil is thermally cracked to produce light gases (i.e. natural gas). At shallower depths and lower temperatures, gas may also be generated biogenically, through the action of bacteria within the source rock.

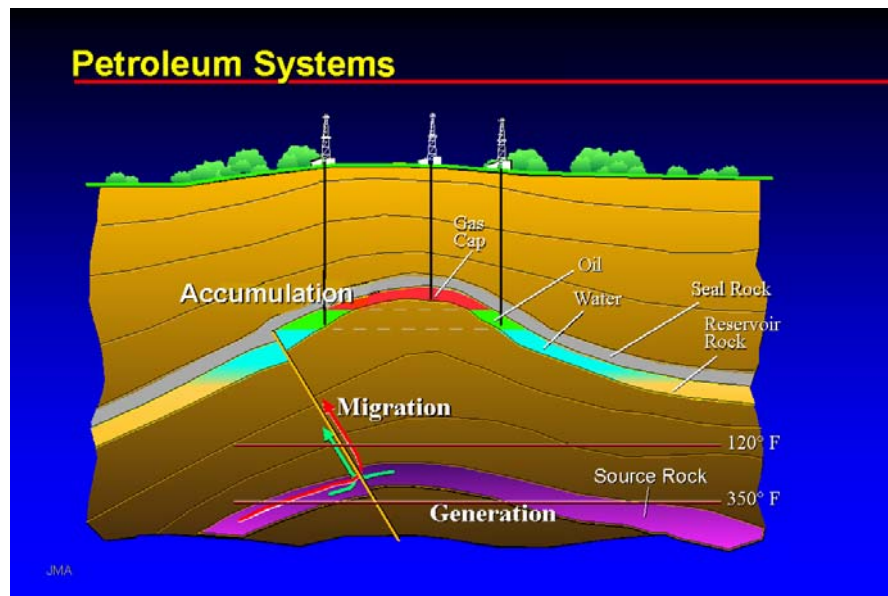


Figure 2. Generic petroleum system model. Source: [http://www.aapg.org/slide\\_bank/armenrout\\_john/index.shtml](http://www.aapg.org/slide_bank/armenrout_john/index.shtml) , American Association of Petroleum Geologists, Slide Resources

Once generated, oil and gas need a path to permit upward flow called migration (usually along faults, fractures, or other permeable zones) until their movement is stopped by the combination of the trap (in this case a fold in the layers of rock, as seen in Figure 2) and the impermeable seal, allowing accumulation within the reservoir rock to begin.

Do these ingredients exist beneath the seafloor offshore Virginia? To answer this question, previous geological studies and testing performed offshore Virginia are reviewed below.

### Previous studies of Virginia offshore resources

#### *Industry Activity*

In the early 1970s, the U.S. Department of Interior's U.S. Geological Survey (USGS) acquired and interpreted seismic data in the Atlantic OCS. Between 1976 and 1978, five Continental Offshore Stratigraphic Test (COST) wells were drilled for scientific research by an industry consortium. The seismic data, 17 lines in total, and the data from the wells enabled the USGS to describe the geologic framework of the Atlantic OCS.

In 1976, the U.S. Department of Interior's Minerals Management Service (MMS), and predecessor agencies, began a program of competitive leasing of offshore acreage by petroleum companies. Between 1976 and 1984, 238 five-thousand-acre blocks were leased, and 46 wells were drilled exploring for hydrocarbons in the Atlantic OCS.<sup>17</sup> Of the 46 wells drilled, five encountered natural gas, and three of these also encountered condensate, a liquid hydrocarbon that condenses from natural gas as it comes to the surface and cools. These five wells were located off New Jersey's coast. All 46 wells were plugged and abandoned. No economically viable quantities of hydrocarbons were discovered.

In addition to the wells actually drilled, a consortium of eight oil companies planned to drill a large natural gas prospect 45 miles northeast of Cape Hatteras, North Carolina, in 1991. Called the "Manteo Prospect", the proposed well targeted a large buried Jurassic-age limestone reef; it was to have been drilled to 14,000 feet. The prospect reportedly held as much as five trillion cubic feet of natural gas.<sup>18</sup> During the environmental review process, the state of North Carolina determined that the consortium's exploration plan and the EPA's discharge permit were inconsistent with its Coastal Zone Management Program. The well was never drilled, and the last OCS lease off of North Carolina was relinquished in 2000.

Figure 3 shows the eastern coast of the U.S., the distribution of the wells drilled between 1976 and 1984, and the location of the shelf edge (blue line) and base of the continental slope (purple line). All but five of these wells were drilled on the continental

---

<sup>17</sup> Source: U.S. Department of Interior, Minerals Management Service, Atlantic OCS Lease Status Information (<http://www.gomr.mms.gov/homepg/offshore/atlocs/atlleas.html>)

<sup>18</sup> Source: U.S. Department of Interior, Minerals Management Service, Fourth Symposium on Studies Related to Continental Margins, 1997 ([http://www.mms.gov/revaldiv/pdf\\_file/margin.pdf](http://www.mms.gov/revaldiv/pdf_file/margin.pdf))



shelf, in water depths less than 650 feet. This was probably due to the drilling technology available at that time and the poor economics of drilling in deep waters offshore the Atlantic coast.

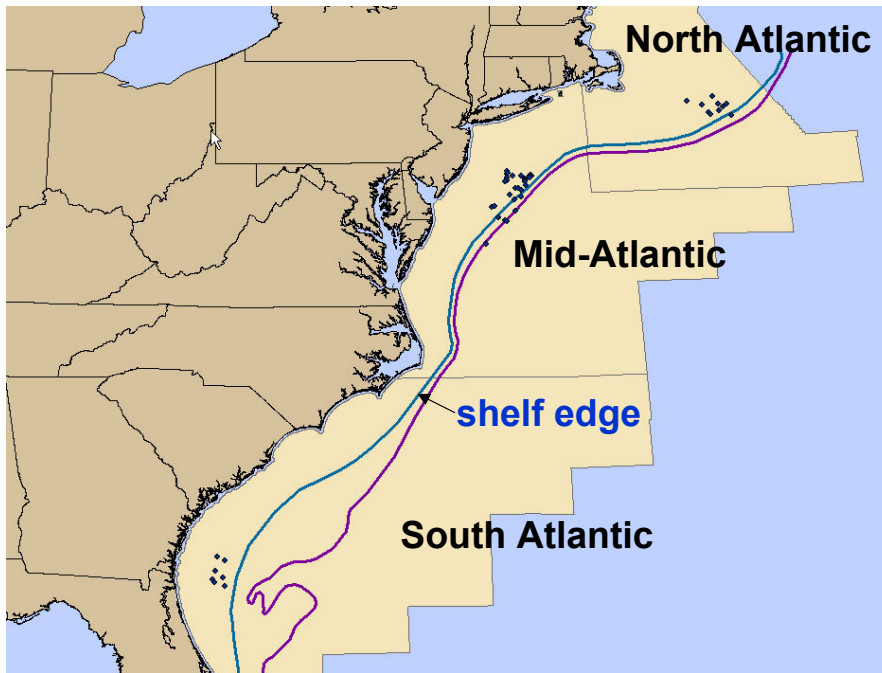


Figure 3: MMS Planning Areas and Atlantic OCS wells. Source: data from Minerals Management Service: 2000 Assessment of Conventionally Recoverable Hydrocarbon Resources of the Gulf of Mexico and Atlantic Outer Continental Shelf as of January 1, 1999

#### *Virginia Geological Survey study*

In 1987, the Virginia Department of Mines, Minerals and Energy's Division of Mineral Resources (DMR), which serves as Virginia's Geological Survey, published "Geology and Petroleum Potential of Mesozoic and Cenozoic Rocks, Offshore Virginia" (Publication 73, by Kenneth C. Bayer and Robert C. Milici). For this report, the 17 seismic lines acquired by the USGS in the 1970s were evaluated, as well as data from two of the COST wells and five industry wells. Major structural and stratigraphic features of the area offshore Virginia were described in this publication.

The conclusion drawn regarding petroleum potential was stated in Part D, page 1: "The probability of the Virginia continental margin containing commercially recoverable quantities of oil and/or gas is considered to range from fair (moderate) to poor (low)." In this publication, it was reported that the source rocks evaluated by some of the wells in the Atlantic OCS were both oil and gas prone, but thermally immature. The Shell 93-1 well, drilled offshore Virginia, encountered low source-rock quality strata that was thermally mature. The authors concluded that satisfactory reservoir rock formations are present, and rock formations that form traps and seals are present. The hydrocarbon

migration route was not discerned from the available data since no accumulations of hydrocarbons were found. The sedimentary section in the Atlantic OCS reaches a thickness in excess of 40,000 feet. Since the deepest well drilled as of October 23, 1984, was 21,872 feet, only one-half of the depth of the basin has been tested. Presence, quality, and thermal maturity of untested source rock formations cannot be known.

#### *Federal studies*

The most recent assessment of natural gas resources in the OCS was completed by the MMS in 2000<sup>19</sup> based on five possible gas plays. “Plays” are conceptual models for styles of hydrocarbon accumulations and are defined primarily on the basis of the geologic parameters that are responsible for the hydrocarbon accumulation. Five of the plays defined in the Atlantic OCS were designated as “undiscovered conventionally recoverable hydrocarbon resources,” or UCRR. All of the estimates are considered undiscovered resources as no economic accumulation has been tested to date. The “conventionally recoverable” resource estimate assumes that present or reasonably foreseeable industry-standard drilling and production technology will be used. Figure 4 illustrates the distribution of the prospective plays in the Atlantic OCS as defined by the MMS in 2000, with the locations of the wells drilled to date, and the three MMS planning areas, North Atlantic, Mid-Atlantic, and South Atlantic. The UCRR defined by the MMS are distributed over an area 30 to 140 miles from the coast in water depths ranging from 80 to 10,000 feet. The UCRR area off of Virginia’s coast is generally located between approximately 50 and 140 miles from its shores.

The prospective plays contain both clastic and carbonate rock formations. Clastic rocks, such as sandstone and shale, are sedimentary rocks whose chief constituent is grains of silicate minerals or broken fragments of preexisting rocks. Carbonate rocks, such as limestone and dolomite, are sedimentary rock whose chief constituent is calcite (calcium carbonate), a mineral derived from seawater. The prospective plays include both structural traps, in which hydrocarbons are trapped in the high spots of folded strata, and stratigraphic traps, in which the hydrocarbons are trapped where reservoir rocks pinch out against sealing strata. The potential for natural gas appears to be higher than that for oil based on well results and geochemical analyses to date.

---

<sup>19</sup> Source: U.S. Department of Interior, Minerals Management Service, 2000 Assessment of Conventionally Recoverable Hydrocarbon Resources of the Gulf of Mexico and Atlantic Outer Continental Shelf (<http://www.gomr.mms.gov/homepg/offshore/gulfocs/assessment/assessment.html#2000>)

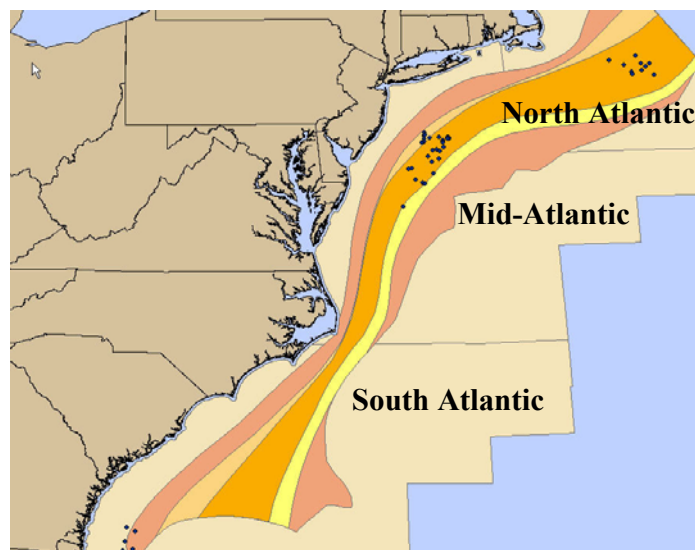


Figure 4: Hydrocarbon play extents defined by the MMS in 2000. Source: data from Minerals Management Service: 2000 Assessment of Conventionally Recoverable Hydrocarbon Resources of the Gulf of Mexico and Atlantic Outer Continental Shelf as of January 1, 1999.

