IN THE SUPREME COURT OF PENNSYLVANIA

Docket No. 72 MAP 2012 & 73 MAP 2012

ROBINSON TOWNSHIP, Washington County, Pennsylvania, BRIAN COPPOLA, Individually and in his Official Capacity as SUPERVISOR of ROBINSON TOWNSHIP, TOWNSHIP OF NOCKAMIXON, Bucks County, Pennsylvania, TOWNSHIP OF SOUTH FAYETTE, Allegheny County, Pennsylvania, PETERS TOWNSHIP, Washington County, Pennsylvania, DAVID M. BALL, Individually and in his Official Capacity as COUNCILMAN of PETERS TOWNSHIP, TOWNSHIP OF CECIL, Washington County, Pennsylvania, MOUNT PLEASANT TOWNSHIP, Washington County, Pennsylvania, BOROUGH OF YARDLEY, Bucks County, Pennsylvania, DELAWARE RIVERKEEPER NETWORK, MAYA VAN ROSSUM, the Delaware Riverkeeper, MEHERNOSH KHAN, M.D.,

Appellants

v.

COMMONWEALTH OF PENNSYLVANIA, PENNSYLVANIA PUBLIC UTILITY COMMISSION, ROBERT F. POWELSON, in his Official Capacity as CHAIRMAN of the PUBLIC UTILITY COMMISSION, OFFICE OF THE ATTORNEY GENERAL OF PENNSYLVANIA, LINDA L. KELLY, in her Official Capacity as ATTORNEY GENERAL of the COMMONWEALTH OF PENNSYLVANIA, PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION and MICHAEL L. KRANCER, in his Official Capacity as SECRETARY of the DEPARTMENT OF ENVIRONMENTAL PROTECTION

Appellees

BRIEF OF AMICI CURIAE IN SUPPORT OF Appellants / MUNICIPALITIES

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I. STATEMENT OF INTEREST OF AMICI CURIAE

The members of the Democratic Caucus of the Pennsylvania House of Representatives (hereinafter "House Democratic Caucus") named below and on Attachment A attached hereto (collectively, "Amici Curiae") file this brief in support of the position of Robinson, Peters, Cecil and Mount Pleasant Townships, Washington County, Pennsylvania; Brian Coppola, Supervisor of Robinson Township; David M. Ball, Councilman of Peters Township; the Township of Nockamixon, Bucks County, Pennsylvania; the Township of South Fayette, Allegheny County, Pennsylvania; the Borough of Yardley, Bucks County, Pennsylvania, the Delaware Riverkeeper Network; Maya Van Rossum, the Delaware Riverkeeper; and Doctor Mehernosh Khan, M.D.

The House Democratic Caucus represents approximately 91 duly-elected members of the Pennsylvania General Assembly during the 2011-2012 Legislative Session. State Representative Frank Dermody is a member of the Pennsylvania General Assembly and the duly-elected State Representative representing the 33rd Legislative District. Dermody was first elected to the Pennsylvania House of Representatives in 1990. In November, 2010, Dermody was elected by the members-elect of the House Democratic Caucus to serve as the Democratic Leader of the Pennsylvania House of Representatives for the 2011-2012 Legislative Session. Among other things, the duty of the Democratic Leader is to advocate for and represent the interests of the members of the House Democratic Caucus.

State Representative Michael K. Hanna is a member of the Pennsylvania General Assembly and the duly-elected State Representative representing the 76th Legislative District. Hanna was first elected to the Pennsylvania House of Representatives in 1990 and currently serves as House Democratic Caucus Whip.

State Representative Dan Frankel is a member of the Pennsylvania General Assembly and the duly-elected State Representative representing the 23rd Legislative District. Frankel was first elected to the Pennsylvania House of Representatives in 1998 and currently serves as the House Democratic Caucus Chair.

State Representative Jennifer L. Mann is a member of the Pennsylvania General Assembly and the duly-elected State Representative representing the 132nd Legislative District. Mann was first elected to the Pennsylvania House of Representatives in 1998 and currently serves as House Democratic Caucus Secretary.

State Representative P. Michael Sturla is a member of the Pennsylvania General Assembly and the duly-elected State Representative representing the 96th Legislative District. Sturla was first elected to the Pennsylvania House of Representatives in 1990 and currently serves as House Democratic Caucus Policy Committee Chairman.

State Representative Ronald I. Buxton is a member of the Pennsylvania General Assembly as the duly-elected State Representative representing the 103rd Legislative District. Buxton was first elected to the Pennsylvania House of Representatives in 1992 and currently serves as House Democratic Caucus Administrator.

State Representative Joseph F. Markosek is a member of the Pennsylvania General Assembly as the duly-elected State Representative representing the 25th Legislative District. Markosek was first elected to the Pennsylvania House of Representatives in 1982 and currently serves as Democratic Chairman of the House Appropriations Committee.

State Representative Nick Kotik is a member of the Pennsylvania General Assembly and the duly-elected State Representative representing the 45th Legislative District, which includes

Petitioner South Fayette Township. Kotik was first elected to the Pennsylvania House of Representatives in 2002.

State Representative Steve Santarsiero is a member of the Pennsylvania General Assembly and the duly-elected State Representative representing the 31st Legislative District, which includes Petitioner Yardley Borough. Santarsiero was first elected to the Pennsylvania House of Representatives in 2008.

State Representative Jesse White is a member of the Pennsylvania General Assembly and the duly-elected State Representative representing the 46th Legislative District, which includes Petitioner Robinson Township, Cecil Township and Mount Pleasant Township, Washington County, and parts of South Fayette Township in Allegheny County. White was first elected to the Pennsylvania House of Representatives in 2006.

As elected members of the House of Representatives, Amici Curiae, in accordance with the Pennsylvania Constitution Article VI, Section 3, have sworn to "support, obey and defend . . . the Constitution of this Commonwealth." Amici Curiae strongly believe that Act 13 of 2012 ("Act 13"), specifically the provisions preempting local zoning prerogatives, violates Article I, Section 1 and Article III, Section 32 of the Pennsylvania Constitution. Consequently, Amici Curiae have a direct and substantial interest in the resolution of the constitutional issues raised. Amici Curiae believes the Court would greatly benefit from their perspective and file this brief in support of the local municipalities.

II. SUMMARY OF ARGUMENT

This Court should affirm that portion of the July 26th Order of the Commonwealth Court that properly determined that 58 Pa. C.S. § 3304 violates Article I, Section 1 of the Pennsylvania Constitution. The blanket zoning preemption provisions contained in Section 3304 of Act 13 are an improper exercise of the Commonwealth's police power as they are not designed to protect the health, safety, morals and public welfare of the citizens of Pennsylvania. As a result, 58 Pa. C.S. § 3304 violates Article I, Section I of the Pennsylvania Constitution.

This Court should also affirm that portion of the July 26th Order of the Commonwealth Court that properly determined that the powers delegated in 58 Pa. C.S. § 3215(b)(4) to the Pennsylvania Department of Environmental Protection (hereinafter "Department"), which allow the Department to grant waivers without defined standards, is an unconstitutional breach of the non-delegation doctrine. Moreover, this Court should exercise its plenary powers and hold that 58 Pa. C.S. § 3215(a), which allows the Department to grant variances from setback distance restrictions without providing sufficient standards to guide and restrain the exercise of the delegated authority, is also an unconstitutional delegation of power to the Department.

Finally, this Court should determine that Commonwealth Court erred in not ruling that Act 13 violates Article III, Section 32 of the Pennsylvania Constitution. Act 13 is a special law that was enacted for the sole benefit of the oil and gas industry. Act 13's zoning preemption affords the oil and gas industry the right to circumvent local zoning procedures otherwise applicable to all other citizens, industries and businesses seeking to develop land in the Commonwealth. By granting the oil and gas industry, alone, the power to bypass all local zoning restrictions and locate well pads anywhere it pleases, Act 13 is in violation of Article III,

Section 32 of the Pennsylvania Constitution.

III. ARGUMENT

A. SECTION 3304 OF ACT 13 IS UNCONSTITUTIONAL BECAUSE THE ZONING SCHEME PROVIDED FOR IN THIS SECTION FAILS TO PROTECT THE HEALTH, SAFETY, MORALS AND PUBLIC WELFARE OF THE CITIZENS OF PENNSYLVANIA.

Act 13's blanket local zoning preemption provision benefitting the oil and gas industry is an unconstitutional exercise of the Commonwealth's police power. Article I, Section 1 of the Pennsylvania Constitution guarantees individuals the ability to acquire, possess and protect property and to use that property as the individual sees fit. *See,* PA. CONST. Art. I, Sec. 1; *see also,* Appeal of Girsh, 437 Pa. 237, 241, 263 A.2d 395, 397, n. 3 (1970). The right of citizens to acquire, possess and protect property is a fundamental right.[1] Therefore, when enacting zoning regulations, all public authorities, including the Pennsylvania General Assembly, must exercise this police power in furtherance of the public health, safety, morals and general welfare of the particular community. *See,* Exton Quarries, Inc. v. Zoning Bd. of Adjustment of West Whiteland Twp., 425 Pa. 43, 66, 228 A.2d 169, 182 (1967) (concurring opinion of Chief Justice Bell).

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[1] The right to own property is recognized in international law and under the United States and Pennsylvania Constitutions. In international law, Article 17 of the Universal Declaration of Human Rights states that every person has the right to own property and that "no one shall be arbitrarily deprived of his property." UN General Assembly, Universal Declaration of Human Rights, 10 Dec. 1948, 217 A (17), at http://www.unhcr.org/refworld/docid/3ae6b3712c.html (accessed 14 May 2012). The 14th Amendment to the United States Constitution prohibits any state from depriving any person of property without due process of law and Article I, Section 1 of the Pennsylvania Constitution states that "All men ... have certain inherent and indefeasible rights, among which are those of ... acquiring, possessing and protecting property...." U.S. Const. amend. XIV, Sec. 1; PA. CONST. Art. I, Sec. 1.

The police power to zone cannot be exercised in an unreasonable or arbitrary manner and must be based upon the unique facts and circumstances present in each community. In Village of Euclid, Ohio v. Ambler Realty, Co., 272 U.S. 365, 387 (1926), the United States Supreme Court recognized that universal, or statewide, zoning is impractical and constitutionally impermissible: "[a] regulatory zoning ordinance, which would be clearly valid as applied to the great cities, might be clearly invalid as applied to rural communities." *See also,* Eller v. Bd. of Adjustment, 414 Pa. 1, 198 A.2d 863 (1964). A zoning ordinance is only constitutional when it promotes the public health, safety, morality and general welfare interests of the community and the regulations are substantially related to the purpose the ordinance purports to serve. Id. It is for these reasons that this Court has consistently ruled that zoning ordinances must be in conformance with a comprehensive plan to allow the community to develop in an orderly manner while observing the public interest of the community as a whole. Best v. Zoning Board of Adjustment of the City of Pittsburgh, 393 Pa. 106, 111, 141 A.2d 606, 610 (1958).

In the name of jobs and profits, many people may think that providing the gas industry with unfettered power and predictability is perfectly acceptable. However, this Court has expressly maintained that, "[g]ood intentions do not excuse non-compliance with the Constitution." Mesivtah Eitz Chaim of Bobov, Inc., v. Pike County Bd. of Assessment Appeals, 43 A.3d 3, 8 (Pa. 2012). The Commonwealth **must** undertake an analysis to determine how the zoning regulation will benefit the local community's health, safety, morals or general welfare before any zoning regulation may be constitutionally justified as an enactment pursuant to the Commonwealth's police power. This constitutional "zoning standard" applies to all levels of government alike; the Commonwealth is likewise limited by constitutional restraints. Exton

Quarries, Inc., 228 A.2d 169, 182 (Pa. 1967) (concurring opinion). The Commonwealth Court recognized in its opinion that the state's interest in oil and gas development is simply to "promote the exploitation of oil and gas resources." Commonwealth Court Opinion Pg. 32. On the other hand, the public interest in zoning is to "foster the orderly development and use of land in a manner consistent with local demographic and environmental concerns." Commonwealth Court Opinion Pg. 31. These conflicting interests must be balanced in favor of the local governments and citizens to determine what is in the best interest of their local communities and families.

Upon inspection of the plain language of 58 Pa. C.S. § 3304, it becomes apparent that this section is intended to provide stability and uniformity to the oil and gas industry and not to protect the interests of the citizens of the Commonwealth. Under § 3304, all local ordinances must authorize oil and gas operations, which include seismic operations, well site preparation, construction, drilling, hydraulic fracturing, site restoration, and construction, installation, use, maintenance and repair of oil and gas pipelines, as a permitted use in **all** zoning districts. 58 Pa. C.S. § 3304(b)(5). Section 3304 also requires municipal zoning ordinances to authorize impoundment areas, which may contain toxic fluids, many known to be carcinogens, in **all** zoning districts. Id. at § 3304(b)(7). Additionally, § 3304 requires local ordinances to authorize compressor stations, which typically run 24 hours a day, 365 days a year and emit unbearable noise, as a permitted use in agricultural and industrial zoning districts and as a conditional use in **all** other zoning districts. Id. The final two provisions in § 3304 prohibit local ordinances from increasing setback distances provided in Act 13, and from imposing limits on hours of operation of compressor stations, processing plants, the drilling of wells, and the assembly of drilling rigs.

Id. at § 3304(b)(10) & (11). Under 58 Pa. C.S. § 3304's scheme, a local community could see compressor stations, wells, and wastewater impoundments placed next to homes, schools, daycares, churches, and hospitals. As the Commonwealth Court concluded in its opinion: Act 13 "does not protect the interest of neighboring property owners from harm, alters the character of neighborhoods and makes irrational classifications." Commonwealth Court Opinion Pg. 33.

Act 13 takes great care to protect the financial health and welfare of the oil and gas industry but ignores the public health, safety, morals and general welfare of the citizens of the Commonwealth. There is no reasonable justification to preempt all local zoning for an industry that has been thriving in the Commonwealth for several years. As explained by the President Judge of the Commonwealth Court: "Before we had this Act, we [had] a lot of gas drilling. I think the estimate is 20,000 permits were issued in the Commonwealth ... [T]he industry was very successful before the Act, and . . . employed a lot of people and . . . received thousands and thousands permits." R.1259a-60a. Above all, preempting all local zoning is excessive and unnecessary for the continued development and success of the oil and gas industry. As a result, this Court should affirm the Commonwealth Court's holding that Act 13 is not in the interest of the health, safety, morals, and public welfare of the citizens of this Commonwealth and is, therefore, an unconstitutional exercise of the Commonwealth's police power.

Further, Act 13 does the *opposite* of protecting the property rights of persons residing in drilling areas. Under Pennsylvania law, the owner of oil and gas rights has the implied right to use the surface estate to access and extract the natural resources underlying the surface estate. Consolidation Coal Co. v. White, 875 A.2d 318, 326 (Pa. Super. 2005). This precedent, in conjunction with the provisions of Act 13, effectively leaves surface owners without *any*

property rights in relation to oil and gas activities. Act 13 not only strips local governments' zoning powers, it also *mandates* that the Department grant setback variances to any well operator that applies. 58 Pa. C.S. § 3215(a). In fact, on several occasions throughout this litigation the Commonwealth and gas industry lawyers admitted that Act 13 was enacted to create a uniform and stable economic climate for the oil and gas industry considering doing business in Pennsylvania and made no mention of the public health, safety and general welfare of the citizens of the Commonwealth.

To make matters worse, the Commonwealth, in the course of defending Act 13, has taken great liberties with the language of Act 13. For example, in its Answer[2], the Commonwealth wrote: "Further guidance can be found through the Clean Water Act and other existing environmental laws which the Legislature made clear are to work concurrently with Act 13 so as to further the environmental goals of the Commonwealth. *See* 58 Pa. C.S. § 3257." However, the Commonwealth either knew or should have known when it made this assertion to the Court that the natural gas industry is exempt from key provisions of many major federal environmental laws.[3] Consequently, the Commonwealth's claim that existing environmental laws are to "work concurrently with Act 13" is disingenuous.

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[2] Commonwealth Respondent's Answer to Petitioners' Motion for Preliminary Injunction, Section II, D, 7, Pages 25-26. (Attachment B).

[3] Natural gas exploration and production processes are exempted from protections under the Clean Water Act, Safe Drinking Water Act (SDWA), National Environmental Policy Act (NEPA), Clean Air Act, Resource Conservation and Recovery Act (RCRA), and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Under the Clean Water Act, it is illegal to discharge a pollutant into navigable waters of the United States without a permit. The revisions under the Energy Policy Act of 2005 exempted "water, gas, or other material which is injected into a well to facilitate production of oil or gas" from the definition of "pollutant." 33 U.S.C. § 1362. The Safe Drinking Water Act establishes minimum

To add insult to injury, Act 13's weak bonding requirements[4] guarantees that taxpayers will be left holding the bag for abandoned well clean-up and reclamation for years to come. Pennsylvania's resident taxpayers are no strangers to footing the bill for the environmental cleanup resulting from outside corporations coming to the Commonwealth with promises of great wealth and leaving the environment in ruin. In fact, the citizens of the Commonwealth are still paying for the environmental damage left behind by the coal barons more than 100 years ago. Abandoned mine drainage continues to be Pennsylvania's single largest non-point source water pollutant, resulting in the impairment of more than 5,500 miles of Commonwealth streams

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requirements for State underground injection programs to prevent drinking water contamination. 42 U.S.C. § 300h. The Energy Policy Act amended the SDWA to exempt hydraulic fracturing fluids from the definition of "underground injection." 42 U.S.C. § 300h(d). The Energy Policy Act also provided for a categorical exclusion from NEPA requirements for certain oil and gas activities conducted pursuant to the Mineral Leasing Act. 42 U.S.C. § 15942. The Clean Air Act requires the aggregation of smaller sources of emissions in order to determine pollution control requirements. However, the Act exempts oil and gas wells, as well as pipeline facilities, from aggregation, meaning that each site is considered an individual source of emissions and does not have to meet the more stringent emissions requirements for "major" sources. 42 U.S.C. § 7412. RCRA is a "cradle-to-grave" waste management program that requires disclosure and safe handling of hazardous waste. Although many materials in hydraulic fracturing fluid are individually considered "hazardous," the Act exempts oil and gas exploration and production wastes from the definition of "hazardous." 42 U.S.C. § 6921. CERCLA holds potentially responsible parties liable for clean-up costs resulting from a release or threatened release of a hazardous substance into the environment. The definition of hazardous substance under CERCLA does not include natural gas, natural gas liquids, or otherwise hazardous substances found in crude oil and petroleum. 42 USC § 9601.

[4] A recent peer-reviewed study from Carnegie Mellon University found that the average cost of plugging a Marcellus well is $100,000. Act 13 requires a $10,000 bond per well, which creates a financial incentive to abandon the well without complying with reclamation requirements. Austin L. Mitchell & Elizabeth A. Casman, *Economic Incentives and Regulatory Framework for Shale Gas Well Site Reclamation in Pennsylvania*, Envtl. Sci. & Tech. (Oct. 10, 2011). (Attachment C).

and 350 acres of Commonwealth lakes.[5] In addition to the weak bonding requirements, Act 13 includes environmental buffers and setbacks that are completely inadequate to protect public water supplies, as well as private, family-owned water wells, from potential pollution and contamination.

Section 3304 of Act 13 essentially gives the oil and gas industry unfettered ability to drill in any zoning district, without oversight or regard for the existing local municipalities' comprehensive zoning plans, tax bases, need for orderly development or the desires and needs of the citizens of local communities. Section 3304 was not enacted in the interest of public health, safety, or welfare, and was instead designed to provide uniformity to the oil and gas industry. Therefore, § 3304 is an unconstitutional exercise of the Commonwealth's police power and this Court should affirm the ruling of the Commonwealth Court holding § 3304 unconstitutional, null and void.

B. THE AUTHORITY GRANTED TO THE DEPARTMENT IN 58 Pa. C.S. §§ 3215(a) AND 3215(b)(4) OF ACT 13 IS AN UNCONSTITUTIONAL DELEGATION OF POWER BY THE GENERAL ASSEMBLY.

Article II, § 1 of the Pennsylvania Constitution provides that "[t]he legislative power of this Commonwealth shall be vested in a General Assembly, which shall consist of a Senate and a House of Representatives." The Legislature may confer authority and discretion upon another body in connection with the execution of a law, but that "legislation *must contain adequate standards which will guide and restrain* the exercise of the delegated administrative functions." Eagle Envlt. II, L.P. v. Commonwealth, 584 Pa. 494, 515, 884 A.2d 867, 880 (2005) (emphasis

[5] PA Dep't of Envtl. Prot., *2010 Pennsylvania Integrated Water Quality Monitoring Assessment Report* (2010). (Attachment D).

added) *quoting* Gilligan v. Pa. Horse Racing Comm'n., 492 Pa. 92, 94, 422 A.2d 487, 489 (1980). *See also* Commonwealth of Pa. v. Parker White Metal Co., 512 Pa. 74, 515 A.2d 1358 (1986). Fundamentally, basic policy decisions must be made by the General Assembly. Blackwell v. State Ethics Comm'n., 523 Pa. 347, 567 A.2d 630 (1989). Although the Legislature may confer authority and discretion in connection with the execution of the law, "[t]he principal limitations on this power are twofold: (1) the basic policy choices must be made by the Legislature; and (2) the legislation must contain adequate standards which will guide and restrain the exercise of the delegated administrative functions." Eagle Envlt. II, L.P., 584 Pa. 494, 517, 884 A.2d 867, 880 (2005).

Section 3215(b) of Act 13 provides limitations in terms of purported minimum setbacks for well sites and disturbed areas from a "solid blue lined stream, spring or body of water" and from "wetlands." *See*, Act 13, § 3215(b)(1)-(3). However, § 3215(b)(4) then provides: "The Department shall waive the distance restrictions upon submission of a plan identifying additional measures, facilities or practices to be employed during well site construction, drilling and operations necessary to protect the waters of this Commonwealth. The waiver shall include additional terms and conditions required by the Department necessary to protect the waters of this Commonwealth." Id. at § 3215(b)(4). That is, the Department may substitute a site-specific determination for the setbacks imposed by § 3215(b)(1)-(3). Section 3215(b)(4) grants operators *the right* to obtain a waiver from the distance restrictions (e.g. "*shall* be granted a variance..." and "[t]he Department shall waive the distance requirements" *See supra.*).

Despite the fact that the Department has *no choice but to grant* the waiver from these distance restrictions, Act 13 fails to specify how far into these minimum distance requirements

the Department can allow an operator to encroach and what specific safeguards or standards need to be met. The plain reading of § 3215(b)(4) is clear; as long as an operator says it will protect the waters of the Commonwealth, the Department ***must*** allow the operator to encroach upon the minimum setback distance requirements and can conceivably allow the operator to encroach upon the setback to the point of nullifying it.

In its opinion, the Commonwealth Court applied the precedent set by this Court in Pennsylvanians Against Gambling Expansion Fund v. Commonwealth, 583 Pa. 275, 877 A.2d 383 (2005) ("PAGE") in examining § 3215(b)(4) of Act 13 and found that this section violated the non-delegation doctrine because it lacked adequate standards for the Department to follow in granting waivers. The Commonwealth Court succinctly stated:

> "In authorizing a waiver, Section 3215(b)(4) gives no guidance to DEP that guide and constrain its discretion to decide to waive the distance requirements from water body and wetland setbacks. Moreover, it does not provide how DEP is to evaluate an operator's "plan identifying additional measures, facilities or practices to be employed ... necessary to protect the waters of this Commonwealth ... Just as in *PAGE,* some general goals contained in other provisions are insufficient to give guidance to permit DEP to waive specific setbacks. Given the lack of guiding principles as to how DEP is to judge operator submissions, Section 3215(b)(4) delegates the authority to DEP to disregard the other subsections and allow setbacks as close to the water source it deems feasible ... Because the General Assembly gives no guidance when the other subsections may be waived, Section 3215(b)(4) is unconstitutional because it gives DEP the power to make legislative policy judgments otherwise reserved for the General Assembly."

Consequently, the General Assembly's failure to provide adequate standards to the Department has resulted in the Department having *de facto* legislative power and the ability to make basic policy choices regarding distance requirements related to the granting of waivers. Because Act 13 provides insufficient guidance to the Department of Environmental Protection regarding

waivers from the setback requirements established by the Legislature, § 3215(b)(4) is unconstitutional under Article 2, § 1 of the Pennsylvania Constitution. This Court should uphold the Commonwealth Court's application of the PAGE standard and its determination that 58 Pa. C.S. § 3215(b)(4) is unconstitutional.

This Court should exercise its plenary power and apply the PAGE standard to § 3215(a) as well. Section 3215(a) provides in relevant part:

> "... If consent is not obtained and the distance restriction would deprive the owner of the oil and gas rights of the right to produce or share in the oil or gas underlying the surface tract, the well operator **shall be granted a variance from the distance restriction upon submission of a plan** identifying the additional measures, facilities or practices **as prescribed by the department** to be employed during well site construction, drilling and operations...".

