Defending the Environmental Rights of Pennsylvania Communities from Shale Gas Development

Strategies for Residents and Local Officials

Prepared by **the Delaware Riverkeeper Network**

September 2015

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The Delaware Riverkeeper Network champions the rights of our communities to a Delaware River and tributary streams that are free-flowing, clean, healthy, and abundant with a diversity of life.

The Delaware Riverkeeper Network gives voice, strength and protection to the communities and waterways of the Delaware River. Through independent advocacy, and the use of accurate facts, science and law, DRN works to ensure the rich and healthy future that can only exist with a clean, healthy and free flowing river system.

The Delaware Riverkeeper Network is unique in that it is founded upon the expectation of personal and community responsibility for river protection, as personified by the Delaware Riverkeeper. DRN is the only grassroots advocacy organization that operates watershed-wide and empowers communities with the engaged interaction and information needed to succeed in protecting our River and region now into the future.

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Contents

Preface

This Guidebook

This Guidebook is meant to provide support and guidance to elected officials, government entities, and residents working at the municipal level to protect the environment and community resources.

The Pennsylvania Supreme Court's recent decision in Robinson Township, Delaware Riverkeeper Network, et al. v. Commonwealth, 83 A.3d 901 (Pa. 2013), has required a reconsideration of the roles and responsibilities of those entrusted to protect our shared natural resources. The Court has recognized that the Pennsylvania Constitution's Environmental Rights Amendment is imperative, requiring that the decisions made at every level of government protect our constitutional environmental rights.

This guidebook also offers tools and strategies to help municipalities carry out these actions at the municipal level. Each municipality has unique needs and specific resources that municipal planning, zoning and regulation are meant to care for and this guidebook helps spell out how to do that.

Municipalities should always be sure to consult with knowledgeable legal counsel and other experts. While there is no cookie-cutter answer, there is a unified goal - to fulfill the letter and spirit of Article I, Section 27, for present and future generations.

Principles of Established Municipal Planning and Regulation

This guide is based on the well-established principles that are the foundation of municipal planning and implementation of environmental laws by government.

At the core, these principles establish:

1. The power and responsibilities of local government to control activities within their jurisdiction;
2. Local zoning is firmly entrenched in Pennsylvania law;
3. Ordinances are essential to preventing harm caused by industrial activities such as gas development and by extension, respecting citizens' constitutional rights.


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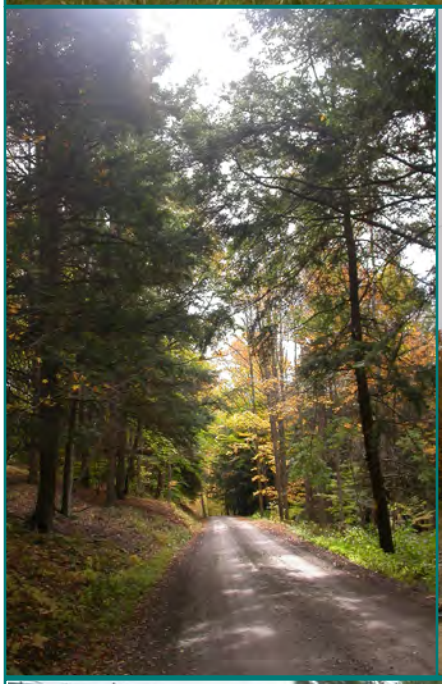

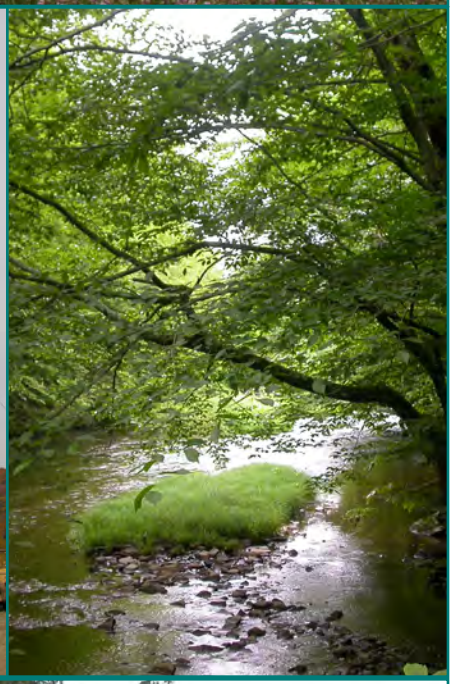


SALE

Introduction

Robinson Township, Delaware Riverkeeper Network, et. al. v. Commonwealth

Anyone interested in figuring out what can be done to protect communities from the risks associated with wide-scale industrial development must start by studying the Delaware Riverkeeper Network's 2013 landmark legal victory in the Pennsylvania Supreme Court. The case, Robinson Township, Delaware Riverkeeper Network, et al v. Commonwealth, is widely recognized as the case that overturned Act 13, a pernicious law that took away local zoning authority over oil and gas development. The case did accomplish that very significant victory, but it did much more. For the first time ever, the court gave real meaning and weight to the Environmental Rights Amendment to the Pennsylvania Constitution (Art I, Sec 27). As a result of the decision, everything we thought we knew about land use law, environmental law and the role of local governments in Pennsylvania needs to be reconsidered.

Ratified over 40 years ago, the Environmental Rights Amendment had been largely considered toothless. Never before had it been used to declare a legislative action unconstitutional. Never before had the Court recognized that our environmental rights are inherent, inalienable, and indefeasible. Never before had the Court recognized that, just like the government can't take any action that would unreasonably interfere with our free speech rights or our right to bear arms, likewise, the government cannot take any action that would unreasonably interfere with our environmental rights. That means that government agencies cannot enact regulations that would cause an unreasonable degradation of our air or water. It means that government agencies cannot issue permits for any project that would unreasonably degrade our shared natural resources. It means that government agencies must protect our natural resources for future generations.

How will this impact what happens at the local level? The truth is that we do not fully know. Legislative bodies, executive agencies and courts have disregarded our constitutional environmental rights in the past, many are disregarding our constitutional environmental rights now, and they might try to disregard them in the future. As the Rev. Martin Luther King, Jr. said, "The arc of the moral universe is long, but it bends towards justice." We might not obtain justice in every case, but now that this understanding of our constitutional environmental rights has been expressed by the highest court in our state, there is only so far backward we can go. There is no putting the genie back in the bottle. We have entered a new era of environmental rights. The text of the Environmental Rights Amendment has meaning and it cannot be ignored. At every turn, we must insist that our elected representatives, our appointed government officials, and our judges respect and fulfill the promise of the Environmental Rights Amendment. The discussion that follows provides a framework for this vital long-term effort.

The Marcellus Shale Frack Frenzy

Shale gas development has engulfed parts of Pennsylvania underlain by the Marcellus Shale formation. All of Pennsylvania is experiencing impacts from shale gas development because of gas-related infrastructure buildout, waste disposal, and end use of fracked gas.

The undeniable environmental and community impacts that have occurred have changed life in municipalities where drilling and gas related operations are located and indelibly changed the face of the state.

The unsustainable practices that are being used by the shale industry have taken their toll despite current regulations and industrial "best management practices". The inability to make drilling safe is explained in detail in Delaware Riverkeeper Network's publication *Unsafe and Unsustainable; Experts Review the Center for Sustainable Shale Development's Performance Standards for Shale Gas Development* at www.bit.ly/DRN-CSSDExpertReviews.

This municipal guide was created following the Supreme Court decision on Act 13 to help citizens and local officials where drilling is occurring. The following sections of this guide provide information on what Pennsylvania law says about municipal control over oil and gas development and how zoning and other types of ordinances can help protect health, quality of life, and the environment. It also offers sample resolutions that can help communities express the policies and principles they envision for themselves.

With these, we seek to support citizens who want to have input into the laws and practices that affect them and elected officials who want to fulfill their sworn responsibilities to protect their communities for years to come.

Section 1 - General Guidance for Municipalities on the Environmental Rights Amendment

This section provides guidance concerning the Pennsylvania Supreme Court's decision in Robinson Township, Delaware Riverkeeper Network, et al v. Commonwealth of Pennsylvania, which contained an extensive discussion of municipal obligations under Article I, Section 27 of the Pennsylvania Constitution ("Section 27"). The plurality's thorough discussion of Section 27 principles re-affirms both municipal authority and ***obligation*** to act as trustee of the people's public natural resources, and to respect the individual environmental rights of citizens. This section will summarize the Court's analysis of Section 27, and outline how it could impact municipal decision making. At its core, the decision provides substantial weight to the argument that municipalities *must* comply with Section 27 and that municipalities are restrained from unduly infringing on the individual environmental rights of citizens, just as municipalities may not unduly infringe on private property rights.

Although only a plurality of justices signed the Court's discussion concerning Section 27, the discussion is the most significant judicial pronouncement ever on Section 27. None of the other justices engaged in a substantive analysis of Section 27's text contradicting the textual analysis the plurality provided. As a result, the plurality opinion is likely to be relied on or looked to as guidance by lower courts and citizens in further Section 27-based challenges.

1. The Plurality's Textual Analysis of the Pennsylvania Constitution's Environmental Rights Amendment

Article I, Section 27 of the Pennsylvania Constitution 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.

In interpreting the plain language of Section 27, the Pennsylvania Supreme Court has explained that Section 27 has two components that may overlap at times. The first component is that of individual environmental rights, while the second is the public trust. We summarize each below.

a. Individual Environmental Rights

> 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. —Art. 1, Sec. 27, cl.1

The first clause of Section 27 is a statement that the Pennsylvania Constitution protects individual environmental rights from governmental infringement. See, e.g., Pennsylvania Envtl. Def. Found. v. Com. ("PEDF"), 108 A.3d 140, 157 (Pa. Commw. Ct. 2015), reargument denied (Feb. 3, 2015) (citing and quoting Robinson Twp., 83 A.3d at 953). The term "the people" translates to a right "personal to each citizen," just as Article I, Section 8 has been interpreted to mean an individual right of privacy. Robinson Twp v. Commonwealth of Pennsylvania, 83 A.3d at 951 n.39. Thus, each citizen has an individual right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. The Pennsylvania Constitution protects these rights in the same way as all other inherent rights enshrined in Article I, including the right to free speech and property rights. Id. at 953-54.

"The corollary of the people's Section 27 reservation of right to an environment of quality is ***an obligation*** on the government's behalf to refrain from ***unduly infringing*** upon or ***violating*** the right, including by legislative enactment or executive action." Robinson Twp., 83 A.3d at 952; see also PEDF, 108 A.3d at 156-57 (quoting 83 A.3d at 953). In other words, Section 27 protects individual environmental rights from undue governmental infringement, just like other rights such as free speech, due process, and property rights.

b. Public Trust

> 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. —Art. I, Sec. 27, cls. 2 & 3.

Section 27 recognized a public trust over Pennsylvania's public natural resources, and charged the Commonwealth ***and*** its political subdivisions, as trustees. See, e.g., id. at 951-52, 956-57, 977-78; PEDF, 108 A.3d at 171-72 (citizens entitled to expect that governmental officials will respect the Pennsylvania Constitution). As trustees, state and local governments are constrained to conserve and maintain public natural resources for the benefit of all Pennsylvania citizens, including generations yet to come. Id. at 954-59. PEDF, 108 A.3d at 171-72; Franklin Twp. v. Com., Dep't of Envtl. Res., 452 A.2d 718, 721-22 (Pa. 1982);[1] Cmty. Coll. of Delaware Cnty. v. Fox, 342 A.2d 468, 481 (Pa. Commw. Ct. 1975). Public natural resources, which form the body or corpus of the trust, include both publicly-owned resources such as state forest lands and local parks, and "those resources not owned by the Commonwealth, which involve a public interest," which might include resources like groundwater. 1970 Pa. Legislative Journal-House, at 2271-72; see also PEDF, 108 A.3d at 167-68 (quoting and discussing Robinson Twp., 83 A.3d at 955.

As a trustee, municipalities have fiduciary duties that they owe to both present and future Pennsylvanians. PEDF, 108 A.3d at 157; Robinson Twp., 83 A.3d 956-57, 958-59, 977-78, 980-81 (plurality). "The plain meaning of the terms conserve and maintain implicates a duty to prevent and remedy the degradation, diminution, or depletion of our public natural resources. As a fiduciary, the Commonwealth has a duty to act toward the corpus of the trust—the public natural resources—with prudence, loyalty, and impartiality." PEDF, 108 A.3d at 168 (quoting Robinson Twp., 83 A.3d 957). Two primary duties are "implicit" in the fiduciary relationship set forth by Section 27. These duties are both "prohibitory" and affirmative. Most notably, Section 27 ***prohibits*** government:

> from performing its trustee duties respecting the environment unreasonably, including via legislative enactments or executive action. As trustee, the Commonwealth has a duty to refrain from permitting or encouraging the degradation, diminution, or depletion of public natural resources, whether such degradation, diminution, or depletion would occur through direct state action or indirectly, e.g., because of the state's failure to restrain the actions of private parties. —PEDF, 108 A.3d at 157 (quoting Robinson Twp., 83 A.3d at 957–58)(emphasis added).

Section 27 also requires government "to act affirmatively to protect the environment, via legislative action." Id.

As to present and future Pennsylvanians, who are the beneficiaries of Section 27's public trust, state and local governments have fiduciary duties "to deal impartially with all beneficiaries and, second, . . . to balance the interests of present and future beneficiaries." Robinson Twp., 83 A.3d at 959, 980-81; PEDF, 108 A.3d at 157 (quoting id. at 958-59). The duty of impartiality "means that the trustee must treat all equitably in light of the purposes of the trust," which can touch on "questions of access to and distribution of public natural resources."

1 Adopted by Supreme Court majority in Susquehanna Cnty. v. DER, 458 A.2d 929, 931 (Pa. 1983).

Robinson Twp., 83 A.3d at 959; see also PEDF, 108 A.3d at 167. Further, to treat present and future beneficiaries equitably means to balance their interests; in other words, "the trustee cannot be shortsighted." Robinson Twp., 83 A.3d at 959; PEDF, 108 A.3d at 157 (quoting id.)

2. What the Plurality's Textual Analysis of Section 27 Means for Municipalities

The plurality's textual analysis of Section 27 has several implications for municipalities. Most notably, the plurality made clear that Section 27 restricts municipalities from acting in ways that diminish public trust resources or unduly infringe on protected individual environmental rights. To comply with such constitutional restrictions on their authority municipalities must engage in pre-action environmental impact analyses to gauge the impact of a particular action on protected environmental rights and public natural resources. "Protection of environmental values . . . is a quintessential local issue that must be tailored to local conditions." Robinson Twp., 83 A.3d at 979 (plurality).

At the same time, the plurality reinforced that Section 27 is not designed to end all development. It also emphasized that governmental entities may encounter situations that require a delicate balance between different rights protected under Article I of the Constitution. These issues are discussed more below.

a. True Balance Required

Developers have often held municipalities accountable for enacting restrictive zoning ordinances that unduly limit development. In declaring such ordinances invalid, the courts have found that ordinances that unduly restrict development do not strike an appropriate balance. See, e.g., Main St. Dev. Grp., Inc. v. Tinicum Twp. Bd. of Supervisors, 19 A.3d 21 (Pa. Commw. Ct. 2011); reargument denied (May 12, 2011), appeal denied 40 A.3d 123 (2012).

When we apply a balancing framework, we implicitly recognize that sometimes an ordinance might lean too far in one direction, and sometimes it might lean too far in another. While municipalities have not historically faced challenges that their ordinances go too far in allowing an unreasonable degradation of the environment, the *Robinson Township* decision supports the proposition that municipalities cannot simply allow unfettered development. See also PEDF, 108 A.3d at 170. As discussed further below, that means that municipalities could face challenges if they fail adequately balance conserving natural resources. See, e.g., Robinson Twp., 83 A.3d 901, 953-54, 960 (plurality).

