CITIZEN PETITION REQUESTING THE COMPLETION OF A PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT AND REGULATIONS ADDRESSING THE CUMULATIVE IMPACTS OF DRILLING IN THE MARCELLUS SHALE FORMATION IN THE CHESAPEAKE BAY STATES

CHESAPEAKE BAY FOUNDATION, INC., NATIONAL PARKS CONSERVATION ASSOCIATION, APPALACHICAN CENTER FOR THE ECONOMY AND THE ENVIRONMENT, CHESAPEAKE CLIMATE ACTION NETWORK, SHENANDOAH VALLEY NETWORK, THE FOUNDATION FOR PENNSYLVANIA WATERSHEDS, DAMASCUS CITIZENS FOR SUSTAINABILITY, and FRIENDS OF THE UPPER DELAWARE RIVER,

Petitioners,

Filed With:

NANCY SUTLEY, Chair, COUNCIL ON ENVIRONMENTAL QUALITY, LISA P. JACKSON, Administrator, U.S. ENVIRONMENTAL PROTECTION AGENCY, KEN SALAZAR, Secretary, U.S. DEPARTMENT OF INTERIOR, TOM VILSACK, Secretary, U.S. DEPARTMENT OF AGRICULTURE, Dr. STEVEN CHU, Secretary, U.S. DEPARTMENT OF ENERGY, RAY LaHOOD, Secretary, U.S. DEPARTMENT OF TRANSPORTATION, Lt. Gen. ROBERT L. VAN ANTWERP, Commanding General, U.S. ARMY CORPS OF ENGINEERS, and JON WELLINGHOFF, Chairman, FEDERAL ENERGY REGULATORY COMMISSION.

CITIZEN PETITION REQUESTING THE COMPLETION OF A PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT AND REGULATIONS ADDRESSING THE CUMULATIVE IMPACTS OF DRILLING IN THE MARCELLUS SHALE FORMATION IN THE CHESAPEAKE BAY STATES

INTRODUCTION

Drilling for natural gas in the Marcellus Shale formation has significant impacts within the Chesapeake Bay states and to the 35 national park units that lie within or in the vicinity of the formation - and those impacts demand that action be taken by the federal government to determine the best way to protect human health and the environment. The National Environmental Policy Act (NEPA) serves as this country's basic environmental charter and requires that all federal decisions include environmental considerations. The Council on Environmental Quality (CEQ) is charged with overseeing NEPA and ensuring that all federal agencies comply with its requirements.

Pursuant to the First Amendment of the United States Constitution, and the Administrative Procedures Act, which grant the right to people to petition the federal government for redress of grievances, as well as the President's Executive Order 13508 of May 12, 2009, the Chesapeake Bay Foundation (CBF), National Parks Conservation Association (NPCA), Appalachian Center for the Economy and the Environment (ACEE), Chesapeake Climate Action Network (CCAN), Shenandoah Valley Network (SVN), The Foundation for Pennsylvania Watersheds, Damascus Citizens for Sustainability (DCS), and Friends of the Upper Delaware River (FUDR) petition the U.S. Environmental Protection Agency (EPA), Department of Interior (DOI), Department of Agriculture (USDA), Department of Energy (DOE), Department of Transportation (DOT), the Army Corps of Engineers (Corps), and the Federal

Energy Regulatory Commission (FERC), with oversight from the Council on Environmental Quality (CEQ), to prepare a Programmatic Environmental Impact Statement (PEIS) regarding the cumulative impacts of drilling in the Marcellus Shale formation within the Chesapeake Bay states and promulgate necessary regulations based upon the outcome of the study.[1,2]

This petition requests that CEQ and the federal agencies, referenced above, involved with the drilling, extraction, transportation and combustion of natural gas in the Marcellus Shale take the following actions:

1. Undertake a cumulative impacts analysis to determine the effects that drilling in the Marcellus Shale region has on human health and the environment throughout the Chesapeake Bay states including, but not limited to, impacts to the air, water quality, forest land, national park land, wildlife habitat and ecosystems;

2. Issue a Programmatic Environmental Impact Statement addressing the cumulative impacts and suggesting reasonable alternatives to mitigate negative impacts throughout the Chesapeake Bay states; and

3. Promulgate any necessary guidance and regulations based upon the findings in the PEIS and to comply with the mandates of Executive Orders 13508, 11514, 11991,and 13352.

Given the substantial and ever growing expansion of natural gas drilling, extraction, processing, and transportation in the Marcellus Shale region, we urge CEQ and these federal agencies to immediately address their responsibility to protect human health and the environment within the Chesapeake Bay states and to comply with NEPA by preparing a Programmatic Environmental Impact Statement (PEIS) and promulgating any necessary regulations.

[1] U.S. Const., amend. I. ("Congress shall make no law . . . abridging . . the right of the people . . . to petition Government for a redress of grievances."). *United Mine Workers of Am., Dist. 12 v. Illinois State Bar Ass'n.*, 389 U.S. 217, 222 (1967) (the right to petition for redress of grievances is among the most precious of the liberties safeguarded by the Bill of Rights).

[2] 5 U.S.C § 553(e) (2005) ("Each agency shall give an interested person the right to petition for the issuance, amendment, or repeal of a rule.")

PETITIONERS

Chesapeake Bay Foundation, Inc.

Petitioner, Chesapeake Bay Foundation, Inc. (CBF) is a 501(c)(3), non-stock, Maryland corporation with offices in Annapolis, Maryland; Harrisburg, Pennsylvania; Richmond, Virginia; Norfolk, Virginia; and the District of Columbia. CBF is the largest conservation organization dedicated solely to protecting the Chesapeake Bay watershed, the Chesapeake Bay itself, and its tributaries. Since CBF's founding over forty years ago, its goal has been to improve water quality in the Chesapeake Bay and its tributaries by reducing pollution. CBF is the only independent organization dedicated solely to restoring and protecting the Chesapeake Bay and its tributary rivers. Its goal is to improve water quality by reducing pollution. CBF's vision for the future is a restored Bay with healthy rivers and clean water; sustainable populations of crabs, fish, and oysters; thriving water-based and agricultural economies; and a legacy of successful protection and restoration of the Chesapeake Bay ecosystem for our children and grandchildren. CBF has approximately 170 staff members who work throughout the Chesapeake Bay watershed to "Save the Bay" through educational programs, environmental restoration projects, science-based advocacy, lobbying at the State and Federal levels, and targeted litigation. Additionally, CBF represents over 206,000 members and e-subscribers as well as nearly 12,000 active adult and student volunteers. Development of Marcellus Shale gas extraction adversely impacts the interests of CBF and its members.

National Parks Conservation Association

Petitioner, National Parks Conservation Association (NPCA) is a national non-profit organization with offices in Washington DC, and most of the states affected by drilling in the

Marcellus Shale, including Tennessee, West Virginia, Pennsylvania, and New York.

NPCA protects and enhances America's parks for present and future generations, with over 330,000 members nationwide and almost 87,000 members in the Marcellus Shale states. NPCA accomplishes this by working on projects that protect and enhance national parks, including the 35 national parks in and near the Marcellus Shale. NPCA brings this petition action on its own institutional behalf and on behalf of its members, board, and staff, some of whom regularly enjoy and wish to continue to enjoy the national parks that would be impacted by drilling in the Marcellus Shale. The interests of NPCA and its members, board, and staff in enjoying these park units will be harmed by the impacts of drilling. Specifically, water, air, light, and sound pollution; water depletion; and the destruction of important habitat will detract from their experiences in these parks. NPCA, its members, board, and staff have worked to protect the park units within and near the Marcellus Shale for many years, including helping to lead the "Choose Clean Water" coalition, which advocates for federal policies to protect and restore local water quality at dozens of national parks in the region and in the Chesapeake Bay and have expended significant organizational resources to ensure the future health of these parks.

Appalachian Center for the Economy and the Environment

Petitioner, the Appalachian Center for the Economy and the Environment (ACEE) is a non-profit, regional law firm and policy organization based in Lewisburg, West Virginia. The Center represents and works with individual citizens and grassroots citizens' groups to clarify, analyze, and act on the environmental and economic issues that affect regional communities. We carry out precedent-setting litigation strategically designed to protect the environment and the health of communities. We also conduct research and analysis, and advocate for a sustainable and just economy for the region. Ultimately, ACEE is working to protect communities from the

adverse health effects caused by water and air pollution generated by resource extraction, coal burning power plants, and other destructive practices. ACEE and the citizens groups it represents will be adversely affected by the impacts from drilling in the Marcellus Shale formation.

Chesapeake Climate Action Network

Petitioner, the Chesapeake Climate Action Network (CCAN) is the first grassroots, nonprofit organization dedicated exclusively to fighting global warming in Maryland, Virginia, and Washington, D.C. CCAN's mission is to build and mobilize a powerful grassroots movement in this unique region that surrounds our nation's capital to call for state, national and international policies that will put us on a path to climate stability. CCAN represents over 50,000 members throughout Maryland, DC and Virginia. CCAN and its members are concerned about and will be negatively affected by the human health and environmental impacts from drilling in the Marcellus Shale formation.

Shenandoah Valley Network

Petitioner, the Shenandoah Valley Network (SVN) is a non-profit organization that works to maintain healthy and productive rural landscapes and communities, to protect and restore natural resources, and to strengthen and sustain the region's agricultural economy. SVN pursues this mission by supporting strong local citizens' groups and promoting good local land use and transportation plans, compatible economic development strategies, and effective land protection programs. SVN serves community groups in six Virginia counties: Frederick, Warren, Shenandoah, Page, Rockingham and Augusta. SVN provides leadership and advocacy on regional issues, such as drilling in the Marcellus Shale formation, that threaten the natural and historic resources, agricultural economy and traditional communities in the northern Shenandoah

Valley. SVN has member and partner organizations throughout the northern Shenandoah Valley. The interests of these organizations, along with their boards and staff, will be harmed by the impacts from poorly regulated drilling in the Marcellus Shale formation. SVN's work to protect rural landscapes and communities, protect and restore natural resources, and to strengthen and sustain the area's agricultural economy will be adversely impacted from these activities.