(emphasis added). The plain reading of § 3215(a) shows that the Legislature conferred expansive authority and discretion upon the Department in connection with its execution of Act 13 and the granting of a variance from the distance restriction upon submission of "a plan," "as proscribed by the department". Like § 3215(b)(4), § 3215(a) lacks adequate standards, which will guide and restrain the Department in the exercise of the delegated administrative functions. The General Assembly's failure to provide adequate standards to the Department in § 3215(a) of Act 13 has granted the Department the right to make basic policy choices regarding distance requirements and has resulted in *de facto* legislative power being vested in the Department. Section 3215(a) is also unconstitutional under Article 2, § 1 of the Pennsylvania Constitution because it fails to provide adequate guidance to the Department as to when to grant a variance from the setback requirements established by the Legislature.

C. ACT 13 IS A "SPECIAL LAW," WHICH CREATES UNCONSTITUTIONAL DISTINCTIONS BETWEEN THE OIL AND GAS INDUSTRY AND OTHER INDUSTRIES OPERATING IN THE COMMONWEALTH IN VIOLATION OF ARTICLE III, SECTION 32 OF THE PENNSYLVANIA CONSTITUTION.

Article III, Section 32 became part of Pennsylvania's Constitution in 1873 to prevent the General Assembly from creating classifications in order to grant privileges to one person, one company or one county. Wings Field Preservation Assoc., L.P. v. Com. Dept. of Trans., 776 A.2d 311, 316 (Pa. Commw. Ct. 2001). The evil of catering to an industry not in need of special protection was the catalyst for the Pennsylvanian equal protection constitutional amendment. Harrisburg School Dist. v. Hickok, 761 A.2d 1132, 1136 (Pa. 2000). The local zoning preemption provisions of Act 13 are precisely what the Constitution prohibits.

Act 13 is a "special law," which creates an unconstitutional distinction between the oil and gas industry and every other industry operating in the Commonwealth in violation of Article III, Section 32 of the Pennsylvania Constitution, which provides:

> The General Assembly shall pass no local or special law in any case which has been or can be provided for by general law and specifically the General Assembly shall not pass any local or special law:
>
> 1. Regulating the affairs of counties, cities, townships, wards, boroughs, or schools districts,
> ...
> 7. Regulating labor, trade, mining or manufacturing.
> ...
> Nor shall the General Assembly indirectly enact any special or local law by the partial repeal of a general law; but laws repealing local or special acts may be passed.

PA. CONST. Art. III, § 32. Under Act 13, the oil and gas industry is subject to virtually NO local scrutiny while every other industry operating in the Commonwealth is required to follow the

existing zoning requirements in the municipality in which they are located. Any classification or distinction between groups made in the law must seek to promote a legitimate state interest or public value, and bear a "reasonable relationship" to the object of the classification. PA Turnpike Com'n. v. Commonwealth, 899 A.2d 1085, 1094-1095 (Pa. 2006). The proponents of Act 13 have not provided any reasonable constitutional justification for the special classification made in Act 13 and the differing treatment between the oil and gas industry and all other industries.

Such special treatment for a select interest is the cornerstone of an unconstitutional "special law." Historically, Pennsylvania has kept zoning decisions local. Local municipalities have been vested with the responsibility to use their "unique expertise ... to designate where different uses should be permitted in a manner that accounts for the community's development objectives, its character, and the suitabilities and special nature of particular parts of the community." Huntley & Huntley, Inc. v. Boro. Council of the Boro. of Oakmont, 600 Pa. 207, 225, 964 A.2d 855, 866 (2009) (internal quotations omitted). The zoning power may only be exercised to promote the health, safety, morals and welfare of the community and to protect individuals from the harmful effects of neighbors' incompatible property uses. Therefore, zoning districts are only found to pass constitutional scrutiny if each district only allows uses of land that are of the same character and are compatible with one another. Village of Euclid, Ohio v. Ambler Realty Co., 272 U.S. 365, 47 S.Ct. 114 (1926); Hopewell Twp. Bd. of Supervisors v. Golla, 499 Pa. 246, 452 A.2d 1337, 1341-42 (1982). Act 13's blanket, one-size-fits-all, local zoning preemption goes too far and allows for unconstitutional "spot zoning." Unlike every

other citizen, business or industry seeking to establish operations in a local municipality, the oil and gas industry is subject to special zoning standards under Act 13.

All other industrial uses are generally confined to industrial districts. However, under Act 13, oil and gas companies are permitted to locate the industrial use of oil and gas operations in any zoning district without any additional oversight or procedural constraints placed upon them. *See* 58 Pa. C.S. § 3304(b)(5). Unlike ordinary citizens, who are limited in how they can develop parcels in residential districts, the oil and gas industry has been given special rights that are significantly greater than any other group of citizens. *See* 58 Pa. C.S. § 3304. Take Petitioner South Fayette Township's zoning ordinance, for example. Under the Township's zoning ordinance, "private storage buildings," or sheds, are a permitted accessory use in residential zoning districts. South Fayette Township, Pa., Code § 240 (2005). However, they are not permitted to be located in a front yard. Id. at § 240-99(C)(9). They are also subject to size restrictions and setback distances from any property line. Id. On the other hand, Act 13 requires local zoning ordinances to authorize impoundment areas as a permitted use in all zoning districts. 58 Pa. C.S. § 3304(b)(6) (emphasis added). They can be located anywhere within the township boundaries, even in a front yard. Although Act 13 provides for a 300 foot setback distance from an existing building, Act 13's preemption of all ordinances regulating the "same features" of oil and gas operations as are contained in the Act prevent local municipalities from imposing additional, stricter requirements on wastewater impoundment areas. *See* 58 Pa. C.S. § 3302. The oil and gas industry is the only industry that has been granted, to this degree, a special exemption to the standard rules for all to follow.

Additionally, landowners have an interest in the quiet use and enjoyment of their property near any proposed use, and a right to participate in the governing body's hearings. In re McGlynn, 974 A.2d 525 (Pa. Commw. Ct. 2009). Under Act 13, a local zoning board is mandated, regardless of the evidence, to approve oil and gas activities, turning zoning board hearings related to oil and gas into "kangaroo courts," because they are forced to turn a blind eye to any evidence brought forth by citizens, religious groups, community organizations and landowners. What's more, unlike any other industry, the oil and gas industry has been permitted to develop without regard for the local consideration of the health, safety, and general welfare of surrounding citizens and communities. No other citizen, business, or industry has been granted such "special treatment" to act without consideration of the health, safety and property rights of the citizens of the Commonwealth.

No valid constitutional justification has been proffered for exempting the oil and gas industry from local zoning procedures and appeal processes, which exist for the protection of the community. Plenty of applicants would welcome a pass from municipal oversight, yet only the oil and gas industry has received such "special treatment." During arguments before the Commonwealth Court, the President Judge hit the proverbial nail on the head when he engaged in the following exchange with the lawyer representing the gas industry:

> **Industry Lawyer**: There are municipalities that do, in fact, have exclusionary zoning.
> **The Court**: So, just like every other, can't you challenge that through the normal zoning process?
> **Industry Lawyer**: Therein lies the problem, Your Honor. You're putting the industry in a situation where they have to go into each municipality, take on each ordinance, run it up through the Zoning Hearing Board, the Court of Common Pleas, this Court and the Supreme Court in a four

> or five year litigation nightmare in every municipality in this state that has preclusive effects on oil and gas operations.
> **The Court**: So in effect your argument is that you're special; that if there's – every other – I'm sure the Tavern Association of Pennsylvania would want to put a tavern everywhere. And I don't think every ordinance is exclusionary, but what you're in effect saying is that you just don't want to deal with local zoning because its – you don't want to follow – it would be more convenient for you to not have to do that but everybody else has to.

R.1263a-64a.

Article III, Section 32 of the Pennsylvania Constitution has been interpreted to require that like persons in like circumstances are treated similarly. PA Turnpike Com'n. v. Commonwealth, 899 A.2d 1085, 1094 (Pa. 2006). The General Assembly is prohibited from passing any "special law" for the benefit of one group to the exclusion of others. *See*, Laplacca v. Philadelphia Rapid Transit Co., 108 A. 612 (Pa. 1919). Any classification or distinction between groups made in the law must seek to promote a legitimate state interest or public value, and bear a "reasonable relationship" to the object of the classification. PA Turnpike Com'n. v. Commonwealth, at 1094-1095. A classification may be deemed *per se* unconstitutional if the classified class consists of one type of member and is substantially closed to other members. *See*, In re Williams, 234 A.2d 37 (Pa. Super. 1967). The constitutional prohibition against special laws was adopted to put an end to privileged legislation enacted for private purposes. Hickok, at 1132.

Currently, and during the movement of the legislation that became Act 13 through the legislative process, supporters have touted the benefits of giving the oil and gas industry predictability and uniformity as it operates in various locales across the Commonwealth.

However, the oil and gas industry is clearly not the only industry that operates statewide and must (absent Act 13's provisions) comply with differing local regulations. Consider Pennsylvania's manufacturing industry, for instance. "Heavy manufacturing," which is defined in the South Fayette Township Zoning Ordinance as the manufacture of certain materials and products where processes involved will produce "noise, vibration, water pollution, fire hazard or noxious emissions that will disturb or endanger neighboring properties," is not an authorized use in any zoning district in South Fayette Township. South Fayette Township, Pa., Code § 240 (2005). Therefore, if a manufacturing business wants to locate in South Fayette Township it must submit a written application for approval of a use by special exception to the Zoning Officer. The Zoning Hearing Board will then hold a public hearing, in which the burden of persuasion is on the applicant to prove that the proposed use "will not offend general public interest such as the health, safety and welfare of the neighborhood." Id. at § 240-93(C)(4). If the Board approves the use, it may then prescribe conditions to safeguard the community. Under Act 13, zoning ordinances must authorize oil and gas operations in all zoning districts. 58 Pa. C.S. § 3304(b)(5) (emphasis added). Therefore, the oil and gas industry is not required to go through any approval process or public hearings in order to locate a well anywhere in a municipality.

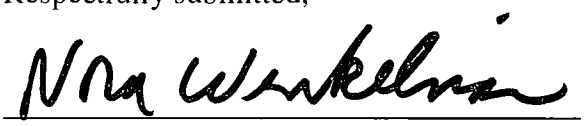
Unlike any other industry in Pennsylvania, the oil and gas industry is subject to NO local scrutiny under Act 13. Giving the oil and gas industry the right to bypass that which others must comply with as a regular incident of doing business is a "special" consideration and distinction that cannot be justified on any legitimate constitutional basis. Act 13 has unconstitutionally

bestowed favor on one industry by providing it with special treatment not otherwise afforded to any other industries or citizen in the Commonwealth.

IV. CONCLUSION

Accordingly, for the foregoing reasons, Amici Curiae respectfully request this Court to declare 58 Pa. C.S. § 3304 unconstitutional based on Article I, Section 1 of the Pennsylvania Constitution; declare 58 Pa. C.S. §§ 3215(a) and (b)(4) unconstitutional for violating the non-delegation doctrine; and declare Act 13 unconstitutional because it is a "special law" and violates Article III, Section 32 of the Pennsylvania Constitution.

Respectfully submitted,



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DATED: September 18, 2012

CERTIFICATE OF SERVICE

I hereby certify that the above Application for Leave and Amicus Curiae Brief for the Pennsylvania House of Representatives, Democratic Caucus as Amici Curiae, in Support of Robinson Township, et al. was served by electronic mail on the 18th day of September 2012 upon the following:

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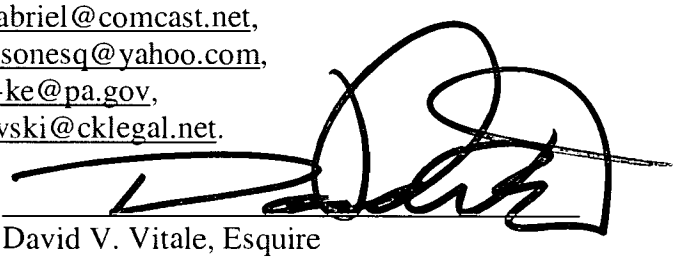

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Attachment A

House Democratic Caucus Members

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Representative Brendan F. Boyle, 170th Legislative District
Representative Matthew Bradford, 70th Legislative District
Representative Tim Briggs, 149th Legislative District
Representative Michelle Brownlee, 195th Legislative District
Representative Michael Carroll, 118th Legislative District
Representative Scott Conklin, 77th Legislative District
Representative Dom Costa, 21st Legislative District
Representative Peter Daley, 49th Legislative District
Representative Margo Davidson, 164th Legislative District
Representative Madeleine Dean, 153rd Legislative District
Representative Pamela DeLissio, 194th Legislative District
Representative Anthony DeLuca, 32nd Legislative District
Representative Maria P. Donatucci, 185th Legislative District
Representative Florindo "Flo" Fabrizio, 2nd Legislative District
Representative Robert Freeman, 136th Legislative District
Representative Camille "Bud" George, 74th Legislative District
Representative Neal Goodman, 123rd Legislative District
Representative Babette Josephs, 182nd Legislative District
Representative Sid Michaels Kavulich, 114th Legislative District
Representative William Kortz, 38th Legislative District
Representative Deberah Kula, 52nd Legislative District
Representative Robert F. Matzie, 16th Legislative District
Representative Gerald Mullery, 119th Legislative District
Representative Phyllis Mundy, 120th Legislative District
Representative Kevin Murphy, 113th Legislative District
Representative Michael O'Brien, 175th Legislative District
Representative Eddie Day Pashinski, 121st Legislative District
Representative Tony J. Payton, Jr., 179th Legislative District
Representative Steve Samuelson, 135th Legislative District
Representative Martin M. Schmotzer, 22nd Legislative District
Representative Gregory S. Vitali, 166th Legislative District
Representative Gary Williams, 197th Legislative District
Representative Rosita Youngblood, 198th Legislative District

Attachment B

IN THE COMMONWEALTH COURT OF PENNSYLVANIA

ROBINSON TOWNSHIP, Washington County, Pennsylvania; BRIAN COPPOLA, Individually and in his Official Capacity as Supervisor of Robinson Township; TOWNSHIP OF NOCKAMIXON, Bucks County, Pennsylvania; TOWNSHIP OF SOUTH FAYETTE, Allegheny County, Pennsylvania; PETERS TOWNSHIP, Washington County, Pennsylvania; DAVID M. BALL, Individually and in his Official Capacity as Councilman of Peters Township; TOWNSHIP OF CECIL, Washington County, Pennsylvania; MOUNT PLEASANT TOWNSHIP, Washington County, Pennsylvania; BOROUGH OF YARDLEY, Bucks County, Pennsylvania; DELAWARE RIVERKEEPER NETWORK; MAYA van ROSSUM, the Delaware Riverkeeper; and MEHERNOSH KHAN, M.D. **Petitioners** **v.** **COMMONWEALTH OF PENNSYLVANIA; PENNSYLVANIA PUBLIC UTILITY COMMISSION, ROBERT F. POWELSON, in his Official Capacity as Chairman of the Public Utility Commission; OFFICE OF THE ATTORNEY GENERAL; LINDA L. KELLY, in her Official Capacity as Attorney General of the Commonwealth of Pennsylvania; PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION; and MICHAEL L. KRANCER, in his Official Capacity as Secretary of the Department of Environmental Protection,** **Respondents**	**NO. 284 MD 2012**

COMMONWEALTH RESPONDENTS' ANSWER TO PETITIONERS' MOTION FOR A PRELIMINARY INJUNCTION

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The Commonwealth of Pennsylvania; the Pennsylvania Public Utility Commission ("PUC"); Robert F. Powelson, in his official capacity as Chairman of the PUC; Pennsylvania Office of Attorney General; Attorney General Linda L. Kelly, in her official capacity; the Pennsylvania Department of Environmental Protection ("DEP"); and Michael L. Krancer, in his official capacity as Secretary of DEP (collectively, "Commonwealth Respondents"), through their counsel, hereby answer Petitioners' motion for a preliminary injunction as follows:

I. INTRODUCTION

Act 13 of 2012, 58 Pa. C.S. §§ 2301-3504, is a comprehensive and broad reform of the laws governing the development of oil and gas resources in Pennsylvania. Among other things, it revises and updates the Commonwealth's environmental regulation of the oil and natural gas industries, promotes economic development and energy self-sufficiency in Pennsylvania, provides for drilling impact fees which are targeted to benefit municipalities where oil and gas operations occur, and creates uniformity with respect to the development and operation of oil and gas operations in different municipalities throughout Pennsylvania while preventing individual municipalities from unreasonably excluding or hampering development of an important and growing industry.

The Petitioners in this case are Robinson Township and five other municipalities from Pennsylvania; various officials from these municipalities; the

Delaware Riverkeeper Network, a non-profit organization which has as its primary mission the maintenance and restoration of the Delaware River; Maya Van Rossum, a privately funded ombudsman who advocates for the protection and restoration of the Delaware River Basin; and Dr. Mehernosh Khan, M.D., a medical doctor practicing in Monroeville, Allegheny County.

Petitioners have filed a voluminous petition for review consisting of 108 pages and 292 paragraphs in which they seek a permanent injunction which would enjoin the implementation of Act 13. In the petition for review, Petitioners allege that Act 13 is unconstitutional because:

a. Act 13 violates Article I, Section 1 of the Pa. Constitution and the 14th Amendment of the U.S. Constitution because it is an improper exercise of the Commonwealth's police power since it is not designed to protect the health, safety, morals and public welfare of the citizens of Pennsylvania;

b. Act 13 violates Article I, Section 1 of the Pa. Constitution because it allows "incompatible uses" in like zoning districts so as to conflict with the comprehensive zoning plans of municipalities;

c. Act 13 violates Article I, Section 1 of the Pa. Constitution because it restricts the ability of municipalities to follow existing zoning ordinances or comprehensive plans and limits the ability create new zoning ordinances or

comprehensive plans as required under the Municipalities Planning Code ("MPC");

d. Act 13 violates Article III, Section 32 of the Pa. Constitution because it is a "special law" which was enacted solely for the benefit of the oil and gas industry;

e. Act 13 violates Article I, Sections 1 and 10 of the Pa. Constitution because it constitutes an improper use of the Commonwealth's eminent domain power;

f. Act 13 violates Article I, Section 27 of the Pa. Constitution by denying municipalities the ability to carry out their duty to protect the environment;

g. Act 13 violates the Separation of Powers doctrine because it allows the PUC to draft legislation;

h. Act 13 violates the Separation of Powers doctrine because it allows the PUC to render judicial decisions;

i. Act 13 improperly delegates power to DEP to establish standards for the regulation of the oil and gas industry;

j. Act 13's setback requirements are unconstitutionally vague because they do not provide necessary or sufficient information regarding what actions by a municipality are prohibited;

k. Act 13's timing and permitting requirements are unconstitutionally vague because they fail to provide municipalities with necessary or sufficient information regarding what actions by a municipality are prohibited;

l. Act 13's provisions restricting the disclosure of medical diagnostic information by health care professionals is a "special law" which violates Article III, Section 32 of the Pa. Constitution;

m. Act 13 violates the single subject rule of Article III, Section 32 of the Pa. Constitution by including provisions which restrict the disclosure of medical diagnostic information by health care professionals.

(Petition for Review at ¶ 20)

Petitioners have also filed a separate motion requesting a preliminary injunction in which they ask the Court to preliminarily enjoin Act 13 from going into effect on April 14, 2012. However, for the reasons set forth more fully in the argument section below, the Commonwealth Respondents do not believe that Petitioners can establish that they have met the prerequisites for being granted a preliminary injunction.

In particular, Petitioners cannot demonstrate that they will suffer irreparable harm if Act 13 is allowed to go into effect or that they are likely to prevail on the merits. Moreover, Act 13 represents a significant attempt by the Legislature to create a uniform system for the production of oil and gas while at the same time

protecting the environment and the rights of landowners. While Petitioners apparently disagree with some of the policy choices made by the Legislature, validly enacted statutes such as Act 13 are the result of our democratic process and as such represent the public policy of Pennsylvania. Absent an actual constitutional impediment, Act 13 must be upheld by the Courts regardless of how much any individuals or subordinate government bodies believe they are personally "harmed" or "disadvantaged" by it. Many of the objections raised by Petitioners are on closer examination nothing more than a broad criticism of the scope and effectiveness of Act 13's substantive provisions rather than real or substantiated claims that Act 13 actually infringes on any of the rights protected by the Pennsylvania Constitution. Where Petitioners actually move beyond their personal assessment of the wisdom of the Legislature in enacting Act 13, they cannot establish that Act 13 actually infringes upon the rights of municipalities, the Delaware Riverkeeper Network, or any of the individuals named as petitioners.

II. ARGUMENT

In order to be entitled to a preliminary injunction, a petitioner must demonstrate the following essential prerequisites: (1) it is necessary to prevent immediate and irreparable harm which could not be compensated by damages; (2) greater injury would result by refusing it than granting the injunction; (3) it will properly restore the parties to their status as it existed immediately before the

alleged wrongful misconduct; (4) the right to relief is clear and that the wrong is manifest; (5) the injunction is reasonably suited to abate the offending activity; and (6) it will not adversely affect the public interest. *Free Speech, LLC v. City of Philadelphia*, 884 A.2d 966, 970 (Pa. Cmwlth. 2005) (citing *Warehim v. Warehime*, 580 Pa. 201, 860 A.2d 41 (2004); *Paupack Township, Wayne County v. Lake Mac-a-tek, Inc.*, 863 A.2d 615, 617 (Pa. Cmwlth. 2004) (citing *Summit Towne Centre, Inc. v. Shoe Show of Rocky Mount, Inc.*, 573 Pa. 637, 828 A.2d 995 (2003). Notably, these elements are cumulative and, therefore, failure on any of them requires denial of the preliminary injunction. *See County of Allegheny v. Commonwealth*, 518 Pa. 556, 560, 544 A.2d 1305, 1307 (1988) ("For a preliminary injunction to issue, every one of these prerequisites must be established; if the petitioner fails to establish any one of them, there is no need to address the others."). *See also Reed v. Harrisburg City Council*, 927 A.2d 698, 703 (Pa. Cmwlth. 2007). Petitioners cannot establish that they are entitled to a preliminary injunction for the reasons explained below.

A. <u>Justiciability and Standing</u>

To the extent Petitioners are attempting to second-guess and ultimately overturn the determinations made by the Legislature on how to best regulate the oil and gas industry in Pennsylvania, this is improper and their claims are non-justiciable. Under the Constitution, and integral to our concept of an ordered

democratic society, is the principle that the Legislative branch enacts the laws and their judgment on how best to exercise its powers cannot ordinarily be infringed upon by the judiciary. The Legislature has broad latitude in how to exercise its police powers. If a law has a conceivable rational basis and it is not otherwise prohibited by the United States or Pennsylvania Constitutions, the proper means for its rescission is through the ballot box and not the Courts.

In addition, in order to be entitled to relief before the courts in any case, it is necessary that the parties seeking relief have standing. For a party to have standing, it must be aggrieved by the government action. Moreover, the interest it seeks to protect must be within the zone of interests which are protected by the statute or constitutional guarantee in question. *William Penn Parking Garage v. City of Pittsburgh*, 464 Pa. 168, 346 A.2d 269 (1975). The standing of the municipalities in this case is questionable as to many, if not all, of the claims raised because municipalities are themselves created by the grace of the Legislature and are not "persons" with the same constitutionally protected rights as citizens. Article I, Section 1, for instance, sets forth basic protections for individuals. It would seem that municipalities are not proper parties to raise claims under Article I, Section 1 and that they could not properly raise these claims on behalf of their inhabitants under Article I, Section 1.

Similarly, Article I, Section 27, recognizes the right of the Commonwealth to "conserve and maintain" the natural resources of Pennsylvania for the benefit of the people. It is the Legislature which has the power and the discretion to exercise these powers. Municipalities have the authority to exercise such powers to the extent they are granted to them by the state. However, it is simply illogical for a municipality to complain that the Commonwealth, in exercising its powers to oversee oil and gas resources under Article I, Section 27, has somehow improperly limited the power of municipalities to oversee Pennsylvania's oil and gas resources. Municipalities lack standing to bring a claim pursuant to Article I, Section 27 for at least two reasons: they are not "persons" for whom the provision is intended to benefit and the determinations of the Legislature as to how best protect the Commonwealth's resources are generally not subject to challenge in the Courts. Rather than providing Petitioners with an avenue to challenge the Legislature's determination regarding how to properly manage Pennsylvania's environment and the development of its precious resources, Article I, Section 27 is better viewed as expressly guaranteeing the Legislature's power to do so.