Section 27 constrains governmental entities to exercise authority "in a manner that promotes sustainable property use and economic development." PEDF, 108 A.3d at 157 (quoting Robinson Twp., 83 A.3d at 954). Given the genesis for Section 27, respect for individual constitutionally-protected environmental rights and public trust resources requires state and local decision making processes that consider and account for environment and public health impacts in advance. More broadly, Section 27 requires a shift to development that respects and sustains local health, local ecosystems, and local economies.

b. Limitations on Municipal Action Unless Science-Based Decision Making Establishes that Action Will Not Cause Unreasonable Environmental Degradation

The plurality also discussed the obligations of governmental entities to engage in science-based decision making.[2] This fits with the spirit of Section 27, which requires a shift in decision making processes to sustainable development. In order to assess whether a particular course of action, piece of legislation, approval, or other decision raises a risk of a Section 27 violation, municipalities will need to incorporate into their decision making processes a science-based consideration of the impact of the course of action on individual environmental rights and public trust resources. The plurality explained that performing investigation and

2 The Commonwealth Court's discussion in PEDF reinforces this analysis. See, e.g., 108 A.3d at 156-57, 168, 172.

analysis in advance of acting, and taking seriously the outcome of those analyses, is part of the Constitutional obligation. This action is required to avoid claims that the municipality has infringed on each citizen's right to a clean, healthy environment, and to act as a trustee (a fiduciary) of the people's public natural resources.

To respect individual environmental rights, a governmental entity must evaluate in advance of acting whether a proposed course of action would unreasonably cause actual or likely degradation of the environment in violation of Section 27. Governmental entities must engage in science-based decision making to determine whether a proposed course of action will infringe on a citizen's constitutionally-protected environmental rights. This analysis must reasonably account for local conditions. As part of this science-based decision making, governmental entities must consider whether a proposed course of action would cause unreasonable "actual or likely degradation" of air or water quality, or other protected constitutional features, such as natural and scenic values of the environment. If a governmental entity fails to engage in science-based decision making or allows development to proceed that would cause unreasonable "actual or likely degradation," it raises a significant risk of a Section 27 challenge by citizens.

Further, as a trustee, local governments must consider before acting whether the proposed action (such as legislation or permitting) will lead to the "degradation, diminution, or depletion" of the people's public natural resources either now, or in the future. Likewise, the trustee must consider whether the proposed action places higher environmental burdens on some citizens than others. Such action would violate a trustee's duty of impartiality to treat the beneficiaries "equitably in light of the purposes of the trust.

The plurality stated, "The Environmental Rights Amendment offers protection equally against actions with immediate severe impact on public natural resources and against actions with minimal or insignificant present consequences that are actually or likely to have significant or irreversible effects in the short or long term." Consequently, pre-action analyses must account for the range of present and future impacts of proposed activities or courses of action.

Under the plurality's textual analysis, these pre-action analyses must become a part of any decision making process that could impact environmental rights or public natural resources. As a result, analyses should be incorporated into zoning and land use decisions, including quasi-judicial determinations, as well as other areas such as open space, stormwater, and similar issues. Further, in enacting ordinances, municipalities should consider including statements in the whereas clause section acknowledging Section 27 obligations, and that a particular pre-action analysis was done in accordance with Section 27 to inform the language and approach in the ordinance. This can help protect a municipality both in challenges by developers, and by citizens who believe that a particular ordinance does not go far enough.

c. Additional Themes and A Preview of Future Disputes

i. Local Considerations Matter

The Supreme Court affirmed that local conditions matter and must be considered when development is proposed for a property. In finding Sections 3303 and 3304 of Act 13 unconstitutional, the Court expressly found fault with the provisions' complete elimination of any local considerations, which traditionally has been accounted for at the local level via zoning. Robinson Twp., 83 A.3d at 977-982 (plurality); id. at 1004-08 (Baer, J., concurring). As the court recognized, local environmental considerations are a crucial part of environmental decision making in Pennsylvania that cannot be ignored without raising a significant risk of breaching trustee obligations. As the court stated:

> In Pennsylvania, terrain and natural conditions frequently differ throughout a municipality, and from municipality to municipality. As a result, the impact on

> the quality, quantity, and well-being of our natural resources cannot reasonably be assessed on the basis of a statewide average. Protection of environmental values, in this respect, is a quintessential local issue that must be tailored to local conditions. — Id. at 979 (plurality).

ii. Are municipalities restricted from allowing industrial development activity in non-industrial zoning districts?

With the shale gas boom, municipal officials have been pressured to allow industrial unconventional shale gas development in every zoning district. Municipal officials who allow industrial development in non-industrial zoning districts risk constitutional claims for violating citizens' due process rights and for violating citizens' rights under the Pennsylvania Constitution's Environmental Rights Amendment.

- *Allowing industrial development in non-industrial zoning districts exposes municipal officials to constitutional claims for violation of property owners' due process rights*

Allowing industrial uses in a non-industrial zoning district exposes municipal officials to claims that they have violated constitutional due process guarantees.

The Pennsylvania and United States Constitutions require that for any zoning to be constitutional it must promote the public health, safety, morals, or welfare, and be substantially related to the protecting or furthering that interest. In re Realen Valley Forge Greenes Associates, 838 A.2d 718, 728 (Pa. 2003); C & M Developers, Inc. v. Bedminster Township Zoning Hearing Board, 820 A.2d 143, 150 (Pa. 2002); Boundary Drive Associates v. Shrewsbury Twp. Bd. of Sup'rs, 491 A.2d 86, 90 (Pa. 1985). "Lawful zoning must be directed toward the community as a whole, concerned with the public interest generally, and justified by a balancing of community costs and benefits." In re Realen Valley Forge Greenes Associates, 838 A.2d 718, 729 (Pa. 2003). A municipality violates its constitutional obligations if it fails to balance citizens' sometimes competing constitutional rights to the use and enjoyment of property – both of those who would develop their properties, and those who wish to protect theirs. Article I, Section 1 of the Pennsylvania Constitution. Robinson Twp., 83 A.3d at 1007-08 (Baer, J., concurring); Robinson Twp. v. Com., 52 A.3d 463, 484-85 (Pa. Commw. Ct. 2012) aff'd in part, rev'd in part sub nom. Robinson Twp., Delaware Riverkeeper Network, et al. v. Com., 83 A.3d 901 (Pa. 2013).

Allowing new industrial uses in a non-industrial zoning district could be the basis for a claim that municipal officials are violating these due process principles. Such municipal action injects uses that are incompatible with the purpose of the zoning district, thereby upsetting the established expectations of those who live there. See Robinson Twp., Delaware Riverkeeper Network, et al. v. Com., 83 A.3d 901, 979 (Pa. 2013)(plurality); id. at 1004-05, 1006-07 (Baer, J., concurring); Robinson Twp. v. Com., 52 A.3d 463, 484-85 (Pa. Commw. Ct. 2012) aff'd in part, rev'd in part, 83 A.3d 901 (Pa. 2013). Industrial uses, with detrimental impacts on health, safety, welfare, property values, and public natural resources, do not fit into zones set aside for other types of uses, including residential uses and conservation of natural resources for future generations. See Robinson Twp. v. Com., 52 A.3d 463, 484-85 (Pa. Commw. Ct. 2012) aff'd in part, rev'd in part, 83 A.3d 901 (Pa. 2013). By allowing industrial operations in areas set aside for non-industrial land uses, a municipality exposes itself to claims that it has failed to further the very purposes underlying the non-industrial zoning district, and makes the district irrational.

To illustrate, allowing a new asphalt plant, a surface coal mine, or a quarry into an agricultural zone would destroy soils set aside for agriculture and would increase the risk of water contamination and depletion. In agricultural zones, water resources are important for irrigation, livestock, and drinking water. Such new

industrial land uses would also bring truck traffic, dust, and the risk of industrial accidents that could threaten the lives and livelihoods of those who live and work nearby.

Similarly, placing a refinery in an open space zone would upset the expectation that the zone will be set aside for resource protection, recreation, and/or scenic values. Further, those who moved into the zone, and invested in their properties with the expectation that the surrounding land uses would be compatible would now face a situation in which their investments are diminished more so than their neighbors who happen not to live next to the property where the incompatible use is allowed. Robinson Twp., Delaware Riverkeeper Network, et al. v. Com., 52 A.3d at 484-85 (Pa. Commw. Ct. 2012) aff'd in part, rev'd in part, 83 A.3d 901 (Pa. 2013).

Likewise, allowing an unconventional gas well into a residential zone would bring non-stop lighting, flaring, truck traffic, dust, noise, chemical emissions, and other materials that disrupt the zone's purpose of being set aside for quiet, low-traffic areas where children can play, and people can rest after a hard day's work. See Robinson Twp., 83 A.3d at 1005 (Baer, J., concurring).

Protestants can argue that allowing incompatible uses together makes the zoning classifications arbitrary, undermines the rationality of the ordinance, and is therefore vulnerable to constitutional challenge. It is irrational to allow an incompatible land use in a zone that was established to achieve a non-industrial character, development and conservation goals. Id.; Robinson Twp., 83 A.3d at 1005, 1007-08 (Baer, J., concurring).

- *Allowing industrial development in non-industrial zoning districts exposes municipal officials to legal challenge for violating the Pennsylvania Constitution's Environmental Rights Amendment*

Allowing industrial uses, such as unconventional shale gas development, in a non-industrial zoning district exposes municipal officials to claims that they have violated the Pennsylvania Constitution's Environmental Rights Amendment.

Municipalities have constitutional obligations to respect their citizens' constitutional right to "an environment of quality" and their constitutional "right to benefit from" their public natural resources. Pa. Const. Article I, Section 27; Robinson Twp., Delaware Riverkeeper Network, et al. v. Com., 83 A.3d 901, 976 (Pa. 2013). Municipal officials also have fiduciary duties as trustees of the public's public natural resources "to refrain from permitting or encouraging the degradation, diminution, or depletion of public natural resources, whether such degradation, diminution, or depletion would occur through direct state action or indirectly, e.g., because of the state's failure to restrain the actions of private parties." Robinson Twp., 83 A.3d at 957 (plurality); see also PEDF, 108 A.3d at 157 (quoting same).

In Robinson Township, the Supreme Court struck down a state law that would have placed industrial activity in every zoning district in every municipality. In reaching this holding, the Court stated, "a new regulatory regime permitting industrial uses as a matter of right in every type of pre-existing zoning district [including residential and agricultural] is incapable of conserving or maintaining the constitutionally-protected aspects of the public environment and of a certain quality of life." Robinson Twp., 83 A.3d at 979.

Placing industrial uses in areas designated for non-industrial uses exposes municipal officials to claims that they have allowed the unreasonable degradation of the local environment in which people live, work, and recreate, including the public natural resources on which people rely. It does so by exposing "otherwise protected areas to environmental and habitability costs associated with this particular industrial use: air, water, and soil pollution; persistent noise, lighting, and heavy vehicle traffic; and the building of facilities incongruous with the surrounding landscape." Robinson Twp., 83 A.3d at 979. In addition, "some properties and communities will carry much heavier environmental and habitability burdens than others" by virtue of the haphazard placement

of industrial operations. Id. at 980. "This disparate effect is irreconcilable with the express command that the trustee will manage the corpus of the trust for the benefit of 'all the people.' Pa. Const. Art. I, § 27." Id.

The *Robinson Township* decision supports the proposition that municipalities cannot simply allow unfettered development. Municipalities must balance development against conserving the natural resources. The courts will strike down municipal zoning ordinances that do not strike an appropriate balance. Main St. Dev. Grp., Inc. v. Tinicum Twp. Bd. of Supervisors, 19 A.3d 21 (Pa. Commw. Ct. 2011); reargument denied (May 12, 2011), appeal denied 40 A.3d 123 (2012). Municipalities must balance competing interests and cannot favor some to the exclusion of others. See, e.g., Robinson Twp., 83 A.3d 901, 953-54, 960 (plurality). Allowing industrial development throughout a municipality exposes local officials to claims that they have failed to conduct the constitutionally-required balancing.

Such a failure exposes municipalities and their officials to a legal challenge for violation of citizens' constitutional environmental rights. Robinson Twp., 83 A.3d at 951-52, 956-57, 974-75, 977-78. The plurality in Robinson recognized that the rights guaranteed in the Environmental Rights Amendment are on a par with our other inherent political rights, including our private property and free speech right and that just as citizens may vindicate those political rights in the courts, citizens may also vindicate their rights and hold government officials accountable under the Environmental Rights Amendment. Id. at 951-54, 956-57, 974-75, 977-78; PEDF, 108 A.3d at 156 (quoting id. at 950-51).

3. Are Municipalities Obligated — Before Acting — To Determine Whether the Proposed Action Will Cause an Unreasonable Degradation of Our Air and Water?

Municipalities may face claims that the Pennsylvania Constitution limits government officials from acting when they have not determined in advance whether the proposed activity will cause an unreasonable degradation of our environment.

Under the plurality's textual analysis of Section 27, state and local government officials have an obligation to assess whether any proposed project, law, regulation or ordinance would cause unreasonable "actual or likely degradation" of air or water quality, or other protected constitutional features, such as natural and scenic values of the environment. Robinson Twp. v. Com., 83 A.3d 901, 951-955 (Pa. 2013)(plurality); Pennsylvania Envtl. Def. Found. v. Com., 108 A.3d 140, 156 (Pa. Commw. Ct. 2015), reargument denied (Feb. 3, 2015). If a governmental entity fails to perform the analysis, or allows development to proceed that would cause unreasonable "actual or likely degradation," it raises a significant risk of a Section 27 challenge by citizens. Robinson Twp., 83 A.3d at 952 ("The failure to obtain information regarding environmental effects does not excuse the constitutional obligation because the obligation exists a priori to any statute purporting to create a cause of action."); see also id. at 951 (stating that clause 1 "implicates a holistic analytical approach to ensure both the protection from harm or damage and to ensure the maintenance and perpetuation of an environment of quality for the benefit of future generations."); see also PEDF, 108 A.3d at 156, 172.

Further, as a trustee, government officials must consider before acting whether the proposed action will lead to the "degradation, diminution, or depletion" of the people's public natural resources either now, or in the future. Id. at 952, 957, 959 & n.46; see also id. at 959 n.45, 20 Pa.C.S. § 7203(a) & (c)(5); PEDF, 108 A.3d at 157, 168; In re Scheidmantel, 868 A.2d 464, 492 (Pa. Super. Ct. 2005) ("trustee's action must represent an actual and honest exercise of judgment predicated on a genuine consideration of existing conditions"); 20 Pa.C.S. § 7773. Likewise, government officials must consider whether the proposed action places higher environmental burdens on some citizens than others, which would violate a trustee's duty of impartiality to treat the beneficiaries "equitably in light of the purposes of the trust." Robinson Twp., 83 A.3d at 957, 959, 980; PEDF, 108 A.3d at 157 (quoting id. at 958-59). Section 27 specifically establishes a preference for protecting the natural quality of

the environment and its benefits over development and disturbance, requiring that the government officials take the same focus and care in their actions. Robinson Twp., 83 A.3d at 973 n.55.