The Foundation for Pennsylvania Wetlands

Petitioner, the Foundation for Pennsylvania Watersheds (Foundation) is an operating foundation, philanthropic in nature working from the founding premise that every grant that is made goes for environmental restoration or preservation and partners with agency programs, both state and federal. To date the Foundation has assisted more than 150 groups, funded more than $6.7million in projects, leveraged more than $117 million in additional investments and restored more than 700 miles of polluted streams and rivers. The Foundation's mission is to foster stewardship for the protection, preservation and restoration of Pennsylvania's unique water resources and watersheds, while leveraging local, state and federal agency funds. The Foundation has 150 grantees whose membership's number in the thousands. The Foundation has provided grant funding to multiple groups working on various issues dealing with drilling in the Marcellus Shale formation. It is important to the Foundation that the mistakes of the past are not repeated and that a rush to develop a new source of energy production be given thoughtful consideration. Without consideration of the cumulative impacts of gas drilling, well pad sitting, road access, and disposal of the wastewater from the fracking process, the Foundation feels that the Watershed Implementation Plans which Pennsylvania has committed to will not be meaningful in the restoration of the great biological resource known as the Chesapeake Bay. The

Foundation and its grantees and their members will be negatively affected by drilling in the Marcellus Shale formation and its associated activities.

Damascus Citizens for Sustainability, Inc.

Petitioner, Damascus Citizens for Sustainability, Inc. (DCS) is a 501(c)(3) non-stock Pennsylvania corporation established in 2008 to protect the Delaware River Basin and watershed from the risks associated with natural gas exploration, production, processing and transportation (collectively "natural gas development") and to promote the health and prosperity of communities in the Delaware River Basin. DCS's 5,000 members live, work, recreate and have family, property and businesses in the Delaware River Basin. Many of DCS's members obtain their water for domestic, agricultural, and other purposes from groundwater, streams and other surface waters within the Delaware River watershed. Natural gas development will have an adverse impact on these water resources, the environment and the ecosystems in the watershed that are important to DCS and its members. DCS and its members are committed to protecting the existing high quality waters, environment, and ecosystems in the Delaware River watershed for current and future generations from the risks associated with natural gas development. DCS and its members interact with, use and enjoy the water resources and flora and fauna in the drainage area of the Special Protection Waters of the Delaware River watershed and the areas within the watershed designated as a Scenic and Recreational River under the Wild and Scenic Rivers Act. DCS has advocated to the Delaware River Basin Commission (DRBC) that it is required by the Delaware River Basin Compact to regulate any and all natural gas development that may have a substantial impact on the water resources and ecosystems of the Basin.

Friends of the Upper Delaware River

Petitioner, Friends of the Upper Delaware River is a 501(c)(3) non-stock Pennsylvania corporation with offices in Delaware County, New York, New York City, New York, and Wayne County, Pennsylvania. The mission of FUDR is to protect, preserve and enhance the ecosystem and cold-water fishery of the upper Delaware River watershed and to address any environmental threats to the watershed for the benefit of local communities, residents and visitors to the region. FUDR recently developed two comprehensive stream restoration projects to reduce or eliminate flooding, turbidity and suspended solids pollution from two major tributary streams to the East and West Branches of the Delaware River in the Hancock, New York area. With funding from its members and its annual "One Bug" fund raising event and generous support from the National Fish and Wildlife Foundation, FUDR is partnering with the Town of Hancock, the Delaware County Department of Public Works, and the U.S. Army Corps of Engineers in spearheading these stream restoration projects. FUDR has and will continue to play an active role in efforts to protect the Upper Delaware River region in connection with shale gas development projects. It has always been a fundamental principal of FUDR that resource management decisions should only be made after full and thoughtful investigation of the scientific information related to such decisions.

STATUTORY AND REGULATORY FRAMEWORK

I. National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA), 42 U.S.C. § 4321*et seq.*, is the "basic national charter for protection of the environment." 40 C.F.R. § 1500.1 (2005). NEPA is intended to "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." 42 U.S.C. § 4321. NEPA ensures that "environmental information is available to public officials and citizens before decisions are made

and before action is taken." 40 C.F.R. § 1500.1(b), (c). As such, Congress required all federal agencies to act to preserve, protect and enhance the environment. 42 U.S.C § 4331(b).

NEPA requires that before federal agencies make decisions, they must consider the effects of their actions on the quality of the human environment. 42 U.S.C. § 4332. When a federal agency proposes to take action and any reasonable alternatives have been developed, the agency must determine if the action has the potential to affect the quality of the human environment. NEPA, Section 102(2)(C), sets out the framework by which federal agencies consider the environmental impacts in their decision-making processes and inform the public of those impacts. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (noting that "the sweeping policy goals announced in §101 of NEPA are thus realized through a set of 'action-forcing' procedures that require the agencies take a 'hard look' at the environmental consequences").

As part of this process, federal agencies must, among other things, "[i]nclude in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment, a detailed statement . . . which addresses the environmental impact of the proposed action;" "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflict concerning alternative uses of available resources;" and to "recognize the worldwide and long-range character of environmental problems." 42 U.S.C. § 4332(C), (E) and (F).

The review process under NEPA results in one of three levels of NEPA analysis: (1) a Categorical Exclusion; (2) an Environmental Assessment (EA); or (3) an Environmental Impact Statement (EIS). Further, because NEPA applies to all federal agencies within the executive

branch, each agency is responsible for developing regulations on how it will implement NEPA. While each agency is responsible for implementing and applying NEPA to its actions, CEQ oversees the NEPA process. 42 U.S.C §§ 4321, 4344.

NEPA requires that federal agencies prepare an EIS for "major federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(c). The purpose of an EIS is to ensure that the policies and goals of NEPA are "infused into the ongoing programs and actions of the Federal Government." 40 C.F.R. § 1502.1. Further, an EIS shall provide a "full and fair discussion of significant environmental impacts and shall inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment." *Id.* Federal actions requiring an EIS based on broad actions may be evaluated by a number of criteria, most importantly here, geographically, including those actions occurring in the same general location, such as body of water, region or metropolitan area. 40 C.F.R. § 1502.4(c).

Further, NEPA requires that agencies employ scoping and tiering, to relate broad and narrow actions to avoid duplication and delay. 40 C.F.R. § 1502.4(d). Tiering refers to the coverage of general matters in a broader environmental impact statement. 40 C.F.R. § 1508.28. NEPA encourages federal agencies to tier their environmental impact statements to eliminate repetitive discussions of the same issues. 40 C.F.R. § 1502.20.

NEPA uses the terms "effects" and "impacts" synonymously and defines them as ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect or cumulative. 40 C.F.R. § 1508.8. An EIS needs to consider environmental impacts, including cumulative impacts which are defined as:

> . . . the impact on the environment which results from the incremental impact of the action when added to other past, present,

> and *reasonably foreseeable future actions* regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7 (emphasis added).

Evaluating the effects of agency decisions on the quality of the human environment includes considering the cumulative impacts of those actions. *See, e.g. Boston v. Volpe,* 464 F2d 254 (1st Cir. 1972) (holding the purpose of NEPA is to build environmental considerations into agency decision process as early as possible, taking into account overall, cumulative impact of action proposed and of further actions contemplated, as well as of environmental consequences not fully evaluated at the outset of the project or program.)

II. The Council on Environmental Quality (CEQ)

CEQ, established by Congress, was created to assist the President in developing national policies to foster and promote the improvement of environmental quality and to conduct investigations relating to ecological systems and environmental quality. 42 U.S.C. § 4344. CEQ also ensures that all federal agencies meet their obligations under NEPA, issues and interprets NEPA regulations, and reviews and approves federal agency NEPA procedures and regulations. 42 U.S.C. §§ 4321, 4344. CEQ's regulations, 40 C.F.R. parts 1500-1508, set forth the minimum requirements necessary for agencies to comply with NEPA and require that federal agencies create their own implementing regulations to supplement those of CEQ. 40 C.F.R. § 1507.3. These regulations are binding on all federal agencies. 40 C.F.R. §§ 1500.3, 1507.1. CEQ's regulations mandate that all federal agencies address all "reasonably foreseeable" environmental impacts of their proposed programs, projects, and regulations. 40 C.F.R. §§ 1502.4, 1508.8, 1508.18 & 1508.25.

While CEQ is charged with the general oversight of NEPA, as explained below, the Administrator of EPA is also empowered to coordinate with other federal agencies' environmental research within and outside the federal government to minimize unnecessary duplication of programs and projects. 42 U.S.C. § 4366. Additionally, EPA, pursuant to Section 309 of the Clean Air Act, is required to review and comment on any EIS or EA issued by any federal agency. 42 U.S.C. § 7609.

III. Agency NEPA Implementing Regulations

NEPA requires that all federal agencies comply with the regulations promulgated by CEQ. 40 C.F.R. § 1507.1. Further, each federal agency retains flexibility in adopting its own NEPA implementing regulations pursuant to 40 C.F.R. §§ 1507.1 & 1507.3. For instance, EPA regulations spell out criteria to determine which proposed actions require an EIS. 40 C.F.R. § 6.207. If the action meets *any* of the criteria listed then an EIS would be required. *Id.* (emphasis added). Of those criteria listed, several are relevant in this context, including:

> (ii) The proposed action is likely to directly, or through induced development, have significant adverse effect upon local ambient air quality or local ambient noise levels.
>
> (vi) The proposed action is likely to significantly affect the environment through the release of radioactive, hazardous or toxic substances, or biota.
>
> (vii) The proposed action involves uncertain environmental effects or highly unique environmental risks that are likely to be significant.
>
> (ix) The proposed action is likely to significantly affect environmentally important natural resources such as wetlands, significant agricultural lands, aquifer recharge zones, coastal zones, barrier island, wild and scenic rivers, and significant fish or wildlife habitat.