The issues of justiciability and standing must be considered by the court at any time in the proceedings as they are necessary prerequisites for the Court to have jurisdiction over petitioners' claims. However, for purposes of this answer, these issues will be more generally discussed within the overall framework of

petitioners' entitlement to a preliminary injunction. We believe the deficiencies of petitioners' claims can more easily be seen using this approach.

B. Petitioners Cannot Establish Irreparable Harm

Municipalities are not persons and do not have the same rights as individuals. While Act 13 undoubtedly places much of the responsibility for regulating oil and gas development under the authority of the DEP and PUC instead of local municipal authorities, municipalities do not have any legal entitlement versus the state to make these types of determinations. There is simply no cognizable legal harm to a municipality in the Legislature changing the scope and authority of local authorities in zoning matters. The Commonwealth exercising its inherent right of preemption does not constitute a cognizable legal harm in this case.

Although couching their petition in terms of specific violations of the Pennsylvania Constitution, Petitioners repeatedly fall back on the claim that Act 13 "constrains municipalities' authority over 'where' gas drilling operations may be located within the municipal borders. (Motion for Preliminary Injunction at ¶ 5) In *Huntley & Huntley v. Borough Council of the Borough of Oakmont*, 600 Pa. 207, 964 A.2d 855 (2009), the Supreme Court held that the Legislature in enacting the Oil and Gas Act,[1] Act 13's predecessor, did not intend to negate the power of

[1] 58 P.S. §§ 601.101 – 601.606.

municipalities to use their zoning powers to regulate oil and gas development within their territory. However, the Supreme Court did not hold that the Legislature lacked the authority to preempt local zoning laws and in fact recognized the Legislature's right to do so. In passing Act 13, the Legislature made clear its intent to preempt local zoning powers. Furthermore, Petitioners simply do not have any basis to argue that Act 13 is invalid because it conflicts with or preempts the Municipalities Planning Code[2] ("MPC") or any other statute. Likewise, municipalities cannot claim that they are harmed because the Legislature chooses to use its powers to preempt local ordinances with statewide standards and regulations for the oil and gas industry.

Municipalities do allege that they are required to amend their zoning ordinances within 120 days of the effective date (April 14, 2012). We would initially point out that municipalities have in fact been given 180 days, and not just 120 days, to accomplish this since Act 13 was actually approved by the Governor on February 14, 2012. It also does not seem that amending a zoning ordinance as required by Act 13 would require the complete overhaul of a municipalities' comprehensive plan and zoning codes. The Legislature, in passing Act 13, certainly did not envision a process which would take more than 6 months to comply with. To the extent that the MPC would require more extensive review, it

[2] 53 P.S. §§ 10101 -11107.

is in direct conflict with the requirement of Act 13 and municipalities would not be bound by the ordinary review process.

More importantly, even if municipalities – acting in good faith – are unable to successfully amend their ordinances by August 12, 2012 (180 days after February 14th), it is difficult to see how they are irreparably harmed. First, while municipal petitioners could lose access to impact fee funds under Act 13, these funds will only exist if Act 13 is allowed to go into effect. If Act 13 is enjoined, there will be no impact fees for municipalities whether their zoning ordinances are amended to comply with the Act or not.

Second, despite the allegations in the motion for a preliminary injunction, Act 13 guarantees that municipalities will have 120 days in which to amend their ordinances after the effective date of the statute. Even if it true that some industry officials have declared that they will ignore this grace period and seek immediate relief against municipalities, the statute expressly provides a 120 day grace period. A statute should not be enjoined to prevent something which it simply does not provide for.

Third, Section 3307 provides for attorney fees and costs as follows:

> (1) If the court determines that the local government enacted or enforced a local ordinance with willful or reckless disregard of the MPC, this chapter or Chapter 32 (relating to development), it may order the local government to pay the plaintiff reasonable attorney fees and other reasonable attorney fees and other reasonable costs incurred by the plaintiff in connection with the action.

58 Pa. C.S. Sec. 3307. If a municipality has been unable to amend its local zoning ordinance to comply with Act 13 because of concerns with following due process, court challenges to the amendments, and similar delays which are outside the control of local officials, it would seem highly unlikely that they could be found to have acted willfully or recklessly so as to incur attorney fees. Moreover, given the preemptive effect of Act 13, local officials would have a proper legal basis to not enforce any zoning ordinance which conflicted with Act 13. Therefore, even if municipalities could not amend their zoning ordinance within the 120 grace period, they are not prevented from complying with Act 13 despite what their current zoning ordinance might provide.[3]

Fourth, municipalities are not without a remedy if they are unfairly sued under Act 13. Section 3307(2) provides that "If the court determines that the action brought by the plaintiff was frivolous or was brought without substantial justification . . . it may order the plaintiff to pay the local government reasonable attorney fees and other reasonable costs incurred by the local government in defending the action." Petitioners' claims that they need an injunction because

[3] If a statute is declared unconstitutional, state and local officials are not required to follow the statute (and are in fact obligated not to) even though it still appears on the books. Similarly, while the zoning ordinances of municipalities may not have changed due to Act 13's passage, local officials have an obligation to not enforce those provisions which have been preempted by state law.

they have no remedy against unfair or unsubstantiated claims against them are simply unfounded as Act 13 itself provides a remedy.

C. The Public Interest In Establishing A State-Wide System For The Development Of The Commonwealth's Oil And Natural Gas Resources While Also Establishing Uniform Regulations Of This Industry To Protect The Environment And The Rights Of Landowners Outweighs Petitioners' Interests In Retaining Local Control Over These Types Of Policy Decisions.

The Commonwealth is the home for an abundant supply of fuel which is a critical component of Pennsylvania's economic future. At the same time, the exploration, development and production of these resources poses potential risks to the environment and may infringe on the rights of other landowners. Given these problems, the Legislature has determined that it is important to have a uniform regulatory scheme to protect both the environment and foster economic growth instead of allowing individual municipalities to engage in piecemeal regulation which in some cases may not adequately protect the Commonwealth's natural resources and at other times may prevent the reasonable development of these resources.[4]

[4] Some communities may wish to exclude any oil and gas development within their borders. Conversely, other communities may be too eager to allow such development for their own economic benefit while failing to adequately protect the interests of neighboring communities and the overriding interest of the Commonwealth and its citizens in protecting its natural resources for present and future generations. Through the enactment of Act 13, the Legislature is preventing

In enacting Chapter 32 of Act 13, the Legislature intended to:

> (1) Permit optimal development of oil and gas resources of this Commonwealth consistent with protection of the health, safety, environment and property of Pennsylvania citizens.
>
> (2) Protect the safety of personnel and facilities employed in coal mining or exploration, development, storage and production of natural gas or oil.
>
> (3) Protect the safety and property rights of persons residing in areas where mining, exploration, development, storage or production occurs.
>
> (4) Protect the natural resources, environmental rights and values secured by the Constitution of Pennsylvania.

58 Pa. C.S. § 3202. These objectives further the public policy of this Commonwealth. Act 13 requires DEP to issue permits, provide governmental oversight, promulgate appropriate regulations under the Act, and enforce compliance. Individual municipalities would be unable to establish the type of uniformity which the Legislature has deemed necessary. Similarly, individual municipalities would lack the same level of expertise and resources as DEP to adequately oversee the oil and gas industry.

Moreover, Act 13 does not limit the Commonwealth or a private individual from exercising rights which existed prior to its passage.

> It is hereby declared to be the purpose of [Chapter 32] to provide additional and cumulative remedies to control activities related to

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individual municipalities from adopting policies which are contrary to the underlying economic and environmental policies of the Commonwealth.

> drilling for, or production of, oil and gas in this Commonwealth, and nothing contained in this chapter abridges or alters rights of action or remedies existing, or which existed previously, in equity or under common or statutory law, criminal or civil. Neither this chapter, the grant of a permit under this chapter nor an act done by virtue of this chapter stops the Commonwealth, in exercising rights under common or decisional law or in equity, from suppressing a nuisance, abating pollution or enforcing common law or statutory rights. No court of this Commonwealth with jurisdiction to abate public or private nuisances shall be deprived of jurisdiction in an action to abate a private or public nuisance instituted by any person on grounds that the nuisance constitutes air or water pollution.

58 Pa. C.S. § 3257 (existing rights and remedies preserved and cumulative remedies authorized).

Delaying the additional protections offered to the citizens of Pennsylvania by enjoining Act 13 from going into effect would be contrary to the public interest. Enjoining Act 13 would disrupt the efforts of DEP and the PUC who have begun the process of implementing the Act's requirements. Furthermore, despite the claims of Petitioners to the contrary, Act 13 does not dismantle the environmental protections enjoyed by Pennsylvania's citizens, but in fact enhances the protection of previously existing laws.

In addition, Act 13 was enacted, at least in part, to create a uniform and stable economic climate for oil and gas developers considering doing business in Pennsylvania. Enjoining Act 13 would create uncertainty and discourage investment in an important and growing industry. As a result, fewer jobs will be created and less tax revenue generated.

Finally, enjoining Act 13 will prevent counties and municipalities from collecting the impact fees provided for under the law. These fees are necessary to help offset the external costs to local communities which are inevitably created by the expansion and growth of the oil and natural gas industry. As it is unlikely that these fees could be fully recouped if Act 13 is enjoined, it is contrary to the public interest to do so.

D. Petitioners Cannot Establish That They Are Likely To Prevail On The Merits

Petitioners raise thirteen issues in their petition for review. Even accepting their factual allegations as true, they cannot establish that there is a likelihood that they will prevail on the merits on any of their claims. In fact, as explained below, it is highly unlikely that Petitioners will prevail on any of their claims as they cannot demonstrate that Act 13 is unconstitutional under any of the various legal theories offered to the Court. Rather, Act 13 is a proper exercise of the power of the Legislature and fully withstands Petitioners' constitutional scrutiny. While Petitioners apparently disagree with the policy determinations made by the Legislature, they cannot overcome the presumption that laws duly enacted by the Legislature are valid or that the Legislature had a rational basis in enacting a detailed and comprehensive piece of legislation. Accordingly, they are not entitled to a preliminary injunction. We address each claim separately below.

1. **Act 13 does not violate principles of due process under Article I, Section 1 and the Fourteenth Amendment as it has a rational basis and constitutes a proper exercise of the Commonwealth's police powers.**

Initially, we would note that municipalities do not have an inherent right to the powers conferred upon them by the state. The Legislature has established municipalities and their power is ultimately derived from it. While the MPC and other legislation may give certain powers to municipalities, the Legislature reserves the power to modify or rescind these powers as it sees fit. As discussed, *supra,* it seems doubtful that the municipalities are proper parties to assert claims under Article I, Section 1 of the Pa. Constitution.

However, even if petitioners have standing to bring these claims, they cannot establish that Act 13 violates due process. There is a strong presumption that acts of the General Assembly are constitutional. Accordingly, petitioners have a heavy burden in attempting to have Act 13 declared unconstitutional. *Pennsylvania Against Gambling Expansion Fund, Inc. v. Commonwealth [PAGE],* 583 Pa. 275, 292, 877 A.2d 383, 393 (2005). Furthermore, to withstand a due process challenge, a law which does not implicate any fundamental rights (such as Act 13) must only be rationally related to a valid state objective. *See Parker v. Com., Dept. of Labor and Industry*, 540 A.2d 313 (Pa. Cmwlth.), *aff'd,* 521 Pa. 531m 557 A.2d 1061 (1988). In the present case, the provisions contained in Act 13 are rationally related to the Commonwealth's objectives of protecting the environment,

protecting the rights of landowners, and encouraging the economic development of the oil and gas industry. As such, Act 13 is a proper exercise of the Commonwealth's police powers and does in fact further the health, safety and welfare of Pennsylvania's citizens. While Petitioners may question the wisdom of the Legislature's choices, Act 13 meets the minimum requirements of due process.

2. The Legislature has the inherent authority to enact laws like Act 13 which preempt local zoning ordinances and by doing so does not violate Article I, Section 1 of the Pa. Constitution.

As discussed immediately above, municipalities are creatures of the state and their powers are ultimately derived through the grace of the Legislature. *Pennsylvania Gaming Control Bd. V. City Council of Phila.*, 593 Pa. 241, 266, 928 A.2d 1255, 1270 (2007). While the MPC places limits on the power of municipalities in enacting zoning laws, the Legislature may repeal, limit, or preempt such provisions so long as it does not violate the Federal or Commonwealth Constitutions in the process. *See Olon v. Com., Dept. of Corrections*, 534 Pa. 90, 94, 626 A.2d 533, 535 (1993). The fact that Act 13 may conflict with the MPC does not render Act 13 unconstitutional. While in local communities the MPC may at times seem to have "constitutional" dimensions, it is not a part of the Constitution and the Legislature is not bound to follow it in enacting legislation.

Petitioners rely heavily on *Village of Euclid v. Ambler Realty Co.*, 272 U.S. 365 (1926) and later cases to support their position that municipalities may exercise certain rights when it comes to zoning. However, Petitioners turn *Village of Euclid* on its head when they claim they have a right to such powers which cannot be overridden by the state. *Village of Euclid* and its progeny helped determine that the government could use zoning to regulate land use without violating the due process rights of individuals. While the necessity of having some type of zoning is widely accepted and no longer controversial, neither the United States Supreme Court nor the Pennsylvania Supreme Court have ever held that zoning is a birthright of municipalities or that the state government cannot determine the scope and authority of zoning by them. Neither the Pennsylvania Constitution nor the MPC establishes vested rights which prevent the Legislature from limiting the power of municipalities to regulate the oil and gas industry.

3. Act 13 is not a "special law" which violates Article III, Section 32 of the Pa. Constitution because it is uniform in its regulation of the oil and gas industry and does not benefit, or apply solely to, a single group or entity.

Article III, Section 32 of the Pennsylvania Constitution prohibits the Legislature from enacting "special laws." However, Act 13 is not a special law and thus, this particular constitutional provision does not apply. Special laws are only those laws which grant special privileges to an individual person, company or municipality. *See Wings Field Preservation Associates v. Dept. of Transp.*, 776

A.2d 311 (Pa. Cmwlth. 2001). The Legislature has made a valid classification in providing for the regulation of the oil and gas industry. Moreover, its provisions are uniform and establish strict environmental requirements for participants in the oil and gas industry. Act 13 also establishes protections for landowners who may live or own land in proximity to oil and gas operations. In sum, Act 13 furthers the economic and environmental interests of the Commonwealth rather than benefitting a single group or entity. For these reasons, among others, Act 13 does not qualify as a "special law" which is prohibited under Article III, Section 32 of the Constitution.

4. Section 3241, which entitles certain corporations to acquire an interest in real property under Act 13, is a proper exercise of the Commonwealth's power of eminent domain for public purposes and does not violate Article I, Sections 1 and 10 of the Pa. Constitution.

Petitioners fail to state a claim that Act 13 is an improper exercise of the Commonwealth's power of eminent domain. First, there is no allegation that any of petitioners' property has been, or is threatened to be, taken without just compensation. Without such action, Petitioners' claim is speculative and not ripe for adjudication.

Second, while Petitioners maintain that Section 3241 provides for the taking of property for a non-public purpose, this is blatantly untrue. The only corporate entities within the Commonwealth which have the authority to transport, sell, or

store natural gas or manufactured natural gas are public utilities. As these are the only corporations which are authorized to use the power of eminent domain under Section 3241, the suggestion that this provision does not serve a public purpose or is intended to allow oil and gas production companies to appropriate land for the benefit of private interests is not just misleading, but an incorrect interpretation of Act 13's provisions.

5. Act 13 is a proper exercise of the Legislature's power to regulate and control natural resources and therefore does not violate Article I, Section 27 of the Pa. Constitution.

"It is fundamental that municipal corporations are creatures of the State and that the authority of the Legislature over their powers is supreme." *Knauer v. Commonwealth*, 332 A.2d 589, 590 (1975). A municipality "possesses only such powers of government as are expressly granted to it and as are necessary to carry the same into effect." *Appeal of Gagliardi*, 163 A.2d 418, 419 (Pa. 1960). Where the existence of municipal power is questioned, courts apply a presumption against the existence of the municipal power. *Knauer*, 332 A.2d at 590 (1975)(citing *Kline v. Harrisburg*, 68 A.2d 182, 184-185 (Pa. 1949)).

Petitioners improperly assert that Art. I, Section 27 grants municipalities the power to protect public natural resources as against the Legislature. Art. I, Section 27 imposes a duty on the Commonwealth to conserve and maintain Pennsylvania's public natural resources. Pa. Const. art. I, § 27. Art. I, Section 27 states:

> The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the **Commonwealth** shall conserve and maintain them for the benefit of all the people.

Pa. Const. Art. I, § 27 (emphasis added). Article I, Section 27, on its face, names the Commonwealth as trustee of Pennsylvania's public natural resources. "Constitutional provisions are not to be read in a strained or technical manner. Rather, they must be given the ordinary, natural interpretation the ratifying voter would give them." *Com. ex rel. Paulinski v. Isaac*, 397 A.2d 760, 765 (Pa. 1979). Here, Article I, Section 27 plainly places that obligation on the Commonwealth.

Petitioners have cited no basis for their premise that Article I, Section 27 grants municipalities power as against the Legislature. Because Article I, Section 27 grants only the Commonwealth the power to conserve and maintain Pennsylvania's public natural resources, and because municipalities' power is limited to that granted by the Legislature, no power of municipalities as against the Legislature may be inferred. Therefore, Petitioners claim must fail.

6. The authority given by Act 13 to the PUC to issue non-binding, advisory opinions regarding zoning ordinances does not confer legislative authority nor judicial authority on the executive branch in violation of the principle of separation of powers.

Act 13 confers on the PUC the authority to issue non-binding advisory opinions regarding the compliance of a local zoning ordinance with the

requirements of Act 13. Executive agencies are often called upon to provide advice or give an opinion regarding the validity of statutes and other legislative pronouncements. For example, the Office of Attorney General provides advisory opinions to the Governor and other executive agencies under the Commonwealth Attorneys Act without intruding into the authority of the legislature or the judiciary. Commonwealth Attorneys Act, 71 P.S. §732-204. According to the position adopted by the Petitioners, however, opinions of this kind by the Attorney General would themselves be unconstitutional.

The judiciary itself is prohibited from rendering advisory opinions. Apparently, under Petitioners' view, the rendering of advisory opinions by any branch of government is unconstitutional. Of course, this is not true. The key is that the PUC is only rendering an opinion and not making a binding, judicial determination which can only be made by the judicial branch. Petitioners' contention that legislative bodies cannot use or otherwise rely on the expertise of executive agencies in enacting legislation is absurd. So long as the executive branch does not tie the hands of a municipality in enacting local zoning ordinances, it does not infringe on the independence of the legislative process.

Act 13 establishes a resource to assist municipalities in complying with its requirements. However, municipalities are not required to ask the PUC for its advice and the judiciary remains the final arbiter of whether a particular ordinance

is lawful. Moreover, an order by the PUC resulting from a request by an owner or operator of an oil or gas operation, or a person aggrieved by the enactment or enforcement of an ordinance, allows an aggrieved party the right to a *de novo* appeal to Commonwealth Court. *See* 58 Pa. C.S. § 3305(b). Regardless of who brings a matter before the PUC, all interested parties retain the right to have any matter decided by the courts. Accordingly, the PUC is not usurping the authority of the courts.

7. Act 13 establishes basic policy choices and enacts sufficient standards for the DEP to promulgate regulations without violating the Non-Delegation Doctrine of Article II, Section 1 of the Pa. Constitution.

Initially, Petitioners' claim that Act 13 unconstitutionally delegates legislative authority to DEP appears premature and speculative as they do not point to any specific waivers which have been granted or any regulations which have been enacted which would violate the requirements of Article II, Section 1 of the Pennsylvania Constitution. Nonetheless, their challenge under Article II, Section 1 cannot be maintained in any case as Act 13 provides sufficient guidance to DEP to allow them to implement necessary regulations and otherwise follow the Act's requirements as established by the Legislature.

The Non-Delegation Doctrine is a natural corollary of Article II, Section 1. "[I]t requires that the basic policy choices involved in 'legislative power' actually be made by the Legislature as constitutionally mandated." *Chartiers Valley Joint*

Schools v. County Bd. of Sch. Dirs., 418 Pa. 520, 529, 211 A.2d 487, 492 (1965). Nonetheless, while prohibited from delegating the power to make laws, the Legislature can delegate policy-making authority to the executive branch so long as it makes the basic policy choices and enacts adequate standards to guide and restrain the exercise of the delegated administrative functions. *Id.*, 418 Pa. at 529, 211 A.2d at 492. Furthermore, as the Supreme Court recently recognized in *Casino Free Philadelphia v. Pennsylvania Gaming Control Board,* 594 Pa. 202, 207, 934 A.2d 1249, 1253 (2007), "there is nothing in the [Non-Delegation Doctrine] that would require an exhaustive definition of [each purpose and objective of a law]. The Legislature is not constitutionally required to micromanage the administrative agencies it creates."

Act 13 includes specific guidance as to the purpose of its provisions. In Section 3202 it states that the Legislature intended, *inter alia,* to "permit optimal development of oil and gas resources of this Commonwealth consistent with protection of the health safety, environment and property of Pennsylvania citizens." 58 Pa. C.S. § 3202. These and other clearly stated objectives provide the necessary signposts for DEP to make appropriate regulations without usurping the Legislature's function. If this were not sufficient in itself, Act 13 provides a substantial amount of guidance through its lengthy and rather detailed provisions governing the oil and gas industry. Further guidance can be found through the

Clean Water Act and other existing environmental laws which the Legislature made clear are to work concurrently with Act 13 so as to further the environmental goals of the Commonwealth. *See* Section 3257 of Act 13. Accordingly, Act 13 does not violate the Non-Delegation doctrine of Article II, Section 1 of the Constitution.

8. The setback, timing and permitting requirements set forth in Act 13 are clearly defined and provide sufficient notice to municipalities so as to not be unconstitutionally vague.

A statute is rendered vague not because it is sometimes difficult to ascertain how it applies, but because its application is indeterminable. *See United States v. Williams,* 553 U.S. 285, 306 (2008). A vague statute lacks definite standards and is susceptible to arbitrary interpretation by government officials. While petitioners may not agree with the determinations of the Legislature, Act 13 is neither vague nor arbitrary. It provides definitive rules and standards which can be applied with mathematical and scientific precision.

Act 13 is a highly detailed piece of legislation which contains carefully defined terms. The setback and other requirements established under Act 13 use standard measurements which can be understood as having the same meaning in every county and municipality across Pennsylvania. While it seems clear that specific provisions in Act 13 would override provisions of the MPC with which they conflict, the fact that questions regarding statutory construction and

preemption of local ordinances may occasionally arise does not render Act 13 vague or otherwise unconstitutional.

Act 13 is not vague because it "give[s] the person of ordinary intelligence a reasonable opportunity to know what is prohibited, so that he may act accordingly." *See Village of Hoffman Estates v. Flipside, Hoffman Estates, Inc.*, 455 U.S. 489, 498. The Legislature in drafting the statute has used words which have commonly accepted definitions, are widely used, and/or are specifically defined by the Act itself. Determining what municipalities have the authority to do or whether Act 13 has been violated does not depend on subjective judgments. Such determinations can be made through a careful reading of the statute and the established rules governing statutory construction. Moreover, the terminology used is not vague and does not allow for arbitrary enforcement.

9. Act 13's provisions restricting the disclosure of medical diagnostic information by health care professionals is applicable to all health care professionals and does not constitute a "special law" which violates Article III, Section 32 of the Pa. Constitution.

As explained previously, Article III, Section 32 prohibits the Legislature from enacting "special laws." However, Act 13 is not a special law and thus, this particular constitutional provision does not apply. Special laws are only those laws which grant special privileges to an individual person, company or municipality. *See Wings Field Preservation Associates v. Dept. of Transp.*, 776 A.2d 311 (Pa. Cmwlth. 2001). The Legislature has made a valid classification in providing for

the regulation of the oil and gas industry. Regardless of Petitioners' claims to the contrary, there is a rational basis for putting some limitations on the dissemination of trade secrets in the oil and gas industry. Furthermore, while Petitioners believe that these restrictions are unnecessary or impede public health, they are uniform across the entire industry and simply do not constitute a "special law" so as to violate Article III, Section 32 of the Pa. Constitution.

10. Act 13 does not violate the single subject rule of Article III, Section 3 of the Pa. Constitution by including provisions which restrict the disclosure of medical diagnostic information by health care professionals.

Article III, Section 3 of the Pennsylvania Constitution provides that "[n]o bill shall be passed containing more than one subject, which shall be clearly expressed in its title, except a general appropriation bill or a bill codifying or compiling the law or a part thereof." Pa. Const. art. III, Sec.3. A strong presumption exists that legislative enactments do not violate our Constitution, and a heavy burden of persuasion is placed on the challenger of a bill's constitutionality. *PAGE*, 877 A.2d at 393. Therefore, courts should exercise deference to the Legislature in construing reasonably broad topics covered by a bill. *City of Philadelphia v. Com.*, 575 Pa. 542, 577-78, 838 A.2d 566, 588 (2003).