As a trustee, municipalities have fiduciary duties that they owe to both present and future Pennsylvanians. PEDF, 108 A.3d at 157; Robinson Twp., 83 A.3d 956-57, 958-59, 977-78, 980-81. "The plain meaning of the terms conserve and maintain implicates a duty to prevent and remedy the degradation, diminution, or depletion of our public natural resources. As a fiduciary, the Commonwealth has a duty to act toward the corpus of the trust—the public natural resources—with prudence, loyalty, and impartiality." PEDF, 108 A.3d at 168 (quoting Robinson Twp., 83 A.3d 957). Two primary duties are "implicit" in the fiduciary relationship set forth by Section 27. These duties are both "prohibitory" and affirmative. Most notably, Section 27 ***prohibits*** government:

> from performing its trustee duties respecting the environment unreasonably, including via legislative enactments or executive action. As trustee, the Commonwealth has a ***duty to refrain from permitting or encouraging*** the degradation, diminution, or depletion of public natural resources, whether such degradation, diminution, or depletion would occur through ***direct*** state action or ***indirectly***, e.g., because of the state's failure to restrain the actions of private parties. —PEDF., 108 A.3d at 157 (quoting Robinson Twp., 83 A.3d at 957–58)(emphasis added).

The plurality further noted that Section 27 requires government "to act affirmatively to protect the environment, via legislative action." Id.

When a governmental body takes action that implicates fundamental rights, such as the rights enshrined in Section 27, such action will face strict constitutional scrutiny. As the Montana Supreme Court stated the standard under its similar constitutional provision, "a clean and healthful environment is a fundamental right because it is guaranteed by the Declaration of Rights found at Article II, Section 3 of Montana's Constitution, and … any statute or rule which implicates that right must be strictly scrutinized and can only survive scrutiny if the State establishes a compelling state interest and that its action is closely tailored to effectuate that interest and is the least onerous path that can be taken to achieve the State's objective." Montana Envtl. Info. Ctr. v. Dep't of Envtl. Quality, 296 Mont. 207, 225, 988 P.2d 1236, 1246 (Mont. 1999).

4. Conclusion

"[W]hen government acts, the act must, on balance, reasonably account for the environmental features of the affected locale … if it is to pass constitutional muster." Robinson Twp., 83 A.3d at 953. This duty, which derives directly from the text of our Constitution's Declaration of Rights, must guide municipal decision making into the future.

Section 2 - What Municipalities Can Do

The ability of local governments to regulate gas development varies from state to state. In Pennsylvania, while municipalities face difficulty in their ability to completely ban gas drilling and in their ability to regulate certain features of gas well operations that are already regulated by the state, ***municipalities can use their zoning authority to regulate the use of land for gas development.***

Citizens must understand the genuine tools available to local governments, so they can answer industry talking points and reassure fair-minded local officials who are concerned about the industry's misrepresentations and threats.

In the sections that follow, we will discuss: 1) current limits on local regulatory authority; 2) municipal authority to regulate gas development; 3) zoning ordinance provisions to protect against adverse impacts of gas development; and 4) the role of municipal resolutions.

Municipalities should keep in mind that the law in this area is in a state of frequent change. Community leaders should consult with legal counsel and planning experts to help enact ordinance provisions that are consistent with current law, local considerations, and local preferences for balancing potential risks and benefits.

Current Limits on Local Regulatory Authority

It is important to understand the current limits on local regulatory authority. Current state law limits a municipality's ability to completely ban gas drilling and to regulate features of gas well operations that are already regulated by the state.

1. Complete Bans

Municipalities in Pennsylvania are limited in their ability to completely ban any particular land uses. Whenever a municipality completely prohibits a particular land use, developers will assert that the ban violates substantive due process rights under the U.S. and Pennsylvania Constitutions.

Further, with gas drilling in particular, a provision of the Municipalities Planning Code ("MPC") requires that municipal zoning ordinances "provide for the reasonable development of minerals." M.P.C. §603(i).

Despite these apparent legal road blocks, we recognize that there are good faith reasons for pursuing a complete ban. A community might attempt to prove that, based on current practices, the dangers associated with unconventional deep horizontal drilling and hydraulic fracturing are unreasonable. It is possible that a community with limited land for drilling and fragile natural resources might be able to overcome the current limits in the law and defend an outright ban. It is important to note, however, that similar efforts to ban other industrial land uses have been struck down, particularly for industries that, like gas drilling, are already regulated by the Commonwealth. (See General Battery Corp. v. Zoning Hearing Board of Alsace Township, 29 Pa. Commw. 498, 371 A.2d 1030 (1977)).

Any community considering an outright ban must weigh the risks associated with defeat. Under Pennsylvania law, when a municipality loses a challenge to the validity of its zoning ordinance, the court can order very drastic remedies. For example, if a municipality completely bans gas drilling and a drilling company wins a challenge to the validity of the ordinance, the court could order that the municipality must allow the drilling company to ***drill throughout the municipality***, even in the most environmentally sensitive and most-populated zones. In other words, an attempt to impose a complete ban can lead to drilling happening everywhere in the municipality. While certain communities may be prepared to take such a risk, the risk that drilling could be allowed throughout the municipality must be weighed carefully, particularly if there are important resources in the municipality that are vital to protect.

2. Regulation of Features of Oil and Gas Operations Already Regulated by the State

After *Robinson Township*, Act 13 of 2012 generally retains the "where" versus "how" distinction that was in place before Act 13. The remains of Section 3302 of Act 13 of 2012 ("Act 13") after *Robinson Township* still address limitations on municipal power to regulate features of "oil and gas operations" that are already regulated by Chapter 32 of Act 13. (58 Pa.C.S. § 3302). Chapter 32 of Act 13 generally reflects many provisions of the former 1984 Oil and Gas Act. "Oil and gas operations" are defined as follows:

> The term includes the following:
>
> (1) well location assessment, including seismic operations, well site preparation, construction, drilling, hydraulic fracturing and site restoration associated with an oil or gas well of any depth;
>
> (2) water and other fluid storage or impoundment areas used exclusively for oil and gas operations;(3) construction, installation, use, maintenance and repair of:
>
> > (i) oil and gas pipelines;
> >
> > (ii) natural gas compressor stations; and
> >
> > (iii) natural gas processing plants or facilities performing equivalent functions; and
>
> (4) construction, installation, use, maintenance and repair of all equipment directly associated with activities specified in paragraphs (1), (2) and (3), to the extent that:
>
> > (i) the equipment is necessarily located at or immediately adjacent to a well site, impoundment area, oil and gas pipeline, natural gas compressor station or natural gas processing plant; and
> >
> > (ii) the activities are authorized and permitted under the authority of a Federal or Commonwealth agency.[1]

1 58 Pa. Cons. Stat. § 3301.

Thus, features of "oil and gas operations" regulated by Chapter 32 include well casing requirements, water supply replacement, bonding, plugging of wells, and well-site restoration. Chapter 32, like the 1984 Oil and Gas Act, still focuses almost exclusively on wells. As a result, although Section 3302 discusses other gas development operations such as compressor stations and seismic testing, Chapter 32 generally contain no technical or operational "features" that are regulated to the same extent as wells.

3. Municipal Resolutions

Resolutions are adopted by local government for various purposes, including making a statement of policy.

For example, as stated in the Borough Code, 8 Pa. C.S. § 3301.1

"(c) Resolutions.--Council shall adopt resolutions in accordance with this part and the laws of this Commonwealth. Resolutions may be adopted for any purpose, including, but not limited to, the following:

(1) Ceremonial or congratulatory expressions of the good will of the council.

(2) Statements of public policy of the council.

(3) Approval of formal agreements of the borough, except for agreements arising under an established purchasing system of the borough.

(4) Approval, if required, of administrative rules, regulations and bylaws arising under State statutes or borough ordinances.

(5) The filling of borough-appointed positions and of vacancies of elected officials, except as otherwise provided.

See ***Section 4 - Municipal Strategies: Adopting a Resolution***.


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Section 3 - Municipal Strategies: Ordinances to Address Local Environmental Conditions

In addition to zoning ordinances, municipalities may also consider regulating activities through other ordinances that take into account local environmental conditions and concerns.

While municipal zoning authority over shale gas development has attracted the bulk of attention, municipalities have other types of relevant regulations beyond zoning that may apply not just to gas development, but many other industrial and non-industrial uses also. Examples of these include stormwater management, land development, grading, and floodplain regulations.[1] These other types of rules focus on tailoring the *impact* of an activity to local conditions. Like zoning ordinances, these "generally-applicable local environmental" regulations are key components of the municipal toolbox.

Despite the crucial nature of these components, one aspect of Act 13 that was underappreciated was how thoroughly it would have eliminated these other municipal tools. Specifically, Section 3303 of Act 13 sought to have state law entirely preempt — or supersede — all local efforts to address local environmental concerns or conditions. Under Section 3303, no local conditions would have mattered and there would not have been any room for consideration of local concerns. Municipalities would not have been able to rely on stormwater management ordinances, floodplain ordinances, or any other local environmental regulations. State and federal law would have set a *ceiling* (rather than a floor) for environmental regulations.

A majority of the Pennsylvania Supreme Court found that these attempts to preempt local environmental regulations were unconstitutional. In striking down an effort to impose statewide zoning standards, the Supreme Court plurality recognized that "[p]rotection of environmental values . . . is a quintessential local issue that must be tailored to local conditions."[2] "[W]hen government acts, the action must, on balance, reasonably account for the environmental features of the affected locale . . . if it is to pass constitutional muster."[3] In his concurrence, Justice Baer also took issue with the lack of consideration of local conditions, noting "Pennsylvania's extreme diversity" in landscape and population density. Justice Baer agreed with the plurality that statewide standards could not protect constitutional rights in the face of such diversity, or "give consideration to the character of the municipality, the needs of the citizens[,] and the suitabilities and special nature of particular parts of the municipality."[4]

As a result of the Pennsylvania Supreme Court's decision striking down two sections of Act 13 that sought to eliminate consideration of local environmental conditions, any argument that other provisions of state law (whether found in Oil & Gas Act or elsewhere) preempt local ordinances that take into account local environmental conditions would be constitutionally suspect.

A municipality with unique environmental resources or constraints may be able to go further in regulating potentially polluting activities than a municipality without such resources. For example, a municipality with only Exceptional Value and High-Quality streams in its municipality, including in its industrial district, may ***need*** to go further than state law in addressing environmental risks. For example, in allowing oil and gas activity in an industrial zone with fragile natural resources, a municipality might determine that to protect those resources, the municipality must require containment around frac tanks, or prohibit wastewater impoundments (neither of which are reflected in the state's regulations, but which are "best practices"). While such an effort

1 In addition, the Air Pollution Control Act specifically leaves room for local air pollution regulation. 35 P.S. § 4012(a) (stating, in part, "Nothing in this act shall prevent counties, cities, towns, townships or boroughs from enacting ordinances with respect to air pollution which will not be less stringent than the provisions of this act, the Clean Air Act or the rules and regulations promulgated under either this act or the Clean Air Act.").

2 Robinson Twp., Delaware Riverkeeper Network, et al. v. Com., 83 A.3d 901, 979 (Pa. 2013).

3 Id. at 953.

4 Id. at 1006 (Baer, J., concurring) (quoting *Hoffman Mining,* 32 A.3d at 603 (quoting 53 P.S. § 10603(a)).

to impose locally-based "best practices" as requirements might face a challenge, this type of effort would find support in the Pennsylvania Supreme Court's decision in the Act 13 case.

Regardless of what DEP does, the Pennsylvania Constitution obligates municipalities to avoid unduly infringing on citizens' constitutional environmental and property rights. This concept – that a municipality cannot unduly infringe on citizens' constitutional rights and cannot escape such obligations — is not new. If a municipality were to ban ownership of guns, it would not take long for a citizen to sue that municipality for violating that citizen's right to bear arms under Article I, Section 21 of the Pennsylvania Constitution.[5] Similarly, a municipality's failure to take proper steps to prevent undue local air and water pollution or undue destruction of local historic resources equally puts that municipality at significant risk of violating its citizens' rights. A state law cannot simply erase an obligation that the Constitution places on a governmental entity. Municipalities must act — regardless of what DEP does or does not do — to protect the local quality of life and environment by tailoring the impacts of heavy industrial or other activities (regardless of whether it is oil and gas activity) to local conditions.

The second reason why it is wrong to focus on whether DEP regulates a particular set of issues (like water) is that there is difference between the statewide standards that DEP administers and municipal standards that address local conditions on the ground where an activity occurs. In other words, DEP standards are a floor (not a ceiling) and local conditions must be addressed in order to ensure that citizens' rights are protected. When DEP issues a gas well permit, that only means that DEP has determined that, under a narrow reading of the state regulations, the applicant meets the bare minimum requirements for getting a well permit. DEP does not usually account for local conditions in permitting, partly because many of the programs that DEP administers are statewide standards. For example, when DEP reviews a gas well permit, it does not look at local geology or hydrogeology; it does not look at whether it makes sense to put a compressor station next to a school; and it does not generally look at any other considerations relevant to whether a site is really a suitable place for a heavy industrial activity, and what protections are needed based on site-specific conditions. Local governments thus have an important role to play in considering and addressing local environmental conditions and concerns.

So with an understanding that municipalities must account for local conditions, how can a municipality go about doing that? The next section will address some potential strategies.

5 "The right of the citizens to bear arms in defense of themselves and the State shall not be questioned."

Section 4 - Municipal Strategies: What to Look for in an Ordinance

This section will address some potential strategies for municipalities to use to help them to account for local conditions. These strategies – consideration of local conditions, science-based decisionmaking – are not new; much of what we will discuss in this section is simply good land use planning. The strategies discussed here are of the same type that municipalities have used for years to protect quality of life in their communities, including special places, natural resources, and places where people live, work, and go to school every day.

We will start with an introduction to what science-based decisionmaking could entail, and then describe different approaches a municipality can take to meet its Section 27 obligations by addressing local conditions in the community.

What is "science-based decisionmaking?" Section 27 requires science-based decisionmaking to determine whether a proposed course of action will unreasonably infringe on constitutional environmental rights (citizens' rights to clean air and pure water, among other values, in their community), or unreasonably degrade public natural resources. Science-based decisionmaking ensures that a municipality will be fully informed as to the actual ramifications of an action it is considering in order to ensure that it does not take any action -- such as enacting a proposed ordinance or granting a permit – if such an action would cause an unreasonable degradation of the environment and therefore violate their constitutional obligations.

In the land use planning context, this decisionmaking process is consistent with what good land use planners should already be doing. Specifically, proper land use planning takes into account a community's public natural resources (e.g., sensitive groundwater areas, fishing streams, parks and forests, agricultural soils, floodplains, wetlands, steep slopes, etc.); historic resources; roads; existing development patterns including location of residences, schools, and hospitals; and crafts from that a plan of growth and conservation for the future, which is then embodied in a zoning ordinance and other ordinances that dictate which uses are allowed where, and what standards and conservation requirements apply. These considerations should always be a part of determining whether a use is proper in a particular location in a municipality – and that applies whether the use is heavy industry, such as shale gas development, or some other type of use.

The more complex the land use activity being proposed for a community, the more study the municipality may need to do in enacting its comprehensive plan and its land use ordinances. Likewise, the more intrusive the land use activity, the more studies a municipality may need to require of applicants to prove that the proposed land use is appropriate for a given location.

For industrial activities like unconventional shale gas development, these studies can include, for example:

- dispersion modeling of potential air emissions, both during regular activities and during accidents, to determine what areas of a community would be downwind of industrial activity, and thus whether the location for the activity is proper; and
- geologic analyses of faults and fractures, to determine whether activity would pose a risk to the local groundwater.

A municipality could choose to do these analyses on its own as part of its planning process, or it may require applicants to perform such analyses as part of the zoning permit approval process.