> (x) The proposed action in conjunction with related federal, state or local government, or federally-recognized Indian tribe projects is *likely to produce significant cumulative impacts*.

40 C.F.R. §6.207(a)(3)(ii), (vi), (vii), (ix) and (x).

In many instances, federal agencies have also adopted regulations that expand on the traditional NEPA EIS. These agencies have determined that in some cases a Programmatic Environmental Impact Statement (PEIS) is appropriate. A PEIS is simply a subspecies of an EIS but is usually prepared for broad federal actions such as policies, plans or programs. In 1981, CEQ, as part of its oversight of NEPA implementation, compiled a list of the *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act*. One of those questions dealt with an area-wide or overview EIS and when it may be appropriate. An area-wide or overview EIS is simply another term for a PEIS. CEQ stated that generally, an area-wide or overview EIS is useful "when similar actions, viewed with other reasonably foreseeable or proposed agency actions, share common timing or geography."[3] The example used by CEQ to demonstrate when an area-wide or overview EIS may be appropriate is "when a variety of energy projects may be located in a single watershed."[4]

Several federal agencies' NEPA implementing regulations or guidance documents set forth requirements of considering cumulative impacts, tiering, or a PEIS. Department of Energy's NEPA implementing regulations allow for a PEIS at any time the agency determines it is necessary to further the purposes of NEPA. 10 C.F.R. § 1021.330. Any PEIS performed by DOE shall be prepared in accordance with requirements for any other NEPA documents. *Id.* A Programmatic NEPA document is defined as a broad-scope EIS or EA that identifies and assesses the environmental impacts of a DOE program. 10 C.F.R. § 1021.104. The U.S. Army

[3] *See* Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18,026, 18,033 (Mar. 23, 1981).
[4] *Id.*

Corps of Engineers has also addressed tiering and requires that it should be used in appropriate cases and that the PEIS must present sufficient information regarding overall impacts of the proposed action. 33 C.F.R. § 230.13(c). The Department of Interior's NEPA implementing regulations also set forth requirements for using tiered documents. 43 C.F.R. § 46.140. In addition, both the USDA and the DOT also have adopted NEPA implementing regulations. *See e.g.* 7 C.F.R. § 1b.1, *et seq.*

IV. Executive Orders

On May 12, 2009, President Obama signed Executive Order 13508 (Chesapeake EO) for the protection and restoration of the Chesapeake Bay.[5] This Executive Order, among other things, requires the EPA, USDA, Department of Commerce (DOC), Department of Defense (DOD), Department of Homeland Security (DHS), DOI, DOT and other agencies, as determined by the Committee, to conserve landscapes and ecosystems of the Chesapeake Bay watershed and to establish a clear path to meeting water quality and environmental restoration goals. A PEIS is necessary to comply with this Executive Order and determine how natural gas drilling in the Marcellus Shale formation is impacting landscapes and ecosystems of the Chesapeake Bay watershed.

In addition to the Chesapeake EO signed by President Obama, there are two additional Executive Orders that are applicable here. Executive Order 11514, Protection and Enhancement of Environmental Quality, signed on March 5, 1970, (amended by Executive Order 11991 signed on March 24, 1977), was signed to further the purpose and policy of NEPA. This Executive Order requires all heads of Federal agencies to "monitor, evaluate, and control on a continuing basis their agencies' activities so as to protect and enhance the quality of the environment." The

[5] Executive Order 13508, Chesapeake Bay Protection and Restoration, 74 Fed. Reg, 23099 (May 15, 2009), available at: http://www.whitehouse.gov/the-press-office/executive-order-chesapeake-bay-protection-and-restoration

Executive Order goes on to state that agencies shall review their statutory authority, including relating to permits to identify any deficiencies or inconsistencies which prohibit or limit full compliance with NEPA. Finally, the Executive Order states that CEQ shall determine the need for new policies and programs for dealing with environmental problems not being adequately addressed – in this instance drilling in the Marcellus Shale.

Executive Order 13352, Facilitation of Cooperative Conservation, signed on August 26, 2004, requires that DOI, USDA, DOC, DOD and EPA implement laws in a manner that promotes cooperative conservation. This requires that programs, projects, and activities be consistent with protecting public health and safety. Drilling in the Marcellus Shale impacts many resources, drinking water sources, surface water, air, forestland, national park land, and landscapes just to name a few. Because thousands of wells have been drilled and drilling is taking place throughout the Chesapeake Bay states and each permit and drilling extraction related project is treated separately, a comprehensive scientific examination of the cumulative impacts has not been identified or studied.

STATEMENT OF FACTS

I. The Marcellus Shale Formation, Natural Gas, and the Surrounding Communities

The Marcellus Shale is an underground shale formation stretching from Ohio and West Virginia into Pennsylvania and southern New York. The Marcellus Shale formation underlies portions of the Chesapeake Bay states of New York, Pennsylvania, Maryland, West Virginia, and Virginia.[6] Thirty-five national park units overlie or are in the vicinity of the Marcellus Shale, nine of those units are within the Chesapeake Bay watershed. The Marcellus Shale is believed to hold trillions of cubic feet of natural gas at depths of more than 7,000 feet.[7] Some

[6] *See* Exhibit A Map of shale/bay watershed
[7] *See* http://www.dec.ny.gov/energy/46288.html.

estimate that there is between 250 to 500 trillion cubic feet of natural gas in the Marcellus Shale formation and could produce natural gas for up to 80 years.[8,9] Extracting the natural gas from the Marcellus Shale involves the processes of vertical and horizontal drilling as well as hydraulic fracturing. Hydraulic fracturing involves the use of millions of gallons of water and sand mixed with potentially hundreds of chemicals and numerous other fracturing fluids at high pressure to fracture the shale and release the natural gas. This mixture or "proppant" holds the fractures open, allowing gas to flow into the well.[10] Much of this water, sand and chemical mixture returns to the surface and must be treated and disposed of properly as it contains many hazardous chemicals and even some radioactive material.[11]

Drilling in the Marcellus Shale impacts many areas of interest and raises infrastructure, economic, legal and environmental implications. Some of the issues associated with infrastructure include impacts on local roads due to the amount of truck traffic generated by each well as local roads were not designed to manage such heavy and intense traffic. For instance, a recent study in Lycoming County, Pennsylvania showed that 77 tractor trailer loads were necessary simply to bring the drilling equipment to the site.[12] This does not include the

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[8] Pennsylvania Environmental Council, *Developing the Marcellus Shale*, 2010 , found at: http://www.pecpa.org/sites/pecpa.org/files/downloads/Developing_the_Marcellus_Shale_0.pdf.

[9] While this petition involves drilling in the Marcellus Shale formation, the Utica Shale formation must also be mentioned and considered. The Utica Shale is a rock formation located a few thousand feet below the Marcellus Shale (in some parts of Pennsylvania it is over two miles below sea level and up to 7,000 feet below the Marcellus Shale) and has the potential to become one of the largest gas plays. *See* http://geology.com/articles/utica-shale/ and map of all shale plays in US http://www.eia.gov/oil_gas/rpd/shale_gas.pdf. The Utica Shale formation is much larger than the Marcellus Shale formation and is located under portions of Kentucky, Tennessee, Ohio, Pennsylvania, West Virginia, Virginia, Maryland, New York, Lake Erie, Lake Ontario and Ontario, Canada. *Id.* While the Utica Shale has not been extensively evaluated, the results of early exploratory testing show that it is very likely to be productive. *Id.* In parts of Ohio and Canada the Utica Shale is not as deep and drilling has already begun. In Pennsylvania, Consol Energy drilled one successful exploratory well in 2010 with plans to drill several more this year. *See* Consol Energy press release Jan 27, 2011 at http://phx.corporate-ir.net/phoenix.zhtml?c=66439&p=irol-newsArticle&ID=1520696&highlight=.

[10] *Id.*

[11] *See* http://www.nytimes.com/interactive/2011/02/27/us/natural-gas-map.html

[12] *See* http://pubs.cas.psu.edu/freepubs/pdfs/ua454.pdf.

thousands of truck trips needed to bring water, sand, chemicals, and other necessities to the site and to remove wastewater from the site. There have been substantial and rapid increases in the population of some areas causing negative impacts on schools, housing needs and businesses.[13] Lower income housing is becoming scarce as rental units are taken by industry. If adequate housing is not available, workers may not live in the community reducing any possible economic benefits for local businesses and governments.[14] Many communities have also seen an increase in nonviolent crime, substance abuse, teen pregnancies and a demand for social services. These all have serious tax implications for local governments. Yet many local jurisdictions, especially in Pennsylvania, will see little if any new tax revenue as natural gas is not subject to local taxation.[15] As such, local jurisdictions will face increased demands for services and thus higher costs, such as those associated with damage to local roads, additional housing units, or capacity in their schools, but will receive little new revenue to pay for these needs.[16]

There are many legal implications resulting from drilling in the Marcellus Shale. Conflicting land use rights and leasing rights for both surface and sub-surface owners are well-known. Water withdrawal issues; the sufficiency of local and state regulations and permits; rights to safe drinking water, and clean air and healthy ecosystems - all of these raise legal implications of significant size and scope.