Petitioners incorrectly characterize Section 3222.1(b)(11) as a restriction on health professionals and as falling outside the subject of the regulation of the oil and gas industry. However, Section 3222.1(b)(11) is not a restriction on health

professionals, but a restriction on the oil and gas industry. This section provides that the oil and gas industry must report trade secrets and confidential proprietary information to health professionals in emergencies. While health professionals must use such information for the purpose of medical treatment and are not permitted to disseminate the information for other purposes under the Act, it properly falls within the subject matter of Act 13 and Title 58 of Pennsylvania Statutes.

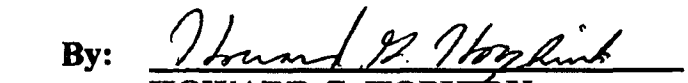
Oil and gas well reporting requirements are germane to the regulation of the oil and gas industry. Petitioners assertion that oil and gas well reporting requirements such as § 3222.1(b)(11) should be placed in Title 35 which regulates health professionals is incorrect. No reasonable person would expect to find oil and gas well reporting requirements in statutory provisions governing medical professionals. A reasonable person would look for these requirements within Title 58. For these reasons, Petitioners cannot prevail on their claim that Act 13 violates the single subject requirement under Article III, Section 1 of the Pennsylvania Constitution.

III. CONCLUSION

WHEREFORE, Petitioners' motion for a preliminary injunction should be denied.

Respectfully submitted,

LINDA L. KELLY
Attorney General

By: 

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CERTIFICATE OF SERVICE

I, **Howard G. Hopkirk**, Senior Deputy Attorney General, hereby certify that on April 10, 2012, I caused to be served the foregoing **Commonwealth Respondents' Answer To Petitioners' Motion For A Preliminary Injunction,** by depositing a copy of same in the United States Mail, first class, postage prepaid, in Harrisburg, Pennsylvania upon the following:

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Attachment C

ENVIRONMENTAL Science & Technology

POLICY ANALYSIS

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Economic Incentives and Regulatory Framework for Shale Gas Well Site Reclamation in Pennsylvania

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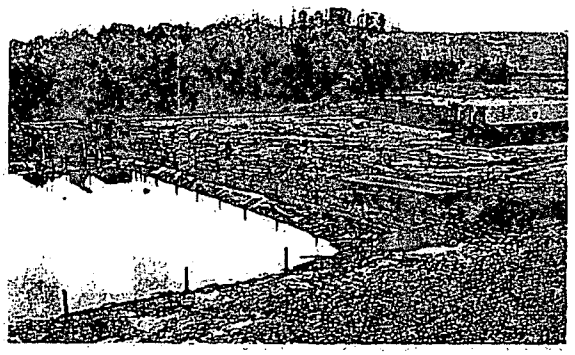
ABSTRACT: Improperly abandoned gas wells threaten human health and safety as well as pollute the air and water. In the next 20 years, tens of thousands of new gas wells will be drilled into the Marcellus, Utica, and Upper Devonian shale formations of Pennsylvania. Pennsylvania currently requires production companies to post a bond to ensure environmental reclamation of abandoned well sites, but the size of the bond covers only a small fraction of the site reclamation costs. The economics of shale gas development favor transfer of assets from large entities to smaller ones. With the assets go the liabilities, and without a mechanism to prevent the new owners from assuming reclamation liabilities beyond their means, the economics favor default on well-plugging and site restoration obligations. Policy options and alternatives to bonding are discussed and evaluated.



The emergence of technologies for economic recovery of natural gas from tight shale formations across the U.S. is responsible for a resurgence in domestic natural gas production. Even though the national average wellhead price has dropped by more than two-thirds in three years, shale gas production continues to increase. The Marcellus shale formation underlies numerous Appalachian states and is considered to be the largest gas-bearing shale formation in the U.S. Rapid development of this resource, evidenced by thousands of new wells in the region since the first well in 2004, is charting a new course for natural gas supply and utilization in the Northeast. In Pennsylvania, where there are more drilled wells than any other Appalachian state, this development already dwarfs past oil and gas booms in areal extent and production

■ ECONOMIC, ENVIRONMENTAL, AND HUMAN HEALTH RISKS OF IMPROPERLY ABANDONED SHALE GAS WELLS

Disturbance of the surface environment and subsurface geological strata is a necessary outcome of shale gas development in Appalachia. Surface disturbance is caused by the construction of well pads, impoundments, access roads, and pipelines. Reclamation of the disturbed surface occurs in two stages. Shortly after a well begins production the size of the well pad is reduced and the impoundment is removed. Full reclamation does not occur until after a well is abandoned (permanently taken out of production) because site access is necessary for routine maintenance and removing produced water (brine that comes up with gas).

If a well site is not properly reclaimed after abandonment, the well pad and access roads may cause permanent changes to the natural environment. The deterioration of erosion control features increases siltation, which results in the loss of nutrient-rich topsoil and increased sedimentation of nearby surface waters, impairing natural habitats of aquatic species.[1−3] Compared to natural forest clearing occurrences (e.g., fire), the recruitment, growth, and mortality rate of native plant species at reclaimed oil and gas well sites in boreal forests was found to be significantly worse.[4] Without restoration of topsoil and proper revegetation, the regeneration of natural habitat will be delayed and the environmental impacts of forest fragmentation, including loss of biodiversity and introduction of invasive species, will be exacerbated. The adverse effects of forest fragmentation on the nesting success of migratory birds have been documented,[5] and the impacts extend to other plant and animal species dependent on shade, humidity, and tree canopy protection characteristic of deep forest environments in the region.[6,7] The construction of well pads, water impoundments, and access roads is projected to disturb 129 000−310 000 acres of forested land in Pennsylvania.[6] In northern Pennsylvania forests, where largest blocks of public forests exist, the potential for lasting forest fragmentation and associated environmental impacts could negatively affect economic interests related to timber management, game, and tourism.[7]

To reach the Devonian Shale formations, wellbores transect a mile or more of geologic strata, including fresh and saline aquifers and shallow gas-bearing formations. Shale gas wells will need to be plugged to prevent environmental damage

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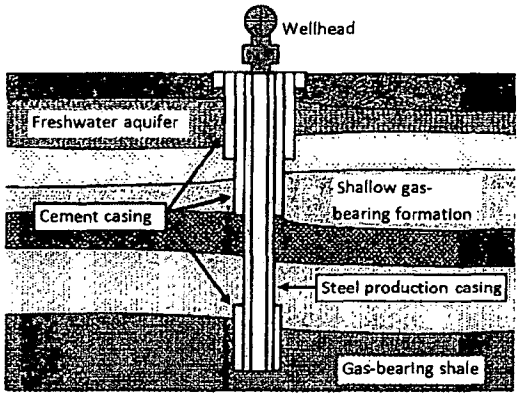

Figure 1. Simple representation of shale gas well anatomy. Layers of cement and steel casing are used to isolate production zones from freshwater aquifers. To properly close a shale gas well, the wellhead and steel production casing are removed and cement plugs are installed to prevent fluid movement in the wellbore and annulus. This diagram is not drawn to scale.

caused by the disturbance of the subsurface, namely the movement of oil, gas, and brine to the surface and between geologic formations connected by the wellbore. General plugging procedures in most states, including Pennsylvania, begin with the removal of steel production casing, which extends from the surface to producing formations, for scrap value. Next, a series of cement plugs will be installed in the wellbore to isolate freshwater and saline aquifers and gas producing formations.[8] (Figure 1)

Unplugged wells may provide a direct pathway to the environment for fluids in the wellbore,[9] which results in ecological harm, property damage, and surface and groundwater contamination. Additional pathways in the annulus (an industry term for the space between two concentric objects, such as between the wellbore and casing or between casing and tubing) may develop that would allow oil, gas, and brine to move vertically across geologic formations and contaminate groundwater. Substances dissolved in the brine may include those that occur naturally in the shale formations (some radioactive) and others injected during the hydraulic fracturing process (some toxic). Also upwardly migrating gas, known as stray gas, represents an explosion hazard if not properly vented away from buildings and drinking water wells.[10−12]

The risk that annular pathways will develop increases over time as chemical, mechanical, and thermal stresses causes deterioration of well structures and components. Failure modes of improperly abandoned wells (defined here as nonproducing wells not in compliance with Pennsylvania plugging requirements or inactive status rules) include the formation of cracks in the cement casing or packers, corrosion of steel production casing, faulty valves, and leaking temporary plugs or surface caps.[9,13−17] Properly performed, the plugging process reinforces existing casing and seals and prevents fluid movement in the wellbore, which may retard the deterioration of vital well components and structures. Therefore, prompt plugging once a shale gas well becomes uneconomic may reduce the risk of negative environmental and human health impacts,[13,14] while also avoiding additional plugging costs that may be incurred if the mechanical integrity of a casing has been compromised.[18] However, the risk of failures leading to fluid migration pathways still exists after a well has been plugged and increases with time.[9,14−16]

The impacts and remediation costs resulting from gas migration and groundwater contamination due to failures at unplugged and improperly abandoned gas wells is well documented in Pennsylvania and elsewhere.[10,12,19−21] Property values can be negatively affected if gas wells contaminate groundwater used for drinking.[22−24] Moreover, the presence of an improperly abandoned gas well may prevent landowners from using their property for other purposes.[25] Stray gas, which is mostly methane, is also a potent source of greenhouse gas emissions.[26]

■ THE SAUDI ARABIA OF NATURAL GAS AND THE SWISS CHEESE OF APPALACHIA

Approximately 350 000 conventional oil and natural gas wells have been drilled in Pennsylvania since the 1859 discovery of oil in Titusville.[11] Many of these legacy wells that are no longer producing oil or gas were never plugged. Some leak gas, oil, and/or brine into freshwater aquifers and the surface environment.[27,28] To remedy this situation, Pennsylvania's Oil and Gas Act of 1984 required all wells from which economic benefits were accrued after 1979 to be plugged according to the latest standards and the well sites reclaimed by their owners. To promote compliance with this statute and cover the cost in the event of owner insolvency, a bonding requirement was established. In 1985, Pennsylvania started plugging oil and gas wells lacking a legally responsible owner, known as orphan wells, and supported these activities with fees on new oil and natural gas well permits ($200 and $50 per well for the Orphan Well Plugging Fund and Abandoned Well Plugging Fund, respectively), monies collected for regulatory violations, and grants distributed by Pennsylvania's taxpayer-funded Growing Greener program.[29] From 2007 to 2008, the most recent years for which data are available, a total of $1,066,000 in Growing Greener grants were awarded to reclaim orphan and abandoned wells.[30,31] Before the current shale gas boom, the Pennsylvania Department of Environmental Protection (PADEP) estimated that at 2004 funding rates it would take around 160 years to plug all the existing orphan wells in the Commonwealth.[11]

■ COSTS OF SITE RESTORATION AND SHALE GAS WELL CLOSURE

Pennsylvania's 1984 Oil and Gas Act defines a natural gas operator's drinking water, site restoration, and well closure responsibilities. Once a well is abandoned, the owner has 12 months to properly plug it and restore the well pad to its previous condition. Restoration of the production well pad (which typically covers 1−3 acres[32]) may involve regrading of land, removing access roads and impoundments, restoring top soil, planting native flora, or other necessary restoration required for compliance with Pennsylvania's Clean Streams Law of 1937. Operators must also remove all equipment used in the production of gas as part of the well abandonment process. This equipment includes the production casing (innermost steel casing that extends down to the production zone), Christmas tree (a grouping of pipes, valves, and fittings used to control the flow of gas from a well), dehydrator, compressor, and tank battery.

The cost to plug a deep shale gas well has not been formally estimated by the PADEP, however, it is understood that the cost to plug a well depends primarily on its measured depth (full length of wellbore including horizontal portions). Plugging costs

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increase when the condition of the wellbore is poor or access to the site is difficult. For orphan oil and gas wells in Southwestern Pennsylvania, the PADEP estimates the total cost to plug and restore the site of a well approximately 914 m (3000 feet) in depth averages $60,000, but per well reclamation costs have also exceeded $100,000.[18] Reclamation costs of wells drilled into the Devonian Shale (Marcellus, Utica, and Upper Devonian), which range from 1524 to 2744 m deep, will be greater because costs are strongly correlated with depth. Using reclamation data from 255 orphan wells in Wyoming, Andersen and Coupal (2009) estimated the relationship between reclamation costs and depth.[33] They estimated that total reclamation costs (well plugging, site restoration, and equipment removal) were approximately $34.45 per meter ($10.50 per foot). They also noted that economies of scale exist when more than one well is on each well pad, which is the norm for wells in the Marcellus Shale. Summarizing data from approximately 1000 individual well completion reports catalogued by the Pennsylvania Department of Conservation and Natural Resources,[34] the average measured depth of hydraulically fractured shale gas wells completed in Pennsylvania during 2010 was approximately 3254 m (10 675 feet). Thus, for a single well, at $34.45 per meter, the average reclamation cost for a well in the Marcellus Shale will be in the vicinity of $100,000. However, in some cases the costs for plugging and abandonment of a shale gas well in Pennsylvania have been substantially higher. For instance, in 2010, Cabot Oil & Gas Corporation estimated that it spent $2,190,000 to properly abandon three vertical Marcellus Shale gas wells in Susquehanna County, Pennsylvania, about $700,000 per well.[35]

■ PENNSYLVANIA BONDING REQUIREMENTS ON PRIVATE LANDS DO NOT INCENTIVIZE RECLAMATION

Issues of operator insolvency due to the boom and bust cycles of oil and gas development complicate efforts to hold liable parties responsible and provide for timely environmental reclamation. In theory, requiring that operators post bonds prior to drilling bolsters traditional liability rules by incentivizing compliance.[36] In Pennsylvania, bonded monies are released one year after the PADEP deems regulatory requirements associated with reclamation have been satisfied. If the level of bonding is set less than the associated reclamation costs, companies could be tempted to pursue strategies that avoid their liabilities.

Oil and gas bonding requirements vary across states and on federal lands, but most have established minimum bonding levels (blanket or for individual wells).[25] In general, the dollar amount of state and federal bonds for oil and gas wells often do not reflect expected reclamation costs. The full effect of this imbalance has not yet been felt because oil and gas wells may have long life spans (up to 50 years, which can be prolonged further on paper via regulatory allowances), and bonding requirements are relatively new.[36]

Pennsylvania's experience with bonding of coal mining sites may be indicative of what to expect. From 1985 to 1999, bonds for surface mining permits covering approximately 10% of total acreage were forfeited.[37] Since the cost to reclaim a mine in most cases was higher than the amount bonded, funding to bring abandoned mine lands into compliance has generally been inadequate.[37−39] In 1986, only 33% of acreage covered by forfeited bonds had been reclaimed, according to a U.S. General Accounting Office study. The discrepancy was attributed to inadequate funding from forfeited bonds and legal delays in bond forfeiture.[39] Following a lawsuit and increased Federal scrutiny thereafter, Pennsylvania modified its regulatory framework related to the reclamation of abandoned mine lands.[38] Pennsylvania now requires mine operators to perform site-specific estimation of reclamation liabilities to ensure posted bonds cover the full cost of reclamation.[40]

Today, shale gas operators in Pennsylvania must post either a bond of $2500 for each well or a blanket bond of $25,000 to cover all the wells they drill in the state. This is the same dollar amount required in 1984, despite statutory provisions that empower the Environmental Quality Board to adjust the level of bonding to match projected reclamation costs every two years. A bond of $2500 is inadequate to cover the costs to plug a deep shale gas well and restore the land (approximately 100−700 thousand dollars). The inadequacy of the blanket bond is even more pronounced, as many operators are expected to drill thousands of wells. For example, Chesapeake Energy, operating in a joint venture with Statoil, plans to drill up to 17 000 shale gas wells in Appalachia over the next 20 years.[41]

The Oil and Gas Act prohibits private landowners from securing financial assurances from the operator independent of Pennsylvania regulations. The situation is different on Pennsylvania's state-owned land. Pennsylvania includes a condition in all of its lease agreements for drilling in state forests that requires operators to submit additional individual well bonds. The dollar amount required scales with the measured depth, so operators in state forests are required to post bonds of $50,000−100,000 per well drilled.[42]

It is important to note that the substantial bonds required in drilling leases in state forests did not preclude a successful lease auction, proceeds of $128 million far exceeded original expectations of $60 million.[43] This suggests that bonds in the $100,000 range are not prohibitive for large exploration and production companies, though they may be an obstacle for smaller concerns.

■ TRANSFERRING ASSETS SHIFTS ENVIRONMENTAL LIABILITY

Over the next two decades, drilling rates of 1000 or more new shale gas wells per year are projected, as production from Pennsylvania's Marcellus Shale is expected to reach approximately 110 million cubic meters (4 billion cubic feet) of natural gas per day by 2015.[44,45] To sustain such high levels of production, the shale gas industry needs to constantly drill and complete new wells because gas production rapidly declines in the first few years of production.

Figure 2 shows a type curve published by a Marcellus Shale operator, EQT Production.[46] A type curve is a gas production curve modeled from initial and historic production data and reservoir characteristics. The precipitous decline in production rate of gas is typical of deep shale gas wells in Pennsylvania and elsewhere. (Refracking is a process that can be used to increase production in a declining well. Because there are no reliable data published on this practice in Appalachia it is excluded from this analysis.)

Industry economics are dominated by high initial gas production rates. For a typical well, assuming a constant price of $176.6 per thousand cubic meters of gas ($5/Mcf) and a $5.3 million cost to drill and complete a new well,[46] the internal rate of return (IRR) asymptotes near 79% after the seventh year, after which production revenue dwindles compared to that of the initial years. Assuming a 10% discount rate, 81% of the net present value (NPV) of gross revenue would be realized in 10 years. Compared to the potential revenue from gas sales, the present value of long-term shale gas liabilities, which are discounted

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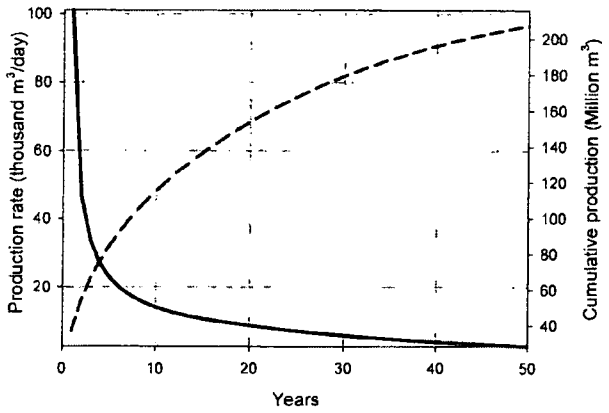

Figure 2. Expected gas production rate (solid line) and cumulative production curve (dashed) for EQT Production's Marcellus Shale operations.[46].

40−50 years, has negligible impact on near-term accounting. The problem of failing to internalize reclamation liabilities emerges when the liabilities begin to exceed the current asset value.

The steep decline in production may drive divestment of shale gas assets by primary exploration and production companies well before the expected closure of a shale gas well. The transfer of marginally producing assets to smaller independent operators or surface owners is common practice in the oil and gas industry.[47−49] Sometimes surface owners take ownership of a marginally producing well for household use. In such cases, the Oil and Gas Act permits oil and gas asset transfers as long as the prospective owner satisfies the applicable bonding requirements. In Pennsylvania, there exists no formal regulatory mechanism to prevent fully bonded owners from assuming shale gas assets with reclamation liabilities substantially above their own financial means. Large liabilities covered by limited resources could lead to large-scale insolvency, similar to the situation that spawned Pennsylvania's pervasive abandoned acid mine drainage and orphan well problems.[50]

In Pennsylvania and other U.S. states, individual and blanket bonds may be satisfied using a number of financial instruments and often do not even require monies to be transferred. Requiring only the demonstration of assets is common, especially for large operators. When an operator cannot demonstrate sufficient assets to cover liabilities, third party backing, usually in the form of a surety bond, may be obtained for a percentage of the bond's face value. Since surety companies or banks underwriting the bond are liable if an operator is unable to perform reclamation, bond rates are set according to an individual operator's risk of insolvency.[36]

Today's low bonding levels make it possible for hundreds of independent operators satisfy the Pennsylvania's blanket bonding requirements.[51] These operators are capable of producing marginal amounts of oil and gas economically, which allows them to maximize potential economic benefits by extending the productive lifetime of oil and gas wells.[52] The ability to transfer well ownership to independent operators benefits the industry, but a potential consequence of increasing bonding minima could be that smaller operators may face steep risk premiums or not qualify for third party backing and be excluded from participation.

Primary exploration and production companies rely on divestment of existing assets to fund new drilling operations. Blocking independent operators from the market may force these companies to temporarily abandon their uneconomic wells and apply for inactive status instead. In Pennsylvania, nonproducing wells may be granted inactive status for a period of five years, but to be granted an annual extension the operator only has to declare regulatory compliance and the capacity to produce gas in the future from the inactive well. Inactive status and similar provisions in other states grant operators the ability to temporarily abandon a gas well until technology advances or favorable gas prices improve the economics of production, though in practice the decision to reopen a well is expected to be dominated by reclamation and other liabilities.[13]

Inactive status could be used to defer the costs of reclamation indefinitely. According to PADEP records, almost 17 000 conventional oil and gas wells did not report or produce oil or gas for three consecutive years (2007−2009), and were listed as active at the end of 2009.While it may be the case that many of the operators of these wells simply failed to report production, poor compliance with reporting requirements prevents the PADEP from enforcing plugging requirements or administering the inactive status program. In 2009 alone, only 38% of the Commonwealth's conventional oil and gas wells reported production, which indicates a majority of the wells drilled in Pennsylvania may represent environmental liabilities as opposed to a source of revenue.[53] Incentives (fines) are needed to improve compliance with production reporting requirements, though reporting alone will not close this loophole.

The delay between production and reclamation temporally separates revenue generation from the future liabilities. Others have recognized this undesirable trend and instituted remedies. Growth in the number of nonproducing (idle) wells in Alberta and Saskatchewan led these two Canadian provinces to implement a Licensee Liability Rating Program as a measure of insolvency risk and to minimize state financial exposure to orphan wells. The program requires individual operators to provide financial assurance equivalent to the difference between the operators' assets (active wells and assets) and liabilities (inactive wells and abandoned assets).[54,55] Some U.S. states offer tax breaks to promote marginal well production, while others require additional bonds or levy annual fees for inactive wells to incentivize new production or plugging, and to fund compliance monitoring.[25,52]

■ REGULATORY POLICY AND FINANCIAL ASSURANCE OPTIONS

When bonding requirements are smaller than expected liabilities, there is a financial incentive to not comply with reclamation requirements. Individual well bonding requirements that match reclamation costs would remedy this situation, especially with the blanket bonds, where misalignments with reclamation costs can be huge. Eliminating the blanket bond would be a common sense first step for Pennsylvania. However, simply increasing the bond requirement to match reclamation costs may not be the best alternative because more operators will need to obtain third party backing. In theory, reliance on third party backing favors operators that manage assets and liabilities effectively since the underwriting firms would assess the risk of insolvency of individual operators. However, the same may not be true for third party backers. Insolvency of these financial firms is a real concern and the effects may be large.[36,56]

Furthermore, bonds are inherently inflexible to changes in the cost of performing reclamation, to the economics of gas extraction

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when wells start to lose pressure, and the way financial risk is shared in the industry. This is problematic if reclamation costs deviate dramatically from the average. For instance, following methane migration into the aquifer supplying drinking water to 14 households in Dimock, Pennsylvania, the estimated costs for individual water filtration units and supply replacement via permanent pipeline were approximately $8,000 and $800,000 per household, respectively.[57,58] Underwriting firms will only market surety bonds when the amount and term of liability are strictly defined,[36] so bonds are not well suited to cover uncertain liabilities. Bonds would also fail to provide funding for maintenance and monitoring of plugged and abandoned wells and the potential environmental issues that may arise postreclamation. After the release of a bond, recovery of additional environmental costs would require aggrieved citizens or the State to pursue civil action. The State may also block the issuance of new permits to operators with outstanding reclamation liabilities, but for operators without ongoing interests in Pennsylvania, this enforcement mechanism will be limited.

■ ALTERNATIVES TO BONDS

To pay for the long-term treatment of acid mine discharges, coal mine operators in Pennsylvania may establish trust accounts under contract with the State. Funding requirements are based on operator estimates of the present value of capital costs and operating expenses of pollution control projects, which depend on the inflation rate and the expected growth of the trust account. As irrevocable beneficiaries of the trust, the State will reimburse coal mine operators one year after the performance of work, or in the case of nonperformance, the State may use accumulated funds to do the work.[59]

If reclamation trust accounts were to be used for the shale gas industry, it would be the responsibility of the operator to determine current (time zero) reclamation costs as part of the drilling permit and the responsibility of the state to approve that figure. If fully funded trust accounts were tied to individual wells rather than pooling them, timely plugging would become independent of the solvency of the last operator.