For instance, for heavy industrial activity like unconventional shale gas development, a municipality might place such uses together as conditional uses in industrial and extraction/quarry zones, and require applicants to produce site-specific scientific studies demonstrating that the use would not unduly degrade the local environment.

The Commonwealth Court described this effort to respect environmental rights well when it said: "[W]hen environmental concerns of development are juxtaposed with economic benefits of development, the Environmental Rights Amendment is a thumb on the scale, giving greater weight to the environmental concerns in the decision-making process." Pennsylvania Envtl. Def. Found. v. Com., 108 A.3d 140 (Pa. Commw. Ct. 2015).

The following pages offer some samples of different types of ordinance provisions that communities may wish to use as a starting point. Each municipality is unique. There is no single, one-size-fits-all approach that applies to all municipalities. Each community must consider its own local resources and attributes, its existing land uses, its at-risk populations, and the planning and ordinances that are already in place. While we

offer here ideas and possible ordinance provisions, these should be used only as a starting point for discussion. Community leaders should consult with knowledgeable legal counsel and planning experts to help enact ordinance provisions that are consistent with current law and local conditions.

- Examples of general resource-protective ordinances that a municipality might use:
  - Stream or riparian buffer requirements (sample in Appendix A);
  - Overlays in zoning ordinances to protect natural resources such as steep slopes, special protection watersheds, wetlands, aquifers, scenic views, etc.;[1]
  - Stormwater management ordinances;
  - Grading ordinances;
  - Floodplain ordinances;
  - Subdivision and land development ordinances;
  - Air emissions ordinances or requirements (such as dispersion modeling) that address local conditions (such as topography, prevailing wind speed and direction, and nearby land uses);[2]
  - Water well construction ordinances;
  - Wellhead protection areas;
  - Water well pumping test requirements; and
  - Historic resource protection requirements.

- More specific examples of provisions that can be included in zoning or other ordinances:
  - Environmental assessment requirements as part of application criteria, which would require an applicant to identify local resources and the potential impacts to those resources resulting from a proposed activity. Impact studies should include short-term, long-term, and cumulative effects.

1 For example, see http://www.tinicumbucks.org/maps.htm

2 See 35 P.S. § 4012(a) (stating, in part, "Nothing in this act shall prevent counties, cities, towns, townships or boroughs from enacting ordinances with respect to air pollution which will not be less stringent than the provisions of this act, the Clean Air Act or the rules and regulations promulgated under either this act or the Clean Air Act.").

- Placement of industrial activity in industrial or extraction/quarry zones only.
- Noise-related requirements, such as:
  - Noise limitations that are consistent with the general background level of noise during the day and at night in a particular area;
  - Requirement that applicants conduct noise impact studies that include a comparison of the noise an activity may generate at a property line boundary and the background level of noise (day and night) that is usually present in that area; and
  - Hours of operation restrictions.
- Setbacks from buildings, water bodies, wetlands, floodplains, livestock areas, property lines, right-of-ways (including roads), as well as screening and/or landscaping requirements.
  - Setback distances should depend on various factors, including what's being protected, and factors unique to the particular municipality in question (e.g. topography, local groundwater flow).
  - Publicly-available research materials from university studies and peer-reviewed literature can help inform municipalities about what setbacks might be prudent based on health or other environmental concerns from particular industrial operations.

- Protections for sensitive populations, such as children, the elderly, and the infirm. Examples include:
  - More protective setbacks from schools, playgrounds, hospitals, and senior care facilities than other buildings;
  - Prohibition of heavy industry near such areas (e.g. via overlays or by which districts the uses are allowed in);
  - Prohibition on heavy truck traffic on school bus routes or near school bus stops; and

- Other protections that may be wise based on local conditions (e.g. local air quality issues, etc.).

- Protections for special or sensitive places and public natural resources in the municipality:
  - Types of special or sensitive places could include:
    - Parks and forests;
    - Popular fishing streams, hunting areas, and hiking trails;
    - Properties conserved with municipal open space funds (whether by purchase or by conservation easement) and privately-conserved lands;
    - Important scenic views or viewsheds;
    - Important wildlife habitat (e.g. eagle nesting areas, habitat for endangered or threatened species);
    - Headwater areas of streams and wetlands;
    - Areas with carbonate geology/karst topography;
    - Cemeteries and places of worship; and
    - Historic and/or known archeological resources or areas.
  - Types of public natural resources (not already mentioned) include:
    - Groundwater resources, including sensitive aquifer or recharge areas;
    - Streams and wetlands;
    - Endangered or threatened species;
    - Prime agricultural soils; and
    - Local air quality.

- There are various types of protections that might be appropriate depending on the type of resource and the municipality. Tools include:
    - Prohibition of industrial or other incompatible uses in particular areas (e.g. no wastewater impoundments in a headwaters area; no industrial activity on conserved lands; only industrial activity in industrial and quarry/extraction districts);
    - Setbacks;
    - Overlays;
    - Requirements on an applicant to demonstrate that the proposed activity will not have an adverse impact on these resources;
    - Riparian buffer protections;
    - Screening and landscaping; and
    - Lighting and/or glare restrictions.

- Road-related requirements:
    - Requirements for road use plans, and to keep heavy industrial traffic away from school bus routes, schools, and important emergency vehicle routes;
    - Bonding for overweight vehicles;
    - Requirements to keep roads clear of mud and other debris;
    - Road maintenance agreements; and
    - Requirement that transportation of hazardous material be in accordance with federal and state law.

- Air and water quality:
  - Dispersion modeling of potential air emissions, both during regular activities and during accidents, to determine what areas of a community would be downwind of industrial activity;
  - Requirement of "best practices" in areas with very good surface water and/or groundwater quality;
  - Prohibition on offensive or noxious odors, gases, fluids, etc.; and
  - Requirement that all trucks transporting waste, extracted material, or construction material be covered to minimize fugitive dust and spills.

- Emergency planning and related requirements:
  - Protections or requirements for areas of potential wildfire hazard;
  - Floodplain development restrictions;
  - Requirements for fire protection plan, public safety plan, and information on chemicals being used on site;
  - Provision of emergency contact information to the municipality and local fire departments and other first responders; and
  - Requirement to notify the municipality of spills or other accidents so that it may notify residents (especially those on private groundwater) of the spill.
- Other types of requirements:
  - Lighting ordinances or requirements, including to avoid glare. Some municipalities are in remote areas known for stargazing, and so a municipality might want to consider that when addressing lighting requirements;
  - Provision of insurance policy that meets certain requirements;

- General safety requirements, such as signs, gates and fencing;
- Provision of all state permit application materials and any permits acquired to municipality;
- Requirements re: storage of trash, junk, refuse, equipment onsite; and
- Requirement of compliance with federal and state law, as well as local ordinances.

o Definitions of uses and activities, and important terms being used:

- In the shale gas development context, municipalities need to be careful to define uses to include the full range of potential activities that might occur as part of shale gas development. Examples of uses that a municipality might want to define are:
  - Gas or oil wellsite development, or recovery of subsurface oil and gas deposits;
  - Pipeline facilities (such as pig launchers);
  - Compressor stations;
  - Wellhead compressors;
  - Processing facilities;
  - Pipelines;
  - Seismic testing or other geophysical exploratory activities;
  - Gas storage and/or wastewater injection wells;
  - Staging and/or storage areas for equipment, materials, vehicles, pipes, etc.; and
  - Water withdrawal facilities.

- If there are particular, important terms being used in the ordinance, those should be defined so that everyone – citizens, municipal officials, applicants – understand what is meant.
    - For example, if a municipality wants to require a setback from all special protection waters, it should define what "special protection waters" means, such as any waterbody that qualifies as exceptional value water or high quality water, or is subject to other special protections for water quality, including standards set by interstate river basin commissions.

- Strong conditional use and/or special exception requirements:
    - Conditional uses and special exceptions are a type of permitted use.
    - When a municipality designates a land use as a conditional use or special exception it means that the municipality considers the general impacts of the proposed activity to be acceptable in the district for which it is proposed.
    - This means that if a given use is allowed by conditional use or special exception, there is a presumption that, once the applicant meets the requirements in the ordinance for the activity, the activity will be permitted.
    - It is important for municipalities to establish clear, objective criteria in their ordinances that the applicant must meet and that help the municipality determine whether the impact of a proposed conditional use or special exception as proposed for a particular location is reasonable.[3]
    - To illustrate, zoning ordinances will have different categories of requirements, such as:
        - General standards applicable in a given district (e.g. which uses are allowed, yard and lot size requirements, noise regulations);
        - Standards applicable to categories of uses regardless of district (e.g. parking or

3 Because the use is, by default, permitted, it is important before enacting an ordinance for municipal officials to educate themselves about the nature of the use so that they have an accurate picture of the potential impacts and place the activity in a proper zoning district. This research would inform officials about what land uses are compatible with other land uses, such as whether a compressor station is consistent with other industrial land uses or residential uses.

driveway standards for residential and commercial uses);

- General requirements that apply across the board (e.g. resource protection requirements, application requirements for conditional uses and special exceptions); and
- Standards applicable to specific uses or class of uses.

- Standards applicable to specific uses might include the items listed earlier, such as:
  - A requirement of an environmental assessment;
  - A noise impact study;
  - Air emissions dispersion modeling; and
  - Geologic analyses (e.g. of sensitive geological areas, of fractures, etc. that might dictate whether a particular location is, for example, at higher risk of contaminating local groundwater).
- In addition to imposing standards for specific land uses, a municipality might impose such standards across a class of uses, such as all industrial uses.
- Some industrial uses may pose risks to neighbors that are peculiar to that use that a municipality may want to address.
  - For instance, municipalities often require groundwater studies of quarrying operations due to concerns for depletion of neighbors' water wells due to pumping.
  - Extraction uses with heavy truck traffic pose risks regarding fugitive dust, road debris, and conflicts with other types of traffic. Municipalities often require traffic studies, road use plans, requirements to cover trucks, and plans to keep roads clear of mud and other debris to determine whether there would be an adverse impact from the proposed use.
  - Some uses pose greater risks of exposure to radiological material (nuclear plants, radiological-focused research facilities, shale gas well sites and waste disposal). Thus, requirements of containments, proof of security measures, and local monitoring plans might be required.
  - Some industrial uses do not have extensive air emissions (e.g., equipment sales and storage) while others do (e.g., asphalt and concrete plants, shale gas development). Requirements of air emissions dispersion modeling could be put in place for those uses that pose the most potential risk to surrounding residents based on prevailing wind patterns and topography.
- The ordinance needs to establish objective criteria for the use, including what types of material the applicant needs to present to meet its burden.
- Municipalities should expressly state any requirements such as local air emissions modeling, geologic and/or groundwater studies. That way, the applicant knows what it must present so that municipal officials can determine whether the applicant has shown that its use is on par with what would be generally be expected, including whether the use would have an unreasonable impact on local citizens.

Section 5 - Municipal Strategies: Adopting a Resolution

The policies set by municipal officials help to guide and inform the municipal regulatory and planning process. A statement of public policy can be expressed in a resolution adopted by the local governing body (8 Pa. C.S. § 3301.1.).

The following sample resolution is offered to assist elected officials in drafting a resolution that calls on the Legislature, government entities, and other decisionmaking bodies invested with the authority to enact and implement a prohibition, moratorium or ban on shale gas development and related operations.

SAMPLE MUNICIPAL RESOLUTION

WHEREAS, a fundamental purpose of government is to protect the health, safety, and welfare of citizens;

WHEREAS, Article I, Section 27 of the Pennsylvania Constitution affirms that, "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;"

WHEREAS, Article I, Section 27 further declares, "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;"

WHEREAS, there is significant evidence that shale gas development has an adverse effect on public health, property interests, agriculture and on our air, water, and land;[1]

WHEREAS, no Pennsylvania or regional agency has conducted a comprehensive assessment of the cumulative and long-term impacts of hydraulic fracturing and related shale gas development activities;

WHEREAS, the absence of such an assessment makes it impossible to determine whether shale gas development can proceed safely and prevents the appropriate management of the harms associated with shale gas development, including risks to public health, property values and the clean air and water upon which all citizens and businesses depend;[2]

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1 PSE Healthy Energy Library, https://www.zotero.org/groups/pse_study_citation_database/items; See, e.g., Jemielita, et al., Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates, (July 2015), http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0131093; Delaware Riverkeeper Network, "Unsafe and Unsustainable," http://www.delawareriverkeeper.org/Documents/DRN_Report_Unsafe+Unsustainable_fr.pdf

2 For examples of risks not considered, see E.L. Rowan, et al., Radium Content of Oil- and Gas-Field Produced Waters in the Northern Appalachian Basin (USA): Summary and Discussion of Data, United States Geological Survey ("USGS") Scientific Investigations Report 2011-5135 (2011); "NIOSH Field Effort to Assess Chemical Exposure Risks to Gas an d Oil Workers," http://www.cdc.gov/niosh/docs/2010-130/pdfs/2010-130.pdf; "CDC scientist: tests needed on gas drilling impact," Wall Street Journal, January 4, 2012, http://online.wsj.com/article/AP8338b702930849f49d22a5d96b7d1b2d.html; OSHA-NIOSH, "Worker Hazard Alert: Worker Exposure to Silica during Hydraulic Fracturing," http://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.pdf ("Recent NIOSH field studies identified overexposure to airborne silica as a health hazard to workers."); E.T. Slonecker, et al., Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004-2010, USGS Open File Report 2012-1154 (2012); E.T. Slonecker, et al., Landscape Consequences of Natural Gas Extraction in Allegheny and Susquehanna Counties, Pennsylvania, 2004-2010; USGS Open File Report 2013-1025 (2012); P.J. Drohan, M. Brittingham, J. Bishop, and K. Yoder, Early Trends in Landcover Change and Forest Fragmentation Due to Shale-Gas Development in Pennsylvania: A Potential Outcome for the Northcentral Appalachians, Environmental Management, (2012) at 1, 4-6, 9-13; American Water Works Ass'n, "Water and Hydraulic Fracturing: A White Paper from the American Water Works Association" (2013) at 4 (describing degradation of well casing over time); Michelle Bamberger & Robert E. Oswald, Impacts of Gas Drilling on Human and Animal Health , New Solutions, 2012, at 54-61; U.S. Geological Survey Powell Center for Analysis and Synthesis, "Water Quality Studied in Areas of Unconventional Oil and Gas Development, Including Areas Where Hydraulic Fracturing Techniques are Used, in the United States," April 2012, http://pubs.usgs.gov/fs/2012/3049/FS12-3049_508.pdf ("The effects of unconventional oil and gas development and production on regional water quality have not been previously described despite the fact that oil and gas development in the United States began nearly 150 years ago, and more than 4 million oil- and gas-related wells . . . have been drilled with an increasing trend in the use of hydraulic fracturing.")

WHEREAS, there have not been sufficient public funds available to equip affected government agencies with the proper personnel and resources to: study all impacts of shale gas development, including impacts on human health and food safety; conduct baseline water and air testing; conduct meaningful reviews of all permits prior to issuance; and implement and enforce all applicable laws and regulations;

WHEREAS, the shale gas industry has received unprecedented exemptions from our nation's most important environmental and public health laws including the Safe Drinking Water Act, Clean Air Act, and the Clean Water Act;[3]

WHEREAS, after exhaustive study, New York and Maryland have prohibited hydraulic fracturing in their states;[4]

WHEREAS, (insert local information that addresses specific conditions such as geology that could make the municipality a target for shale gas development);

WHEREAS, (insert any regional relevant actions in place to prevent shale gas development such as a moratorium or prohibition of activity); and

WHEREAS, the (Borough, Township, County or other local government unit) supports the continuation of these prohibitions;

NOW, THEREFORE, BE IT RESOLVED that:

1. The (Borough, Township, County or other local government unit) calls upon the Commonwealth of Pennsylvania to institute a permanent on shale gas development in Pennsylvania; and
2. The (Borough, Township, County or other local government unit) calls upon all regulatory agencies to enact a permanent ban shale gas development, including hydraulic fracturing for gas or oil.