Drilling in the Marcellus Shale also creates the threat of numerous adverse environmental impacts. The exploration, drilling, extraction, and transport of the natural gas all present negative impacts of varying degrees, threatening the environment and human health. Various infrastructure needs such as new access roads and site clearing for the well pads, pipelines and

[13] *Id.*
[14] *Id.*
[15] *Id.*
[16] *Id.*

compressor stations are necessary, resulting in deforestation, habitat fragmentation, negative impacts to water and timber resources, and soil compaction, erosion, and long-term site infertility.[17] Drilling and extraction consumes large volumes of water, sand and chemicals. Given the remote location of many drilling operations, sources of water can often be local, small streams. The withdrawals threaten flow maintenance and aquatic life sustainability. The chemicals used in the drilling process as well as the natural gas itself can contaminate surface waters as well as drinking water and aquifers. Air pollution, from the trucks, wells, compressor stations, and pipelines, are an inevitable consequence of drilling. Habitat in state and Federal forests and state and national parks are disrupted by the new access roads, well pads, and associated structures. Construction of these facilities generates runoff and sedimentation of creeks, streams, ponds, lakes, wetlands, rivers, and other aquatic resources. After the well is drilled, unmanaged or improperly managed post-construction runoff from the site can cause or exacerbate flooding and stream erosion. Once the well is established, reclamation is critical along with proper plugging and capping once production ceases. The wastewater from the drilling and pumping process is contaminated with the sand, chemicals, heavy metals, naturally occurring radioactive material, as well as high levels of salinity and chlorides. This wastewater needs to be treated and disposed of properly. Contaminated drill cuttings, deep underground rock, soil, some of which may be radioactive, and chemical additives removed during the drilling process are either buried onsite or sent to landfills in sealed containers. Along the way, this material can travel in trucks with no markings baring the material being transported through downtowns, neighborhoods, school bus stops, and playgrounds.

All of these potential impacts are compounded by the existing and future extent of drilling within the Marcellus Shale formation. Yet no agency, federal or state, is looking at the

[17] *Id.*

cumulative impacts this drilling will have on the Chesapeake Bay region. As explained below, all of these issues present the potential for serious and long-term consequences to the 17 million people that live in the Chesapeake Bay watershed, the 20 million people who live in or depend on the Delaware River watershed water supply, and the millions of people who live in the Hudson River, Monongahela River, Allegheny River, Ohio River, and Potomac River watersheds. Yet throughout these watersheds, most notably in Pennsylvania, wells are being permitted at breakneck speed with little regard to cumulative impacts.

II. The Chesapeake Bay

The Chesapeake Bay is a national treasure. Pub. L. 106-457, Title II, § 202, Nov. 7, 2000, 114 Stat. 1967. The Chesapeake Bay is the largest estuary in North America, covering 64,000 square miles encompassing parts of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the entire District of Columbia. More than 100,000 miles of streams and rivers are within the Chesapeake Bay watershed. Today, the Chesapeake Bay is an impaired water body. *See* 33 U.S.C. § 303(d). The cause of this impairment is, among other things, excess nitrogen and phosphorus (nutrients) and sediment from both point[18] and non-point sources.

Nitrogen and phosphorus are the major source of pollution in the Bay. This pollution comes from three major sources: point sources (such as wastewater treatment plants), runoff (from farmland as well as urban and suburban lands) and air pollution.[19] This pollution spurs the growth of algae blooms which block sunlight, causing underwater grassed to die off. This leads to loss of habitat and food for crabs, oysters, fish and waterfowl. The die off of the algae also

[18] The term "point source" is defined by the Clean Water Act as, "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged." 33 U.S.C. § 1362(14).

[19] Chesapeake Bay Program facts found at: http://www.chesapeakebay.net/nutrients.aspx?menuitem=14690.

depletes oxygen in the water and causes massive dead zones throughout the Chesapeake Bay. During an average summer, more than three-quarters of the Bay and its tidal rivers have insufficient levels of oxygen to support aquatic life.[20]

Excess sediment is the third leading cause of pollution in the Chesapeake Bay. More than 18.7 billion pounds of sediment enter the Chesapeake Bay each year.[21] The majority of sediment is due to erosion caused by agriculture and development.[22] Excess sediment blocks sunlight from reaching the underwater grasses causing them to die which in turn affects fish and blue crabs which use the grasses for food and shelter. Further, when nutrients and chemicals bind with sediment, the pollutants spread throughout the Bay and tributaries. Finally, excess sediment can smother oysters and other bottom-dwelling aquatic species.

Air pollution is another growing problem in the Chesapeake Bay region. Airborne nitrogen pollution accounts for nearly one-third of the total load of nitrogen pollution in the Bay.[23] Nitrogen oxides (NO_x) are primarily released as a by-product of combustion from the burning of fossil fuels such as oil, gas and coal. Mobile sources, such as cars, trucks and other on-road vehicles, also contribute to air pollution.

Congress has recognized the importance of the Chesapeake Bay to the nation and the restoration challenges faced by the Chesapeake region. Accordingly, in the Clean Water Act Congress mandated that the Administrator of the United States EPA shall maintain a Chesapeake Bay Program (Bay Program). 33 U.S.C. § 1267(2)(A). The Bay Program has many functions, including assisting the signatories of the Chesapeake Bay Agreements (Bay Agreement) in

[20] *See* http://www.chesapeakebay.net/dissolvedoxygen.aspx?menuitem=14654.
[21] Chesapeake Bay Program facts found at: http://www.chesapeakebay.net/sediments.aspx?menuitem=14691.
[22] *Id.*
[23] Chesapeake Bay Program facts found at: http://www.chesapeakebay.net/airpollution.aspx?menuitem=14693.

developing and implementing specific action plans to carry out the responsibilities of the Bay Program.

The first Bay Agreement was signed in 1983. Its purpose was to identify and address environmental issues within the Chesapeake Bay, including improving water quality. A second Bay Agreement was signed in 1987 to include the goal of reducing nutrient loads, specifically total nitrogen and total phosphorus, by forty percent by the year 2000. The 1992 amendment to the second Bay Agreement re-affirmed that commitment. A third Bay Agreement (the Chesapeake 2000 Agreement) was signed in 2000. The goals of the Chesapeake 2000 Agreement include, among other things, to remove the Chesapeake Bay and its tidal rivers from the Clean Water Act Section 303(d) impaired waters list by 2010 and to permanently protect 20 percent of the land area of the watershed in the signatory jurisdictions by 2010. The signatories to the 1987 and 2000 Agreements as well as the 1992 amendments are the State of Maryland, the Commonwealth of Pennsylvania, the Commonwealth of Virginia, the District of Columbia, EPA on behalf of the United States, and the Chesapeake Bay Commission.

III. The Bay TMDL

The Clean Water Act is the nation's preeminent statute addressing pollution of our waters. Its overall objective is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). To meet this objective, it provides as a goal the attainment of water quality levels sufficient to protect aquatic life and recreation (often referred to as the "fishable and swimmable" goal). 33 U.S.C. § 1251(a)(2). Pursuant to section 302 of the Federal Clean Water Act (CWA), states are required to set effluent limits for point sources. Those limits must meet technology and water quality-based standards.

The CWA further requires that each state identify waters within their boundaries that do not meet the water quality standards. 33 U.S.C. § 1313(d)(1). This is often called the 303(d) list. For the waters on the 303(d) list, the state must then establish a total maximum daily load (TMDL) for the pollutants causing the impairment. This TMDL sets the maximum amount of a pollutant that can be discharged into that water body from all combined sources. Once the state sets a TMDL, it has to be approved by the U.S. EPA. If the state does not set a TMDL, EPA is required to set one for the state.

Many states in the Chesapeake Bay region, while issuing a 303(d) list, have not completed TMDLs for those impaired waters. Because these TMDLs had not been completed, several lawsuits were filed to require states to act swiftly in setting the necessary TMDLs. In Virginia, the American Canoe Association and the American Littoral Society sued the EPA for failure to properly implement Virginia's 303(d) list. *American Canoe Ass'n, et al. v. U.S. EPA,* 54 F.Supp.2d 621 (E.D. Va. 1999). This case resulted in a Consent Decree requiring the state of Virginia to complete TMDLs for all impaired waters by May 1, 2010, and if the state failed to do so, EPA would complete the TMDLs by May 1, 2011.

On September 24, 2010, the United States EPA issued a draft TMDL for the entire Chesapeake Bay watershed.[24] The TMDL set yearly limits on nitrogen (185.9 million pounds), phosphorus (12.5 million pounds) and sediment (64.5 billion pounds) that point sources and non-point sources can contribute to the Chesapeake Bay watershed.[25] In conjunction with the TMDL, each of the watershed jurisdictions submitted Watershed Implementation Plans (WIPs)

[24] *See* http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/BayTMDLFactSheet8_6.pdf. The Chesapeake Bay TMDL is actually a combination of 92 smaller TMDLs for individual Chesapeake Bay tidal segments.
[25] *See* http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/BayTMDLFactSheet8_6.pdf. This represents a 25 percent reduction in nitrogen, 24 percent reduction in phosphorus and 20 percent reduction in sediment.

that set forth the means by which each jurisdiction would meet those allocations. The final TMDL was issued on December 29, 2010.

While drilling in the Marcellus Shale will have significant impacts throughout the watershed and increased discharges of nutrients and sediment, neither the TMDL nor the WIPs account for any of the potential new loads associated with drilling in the Marcellus Shale.

IV. Drilling in the Marcellus Shale Formation is an Unquantified Source of Pollution in the Watersheds Overlying this Formation.

Drilling in the Marcellus Shale formation has many negative environmental impacts and has others that have not yet been identified but are reasonably foreseeable. Because of the many potential environmental and human health impacts, several state and local governments and entities in the areas where this formation is present have implemented a moratorium on drilling until all of the impacts are studied. For instance, the City of Pittsburgh, the State of New York, and the Delaware River Basin Commission have all passed a moratorium on drilling until studies are complete and/or regulations are updated. The State of New York is currently preparing a study based on an Executive Order by former Governor Paterson.[26] The Common Council of Buffalo, New York, also voted to ban any form of natural gas extraction, including hydrofracking, within city limits and the City of Philadelphia voted to ban their utility from buying any gas that is extracted from the Marcellus Shale.[27]

This extraction will alter the ecology and infrastructure of every state in the Chesapeake Bay region. For example, John Quigley, former secretary of Pennsylvania's Department of Conservation and Natural Resources, recently testified before Maryland's House Environmental Matters Committee and urged Maryland legislators to take this opportunity to slow down and

[26] *See* http://www.dec.ny.gov/energy/46288.html#41.
[27] *See* http://ia600403.us.archive.org/10/items/BuffaloNaturalGasExtractionProhibition/OrdAmendGasExtraction-11-0208_text.pdf, http://legislation.phila.gov/detailreport/matter.aspx?key=10912, and http://legislation.phila.gov/attachments/10946.pdf.

require more study of the immediate and long-term impacts of drilling before opening up Western Maryland to drilling for natural gas in the Marcellus Shale formation.[28] He stated that Pennsylvania has experienced major problems including, contamination of drinking water wells, natural gas bubbling up in the middle of the Susquehanna River, diesel fuel spills, spills of other fracking fluids, well blowouts, explosions and fires, and tainted groundwater.