For the mining industry, trusts are designed so that they will be fully funded one-year after production ends. The size the trust is estimated from eq 1, which shows the calculation for the present value of reclamation costs.

$$PV = \left[\frac{RC}{(1 + [E - I])^t}\right] \times (1 + Vol) \quad (1)$$

Where RC = estimated cost of reclamation in current dollars, E = expected annual return on investments in trust, I = inflation rate, Vol = volatility premium, proportional to amount invested in stock market, and t = time in years, duration of production

For the shale gas industry, the contract between the State and individual operator would specify the firm responsible for managing the trust account and investment strategy. An inflation rate of 3.1%, bond yield of 5.25%, and market return of 11.2% are recommended by the PADEP for eq 1. At most, 80% of the trust may be invested in stock. A 20% volatility premium is required for the portion of the trust invested in stock.[59] It is the responsibility of the PADEP to ensure an operator's inflation, bond yield, and market return assumptions reflect current conditions. This contract would also detail the irrevocable rights held by the State to claim monies held in the trust.

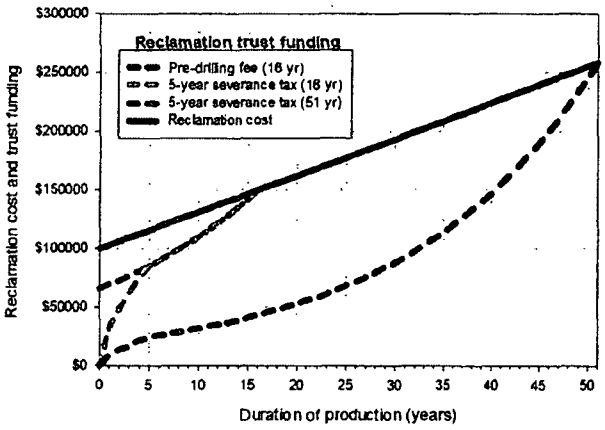

Figure 3. Comparison of financial assurance mechanisms for funding a reclamation liability costing $100,000 at time zero. Assumptions: gas is produced according to the EQT Production type curve (Figure 2); the inflation rate is 3.1%; and monies invested in the trust have an assumed annual return of 5.25%, following PADEP guidance for bond yields.[59] The "no risk" cash bond option is not shown as it is equal to the cost of reclamation. The funds collected by a predrilling fee and severance tax collected for five years are contrasted. Delayed collection options run the risk of collecting insufficient funds for reclamation of the well if the number of productive years is less than the number of years used to determine present value of reclamation costs. At any given year, the funding shortfall is measured as the difference between the projected reclamation cost line and the respective delayed option line.

We compare three potential mechanisms to fund well reclamation costs estimated using eq 1: cash bond, severance tax on gas production, and a discounted predrilling fee. The properly sized cash bond represents a "no risk" scenario for Pennsylvania because operators would be required to deposit the full cost of reclamation as a precondition for drilling permit approval. Compared to the other forms of bonding allowed by the PADEP, the State Treasurer would manage the bonded monies and the risks associated with operator or third-party default or insolvency would be eliminated. A severance tax on gas production would gradually collect and reinvest monies to reach the future value of reclamation. Pennsylvania's Governor, Tom Corbett, opposes levying taxes on the natural gas industry, but has supported a one-time, per well fee to pay for local impacts of the natural gas industry. To fund a reclamation trust via a discounted predrilling fee, we assume that the fee would need to be assessed in an amount equal to the present value of expected reclamation costs at the time of well closure. The severance tax and predrilling fee represent delayed funding mechanisms, so the annual growth and security of the trust as well as the productive lifetime of a shale gas well are important variables. The cost to perform reclamation is compared to funds accrued in a reclamation trust by a severance tax (calculated for two different anticipated well lifespans) and a predrilling fee in Figure 3. To fully fund a reclamation trust by year 16, a predrilling fee of $65,975 and a severance tax of $0.87/TCM ($0.25/Mcf) collected for five years would need to be assessed. A severance tax of $0.15/TCM ($0.004/Mcf) on the first five years of production would be assessed if full funding of the trust is not required until year 51. The cash bond option is not graphed because it is equivalent to the inflated reclamation cost each year. The options are fully

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funded when they intersect the reclamation cost line. If the well is abandoned before the reclamation trust is whole, the difference between the accumulated funds and the inflated reclamation costs will be the shortfall.

No empirical evidence exists to suggest the economic lifetime of a shale gas well will reach generic industry predictions of 40−50 years. Well productivity and the economics of shale gas production have equal weight in an operator's decision to keep a well open. The use of unrealistic expectations of well economics has implications for the application of delayed funding mechanisms and risks underfunding reclamation trust accounts. Figure 3 shows that even if a 15-year lifetime is assumed (reclamation costs discounted from year 16), the difference between the reclamation cost and the funding levels in the trust are substantial for wells abandoned sooner. For the purpose of estimating reclamation costs, it would be wise for Pennsylvania to require that reclamation costs by funded within 10 years, regardless of the actual life span of the well.

Actual production will deviate from industry type curves. Figure 4 shows the cumulative production from horizontal shale gas wells in Pennsylvania that began producing gas from January 2010 through July 2011 compared to the EQT Production type curve (Figure 2).

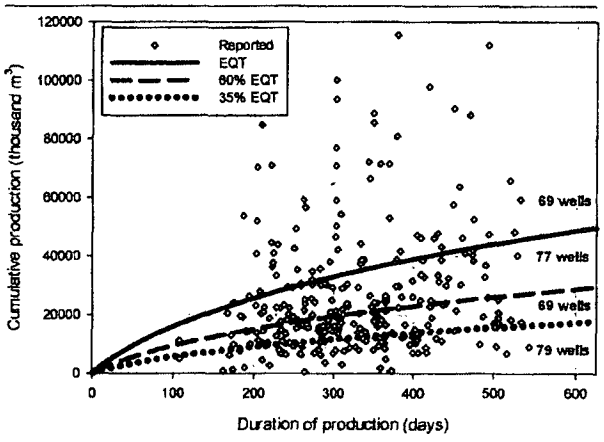

Figure 4. Reported cumulative production of 294 individual horizontal Marcellus Shale gas wells that began producing after 1/1/2010.[51] Three continuous cumulative production curves are modeled: EQT Production's type curve (Figure 2), a 60% EQT, and 35% EQT. Cumulative production predicted by the 60% EQT and 35% EQT curves is exceeded by 50% and 75% of horizontal Marcellus Shale gas wells, respectively.

While nearly a quarter of the wells exceeded the EQT curve, half of the wells produced less than 60% of the EQT curve and 25% of the wells produced 35% or less of the EQT estimate. The variability in cumulative production indicates that industry type curves should not be used to set the terms of financial assurance policy. If a 5-year severance tax is calculated from EQT Production's type curve and applied to the cumulative production of all the wells in Figure 4, independent of the tax rate, the amount of money collected in a trust would only be 62% of the target funding level, assuming that excess funds are returned to the operator.

■ THE IMPACT OF THESE REGULATORY OPTIONS ON THE INDUSTRY BOTTOM LINE

From the point of view of industry finances, the different funding mechanisms have similar impacts on the internal rate of return (IRR) of a producing well, even if total production is low. Table 1 contrasts the IRRs resulting from implementation of (1) the current bond requirement ($2,500), (2) a cash bond equivalent to the reclamation cost, (3) a predrilling fee, and (4) a 5-year severance tax. We assume 50 years of revenue from production, but use a 10-year funding timeline to minimize the risk of underfunding the reclamation trust.

Though these are rough calculations based on simple assumptions, Table 1 shows that levying a predrilling fee and small severance tax on the first five years of production would quickly fund a trust account with minimal impact on the project's IRR. From the industry point of view, paying the full cost of reclamation in an up-front bond is the least attractive alternative. However, actual implantation of any financial assurance requires an industry-wide evaluation of financial assumptions

■ RISKS TO THE STATE

From the State's point of view, there is a risk that the well will become uneconomic prior to year 10, especially if production is much less than EQT Production's type curve. If this occurs, the shortfall of the 5-year severance tax would be greatest.

The problem of underperforming wells or dry holes, however, is not adequately addressed, and unless the "no risk" cash bond is employed, it is expected that both delayed funding options will result in inadequate funding of the reclamation trust account. In the coal industry, operators are required to make underfunded trust accounts whole either by direct payments into the trust or supplementary bonds. If regulations are strictly enforced to prevent dry holes and uneconomic wells from being granted

Table 1. Gross Revenue IRRs Incorporating the Implementation Cost of Financial Assurance Mechanisms[a]

reclamation cost	gas production curve model	IRR with current bond	IRR with "no risk" cash bond	IRR with predrilling fee	IRR with 5-year severance tax
$100,000	EQT	78.7%	76.7%	77.1%	78.1%
	60% EQT	34.3%	33.2%	33.5%	33.8%
	35% EQT	13.2%	12.7%	12.8%	12.9%
$700,000	EQT	78.7%	65.6%	68.4%	74.3%
	60% EQT	34.3%	27.6%	29.0%	30.7%
	35% EQT	13.2%	10.2%	10.8%	11.0%

[a] Drilling and completion cost of $5.3 million and $176.6/TCM ($5/Mcf) price of gas is assumed. The pre-drilling fee and 5-year severance tax are calculated to fully-fund the reclamation trust by year 11. Two target reclamation costs are contrasted, $100,000 and $700,000. The pre-drilling fees are $76,000 and $535,000 for targets of $100,000 and $700,000, respectively. A severance tax rate of $1.01/TCM ($0.029/Mcf) is required for reclamation cost of $100,000 and the EQT production curve. The rate increases to $20.01/TCM ($0.57/Mcf) for reclamation cost of $700,000 and the 35% EQT production curve. TCM = thousand cubic meters. Mcf = thousand cubic feet.

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inactive status, the risk of these wells becoming State liabilities decreases.

The risk of underfunded reclamation trusts due to dry holes or otherwise underperforming wells could be reduced if individual operators pooled monies in a reclamation trust. In this case, the severance tax would need to be based on the value of the pooled trust, aggregate production data, and total reclamation liability. To prevent operators from shirking environmental responsibility and ensure the State has adequate resources in case of insolvency, adjustments to the severance tax rate may be necessary so that pooled funds cover the sum of expected reclamation costs.

PADEP may readjust trust funding levels for the mining industry to reflect changes in pollution control costs of plus or minus 10%.[59] However, regulatory inertia or poor oversight pose a threat to the achievement of adequate funding levels, as demonstrated by the lack of adjustment in oil and gas well bonding levels for more than a quarter-century. In theory, the potential for a downward adjustment of the required funding level incentivizes operators to invest in new technologies (or enhanced "pollution control") to lower the cost of reclamation and to have excess funds returned.[60]

■ DISAGGREGATING ENVIRONMENTAL ACCIDENTS FROM WELL SITE RESTORATION AND CLOSURE

While bond forfeiture is commonly associated with operator failure to perform site restoration and plug abandoned wells, the intent of current bonding system for oil and gas wells is much broader. At any point during the productive life of a well, noncompliance with the Oil and Gas Act or an order of the PADEP may be grounds for bond forfeiture. Restoration of water supplies impacted by nearby shale gas operations is an example.

The formation of a competitive bond market requires that liabilities be well-defined in amount and time. Therefore, neither bonds nor trust accounts are the appropriate tool for environmental accidents that occur during production. A remedy could be for Pennsylvania to adopt financial assurance rules that separate expected liabilities from uncertain events such as casing failure or other environmental accidents. Requiring active operators to obtain liability insurance for uncertain events is a partial solution. Insurance companies would need to quantify potential risks and determine an efficient way to pool risk across multiple wells or operators. However, in the absence of a responsible operator, the State or affected citizen is likely to bear the cost in the event of an environmental issue postreclamation.

■ CONCLUSION

The financial assurance mechanisms that Pennsylvania uses to ensure compliance with Pennsylvania's Oil and Gas act of 1984 are outdated and allow ownership transfers to entities less likely to be able to cover the expected costs of reclamation. Without strict enforcement of gas production reporting requirements, the PADEP will be unable to monitor compliance with plugging requirements and prevent abuse of the inactive status program. Timely plugging and abandonment should be the goal of PADEP policy because the long-term environmental and human health risks of shale gas development will increase over time and with the risk of operator insolvency. However, increasing the bonding requirements to fully cover reclamation costs, which is within the PADEP's mandate, will not address well-known limitations of environmental bonds and may limit participation in shale gas development to larger companies. Alternative mechanisms to ensure operators pay for future reclamation costs include a cash bond, a predrilling fee, and a severance tax. If operators were to deposit the full cost of reclamation in the form of a cash bond, the risk of underfunding will be lowest. Taxing gas production to fund an individual-well trust account for future reclamation poses no additional barrier to operator entrance. This approach may force the State to assume the risk of reclaiming dry holes unless wells are pooled and a severance tax adjustable to funding levels in the trust, total reclamation liabilities, and aggregate production is developed. Comparing all three mechanisms, we found that generating funds directly from the revenue stream during the most lucrative years of gas production has the lowest impact on an operator's IRR. Though the industry generically predicts wells to operate for 40–50 years, reliance on these assumptions to define the terms of financial assurance increases the risk of underfunding and cannot be justified. Separate handling of reclamation and accidental environmental liabilities would promote the development of a competitive bond market if the current system is kept in place.

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Both authors contributed to the content and writing of this manuscript.

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■ NOMENCLATURE

BCF, billion cubic feet
Mcf, thousand cubic feet
TCM, thousand cubic meters
PADEP, Pennsylvania Department of Environmental Protection
IRR, internal rate of return
NPV, net present value

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Attachment D

2010 Pennsylvania Integrated Water Quality Monitoring and Assessment Report

Clean Water Act
Section 305(b) Report and 303(d) List

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EXECUTIVE SUMMARY

Pennsylvania has a population of 12,448,279 and area of 45,333 square miles. There are six major river basins - Delaware, Susquehanna, Genesee, Potomac, Ohio, and Lake Erie - with an estimated 86,000 stream and river miles and 161,455 lake acres. Seventeen square miles of Delaware Estuary and 512 acres of tidal wetlands exist in the southeast corner. In the northwest corner are 63 miles of Lake Erie shoreline. Scattered throughout the state are 403,924 freshwater wetlands. These numbers illustrate the magnitude and complexity the Pennsylvania of Department of Environmental Protection (DEP) faces in assessing, protecting, and managing its water resources.

There are several goals of the 2010 Integrated Water Quality Monitoring and Assessment Report (Integrated Report). Foremost is to report on the condition of the waters in the Commonwealth. Other goals include describing the water pollution control and assessment/monitoring programs. Pollution control programs are discussed in detail in Part B, and Assessment and Monitoring in Part C. The report concludes with a discussion of groundwater in Part D.

Part A summarizes and discusses stream and lake assessments. The introduction describes the five-part list. These lists of individual waterbodies are separate from the narrative because of their size and are available on DEP's website.

In April 2007 DEP completed a ten year program to assess all wadeable streams. The census utilized a biological assessment of the aquatic life use. Other designated uses and non-wadeable waters were assessed to a lesser extent as resources and time permitted. As of this report 84,867 miles of streams and rivers are assessed for aquatic life use with 68,320 miles listed as attaining that water use. Of the impaired miles, 9,413 require development of a Total Maximum Daily Load (TMDL) to reduce pollutant inputs and 6,105 have an approved TMDL. An additional 65 miles are under compliance agreements and expected to improve within a reasonable amount of time. The two largest problems are agriculture and abandoned mine drainage. The largest stressors are siltation and metals. However, other problems should not be minimized because in local areas they may impact a relatively large percentage of waters. For example, urban runoff/stormsewers is a minor problem in rural areas but major in metropolitan regions.

There are 76,483 acres of lakes assessed for aquatic life use and 39,301 acres are attaining that use. Of the impaired acres, 5,349 require a TMDL, 11,290 have an approved TMDL, and 20,543 acres are impaired but do not require a TMDL because they are not affected by pollutants. The largest problem source is agriculture and largest stressors are nutrients, suspended solids, and organic enrichment/low D.O. As discussed above, smaller problems should not be minimized because they still have regional importance.

To protect the health of those who consume fish caught in the Commonwealth, DEP monitors fish flesh for possible contaminants. When concentrations of substances known to be harmful to humans reach action levels, fish consumption advisories are issued to inform people of the possible dangers and the actions they can take to protect themselves. Currently there are

approximately 1,195 miles of fish consumption advisories in need of TMDLs and 712 with approved TMDLs. Lake listings include 38,870 acres requiring TMDLs and an additional 5,349 with approved TMDLs. There is a statewide fish consumption advisory of no more than one meal per week for all waters to protect against the ingestion of unconfirmed contaminants. The fish consumption listings in this report have triggered action levels more restrictive than the one meal per week. It should be noted that DEP directs much of its fish tissue sampling to areas where there is a greater chance of problems. As a result, it is not surprising to see a higher number of stream miles and lake acres impaired for this use compared to the stream miles (2,430) and lake acres (13,942) attaining this use.

Aquatic life use was the original focus of the statewide surveys because with a rapid and efficient biological assessment of aquatic macroinvertebrates (insects, snails, clams, etc.) it was possible to canvas the state over a ten year period. In addition, aquatic life use is a good measure because it is reliable as an indicator of long term pollution problems. Since completing the statewide census for aquatic life use, DEP is emphasizing developing assessment methodologies, programs, and partnerships to increase recreational and potable water supply use assessments.

Of the 1,397 stream miles assessed for recreational use, 701 were attaining. There are 688 impaired miles requiring a TMDL and 8 with an approved TMDL. Lake recreational use was assessed for 79,040 acres with 73,928 attaining, and 5,112 impaired requiring a TMDL. The potable water supply use was assessed for 2,883 stream miles with 2,762 attaining, 107 impaired requiring a TMDL, and 14 with approved TMDLs. Lake potable water supply use was assessed for 44,933 acres with 44,921 attaining, and 12 impaired requiring a TMDL.

Part B is the narrative describing the Commonwealth's water pollution control programs. The section begins with a description of progressive efforts to prevent pollution before it becomes a problem. The Alternate Energy Portfolio Standard (AEPS) was adopted to shift energy dependence from polluting non-renewable energy sources to clean renewable sources. With the success of AEPS, other energy legislative initiatives such as, The Alternative Energy Investment Fund Act and House Bill 1202, were also passed in 2008. On other fronts, DEP has programs to encourage reduction in pollution that also provide cost savings to the treatment facilities. Examples of these successes are provided.

As evident in the Part B narrative, the Commonwealth's permitting and NPDES program is complex and deals with a large number of inspections and permits including regulating and permitting 4,548 industrial and sewage treatment facilities. Pennsylvania is a large producer of coal and natural gas and all mining and extraction activities require permits and inspection. It is DEP 's responsibility to issue permits that assure stormwater from earthmoving and construction activities is managed properly so as not to cause damage to streams or adversely affect their hydrology. County conservation districts work with DEP on stormwater protection. DEP also regulates combined sewer overflows (CSO) and manages and protects wetlands.

Part B also includes a discussion of non-point source programs. Pennsylvania's Non-point Source (NPS) Program was developed in response to Section 319 of the federal Clean Water Act to address problems caused by pollution from non-point sources. Unlike point source pollution,

which comes from pipes, the causes of non-point source pollution can be difficult to define or quantify. Sometimes referred to as "polluted runoff," non-point source pollution is generally caused by stormwater runoff across the land or infiltration of pollutants into the groundwater.

Non-point source problems require treating and controlling runoff from large areas. Treatment and control is accomplished through what are known as best management practices (BMP). BMPs are often specifically adapted to a particular location and problem. Examples include improving farming practices, reclamation of abandoned mines, installation of sediment ponds, and planting riparian buffers. A major function of the non-point source program is to identify the need for and initiate funding of BMP projects. Some examples of successful projects are described in the narrative.

The non-point program works with the TMDL program. A TMDL model outputs a load reduction of, for example, sediment. That sediment load reduction must be achieved to meet water quality goals and the reductions are achieved through the use of non-point BMPs. The non-point program provides technical assistance, education, and funding necessary to put the BMPs in place. Education is an important facet of the non-point program. It often takes a consortium of interested and active people concerned about their watershed to achieve non-point source controls. The purpose and goals of the TMDL program are outlined following the section on the non-point program.

In 2005 Commonwealth voters approved Growing Greener II (Act 45 of 2005). This bond issue made $230 million available to DEP over the next five years to clean up rivers and streams, take on serious environmental problems at abandoned mines and contaminated industrial sites, and finance the development and deployment of advanced energy projects. Growing Greener funds are important to the success of non-point source controls and programs as illustrated in the Part B narrative.

The combined efforts of the NPDES and non-point programs to identify and correct problems have resulted in many water quality improvements. In 2007, DEP began an ongoing process of identifying areas where restoration efforts were underway and targeting them for monitoring. When monitoring indicates the waters are restored, Department biologists document the improvements and remove the problem from Category 5 of the List (impaired waters requiring a TMDL) and place it in Category 2 (waters attaining at least one use). Seventeen such sites were identified and sampled in 2008/2009.

Part C is the Surface Water Quality Monitoring and Assessment discussion. It begins with a discussion of the Water Quality Standards Program which includes water uses, water quality criteria, and Pennsylvania's Antidegradation Program.

The next three sections discuss monitoring programs including intensive surveys, ambient fixed station monitoring at Water Quality Network (WQN) sites, and lake monitoring.

Citizen Volunteer Monitoring Program (CVMP) is an important program with the goal of working with interested groups in projects that generate quality assured data related to DEP's highest priorities. Ongoing projects include: bacteria sampling with the intent of assessing streams for recreational use; monitoring the effects of restoration efforts with the intent of tracking the improving water quality of streams and lakes; protecting our most valuable watersheds by implementing an early warning system for Exceptional Value (EV) and High Quality (HQ) streams and lakes that are vulnerable to degradation because of changing land use.

EPA's Integrated Listing guidance requires states to gather and use all existing and readily available data generated by sources outside DEP. This data must meet quality assurance and procedural guidelines outlined by DEP. Data solicitations were sent to over 500 outside sources in an effort to satisfy this requirement.

The Assessment and Listing Methodology is a collection of protocols used to conduct field surveys and evaluate information for assessments. These protocols are the basis for the streams and lakes information contained in the Integrated Report narrative and the five part list. These protocols were subjected to peer review. Before being adopted, the entire methodology was made available for public review during the summer of 2007 and spring 2009. The methodology is lengthy and as a result is reported separately from this narrative and is available on DEP's website along with the responses to public comment.

The next several sections present detailed tables summarizing stream and lake use support. These tables formed the basis for the discussions presented at the beginning of the Executive Summary. The lakes section also contains discussions on restoration and control efforts. Some funding is available from DEP to restore and/or protect lakes. Control measures are codified in DEP's Rules and Regulations at Section 96.5 - Discharges to Lakes, Ponds, and Impoundments, which sets forth treatment requirements for point source discharges necessary to control eutrophication. Both efforts are important in protecting and restoring the Commonwealth's lakes. Section C ends with an overview of wetlands. It describes the types of wetlands found, DEP's jurisdiction and responsibility to protect wetlands, and other wetland related activities.

Finally, Part D provides an overview of the groundwater program including assessment activities and wellhead and source water protection.

PART A: INTRODUCTION

This report is the twentieth in a series of reports prepared in response to Section 305(b) of the federal Clean Water Act that requires states to provide an assessment of water quality. These reports are prepared on a biennial basis.

DEP uses an integrated format for Clean Water Act Section 305(b) reporting and Section 303(d) listing. The "2010 Pennsylvania Integrated Water Quality Monitoring and Assessment Report" satisfies the requirements of both Sections 305(b) and 303(d). The narrative that follows contains summaries of various water quality management programs including water quality standards, point source control, and nonpoint source control. It also includes descriptions of programs to protect lakes, wetlands, and groundwater quality. A summary of the use support status of streams and lakes is also presented in the narrative report.

In addition to this 305(b) narrative, the water quality status of Pennsylvania's waters is presented using a five-part characterization of use attainment status. The listing categories are:

Category 1: Waters attaining all designated uses.

Category 2: Waters where some, but not all, designated uses are met. Attainment status of the remaining designated uses is unknown because data are insufficient to categorize the water.

Category 3: Waters for which there are insufficient or no data and information to determine if designated uses are met.

Category 4: Waters impaired for one or more designated uses but not needing a total maximum daily load (TMDL). These waters are placed in one of the following three subcategories:

- *Category 4A*: TMDL has been completed.
- *Category 4B*: Expected to meet all designated uses within a reasonable timeframe.
- *Category 4C*: Not impaired by a pollutant and not requiring a TMDL.

Category 5: Waters impaired for one or more designated uses by any pollutant. Category 5 includes waters shown to be impaired as the result of biological assessments used to evaluate aquatic life use. Category 5 constitutes the Section 303(d) list EPA will approve or disapprove under the Clean Water Act.