3 33 U.S.C. § 1342(l)(2); 42 U.S.C. § 300h(d); 42 U.S.C. § 7412(n)(4)(pertaining to aggregation for hazardous air pollutants such as benzene); "Lax Rules for the Natural Gas Industry," New York Times, http://www.nytimes.com/interactive/2011/03/03/us/20110303-natural-gas-timeline.html?_r=0

4 http://www.dec.ny.gov/docs/materials_minerals_pdf/findingstatehvhf62015.pdf; http://www.health.ny.gov/press/reports/docs/high_volume_hydraulic_fracturing.pdf; http://mdehn.org/resources/public-health-study-of-fracking/; http://thinkprogress.org/climate/2015/05/29/3664098/larry-hogan-maryland-fracking-ban/

Appendix A

Sample Riparian Ordinance

Appendix A - Sample Riparian Ordinance

Part 1: Guidance for FEMA Community Rating System Credits

In preparing the sample riparian buffer ordinance, we sought guidance from the Federal Emergency Management Agency ("FEMA") regarding the sample ordinance, and how such ordinance provisions might help municipalities qualify for FEMA's Community Rating System ("CRS") credits. In providing feedback, FEMA staff offered some comments that municipal officials may want to consider to better the chances that FEMA will award CRS credits for enacting and implementing ordinance provisions such as these. Some of these comments are provided below. Municipalities may also want to contact FEMA directly for further guidance.

Sample Ordinance Section	Language in Sample Ordinance	FEMA Staff Comment
Section on Improvements to the buffer area – B.(d)(i), third bullet point	"Applicants shall provide permanent protection of riparian buffer area by placing a conservation easement on the property."	Once this easement is established, the land could qualify as Naturally functioning open space.
Sec. C.(4)	"No concrete, armoring, levees, rip rap, dams, beach nourishment, or other forms of human structural stream bank or shoreline stabilization methods may be employed as a component of riparian buffer restoration."	This language could qualify a length of shoreline for NSP – Natural Shoreline Protection Credit
Exemptions – D.(h)(iii) (on single family residences)	"The dwelling is not located in whole or in part in a 100 year floodplain."	Potentially DL2 – development limitations credit
Variance section as a whole	Variance section as a whole	By allowing variances, the buffer area will not be treated as open space until it is placed in a permanent easement preserving the buffer as a natural riparian area.
Variances - Section E.1.	(1) Criteria. — The Township may grant a variance if the applicant demonstrates any of the following: (a) Strict compliance would prevent all economic use of the property or constitute a legally defined taking. (b) The project would serve a compelling public need and no feasible alternative is available. (c) The project consists of the repair and maintenance of public improvements where avoidance and minimization of adverse impacts to the riparian buffer area have been addressed.	Re: Section (1)(a): Since the meaning of the phrase "constitute a legally defined taking" varies by state, it may negate much of the potential credit. Record of easements would result in credit in all cases. Re: Section (1)(b): may result in reduction of credit depending on how often such variances are granted.
Optional Variance Provisions – (4)	"In granting a variance, the Township may allow the buffer width to be relaxed and the permitted buffer area to become narrower at some points, as long as the average width and total area meet the requirements set forth in subsection B. This averaging of the buffer area may be used to allow for the presence of an existing structure or to recover a lost lot; however, the buffer width may be narrowed by no more than 25%, and no new land development activity may take place within the 100-year floodplain."	This prohibition on new land development, if strictly enforced, may result in credit for DL2 and, if fill is prohibited, DL1. DL1 credit can result in bonus credit for freeboard, FRB.
Optional Variance Provisions – (5)	"The Township may offer credit for additional density elsewhere on the site to offset for the loss of developable land due to the requirements of this section. This offset may increase the total number of dwelling units on the site up to the amount permitted under the base zoning requirements."	This is analogous to a transfer of development rights, or clustering. Both credited as Open Space Incentives (OSI).

Part 2: Sample Ordinance

ORDINANCE NO. _____

AN ORDINANCE OF THE TOWNSHIP OF PUREWATER, HEALTHY COUNTY, PENNSYLVANIA, AMENDING CHAPTER X OF THE PUREWATER TOWNSHIP CODE OF ORDINANCES PERTAINING TO SUBDIVISION AND LAND DEVELOPMENT AND RIPARIAN BUFFERS.

WHEREAS, Section 1516 (53 P.S. Section 66516) of the Pennsylvania Second Class Township Code provides that the corporate powers of the Board of Supervisors of Purewater Township (the "Board of Supervisors") include the ability to plan for the development of the Township through Zoning, Subdivision, and Land Development Regulations under the Act of July 13, 1968 (P.L. 805, No. 247), known as the "Pennsylvania Municipalities Planning Code";

WHEREAS, the Purewater Township Subdivision and Land Development Ordinance, as amended, is codified in Chapter X of the Code of Ordinances of Purewater (The Code);

WHEREAS, Section 1601 of the Second Class Township Code provides that the Board of Supervisors may adopt Ordinances in which general or specific powers of the Township may be exercised, and, by the enactment of subsequent Ordinances, the Board of Supervisors may amend, repeal, or revise existing Ordinances (53 P.S. Section 66601);

WHEREAS, natural riparian buffers are the most cost-effective means of addressing multiple threats to surface water quality and aquatic health, including streambank erosion, nutrient, sediment, thermal, and other forms of pollution, rapid fluctuations in flow due to stormwater influxes, ecosystem impairment, and habitat loss;

WHEREAS, natural riparian buffers contribute to citizens' quality of life by maintaining and protecting water quality and aquatic life, reducing flooding, preventing property damage, conserving scenic areas in the Township, improving property values, and providing places for passive recreation;

WHEREAS, the proposed amendments are consistent with the Township's obligations under Article I, Section 27 of the Pennsylvania Constitution;

WHEREAS, the proposed amendments will improve surface water quality, reduce adverse aquatic health impacts, improve and maintain water quality for a variety of uses, manage stormwater, conserve natural features, help the Township qualify for "community rating system" (CRS)[1] credit regarding floodplains and flood insurance;

WHEREAS, the proposed amendments are protective of the public health, safety, and welfare of Township citizens and businesses; and

1 The CRS program is administered by the Federal Emergency Management Agency ("FEMA").

WHEREAS, the proposed amendments have been advertised, considered, and reviewed in accordance with Municipalities Planning Code Sections 505 and 506 (53 P.S. Section 10505, 10506) and the Township's Code of Ordinances;

NOW THEREFORE, in consideration of the foregoing, be it **ENACTED** and **ORDAINED** by the Board of Supervisors of Purewater Township, Healthy County, Pennsylvania, as follows:

I. Chapter X of the Purewater Township Code of Ordinances is hereby AMENDED as follows:

ADD a new Section X-### as follows:

§ X-###. Riparian Buffers.

A. Definitions. The definitions set forth below shall apply only to this Section X-### unless otherwise indicated or unless the context clearly indicates otherwise.

"Department." The Department of Environmental Protection of the Commonwealth.

"Earth disturbance." A construction or other human activity which disturbs the surface of the land, including land clearing and grubbing, grading, excavations, embankments, land development, agricultural plowing or tilling, operation of animal heavy use areas, timber harvesting activities, road maintenance activities, oil and gas activities, well drilling, mineral extraction, and the moving, depositing, stockpiling, or storing of soil, rock or earth material.

"Earth disturbance activity." An act or activity that comprises, facilitates or results in earth disturbance.

"Exceptional value water." Surface water of exceptional value that satisfies the provisions of 25 Pa. Code § 93.4b(b) (relating to qualifying as high quality or exceptional value waters).

"Floodplain." Any land area susceptible to flooding, that has at least a 1% probability of flooding occurring in any calendar year based on the basin being fully developed as shown on a current land use plan. For areas that do not have a mapped 100-year floodplain, the 100-year floodplain is considered to extend for a horizontal distance of 50 feet from the top of the streambank.

"High quality water." Surface water having quality that exceeds levels necessary to support propagation of fish, shellfish and wildlife and recreation in and on the water by satisfying the provisions of 25 Pa. Code § 93.4b(a) (relating to qualifying as high quality or exceptional value waters).

"Impaired riparian buffer." A riparian buffer that, as a result of land development activity, contains impervious cover or no longer meets the definition of "natural riparian buffer."

"Impervious cover." Those surfaces which do not readily absorb precipitation and surface water. The term includes but is not limited to buildings, parking areas, driveways, roads, sidewalks, swimming pools, and any areas in concrete, asphalt, packed stone, or other equivalent surfaces, including those with a coefficient of runoff of 0.7 or higher. Impervious surfaces also include disturbed soils with a bulk density of 95 percent of the value at which plant growth limitation is expected for average plant material.

"Land development." Any land change, including, but not limited to, clearing, grubbing, stripping, removal of vegetation, dredging, grading, excavating, transporting and filling of land, construction, subdivision, paving, or any other increase in impervious cover.

"Land development activity." An act or activity that comprises, facilitates or results in land development.

"Natural riparian buffer." A riparian buffer that is dominated by native vegetation, including trees, shrubs and/or herbaceous plants, and provides any of the following functions:

(1) Maintains the integrity of adjacent stream channels and shorelines or helps stabilize stream banks including reducing erosion;

(2) Reduces the impact of upland sources of pollution by trapping, filtering or converting sediments, nutrients or other contaminants;

(3) Supplies food, cover, shelter, habitat or thermal protection to fish, other aquatic life, or other wildlife;

(4) Protects or benefits the ecological and absorptive capacity of soils, floodplains and/or wetland areas; or

(5) Increases storage and infiltration of floodwaters and reduces floodwater velocities; or

(6) Reduces impacts of climate change by absorbing greenhouse gases.

"Nonconforming uses or structures." Any uses or structures that were legally established prior to the effective date of this section, but which do not comply with the provisions of this act.

"Nontidal wetlands." Those areas not influenced by tidal fluctuations that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

"One hundred-year flood plain." The area of land adjacent to a stream that is subject to inundation during a storm event that has a probability of occurrence of 1% in any given year.

"Ordinance." An ordinance adopted by a municipality for riparian buffers.

"Permit." A final permit issued by a municipality for undertaking any land development activity.

"Person." An individual, partnership, firm, association, joint venture, public or private corporation, trust, estate, commission, board, public or private institution, utility, cooperative, city, county or other political subdivision of this Commonwealth and an interstate body or other legal entity.

"Pollution." Contamination of any waters of this Commonwealth -- including, but not limited to, such contamination by alteration of the physical, chemical or biological properties of such waters, or change in temperature, taste, color or odor thereof, or the discharge of any liquid, gaseous, radioactive, solid or other substances into such waters -- that does, will or is likely to:

(1) Create a degradation of water quality; or

(2) Create a nuisance; or

(3) Render waters harmful, detrimental or injurious to:

(a) public health, safety or welfare;

(b) domestic, municipal, commercial, industrial, agricultural, recreational or other legitimate beneficial uses; or

(c) livestock, wild animals, birds, fish or other aquatic life, or

(4) Cause or contribute to the failure of a waterbody to meet applicable water quality standards or criteria enacted by the Commonwealth of Pennsylvania or any of the River Basin Commissions of which it is a voting member.

"Riparian." Belonging or related to the bank of a waterbody, river, stream, wetland, lake, pond or impoundment.

"Riparian buffer area." An area adjacent to a waterbody.

"Riparian buffer restoration." Returning an impaired riparian buffer to being a naturally functioning riparian buffer dominated by native vegetation, including trees, shrubs and/or herbaceous plants. No concrete, armoring, levees, rip rap, dams, beach nourishment, or other forms of human structural stream bank or shoreline stabilization methods may be employed as a component of riparian buffer restoration.

"Special protection waters." Any waterbody that qualifies as exceptional value water or high quality water, or is subject to other special protections for water quality, including standards set by interstate river basin commissions.

"Stream." A perennial or intermittent watercourse with a defined channel, bed and banks.

"Stream bank." Sloping land that contains a stream channel and the normal flows of the stream.

"Stream channel." The part of a watercourse either naturally or artificially created that contains an intermittent or perennial base flow of groundwater origin. Base flows of groundwater origin can be distinguished by any of the following physical indicators:

(1) Hydrophytic vegetation, hydric soil or other hydrologic indicators in the area where groundwater enters the stream channel in the vicinity of the stream headwaters, channel bed or channel banks.

(2) Flowing water not directly related to a storm event.

(3) Historical records of a local high groundwater table, such as well and stream gauge records.

"Vernal pond." A small body of standing water that forms in the spring from meltwater and is often dry by mid-summer or may even be dry before the end of the spring growing season.

"Waterbody." Any natural or manmade pond, lake, wetland, impoundment, stream or watercourse. This shall not include any pond or facility designed and constructed solely to contain stormwater.

"Watercourse." Any channel of conveyance of surface water having a defined bed and banks, such as a stream, river, brook, or creek, whether natural or artificial, with perennial, intermittent or seasonal flow. This shall not include any channel or ditch designed and constructed solely to carry stormwater.

"Watershed." The land area that drains into a particular stream, waterbody or watercourse.

B. Protection of Existing Riparian Buffers.

(1) Prohibited activity.-- No land development shall be permitted within a riparian buffer area, except as otherwise provided below.

(2) General Width of Riparian Buffer Area.-- Except as otherwise required under subsection (3), the width of the riparian buffer area protected under subsection (1) shall be a minimum of one hundred (100) feet on each side of the stream as measured from the top of the bank.

(3) Additional Width Requirements.

(a) If the waterbody is designated as special protection waters, high quality water, or exceptional value water, the minimum width shall be a minimum of three hundred (300) feet on each side of the waterbody as measured from the top of the bank.

(b) In the case of the presence of a nontidal wetland or vernal pond wholly or partially within the riparian buffer area, an additional twenty-five (25) feet shall be added to the otherwise required widths from the wetland or vernal pond boundary.

(c) Steep Slopes. The following additional distances will be added to the minimum width provided above based on the following formula:

(i) ten (10) feet if slope is 10-15%;

(ii) twenty (20) feet if slope 16-17%;

(iii) thirty (30) feet if slope is 18-20%;

(iv) fifty (50) feet if slope is 21-23%;

(v) sixty (60) feet if slope is 24-25%; and

(vi) seventy (70) feet if slope exceeds 25%.

(d) If the waterbody has been identified as impaired in accordance with Section 303 of the Clean Water Act and implementing state regulations, an additional fifty (50) feet shall be added to the minimum one hundred (100) foot width. In the case of a waterbody that has been identified as impaired by the Department, the developer shall have the option of either choosing to extend the riparian buffer area an additional fifty (50) feet from the top of the bank beyond the other requirements **or** to implement the following improvements in the riparian buffer area **and** in the developed area adjacent to it:

(i) Improvements to the buffer area:

- Fifty percent (50%) or more of trees planted in the riparian buffer area must be of two inch caliper or greater, and tree species composition shall consist of a diverse mix of native tree species planted in the proper hydrologic zone as listed in Appendix B of

the Pennsylvania Stormwater Best Management Practice ("BMP") Manual.

- Applicants shall develop and implement an operation and maintenance plan for the riparian buffer to be approved by the Department. The operation and maintenance plan shall require maintenance activities for a minimum of five (5) years, include measures to control invasive species, deer and rodent damage, and require replacement of all deceased trees for a minimum of the first three (3) years.
- Applicants shall provide permanent protection of riparian buffer area by placing a conservation easement on the property.