The 2000 Assessment published by the MMS explained that the size distribution of hydrocarbon accumulations within a productive province is skewed. There typically are many small accumulations and very few large ones. However, the large deposits contain the majority of the resources. The MMS uses the distribution of the number of known fields in each size category to generate a predictive computer model, which allows for the estimation of resources in unproven provinces. This is called a probabilistic method, and it involves the recognition of uncertainty in trying to predict undiscovered resources. This method relies on the technical judgments of geoscientist teams working with other assessors, such as economists. An effective assessment of undiscovered petroleum can be developed from estimates of the size distribution of the potential fields in the play, the distribution of the total number of fields in a comparative area, and an assessment of the appropriate probability of hydrocarbons.

Parameters that go into the resource estimation process, and the resource estimates themselves, are calculated in this probabilistic approach to yield a number of possible future outcomes. Generally, the mean of the probabilistic distribution will be included in this report. It is also worth noting that these resource estimates are made without consideration of economic constraints.

In 2000, the MMS assessment for UCRR in the Atlantic OCS Region ranged from 1.2 billion barrels (Bbbl) of oil and 16.12 trillion cubic feet (Tcf) of gas to 3.7 Bbbl of oil and 43.5 Tcf of gas. The mean was 2.3 Bbbl and 27.7 Tcf. The Mid-Atlantic assessment mean was 9.72 Tcf gas and 0.81 Bbbl oil. Based on the MMS's January 3, 2006, identification of offshore administrative areas, about 11% of the Mid-Atlantic resources identified can be attributed to offshore Virginia, or about 1.1 Tcf gas and about 0.11 Bbbl

oil. This percentage is considerably less than the percentage anticipated during the advisory group discussions.

In 2003, the MMS published an abbreviated update to the resource assessment of OCS Regions.<sup>20</sup> For the Atlantic OCS, the MMS considered the results of recent drilling offshore Canada and other factors. The results of this activity caused the MMS to lower the risk on some of the previously defined plays and to add new plays. The result was that the MMS assessment increased for the Atlantic OCS. The estimated mean oil resources increased by 52 percent, and the estimated mean gas resources increased 19 percent. The mean assessment for UCRR in the Atlantic OCS Region increased to 3.5 Bbbl oil and 33.3 Tcf gas, which amounts to about a half year of U.S. oil consumption and one and a half years of natural gas consumption (according to U.S. Energy Information Administration data for 2004). The MMS did not subdivide the resource assessment into the three planning areas for the Atlantic Region. Based on calculated percent increases over the 2000 total resource estimates, the mean resource assessment for the Mid-Atlantic planning area may have increased to 11.68 Tcf and 1.23 Bbbl in 2003.

On January 3, 2006, the MMS issued a public notice stating that it had completed development of offshore administrative boundaries between states. Previously referred to as “state lateral boundaries”, the boundaries are divisions of the federal Outer Continental Shelf (OCS) into areas assigned to adjacent coastal states for Department of Interior planning, coordination, and administrative purposes. Such boundaries had previously been established for the Gulf of Mexico and parts of the U.S. Pacific coast, but none had been established for the Atlantic.

The notice listed benefits of having these boundaries in place, including: enhancing the Secretary of Interior’s ability to identify which states have the most interest in proposed commercial activities in the Federal OCS; assisting in determining “affected state” status under the Coastal Zone Management Act and the OCS Lands Act; providing a more accurate basis for the Secretary to consider a state’s request to analyze potential leasing off its shores; assisting in comparative analysis to determine “an equitable sharing of developmental benefits and environmental risks among regions”; and helping define appropriate consultation and information sharing with states.

The MMS used the “equidistance” method to determine the boundaries. By this method, a boundary line is drawn equally distant from the seaward boundaries of the adjacent states. The MMS cited the Act of 11 February 1805, 2 Stat. 313, which used this method for dividing public lands, and the decision of the U.S. Baseline Committee, which directed all federal agencies to apply this standard in dealings with coastal states. They also cited Article 6 of the Geneva Convention on the Continental Shelf, which was ratified by the U.S. Senate in 1961.

---

<sup>20</sup> Source: U.S. Department of Interior, Minerals Management Service, Assessment of Undiscovered Technically Recoverable Oil and Gas Resources of the Nation’s Outer Continental Shelf, 2003 Update (<http://www.mms.gov/revaldiv/PDFs/2003NationalAssessmentUpdate.pdf>)

A portion of the map used by the MMS to illustrate the new boundaries is shown in Figure 5. Due to the shape of Virginia's coastline, the offshore administrative boundary takes the general form of a triangle extending about 150 miles east of Cape Charles. The area of this triangle is about six million acres, or 7.2% of the MMS Mid-Atlantic Planning Area. Figure 6 depicts a broad band parallel to the coast containing geological conditions potentially suitable for natural gas accumulation, and to which the MMS assigned undiscovered natural gas resources in their 2000 assessment. Approximately 11% of this area falls within Virginia's offshore administrative boundary. Using a *pro rata* assumption for production across this area yields 1.3 Tcf of potential natural gas resources and 0.135 Bbl of potential oil resources.

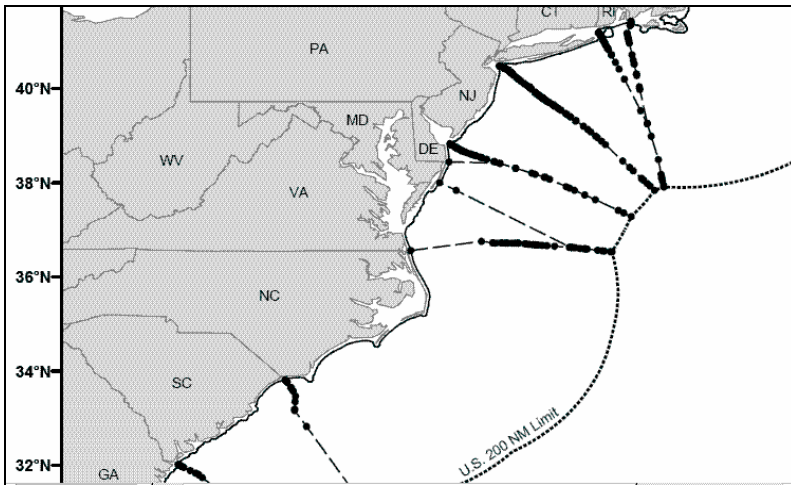


Figure 5: MMS Atlantic Administrative Boundaries, January 3, 2006. Source: January 3, 2006, Federal Register, volume 71, Number 11, pages 127-131.

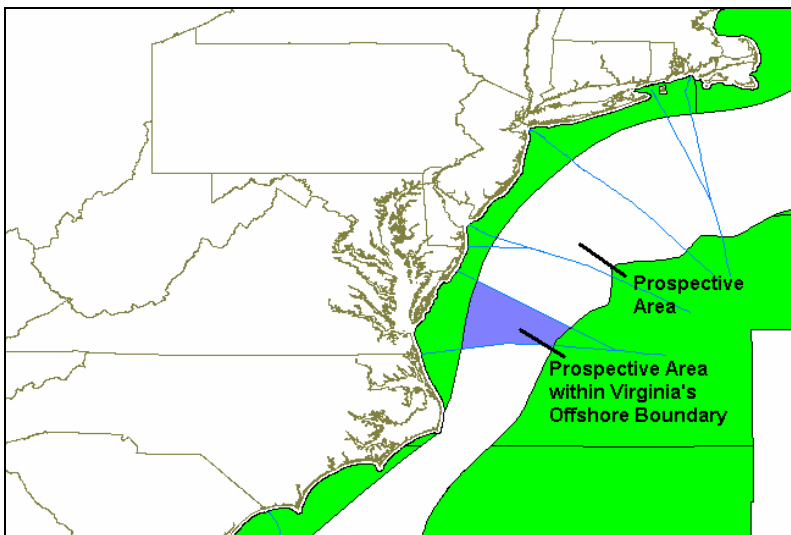


Figure 6: MMS Virginia Administrative area within the oil and gas prospective area. Source: Adapted from the January 3, 2006, MMS administrative boundary map and

MMS 2000 Assessment of Conventionally Recoverable Hydrocarbon Resources of the Gulf of Mexico and Atlantic Outer Continental Shelf as of January 1, 1999.

The MMS is currently preparing an updated OCS resource assessment. The updated assessment for the Mid-Atlantic Planning Area will not incorporate any new data from that area but will use knowledge gained from recent oil and gas developments in Atlantic Canada. The MMS plans to publish it in late 2005.

### Production and royalty potential

Prediction of potential future revenue from an area with no presently known commercial accumulations of hydrocarbons involves a great deal of uncertainty. Existing estimates of natural gas resources and projections of future prices yield an estimate of the total commercial value of the gas. Potential changes to federal revenue sharing with states introduce additional uncertainty regarding what share of these funds, if any, could come to Virginia.

The federal government currently receives three kinds of revenue from offshore leasing: bonuses, rents, and royalties. Offshore lease blocks, generally 5000 acres apiece, are offered by the MMS in competitive lease sales. A lease bonus is the amount paid by the company placing the highest bid on each available block. Companies must then pay annual rent to hold the block until production commences or the lease is relinquished. Royalty is the fraction of the value of production paid to the federal government, generally 1/6 (16.67 percent). The MMS presently shares bonuses, rents, and royalties with coastal states, but only those revenues derived from a zone of federal waters extending three miles beyond the limit of state waters. Within this zone, termed the “8(g) zone” (after the section 8(g) of the Outer Continental Shelf Lands Act), the MMS shares 27 percent with the adjacent coastal state. Even 27 percent from this narrow zone can be substantial; in 2004, Louisiana received \$41.4 million and Texas received \$14.8 million.<sup>21</sup>

We can apply certain assumptions to estimate the potential revenue from possible leasing and production in offshore Virginia. The MMS has divided its Mid-Atlantic Planning Area into 14,731 lease blocks. Roughly one-fourth of these, or about 3680, are offshore of Virginia. To estimate the potential revenue from these blocks, we must consider the variables relating to bonuses, rents, and royalties, and the possible ranges of values for those variables. For total revenue from lease bonuses, the variables are the number of blocks leased and the average bonus paid per lease. Lease sales in recent years, for example, in the Gulf of Mexico, have brought lease bonuses ranging from \$125,000 (the minimum for a 5000-acre block) to over \$20 million.<sup>22</sup> If we assume that five percent (185) of the blocks get leased (compared to approximately ten percent in the Gulf of Mexico) and assume an average lease bonus of \$750,000 (the average high bid on

---

<sup>21</sup> Source: U.S. Department of Interior, Minerals Management Service, News Release #3222 (<http://www.gomr.mms.gov/homepg/whatsnew/newsreal/2005/050201.html>)

<sup>22</sup> Source: U.S. Department of Interior, Minerals Management Service, Gulf of Mexico Region Lease Information (<http://www.gomr.mms.gov/homepg/lseale/lseale.html>)

3500 blocks leased in sales between 1998 and 2004, when natural gas prices were much lower, was \$735,000),<sup>23</sup> the total federal revenue from lease sales would be about \$140 million. The annual rent required for a company to hold a lease is a set value, \$6.25 per acre, or \$31,250 per year for a 5000-acre lease (assuming that each lease will be held for 7.5 years before it is drilled or relinquished yields \$43 million in total rent for the 185 leased blocks). The variables for calculating royalty revenue are total production and future commodity price (assuming that all of the 2.9 Tcf of undiscovered conventionally recoverable natural gas is eventually produced and assuming \$12 per thousand cubic feet yields \$35 billion in total value of gas produced). One-sixth of this, the standard royalty rate paid to the federal government for OCS production, is \$5.8 billion. Of course, it's possible that no economically viable deposits of natural gas will be found, in which case royalty revenue would be zero.