A. Water pollution caused by drilling.

Drilling in the Marcellus Shale remains an unaccounted for contributor to water pollution in the Chesapeake Bay region, including the discharge of nutrients and sediment into the Bay and its tributaries. One source of water pollution is the discharge of large amounts of sediment-laden runoff to pristine waterways which are tributaries to the Chesapeake Bay. The construction of well pads, haul roads, pipelines and other associated facilities may increase the amount of sediment released into local waterways.

Although no published data for Pennsylvania exists, a 2008 study in Texas concluded that gas well site construction activities greatly increase the rate of sediment loading to streams compared to pre-development conditions.[29] These increases are similar in magnitude to typical construction sites that are currently regulated under the federal NPDES permit program.[30]

Preliminary research released in 2010 by scientists from the Academy of Natural Sciences in Philadelphia showed the environmental impact of drilling may be directly related to the amount of drilling in a specific area, referred to as the "density" of drilling. Researchers examined nine sites in small watersheds in northeastern Pennsylvania, three in which there had been no drilling, three with some drilling, and three with a high density of drilling. At each site,

[28] *See* Testimony of John Quigley to Maryland House Environmental Matters Committee, February 9, 2011, attached as Exhibit B.
[29] *See* http://digital.library.unt.edu/ark:/67531/metadc11064/
[30] *Id.*

they tested the water, abundance of certain sensitive aquatic species, and abundance of salamanders. For each of the measures, there was a significant difference between high-density drilling locations and locations with no drilling or less drilling. The studies showed that water conductivity was almost twice as high in the high density sites as the other sites, and the number of both sensitive aquatic species and salamanders were reduced by 25 percent.[31]

Drilling into the Marcellus Shale uses a technique called "hydraulic fracturing" or "fracking." This technique uses millions of gallons of water and tons of sand and chemicals that are pumped at very high pressure into the shale formation to fracture the shale and prop open the fractures allowing the gas to flow into the well.[32] Fracking requires large volumes of water, with an average well using between two to nine million gallons. In addition to the water, the average well uses 200,000 to 300,000 pounds of sand and various chemicals. These chemicals can include surfactants, friction reducers, biocides and gels to carry the proppant into the fractures and consist of, among other things, hydrochloric acid, sodium chloride, petroleum distillate, ammonium bisulfate, and ethylene glycol.[33] In addition, Congress recently found that between 2005 and 2009, oil and gas companies injected 32.2 million gallons of diesel fuel or hydraulic fracturing liquids containing diesel fuel into wells in 19 states.[34]

Dealing with the large amounts of wastewater after drilling is complete is an issue with which many States are struggling. Estimates show that about 25 percent of the water used for fracking a well returns to the surface once the frack is complete, with an additional 20 percent

[31] *See* http://www.ansp.org/research/pcer/projects/marcellus-shale-prelim/index.php

[32] *See* http://www.dec.ny.gov/energy/46288.html.
[33] *See* J. Daniel Arthur, P.E., et al., *Hydraulic Fracturing Considerations for Natural Gas Wells of the Marcellus Shale*, September 2008 found at http://www.dec.ny.gov/docs/materials_minerals_pdf/GWPCMarcellus.pdf.
[34] *See* Waxman, et al. letter to U.S. EPA, January 31, 2011.

returning to the surface over the life of the well.[35] Because this wastewater contains high salinity, heavy metals, and biocides that are incompatible with current treatment technologies, almost none of the existing wastewater treatment plants are equipped to adequately treat the waste. Many times this wastewater is stored in ponds or tanks on the drill site and eventually trucked offsite to industrial treatment facilities in and out of the state. Regardless of the disposal method the probabilities of unpermitted discharges that can lead to contamination of drinking and surface water are a major concern.[36]

The potential for water pollution of streams and rivers within the watersheds affected by Marcellus Shale activity also extends to groundwater. While most aquifers are much closer to the surface than the Marcellus Shale over most of the formation area, there are several ways in which contamination can and has migrated from the gas exploration and production facilities into groundwater used for potable water supply purposes. One pathway is through failure of cementing between casings and the well bore walls. This can occur due to insufficient amounts of cement to fill the annulus between the well bore and the casing pipe, improper curing of the cement, or failure of the cement over time due to chemical interactions or to physical shearing or fracturing due to seismic activity.[37] Many areas within the affected watersheds, especially in the Delaware River watershed, are very seismically active and are heavily jointed and fractured.

Another pathway for migration of fracking fluid from the deep gas producing zones to the shallower aquifer regions is through the hundreds of thousands of abandoned wells that are estimated to exist across the entire Marcellus Shale area. Abandoned wells have been discovered, evidence that most of the wells were simply bore holes with no casing or cementing

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[35] *See* http://news.nationalgeographic.com/news/2010/10/101022-energy-marcellus-shale-gas-science-technology-water/.
[36] *See* http://www.fish.state.pa.us/newsreleases/2011press/pge_settle.htm.
[37] See, Dusseault, Maurice B., "*Why Oil wells Leak: Cement Behavior and Long Term Consequences*" SPE 64733 (2000)

and were abandoned without any capping or plugging as soon as the passive gas production declined. Many of these wells were drilled into a sandstone layer that is often found immediately below the Marcellus Shale formation.

A third way in which fracking chemicals and formation fluids and gases may reach potable water supply wells is through upward migration along fractures, faults and joints that are typical across most of the Marcellus Shale area. It is this potential route of migration that exists across the entire Catskill Mountains area that led the City of New York to conclude that no gas exploration or production activity should be allowed anywhere within the Delaware River watershed that provides drinking water to the City.[38]

Protection of groundwater from contamination by shale gas development is critical because so many residents and communities across the entire watershed area rely on wells completed in these groundwater aquifers for their drinking and household water supply. Especially in the rural areas where the vast majority of the Marcellus Shale production wells will be located there will be no alternative water supply available.

The Delaware River watershed is an excellent case in point on the critical importance of protecting the water supply at all costs. For over 50 years, New York City has drawn 90 percent or more of its water supply from reservoirs in the Delaware River watershed and the Hudson River watershed located above the Marcellus Shale. New York is not the only city that relies on the Delaware River for its water supply. Communities all along the Delaware from Hancock, New York, to Wilmington, Delaware draw water from the river for drinking water supply. This includes Philadelphia, Trenton, Camden, and most of central and southern New Jersey (the latter

[38] See, Hazen & Sawyer, "*Final Impact Assessment Report: Impact Assessment of Natural Gas Production in the New York City Water Supply Watershed*" (2009).

from a sole source aquifer system which gets 45 percent of its recharge from the river). In all, some 20 million people rely on water from the Delaware River and Hudson River watersheds.

In addition to water pollution issues, water withdrawal issues present serious concerns. Much of the water used to frack a well is drawn from local headwater streams which have low volumes, particularly during low flow periods of the year. These small streams often are spawning areas for important fish species such as brown, rainbow, and brook trout. During periods of low flow in the rivers served by these tributary streams, the trout seek refuge in the tributaries. These fisheries, and especially the wild trout fisheries in the Delaware River watershed, support major recreational use by fishermen from around the world and are a significant contribution to the economy of the area. If too much water is withdrawn or the water is withdrawn during dry weather, streams can be dewatered to the point where fish and other aquatic life will not be able to survive. Many of the states do not have laws in place regulating water withdrawals from streams. For instance, in West Virginia, some streams are the home to endangered mussel species. Should a company withdraw enough water to kill those mussels it would be a direct violation of the Endangered Species Act. [39]

B. Air pollution caused by drilling.

In addition to impacts to water resources, various air contaminants are known to be emitted from numerous sources throughout the gas development process. The air contaminants can include particulate matter, NO_x, SO_x, VOCs, methane, dust, carbon monoxide and numerous other hazardous air pollutants.[40] These air contaminants come from a variety of sources including trucks, flaring of the wells, construction activity, holding tanks, compressor engine

[39] *See* http://www.fisheries.org/blog/effect-of-marcellus-drilling-on-west-virginia-fisheries-could-be-profound/.
[40] *See http://www.earthworksaction.org/oilgasairpollution.cfm*.

exhausts, well drilling and fracking engines, gas processing, and pipelines.[41] Like the direct impacts to water, the cumulative impacts to air quality due to the industry has not been considered.

A recent study by Cornell University has projected that the greenhouse gas emissions from shale gas production over the next 20 years may be higher than emissions from surface-mined coal.[42] One reason for this projected increase is that methane, a more potent greenhouse gas than carbon dioxide, is released either purposely when wells are vented or accidentally when there are leaks during the fracturing, production, storage, or transportation of the gas. EPA recently increased its projection of methane emissions per well completion from 0.02 tons per year to 177 tons per year, an increase factor of 8,850.[43] A study of the Barnett Shale region of Texas showed that in the five county Dallas-Fort Worth area, the smog-forming emissions from the oil and gas sector were greater than those of all regional on-road motor vehicle emissions.[44]

As stated above, the average Marcellus shale gas well uses two to nine million gallons of water. Because most water is brought to the well site by truck it requires approximately 1,500 truck trips per well.[45] In addition to the air emissions from the trucks, many companies flare the gas well to both test the volume and enable them to collect the produced wastewater.[46] Flaring emits air pollution that is not accounted for in where wells are sited.