(ii) Improvements to adjacent area:

- Achieve no net increase in pre-development to post-development volume, rate, peak and concentration of pollutants using alternative site design, low impact development principles such as limiting disturbance, infiltration BMPs and other environmentally sound stormwater BMPs.
- Through deed restriction for all lots sold and as a condition of any final land development plan approval, ban the use of fertilizers, pesticides, herbicides or other chemicals on lawns and other portions of the property, except that herbicides may be used for invasive species control in riparian buffer areas if part of an operation and maintenance plan approved by the Department.
- Developments shall replace any and all trees removed during the development process with the caliper of removed trees approximately matched by the sum of the caliper of replacement trees (i.e. four (4) three (3) inch trees replace one 12 inch tree).

(4) Condition of Other Approvals and Permits. Full compliance with the provisions of this section shall be a condition of any and all approvals and permits by the Township, including but not limited to the following:

(a) Approval of land development activity;

(b) Building permit;

(c) Zoning hearing board approval;

(d) Conditional use approval;

(e) Subdivision approval;

(f) Grading permit; or

(g) Sewage facilities (Act 537) planning module approval.

C. Restoration of Impaired Riparian Buffers.

(1) General Rule. For a property with an impaired riparian buffer, riparian buffer restoration shall be a condition of any and all governmental approvals and permits, including but not limited to any:

(a) Approval of land development activity;

(b) Building permit;

(c) Zoning hearing board approval;

(d) Conditional use approval;

(e) Subdivision approval;

(f) Grading permit; or

(g) Sewage facilities (Act 537) planning module approval.

(2) Riparian buffer restoration shall conform to the width requirements set forth in subsection B above.

(3) As part of riparian buffer restoration, fifty percent (50%) or more of trees planted in the riparian buffer area must be of two inch caliper or greater, and plant species composition shall consist of a diverse mix of native species planted in the proper hydrologic zone as listed in Appendix B of the Pennsylvania Stormwater Best Management Practice ("BMP") Manual.

(4) No concrete, armoring, levees, rip rap, dams, beach nourishment, or other forms of human structural stream bank or shoreline stabilization methods may be employed as a component of riparian buffer restoration.

D. Exemptions.

(1) Land Development Activity Allowed within Riparian Buffer Areas.-- The following land uses shall be exempt from the prohibitions and requirements set forth in subsections B and C:

(a) Land uses existing as of the effective date of this section, except as follows:

(i) when the existing land use, or any building or structure involved in that use, is enlarged, increased or extended to occupy a greater area of land;

(ii) when the existing land use, or any building or structure involved in that use, is moved, in whole or in part, to any other portion of the property; or

(iii) when the existing land use ceases for a period of more than one (1) year.

(b) Agricultural production that is consistent with all Federal and State laws, regulations promulgated by the Department and best management practices established by the State Conservation Commission and the Department of Agriculture of the Commonwealth.

(c) Selective logging provided that the logging practices comply with the best management practices set forth by the Bureau of Forestry, provided, however, that no logging shall occur within 100 feet of any stream.

(d) Crossings by transportation facilities and utility lines. Issuance of permits for these uses or activities is contingent upon the completion of a:

(i) Feasibility study that identifies alternative routing strategies that do not impact a riparian buffer area.

(ii) Mitigation plan to minimize impacts on the riparian buffer area utilizing natural channel design practices to the greatest degree possible.

(e) Temporary stream restoration projects, stream bank restoration projects and vegetation restoration projects to restore the stream or riparian zone to an ecologically healthy state utilizing natural channel design practices to the greatest degree possible. No concrete, armoring, levees, rip rap, dams, beach nourishment, or other forms of human structural stream bank or shoreline stabilization methods may be employed as a component of restoration.

(f) Structures that, by their nature, cannot be located anywhere except within the riparian buffer area. These structures shall include docks, boat launches, public water supply intake structures, facilities for natural water quality treatment and purification and public wastewater treatment plant sewer lines and outfalls. The structures shall provide for the minimum practicable disturbance of the riparian buffer area by minimizing size and location and by taking advantage of collocation, if possible. Stormwater conveyance structures and outfalls are not included in this group and shall be located outside of the buffer area.

(g) Wildlife and fisheries management activities consistent with the purposes of, but not limited to:

(i) 30 Pa.C.S (relating to fish).

(ii) 34 Pa.C.S. (relating to game).

(iii) The act of December 5, 1972 (P.L.1277, No.283), known as the Pennsylvania Scenic Rivers Act.

(iv) The act of April 28, 1978 (P.L.87, No.41), known as the Pennsylvania Appalachian Trail Act.

(v) The act of June 23, 1982 (P.L.597, No.170), known as the Wild Resource Conservation Act.

(h) Construction of a single-family residence, including the usual appurtenances, provided that:

(i) Based on the size, shape or topography of the property, as of the effective date of this section, it is not reasonably possible to construct a single-family dwelling without encroaching upon the riparian buffer area.

(ii) The land development conforms with all other zoning and land use regulations.

(iii) The dwelling is not located in whole or part in a 100 year floodplain.

(iv) No septic tanks, septic drain fields, or other sewage management facilities shall be located within the riparian buffer area.

(v) The dwelling avoids, to the maximum extent practicable, disturbance of the riparian buffer area.

(vi) Any encroachment into the riparian buffer area is offset by an equal amount of wider riparian buffer width elsewhere on the same property so that the average

width and total area of the riparian buffer meets the requirements as set forth in subsection B.

(vii) The construction, dwelling and/or property is not, nor was originally presented for approval, following the effective date of this section, as part of a multi-lot subdivision.

(i) Other uses permitted by the Department under the act of June 22, 1937 (P.L.1987, No.394), known as The Clean Streams Law, and the act of November 26, 1978 (P.L.1375, No.325), known as the Dam Safety and Encroachments Act.

(2) All exempted uses, structures and activities shall comply with the requirements of 25 Pa. Code Ch. 102 (relating to erosion and sediment control) and all applicable best management practices and shall not diminish water quality except as otherwise permitted by the Department.

(3) All exempted uses shall be located as far from the stream bank as reasonably possible.

E. Variances.

(1) Criteria.-- The Township may grant a variance if the applicant demonstrates any of the following:

(a) Strict compliance would prevent all economic use of the property or constitute a legally defined taking.

(b) The project would serve a compelling public need and no feasible alternative is available.

(c) The project consists of the repair and maintenance of public improvements where avoidance and minimization of adverse impacts to the riparian buffer area have been addressed.

(2) Least Intrusive Variance Necessary.-- No variance shall be granted unless the buffer intrusion is the least intrusive means necessary to satisfy the criteria set forth in subsection (1) above.

(3) Procedures.

(a) An applicant must submit a written request for a variance to the Township. The application shall include specific reasons justifying the variance and any other information necessary to evaluate the proposed variance request.

(b) The Township may require an alternatives analysis clearly demonstrating that no other feasible alternatives exist and that minimal impact will occur as a result of the project or development.

(c) In granting a request for a variance, the Township may require additional site design, landscape planting, fencing, the placement of signs and the establishment of water quality best management practices in order to reduce impacts on water quality, wetlands and floodplains.

Optional Variance Provisions:

(4) In granting a variance, the Township may allow the buffer width to be relaxed and the permitted buffer area to become narrower at some points, as long as the average width and total area meet the requirements

set forth in subsection B. This averaging of the buffer area may be used to allow for the presence of an existing structure or to recover a lost lot; however, the buffer width may be narrowed by no more than 25%, and no new land development activity may take place within the 100-year floodplain.

(5) The Township may offer credit for additional density elsewhere on the site to offset for the loss of developable land due to the requirements of this section. This offset may increase the total number of dwelling units on the site up to the amount permitted under the base zoning requirements.

F. Inspections.

(1) General rule.-- The Township may conduct investigations as it may reasonably deem necessary to carry out its authority as prescribed in this section and for this purpose shall have the power to and may enter at reasonable time upon any property, public or private, for the purpose of investigating and inspecting property that contains riparian buffers.

(2) Prohibited conduct.-- No person shall refuse entry or access to any authorized representative or agent who requests entry for purposes of inspection, and who presents appropriate credentials, nor shall any person obstruct, hamper or interfere with any such representative while in the process of carrying out official duties.

G. Enforcement.

(1) General rule.-- The zoning officer or other authorized agent of the Township shall enforce the requirements of this section in accordance with this subsection.

(2) Violations.-- If, upon inspection or investigation, the zoning officer or other authorized agent of the Township determines that an activity violates the requirements of this section, the activity shall be considered to be in violation of this section.

(3) Notice of violation.-- Upon determination of a violation, the Township shall issue a notice of violation to the permit holder, property owner or party in charge of the activity on the property. The notice shall be in writing and require the immediate stoppage of all work on the property. The notice shall include:

(a) The name and address of the owner.

(b) The address or description and location of the property where the violation occurred.

(c) A description of the violation or violations.

(d) A description of the corrective actions needed to return to compliance and a time schedule to complete the corrective actions.

(4) Emergency.-- Where an emergency exists, no written notice shall be required to stop work. Written notice of the stop-work order shall be presented to the appropriate responsible parties within three (3) business days of the emergency order.

H. Appeals.

(1) General rule.-- Any person who is aggrieved by a decision or order of the Township imposed under this section may appeal the decision or order in writing to the Zoning Hearing Board in accordance with the time limitations and requirements in the Municipalities Planning Code.

(2) Judicial review.--Any person aggrieved by a decision or order of the Township imposed under this section shall have the right to appeal to the Court of Common Pleas of Healthy County in accordance with the Municipalities Planning Code.

I. Penalties, Civil Action and Liability for Costs.

(1) Penalties.-- The penalties that may be assessed for a violation of this section may include:

(a) If, through inspection, it is determined the corrective measures specified in a stop-work order have not been completed within the specified time, the responsible party shall be deemed to be in violation, and, in addition to other penalties, any performance bond shall be subject to forfeiture.

(b) Any permit issued by the Township may be suspended, revoked or modified if, through inspection, it is determined the corrective measures specified in a stop-work order have not been completed within the specified time.

(c) Any person who violates any provision of this section, permitting conditions or stop-work order, and also the owner of the land where the violation occurs shall be liable for a civil penalty of no more than $500, plus all court costs, including reasonable attorney fees incurred by the Township as a result of the violation. Each day the violation continues shall constitute a separate offense.

(2) Civil action for recovery of damages.

(a) In addition to any other sanction authorized under this Section, a person who fails to comply with the provisions of this section shall be liable to the Township in a civil action for damages in an amount equal to one and one-half times the cost of restoring the buffer.

(b) Damages that are recovered under this subsection shall be used for the restoration of buffer systems or for the administration of programs for the protection and restoration of water quality, streams, wetlands and floodplains.

(3) Liability for costs.-- Any person who violates a provision of this section may be liable for any cost or expenses incurred as a result thereof by the municipality.

K. Conflicts with Laws, Regulations, or Ordinances.

(1) Where the standards of this section are in conflict with other laws, regulations, or ordinances regarding waterbodies, streams, steep slopes, erodible soils, wetlands, floodplains, timber harvesting, earth disturbance activities or other environmental protective measures, the more restrictive shall apply.

(2) Where any provision of this section is in conflict with another law, regulation, or ordinance, the more restrictive shall apply.

II. Partial Repealer

All other provisions of the Purewater Township Subdivision and Land Development Ordinance, as amended, shall remain in full force and effect. All other Ordinances or provisions of the Subdivision and Land Development Ordinance inconsistent herewith or in conflict with any of the terms hereof are, to the extent of said inconsistencies or conflicts, hereby specifically repealed.

III. Severability

The provisions of this Ordinance are severable. If any section, clause, sentence, part or provision thereof shall be held illegal, invalid, or unconstitutional by a court of competent jurisdiction, such decision of the court shall not affect or impair any of the remaining sections, clauses, sentences, parts or provisions of this Ordinance. It is hereby declared to be the intent of the Board of Supervisors that this Ordinance would have been adopted if such illegal, invalid, or unconstitutional section, clause, sentence or part of a provision had not been included herein.

IV. Effective Date

All provisions of this Ordinance shall be in full force and effect five (5) days after the approval and adoption.

ENACTED AND ORDAINED this __the day of _____, 2015.

ATTEST:

PUREWATER TOWNSHIP
BOARD OF SUPERVISORS
By:

_____ , Secretary

_____ , Chair

Appendix B

Private Well Water Supply Testing Ordinance

Appendix B - Private Well Water Supply Testing Ordinance

Part 1: Why Enact A Private Well Water Supply Testing Ordinance?

As part of their zoning, subdivision and land development application procedures, municipalities may require well water quantity testing to protect well water supplies. This is particularly important for areas where water-consumptive industrial use, such as gas drilling, is occurring or could potentially occur.

Such testing will help insure that well users will have a reliable and adequate amount of water to serve their needs. It will also provide important data about groundwater and aquifer conditions that will help the community plan for water resource sustainability.

Local groundwater supplies can be depleted and/or disrupted by water withdrawals from groundwater wells or surface water. For example, since the water used in gas drilling and hydraulic fracturing (fracking) is a consumptive loss (it is not returned to the source), water resource depletion can be substantial locally and regionally; cumulatively they can have significant impacts on watersheds (NY Draft Supplemental Generic Environmental Impact Statement, 2011). Water extraction for gas development can impact the yield and performance of water wells within a zone of influence.

To protect private individual water well supply a municipality can adopt a well water quantity testing requirement that must be followed by developers. The information produced by the test can be used to assess whether the proposed development is likely to impact or interfere with existing water wells in the region and can provide valuable baseline data that can protect existing water sources and aquifers.

The mapping of the aquifer to be tested needs to be set based on site-specific geologic analysis and current uses to assure the zone of influence is accurately measured. To help set the specific test protocol and to help with analysis of test results, the municipality can employ the services of a hydrogeologist on an as-needed basis. This sample ordinance suggests provisions that can be considered when developing a water well quantity testing ordinance. Any such provisions will require review by the municipal solicitor.

Part 2: Sample Water Well Quantity Testing Ordinance

ORDINANCE NO. _____

AN ORDINANCE OF THE TOWNSHIP/ OF PUREWATER, HEALTHY COUNTY, PENNSYLVANIA

GENERAL REFERENCES

§ XXX-1. **Purpose and Authority.**

A. It has been shown that groundwater supply and well performance are vulnerable to activities on adjoining properties, new commercial and industrial water demands and regional disruption in aquifer properties in Purewater Township and surrounding municipalities depending on geological and hydrological factors.

B. Purewater Township depends upon groundwater as its sole water resource. Municipal planning must act in a responsible fashion to protect this essential resource for present and future generations.

C. This chapter is designed:

(1) To ensure that proposed land uses seeking zoning or subdivision/land development approval will produce sufficient volumes of water to serve their intended use and to maintain acceptable standards of hygiene and sanitation;

(2) To ensure that proposed land development does not unduly infringe upon the performance of existing wells; and

(3) To collect data and information about local groundwater aquifers to determine aquifer characteristics and evaluate any long term changes to aquifer yield and water quality.

§ XXX-2. **Incorporation of state standards by reference; higher standards to prevail.**[1]

The following standards are hereby incorporated and made part of this chapter by reference: Pennsylvania Safe Drinking Water Act (Chapter 109) and the Public Water Supply Manual. If there are conflicts between any part of this chapter and any other applicable law, the more stringent of the two shall apply.

§ XXX-3. **Definitions.**

As used in this chapter, the following terms shall have the meanings indicated:

"Advance notice of test dates." Communications in writing or by telephone with the secretary of the Township or with a field witness designated by the Township. Messages left on answering machines are not binding advance notices.