Under current regulations, none of the potential federal revenue is likely to be shared with Virginia. Virginia's 8(g) zone does not overlap with the area assigned potential natural gas resources by the MMS in their 2000 assessment. However, proposals currently pending in Congress would expand revenue sharing beyond the 8(g) zone, perhaps to the entire OCS, and increase the rate of sharing from 27 percent to 40 or even 50 percent. Using the estimates above, sharing of half of federal revenue from Virginia's Outer Continental Shelf could mean nearly \$3 billion in direct payments to Virginia's treasury. These payments would be spread out over thirty to fifty years, the estimated time it would take to develop and produce the offshore resources, and would be unlikely to begin, if at all, until the year 2016 at the earliest.

Of course, this is all very speculative and requires the piling of speculation upon estimates upon forecasts. However, the fact that we do not know, and cannot know, the actual amount of gas or oil in Virginia's OCS does not argue against exploration. In fact, that lack of knowledge is the very reason exploration may be called for. If we knew what was out there and where it was then we would not need to explore in the first place.

### Exploration and Development Process

The exploration and development of offshore resources requires the cooperation of government and industry entities. The process can be viewed in four phases:

1. Five-year lease program.
2. Individual lease sales.
3. Exploration plan.
4. Development and production plan.

The first two stages are the responsibility of the MMS; the second two are the responsibility of industry, although the MMS must review and approve the plans. An important part of the MMS review process is governed by the National Environmental Policy Act (NEPA), which guides the agency's consideration of potential environmental

---

<sup>23</sup> Source: U.S. Department of Interior, Minerals Management Service, Outer Continental Shelf Lease Sale Statistics (<http://www.gomr.mms.gov/homepg/lseale/swiler/swiler.html>)

impacts, potential mitigation measures, and evaluation of alternatives. Guidelines set out in NEPA determine at what stages environmental reviews must occur and what level of environmental review is required. Throughout the process, there are multiple opportunities for public comment. Coastal states also have the opportunity to influence the process through review and comment, as well as Coastal Zone Management consistency determinations.

*Phase 1*

The MMS begins preparation of its five-year program with solicitation of scoping comments from industry, state agencies, and the public. This comment period lasts 45 days, after which a Draft Proposed Program is published. The Draft Program outlines the number, geographic scope, and dates of all the sales the MMS intends to offer over the next five years, although this schedule is subject to change pending consideration of comments during the rest of the program’s development process. Publication of the draft begins a 60-day comment period, after which a Proposed Program and Draft Environmental Impact Statement (EIS) are published. After a 90-day comment period, the Proposed Final Program and Final EIS are published, which triggers a 60-day waiting period. At the end of that period, the Final Five-Year Program is released. The entire process takes eighteen to twenty-four months (Figure 7).

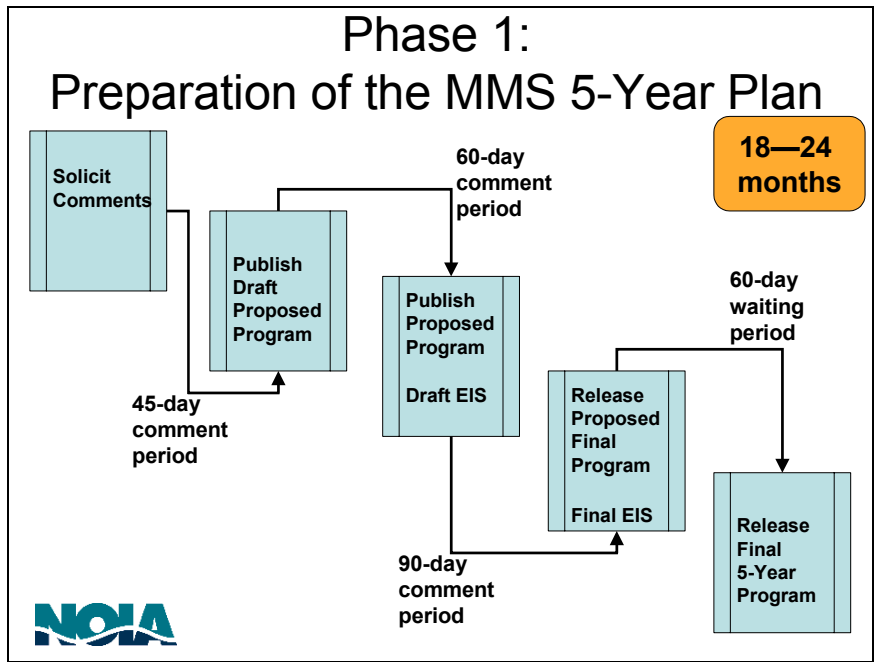


Figure 7. Diagram describing the Minerals Management Service’s process for developing its five-year leasing program (source: National Ocean Industries Association).

*Phase 2*

Each individual sale specified in the Five-Year Program involves several stages of review and comment. The MMS first issues an initial call for information and opens a 45-day comment period, during which the industry can express its interest in leasing particular areas. The MMS then develops and issues a draft EIS for the sale, which



begins another 45-day comment period, after which the agency issues a Proposed Notice of Sale. At this time, coastal states begin their 90-day review for Coastal Zone Management (CZM) consistency determination, and the MMS begins drafting its Final EIS. If the proposed sale is determined to be consistent with states' CZM programs, a Final Notice of Sale is issued, followed by an additional thirty-day comment period. At the sale, the MMS receives and publicly reads aloud sealed bids on available lease blocks. Following the sale, the MMS evaluates the bids; generally speaking, for blocks receiving bids at or above the minimum acceptable bid (determined by the MMS separately for each lease block), leases are issued to the highest bidders. This entire process takes eighteen to twenty-four months (Figure 8).

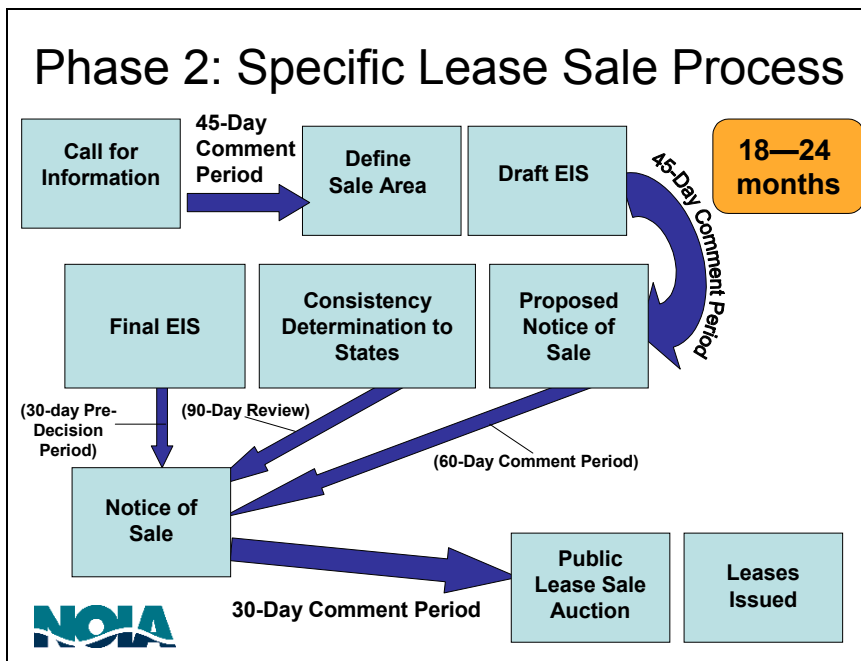


Figure 8. MMS process for implementing an individual OCS lease sale (Source: National Ocean Industries Association).

### Phase 3

Companies with winning bids are likely to have already acquired geophysical data, such as seismic surveys, covering the blocks they bid upon. After winning leases, the companies may acquire additional seismic data to assist them in developing their Exploration Plan. The Exploration Plan is a detailed statement of the company's intent to drill one or more wells on a lease block. The plan includes the number, location, and depth of the proposed wells, as well as basic information about well design. It also includes information about equipment and personnel to be used, including type of drilling rig, safety and environmental precautions, number of workers, and ships and aircraft to be used to support the operation. Exploration Plans outside of the Gulf of Mexico require the completion of an Environmental Assessment (EA) by the MMS. They also undergo CZM review by adjacent coastal states. The approval process for the Exploration Plan takes twelve to twenty-four months. If approved, the company must then acquire

necessary permits for drilling. When the permits are granted, drilling of the exploratory well(s) can begin (Figure 9).

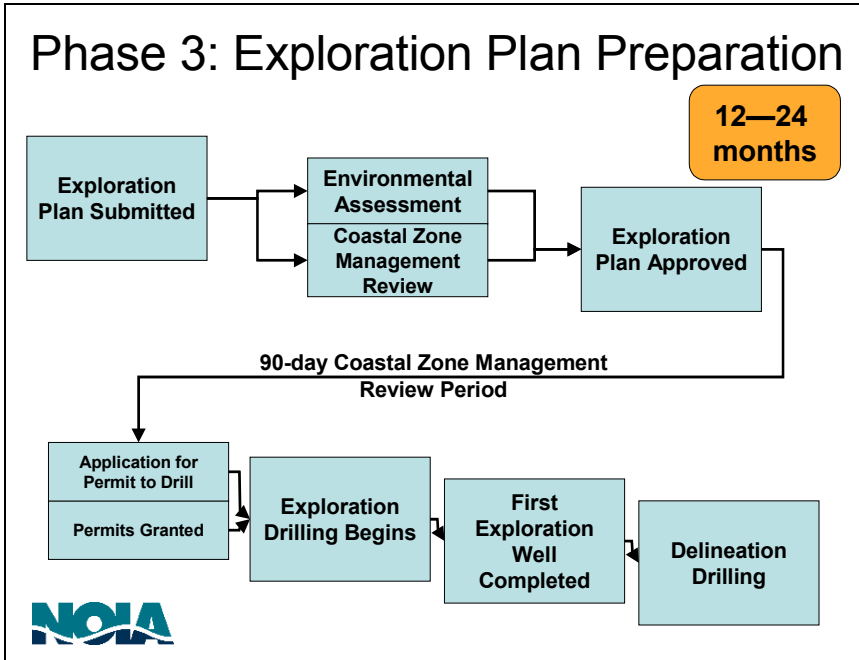


Figure 9. Approval process for an Exploration Plan submitted to the MMS by a company intending to drill an exploratory well (Source: National Ocean Industries Association).

#### Phase 4

If exploratory drilling indicates commercial quantities of oil or gas and the company decides to produce the resource, they must then devise a Development and Production Plan. This plan states the steps to be taken to get the resource out of the ground, including the number and locations of additional wells to be drilled, production platforms to be constructed, pipelines to be installed, and other production facilities necessary to produce, process, and deliver the resource to shore. The approval process involves preparation of an EIS by the MMS, state CZM consistency review, and a 90-day public comment period (Figure 10).

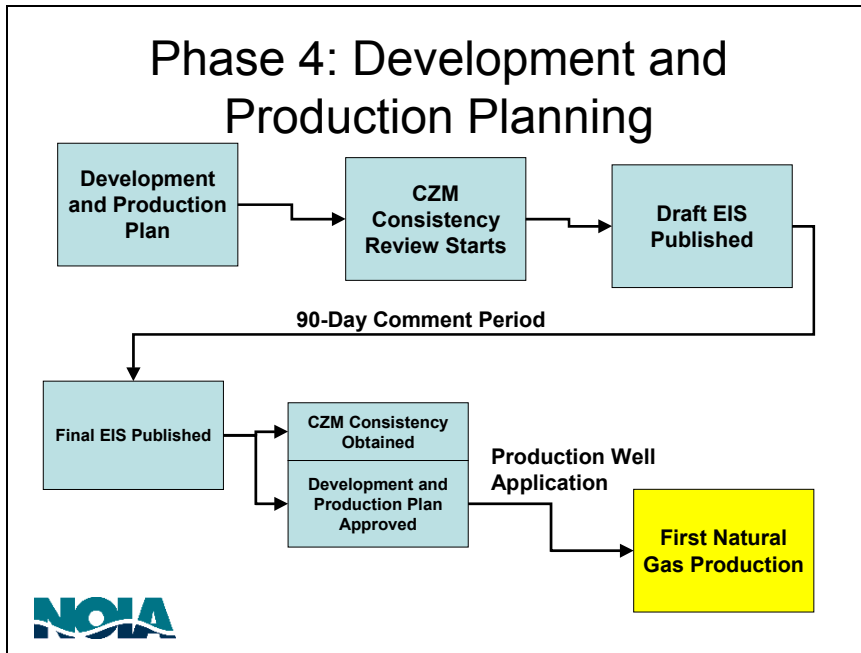


Figure 10. Approval process for a Production Plan submitted to the MMS by a company intending to drill production wells (Source: National Ocean Industries Association).