The Pennsylvania Department of Environmental Protection (PA DEP) released a study on January 31, 2011, with the results of a four-week air quality study conducted near Marcellus

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[41] *Id.*
[42] *See* http://www.eeb.cornell.edu/howarth/GHG%20update%20for%20web%20--%20Jan%202011%20(2).pdf
[43] *See* EPA, "*Greenhouse Gas Emissions Reporting from the Petroleum and Natural Gas Industry: Technical Background Document*" (Nov. 30, 2010), found at: http://www.epa.gov/climatechange/emissions/downloads10/Subpart-W_TSD.pdf.
[44] *See* http://www.edf.org/documents/9235_Barnett_Shale_Report.pdf.
[45] *See http://news.nationalgeographic.com/news/2010/10/101022-energy-marcellus-shale-gas-science-technology-water/.*
[46] *Id.*

Shale gas operations in Susquehanna and Sullivan Counties.[47] While the study did not find concentrations of any compound that would likely trigger air-related health issues the report notes that it did not address potential long-term, cumulative impacts.[48] Yet, to truly ascertain what air-related impacts the drilling in the Marcellus Shale may have, long-term, cumulative impacts must to be studied. In fact, the Scranton-Wilkes-Barre area of Pennsylvania is currently a nonattainment area for the 8-hour ozone standards, yet Pennsylvania has not considered how drilling in the Marcellus Shale may impact this and other areas.[49] Studies need to be conducted to not only determine the long term impacts of on air quality due to shale gas extraction and transportation on the local area but also to determine if these practices will cause other areas to no longer be in attainment for air standards.

C. Impacts to critical natural areas, treasured landscapes and ecosystem caused by drilling.

The average well pad is approximately 3.1 acres in size with the associated infrastructure (roads, water impoundments, and pipelines) taking up an additional 5.7 acres for a total of 8.8 acres per well pad.[50] In Pennsylvania alone, nearly 1,400 new natural gas wells were drilled in 2010.[51] Many more wells will be drilled as companies have leased hundreds of thousands of acres throughout the watershed. In Northern West Virginia and Fayette County Pennsylvania, Triana Energy and Marathon Oil plan to develop an additional 82,000 acres and 124,000 acres of land have been leased in Garrett County Maryland, more than a quarter of the county.

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[47] *See* http://www.portal.state.pa.us/portal/server.pt/community/newsroom/14287?id=%2016139%20&typeid=1.
[48] *Id.*
[49] *See* http://www.fhwa.dot.gov/environment/air_quality/conformity/reference/maps/ozone_1997/pa_scranton-wilkesbarre.cfm.
[50] *See* http://tnc.pr-optout.com/ViewAttachment.aspx?EID=AOvs%2Bk1ekvYepDz0oLod5Mk9alHDzxrNXm%2FPVatL%2FFo%3D.
[51] *See* http://www.dep.state.pa.us/dep/deputate/minres/oilgas/2010PermitDrilledmaps.htm

Many of these wells are drilled in state forests. Nearly 1.5 million acres of Pennsylvania State forest overlay the Marcellus Shale.[52] Over the past three years, 130,000 acres have been leased for drilling which brings the total state forest acreage available for drilling to 700,000, representing a third of Pennsylvania's state forest land.[53] In the next 15 to 20 years, 12,000 wells may be drilled on state forest land in Pennsylvania.[54] A recent study in West Virginia showed that a natural gas drilling operation in a West Virginia State forest killed dozens of trees, damaged roads and eroded land.[55]

ARGUMENT

NEPA, CEQ's regulations and each federal agency's NEPA implementing regulations establish the regulatory mechanisms by which Programmatic Environmental Impact Statements are undertaken for federal actions. Petitioners argue that because of the negative cumulative impacts caused by drilling in the Marcellus Shale formation throughout the Chesapeake Bay region, a PEIS and any necessary regulations as a result of that study are required.

I. The Cumulative Impacts of Drilling in the Marcellus Shale Must Be Addressed by a PEIS.

Unfortunately, the 2005 Energy Policy Act exempted some aspects of drilling in the Marcellus Shale formation from having to comply with certain environmental laws. As such, many activities do not require federal permits. While state permits are required for some phases of drilling, these permits do not address the cumulative impacts of drilling in the Chesapeake Bay region. It is the duty of the federal governmental agencies named in this petition and CEQ to ensure that drilling activities are not adversely affecting on a broad scale the quality of the human environment pursuant to NEPA. The CEQ is charged with overseeing NEPA and must

[52] *See* Footnote 22
[53] *Id.*
[54] *Id.*
[55] *See* http://www.fs.fed.us/nrs/pubs/gtr/gtr_nrs76.pdf.

ensure that NEPA's purposes are met and that federal agencies' activities do not run afoul of the statute. The only way to ensure that NEPA's purposes are being met is to complete a PEIS studying the cumulative impacts of Marcellus Shale drilling within the Chesapeake Bay states.

NEPA regulations require that an EIS be completed for all major federal actions significantly affecting the quality of the human environment. 40 C.F.R. § 1502.3. A major federal action is defined as one with "effects that may be major and which are potentially subject to Federal control and responsibility." 40 C.F.R. § 1508.18. NEPA further advises that "significantly" be interpreted to mean considerations of both context and intensity and actions must be analyzed in several contexts such as "society as a whole (human, national), the affected region, the affected interests, and the locality." 40 C.F.R. § 1508.27.

NEPA regulations require the analysis of both direct, indirect and most importantly here, cumulative effects or impacts. *See* 40 C.F.R. §§ 1508.8 & 1508.25(c). Section 1508.8 states:

> "Effects" include:
>
> (a) Direct effects, which are caused by the action and occur at the same time and place.
>
> (b) Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
>
> Effects and impacts as used in these regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, *whether direct, indirect, or cumulative*. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

40 C.F.R. § 1508.8 (Emphasis added).

NEPA regulations require that federal agencies consider all "reasonably foreseeable" environmental impacts of their proposed programs, projects and regulations.[56] An environmental effect is "reasonably foreseeable" if it is "sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision." *Sierra Club v. Marsh,* 976 F.2d 763, 767 (1st Cir. 992).[57] It is the responsibility of all federal agencies to predict the environmental impacts of proposed actions before they are fully known. *Scientists' Inst. For Pub. Info. v. Atomic Energy Comm'n,* 481 F.2d 1079, 1092 (D.C. Cir. 1973) ("It must be remembered that the basic thrust of an agency's responsibilities under NEPA is to predict the environmental effects of proposed action before the action is taken and those effects fully known."). CEQ has clarified, in its *Forty Most Asked Questions Concerning CEQ's NEPA Regulations,* what is "reasonably foreseeable" and has stated that:

> The EIS must identify all the indirect effects that are known, and make a good faith effort to explain the effects that are not known but are "reasonably foreseeable." Section 1508.8(b). . . . The agency has the responsibility to make an informed judgment, and to estimate future impacts on that basis, especially if trends are ascertainable . . . The agency cannot ignore these uncertain, but probable, effects of its decisions.

46 Fed. Reg. at 18031.

NEPA requires agencies to consider cumulative impacts, along with direct and indirect impacts, of their proposed actions. 40 C.F.R. § 1508.25. NEPA defines cumulative impact as:

> the impact on the environment which results from the incremental impact of the action when added to other past, present, and

[56] *See* 40 C.F.R. §§ 1508.7, 1508.8 & 1508.25.

[57] *See also, City of Shoreacres v. Waterworth,* 420 F.3d 440, 453 (5th Cir. 2005); *Dubois v. U.S. Dept. of Agriculture,* 102 F.3d 1273, 1286 (1st Cir. 1996); *Midstates Coalition for Progress v. Surface Transp. Bd.,* 345 F.3d 520, 549 (8th Cir. 2003).

> *reasonably foreseeable future actions* regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7. (emphasis added). The D.C. Circuit has held that individually minor but collectively significant actions, taking place over time, can generate cumulative impacts. *Grand Canyon Trust v. F.A.A.*, 290 F.3d 339, 345 (D.C. Cir. 2002). Because numerous individual wells are being drilled throughout the Chesapeake Bay states, the cumulative impacts on the environment need to be studied to determine what cumulative impacts drilling may have.

As stated earlier, drilling in the Marcellus Shale is already producing environmental impacts throughout the Chesapeake Bay region. In other words, negative environmental impacts from the drilling are "reasonably foreseeable" as defined by NEPA and its regulations. These reasonably foreseeable impacts will be felt throughout the Chesapeake Bay region and, therefore, a cumulative impact study or PEIS, is necessary to comply with NEPA and its regulations. *See Conservation Law Foundation v. General Services Admin.*, 427 F. Supp. 1369 (D. RI, 1977) (holding that a comprehensive Environmental Impact Statement is required whenever an agency proposes major federal action with respect to entire region or when several proposals will have cumulative or synergistic environmental impact upon a region.)

Many drilling sites and associated facilities such as pipelines will be located on federal land and will be considered a major federal action. However, many of the drilling sites, while not on federal land, are regulated by the states through federally delegated programs. Therefore, these would be considered a major federal action and subject to NEPA. *See Sierra Club v. Morton*, 514 F.2d 856 (D.C. Cir. 1975) (reversed on other grounds, 427 U.S. 390 (1976) (holding that "federal action" includes not only action undertaken by agency itself, but also any action permitted or approved by agency.). *See also Mineral Policy Ctr. v. Norton*, 292 F.Supp. 2d 30,

76 (D.D.C. 2003)(Federal involvement in a nonfederal project may be sufficient to "federalize" the project for purposes of the National Environmental Policy Act,); *Md. Conservation Council v. Gilchrist*, 808 F.2d 1039 (4th Cir. 1986)(Non-federal actors may not be permitted to evade NEPA by completing a project without an EIS and then presenting the responsible federal agency with a *fait accompli*.).