Each waterbody must be assessed for four different uses as defined in DEP 's rules and regulations at 25 Pennsylvania Code Chapter 93 (Water Quality Standards) in Section 93.3 Protected Water Uses. The four include Aquatic Life, Water Supply, Fish Consumption, and Recreation. Generally, Aquatic Life pertains to maintaining flora and fauna indigenous to aquatic habitats; Water Supply relates to the protection of ambient water quality for possible use as a potable water supply; Fish Consumption protects the public from consuming tainted fish; and Recreation relates to water contact and boating. Each use may have different water quality criteria for individual chemical constituents and each use requires a different type of stream or lake assessment.

DEP encourages use of the Internet to view the Integrated Report documents electronically on its website at http://www.depweb.state.pa.us, search keyword "Water Quality List". Full address is: http://www.portal.state.pa.us/portal/server.pt/community/water_quality_standards/10556
Because of the size of the five-part list, it will only be available electronically.

PART B: BACKGROUND

Part B1 Total Waters

Table 1
Atlas of Surface Waters in Pennsylvania

The following information is presented to provide a perspective on Pennsylvania's water resources:

State Population	12,448,279†
State Surface Area (square miles)	45,333
Number of Water Basins (major basins)	6
Total Miles of Rivers and Streams	86,000*
Number of Lakes/Reservoirs/Ponds**	3,956
-Number of Significant, Publicly Owned Lakes (subset)	219
Acres of Lakes/Reservoirs/Ponds**	161,445††
-Acres of Significant, Publicly Owned Lakes (subset)	98,942
Square Miles of Estuaries/Harbors/Bays	
-Delaware Estuary	17
-Presque Isle Bay	6
Miles of Great Lakes Shore	63†††
Acres of Freshwater Wetlands	403,924
Acres of Tidal Wetlands	512

† US Census estimate 2008

†† Lakes and ponds greater than two acres

††† Lake Erie - Fourteen miles comprise the Presque Isle Peninsula.

*DEP estimate based on 1:24,000 scale National Hydrography Data (NHD) GIS stream coverage. This 86,000 may change as the NHD is quality assured and corrected.

** "Total Water Estimates for United States Streams and Lakes", EPA, August 1993

Part B2.1 Pollution Prevention and Energy Efficiency Program

DEP recognizes the value of multi-media pollution prevention in providing environmental protection. Not only does preventing pollution create a healthy, sustainable environment, it also saves money, contributing to a stronger economy. Programs throughout DEP are built upon the premise that not generating waste is preferable to dealing with waste after it is generated. Since energy usage and generation has major impacts economically and environmentally to businesses, industry, and state and local governments, there is a recognized need to direct efforts related to energy and alternative fuel issues and as result the Alternative Energy Portfolio Standard (AEPS)

legislation was passed and the Energy Independence Strategy developed. The AEPS law is a two- tiered standard ensuring that in 15 years, 18 percent of all the electricity sold in Pennsylvania will come from clean sources. Tier I requires 8 percent of electricity sold at retail in the state to come from traditional renewable resources such as solar, photovoltaic energy, wind power, and low-impact hydro; and Tier II requires 10 percent of Pennsylvania retail electricity to be generated from resources such as waste coal, distributed generation systems, and demand-side management. At least 0.5 percent of Tier I must be met by electricity from solar photovoltaic cells. The Alternative Energy Investment Fund Act was passed in a special legislative session in 2008, and includes funding for green buildings, energy efficiency, and demand-side response programs designed to reduce Pennsylvania's energy consumption. As a result of the same session, House Bill 1202, which requires that certain percentages of biodiesel and ethanol be included in each gallon of gasoline or diesel sold in the commonwealth as in-state production of biodiesel or cellulosic ethanol reaches certain levels was signed into law.

Additional programs are being launched as a result of the American Recovery and Reinvestment Act (ARRA) in order to help create jobs and further the development of the alternative energy and energy efficiency sectors. These programs provide funding for alternative energy and energy efficiency projects for local governments, businesses, colleges and universities, conservation districts, etc. The eligible technologies included in these programs are combined heat and power, biogas, solar, wind, and other technologies.

DEP's pollution prevention programs help government and businesses move beyond compliance-based, end-of-pipe thinking to preventing pollution before it is created, effectively reducing adverse impacts to the environment. The Office of Energy and Technology Development (OETD) has programs for helping small businesses, industry, government, and schools to better manage their environmental impacts, reduce energy usage, and save money. Some major focus areas of OETD are economic development, indigenous energy, hydrogen economy, market barriers, distributed power, and green buildings.

The Small Business Pollution Prevention Assistance Account (PPAA) loan program has funded a variety of pollution prevention/energy efficiency projects. Reported results for some of these projects are as follows:

Custom Castings Northeast, Inc. has reported saving 497,000 pounds of cement, 75,000 pounds of gypsum, and 76,000 pounds of wood. In addition, the company has reported a reduction of 379,000 pounds of waste as well as reduced labor costs. The company has realized a savings of $355,000 in addition to an increase in production in the six years since implementing their project.

Gautier Steel, Ltd. has reported saving 13,807 MWH (megawatt hours) of electricity, 70,117 MCF (thousand cubic feet) of natural gas and 192,202 MGALS (megagallons) of water. Combined, these savings have given the company $1,891,482 in the four years since implementing their project.

Reynoldsville Casket has reported saving 7,745 gallons of paints and thinners as well as 2,540 gallons of waste paint. In addition, Reynoldsville has reduced their air emissions and waste disposal costs. The company has realized a savings of $92,226 in addition to an increase in production in the seven years since implementing their project.

The loan program has also provided $2,126,930 in funding to 38 healthcare professionals to help them purchase/install new digital x-ray systems in their offices. The new digital systems replaced their film-based x-ray systems and have helped the businesses save water and electricity and reduce the amount of radiation emitted. In addition, the businesses realized a reduction in their hazardous waste stream, wastewater, waste disposal costs, lab and maintenance costs, and x-ray supplies. These 38 projects have saved the businesses $446,257 since implementation.

DEP works with The Pennsylvania Technical Assistance Program (PENNTAP) and other groups to support technology-based economic development. As a means to improving competitiveness, Pennsylvania companies receive a limited amount of free assistance to help resolve specific technical needs. Technical assistance was provided for 218 businesses during the past year resulting in an estimated economic benefit exceeding $18.5 million. Waste and energy use-reduction assessments were performed at 67 businesses. Environmental benefits included conserving 75,000 gallons of water and a reduction in air emissions approaching 2,000 tons per year or 1,420 metric tons of carbon equivalence. Energy savings were estimated at nearly 0.3 megawatts. $232,000 in savings were reported by businesses receiving PennTAP's assistance.

Government is leading by example, integrating pollution prevention and energy efficiency measures throughout the Commonwealth. Examples of this include the work of the Governor's Green Government Council (GGGC) to implement green planning throughout the state to go towards purchases of environmentally friendly green buildings and electricity from renewable sources like wind and solar power. DEP is building strategic partnerships with businesses and organizations throughout the Commonwealth, promoting pollution prevention and energy efficiency, fostering environmental and energy technologies, and providing compliance assistance to help organizations protect the environment while saving money. To lead the way, the Governor issued executive order 12-04 requiring all state agencies to reduce energy usage. Building energy usage was reduced by 18% from calendar year 2005 to 2009, using 2004 as the base year. In addition, the Guaranteed Energy Savings program has been streamlined. Twenty-nine major building retrofits will return major energy savings to seven agencies and cover the capital costs out of the savings. The first nine projects to be completed will save taxpayers over $89.5 million on a capital outlay of $51.7 million. Future energy bills will be reduced by specifying stringent performance goals for new construction. Out of the 162 high performance green buildings in Pennsylvania certified under the US Green Building Council's LEED® rating system, twelve are occupied by state agencies, an increase of three from 2006.

The Commonwealth now ranks 10th on the U.S. Environmental Protection Agency's Top 50 Green Power Partnership List. By modifying its existing contract, the Commonwealth will purchase 400,000 megawatt hours a year, or 40 percent of state government's electricity, from renewable wind and biomass sources. The contract calls for electricity that is generated 10 percent from wind power and 90 percent from biomass sources.

Part B2.2 (a) NPDES

Pennsylvania implements the EPA delegated point source National Pollutant Discharge Elimination System (NPDES) permitting program through DEP's six regional field offices and six district mining operations offices. While program development and evaluation occurs in DEP's central office, the field offices and district mining offices conduct site-specific permitting, monitoring, compliance, and enforcement activities. The central office also provides specialized assistance in the areas of policy, regulatory development, complex permitting, laboratory audits, safety training, treatment plant operations, enforcement, and data management.

The Toxics Management Strategy provides for a consistent statewide approach for addressing EPA priority pollutants and other toxic substances in the NPDES permit program. The strategy, parts of which are codified in a Statement of Policy, Chapter 16, is a support document to DEP's toxic regulation, Section 93.8a of the rules and regulations.

In state fiscal years 2008 and 2009 (July 1, 2007 – June 30, 2009), field office staff issued 476 new, 1,712 renewals, and 189 amendments for NPDES permits for municipal or private sewage treatment plants, industrial discharges and solid or hazardous waste facilities, as well as 128 new, 359 renewals, and 7 amendments for coverage under stormwater general permits.

Water Quality Management (WQM) permits authorize construction and operation of sewage collection and conveyance systems and sewage and industrial wastewater treatment facilities. The field offices issued 955 WQM permits and permit amendments for sewage and industrial waste treatment plants in state fiscal years 2008 and 2009.

Permitting summaries for other programs follow later in the document.

Part B2.2 (b) Compliance and Enforcement

The DEP point source control program regulates approximately 9,050 sewage and industrial dischargers in Pennsylvania. Approximately 385 of these are considered major dischargers based on EPA criteria. DEP field offices maintain a staff of field inspectors, hydrogeologists, biologists, compliance specialists, supervisors, and managers to conduct activities including inspections of both NPDES and non-NPDES wastewater treatment facilities, emergency response, investigation of pollution incidents and complaints, and routine stream monitoring.

Approximately 7,490 facilities inspections were conducted during state fiscal years 2008 and 2009. Generally, if environmental damage or willfulness is not involved in violations, an attempt is made to obtain voluntary compliance. In more serious situations, criminal, civil, or administrative actions may be used. DEP field offices completed 383 such actions in state FYs 08 and 09, resulting in approximately $10.96 million in penalties.

The Water and Wastewater Operator Outreach program is continuing to have a positive impact on effluent quality by providing on-site training for wastewater treatment plant operators. This program has expanded to the point where training was conducted at an average of 40 sites per federal fiscal year from 2001-2009. As a result of this training, most sites show substantial improvement in compliance with permit requirements.

Tracking of data on effluent quality for major dischargers is accomplished through EPA's Integrated Compliance Information System (ICIS). There has been an ongoing effort to enhance the compliance monitoring program by automating the input of effluent limits data and discharge monitoring data to ICIS. In 2007, DEP implemented an electronic DMR system to store monitoring data as well as a data system called the NPDES Management System to store permit information. These systems have significantly reduced the number of data elements that were electronically unavailable. In 2008, with the intention of acquiring information through data transfers from the States, EPA released a "schema" (database requirements) for a subset of data elements. Approximately 20 fields were associated with DMRs. Pennsylvania is now transferring DMR data electronically to ICIS, thus reducing the manual data entry burden for DEP staff.

There are several checks and balances in place to ensure the quality of self-monitoring data. Since 2006, DEP's Bureau of Labs (BOL) has been responsible for oversight of all environmental labs. BOL provides a year end report to EPA with details and accreditation information. In addition, field inspectors review information and self-monitoring data during surveillance activities, and follow-up as appropriate.

Part B2.2(c) Mining

District mining operations offices, under the direction of DEP's Bureau of Mining and Reclamation (BMR), issue NPDES discharge permits for active mining operations. During federal FY 08 and FY 09, the following new permits were issued: 105 coal surface, 11 coal underground, 13 coal refuse reprocessing, one coal refuse disposal, and 41 industrial mineral surface permits.

Part B2.2 (d) Oil and Gas

During the two year period from October 1, 2007 to October 1, 2009, the Bureau of Oil and Gas Management (BOGM) issued three new NPDES discharge permits and one new NPDES permit for coalbed methane wastewater treatment facilities. There are 12 active NPDES permits for coalbed methane treatment facilities and 12 active NPDES permits for brine treatment facilities in Pennsylvania.

Currently within the BOGM, nine NPDES permit applications for new facilities are pending and there are five pending renewals. In addition, five stripper oil well discharges are covered by the

general permit, with two receiving Water Quality Management Part II permits and two pending a Water Quality Management Part II permit.

In response to the increasing need for treatment facilities to reduce the environmental impacts of the exploitation of natural gas resources associated with the Marcellus Shale formation, the Department of Environmental Protection issued in, April 2009, a Total Dissolved Solids Strategy. In addition, the Department moved to develop a more standardized permitting process coordinating well drilling approvals from BOGM, approvals for water withdrawals issued by River Basin Commissions, correction of site development issues at well pads through the management and treatment of wastes from drilling operations, and addressing production activities. Department regional offices received inquires about new wastewater treatment facilities from at least 29 parties. Of these, approximately 25 applications were submitted and are now under review by the regional staff. Lastly, the Department is currently revising 25 Pa Code Chapter 93 Water Quality Standards and Chapter 95 Wastewater Treatment Requirements regulations to address in-stream, treatment, and effluent discharge criteria for specific contaminants of concern.

Part B2.2 (e) Stormwater Discharge Permits

The 1990 federal stormwater regulations require NPDES permits for discharges of stormwater from certain industrial activities and municipalities. Initially, there were four Pennsylvania cities (Philadelphia, Pittsburgh, Allentown, and Erie) on the EPA list of municipalities needing stormwater permits. Later, Pittsburgh and Erie were exempted from the stormwater permitting requirements because of large areas of combined sewers in these cities. Permits have been issued to Philadelphia and Allentown.

DEP began implementing the Phase II stormwater regulations on December 8, 2002. These regulations require construction activities consisting of earth disturbance activities between one and five acres with point sources and all construction activities consisting of earth disturbance activities greater than five acres to obtain permits. In addition approximately 940 small municipalities (including those that were initially exempted), must obtain NPDES permits to operate their municipal separate storm sewer systems (MS4s).

DEP administers a reimbursement and grant program under the Storm Water Management Act (Act 167) for counties to prepare comprehensive stormwater management watershed plans to regulate activities and development that may cause accelerated stormwater runoff. Municipalities implement the plans through the enactment or amendment of local ordinances. One hundred and sixty-seven (167) stormwater management plans have been approved by DEP across Pennsylvania (as of November 2007). All plans approved since 2001 include specific components to enhance protection of water quality, groundwater recharge, and groundwater recharge areas. Sixty-seven (67) watersheds have plans that include water quality components. Forty-six (46) new plans are currently underway, with the emphasis on stormwater management plans that address planning for all watersheds within the county boundary.

On September 28, 2002, DEP released a stormwater policy that addresses the need to improve water quality, sustain water quantity (including groundwater recharge and stream base flow), and integrate upcoming federal stormwater management regulatory obligations. DEP proposes a best management practices (BMP) approach to stormwater management that generally encourages the minimization of runoff by allowing stormwater to infiltrate into the ground whenever possible and requires the management of any net increase in quantity of runoff. This approach will reduce pollution to streams, provide for groundwater recharge, enhance stream flow during times of drought, and reduce the threat of flooding and stream bank erosion resulting from accelerated runoff.

Final policies were published on June 3, 2006 for compliance and enforcement of both Act 167 and the MS4 permitting program (DEP documents 363-4000-003 and 363-4000-004, respectively).

Part B2.2 (f) Construction and Urban Runoff

This category includes two major subcategories: highway construction and new land development including residential, industrial, commercial, institutional, and recreational construction. Uncontrolled runoff from these sites has the potential to cause significant soil erosion and localized sediment pollution in streams.

Standards and criteria for minimizing erosion and preventing sediment pollution are contained in Chapter 102 rules and regulations. These regulations apply to any earth disturbance activity, including land development and road, highway or bridge construction. Requirements for control measures and facilities are written to utilize best management practices, primarily by establishing design and performance standards.

Pennsylvania's program is administered by DEP and county conservation districts through a delegation of DEP authorities to the conservation districts. Joint responsibilities for program implementation include the processing and issuance of permits, complaint investigations, site inspection, compliance, and enforcement. BMPs are reviewed for design and performance effectiveness through permit plan reviews and periodic monitoring at the construction site. Both DEP and the county conservation districts facilitate implementation of BMPs by conducting numerous training seminars and workshops for individuals, municipalities, and other parties engaged in undertaking earth disturbance activities.

DEP's comprehensive stormwater management policy uses existing authority to provide a framework for the integration of all Department stormwater management programs and promotes a comprehensive watershed approach to stormwater management in the Commonwealth. Fundamentally, the policy emphasizes the reduction of stormwater runoff generated by development and other activities by encouraging minimization of impervious cover, use of low impact development designs, and use of innovative stormwater BMPs that provide infiltration, water quality treatment, and otherwise more effectively manage the volume and rate of stormwater discharges. These stormwater BMPs and planning practices will be advanced

through increased emphasis on DEP 's Act 167 stormwater management planning program and implementation of the new (Phase II) and existing (Phase I) NPDES Stormwater Discharge Associated with Construction Activity Permit programs, and the new NPDES MS4 permits.

Because of increased need and emphasis on improving water quality and protecting water resources through improved stormwater runoff management, DEP developed the Pennsylvania Stormwater Management Best Management Practices (BMP) Manual to support the implementation of stormwater management requirements and water quality antidegradation requirements. The BMP Manual provides the design standards and planning concepts to guide local authorities, planners, land developers, contractors, and others involved with planning, designing, reviewing, approving, and constructing land development projects. The BMP Manual also advances the most recent innovations in stormwater management, focusing on preserving on-site and off-site pre-construction hydraulic conditions. Volume and rate management through ground water infiltration, porous surfaces, and other onsite management are emphasized. Water quality components such as oil separators, passive wetland treatment, and other advanced technologies are also being emphasized and integrated into the BMP Manual.

Existing Erosion and Sediment Control (E&S) regulations found at Title 25, Chapter 102 describe the requirements for controlling accelerated erosion and preventing sediment pollution from various earth disturbance activities. The purpose of Chapter 102 is to protect surface waters of the Commonwealth from sediment and stormwater pollution by requiring the use of best management practices (BMPs) that minimize accelerated erosion and sedimentation and manage post construction stormwater runoff, both during and after earth disturbance activities.

Since 1972, earth disturbance activities related to agricultural plowing and tilling, as well as, non-agricultural earth disturbance activities have been regulated under this Chapter by requiring persons to develop, implement, and maintain BMPs.

The Department is currently proposing amendments to Chapter 102 that incorporate provisions which: enhance requirements related to agriculture; clarify existing requirements for accclerated E&S control; incorporate updated federal requirements; update permit fees; codify Post-Construction Stormwater Management (PCSM) requirements; and add requirements related to riparian forest buffers.

Part B2.2 (g) Stormwater Permits Conservation Districts

DEP and county conservation districts jointly administer issuance of NPDES permits for stormwater discharges associated with construction activities. During calendar years 2007 and 2008, conservation districts received, reviewed and acknowledged 3,863 Notices of Intent (NOI) for coverage under the statewide general permit. DEP issued 718 individual NPDES permits authorizing stormwater discharges from construction activities. In addition, conservation districts conducted 32,324 compliance-monitoring inspections at permitted and non-permitted sites. Conservation districts also conductcd 5,181 complaint investigations, in addition to routine compliance inspections.

Part B2.2 (h) Combined Sewer Overflows

Combined sewer overflows (CSOs) to waters of the Commonwealth are considered point sources subject to NPDES permitting, compliance, and enforcement requirements. EPA has been regulating CSOs through the 1989 and 1994 national CSO policies that require each state to develop and implement a state CSO control strategy. DEP revised its policy in September 2007. The revised policy reiterates the need for permittees to have Nine Minimum Controls (NMC) in place and to implement a Long-Term Control Plan (LTCP). LTCP milestones are placed in NPDES permits with dates for completing them. The revised policy also made clearer the need for a post-construction monitoring plan.

DEP has continued to place a high priority on the permitting and inspection program to deal with requirements for implementation of nine minimum controls and long-term control plans.

Part B2.3 (a) Non-point Source Control Program

Pennsylvania's Non-point Source (NPS) Program was developed in response to Section 319 of the federal Clean Water Act to address problems caused by non-point sources, such as the overland flow of stormwater or infiltration of pollutants into the groundwater. The three main sources of non-point runoff resulting in degraded water quality in Pennsylvania are agriculture, abandoned mine drainage, and urban runoff. Other sources include abandoned oil and gas wells, construction activities, land disposal, habitat modification, hydromodification, and silviculture (logging practices).

The Clean Water Act requires each state to prepare a Management Plan for its non-point source program. This Management Plan outlines the program components to be used to address non-point source problems including a variety of non-regulatory, financial, and technical assistance programs needed to improve and maintain surface and groundwater quality. Pennsylvania last updated its NPS Management Plan in 2008.

Pennsylvania has received more than $83 million from the federal Section 319 Grant Program (FY 1990 - 2009). This money has been used to institutionalize a non-point source program, implement various innovative technologies to treat non-point source pollution problems, develop an educational program, and begin several comprehensive watershed initiatives. Other funding sources for non-point source pollution management include: Pennsylvania's Chesapeake Bay Program, the Nutrient Management Act, the County Conservation District Assistance Funding Program, the Stormwater Management Act Fund, the Coastal Zone Resources Program, USDA's Environmental Quality Incentives and Conservation Reserve Enhancement Programs, and the Environmental Stewardship and Watershed Protection Grant, also known as Growing Greener.

Growing Greener has provided $280.1 million in watershed grants since 1999. Local partners have added another $511 million from their own resources. The tremendous value of the

program became clear to legislators and Growing Greener funding was initially extended through 2012. This increased total funding to $547.7 million from the original $241.5 million allocated to DEP. The funding is being made possible through a $4.25-per ton tipping fee on solid waste disposed in Pennsylvania's municipal waste landfills. In July 2005, Growing Greener II was passed which removed the 2012 sunset date on the tipping fee and increased funding for projects through 2010. An additional $74.3 million has been allocated for watershed grants.

Monitoring of both land treatment and water quality for a five- to ten-year period is the best way to document the effectiveness of non-point source pollution control efforts. Pennsylvania has hosted 4 of the 24 EPA Section 319 National Monitoring Projects (NMP) across the country. Pennsylvania NMPs include: the Swatara Creek NMP, monitoring the effect of passive treatment on abandoned mine drainage; the Stroud Water Research Center NMP, monitoring a riparian buffer project in an agricultural watershed; the Pequea and Mill Creek NMP, using a paired watershed approach to monitor the effectiveness of agricultural best management practices (BMPs); and the Villanova Urban Stormwater BMP demonstration site, monitoring a suite of innovative stormwater management practices.

Four watersheds in Pennsylvania have been awarded EPA Targeted Watershed Grants: the Dunkard Creek Watershed, Christina River Basin Initiative, Upper Susquehanna River Basin Restoration, and Schuylkill River Watershed Initiative. The Targeted Watershed Grant is an EPA program designed to encourage successful community-based approaches and management techniques to protect and restore the nation's waters.

Part B2.3 (b) Highlights of Pennsylvania's Current NPS Program

Education and Outreach

Some of the Section 319 Grant Program involves projects fully or partially directed towards NPS education and outreach. Two initiatives funded through the Section 319 Grant Program that are directed entirely at education and outreach at the grassroots level include the Pennsylvania League of Women Voters (LWV) and the Pennsylvania Association of Conservation Districts (PACD). Using funds from the Section 319 Grant Program, The LWV Water Resources Education Network (WREN) supported eleven grants of up to $5,000 in 2009 to enable groups of local citizens and officials to build community support for water resource protection. PACD's NPS Pollution Prevention Educational Mini-Grant program provided funding of up to $2,500 each for 29 projects. These projects included the development of audio- visual products, exhibits or models, production of special events, marketing tools, publications, actual stream reclamation projects, hands-on water studies, and educational workshops.

Since 1999, the Growing Greener Program has funded 175 education/outreach projects for a total of $10.2 million.

Building Capacity

Table 3 summarizes the sources of impairment problems and Table 4 the causes. Note that totaling the sources or causes will not equal the miles summarized in Table 2 because a given waterbody may have multiple sources and/or causes. The tables are statewide summaries. The individual source/cause pairs for each waterbody are found on Categories 5, 4b, and 4c. The lists are large and, as a result, are provided separately in electronic format.