The entire process, from the MMS Five-Year Program to the time the first natural gas is actually produced, can take upwards of ten years.

### Environmental Issues

The Virginia Coastal Policy Team identified potential environmental impacts from natural gas exploration and development, how Virginia would be involved in review of environmental impact studies under the National Environmental Policy Act, what mandatory and advisory components of Virginia’s Coastal Zone Management (CZM) Program would affect offshore natural gas development, and areas where the Team felt there were data gaps needed to be filled as any proposed development was considered. The agencies represented on the Coastal Policy Team are listed in Attachment 3.

### *Impacts from exploration*

Exploration includes seismic exploration conducted from boats. Exploratory well impacts are considered below under impacts from drilling. Most impacts from exploration are likely to be temporary but could include the following. These impacts should be mitigated as part of any exploration activity.

- Water quality impacts from debris, oil, and other contaminants from work boats and equipment.
- Acoustic impacts to marine mammals and fish.
- Direct impacts to marine mammals and reptiles from vessel strikes.
- Temporary disruption to fish, birds, reptiles, and mammals (migration, feeding, mating, spawning) from increased activity in previously quiet waters.

More information is needed on the extent of these impacts before recommendations on ways to mitigate impacts could be generated. Such techniques as time of year restrictions on exploration activities may help to mitigate impacts.

*Impacts from drilling, production, and associated large vessel traffic*

The activities considered at this stage include all the activities at the drill site as well as vessel traffic for building the platforms or rigs and transporting workers to the platforms or rigs once they have been completed and are operational. Release of any of the potential contaminants, in addition to affecting water quality and organisms in the area of the well, could wash ashore and impact the Eastern Shore barrier island/lagoon system as well as the Virginia Beach resort area, Back Bay, and Chesapeake Bay. The potential impacts of concern at this stage include:

- Water quality impacts from debris, oil, and other contaminants from the boats, equipment, and platforms.
- Disruption to fish, birds, reptiles, and mammals (migration, feeding, mating, spawning) from the increased activity.
- Direct impacts to marine mammals and reptiles from vessel strikes.
- Direct habitat disturbance to the submerged land where the activity occurs, including impacts to submerged aquatic vegetation beds, oyster reefs, and other shellfish habitats.
- Geologic disturbance (erosion, sea floor sloughing).

*Impacts from new infrastructure (onshore and pipelines)*

Additional infrastructure would be needed to support exploration, drilling, and production of natural gas offshore of Virginia. This includes the offshore platforms and rigs as well as pipelines to transport gas onshore, onshore processing facilities, and any additional port or manufacturing facilities that would be needed to build and service the platforms. Subaqueous lands (including submerged aquatic vegetation and oysters), wetlands, dunes, beaches, riparian buffers, historic properties, other sensitive coastal habitats, and wildlife could all be impacted by the placement of the pipeline and onshore processing facilities

More information on the extent of these potential impacts would be needed before recommendations on ways to mitigate impacts could be generated. Appropriate siting of infrastructure will be a key in reducing potential environmental impacts from these activities.

*Current NEPA Review Process*

Virginia Department of Environmental Quality's Office of Environmental Impact Review (OEIR) coordinates responses to NEPA documents for the state. OEIR can solicit input from any agency, locality, and PDC in Virginia. Therefore comments could address any of the above mentioned impacts or issues during the scoping phase (used to gather information for preparation of the NEPA document) as well as in response to the

federal agency's (e.g. MMS, FERC, the Army Corps of Engineers) issuance of an Environmental Assessment (EA) or Environmental Impact Statement (EIS).

The federal agency issuing the EA or EIS is not required by law to implement the recommendations received during the comment period. They are, however, required to address the state's concerns and provide a justification if any state recommendations will not be implemented.

#### *Natural Resource Regulatory Agency and Coastal Zone Management Act Consistency Requirements*

The Commonwealth of Virginia has several regulatory programs designed to protect our natural and historic resources that may govern activities related to natural gas drilling and exploration offshore Virginia. In addition to laws and regulations addressing resources within state jurisdiction, federal actions that affect Virginia's coastal resources must be consistent with Virginia's Coastal Zone Management Program. Under this requirement, federal agencies must determine or certify that their actions are consistent with the enforceable policies of the state's CZM Program. These nine enforceable policies include:

1. *Commercial and Recreational Fisheries Management.* The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. The State Tributyltin Regulatory Program has been added to the Fisheries Management Program (Code of Virginia § 3.1-249.59 thru 3.1-249.62). The fisheries management program is administered by the Virginia Marine Resources Commission (Code of Virginia § 28.2-200 thru 28.2-713) and the Department of Game and Inland Fisheries (Code of Virginia § 29.1-100 thru 29.1-570).
2. *Subaqueous Lands Management.* The management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the Department of Environmental Quality, Water Division. The program is administered by the Virginia Marine Resources Commission (Code of Virginia § 28.2-1200 thru 28.2-1213).
3. *Wetlands Management.* The purpose of the wetlands management program is to preserve wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation. The tidal wetlands program is administered by the Virginia Marine Resources Commission (Code of Virginia § 28.2-1301 thru § 28.2-1320). The Virginia Water Protection Permit program administered by the Department of Environmental Quality includes protection of wetlands, both tidal and non-tidal. This program is authorized by Code of Virginia § 62.1-44.15.5 and the Water Quality Certification requirements of Section 401 of the Clean Water Act of 1972.

4. *Dunes Management.* Dune protection is carried out pursuant to the Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by the Virginia Marine Resources Commission (Code of Virginia § 28.2-1400 thru 28.2-1420).
5. *Non-point Source Pollution Control.* Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by the Department of Conservation and Recreation (Code of Virginia § 10.1-560 *et seq.*).
6. *Point Source Pollution Control.* The point source program is administered by the State Water Control Board (Code of Virginia § 62.1-44.15). Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System permit program established pursuant to Section 402 of the federal Clean Water Act and administered in Virginia as the Virginia Pollutant Discharge Elimination System permit program.
7. *Shoreline Sanitation.* The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth. This program is administered by the Department of Health (Code of Virginia § 32.1-164 thru § 32.1-165).
8. *Air Pollution Control.* The program implements the federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. This program is administered by the State Air Pollution Control Board (Code of Virginia § 10.1-1300).
9. *Coastal Lands Management.* This program is a state-local cooperative program administered by the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance and 84 localities in Tidewater, Virginia. It is implemented pursuant to the Chesapeake Bay Preservation Act (Code of Virginia § 10.1-2100 thru § 10.1-2114) and Chesapeake Bay Preservation Area Designation and Management Regulations (Virginia Administrative Code 9 VAC 10-20-10 *et seq.*).

The Virginia Coastal Zone Management Program also includes several advisory policies that must be addressed by federal agencies, in accordance with 15 CFR § 930.39(c), in the CZM Consistency review. These policies address geographic areas of particular concern and shorefront access planning and protection. However, inconsistency with these policies will not hold up a project or result in a determination that the project is inconsistent.

The advisory policies for geographical areas of particular concern include:

- *Coastal Natural Resource Areas.* These areas are vital to estuarine and marine ecosystems or are of great importance to areas immediately inland of the shoreline. Such areas receive special attention from the Commonwealth because

of their conservation, recreational, ecological, and aesthetic values. These areas are worthy of special consideration in any planning or resources management process and include the following resources:

- Wetlands
  - Aquatic spawning, nursery, and feeding grounds
  - Coastal primary sand dunes
  - Barrier islands
  - Significant wildlife habitat areas
  - Public recreation areas
  - Sand and gravel resources
  - Underwater historic sites.
- *Coastal Natural Hazard Areas.* This policy covers areas vulnerable to continuing and severe erosion and areas susceptible to potential damage from wind, tidal, and storm-related events, including flooding. New buildings and other structures should be designed and sited to minimize the potential for property damage due to storms or shoreline erosion. The areas of concern are highly erodible areas and coastal high hazard areas, including flood plains.
  - *Waterfront Development Areas.* These areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities. The areas of concern are commercial ports, commercial fishing piers, and community waterfronts. Although the management of such areas is the responsibility of local government and regional authorities, designation of these areas as Waterfront Development Areas of Particular Concern under the Virginia Coastal Resources Management Program allow the use of federal Coastal Zone Management Act funds to be used to assist in planning for such areas and in the implementation of such plans. The Virginia Coastal Resources Management Program recognizes two broad classes of priority uses for Waterfront Development Areas of Particular Concern, including (i) water access-dependent activities and (ii) activities significantly enhanced by the waterfront location and complementary to other existing or planned activities in a given waterfront area.

The advisory policies for shorefront access planning and protection include:

- *Virginia Public Beaches.* Approximately 25 miles of public beaches are located in the cities, counties, and towns of Virginia exclusive of public beaches on state and federal land. These public shoreline areas will be maintained to allow public access to recreational resources.
- *Virginia Outdoors Plan.* Planning for coastal access is provided by the Department of Conservation and Recreation in cooperation with other state and local government agencies. The Virginia Outdoors Plan, published by the Department, identifies facilities in the Commonwealth that provide recreational access. The Virginia Outdoors Plan also identifies future needs of the Commonwealth for the provision of recreational opportunities and shoreline access. Prior to initiating any project, consideration should be given to the proximity of the project site to recreational resources identified in the Virginia Outdoors Plan.

- *Parks, Natural Areas, and Wildlife Management Areas.* Parks, wildlife management areas, and natural areas are provided for the recreational pleasure of the citizens of the Commonwealth and the nation by local, state, and federal agencies. The recreational values of these areas should be protected and maintained.
- *Waterfront Recreational Land Acquisition.* It is the policy of the Commonwealth to protect areas, properties, lands, or any estate or interest therein of scenic beauty, recreational utility, historical interest, or unusual features which may be acquired, preserved, and maintained for the citizens of the Commonwealth.
- *Waterfront Recreational Facilities.* This policy applies to the provision of boat ramps, public landings, and bridges, which provide water access to the citizens of the Commonwealth. These facilities shall be designed, constructed, and maintained to provide points of water access when and where practicable.
- *Waterfront Historic Properties.* The Commonwealth has a long history of settlement and development, and much of that history has involved both shorelines and near-shore areas. The protection and preservation of historic shorefront properties is primarily the responsibility of the Department of Historic Resources. Buildings, structures, and sites of historical, architectural, or archaeological interest may be significant resources. It is the policy of the Commonwealth and the Virginia Coastal Resources Management Program to enhance the protection of buildings, structures, and sites of historical, architectural, and archaeological significance from damage or destruction when practicable.

The Virginia Coastal Program is developing a Blue-Green Infrastructure system (the Virginia Coastal Zone Management Programs Geospatial and Education Mapping System) to map coastal resources. This system could be used to help assess impacts from any proposed offshore energy development.

States can require that federal actions be consistent with state coastal zone management laws and policies for activities occurring outside the state's three-mile coastal zone boundary that are likely to affect the state's coastal resources that occur inside the boundary. Impacts from drilling alone, if the site is well beyond the state three-mile territorial boundary, may fail the "affects test." Coastal zone management consistency review is most likely to cover impacts from new infrastructure (onshore and pipelines). The enforceable polices of the Virginia coastal zone management program directly apply to impacts from those activities.

While The National Environmental Protection Act and coastal zone management consistency reviews provide the state the opportunity to comment on proposed projects, they do not provide the state with the tools to proactively designate corridors or other places that would be most appropriate for pipelines and onshore activities. This would fall under local authority under current Virginia law.