While EPA agreed to conduct a study related to Marcellus Shale in March 2010, that study is very limited in scope and does not go far enough in determining the cumulative environmental impacts within the Chesapeake Bay states and the affected watersheds. EPA has stated that the study, *Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources,* will be limited to the life-cycle of water used in hydraulic fracturing and its impacts on drinking water.[58] It will not deal with impacts to surface and groundwater quality, stream pollution and flow; air quality concerns; impacts to endangered and threatened species; forest lands; treasured landscapes and national parks; and wildlife habitat. The study's scoping plan was reviewed by EPA's Science Advisory Board in March 2011 and the findings of the study are to be released to the public by the end of 2012. Because the EPA study is so limited in scope, it is yet another example of why a cumulative impact study or PEIS is required.

II. CEQ and the Other Named Federal Agencies are Subject to the Provisions of the APA.

Because this petition requests that any necessary regulations be promulgated upon the completion of the PEIS, Section 553 of the APA is applicable. Section 553 provides that all agencies "give an interested person the right to petition for the issuance, amendment, or repeal of a rule." 5 U.S.C. § 553(e). The APA applies to every federal government "agency." "Agency" is defined by the APA as:

[58] *See* http://yosemite.epa.gov/sab/sabproduct.nsf/02ad90b136fc21ef85256eba00436459/d3483ab445ae61418525775900603e79!OpenDocument&TableRow=2.0#2

> Each authority of the Government of the United States, whether or not it is within or subject to review by another agency, but does not include – (A) the Congress; (B) the courts of the United States; (C) the governments of the territories or possessions of the United States; (D) the government of the District of Columbia.

5 U.S.C. §§ 551(1), 701(b)(1).

The D.C. Circuit has interpreted the APA and its Freedom of Information Act (FOIA) provisions to confer agency status on "any administrative unit with the substantial independent authority in the exercise of specific function." *Soucie v. David*, 448 F.2d 1067, 1073 (D.C. Cir. 1971). Any part of the government which has the authority to take final and binding action affecting the rights of individuals would be an "agency" pursuant to the APA.[59] Therefore, the federal agencies petitioned here, EPA, DOI, USDA, DOE, DOT, the Corps, and FERC are all "agencies" for purposes of the APA. CEQ is also an "agency" under the APA. Pursuant to NEPA, CEQ's powers include, among other things: to review and appraise the various programs and activities of the Federal Government in light of NEPA, conducting investigations, studies, surveys, research, and analyses relating to ecological systems and environmental quality, and advising the President on environmental matters. 42 U.S.C. § 4344 (1), (3), (5) and (7).

Additionally, CEQ has been recognized by the courts to be an agency for the purposes of FOIA. *See Pacific Legal Foundation v. Council on Environmental Quality*, 636 F.2d 1259, 1262-62 (D.C. Cir. 1980) (holding that CEQ was an "agency" for the purposes of the Government in the Sunshine Act and FOIA, 5 U.S.C. § 552, the public information provision of the APA). Because CEQ and the federal agencies named in this petition have the authority to issue binding guidance and regulations they are all "agencies" subject to the APA and FOIA. As

[59] *See Dong v. Smithsonian Inst.*, 125 F.3d 877, 881 (D.C. Cir. 1997) (quoting James O. Freedman, *Administrative Procedure and the Control of Foreign Direct Investment*, 119 U. Pa. L. Rev. 1, 6-9 (1970).

such, they are all subject to the judicial review provisions of the APA and must respond to this petition in a timely manner pursuant to 5 U.S.C. § 555(b).

III. CEQ Must Issue Regulations Regarding the Findings of the PEIS on Cumulative Impacts from Drilling in the Marcellus Shale.

This petition seeks the completion of a PEIS studying the cumulative impacts of drilling in the Marcellus Shale formation in the Chesapeake Bay region. Once that PEIS is complete, CEQ should then draft and promulgate any necessary regulations pursuant to the study as well as the Executive Order to protect the Chesapeake Bay.

Congress has mandated that CEQ, among other things, "formulate and recommend national policies to promote the improvement of the quality of the environment," and "conduct investigations, studies, surveys, research, and analyses relating to ecological systems and environmental quality." 42 U.S.C. §§ 4342, 4344(5). Further, the President granted CEQ the authority to issue regulations to implement NEPA as well as instruct other agencies as required to carry out CEQ's responsibilities under NEPA.[60]

Pursuant to its statutory authority, Petitioners request CEQ to instruct the federal agencies named in this petition to address the cumulative impacts of drilling in the Marcellus Shale formation in the Chesapeake Bay region. As CEQ oversees the implementation of NEPA, it must advise other federal agencies that a PEIS is mandated here. Each federal agency should then undertake a cumulative impact study of its role in regulating the drilling, storage, and transport of natural gas in the Marcellus Shale region.

Once the PEIS is complete and the cumulative impacts are determined, CEQ should draft the necessary regulations, in compliance with NEPA. In addition to regulations, CEQ, pursuant to 40 C.F.R § 1506.7, also has the authority to issue guidance to instruct federal agencies how to

[60] *See* Executive Order 11991, § 3(h) & (i) (May 24, 1977), amending Executive Order 11514 (March 5, 1970).

address the impacts from drilling, storage, and transportation of natural gas from the Marcellus Shale region based on the findings of the PEIS.

IV. The Chesapeake Bay Executive Order Requires that Regulations are Drafted.

Among its many goals, the Chesapeake 2000 Agreement aimed to permanently protect 20 percent of the land area of the Chesapeake watershed in the signatory jurisdictions by 2010. This is a hefty goal as only about 58 percent of the Chesapeake Bay watershed is undeveloped and primarily forest lands.[61] In addition to the Chesapeake 2000 Bay Agreement, Executive Order 13508 issued by President Obama on May 12, 2009 and its implementation strategy outline land conservation initiatives to accelerate the rate of progress to restore the Chesapeake Bay.[62,63] The Chesapeake Bay Executive Order strategy sets a goal to permanently protect an additional two million acres by 2025.

Forest land is important to the Chesapeake Bay watershed as its filtering capacity protects the quality of rivers and streams as well as drinking water supplies and can serve as a revenue source for local economies by providing carbon and nutrient credits.[64] This has the potential to be instrumental in many areas in order to achieve the targets set by the Chesapeake Bay TMDL. Forest land is much more beneficial to water quality than agricultural land as it is more efficient at absorbing nutrients and preventing nutrients and sediment from reaching streams.[65]

Many of the new wells being drilled are in state and federal forests, as well as in privately owned forests, with more acres being leased daily by both the state and federal governments.

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[61] *See* http://www.chesbay.state.va.us/Publications/Conserving-Chesapeake-Landscapes.pdf.
[62] *See* Executive Order 13508, Chesapeake Bay Protection and Restoration, 74 Fed. Reg, 23099 (May 15, 2009), available at: http://www.whitehouse.gov/the-press-office/executive-order-chesapeake-bay-protection-and-restoration
[63] *See Strategy for Protecting and Restoring the Chesapeake Bay Watershed*, May 12, 2010, available at: http://executiveorder.chesapeakebay.net/file.axd?file=2010%2f5%2fChesapeake+EO+Strategy%20.pdf.
[64] *See* http://www.chesbay.state.va.us/Publications/Conserving-Chesapeake-Landscapes.pdf.
[65] *Id.*

The Chesapeake Bay Executive Order is clear that to meet the goals of preserving and restoring the Chesapeake Bay and to preserve an additional two million acres by 2025:

> Agencies with land, facilities, or installation management responsibilities affecting ten or more acres within the watershed of the Chesapeake Bay shall, as expeditiously as practicable and to the extent permitted by law, implement land management practices to protect the Chesapeake Bay and its tributary waters . . .[66]

As one of those agencies and given its supervisory function over other federal agencies on matters of environmental policy, CEQ and the responsible federal agencies are required to promulgate regulations to meet the goals of the Chesapeake Bay Executive Order and its implementation strategy that incorporate any recommendations from the PEIS, mitigate the impacts from drilling, storage or transportation of natural gas from within the Marcellus Shale formation, and preserve forest land to the greatest extent possible.

CONCLUSION

Drilling for natural gas in the Marcellus Shale formation – along with associated activities – is rapidly expanding throughout the Chesapeake Bay states. The diverse and vast cumulative impacts from the number of wells and associated structures will likely lead to serious, irreversible consequences on the water quality, air quality, forest land, national park land, wildlife habitat and treasured landscapes throughout the region. It is the charge of CEQ, through NEPA, to "foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the Nation."[67] The only way to guarantee that the natural resources and environment of the Chesapeake Bay states are protected as required by federal law, the Chesapeake Bay TMDL, and the President's Chesapeake Bay Executive Order is to require the federal agencies named in this petition and

[66] *See* Bay Executive Order, Section 501.
[67] 42 U.S.C. § 4344(4).

CEQ to conduct a PEIS to study the cumulative impacts from drilling and to, in turn, draft and issue regulations promulgating the necessary protections.

WHEREFORE, the Petitioners respectfully request that the CEQ and federal agencies named in this petition undertake the following actions:

1. Undertake a cumulative impacts study to determine the effects that drilling and associated activities in the Marcellus Shale formation has on human health and the environment throughout the Chesapeake Bay region including, but not limited to, impacts to the air, water quality, forest land, national park land, wildlife habitat and ecosystems;

2. Issue a Programmatic Environmental Impact Statement addressing the cumulative impacts and suggesting reasonable alternatives to mitigate negative impacts throughout the Chesapeake Bay region; and

3. Promulgate any necessary guidance and regulations to protect the Chesapeake Bay states based upon the findings in the PEIS.

In accordance with the APA, CEQ's and the federal agencies' response to this petition is required in a time manner.