Table 2

Statewide Assessment Summary
A statewide summary of use support status for four water uses in assessed streams

	Aquatic Life Use	Fish Consumption Use	Recreational Use	Potable Water Supply Use
Streams (miles)				
Assessed	84,867	4,337	1,397	2,883
Supporting	68,320	2,430	701	2,762
Impaired	9,413	1,195	688	107
*Approved TMDL	6,105	712	8	14
Compliance	65	---	---	---
**Pollution	2,580	---	---	---

* TMDL miles reported here are only those overlapping impaired segments. A TMDL allocation may include an entire watershed, including streams listed as attained.

** 1,616 miles have both pollution and pollutant problems

Table 3

Statewide Assessment Summary
Sources of Impairment: Streams
Totals Include List 4a, 4b, 4c, and 5
(Mile totals will not equal Table 2 because a waterbody can have multiple impairments)

	Designated Use (Miles)				
Source	Aquatic Life	Fish Consumption	Recreation	Water Supply	Total
Abandoned Mine Drainage	5,467			79	5,546
Agriculture	5,380		65	39	5,484
Source Unknown	403	1664	617	39	2,723
Urban Runoff/Storm Sewers	2,302		36		2,339

Road Runoff	871				871
Small Residential Runoff	711				711
Habitat Modification	616				616
Municipal Point Source	391		6	1	398
Removal of Vegetation	394				394
Atmospheric Deposition	392				392
Channelization	322				322
Other	309			9	318
Bank Modifications	272				272
Land Development	226				226
On site Wastewater	200		5		205
Industrial Point Source	120	29		67	216
Erosion from Derelict Land	200				200
Subsurface Mining	106			67	173
Construction	164				164
Natural Sources	162				162
Upstream Impoundment	155				155
Hydromodification	142				142
Flow Regulation/Modification	117				117
Surface Mining	115				115
Combined Sewer Overflow	104		11.7		115
Golf Courses	53				53
Petroleum Activities	52				52
Package Plants	20				20
Silvaculture	19				19
Land Disposal	14				14
Highway, Road, Bridge Const.	12				12
Draining or Filling	10				10
Recreation and Tourism	3				3
Logging Roads	2				2
Dredging	1				1

Table 4

Statewide Assessment Summary
Causes of Impairment: Streams
Totals Include List 4a, 4b, 4c, and 5
(Mile totals will not equal Table 2 because a waterbody can have multiple impairments)

	Use Designation (Miles)				
Cause	Aquatic Life	Fish Consumption	Recreation	Water Supply	Total
Siltation	8,271			3	8,274
Metals	5,048			12	5,060
pH	2,728				2,728
Nutrients	2,596			35	2,631
Water/Flow Variability	1,476				1,476
Organic Enrichment/Low D.O.	1,339				1,339
Other Habitat Alterations	963				963
PCB		940			940
Mercury		922			922
Cause Unknown	877				877
Pathogens	7		718	39	764
Flow Alterations	700				700
Suspended Solids	561				561
Turbidity	224				224
Salinity/TDS/Chlorides	190			8	198
Excessive Algal Growth	128				128
Chlordane		119			119
Other Inorganics	44			69	113
Unknown Toxicity	83				83
Thermal Modifications	86				86
Dioxins		46			46
Oil and Grease	39				39
Exotic Species	26				26
Pesticides	25				25
Nonpriority Organics	23				23
DO/BOD temp	22				22

Unionized Ammonia	18				18
Priority Organics	17				17
Color	10				10
Osmotic Pressure	9				9
Chlorine	9				9
Taste and Odor	7				7
Filling and Draining	5				5
Noxious Aquatic Plants	5				5

Monitoring information indicates that 68,320 miles support designated aquatic life use. A total of 9,413 miles are reported as impaired and still requiring a TMDL and 6,105 miles are impaired but already have an approved TMDL. There are 2,580 miles with pollution problems not requiring a TMDL and 65 miles are impaired but expected to improve in a reasonable time pending agreed upon corrective action.

The three largest sources of reported impairment for aquatic life are abandoned mine drainage, agriculture, and urban runoff/storm sewers. The leading causes are siltation, metals, pH, nutrients, water/flow variability, and organic/enrichment. While direct source/cause linkages cannot be made at the level of detail presented in Tables 3 and 4, causes other than water/flow variability are known to be associated with the three leading sources abandoned mine drainage, agriculture, and urban runoff/storm sewers. Agricultural impairments are generally caused by nutrients and siltation associated with surface runoff, groundwater input and unrestricted access of livestock to streams. Low pH, elevated concentrations of metals, and siltation are the result of abandoned mine drainage runoff from mine lands and refuse piles. Increased levels of nutrients and siltation, along with flow variability, are associated with urban runoff. The sources associated with water/flow variability are varied, including hydromodification, road runoff, urban runoff/storm sewers, and several others. Any source that alters runoff or stream flow can effect water/flow variability. Water/flow variability is considered pollution not requiring a TMDL but the problem still requires remediation.

There are 4,337 assessed miles supporting the fish consumption use and 1,195 miles impaired and still requiring a TMDL. There are approved TMDLs for 712 miles. The 2,430 miles supporting this use is a conservative estimate. As a rule, when fish tissue samples are clean the results are only extrapolated to represent two miles on small streams and ten on larger waterbodies. To protect the public, larger extrapolations are made when the fish tissue samples are tainted.

The major source of contamination resulting in fish consumption advisories is listed as unknown because it is difficult to trace the sources. The contamination can be in the soil, groundwater, stream sediment, or point sources. The contaminants do not readily break down and can linger for decades. In addition, fish can move considerable distances. Only with careful study can the source of contamination be determined with certainty. The contaminants documented are PCB,

mercury, chlordane, and dioxin in decreasing order. Atmospheric deposition is the most likely source of the mercury. There is a statewide advisory limiting consumption of recreationally caught fish to one meal per week. If fish tissue mercury concentrations are greater than the one meal per week level (higher concentrations), they are placed on Category 5 of waters. Conversely, if subsequent samples indicate the concentrations are now less than the one meal per week level they are removed from Category 5.

Recreational use is assessed primarily by measuring bacteria levels. High bacteria densities indicate conditions that might cause sickness from contact with or ingestion of the water. Many of the waters targeted for sampling were suspected of having bacteria problems so the 688 miles of impaired miles versus the 701 miles attaining is not unexpected. There are 8 miles with an approved pathogen TMDL. The major source of pathogens is listed as source unknown followed by agriculture. If there are several potential sources of bacteria in the watershed the assessor lists the source as unknown until better information becomes available.

Potable water supply use was supported in 2,762 miles of streams assessed, not supported in 107, and 14 had approved TMDLs. This potable water supply use is measured before the water is treated for consumption. The primary assessment measures are nitrate+nitrite levels and bacteria but additional parameters, both organic and inorganic, are considered.

Part C3.2 Record of changes to the 2008 Integrated List 5 made in the 2010 Integrated List

The Integrated List is part of a biennial report. The previous list included data gathered through 2008. In the two year period leading up to this report, a number of waterbodies listed as impaired on the 2008 Integrated Report were resurveyed. Impaired waters may be resurveyed for a number of reasons including the need for additional data to support TMDL development, or changes in land use, or point source discharge characteristics. Waters are revaluated on a rotating basis as per the ICE sampling protocol outlined in the 2009 Assessment Methodology. Areas where watershed improvement projects are in place are also targeted to document improvements that may results.

Appendix E tracks changes in the status of waters impaired in 2008 but attaining uses in 2010. Each of these delistings is the result of a detailed chemical or biological survey and subsequent data evaluation. Appendix F tracks changes in the pollutant causes. Entries for waters that were reported as impaired in 2008, but a subsequent survey found them to be impaired but by different pollutants are edited to better reflect the problems. The comments associated with each record describe the changes. Lastly, Appendix G describes records with errors. Some are mapping errors discovered because the GIS coverage has undergone several revisions over the past 12 years and occasionally some legacy mapping errors are uncovered. Other errors relate to an impairment being incorrectly mapped to a pollutant source. Comments in these records describe the error.

Part C3.3 Lakes Use Support

Table 5 is a summary of the four use support categories for lakes. Acres "supporting" is the number of acres not impaired for the assessed use. "Impaired" acres (List 5) do not support the assessed use and still require a TMDL. "Approved TMDL" includes impaired lake waters where a TMDL has been completed and approved by EPA. "Impaired (List 4c)" is a special category of use impairment where a problem is documented but it will not be addressed through a TMDL. Pollution is a special category of impairment where there is a problem but it will not be addressed through a TMDL because it does not involve pollutant loadings. "Assessed" refers to the total acres surveyed for that use.

Table 6 summarizes the sources of impairment problems and Table 7 the causes. Note that totaling the sources or causes will not equal the acres summarized in Table 5. This is because a waterbody may have multiple sources and causes. The individual source/cause pairs for each waterbody are found on List 5, 4b, and 4c. The lists are large and as a result are presented only in electronic format separate from this narrative.

Table 5

Statewide Lake Assessment Summary
A statewide summary of use support status for four water uses in assessed lakes

	Aquatic Life Use	Fish Consumption Use	Recreational Use	Potable Water Supply Use
Lakes (acres)				
Assessed	76,483	58,295	79,040	44,933
Supporting (List 2)	39,301	13,942	73,928	44,921
Impaired (List 5)	5,349	38,870	5,112	12
Impaired (List 4c)	20,543	---	---	---
Approved TMDL List 4a	11,290*	5,483	---	---

*Lake Jean pH TMDL (248 acres) now attaining, so no longer included in TMDL total.

Dutch Fork Lake (87 acres) has a completed TMDL but has been breached so is no longer impaired.

*Presque Isle Bay acres are included in the fish consumption and recreation use totals. The remainder of Lake Erie is not included in the pathogen and recreation acre totals. Pennsylvania has 60 miles of Lake Erie shoreline, 14 of which comprise Presque Isle.

Table 6

Statewide Assessment Summary
Sources of Impairment: Lakes
Totals Include List 4a, 4b, 4c, and 5
(Acre totals will not equal Table 5 because a waterbody can have multiple impairments)

	Use Designation (Acres)				
Source	Aquatic Life	Fish Consumption	Recreation	Water Supply	Total
Atmospheric Deposition	219	38,870			39,089
Other	19,859				19,859
Agriculture	12,846		1,307		14,153
Source Unknown	2,935	5,588			8,523
Urban Runoff/Storm Sewers	3,641		82		3,723
On site Wastewater	3,223		87		3,310
Municipal Point Source	2,439				2,439
Natural Sources	1,222				1,222
Small Residential Runoff	531				531
Habitat Modification	486			57	543
Removal of Vegetation	445				445
Abandoned Mine Drainage	365			12	377
Golf Courses	210				210
Road Runoff	185		5		190
Recreation and Tourism	185				185
Hydromodification	121				121
Construction	89				89
Bank Modification	31				31
Land Development	5		5		10

Table 7

Statewide Assessment Summary
Causes of Impairment: Lakes
Totals Include List 4a, 4b, 4c, and 5
(Acre totals will not equal Table 5 because a waterbody can have multiple impairments)

	Use Designation (Acres)				
Cause	Aquatic Life	Fish Consumption	Recreation	Water Supply	Total
Mercury (Lakes)		40,613			40,613
pH	15,852				15,852
Nutrients	13,447		137		13,584
Suspended Solids	10,989		57		11,046
Organic Enrichment/Low D.O.	8,603				8,603
Pathogens			4,897		4,897
PCB		3,740			3,740
DO/BOD	1,280				1,280
Excessive Algal Growth	471		31		502
Turbidity	445				445
Metals	365			12	377
Noxious Aquatic Plants	291		5		296
Exotic Species	226		66		292
Siltation	95		46		141
Other Habitat Alterations	31				31
Unionized Ammonia	25				25

A total of 76,483 acres of Commonwealth lakes have been assessed for aquatic life use. Of these, 39,301 acres support that use. There are 5,349 assessed lake acres that are impaired and still require a TMDL. Approved TMDLs are in place for 11,290 acres. Pollution problems that do not require TMDLs impair 20,543 acres. The major sources of aquatic life use impairment in lakes are "other", and agriculture. "Other" is the source used for lakes on List 4c which are impaired but not requiring a TMDL. These lakes show short term fluctuations in DO or pH but

support a healthy fish community. The primary stressors are nutrients, suspended solids, organic enrichment/low DO, and pH. Low DO and high pH problems are associated with summer lake stratification.

Fish consumption assessments covered 58,295 lake acres (excluding Lake Erie but not Presque Isle Bay). Of these, 13,942 acres are assessed as supporting this use, 38,870 acres are reported as requiring a TMDL, and 5,483 acres have approved TMDLs. The reason for the large proportion of impaired acres is the implementation of Pennsylvania's risk-based mercury fish consumption advisory methodology in 2001. Nearly all of the lake advisories are due to mercury with atmospheric deposition listed as the source.

In addition, fish consumption advisories are in place for a number of species in the Pennsylvania portion of Lake Erie. These advisories are due to PCB and mercury. There are 63 miles of Lake Erie shoreline in Pennsylvania fourteen of which comprise the Presque Isle Peninsula.

A total of 79,040 lake acres have been assessed for recreation use support and 5,112 of those acres require TMDLs. Pathogens and nutrients from agriculture and on site wastewater are responsible for the impairments.

All but 12 acres of 44,933 acres assessed for potable water supply use were found to be attaining that use.

Part C3.4 Excluding the Fishable and Swimmable Uses

DEP routinely re-evaluates, as part of its triennial review of water quality standards, the two water bodies where the fishable or swimmable uses specified in Section 101(a) (2) of the federal Clean Water Act are not being met: (1) the Harbor Basin and entrance channel to Outer Erie Harbor/ Presque Isle Bay and (2) several zones in the Delaware Estuary.

The swimmable use designation was deleted from the Harbor Basin and entrance channel demarcated by U.S. Coast Guard buoys and channel markers on Outer Erie Harbor/ Presque Isle Bay because boat and commercial shipping traffic pose a serious safety hazard in this area. This decision was based on a Use Attainability study completed in 1985. Because the same conditions and hazards exist today, no change to the designated use for Outer Erie Harbor/ Presque Isle Bay is proposed.

DEP cooperated with the Delaware River Basin Commission (DRBC), EPA and other DRBC signatory states on a comprehensive Use Attainability study in the lower Delaware River and Delaware Estuary. This study resulted in appropriate restrictions relating to the swimmable use, which DRBC included in water use classifications and water quality criteria for portions of the tidal Delaware River in May 1991. These changes were incorporated into Sections 93.9e and 93.9g (Drainage Lists E and G) of Pennsylvania's Water Quality Standards in 1994. The

primary water contact use remains excluded from the designated uses for river miles 108.4 to 81.8 because of continuing significant impacts from combined sewer overflows and other hazards, such as commercial shipping traffic.

Part C3.5 Lakes Trophic Status

Lake trophic status, based on Carlson's Trophic State Index (TSI), is used as a tool to monitor lake status in Pennsylvania. Lakes with a TSI of less than 40 are oligotrophic (nutrient poor); 40-50 is mesotrophic; 50-65 is eutrophic (nutrient rich); and greater than 65 TSI is considered hypereutrophic. TSIs for Pennsylvania lakes are based on seasonal mean values of phosphorus, secchi depth and chlorophyll a. Trophic category is based on the Total Phosphorus (TP) TSI. Table 8 summarizes lake trophic status. Sums do not include Lake Erie, but do include Presque Isle Bay for pertinent data.

Table 8

Lake Trophic Status: Summary of Lakes Assessed

	Number of Lakes	Acreage of Lakes
Total Assessed (all types)	311	
Assessed for TSI	293	90024.9*
Oligotrophic	18	11878
Mesotrophic	118	28275.9
Eutrophic	106	42602.5
Hypereutrophic	23	3560.6
Unassigned (data not assembled or current	28	3707.9

* Excel summary table calculation, not NHD coverage.

Part C3.6 Lake Restoration Efforts

The Commonwealth's lake protection and restoration program is mainly supported by EPA's Nonpoint Source Program (Section 319 of the Clean Water Act) and the state's Environmental Stewardship Program, through Growing Greener grants. Other funding sources include EPA Section 104(b)3 grants, the Natural Resources Conservation Service (NRCS) PL566 program, and other programs such as the Chesapeake Bay Program and PENNVEST (Clean Water State Revolving Funds). DCNR also funds in-lake restoration practices for State Park lakes. Various partners are engaged in lake and lake watershed restorations, and are not limited to the lake

owners. Watershed partners include county Conservation Districts which implement many DEP program initiatives and also serve as grant and project managers. Program goals to restore and/or protect lake water quality are based on studies that identify impairments, pollution sources and the course of remediation. Public use and benefit of the lake, and watershed priority based on impairment are important criteria in prioritizing lakes to be funded.

Restoration techniques implemented through Phase II or restoration grants include various watershed and in-lake best management practices (BMPs) such as agricultural BMPs, riparian corridor protection and restoration (buffers and in-stream structures), lake shoreline protection, dredging, stormwater management and control techniques, point source controls, aquatic macrophyte controls, lake and watershed liming, alum treatments, biomanipulation to benefit fisheries, lake drawdowns, septic management, wildlife control, and institutional BMPs such as public education efforts and enacting protective municipal ordinances. Sewage treatment plant upgrades are also an important control technique to improve lake water quality.

Table 9 provides information on current Phase I (assessments) and Phase II (restoration/implementation) lake work being conducted in the Commonwealth. Expenditures on active lake projects or lake watershed projects in Pennsylvania currently amounts to approximately $1.5 million for 2007-2009. Table 10 summarizes known techniques used in lake restoration projects in Pennsylvania's public lakes.

Part C3.7 Lake Control Methods

Pennsylvania's lake management regulation is codified in DEP's Rules and Regulations at Section 96.5 - Discharges to Lakes, Ponds and Impoundments, which sets forth treatment requirements for point source discharges necessary to control eutrophication. It is a technology-based approach that results in increasingly stringent effluent requirements based on an assessment of the water quality benefits of such controls. The need for and extent of point source controls for a specific lake are determined by field studies conducted during spring overturn, summer stratification and fall overturn. Appropriate nutrient limitations and monitoring requirements are included in NPDES permits based on the trophic conditions found during these studies. In most cases, follow-up monitoring is conducted to evaluate the adequacy of the effluent limitations.

Nonpoint source pollution can also impact lake water quality. Phase I diagnostic studies on Pennsylvania lakes have identified nonpoint source impacts from acid deposition, agricultural runoff, streambank erosion, malfunctioning septic systems, construction, stormwater runoff, and pathogens. Mitigation of these sources is highlighted in the previous section. Acidity problems, resulting mostly from acid deposition, but also in a few cases mining runoff, may be mitigated with lime treatments, although funding for these types of projects is very limited. Lakes with naturally low pH (swamps and bogs) are not considered for treatment, but may be listed on part 4C of the Integrated List. Liming is the current method to mitigate low pH in lakes, and is used in PA on both public and private lakes. Some lakes (reservoirs) have been identified as impaired by metals from mine drainage, or more commonly by mercury (mainly via fish tissue) and none have been identified as impacted by "high acidity," based on high concentrations of dissolved

metals. Restoration efforts and BMPs in the watershed are the best way to reduce mining effects in waterbodies (i.e. treating the source of the problem). In-lake mitigation could be explored by using alum treatments to bind metals into the lake sediments. Some "toxics" can be removed by dredging but again, funding for dredging is limited. Most efforts have focused on source control (mining BMPs or AMD BMPs) and natural recovery rather than in-lake mitigation.

Table 9. Current Lake Projects in Pennsylvania as of 2008. Does not include assessments done by DEP. Final reports available from the Bureau of Watershed Management.

Lake or Study Name	County	Study Type	Study Period	Federal Funds	Fund Source	GG totals	319 totals	Match	Sponsor
Lake Jean	Luzerne, Sullivan	Phase II	1995 - yearly		DCNR	$1,500			Bureau of State Parks
Harveys Lake	Luzerne	Phase II and III	2007-2009	$85,000	319		$85,000		Harveys Lake Borough
		Phase II and III	2009 - 2011	$262,534	319		$262,534	$48,315	Harveys Lake Borough
Stephen Foster Lake	Bradford	Phase II	2007-2009	$99,070	319		$99,070		Bradford CCD
		Phase III	2004 - 2009	$4,000	319		$4,000		$2,000/yr for monitoring
Frances Slocum Lake	Luzerne	Phase 1	2007-2009	$48,900	319				Luzerne CCD
Shawnee Lake	Bedford	Phase 1	2007-2009	$30,000	319		$30,000	$30,000	DCNR
Lake Galena	Bucks	Phase 1	2008 - 2009	$45,000	319		$45,000		Bucks CCD
Lake Carey	Woming	Phase II	2008 - 2009		GG	$308,939	$67,490	$67,490	Lake Carey Welfare Association
Glendale Lake	Cambria	Phase II	2008 - 2009		GG	$43,500		$13,106	Cambria Co. Cons. District
Lake Wallenpaupack	Pike, Wayne	Phase II	2008 - 2009		GG	$40,530			Lake Wallenpaupack Wtrshd Mngmt

									Dst.
	Pike	Phase II	2008 - 2009		GG	$26,240		$6,560	Paupack Township
Conneaut Lake	Crawford	Phase II	2008 - 2009		GG	$35,000		$25,000	Crawford Co. Cons. District
		Phase II	2008 - 2009		GG	$30,000		$12,500	
Lake Sinoquipe	Fulton	Phase II	2008 - 2009		GG	$106,960		$19,040	Fulton Co. Cons. District
Various Small Lake Projects	multi	mostly Phase 1	2008 - 2009		GG	$350,000		$252,520	C-SAW
Total Funds				$574,504		$942,669	$593,094	$474,531	
Total 319 + GG									$1,535,763

319 = Nonpoint Source Program

DCNR = PA Dept. Conservation & Natural Resources

GG = Growing Greener Program, PA Environmental Stewardship Funds

CCD = County Conservation District

Not included are funds for dam repairs

Phase I = lake & watershed assessment/monitoring & management plan

Phase II = restoration BMPs, including Educational

Phase III = monitoring for efficacy, post-TMDL

Table 10

Lake Rehabilitation Techniques Used in Public Lakes

Technique	Number of Lakes Where Technique Used	Acres of Lakes Where Technique Used
In-Lake Treatment		
Aeration	2	50
Aquatic herbicide treatment	38	435
Aquatic macrophyte harvesting	3	50
Lake drawdowns	21	7,085
Liming	1	100
Watershed Treatments		
Sediment traps/detention basins	6	8,128
Shoreline erosion controls/bank stabilization	11	13,907
Conservation tillage	4	7,633
Animal waste management practices installed	7	9,787
Riprap installed	4	7,334
Road or skid trail management	4	14,654
Stream restoration (natural channel design)	3	1665
Created wetlands	4	1719
Other Lake Protection/Restoration Controls		
Local lake management program in place	55	63,019
Public information/education program/activities	45	46,645
Local ordinances/regulations to protect lake	2	6,350
Point source controls	14	13,834

Part C4 Wetlands Protection Program

Pennsylvania has 403,924 acres of wetlands and 412,905 acres of deep-water habitats such as ponds and lakes. About 1.4 percent of the Commonwealth's land surface is represented by wetlands, with 97 percent classified as palustrine. Approximately 76 percent of the palustrine wetlands are further classified as forested and scrub/shrub wetlands. Lacustrine wetlands, mainly composed of the shallow zone (less than 6.6 feet deep) of Lake Erie, represent about two percent of the total, while riverine wetlands make up the remaining one percent. Pennsylvania has 512 acres of tidal wetlands in the Delaware Estuary.

Wetlands are most abundant in the glaciated portions of northeastern and northwestern Pennsylvania. Crawford, Mercer, Erie, Monroe, Pike, Wayne and Luzerne counties contain 40

percent of the Commonwealth's wetlands. Pike and Monroe counties have the highest percentages of land covered by wetlands with 6.7 percent and 6.4 percent, respectively.

DEP's jurisdiction for the protection of wetlands is primarily established by the Dam Safety and Encroachments Act of 1978. The Environmental Quality Board adopted Chapter 105, Dam Safety and Waterway Management rules and regulations effective September 27, 1980. Amended regulations became effective October 12, 1991. Since March 1, 1995, DEP has been given authority to attach federal Section 404 authorization along with state permit approvals for most projects through the Pennsylvania State Programmatic General Permit (PASPGP-3). This provides "one-stop shopping" for approximately 80 percent of the state and federal permit applications received. PASPGP-3 will expire on June 30, 2011.

Thirty (30) of Pennsylvania's 66 county conservation districts have Chapter 105 Delegation Agreements with DEP to register Bureau of Watershed Management General Permits within their counties. The basic duties of each district are to provide information and written materials to the general public on the Dam Safety and Encroachments Act and Chapter 105 regulations, register general permits, and perform on-site investigations as the first step to gain voluntary compliance. The Office of Water Management coordinates this program.