### *Data Gaps in Determining Environmental Impacts*

The Virginia Coastal Program identified a number of areas it believes additional data is needed during any evaluation of offshore natural gas operations. Even more data would be needed for full evaluation of offshore oil operations. The oil operation data would be gathered in connection with the additional evaluation process recommended in this report if recoverable reserves of oil are discovered. At this time there is limited information on the:

- Use of the proposed drilling and pipeline areas by fish, mammals, reptiles, and birds.
- Impact of seismic exploration activities on marine animals.
- Effects on historic properties.
- Possible scale of operation, which will determine the extent of impact.
- Impact from large gas or gas condensate escapes (buoyancy of water, air quality).
- Cumulative impacts of outer continental shelf exploration and drilling (e.g. if all east coast states started producing) on sea floor movement, long term productivity of the benthos, fisheries, and other species.

### Economic Impacts

Development of offshore resources will affect coastal localities. The industry requires construction, transportation, communications, and other support services. These are likely to have positive impacts on local economies. They also could affect local governments, shipping (both military and civilian), tourism, and fishing industries.

A study performed by Old Dominion University compared Virginia to Nova Scotia in eastern Canada, where the offshore natural gas industry has been active for about ten years. The study projected that, to develop an infrastructure capable of producing 350 billion cubic feet (Bcf) of gas per year, the industry would have to invest over \$6.3 billion.<sup>24</sup> While this rate of production is toward the high end of projected production estimates for offshore Virginia, substantial infrastructure development would be necessary even for lower production rates. The indirect economic impact of this investment was estimated to be an additional \$1.6 billion. The total, \$7.9 billion, would be expended over approximately ten years. Operational expenditures are projected to be \$36 million annually, with an additional \$9 million in indirect economic benefit. Other expenditures by industry, including research and development, training, and technology transfer, are projected to be \$19.3 million annually, with nearly \$5 million in indirect benefit. Capital investment, operations, and other expenditures are projected to total \$8.5 billion over ten years.

The study also considered the potential effect of the industry on tax revenues and jobs. Virginia state income taxes from increased wages are projected to be \$145 million over ten years; state sales tax collections are projected to increase by \$130 million.

---

<sup>24</sup> Source: Dr. James Koch, Old Dominion University: Analysis of Onshore Economic Impacts of Offshore Natural Gas Production in Virginia, 2005.

Projected employment in the industry is estimated to be 26,000 person-years, or about 2600 jobs each year.

Virginia cannot count on these potential economic benefits being available in the short term. While some exploration work may take place in a shorter time, any offshore development would begin, at the earliest, ten years into the future. The economic impact from offshore development also would take place over a 30-year or longer time frame. While offshore development will help maintain a vibrant Hampton Roads economy, it should not be seen as a windfall.

### Local Impacts

The Hampton Roads area would likely be a center of support for any development of offshore hydrocarbon resources near Virginia. Environmental considerations make much of Virginia's Eastern Shore or North Carolina's Outer Banks inappropriate for most support activities. Hampton Roads' maritime industry could provide many of the services needed for offshore development. New services would likely be located in the area to take advantage of the existing infrastructure.

The Hampton Roads Planning District Commission issued a position statement on offshore oil and gas development in 1991. The Commission requested that no development be made within 50 miles of the coast, recommended that the Minerals Management Service pursue the exploration and study under the 1992-1997 program, and further recommended that various studies be conducted before offshore development should move forward.

The Hampton Roads Planning District Commission will reconsider development of offshore hydrocarbon resources in the near future. HRPDC staff recommended that a comprehensive study that investigates the ramifications of OCS energy discovery and development should be undertaken. Staff further recommended that, due to the fact that Hampton Roads is a likely location for on-shore facilities and activities associated with mid-Atlantic OCS development, the region should be included in all steps of the process that considers offshore development.

### Shipping

Hampton Roads is ranked in the top twenty ports in the U.S., with about 40 million tons of civilian cargo shipped annually.<sup>25</sup> For comparison, the Port of New Orleans is ranked first in the U.S., with over 200 million tons shipped annually. The Gulf of Mexico offshore of the Louisiana coast contains over 3000 oil and gas platforms; the presence of these structures apparently has not negatively impacted the ability of the port to serve the shipping industry. The MMS considers existing shipping lanes when reviewing exploration and production plans.

---

<sup>25</sup> Source: American Association of Port Authorities, Port Industry Statistics ([http://www.aapa-ports.org/pdf/2003\\_US\\_PORT\\_CARGO\\_TONNAGE\\_RANKINGS.xls](http://www.aapa-ports.org/pdf/2003_US_PORT_CARGO_TONNAGE_RANKINGS.xls))

Hampton Roads is also home to the U.S. Navy's Atlantic Fleet. Statistics on military shipping are not available, but Virginia's offshore is used for subsurface, surface, and airborne military transportation and training. Navy aircraft carriers, the largest ships in the fleet, are all nuclear-powered and can only be refueled at Northrup-Grumman Newport News Shipbuilding. Several classes of submarines also use the port. To protect military interests in offshore waters from interference by oil and gas operations, the MMS enters into Memoranda of Agreement with the Department of Defense. Due to the high concentration of naval operations headquartered in Hampton Roads, such agreements would be especially important for any proposed drilling operations offshore Virginia. They must ensure that military operations can maintain their necessary use of offshore areas.

### Tourism

According to the Virginia Tourism Corporation, Virginia was the destination of nearly 36 million travelers in 2004, a 14.5% increase since 2000. Surveys indicate that 67% of visits were for pleasure, 14% were for business, and 19% were for personal or other reasons. These visits represent a \$15.3 billion investment in the economy and signal a positive economic outlook for Virginia's tourism industry. The Virginia tourism industry employs more than 280,000 people and provides more than \$2 billion in state and local taxes annually.

Most of Virginia's publicly accessible Atlantic coast on the Delmarva Peninsula is marshy and provides unique opportunities for recreational use. An additional asset on the Eastern Shore of Virginia is the Chincoteague National Wildlife Refuge, which occupies the Virginia portion of Assateague Island. The Nature Conservancy owns a number of Atlantic coastal islands south of Chincoteague that are managed as wildlife refuges, along with several state-owned natural areas. Virginia's public recreational lands total 145,936 acres on the Eastern Shore. Chesapeake, Virginia, the site of the Great Dismal Swamp National Wildlife Refuge, contains more than 24% of public lands and almost 60% of the region's hunting lands.

South of the mouth of the Chesapeake Bay, Virginia Beach is the most popular tourist destination in the state, with nearly 3 million out-of-town visitors in 2004, according to a study conducted by the City of Virginia Beach. Visitors to Virginia Beach in 2004 spent \$785 million, creating more than 10,000 jobs.

Virginia hosted more than two million fishing trips in 2001, which amounted to a \$456 million economic impact. While there is no breakdown between ocean saltwater fishing and Chesapeake Bay saltwater fishing, Virginia's coastal shores remain a big attraction for anglers. Virginia is also the only state with a statewide birding and wildlife trail, with 50 sites on the Eastern Shore and in the Virginia Beach region.

### *Visual Impact*

Both drilling platforms and airborne and seaborne construction and support vessels represent potential visual impacts for tourists.

Under optimum atmospheric conditions, the view shed off Virginia's shores is approximately 11 miles; therefore, there would be no visual impact to tourists on land in Virginia Beach or the Eastern Shore from drilling platforms located at least 50 miles offshore. There is potential visual impact for tourists arriving and departing on cruise ships out of Norfolk; however, there appears to be no detrimental impact on the cruise industry in other destinations, such as the Gulf Coast. There is potential for visual impacts by recreational boaters who may not want any obstruction; however, the drilling platforms may actually serve as visual points of navigation and can serve to assist less-experienced boaters or boaters with disabled navigation equipment. It is likely that development of offshore platforms would improve navigation, communication, and search-and-rescue infrastructure, contributing to the overall safety of recreational and commercial boat traffic.

Other visual impacts for both land-based and cruise-ship tourists would include commercial ships and air transportation used for construction, operation, and transportation. Inasmuch as military and commercial water and air vessels currently traverse the region with no reported negative impact upon the region to attract tourists, Virginia Tourism Corporation believes that there should be no detrimental visual impact from industry vessels.

Another potential impact is the location of processing and support facilities. The Virginia Tourism Corporation (VTC) presumes that such facilities would be located in already established industrial areas, such as those in Hampton Roads. Should a facility be located in a non-industrialized area of importance to the tourism industry, there could be a negative impact upon that region's ability to attract tourists. Overall, however, the VTC concluded that the visual impact of offshore drilling on tourism would be negligible.

#### *Natural Impact*

Much of the tourism experience in Virginia Beach, on the Eastern Shore, and off the coast is dependent upon conditions that maximize water recreation and wildlife viewing. Therefore, although the risk is low, an oil spill that approached or contacted Virginia's coast could detrimentally impact tourism in the region.

Nevertheless, according to sources at the Virginia Marine Resources Commission, there are also potential positive impacts from the development of offshore structures as these structures create artificial reefs attractive to recreational anglers and scuba diving enthusiasts. Therefore, aside from oil spill accidents, Virginia Tourism Corporation concluded that construction of offshore structures would cause no negative natural impact and could provide a positive natural impact as it relates to recreational fishing and scuba diving.

### *Branding Impact*

The Commonwealth of Virginia, through the Virginia Tourism Corporation and other destination marketing organizations, such as the Virginia Beach Convention and Visitors Bureau and the Eastern Shore Chamber of Commerce, capitalizes upon Virginia's natural resources for recreational purposes. Water recreation, fishing, and wildlife watching, including but not limited to bird watching, whale watching, and dolphin watching are growth opportunities for attracting tourists to Virginia's shores.

Any public controversy, particularly controversies that are reported in the mainstream or national media, could have a negative impact upon the tourism industry's ability to brand Virginia as a pristine destination for water recreation, fishing, and wildlife watching. While this could be offset by information to the public that the visual and natural impacts are negligible, Virginia Tourism Corporation believes that such negative media coverage would be detrimental in attracting tourists. In the absence of a major environmental accident, the Virginia Tourism Corporation estimates that negative press surrounding the construction of offshore drilling would impact tourism only temporarily.

### Experience in other areas with gas and oil development<sup>26</sup>

Worldwide, many offshore areas produce gas and oil. Since offshore production was first established in the Gulf of Mexico nearly sixty years ago, the offshore industry has spread to the North Sea, Alaska, Atlantic Canada, Australia, the Caribbean, Iran, Indonesia, and parts of coastal Africa and South America. The local impact of the industry varies depending on the amount of production, existing local infrastructure, and the regulatory environment of the governing nation.

In the U.S. Gulf of Mexico, oil was first produced from an offshore platform in 1947. Since that time, nearly 40,000 wells have been drilled in the Gulf. The region produces 550 million barrels of oil per year and 4.5 trillion cubic feet of natural gas, with an estimated total economic benefit of over \$6 billion annually. Much of that benefit is through locally based businesses that provide transportation, construction, and other services. Environmental impacts in the coastal areas of the Gulf have been fairly severe due to mistakes that were made in the early decades of the industry before environmental safeguards were implemented. The industry's recent record is excellent, however, as demonstrated by MMS records, robust tourism and the large commercial fishing industry in the Gulf.

In the North Sea, oil and gas are produced in waters offshore of Norway, Denmark, and the United Kingdom. From the first wells drilled in the mid-1960s, the area has grown to have the largest offshore production in the world, with two billion barrels of oil and six trillion cubic feet of natural gas produced annually. In the U.K. alone, industry reportedly invests over \$5 billion per year in capital and operational

---

<sup>26</sup> The source for much of the information in this section is Petroleum Research Atlantic Canada, Final Report, Exploring Issues Related to Local Benefit Capture in Atlantic Canada's Oil and Gas Industry, Wade Locke and Strategic Concepts, Inc., April 2004.

expenditures, and returns \$12.6 billion per year in taxes and royalties to the government. Despite a major oil spill (1.8 million barrels) from a well blowout off Norway in 1977, the industry's recent record has been good. Tourism and fishing remain strong in the coastal areas of each nation.