Respectfully submitted,

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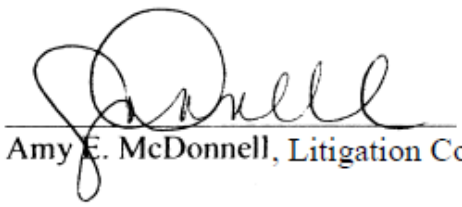
By: 
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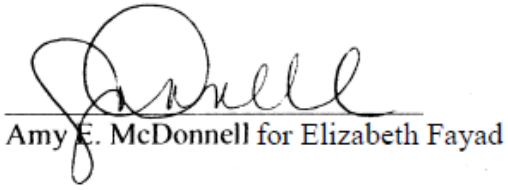
By: 
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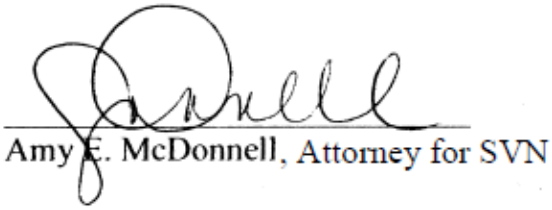
By: 
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CERTIFICATE OF SERVICE

I hereby certify that a copy of this forgoing citizen petition was served on this 4th day of April, 2011, by first class mail upon the parties listed below:

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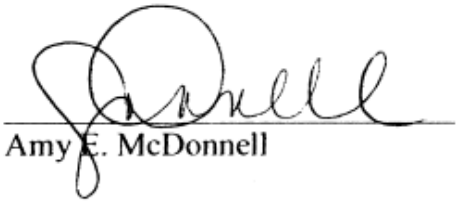
Amy E. McDonnell

Exhibit A

NEW YORK
North Branch
PENNSYLVANIA
Susquehanna River
WEST VIRGINIA
MARYLAND
DELAWARE
VIRGINIA
Marcellus Shale formation
Chesapeake Bay Watershed

Exhibit B

House Environmental Matters Committee

Testimony by John Quigley

Senior Fellow, PennFuture Center for Environmental Excellence

February 9, 2011

Madame Chair, and members of the committee, good afternoon. My name is John Quigley. I am from Camp Hill, Pennsylvania, and for the last 6 years worked in a variety of capacities at the Pennsylvania Department of Conservation and Natural Resources, serving for the last 2 years, until last month, as Secretary of that department and a member of the cabinet of former Governor Edward Rendell.

Thank you for the opportunity to appear before you today and offer my thoughts on the essential elements of public policy as Maryland confronts the challenges and opportunities of Marcellus gas development.

I would like to begin by touching on the opportunities. The natural gas to be found in the Marcellus (and other deeper shales) presents a vast source of domestically-produced energy that can create landowner wealth and new jobs (though I will caution you to be skeptical of industry-funded, hyperbolic estimates of job creation potential).

Natural gas can replace gasoline and diesel fuel in the vehicles we drive, and replace coal in our power plants. As the cleanest burning fossil fuel, an expansion of the use of natural gas and subsitution of it for more polluting fossil fuels can help clean our air, reduce global warming emissions, reduce soot and mercury pollution, and improve public health. All the while enhancing national energy security.

These benefits are significant, and need to be siezed.

But they need to be siezed in a way that recognizes the challenges, the threats, and the balance that is required between natural resource extraction and natural resource protection.

They need to be siezed while enacting the right regulations, and the right taxation.

Let me first discuss my direct experience in dealing with Marcellus development on Pennsylvania's state forest. About 1.5 million acres of that forest overlay the Marcellus fairway, and in the last 3 years, about 130,000 acres has been leased for gas drilling, bringing the total state forest acreage available for drilling to about 700,000 – a third of Pennsylvania's state forest land. Over the next 15 to 20 years, as many as 12,000 wells could be drilled on those lands. An analysis that I directed last year concluded that no additional state forest land can be leased on a wholesale basis without compromising the ecological integrity of the forest, and as a result, Governor Rendell signed an executive order that prohibits additional leasing.

An excellent overview of the variety of issues that Pennsylvania has encountered with natural gas development and the work that DCNR did in response can be found on DCNR's website: http://www.dcnr.state.pa.us/forestry/naturalgasexploration/index.htm.

As you may know, Pennsylvania's history is punctuated by waves of natural resource extraction, from the timbering over of much of the state to fuel the early days of the industrial revolution, to Drake's first oil well, to the rise of coal. In each case, Pennsylvania got it wrong. We privatized profits and socialized costs. The quarter million acres of abandoned mine lands and 5,000 miles of polluted streams that scar the state attest to our mistakes.

The wave of natural gas development sweeping over Pennsylvania will have profound economic and environmental impacts on the Commonwealth. Indeed, the cumulative impacts of the Marcellus play will dwarf all of Pennsylvania's previous waves of resource extraction combined. Pennsylvania cannot afford to repeat our historic mistakes. Maryland must avoid them.

Extraction of natural gas involves land clearing and well pad development, well drilling, and the consumption, treatment, and storage of water and wastewater, and the construction of roads, pipelines and other infrastructure. The environmental issues attached to this industrial activity are complex and daunting. Forest and habitat fragmentation, the introduction of invasive species, soil compaction and erosion, noise, localized air pollution, recreational/aesthetic impacts, and threats to groundwater must be carefully managed. And regulated.

DCNR manages these impacts on the public lands through several processes that go well beyond statutory or regulatory requirements, including:

- A comprehensive environmental review of ecological impacts before land is leased, or when wells are permitted on land where the Commonwealth does not own mineral rights;
- Avoidance/buffering of areas of special ecological consideration, as determined through an environmental review;
- Minimization techniques, such as required the use of existing road networks to minimize forest fragmentation by new disturbance; and
- Reclamation and restoration of gas activity sites, both interim and permanent

With the most protective lease of any public agency of which I am aware, and a collaborative effort with our lessees to develop best management practices around drilling to supplement the protections built in to its 75 page lease document, Pennsylvania's DCNR is working hard to get ahead of the Marcellus curve. Whether the agency will succeed in this challenging budgetary climate remains to be seen.

DCNR, at my direction, also developed a comprehensive monitoring program to begin to gather the data necessary to comprehensively understand the impacts of Marcellus exploration on the public lands. This monitoring program will need to be a permanent, and growing, feature of DCNR's work if they are to have a hope of preserving the state forest for future generations of Pennsylvanians.

I want to spend a few minutes to focus water. Keep in mind that fracing technology was developed in states with different land forms; it is being applied to eastern forests for the first time in Pennsylvania. We have much to learn and ample reasons for caution.

Pennsylvania has already experienced major problems with gas migration and contamination of drinking water wells, caused largely by improper well construction. We have had leaks of wastewater pits. We have had fracing fluid and diesel and other spills at the surface. We have

had well blowouts, explosions, and fires. We have had gas bubbling in the middle of the Susquehanna River. We have had groundwater contaminated, but not from the fracing itself – yet, anyway.

The sheer number of wells that are being drilled and that will be drilled in the coming decades – hundreds of thousands, according to industry estimates – makes these incidents inevitable; indeed a daily occurrence across Pennsylvania. Even if every company does tries to do everything right – as many if not most do – accidents will happen. In the best case, human error and bad luck will intrude. There have already been thousands of recorded violations of environmental regulations. State government must plan accordingly, with a full regulatory program and robust enforcement.

Industry claims it is reusing most or all of its fracwater. Is it? How much of it? Is usage being tracked adequately? Surely, there is a dearth of wastewater treatment facilities that can handle the brines and the naturally occurring radioactive material in what the industry terms "process water." State government must be vigilant in the exercise of its enforcement responsibilities.

In Pennsylvania, gas drilling for decades has involved injecting water underground. Most of that has been done at shallower depths than Marcellus. The fracing taking place to access Marcellus is typically more than 4000 feet below ground water. Is there a risk to groundwater? Is there a possibility that fracing could have water return from depth or leak in the drilling process before it gets to depth or as flowback occurs and contaminate groundwater? No one can say the chance is zero.

Is it a substantial threat?

I do not know, and among the professional geologists and academics I have consulted, there is uncertainty.

But I do know that an abundance of caution in the protection of our irreplaceable water resources is defensible. It is necessary. More study – beyond the good work that EPA is doing at the

Federal level – is needed. There is a need for scientific research on the impacts of fracing to groundwater, and long term monitoring. Regulation must follow wherever the science leads.

In addition to environmental and ecological impacts, Pennsylvania's northern tier in particular is seeing significant social and public impacts from gas development activities – and from the influx of out of state workers that drilling companies are bringing to Pennsylvania. Local roads that were not built to handle heavy truck traffic explode in spring thaws. Bridges must be weight-limited. There have been spikes in social problems – crime, substance abuse, unplanned teen pregnancies, and displacement of low income persons from housing as available rental units are snapped up by the industry. Demand for social services has spiked. All are consequential, and Maryland would do well to consider what is happening in Pennsylvania as a cautionary tale.

Regulation done right is a powerful answer to many of these problems. Regulation of the gas industry will limit land impacts and insure restoration of land. It will insure that water remains safe to drink, and allow local communities to responsibly zone drilling, with adequate setbacks, well spacing requirements, and no-drill zones like floodplains. Regulation means protecting local government authority. It means that wells must be adequately constructed, and bonded so that they are properly sealed at the end of their useful life and not abandoned.

Only when the industry is well-regulated will we be able to say that gas is produced responsibly.

And natural gas production must also be taxed responsibly. Permits should cover the full costs of enforcement and administration, but in addition, gas should be taxed to pay for environmental cleanup, to make whole communities that are impacted by drilling, to support the basic functions of government in a challenging fiscal climate, and indeed to facilitate the shift to cleaner burning sources of energy that grow our economy and protect public health and the environment. Pennsylvania is currently the only gas-producing state in the nation that does not have a drilling tax – the frankly shameful result of industry influence buying in Harrisburg. Maryland should not follow Pennsylvania's lead on that sorry score. Enact a drilling tax now.

With a prudent, thoughtful public policy response, Marcellus shale natural gas development in

our states can be an environmental victory that grows our economy. Whether Maryland achieves that victory is up to you.

Thank you.