An Environmental Review Committee, consisting of representatives of the U.S. Fish and Wildlife Service (USFWS), Pennsylvania Game Commission (PGC), Pennsylvania Fish and Boat Commission (PFBC), EPA, U.S. Army Corps of Engineers (ACOE) and DEP, meets monthly to review selected applications submitted to DEP. A similar committee has been established that meets semi-annually to review ongoing enforcement actions. Through these committees, lead agencies are designated for taking action or providing field support to resolve violations or to provide data for permit reviews. This coordination economically utilizes limited staff of both state and federal agencies.

DEP, in cooperation with the Penn State Cooperative Wetlands Center completed a pilot wetland condition assessment in an area of south central Pennsylvania in 2006. The pilot was to test a wetland condition assessment methodology that could be expanded to the entire Commonwealth. Evaluation of the results could lead to a standardized wetlands condition assessment methodology. Results from the pilot assessment will be evaluated in 2010 with the assistance of EPA's Office of Research and Development. The same wetland assessment methodology is being utilized to evaluate the wetland replacement efforts conducted from 2000-2004. The results of this evaluation will be completed in 2010 as well.

DEP staff participated in the Mid-Atlantic Wetland Workgroup efforts to provide assistance in the 2008-09 probabilistic wetlands assessment of all EPA Region III states and foster coordination between wetland programs and existing water quality monitoring and reporting activities. DEP staff are participating in the National Wetland Assessment Workgroup to plan the 2011 national wetland assessment.

Part C5 Trend Analysis for Surface Waters

Introduction

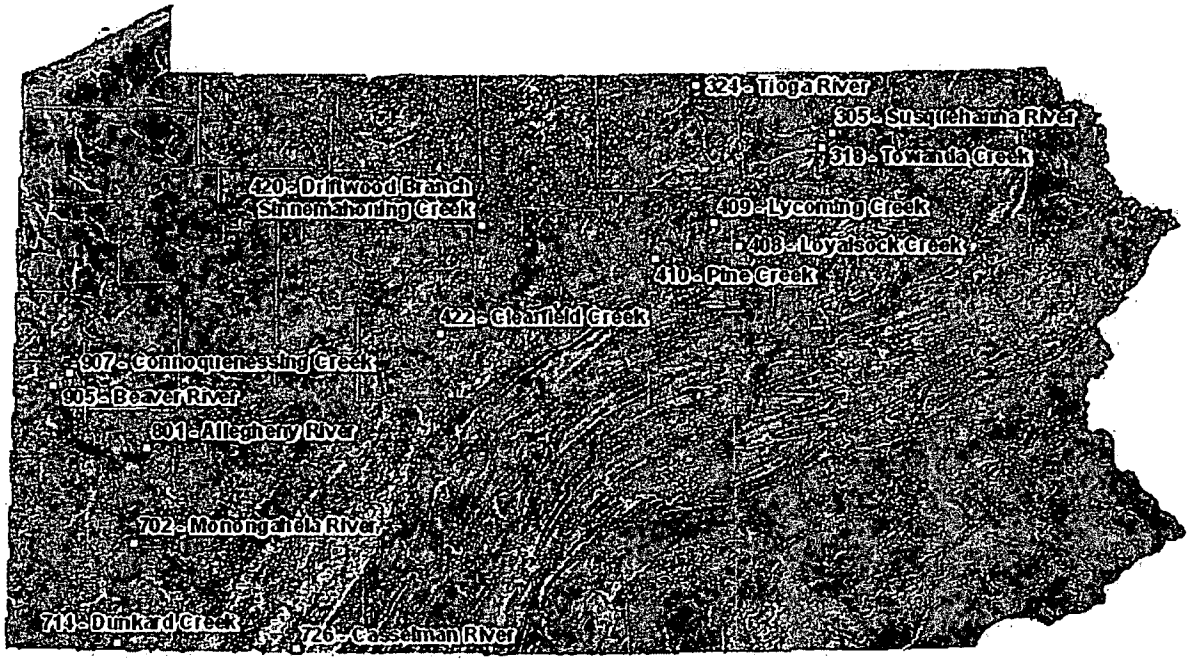
Periodically, the Department analyzes long-term trends of chemical water quality based on data collected at a network of fixed surface water monitoring sites located throughout the Commonwealth.

Trend analysis is a statistical technique used to determine if values of a random variable collected over some time period generally increase or decrease. The results of any trend analysis should be interpreted with caution. Simply because no trend is detected, does not prove that a trend does not exist. Rather, this result may mean that there either really is no trend or that insufficient evidence exists to conclude that there is a trend.

Methods

The present analyses utilized a parametric trend test developed and performed by staff with the United States Geologic Survey. This approach adjusts observed variation in water quality parameters for variation in flow because most water quality parameters exhibit substantial co-variation with stream flow.

The tests were performed on a sub-set of the Department's fixed-site water quality network (WQN) stations located in areas of the state underlain by the Marcellus shale geologic formation. The following map shows the 14 site locations.



At each of the sites, 19 different water quality parameters were tested for trends. The period of data considered in these analyses was from October 1991 through September 2009 for most parameters, with total nitrogen and dissolved inorganic phosphorous data from October 2002 through September 2009. Samples were mostly collected on a monthly or bi-monthly basis. The following parameters were tested for trends at the selected stations:

Alkalinity, total (ALK)
Hardness (HARD)
Calcium (Ca)
Magnesium (Mg)
Aluminum, total (Al)
Copper, total (Cu)
Iron, Total (Fe)
Lead, total (Pb)
Zinc, total (Zn)
Oxygen, dissolved (DO)
Phosphorous, total (TP)
Phosphorus, dissolved inorganic (DIP)
Nitrogen, total (TN)
Nitrite (NO2)
Nitrate (NO3)
Ammonia, total (NH4)
Sulfate (SO4)
Total Dissolved Solids (TDS)
Total Suspended Solids (TSS)

Results

Trend test results are presented in the table below. Dissolved oxygen results are not reported because samples were collected at different times of the day and diurnal fluctuations likely confound any trend observations. Nitrite results are not reported because concentrations were consistently reported at or below laboratory detection limits and slight changes in values had disproportionate effects on nitrite trend tests.

WQN Station	ALK	HARD	Ca	Mg	Al	Cu	Fe	Pb	Zn	TP	DIP	TN	NO3	NH4	SO4	TDS	TSS
305 - Susquehanna River	10	28	22	28	-8	-49	-2	-83	22	29	30	-19	-27	-34	-60	15	15
318 - Towanda Creek	17	11	-8	-20	12	-50	-23	-96	-43	-57	-39	-58	-75	---	-52	22	54
324 - Tioga River	42	5	-21	-24	-29	-50	-19	-93	-66	-22	-34	-20	-34	-38	-34	-2	13
408 - Loyalsock Creek	10	15	-3	-8	-25	---	-36	---	-79	-50	---	-16	-65	---	-20	58	-41
409 - Lycoming Creek	7	7	-11	-15	-11	---	-8	---	-56	-48	---	-38	-58	---	-27	46	-19
410 - Pine Creek	25	37	5	12	104	---	7	-93	-15	-62	---	-30	-64	---	-15	24	69
420 - Driftwood Branch Sinnemahoning Creek	10	26	2	1	-3	---	0	---	---	-54	---	-18	-47	116	-13	54	17
422 - Clearfield Creek	430	13	35	51	-65	-53	-45	-90	-73	-66	---	-24	-42	-69	8	10	2
702 - Monongahela River	46	10	-39	-41	-7	-53	-15	-90	-51	-69	-69	2	-6	-30	-2	12	14
714 - Dunkard Creek	83	92	175	89	-40	-42	-52	-93	-45	-41	-32	97	163	240	144	118	29
726 - Casselman River	36	28	13	1	-28	-79	-19	-80	-40	-50	1	-15	-54	26	-23	-44	98
801 - Allegheny River	30	2	20	19	-36	-53	-38	-95	-45	-69	-10	-28	-29	-35	-29	-7	6
905 - Beaver River	11	13	-28	-40	-13	-58	-47	-84	-44	-2	-33	-18	-45	5	-29	7	41
907 - Connoquenessing Creek	24	-3	-90	-36	-45	-60	-29	-97	-36	-37	41	-26	-92	-71	-24	-6	-28

values indicate approximate % change in flow-adjusted trend over the tested time period

highlighted values indicate statistically significant trends (p-value < 0.05)

--- indicate datasets without enough data to run the trend test

Of the 14 stations tested, 13 showed significant increasing trends in total alkalinity, and 8 showed significantly increasing trends in hardness. The alkalinity trend at WQN 422 on Clearfield Creek was especially pronounced. Only 3 stations exhibited significant trends in calcium concentration, with decreasing trends observed at WQN 409 on Lycoming Creek and WQN 907 on Connoquenessing Creek, and an increasing calcium trend observed at WQN 726 on Casselman River. Three stations also showed significant trends in magnesium concentrations over the tested period of record, with WQN 408 on Loyalsock Creek and WQN 409 on Lycoming Creek displaying decreasing magnesium trends, and WQN 410 on Pine Creek showing an increasing trend in magnesium concentration. The only station that did not show a significant increasing trend in alkalinity – WQN 409 on Lycoming Creek – showed decreasing trends in calcium and magnesium.

The only station showing a significant increasing trend in total aluminum was WQN 410 on Pine Creek; five other stations showed significant decreasing trends in total aluminum. Out of the 11 stations with sufficient total copper data to run the trend test, 10 stations showed significant decreasing trends. Three stations showed significant decreasing trends in total iron, with one station – WQN 905 on Beaver River – showing a significant increasing trend in total iron concentration. All 11 stations with sufficient data for total lead showed significant decreasing trends, as did 11 of the 13 stations with sufficient total zinc data. Twelve of the 14 stations showed significant decreasing trends in total phosphorus, with WQN 305 being the only station exhibiting a significant increasing total phosphorus trend. Only two stations – WQN 318 on Towanda Creek and WQN 702 on Monongahela River – showed significant trends in dissolved inorganic phosphorous, both decreasing. Six stations showed significant decreasing trends in total nitrogen, with WQN 714 on Dunkard Creek being the only station tested to show a significant increasing trend in total nitrogen. Similarly, WQN 714 on Dunkard Creek was the only station displaying a significant increasing trend in nitrate concentration, with significant decreasing trends observed at 11 other stations. All stations that displayed significant decreasing trends in total nitrogen also showed significant decreasing trends in nitrate, with the exception of WQN 305 on Susquehanna River where the nitrate trend was not significant. Five stations showed significant decreasing trends for total ammonia with WQN 714 on Dunkard Creek again being the only station to show a significant increasing trend for this nitrogen parameter.

Eleven tested stations showed significant decreasing trends in sulfate concentrations, with WQN 714 on Dunkard Creek being the only tested station where a significant increasing sulfate trend was observed. Four stations showed significant increasing trends in total dissolved solids; none of the tested stations showed significantly decreasing total dissolved solids trends. None of the trends for total suspended solids were statistically significant.

Discussion

Overall, these results suggest water quality has significantly improved – as evidenced by decreasing trends in potentially toxic metals, decreasing trends in phosphorus and nitrogen species and decreasing sulfate concentrations – at most of these 14 stations based on the sampling conducted during the tested time period. A few significant exceptions to these observations were seen at some stations – like the increasing aluminum trend observed at WQN 410 on Pine Creek, the increasing iron trend at WQN 905 on Beaver River, increasing total phosphorus at WQN 305 on Susquehanna River, as well as increasing nitrogen and sulfate levels at WQN 714 on Dunkard Creek. Also, four stations did show significant increasing trends in total dissolved solids. Almost all of these stations showed significant increasing trends in total alkalinity, which usually can be considered a water quality improvement because increased alkalinity means increased acid neutralizing capacity, but elevation of alkalinity much beyond natural levels can have detrimental consequences to water quality, so assessment of these trends depends on the specific context of conditions at each station.

Part D Groundwater

Part D1 Groundwater Assessment

Ambient/Fixed Station Ground Water Quality Monitoring Network (GWMN):

Resources available to operate the Ambient Fixed Ground Water Monitoring Program continue to be limited. Ground water quality monitoring has been active from 2005 to 2008 in four GWMN basins: Lancaster basin (191), Kirkwood Basin (196), Pottstown Basin (58), and Telford Basin (61). A total maximum daily load is under development for the Upper Octoraro Creek (Kirkwood Basin). The Ground water quality monitoring data for the Kirkwood Basin has been made available for this effort.

Statewide Monitoring Networks:

To address the need for increased groundwater quality monitoring coverage of the state to meet program goals, DEP has worked with the USGS to design a statewide, watershed-based groundwater quality network using the stratified approach applied in the USGS National Water Quality Assessment project for the lower Susquehanna River. There have been 13 major aquifer categories identified for the network based on dominant rock type or geolithologies. The distribution of these geolithic units (except for the glacial outwash) are shown on Figure D-1.

Figure D-1

To develop the groundwater network, 30 groundwater monitoring points are selected within each geolithic unit. This network can be reconfigured to be analyzed based upon the planning watersheds previously used by DEP for watershed management.

Part D2 USGS Releases Groundwater Quality Data Compilation for Pennsylvania

Under a joint funding agreement with the Bureau of Watershed Management, the U.S. Geological Survey has updated a digital Data Series report that provides a compilation of ambient groundwater quality data for a 28-year period based on water samples from wells throughout Pennsylvania. The updated report has tripled the amount of wells used in the original compilation completed in 2006. Twelve data sources from local, state, and federal agencies were used in the updated compilation, which covers 11 different analyte groups. The data are presented both in terms of the 35 water planning watersheds used by DEP as well as 13 major geolithologic units representing the major aquifers in the state. Over 24,000 wells were included in the project and the number of analyses ranged from several thousands for nutrients and other inorganic compounds to two dozen for antibiotics. The number of wells sampled varies considerably across the state with most being concentrated near major urban centers. Minimal data exists for about a fourth of the state. When compared to maximum contaminant levels (MCL), the analyte group with the highest MCL exceedance was microorganisms (50% of 4,674 samples), followed by volatile organic compounds (24% of 4,528 samples). The lowest MCL exceedances were for insecticides (<1% of 1,424 samples) and wastewater compounds (<1% of 328 samples). With limited monitoring of ambient groundwater underway in only a handful of basins in the Ambient/Fixed Station Monitoring Networks, this compilation will help fill in data gaps and shed light on how to establish a more complete statewide groundwater monitoring network. Alternatively, analytical and interpretive tools may be developed and applied to the database to help predict ambient groundwater quality in areas lacking data. The report (Low, D.J., Chichester, D.C. and Zarr, L.F. 2008. Selected groundwater quality data in Pennsylvania – 1979-2006: USGS Data Series 314, 22 p.) is available on-line at http://pubs.usgs.gov/ds/314/

Part D3 Sources of Groundwater Contamination

Each DEP regional office defined its highest priority sources of groundwater contamination. These concerns are consistent from the 2008 report and are shown below in Table D-1. The priorities include industrial facilities, underground storage tanks, hazardous waste sites, abandoned landfills, aboveground storage tanks, manure/fertilizer applications, chemical facilities, and septic systems. The contaminants associated with these sources are also shown. Multiple regional studies have indicated 30% to 90% of private water wells have total coliform contamination. In addition, one study showed up to 30% E. coli contamination. The USGS study Relation Between Selected Well Construction Characteristics And Occurrence Of Bacteria In Private Household Supply Wells, South-Central And Southeastern Pennsylvania, WRIR 01-4206, stated that either

or both well construction and aquifer contamination could be responsible for the results but problems were more likely to occur where the well was poorly constructed.

Table D-1

Major Sources of Groundwater Contamination

Contaminant Source	Highest-Priority Sources (√)	Factors Considered in Selecting Contaminant Sources (1)	Contaminants
Agricultural Activities			
Animal feedlots			
Chemical facilities	√	ADCEFG	ABCDE
Drainage wells			
Manure/fertilizer applications	√	ABCDEFGH	DEIK
On site pesticide mixing/loading			
Pesticide applications			
Storage/Treatment Activities			
Land application of biosolids			
Lawn maintenance/pest treatment			
Material stockpiles			
Storage tanks (above ground)	√	ABCDEFG	ABC
Storage tanks (underground)	√	ABCDEFGH	ABCDEGIJK
Surface impoundments			
Waste piles or tailings			
Disposal Activities			

Abandoned landfills	√	ABCDE	ADGJ
Landfills (current)			
Septic systems	√	ABCDEFGH	EIK
Underground injections wells			
Resource Extraction			
Abandoned/existing oil/gas wells			
Abandoned/poorly built water wells			
Coal mining/acid mine drainage			
Quarries (non coal)/borrow pits			
Other			
Atmospheric deposition			
Industrial facilities	√	ABCDEFG	ABCG
Hazardous waste generators			
Hazardous waste sites	√	ABCDEFG	ABCDEGHIJK
Natural groundwater conditions **(3)**			
Petroleum/fuel pipelines			
Sewer lines			
Salt storage and road deicing			
Spills/transportation of materials			
Urban runoff			

(1) Factors in Selecting a Contaminant Source

A. Human health and/or environmental risk (toxicity)
B. Size of the population at risk
C. Location of the source relative to drinking water
D. Number and/or size of contaminant sources
E. Hydrogeologic sensitivity
F. State findings, other findings
G. Documented from mandatory reporting
H. Geographic distribution/occurrence
I. Other criteria (please describe)

(2) Contaminants

A. Volatile organic chemicals
B. Petroleum compounds
C. MTBE/TBA
D. Pesticides
E. Nitrates
F. Salinity/brine
G. Metals
H. Radionuclides
I. Microbiological
J. Sulfates, manganese and/or
K. Total dissolved solids
L. Other contaminant (please

(3) This could include natural occurring contaminants such as radium, radon, sulfate, iron, manganese,

Part D4 Statewide Groundwater Protection Programs

A summary of state groundwater protection programs is presented in Table D-2. Important groundwater protection programs are summarized following the table. Pennsylvania does not have statewide, private water well construction standards.

Table D-2

Summary of State Groundwater Protection Programs

Programs or Activities	Check (√)	Implementation Status	Responsible State Agency
Active SARA Title III Program	√	Fully established	BLRWM
Ambient groundwater monitoring system	√	Continuing efforts	BWM
Aquifer vulnerability assessment (pesticides)	√	Continuing efforts	PDA
Aquifer mapping	√	Continuing efforts	BTGS
Aquifer characterization	√	Continuing efforts	BTGS
Comprehensive data management system	√	Under development	BWM*
EPA-endorsed Core Comprehensive State Groundwater Protection Program (CSGWPP)	√	Partially established	BWM*
Groundwater discharge permits	√	Continuing efforts	RWM
Groundwater Best Management Practices	√	Continuing efforts	BWM*
Groundwater legislation (remediation)	√	Fully established	BLRWM
Groundwater classification (remediation)	√	Continuing efforts	BLRWM
Groundwater quality standards (remediation)	√	Fully established	BLRWM
Interagency coordination for groundwater protection initiatives	√	Continuing efforts	BWM*
Non-point source controls	√	Continuing efforts	BWM*
Pesticide State Management Plan	√	Continuing efforts	PDA
Pollution Prevention Plan	√	Continuing efforts	OPPCA
Resource Conservation and Recovery Act (RCRA) Primacy	√	Fully established	BLRWM
Source Water Assessment Program (EPA approved 2000)	√	Fully established	BWM
State Superfund	√	Fully established	BLRWM
State RCRA Program incorporating more stringent requirements than RCRA primacy		Not applicable	
State septic system regulations	√	Fully established	BWSFR

Underground storage tank installation requirements	√	Fully established	BLRWM
Underground storage tank remediation fund	√	Fully established	BLRWM
Underground storage tank permit program	√	Fully established	BLRWM
Underground injection control program		Not applicable; EPA direct implementation	
Vulnerability assessment for drinking water/wellhead protection	√	Partially established	BWM*
Well abandonment guidelines	√	Fully established	BTGS*
Wellhead Protection Program (EPA approved 1999)	√	Continuing effort	BWM
Well installation regulations (Public Water Supplies)	√	Fully established	BWSFR
Others:			
Monitoring well installation guidance	√	Fully established	BWM*
Nutrient management program	√	Continuing efforts	BWM
Private well installation guidance	√	Continuing efforts	BWM
Voluntary site remediation program	√	Fully established	BLRWM

BLRWM DEP Bureau of Land Recycling and Waste Management
BTGS Bureau of Topographic and Geologic Survey, Department of Conservation and Natural Resources
BWM DEP Bureau of Watershed Management
BWSFR DEP Bureau of Water Standards and Facility Regulation
OPPCA DEP Office of Pollution Prevention and Compliance Assistance
PDA Bureau of Plant Industry, Department of Agriculture
RWM DEP Regional Water Management Program
* Indicates lead agency

Part D5 Groundwater Protection Program

DEP's Principles for Groundwater Pollution Prevention and Remediation (DEP ID: 383-0800-001), is available on DEP's website at www.depweb.state.pa.us, and has been in place since 1996. This document sets forth the principles for a consistent statewide program for prevention of groundwater pollution and remediation of contaminated

groundwater. The ultimate goal for groundwater protection, as set forth in the Principles, is prevention of groundwater contamination whenever possible.

Part D6 Wellhead Protection and Source Water Protection Programs

Pennsylvania's Wellhead Protection Program (WHP) is the cornerstone of the Source Water Assessment and Protection (SWAP) Program for groundwater resources serving public water systems. Pennsylvania's Wellhead Protection Program (WHP) was developed in 1989 and subsequently approved by EPA in 1999. The Pennsylvania safe drinking water regulations direct public water suppliers to find and utilize the best sources available and take measures necessary to protect those sources. These regulations define wellhead protection, set permitting requirements for groundwater resources, and set forth requirements for state approval of local WHP programs.

More than 450 municipalities or water suppliers are developing or implementing local WHP programs and/or watershed protection programs. DEP has awarded 97 Source Water Protection Grants worth 4.3 million dollars, provided direct technical assistance, and supported partnerships to assist communities and water systems to protect community drinking water sources from contamination. These grants funded the voluntary development of local Source Water Protection (SWP) programs that meet DEP's minimum requirements. Since 2007, direct technical assistance has been provided to community water systems and municipalities through the Source Water Protection Technical Assistance Program. Over 50 Community Water Systems (CWS) are participating in the program at this time. In addition to protecting public health and infrastructure investment by avoiding costly contamination, local SWP efforts complement watershed protection and management through sound land-use planning and pollution prevention activities. Source water protection is an integral part of a sustainable infrastructure for public water supply.

Part D7 Source Water Assessment and Protection (SWAP) Program

The 1996 Safe Drinking Water Act reauthorization requires that states develop a Source Water Assessment and Protection (SWAP) Program. The SWAP program assesses the drinking water sources that serve public water systems for their susceptibility to pollution. This information is used as a basis for building voluntary, community-based barriers to drinking water contamination. States are required to assess all sources (both groundwater and surface water) serving public water systems. In Pennsylvania, this represents about 14,000 permanent drinking water sources. EPA approved Pennsylvania's SWAP program in March 2000. Pennsylvania has completed the source water assessments for 98% of systems in the state. Under the plan, Pennsylvania will continue to conduct assessments for new sources and update completed assessments as needed.

For the assessments that have been completed, the SWAP program has delineated the boundaries of the areas providing source waters for all public water systems and has identified (to the extent practicable) the origins of regulated and certain unregulated contaminants in the delineated area to determine the susceptibility of the water sources to such contaminants.

The SWAP program provides prioritized information on the potential sources of contamination that will be the basis for coordination of restoration efforts and development of local source water protection programs. These efforts will lead to improvements in raw water quality and may also result in reduced treatment costs for the public water system. The following table provides a summary of the results of the source water assessments for the most common and the most threatening potential sources of contamination to sources of public drinking water conducted under the EPA Program. More detail on how the source water assessments were conducted can be found in the Source Water Assessment and Protection Program guidance.

GW RANK	EPA Most Threatening	EPA Most Prevalent
1	Underground Storage Tanks	Transportation Corridors
2	Transportation Corridors	Agriculture
3	Agriculture	Underground Storage Tanks
4	Automobile Related Activities	Septic
5	Mining	Mining

SW RANK	EPA Most Threatening	EPA Most Prevalent
1	Transportation Corridors	Transportation Corridors
2	Agriculture	Municipal Sanitary Waste Disposal
3	Fertilizer and Pesticide Applications	Septic Systems
4	Storm water	Mining
5	Mining	Animal Feeding Operations

Source water assessments support emergency response, improved land use planning and municipal decisions. They also prioritize and help coordinate actions by federal and state agencies to better protect public health and safety. Spill detection and emergency response networks for public water systems in Pennsylvania have been established on the Allegheny, Monongahela, Susquehanna, Schuylkill, and Delaware Rivers. They include a variety of on-line detectors to alert operators to imminent changes in raw water quality at surface water intakes. Long-term trends in raw water conditions based on data provided by these monitors may be the basis for restoration and protection efforts or changes in water treatment schedules. The core of these programs is the Internet based

communication network that shares raw water data, incident information, and response efforts in real-time.