The offshore production nearest to Virginia is in Atlantic Canada, off the coasts of Nova Scotia and Newfoundland. Here, the industry began in 1992 with all modern technology and safety and environmental safeguards. The area currently produces 60 million barrels of oil and 200 billion cubic feet of gas per year. Government controls require substantial local expenditures by industry, and even the relatively small production (less than one-tenth of the U.S. Gulf of Mexico) generates over \$2 billion in direct and indirect economic impact. In November of 2004, failure of an oil/water separator on a production platform off of Newfoundland resulted in the spill of 1000 barrels of oil. This was reportedly the largest oil spill since production began in the area. The incident is still under investigation by the Canada-Newfoundland & Labrador Offshore Petroleum Board. Overall, however, the industry has a good environmental record. Even with natural gas production off their coast, Nova Scotia boasts a thriving tourism industry, with over 700 festivals annually, more than 300 museums and attractions, and "breathtaking scenery". The Grand Banks, off the coast of Newfoundland, are the home to all of Canada's offshore oil production. At the same time, the area is recognized as one of North America's premiere commercial fisheries.

Nigeria has the second-largest offshore oil production in the world. American companies drilled its first wells in the late 1950s. Since then, production has grown to 740 million barrels of oil and 600 billion cubic feet of gas per year. The benefit to the local economy has been historically small due to the lack of infrastructure; most construction, shipping, and support contracts have been with foreign companies, but recent government rules will require 50 percent of expenditures to be made locally by the end of 2005. The country also has few environmental restrictions in place.

Brazil has been producing oil and gas from its Atlantic waters since 1977. Current annual production is 550 million barrels of oil and 600 billion cubic feet of gas. The Brazilian national oil company, Petrobras, held a monopoly on the industry until 1997. Even after nearly ten years of government efforts to attract foreign companies, it still dominates Brazil's oil and gas industry. Government protections continue to assure a thriving local supply and service industry, with over \$7 billion expended annually for infrastructure and support. Historically, the environmental and safety record of Brazil's industry has been fairly poor.

Australia's northwest shelf has been producing oil and gas since 1969. Current production is 260 million barrels of oil and 1.3 trillion cubic feet of gas annually. Local annual expenditures by the industry amount to about \$2 billion. Government policy encourages, but does not require, the use of local suppliers. Strict regulations have fostered an excellent environmental record, and tourism is reportedly one of the region's fastest growing industries.

India has offshore oil and gas resources off of its West coast in the Arabian Sea and East coast in the Bay of Bengal. India's oil sector in total produces over 100 million barrels of oil per year, contributing US\$13.6 billion a year to the national treasury and accounts for more than 25% of total tax revenues. A major fire caused by a supply boat collision killed 12 people and destroyed the Bombay North High oil platform in July 2005. This platform accounted for nearly 38% of India's domestic oil production and 15% of its domestic gas production.<sup>27</sup> An unknown amount of oil was spilled before the wells served by the platform were shut in. Some oil burned in the fire while other spread over the water for 10 nautical miles and was contained or treated with oil spill dispersants.<sup>28</sup>

### Lessons from 2005 and 2006 Gulf of Mexico hurricanes

The risk of spills is one common issue assessed to determine whether offshore hydrocarbons should be developed. One possible cause of spills is severe storms. There have been three strong hurricanes (category 4 or 5 when over offshore production areas) in the natural gas and oil producing areas of the Gulf of Mexico in 2004 and 2005.

Hurricane Ivan destroyed 7 and extensively damaged 20 of the 150 platforms in its path. Hurricane Katrina destroyed 47 and extensively damaged 20 of the approximately 1,300 platforms in its path. Hurricane Rita destroyed 66 and extensively damaged 32 of the approximately 1,600 platforms in its path. Platforms constructed prior to 1988, when platform standards were stiffened, were more likely to be damaged or destroyed than post 1988 platforms. Shallow-water platforms were more likely to be destroyed than deep-water platforms. Hurricane Ivan caused damage to 102 pipelines. Many of the pipelines were damaged when unconsolidated silt shifted due to the storm. Hurricane Katrina caused damage to 70 pipelines, while Hurricane Rita caused damage to 28 pipelines.<sup>29</sup>

Most of the damage to platforms, rigs, and pipelines did not cause pollution leaks. Leaks came primarily from crude oil in pipelines attached to a rig that broke its moorings or from fluids used on the platforms and rigs. Major leaks are prevented when valves are closed at the seafloor before a storm hits to isolate the wells from the surface if damage is caused. Platforms and rigs are evacuated to protect workers. There were 15 incidents caused by Hurricane Ivan that caused a release of greater than 50 barrels of pollutants. Some of these incidents were from fuel and lubricant tanks on platforms that were damaged or lost in the storm; seven were from damaged pipelines, although all of the pipelines were shut in. The pipeline-related spills were from residual oil left in shut-in segments that leaked out when the pipelines were broken by mudflows or anchors that dragged across them. None of the spills were from wells. The average size discharge

---

<sup>27</sup> Source: Cobrapost News Features, India's Oil Security (<http://www.cobrapost.com/documents/indianoil.htm>).

<sup>28</sup> Source: The Tribune, Chandigarh, India, July 29, 2005. Oil Spill Noticed at Bombay High (<http://www.tribuneindia.com/2005/20050729/main5.htm>)

<sup>29</sup> Source: U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability, Gulf Coast Hurricanes Situation Report. See for example report # 32, October 31, 2005 ([http://www.electricity.doe.gov/documents/gulfcoast\\_report\\_103105\\_1500.pdf](http://www.electricity.doe.gov/documents/gulfcoast_report_103105_1500.pdf))

was 321 barrels (52-1720 barrel range in size).<sup>30</sup> Complete data on spills caused by Hurricanes Katrina and Rita are not yet compiled, although 8 million barrels of crude oil and refined products were reportedly spilled from damaged tanks at nine onshore storage facilities and refineries. Much of this volume was retained onsite by secondary containment systems; cleanup and recovery is ongoing.<sup>31</sup> Offshore, it is known that approximately 165 rigs and platforms were damaged or destroyed. It's likely, based on experience with Hurricane Ivan, that some of these resulted in spills, although no oil contamination of coastal areas from offshore sources has been reported so far. Complete data on offshore spills will be made available by the MMS as data collection continues in the aftermath of the storms.

What does this mean for Virginia? These three Gulf of Mexico storms were more intense than most hurricanes in Virginia. While scientists believe that the waters off of Virginia's coast could support a category 4 storm, no category 4 hurricanes and only two category 3 hurricanes have struck Virginia during the last 150 years.<sup>32</sup> Therefore, it is likely that the recent Gulf of Mexico hurricanes were stronger than any storm likely to be experienced off of Virginia's coast. Most platform damage and environmental discharges were located in shallow waters. The areas offshore Virginia that may contain hydrocarbon resources are in deep waters, less subject to damage from severe storms. Additionally, any platforms that would be located offshore Virginia would have to meet the higher, post 1988, construction standards. Nevertheless, any decision to proceed with offshore exploration in Virginia should await completion of a fuller assessment of the oil spills arising from Hurricane's Katrina and Rita and whether appropriate means can be developed to prevent such spills in the future.

### Risk of Oil Spills

Petroleum spills into the sea from man-made sources have decreased significantly in the last three decades. According to a 2002 study by the National Research Council (NRC),<sup>33</sup> a private, nonprofit institution that provides science and technology policy advice under a congressional charter, total petroleum input into the sea decreased from 43 million barrels in 1975 to 9 million barrels in 2002 (Figure 11). During this same time period, annual worldwide offshore oil production increased from 2.3 billion barrels (Bbbl) to 7.0 Bbbl. Of the total petroleum released, the offshore oil and gas industry was responsible for only 4% worldwide, and only 2% in North America. The largest man-made sources of petroleum in the sea have in past decades been marine transportation (including tanker spills) and municipal/industrial waste and runoff. According to the

---

<sup>30</sup> Source: U.S. Department of Interior, Minerals Management Service, Significant Pollution Incidents – 2004 (<http://www.mms.gov/incidents/SigPoll2004.htm>)

<sup>31</sup> Source: United States Department of Homeland Security, United States Coast Guard, Southeast Louisiana Post-Hurricane Pollution Recovery Continues, October 29, 2005 Press Release (<http://www.uscgstormwatch.com/go/doc/1008/87632/>)

<sup>32</sup> Source: Virginia Department of Emergency Management, Newsroom and Archives, Hurricane History and Statistics, <http://www.vaemergency.com/newsroom/history/stats/hurricane/index.cfm#tracks>)

<sup>33</sup> Source: National Research Council report, Oil In the Sea III: Inputs, Fates, and Effects (<http://books.nap.edu/books/0309084385/html/1.html>)



NRC's most recent report, natural leakage from undersea petroleum seeps is now the greatest contributor (Figure 12).

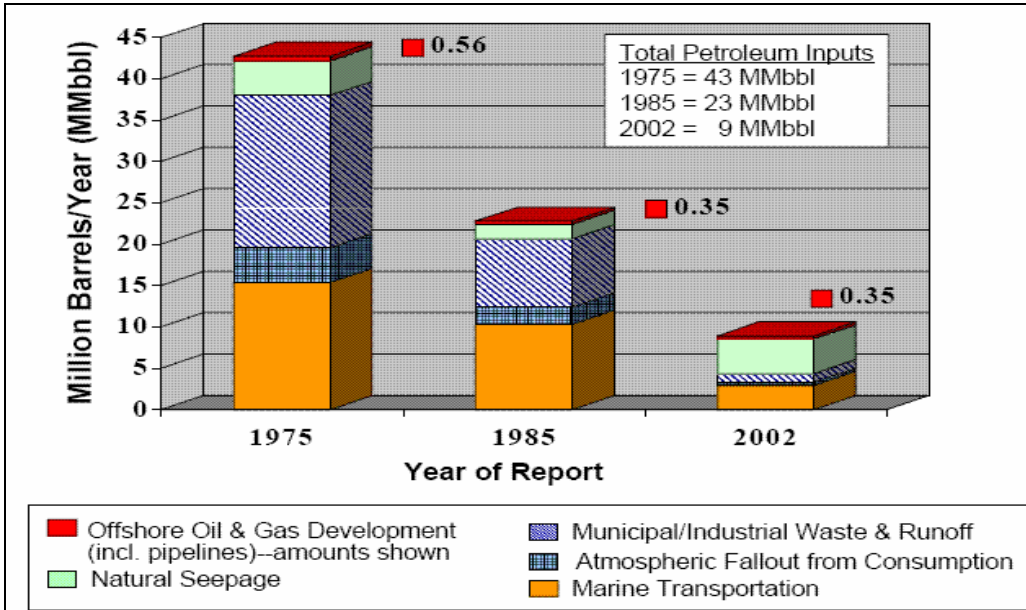


Figure 11. Total petroleum inputs in the marine environment. Source: National Research Council.

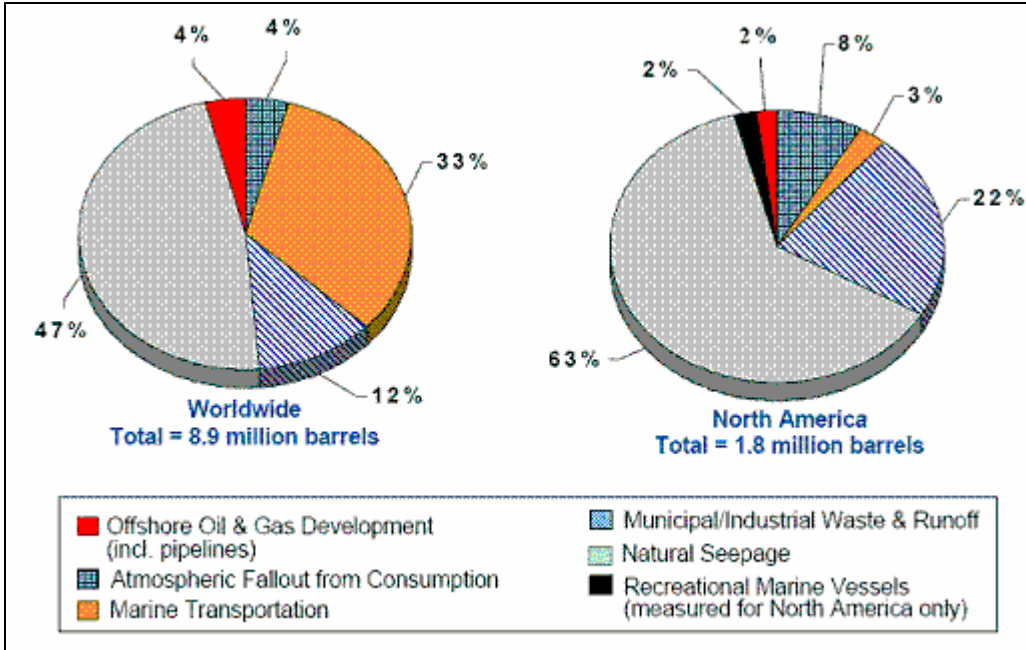


Figure 12. Petroleum input sources in the worldwide and North American marine environment. Source: National Research Council.