"Alteration." Any physical change in the well and water supply distribution system, including deepening, modification, removal, adding additional water distribution lines, change of use, and additional use. The term "alter" shall be construed accordingly. Hydrofracturing shall be considered an alteration if it is not carried out as part of the construction of a new well. Replacement of pumps, installation of pitless adapters, or extension of the well casing above grade to conform to the state code shall be considered repairs and not alterations.

"Approve." Accepted or approved under applicable specifications stated or cited in this chapter, or accepted as suitable for the proposed use under procedures and powers of administration delegated in this chapter, and the word "approval" shall be construed accordingly.

"Authorized agent." Any qualified person who is delegated to function within specified limits by the Township.

"Available drawdown." The distance between the static water level and a water level five feet above the pump intake.

"Certification." A written statement by the Township attesting that the water supply facilities for the proposed realty improvement are in compliance with the requirements of this chapter.

"Commercial water use." The use of well water as an integral part of a commercial operation (e.g., landscaping, restaurants, laundries, or car washes) but not the incidental well water use associated with commercial operations.

"Construct a well." Creating physical access to groundwater-bearing strata for the purpose of providing a water supply.

"Development." The division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation, or enlargement of any building or structure, any mining excavation, landfill, or recreational facility, and any use or change in the use of any building or other structure, or land or extension of use of land.

"Drawdown." A decline in the water level in a well measured from the static level.

"Drilling discharge test (commonly known as "blowing the well")." An estimation of a well yield by measuring the discharge rate from the well bore during the drilling operation as described in § XXX-9.

"GPM" – Gallons per minute

"Cement grout." Portland cement mixed at a rate of six (6) gallons of water per 94 pounds of cement

"Industrial well." The use of well water as an integral part of an industrial operation (e.g., manufacturing, gas drilling supplies, or power generation) but not the incidental potable water use associated with industrial operations.

"Interference test." Performing measurements of water levels in designated observation wells to determine the change in water levels from those measured immediately prior to commencement of the well test.

"Multiple rate step test." A test consisting of four, one-hour long constant rate steps run at equal, increasing rate intervals. For example, the flow rates for a step test would be 3, 6, 9 and 12 gallons per minute (gpm), each step increasing by 3 gpm.

"New well." A newly constructed, altered, or an existing well prior to its certification for a new or expanded use.

"Non-residential water use." Any use of water not related to residential use.

"Observation well." Any nonpumped well utilized to obtain water level measurements during interference testing.

"Potable water." Water free from impurities in amounts sufficient to cause disease or harmful physiological effects and conforming in its bacteriological and chemical quality to the requirements of the Pennsylvania Safe Drinking Water Act regulations.

"Realty improvement." Any proposed new residence or other building the useful occupancy of which requires the installation or erection of a water supply system. Each family unit in a proposed multiple dwelling shall be construed to be a separate realty improvement.

"Repair." To fix, refurbish or replace one or more components of a water supply system in a manner that will restore and preserve the original location, design, construction and installation of the system.

"Residential replacement well." A well constructed to substitute for an existing residential well that has failed to provide sufficient water to adequately supply its existing residence or to provide water of potable quality.

"Specific yield" or "Specific capacity." The rate of discharge of a water well per unit of drawdown, commonly expressed in gallons per minute divided by feet of drawdown (gpm/ft).

"Static water level." The water level in the well either before or after pumping when all drilling and pumping effects on the aquifer have dissipated and the well is in equilibrium with atmospheric pressure.

"Step rate test." A pumping test conducted upon the well so that discharge remains constant with time.

"Test well." A well subjected to the Drilling Discharge Test, to the residential Step Rate Test in § XXX-10, or to the non-residential pump test in § XXX-11.

"Three part step test." The sequence of background test, Multiple Rate Step Test, and well recovery test as described in § XXX-10 for residential wells, and in § XXX-11 for non-residential wells.

"Three part aquifer test." The sequence of background test, Step Rate Test and recovery test as described in § XXX-11 for non-residential wells.

"Well." An artificial excavation that derives water from the interstices of the rocks or soils which it penetrates.

"Well recharge" or "Well recovery." The inflow of groundwater into a well from the aquifers in which the

well is drilled.

"Well yield." The rate at which it has been demonstrated that water can be withdrawn infinitely from the well.

§ XXX-4. **(Reserved).**

§ XXX-5. **(Reserved)**.

§ XXX-6. **Certification**.

A. All zoning, subdivision or land development applications that propose new or altered water wells shall require certification that the proposed use will satisfy the requirements of the residential Three Part Step Test as specified in § XXX-10, or the non-residential Three Part Aquifer Test as specified in § XXX-11. All zoning, subdivision or land development applications that propose new or altered non-residential water wells that are subject to the Three Part Aquifer Test and are located in proximity to existing producing water wells shall undergo the well interference test as specified in § XXX-12 to the satisfaction of the Township or its agent before certification.

§ XXX-7. **Applicability.**

A. General.

(1) The well performance requirements and the well interference requirements contained in this chapter shall be applicable in all zoning districts i f not specifically exempted in other sections of this chapter.

(2) The provisions of this chapter shall apply to all applications to the Township for: approval as to suitability for subdivision as specified in § XXX-7C with the exception of subdivisions performed solely for the purpose of merger, boundary adjustment or agricultural partition;

(3) Any such application submitted to the Township for approval or certification shall be made on forms prescribed by the Township and shall include but not be limited to all data as specified by this chapter.

(4) Any such application shall include a plot plan showing the location of all new wells, the location of all preexisting wells, the location of springs used for water supply, the location of all existing subsurface disposal areas, and the location of soil tests for potential subsurface disposal areas within the distances shown in Table 7-A-4 below.

Table 7-A-4

Lot Size	Minimum Spacing of New Wells from Other Wells*,†
Less than 1.5 acres	100 feet‡
1.5 to 3 acres	150 feet
More than 3 acres	250 feet

* The minimum spacing requirements for a replacement well for an existing use may be waived if there is no expansion or change of use.
† The spacing requirement may be waived for multiple wells on single lots that serve one individual residence with justification.
‡ The spacing requirement for very small lots may be reduced to not less than 50 feet with a minimum of 50 feet of casing to accommodate spacing for existing wells.

(5) Any such application shall include the technical specifications for new wells as needed for the Water Well Completion Report, such as casing depth, casing material, casing diameter, grouting material, proposed total depth and required or desired yield.

B. (Reserved).

C. Subdivisions.

(1) For all major subdivisions in all zoning districts, a hydrogeological report shall be submitted prior to granting approval as to the suitability for subdivision by the Township. This report shall include the information and data specified in § XXX-7E below.

(2) Certification under this chapter shall be required for each lot of any subdivision in allzoning districts before approval as to the suitability of such lot can be granted by the Township. For each of these wells, all wells on the other lots of the proposed subdivision located within the required distance from the test well, as shown in Table 11-B-6, must be available as observation wells according to the well interference test requirements as described in § XXX-12. Preexisting producing wells located within the required distance from any test well may be used as observation wells at the option of their owners.

D. Non-Residential Development.

(1) For nonresidential development proposals with a total projected water use for the project of 4,500 gallons per day (gpd) (slightly more than 3 gallons per minute [gpm] for 24 hours) or more, a hydrogeological analysis shall be required and shall include the information and data specified in § XXX-7E below prior to granting of approval as to the suitability of the proposal by the Township. Such analysis shall be performed by a qualified professional with experience in the field of hydrogeology and as a minimum shall include pump tests and well interference tests designed to show whether the water supply will be adequate for the intended use. Advance approval of all test protocols by the Township shall be required.

(2) For nonresidential development proposals with a total projected water use for the project of less than 4,500 gallons per day a simplified testing procedure consisting of a constant rate and recovery test shall be conducted as specified in § XXX-11B(2) below.

(3) Demand for industrial and commercial use shall be based on the Pennsylvania Public Water Supply Manual (see Table IV-1.2 Part IV).

E. Hydrogeological report.

(1) The preliminary hydrogeological report for the proposed major subdivisions specified in § XXX-7C(1) and non-residential developments specified in § XXX-7D(1) above shall be prepared by a qualified professional with experience in the field of hydrogeology. The qualifications of the persons and firm who will be performing the test shall be submitted for review to the Township. The hydrogeologic report shall include specifics as follows:

(a) A discussion of the hydrogeology of the site and its environs, including the review of available information in published maps and reports depicting the Township and surrounding municipalities. This review shall also include the attitude of formation strike and dip and a fracture trace analysis using aerial photographs showing the location and orientation of fractures beneath the site.

(b) An aquifer test plan shall be submitted including the location and technical specifications for the proposed test well and wells to be monitored for interference in accordance with § XXX-7E(2). Prior to conducting an aquifer test, the applicant shall submit the design of such aquifer test including the location of well(s) to be monitored for interference on adjacent lots. Such a review may include submission of such design to a qualified hydrogeologist representing the Township for review and recommendations. The Township may consider the comments and recommendations of this hydrogeologist prior to approving the aquifer test plan.

(c) The location of all disposal areas, active, abandoned and proposed, and the location of all soil tests for potential subsurface disposal areas within 250 feet of the proposed wells.

(d) A review of all well drilling results from the records of the Pennsylvania Geological Survey from lots located within 1,000 feet of the proposed development.

(e) A review of all gas well locations within one (1) mile of the proposed development.

(f) A summary projection of the hydrological impact (e.g., the projected long-term trend of the water levels in the available aquifers or other sources of potable water) that may be caused by the proposed subdivision or non-residential development and an outline of all measures that may reasonably be employed to minimize adverse impacts. This hydrological analysis shall at a minimum address the impacts of any existing and proposed wastewater disposal systems onto water supplies; impacts of any existing and proposed stormwater management practices onto any existing and proposed water supply and wastewater disposal systems; impacts of proposed water supplies and wastewater disposal systems onto stream baseflow and wetlands; and impacts regarding pollution of surface and groundwaters. The analysis shall also include an outline of all measures that may reasonably be employed to minimize any identified adverse impacts.

(2) As a basis for the required study, an adequate number of test wells shall be provided. The proposed location of these wells must be indicated on a plot plan and along with the aquifer test plan, shall be provided to the Township prior to installation of the wells. The fracture trace analysis should be used to identify all observation wells, which should be located along the primary geologic features. The first observation well, when required, shall be located along strike of the primary geologic fracture/ structures identified on or near the property. Table 7-E-2 is a guide to the number of test well(s) required:

Table 7-E-2

Residential Subdivisions:

Number of Proposed Lots	Number of Test Wells	Number of Observation Wells
4 – 10	1	2
11 - 25	2	4
26 – 49	3	6
50 and over	At the Township's discretion, but not more test wells than 20% of the number of proposed lots.	At the Township's discretion, but not more test wells than 20% of the number of proposed lots.
Public Community Systems	At the Township's discretion.	At the Township's discretion

Non-Residential Developments:

Number of Observation Wells		
Average Demand (gallons per day)	Low Yield Zones	High Yield Zones
4499 or less	1	0
4,500 to 14,999	1	1
15,000 to 50,000	3*	2*
50,000 to 100,000	4*	3*
100,000 or more	Obtain PADEP Water Allocation Permit	Obtain PADEP Water Allocation Permit

* Includes shallow piezometer to assess impact of vertical leakage on shallow ground water, on subsurface disposal units, or on surface waters bodies such as wetlands.

(3) Both test wells and observation wells may be installed in locations which can be utilized for future domestic groundwater supplies. The minimum number of observation wells can include existing wells if construction details are known. Observation wells and all existing wells within a distance from the test well as specified in Table 11-B-6 shall be monitored, but monitoring of existing wells may be performed only if their owners have so requested, following the outline in § XXX-12A.

(4) The qualified professional shall provide an outline of the proposed field work to the Township for review before the field work commences.

§ XXX-8. **(Reserved).**

§ XXX-9. **Test requirements for Drilling Discharge Test**.

A. General requirements. The capability of a residential well to meet the total water requirements of its user can be estimated by a Drilling Discharge Test, a procedure commonly known as "blowing the well." This test shall be conducted under the direction of a qualified professional geologist, a professional engineer or a well driller, licensed under the laws of the Commonwealth of Pennsylvania. The Township reserves the right to witness all Drilling Discharge Tests; the witness will certify the test results to the Township on the appropriate Township Well Testing Report forms. A minimum of two working days advance notice shall be provided to the Township. The well driller may be authorized by the Township to certify the results.

For applications that propose new residential wells, the Drilling Discharge Test is used to select the appropriate rates for the Three Part Step Test. For applications that propose new non-residential wells, the Drilling Discharge Test is used to select the appropriate rate for the Three Part Aquifer Test.

B. Test protocol.

(1) The Drilling Discharge Test may be performed at any time during the drilling operation after the well casing has been installed but preferably after a promising aquifer zone has been penetrated and the desired well depth has been reached. To initiate the test, the drill rotation must be stopped and the flow of any feed water from the drill rig terminated . With the drill bit remaining at the bottom of the well bore, compressed air flow through the drilling pipe is maintained to discharge all the water from the well bore until the overflow has cleared up completely but for at least 20 minutes or to the maximum that conditions allow.

(2) In the meantime, an annular catch basin is formed by mounding the drilling chips around the protruding well casing to collect the entire discharge. A short length of four-inch diameter pipe is imbedded into the wall of this catch basin to form a spout. The well discharge rate is then determined by timing the filling of a container of known volume (typically one gallon for lower well yields and five gallons for high well yields) under the spout with a suitable timer (e.g., a stopwatch). This timing is repeated in intervals of at least two minutes until three consecutive measurements do not differ by more than 10% or by not more than one second, whichever is greater. This flow test may also be performed by other methods such as a calibrated v-notch weir with the prior approval of the Township or the test witness.

(3) It is important to conduct the entire test sequence without interruptions.

(4) The static water level of all wells with a test yield of 10 gpm or more as estimated by the drilling discharge test shall be measured after completion of the drilling operation and the removal of the drilling rig. To allow sufficient time for well recovery, the static water level must be measured no sooner than two hours after removal of water from the well has stopped.

§ XXX-10. **Test requirements for Three Part Step Test**.

A. General requirements.

(1) The capability of a residential well to meet the daily requirements of its user shall be evaluated through a Three Part Step Test. The four rates of the step test are based on the Drilling Discharge Test. The estimated discharge of the Drilling Discharge Test is used as the rate for the third step of the test if the yield of the well is less than 10 gpm. The rates for the Three Part Step Test are at the digression of the driller for yields over 10 gpm. The driller should maximize the top rate of the step test to obtain the specific capacities of the well over a maximum range of flow. This is to maximize the possibility of observing variations with the specific capacity of the well if disruptions to the aquifer occur.

(2) All pump tests shall be conducted under the supervision of a qualified professional geologist, a professional engineer, or a well driller or a pump installer licensed under the laws of the Commonwealth of Pennsylvania, who shall certify the results to the Township if the tests were not witnessed by an agent of the Township. All test results shall be recorded on Township Well Testing Report forms to be issued by the Township.

(3) The Township reserves the right to witness all Three Part Step Tests. A minimum of two working days advance notice shall be provided to the Township, which reserves the right to allot testing dates in case of scheduling problems.

B. General technical requirements.

(1) The Three Part Step Test must be performed in one continuous operation as specified in § XXX-10C, D, and E. The well must be at its static level at the beginning of the test; i.e., the well has to be undisturbed for at least 18 hours before testing. If the test sequence has to be interrupted for technical reasons, the well test must be restarted the following day.

(2) A submersible pump shall be provided that is capable of pumping at least at the Drilling Discharge Test rate, if less than 10 gpm, and can be lowered to a sufficient depth in the well.