Since 1985, wells on the Outer Continental Shelf have produced over 7 Bbbl of oil. During this period, the amount of oil spilled amounted to about 68,500 barrels (0.001% of production), or about 1 barrel spilled for every 102,000 barrels produced. About 97% of the OCS spill events are 1 barrel or less in size. Most of the oil spilled, however, comes from spills that are greater than 10 barrels. Loss of well control from drilling exploratory wells accounted for only two spills that were greater than 5 barrels—a 100-barrel blowout in 1992 and a 200-barrel blowout in 2000. The largest U.S. offshore production platform spill during 1985-2001 was 643 barrels (1985). According to the Minerals Management Service, there have been 11 OCS platform spills greater than or equal to 1,000 barrels since 1964, with most of the large platform spills occurring before 1971. The last major platform spill (1,456 barrels) occurred in 1980. Seventeen OCS pipeline spills greater than 1,000 barrels have occurred since 1964. However, the size of the largest spills has declined over this time period. These numbers indicate that the offshore industry's record of spills from exploratory drilling, production facilities, and pipelines has improved considerably since the 1960s.<sup>34</sup>

As stated above under the heading “Previous studies of Virginia offshore resources”, the likelihood that significant quantities of oil will be discovered in the Mid-Atlantic OCS is fairly low compared to that of natural gas. Furthermore, data from the NRC and MMS suggest that, even if oil were encountered, the chance of a spill of significant size from offshore drilling and production operations is small.

## **Conclusions and Recommendations**

Previous exploration and research indicates there is potential for hydrocarbon deposits in Virginia's portion of the Atlantic Outer Continental Shelf (OCS), although the presence of economically recoverable deposits is far from certain. The United States Minerals Management Service (MMS) estimates that there may be 30 trillion cubic feet of natural gas reserves in the Atlantic OCS areas. Of that, 11.6 trillion cubic feet may be located in the Mid-Atlantic planning area. Virginia's OCS area comprises approximately 11% of the mid-Atlantic OCS prospective area, with its closest point to Virginia's coast at about 50 miles. If recoverable gas exists in the Mid-Atlantic OCS planning area, then Virginia's OCS area may contain  $\pm$  11% of these resources.

Scientific investigations have indicated that Virginia's OCS area is gas prone. However, the presence of oil cannot be ruled out without exploration. Therefore, any analysis of state action with regard to natural gas exploration and development must recognize that there is a potential for oil as well as natural gas. In fact, the history of oil and gas exploration indicates that where economically recoverable reserves of oil are found, they will be commercially exploited in all likelihood. Therefore, the initial question of whether to permit natural gas exploration in the Virginia OCS area is really a broader question: should Virginia permit oil and gas exploration and production in its OCS area?

---

<sup>34</sup> Source: U.S. Department of Interior, Minerals Management Service Fact Sheet: OCS Oil Spill Facts ([http://www.mms.gov/stats/PDFs/2002\\_OilSpillFacts.pdf](http://www.mms.gov/stats/PDFs/2002_OilSpillFacts.pdf))

A federal moratorium on exploration and development of natural gas or oil resources in the Atlantic and other OCS areas is in place. There are ongoing efforts in Washington to change this moratorium. Among the alternatives being considered is one that would provide states with the option to opt out of the federal moratorium for OCS lands located off of their shores. Additionally, the Minerals Management Service has started to develop its 2007-2012 OCS leasing plan. The MMS may include the Atlantic OCS area in its plan.

If MMS includes the Atlantic OCS in its plan or if the federal moratorium is changed to allow OCS natural gas or oil development, Virginia will be faced with a decision whether OCS development is appropriate. Virginia also would be involved in the decision-making process for any OCS development through the National Environmental Protection Act (NEPA) environmental impact review and the Coastal Zone Management Act consistency review. Virginia and its coastal localities also would be responsible for decisions regarding where in Virginia any offshore resources would be landed on-shore and on-shore support facilities would be located. Therefore, it is increasingly likely that Virginia and its coastal localities will be faced with decisions regarding offshore hydrocarbon development. Virginia should prepare itself for making these decisions.

In making these decisions, Virginia is faced with a number of options. If Virginia determines that the risk to its coastal environment and communities cannot be adequately controlled, it may wish to continue the prohibition on any offshore development. Alternately, if Virginia finds that offshore hydrocarbon development may be undertaken in a way that is protective of its coastal environment and coastal communities, it may wish to allow OCS development.

This study has found that the offshore natural gas is able to operate in a manner protective of the environment. In fact, if the question for this study was limited to natural gas exploration and production, then a positive answer would be fairly easy to reach. The issues are more complex when the possibility of oil production is added to the mix. For both natural gas and oil, we can say that while some past practices have caused significant environmental harm, natural gas and oil exploration and production practices and technologies have improved. As a result of those improvements, there has been a very low incidence of environmental damage from recent OCS natural gas and oil exploration and production activity. MMS records show the industry has a record of widespread operation with only a small volume of oil or chemical releases and localized effects from the location of drilling and production operations. The industry has proven generally that it can operate safely in very harsh environments such as the North Sea and in areas subject to extreme storms such as Georges Bank. Zero discharge operations are now feasible. Nevertheless, such problems as have occurred are associated with oil production, including recent oil spills from Hurricanes Katrina and Rita. Therefore, contingent on use of best management environmental and public safety practices and contingent on the other factors set forth below, exploration, development, and production of OCS natural gas resources should not materially adversely affect Virginia's environment. Development of OCS natural gas resources should not be prohibited solely

due to environmental risks associated with offshore exploration, development, and production themselves. And although the environmental risks of offshore oil production are substantially less today than in the past, additional investigations must be undertaken before OCS oil exploration, development, and production is allowed.

OCS hydrocarbon exploration and development offers economic opportunity to the Hampton Roads area. OCS development has provided a substantial economic benefit to other areas hosting such development. With its mature maritime industry, the Hampton Roads area is strongly positioned to provide the support services necessary for OCS exploration and development offshore from Virginia and neighboring states. However, the decision on OCS exploration and production should not be based on speculative benefits to the state and local treasuries or to Hampton Roads. The decision needs to be made on a broader basis: will OCS exploration and production, taking into account known and potential environmental risks as well as potential economic benefits, result in a substantial net benefit to the citizens of Virginia and the nation?

The key economic benefit to Virginians from OCS production, if gas is found in Virginia's OCS area, is the expansion and diversification of Virginia's gas supply that such production could yield. Evidence provided to the advisory group makes clear that supply and transportation constraints and heavy reliance on Gulf coast supplies makes Virginia's cost of natural gas in general, and the cost of gas in southeastern Virginia in particular, among the highest in the United States. In 2004 and 2005, the cost of natural gas was from 5 to 10% higher in Virginia than at the Henry Hub in Louisiana, and from 20 to 50% more expensive than in the Rocky Mountain and mid-continent areas. In contrast, even if offshore oil or gas is found in Virginia's OCS area, there is no certainty that the onshore facilities for such production would be located in Virginia. They could be located elsewhere on the Atlantic coast depending on the location of any discovered resources, so we cannot guarantee that Virginia will receive the business benefit of such production facilities. However, the maritime shipping and construction industries in Hampton Roads would be likely beneficiaries regardless of the location of production facilities. Virginia should at least receive the substantial benefits of an expanded and closer gas supply and enhanced state tax revenues.

It remains critically important that any natural gas or oil development in OCS areas account for the unique conditions found in the areas to be developed. Any development must be consistent with other uses of the OCS and nearby coastal areas. In Virginia, the Eastern Shore contains unique areas inconsistent with operation of natural gas or oil on-shore facilities. Virginia Beach's oceanfront is a major tourist designation. Hampton Roads is home to among the largest concentration of Navy and other military operations anywhere in the world. Facilities should not be located to intrude on areas critical for tourism or military operations in the region. Any on-shore development related to Virginia OCS development and pipelines bringing resources on-shore should be located in the industrial areas of Hampton Roads. With these protections, OCS development should be compatible with existing uses of Virginia's coast.

One factor to be considered in deciding if our nation's OCS hydrocarbon resources should be developed is whether offshore resources should be produced now or whether they should be saved or "banked" for future use. Natural gas, with its high-energy content and clean burning characteristics, is a high-value fuel. Some believe that the offshore natural gas should be saved for the future when there will be less natural gas available from other sources. Others point to the current limited supply and high price of natural gas as evidence that undeveloped OCS natural gas resources should be produced now. In considering this issue, it is useful to keep in mind that even under the fastest development scenarios, production from Atlantic OCS natural gas fields would not begin for ten years or more. This timeline is significant, since it undercuts the notion that Atlantic OCS gas can help fill current gas supply shortages in the U.S. By the time these resources, if present, would begin to serve U.S. markets, the entire supply/demand dynamic will have changed, probably for the worse.

In Virginia, the joint subcommittee studying manufacturing in Virginia has pointed out the costs to Virginia's manufacturing sector. There have been supply shortages in Virginia's Tidewater region due to limited pipeline capacity. The disruption from the 2005 and 2006 Gulf of Mexico illustrates the risks Virginia faces from receiving a substantial portion of its natural gas supply from one geographic region. Diversity of natural gas supply will lessen the risk Virginia's economy faces. It is clear that Virginia, and our country, need a mix of conservation and a diverse supply of reliable sources of natural gas, oil, coal, and non-fossil fuels to meet our energy needs. With proper environmental and safety controls, natural gas located in Virginia's OCS area can help diversify our supply sources and help support Virginia's economy.

One consideration Virginia must address regarding potential OCS hydrocarbon development is whether it will have a sufficient voice in decisions affecting its coastal areas. As noted, Virginia would be involved in the decision-making process for any nearby OCS development through the National Environmental Protection Act (NEPA) environmental impact review and the Coastal Zone Management Act consistency review. The environmental impact review process for any OCS hydrocarbon development is extensive. Environmental reviews, including public involvement, are provided for in four different phases:

- MMS five-year leasing plan development.
- Specific lease sales.
- Exploration plan development.
- Development and production plan development.

Virginia can, and should, be involved in the environmental reviews at each of these stages. The Commonwealth has designated the Department of Mines, Minerals and Energy (DMME) to be the state contact point with the Minerals Management Service regarding the MMS leasing process. DMME has been given the responsibility to coordinate activities regarding MMS' leasing program with other state entities. It is critical that state environmental and economic development interests have a voice in these environmental reviews.

The Virginia Coastal Program agencies raised concerns about the lack of experience and knowledge they possess in dealing with OCS hydrocarbon development. They are concerned that the time frame for comments on any lease sale in Virginia's OCS areas would be insufficient to adequately consider environmental issues. This issue also was raised when exploration was proposed off of Manteo, North Carolina. In this instance, the Minerals Management Service and the State of North Carolina agreed to develop an environmental impact report independent of the regular lease-sale EIS process. This provided additional time for consideration of environmental issues. This provides a good model to address the timing concerns expressed by the Virginia Coastal Program. This process should be used for initial consideration of lease sales in Virginia's OCS areas and should be undertaken on the assumption that both natural gas and oil are present in Virginia's OCS areas.

Various proposals to change the federal moratorium on OCS exploration and development would provide cost sharing of federal OCS revenue with the states. As Virginia would be affected by OCS activities, it should be provided with a share of OCS revenue. Virginia first should consider use of this revenue to support state agencies' and local governments' activities related to the OCS development. Such activities might include CZM consistency reviews, zoning activities, or construction of infrastructure needed to support onshore facilities. This is similar to the use of impact fees shared with the state from on-shore natural gas development. These fees are shared with the localities hosting the onshore oil or gas development to address environmental or community development issues in the area. Second, Virginia should consider the use of such revenues to support state response to other energy and environmental impacts, such as the cost of restoring Chesapeake Bay and research on alternative energy sources.

In summary, Virginia, if given the opportunity, should allow exploration for natural gas in its OCS areas contingent on the following conditions and in full recognition that recoverable reserves of gas and oil may never be found in Virginia's OCS areas. Accordingly, the Commonwealth should not have unrealistic expectations about the likelihood or the amount of potential revenue or economic activity to be derived from the development of such potential reserves.

- Virginia and the nation develop a broad-based energy policy with energy efficiency as the backbone of our response to energy problems, coupled with increasing supplies of conventional and alternative energy resources.
- Ample opportunity is provided for public involvement in the environmental assessment process for offshore energy development. The environmental impact assessment process for the initial exploration efforts in Virginia's OCS areas should follow the process used to evaluate environmental issues related to the Manteo, North Carolina proposed exploration well to allow adequate time to evaluate issues related to such development. Any such environmental assessment should assume exploration and development of both natural gas and oil.

- If commercially recoverable reserves of oil are discovered, Virginia must more fully consider the increased risk of a large oil spill. Therefore, additional environmental assessment, with appropriate opportunities for public involvement, of the potential for and consequences of oil spills and ways to mitigate the risk of spills must be completed. This should include assessment of the oil spills arising from Hurricanes Katrina and Rita and other incidents in the Gulf of Mexico and from offshore oil production in the North Sea, Australia, and Nova Scotia. This analysis should be an integral part of the environmental assessments in phase 4 of the OCS development process.
- The final decision whether to allow exploration and production of hydrocarbons in Virginia's OCS areas must be contingent on the MMS and lease holders showing that the development will be undertaken in a manner protective of the environment and public safety.
- Any offshore operations must use best available technologies and practices to control operations and minimize risks to the environment and public safety.
- No wells should be drilled closer than 50 miles to the Virginia shoreline.
- Any development of pipelines or support facilities in state waters or onshore areas must be consistent with Virginia's Coastal Zone Program requirements.
- No onshore facilities should be located on Virginia's Eastern Shore.
- All facilities located on- or near-shore must be consistent with local zoning and land use plans and not conflict with other land uses near the facilities. Facilities should not be located to intrude on areas critical for tourism or military operations in the region.
- Revenue from OCS leases must be shared with the Commonwealth and affected localities. Revenues should support state response to other energy and environmental impacts, such as the cleanup of Chesapeake Bay and research into alternative energy sources.

As development of hydrocarbons in Virginia's OCS areas is primarily subject to federal authority, implementing these recommendations requires action by the federal government. Existing state laws and regulations governing development in coastal areas have been developed to protect Virginia's environment from the potential harm from differing types of development. OCS hydrocarbon development should not expose Virginia to any greater risk than other possible land uses. Therefore, no new state laws or regulations should be needed to address OCS development. Therefore, this study does not include any proposed state legislation.

While federal law governs development of OCS resources, the Commonwealth can influence how these federal decisions will affect Virginia. This policy could be established under executive authority or by resolution of the General Assembly. Such a resolution is provided in Attachment 4.

## Attachments

Attachment 1: HJR 625 Resolution

Attachment 2: HJR 625 Advisory Group Meeting Agendas

Attachment 3: Virginia Coastal Policy Team Agencies

Attachment 4: Resolution expressing the policy of the Commonwealth regarding development of outer continental shelf hydrocarbon resources



Attachment 1:

**HOUSE JOINT RESOLUTION NO. 625**

*Requesting the Secretary of Commerce and Trade to study the possibility of exploring for natural gas in the coastal areas of the Commonwealth. Report.*

Agreed to by the House of Delegates, February 25, 2005

Agreed to by the Senate, February 24, 2005

WHEREAS, the exploration of natural gas in the Commonwealth's coastal areas is currently prohibited under a federal ban on offshore oil and gas drilling, a moratoria that has been in place since 1982; and

WHEREAS, the General Assembly has enacted legislation prohibiting any person from drilling for oil or gas in the waters of the Chesapeake Bay or any of its tributaries, while also providing permissible locations and procedures for the drilling of oil or gas in other areas of Tidewater Virginia; and

WHEREAS, the rising demand for natural gas as a clean-burning fuel source coupled with its limited supply will continue to boost heating and electricity costs, affecting homeowners and a range of major industries; and

WHEREAS, advances in technology, more stringent safety stipulations, and more frequent inspection requirements have enabled the offshore drilling industry to drill deeper, cleaner, and more efficiently; and

WHEREAS, the Outer Continental Shelf, which includes the Commonwealth's 112 miles of coastline, should be viewed as a significant source for increased supply of natural gas to help meet the Commonwealth's demand for the long term; and

WHEREAS, proposed federal legislation known as the State Enhanced Authority for Coastal and Offshore Resources Act (SEACOR) would enhance states' authority over coastal and offshore resources; provide an exemption to the moratorium that prevents until 2012 any surveying, exploration, development, or production of potential natural gas deposits in areas off the Commonwealth's Atlantic shore that are under federal jurisdiction; and incorporate revenue sharing between the federal and state governments for leasing activity that potentially will provide the Commonwealth with significant additional sources of revenue; and

WHEREAS, proper management of the coastal zone is vital to the Commonwealth's interest in preserving the environment, public access, tourism, and sustainable economic development; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Secretary of Commerce and Trade be requested to study the possibility of exploring for natural gas in the coastal areas of the Commonwealth.

In conducting its study, the Secretary of Commerce and Trade shall include recommended legislation that could permit drilling for natural gas off the coast of the Commonwealth. Technical assistance shall be provided to the Secretary of Commerce and Trade by the Department of Mines, Minerals and Energy, and the Virginia Coastal Program, including making available all records and information necessary for the completion of this study. All agencies of the Commonwealth shall provide assistance to the Secretary of Commerce and Trade for this study, upon request.

The Secretary of Commerce and Trade shall complete the meetings by November 30, 2005, and shall submit to the Governor and the General Assembly an executive summary and a report of his findings and recommendations for publication as a House or Senate document. The executive summary and report shall be submitted as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports no later than the first day of the 2006 Regular Session of the General Assembly and shall be posted on the General Assembly's website.

Attachment 2:

**Study of the Possibility of Exploring For Natural Gas Offshore Virginia  
Pursuant to HJR 625  
Advisory Group Meeting Agendas**

Wednesday, June 22, 2005

1. Call to Order
2. Introduction
  - Secretary Michael J. Schewel
3. Work Plan
  - Secretary Michael J. Schewel
4. Natural Gas Issues Raised In SJR 361 Manufacturing Study
  - Senator Frank W. Wagner, Joint Subcommittee Chairman
5. Supply and Demand for Natural Gas
  - Stephen A. Walz, Department of Mines, Minerals and Energy
6. Previous Studies of Natural Gas Resources Offshore Virginia
  - Edward E. Erb, Department of Mines, Minerals and Energy
7. Authority to Explore in Offshore Waters
  - David B. Spears, Department of Mines, Minerals and Energy
8. Offshore Natural Gas Development Process
  - Tom Fry, President, National Ocean Industries Association
9. Advisory Group Comments
10. Public Comments
11. Adjournment

Tuesday, August 23, 2005

1. Call to Order
2. OCS Leasing, Exploration and Development – Environmental Impact Assessment Process
  - Judy Wilson, United States Department of the Interior, Minerals Management Service
3. State Role in the Environmental Impact Assessment and Coastal Zone Management Act Consistency Reviews
  - Ellie Irons, Virginia Department of Environmental Quality
4. Review of the Manteo Exploration Well Environmental Impact Report
  - David Spears, Virginia Department of Mines, Minerals and Energy
5. Virginia Coastal Program – Environmental Impact and Environmental Impact Review Process Issues
  - Laura McKay, Virginia Department of Environmental Quality
6. Civilian and Military Shipping
  - Ari Lawrence, Surfrider Foundation
7. Advisory Group Discussion - Environmental Impact and Environmental Impact Review Process Issues
  - Advisory Group members
8. Public Comments
9. Adjournment

Wednesday, October 26, 2005

1. Call to Order
2. Review of August 23 Minutes
3. Tourism Impact from Offshore Drilling
  - Diane Béchamps, Virginia Tourism Corporation
4. Economic Impact from Offshore Drilling
  - Jim Kibler, AGL Resources, Inc.
5. Issues Associated With Offshore Energy Development
  - Eric Walberg, Hampton Roads Planning District Commission
6. Potential Royalties from Offshore Drilling
  - David Spears, Department of Mines, Minerals and Energy
7. Experience in Other Areas with Offshore Drilling
  - David Spears, Department of Mines, Minerals and Energy
8. Lessons from Hurricanes Ivan, Katrina, and Rita
  - Steve Walz, Department of Mines, Minerals and Energy
9. Advisory Group Discussion – Outstanding Issues and HJR 625 Report
10. Public Comments
11. Adjournment

Attachment 3:

Virginia Coastal Policy Team Agencies Participating in the HJR 625 Study

- Department of Environmental Quality
- Virginia Marine Resources Commission
- Department of Game and Inland Fisheries
- Department of Conservation and Recreation
- Department of Historic Resources
- Virginia Institute of Marine Resources
- Old Dominion University
- Hampton Roads Planning District Commission

Attachment 4:

House Joint Resolution \_\_\_\_\_ / Senate Joint Resolution \_\_\_\_\_

*Expressing the Policy of the Commonwealth regarding development of outer continental shelf hydrocarbon resources.*

WHEREAS, the exploration of natural gas and petroleum in the Commonwealth's coastal areas is currently prohibited under a federal moratorium on offshore oil and gas drilling in place since 1982; and

WHEREAS, due to the need to protect the unique attributes of the Chesapeake Bay, the General Assembly enacted legislation prohibiting any person from drilling for oil or gas in the waters of the Chesapeake Bay or any of its tributaries; and

WHEREAS, development of gas resources in outer continental shelf areas offshore Virginia would not pose an unacceptable level of environmental risks to Virginia; and

WHEREAS, Virginia should have a role, with the federal government, in any decision to authorize exploration and development of hydrocarbons in Virginia's outer continental shelf areas; and

WHEREAS, the General Assembly requested the Secretary of Commerce and Trade to study the possibility of exploring for natural gas in the coastal areas of the Commonwealth; and

WHEREAS, the Secretary of Commerce and Trade has recommended that exploration of natural gas resources be allowed in outer continental shelf subject to:

- 1) Implementation of a broad-based approach to energy, coupling energy efficiency and efforts to increase our supplies of traditional and alternative energy supplies;
- 2) Ample opportunity for public involvement in the environmental assessment process for offshore energy development, assuming exploration and development of both natural gas and oil, with the environmental impact assessment process for the initial exploration efforts in Virginia's OCS areas following the process used to evaluate environmental issues related to the Manteo, North Carolina proposed exploration well;
- 3) If commercially recoverable reserves of oil are discovered, careful consideration, with appropriate opportunities for public involvement, of the potential for and consequences of oil spills and ways to mitigate the risk of spills. This should include assessment of the oil spills arising from Hurricanes Katrina and Rita and other incidents in the Gulf of Mexico and from offshore oil production in the North Sea, Australia, and Nova Scotia. This analysis should be an integral part of the environmental assessments in phase 4 of the OCS development process;
- 4) The Minerals Management Service and lease holders showing that the development will be undertaken in a manner protective of the environment and public safety;

- 5) Use of best available technologies to control the operations and minimize risks to the environment and public safety;
- 6) No wells being drilled closer than 50 miles to the Virginia shoreline;
- 7) Any development of pipelines or support facilities in state waters or onshore areas being consistent with Virginia's Coastal Zone Program requirements;
- 8) No onshore facilities being located on Virginia's Eastern Shore;
- 9) All facilities located on- or near-shore being consistent with local zoning and land use plans and not conflicting with other land uses in the area near the facilities and not intruding on areas critical for tourism or military operations in the region; and
- 10) Revenue sharing of proceeds from OCS leases being provided to the Commonwealth and affected localities. Revenues should support state response to other energy and environmental impacts, such the cleanup of the Chesapeake Bay and research into alternative energy sources.

RESOLVED by the House of Delegates, the Senate concurring, that it is the policy of the Commonwealth that Virginia should have the authority to authorize exploration of outer continental shelf natural gas resources in areas off Virginia's coast. Such exploration must be subject to the above conditions.