(3) Flow rates at the discharge line must be measured with a water flow meter. A valve must also be on the discharge line in order to permit adjustment of the flow rate. A means of verifying meter calibration during the test (e.g., a five gallon pail and a suitable timer), must be available to the witness. If a witness is not available, a calibration must be performed as soon as practical after the start of the test and during each step, and the results shall be made available to the Township.

(4) Water levels must be measured to the nearest inch or tenth of a foot from a fixed point; e.g., from the top of the casing. The equipment used to measure the water levels must have an audible signal and/or a light to register when water is encountered. Installation of a dip tube is recommended to protect the probe from cascading water.

(5) Failure to have the required equipment at the test well may result in cancellation of the test.

C. Background Test.

(1) General requirements.

(a) The Background Test is a standard aquifer test procedure to evaluate if the aquifer is at a steady state prior to the start of the Step Test.

(2) Test protocol.

(a) To perform the Background Test, the well is not used for a period of 16 hours. Water levels are measured at the end of the Drilling Discharge Test or 24 to 16 hours prior start of the Step Rate Test. The following morning (or the morning of the test if the Drilling Discharge and Step test are not on consecutive days) additional static water levels are obtained,

(b) The static water level is measured at 15 minute intervals the morning of the step test.

(c) The Step Test can be started when the water change over ½ hour is less than 0.05 feet.

D. Step Rate Test.

(1) General requirements. The Step Rate Pump Test is used to measure the well yield and to determine the change in specific capacity with variations in the flow rate. The data from the test is used to evaluate future changes in the yield of the well and yield of the aquifer.

(2) Test protocol.

(a) The Step Rate Test is undertaken immediately following the completion of the Background Test.

(b) The Step Rate Test is normally run for a full four (4) hours with rate changes occurring every hour. The four steps could also be conducted for 100 minutes each to make analysis on logarithmic graph paper easier.

(c) The initial rate of the test is selected to be approximately 1/3 of the rate observed in the Drilling Discharge Test. The last step is to slightly exceed the flow measured in the Drilling Discharge Test to stress the yield of the well over the largest possible range for the step test.

(d) The rate is increased every 60 minutes or 100 minutes at equal intervals.

(e) Water levels are recorded as indicated in Table 10-D-2.

Table 10-D-2

Time from start of step	Suggested Reading Intervals
1 to 10 minutes	Every 1 minute
10 to 20 minutes	Every 2 minutes
20 minutes to 1 hour	Every 5 minutes
Flow Rate measurements	Via totalizing flow meter and calibrated timed five gallon test twice per step

E. Well recovery test.

(1) The well recovery test has no minimum requirements; it is for information on the rate of recharge of the well only. However, failure of a well to recover 90% of the drawdown within a twenty-four-hour period raises doubts about the reliability of the well as a long-term water supply for residential use.

(2) Record the final water level from the Constant Rate Pump Test. Turn off the pump and record that time as the "zero time" for the start of the Well Recovery Test. Continue to record water level measurements as suggested in Table 10-E-2.

Table 10-E-2

Time Period of the Well Recovery Test	Suggested Reading Intervals
1 to 10 minutes	Every 1 minute
10 to 20 minutes	Every 2 minutes
20 minutes to 1 hour	Every 5 minutes
1 hour to 3 hours	Every 10 minutes

§ XXX-11. **Non-Residential requirements for Three Part Aquifer test**

A. General Requirements.

(1) The capacity of a proposed non-residential well(s) to meet the average and peak demand requirements of its user shall be evaluated through a Three Part Aquifer test. The aquifer test shall be conducted with a background phase, a constant rate pumping phase and a recovery phase. The pumping rate and total gallons pumped during the pumping phase should demonstrate that the required water is available without adverse impact on adjacent properties, the aquifer and related surface water features. If multiple production wells are required to meet development demands, the aquifer test plan must provide details for either conducting individual well tests for each proposed production well or on conducting the test using multiple production wells.

(2) The average demand shall be based on § XXX-7(D) above. The yield of the well shall be three times the average daily demand, which is designed to simulate peak demand. The pumping capacity for the Pump Test shall be at least 10 times the pumping rate. The volume of water pumped during the test shall be three times the average daily demand. Additional aquifer testing may be required if multiple supply wells are required to meet the demands of the facility

(3) The Township reserves the right to witness all Three Part Aquifer tests. A minimum of two working days advance notice shall be provided to the Township, which reserves the right to allot testing dates in case of scheduling problems.

B. Technical Requirements.

The Three Part Aquifer test must be performed in one continuous operation as specified in § XXX-11C, D, and E. The general outline of the aquifer test procedure includes a background period of water level data collection prior to the start of the Step Rate Test, a constant rate pumping portion of the test, and a final phase of monitoring recovery from the constant rate pumping portion of the test.

(4) For nonresidential development proposals with a total projected water use for the project of less than 4,500 gallons per day a simplified constant rate will be conducted without the requirements for the background test, the aquifer test plan and hydrogeologic report. The constant rate for the test is based on the requested certification volume. This constant rate is continued for a minimum of two hours until the drawdown has stabilized (i.e., the water level has not changed more than the greater of 1 ft. or 3% of the drawdown or at the discretion of the witness between twenty-minute readings). If the drawdown does not stabilize within this minimum time, pumping may be continued at the established rate until the drawdown stabilizes or the pump rate may be reduced to permit stabilization.

(5) The background phase of testing includes three days of monitoring static water levels in the wells immediately prior to the start of the constant rate portion of the test. A minimum of hourly water level measurements is required from each test and monitoring well during the 3-day period. It is recommended that a continuous water level monitor be used to read the readings. The purpose of the background period of the test is to collect data necessary to demonstrate that any antecedent influence can be removed from the Step Rate Test data. Antecedent effects can include rainfall events, barometric pressure changes, pumping influences from other users in the aquifer and long term seasonal water level trends.

(6) The water levels in the aquifer must be stable prior to the start of the constant rate aquifer test as determined by a final round of pretest background water level measurements. The pump and discharge pipe shall be equipped with a calibrated flow meter for all flows under 40 gpm and shall be verified with timed volumetric measurements (for example, the time required to fill a five (5) gallon pail). The discharge must be directed away from the site without infiltrating to the aquifer and affecting water levels in the monitoring wells. Any permits required by Pennsylvania Department of Environmental Protection (PADEP) for the discharge of water must be obtained prior to starting the test.

(7) The flow rate shall be immediately adjusted at the start of the test to the constant rate developed in the approved aquifer test plan. The flow rate may not vary for more than 10 percent throughout the duration of the test or the test may have to be repeated. Short duration pump failures are not allowed, and the test will have to be repeated.

(8) Water-level measurements during the pumping phase of the test will conform to the schedule in Table 11-B-6 below or shall be conducted in conformance with the approved aquifer test plan. The same requirement holds for water level measurements during the recovery portion of the test.

Table 11-B-6

Time Period of the Step Rate Test	Suggested Reading Intervals
1 to 10 minutes	Every 1 minute
10 to 20 minutes	Every 2 minutes
20 minutes to 1 hour	Every 5 minutes
1 hour to end of test	Every 10 minutes

(9) The water levels in the observation wells shall recover to static levels after conclusion of the Step Rate Test within a time period equal to the duration of pumping. If the observation wells do not fully recover, recovery measurements will be extended to 24 hours from the start of recovery.

C. Final Hydrogeologic Report.

(1) A final hydrogeologic report shall be provided with each non-residential site plan application including all data from the Three Part Aquifer test. Data shall be provided on a floppy disk or CD in Microsoft Word and Excel compatible format.

(2) The final hydrogeologic report shall provide calculations of important aquifer characteristics such as transmissivity and storage coefficient. The radius of influence for the test as determined from observation wells shall be provided. The impact on adjacent land owners shall be described. The overall assessment of the aquifer test compared to data developed in the preliminary hydrogeologic report shall be detailed, specifically variations in expected response of the aquifer.

(3) The final hydrogeologic report shall include a detailed evaluation of the water supply demand for the average and peak day of the facility. Evaluation of the long term use of the well on the ability of the aquifer to sustain the water demand as well as an analysis of the overall ability of the aquifer to meet existing demands of adjoining properties shall be detailed. Impact on the overall water budget from the operation of the facility including impacts on surface water bodies shall be provided.

(4) The report shall include an analysis of the potential impacts from subsurface sewerage disposal systems on the groundwater quality. This analysis shall consist of a site plan depicting the well, septic leach field, geologic features observed from the fracture trace analysis, and the radius of influence from the well.

D. Pass/Fail Criteria for non-residential tests

The proposed development well will be deemed to fail if more than five (5) feet of drawdown as observed in wells on adjoining properties during testing or is projected at any existing property boundary at the rate and duration equal to the peak daily demand over a 24-hour period. The applicant shall either decrease the average daily demand or the applicant's hydrogeologist must provide adequate justification to the Township that water use at average and peak daily demand will not adversely impact water resources and existing wells on affected properties.

§ XXX-12. **Well interference tests.**

A. Proposed new wells in proximity to existing producing wells.

(1) Whenever a proposed new residential water well within the Township is to be subjected to the Three Part Step Test, up to three producing wells existing within the maximum distance specified in Table 12-A-1 from the new well may be used as observation wells to determine well interference. If more than three wells qualify as observation wells, the Township will give preference to the nearest wells and to those located symmetrically around the test well or along known geologic structures.

Table 12-A-1

Size of Lot with New Well (acres)	Maximum Distance of Observation Wells from New Well* (feet)
Less than 3.0	300
3.0 to 10	500
More than 10	1,000

*There is no maximum distance when testing wells of a multiple well system intended to serve a single user; all those wells shall serve as observation wells in turn.

(2) Whenever a new non-residential water well within the Township is to be subjected to the Three Part Aquifer test, rates greater than 4,499 gallons per day, the maximum number of existing producing wells that may be used as observation wells for interference testing are specified in Table 12-A-2. The Township will give preference to the nearest wells and to those located along known geologic structures as determined by the fracture trace analysis.

Table 12-A-2

Average Demand (gallons per day)	Maximum Distance of Observation Wells from New Well (feet)	Maximum Number of Observation Wells
4,500 to 14,999	1,000	3
15,000 to 50,000	2,000	4
50,000 to 100,000	3,000	5
Over 100,000	As determined with PADEP or Applicable River Basin Commission	As determined with PADEP or Applicable River Basin Commission

(3) The applicant shall notify owners of real property within the maximum distance found in

Table 12-A-1 and 12-A-2 from the proposed new residential and non-residential wells, respectively, of the impending well test by certified mail on the forms available from the Township. Any owner of a producing well within the maximum distance from the proposed new well shall have one week from the date of the receipt of the certified letter to request monitoring of such producing well as an observation well at the applicant's expense. Locating and accessing the well shall be at the observation well owner's risk and expense. The owner of the observation well shall sign a release holding the well tester harmless for any inconvenience resulting from the monitoring of the well.

(4) To qualify as an observation well, at least three hours before the beginning of the test sequence, the owner shall not use the well water or shall agree to have the pump of the well electronically disconnected, to permit stabilization of the static water level. Appropriate measures must be taken to assure the agent of the Township of the disabling of the pumps in all observation wells throughout the pump tests.

(5) The water levels in the observation wells for residential well tests shall be monitored before the Peak Demand Test until the completion of the constant rate pump test of the new well at intervals of preferably not more than one hour. The water levels in the observation wells for non-residential well tests shall be monitored beginning at the conclusion of the background well test, for a minimum of two times at 30 minute intervals prior to the start of the Step Rate Test. The water level in the observation well shall not change more than 0.0.5 feet between consecutive measurements or the start of the Step Rate Test shall be delayed.

(6) If the drawdown in any properly monitored observation well during the pump tests of the new residential well exceeds the greater of five feet or of 10% of the maximum drawdown of the new well during the pump tests, significant well interference is likely, and the new well cannot be certified for use, as such.

(7) In such instances, the Township may require the applicant to show why the documented well interference is not significant. If a significant adverse impact of interference cannot be remedied, the Township may deny certification of the new well.

B. Multiple new wells.

(1) Interference testing as described in § XXX-12A(1) above shall be performed between new wells of a proposed subdivision of two or more lots. Wells located within the maximum distance of Table 12-A from a test well shall be tested in accordance with § XXX-12A(1).

(2) If the drawdown in any observation well during these residential pump tests exceeds the greater of five feet or 10% of the maximum drawdown of the test well during the pump tests, the well spacing is considered inadequate, and either the test well or the observation well showing excessive drawdown must not be certified, unless the applicant can show that the documented interference is not significant.

C. Multiple well water supply systems.

(1) If the use of more than one well for provision of the water supply for a residence is proposed, (e.g., for reasons of insufficient yield of individual wells according to § XXX-10(A) of this chapter), interference testing between all wells proposed for the system is mandatory.

§ XXX-12. **Retest procedures**.

A licensed well driller or a professional licensed engineer or pump installer must be present during retest; the entire procedure must be undertaken, even if only one section of the original test has failed.

§ XXX-14. **Violations and penalties.**

Any person or persons, firm or corporation violating any of the provisions of or any order promulgated under this chapter shall, upon conviction thereof, pay a penalty of not more than $500, nor less than $50 for each violation. Each day a particular violation continues may constitute a separate offense.

§ XXX-15. **Severability**

If any provision of this ordinance or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications, and to this end, the provisions of the ordinance are declared to be severable.

§ XXX-16. **Effective Date**

All provisions of this Ordinance shall be in full force and effect five (5) days after the approval and adoption.

ENACTED AND ORDAINED this __the day of _____, 2015.

ATTEST:

PUREWATER TOWNSHIP
BOARD OF SUPERVISORS
By:

_____ , Secretary

_____ , Chair

Appendix C

Municipal Planning and Site Restoration Considerations

Appendix C - Municipal Planning and Site Restoration Considerations

This appendix contains "best practice" standards for site planning and site restoration. These standards are intended to provide merely a guide to municipalities in addressing land uses that may adversely impact the local environment. When addressing site planning and restoration, municipalities should be mindful to look at all uses (not just gas development), and apply standards generally. Municipalities should also consult with knowledgeable legal counsel to ensure consistency with state law limitations and Pennsylvania constitutional obligations. Consultation with relevant experts, such as stormwater engineers or ecological restoration specialists, is also recommended.

Site Planning

- It is important to address existing conditions of a site as a determinant of site planning. Site planning needs to start with a site analysis task including analysis of soils, vegetation, hydrology, topography, habitat, protected species, views, noise, and adjacent conditions. Site plan design, including the design of construction access and temporary facilities, needs to be based upon the site analysis. Factors need to be reviewed and balanced to determine the construction locations with the least negative environmental and social impacts.
- A minimum of two substantial site design alternatives (with at least 50% variance from each other) should be required. The pros and cons of each alternative, including life cycle analysis, restoration costs, and ecological analysis, need to be included in the submission for each site. The chosen alternative then needs technical review by qualified staff and/or consultants and should receive public input, before deciding the preferred design option.

Construction Phase Landscape Installation

- During construction, there will be open disturbed areas that could be fully planted. This planting can include native trees and shrubs, as well as a native seed mix used for soil stabilization, without detriment to the industrial facilities and functions. This planting could help reduce the impact of the forest fragmentation, and reduce the impact of the "edge effect" that encourages invasive species, while the facilities are in operation. Some of this construction phase planting could include the final ecological restoration planting for locations that will not be disturbed in the future.
- At construction disturbances in forest, the "edge effect" and potential impact of invasive species needs to be partially mitigated by extensive tree and shrub planting along the open edges of the forest. This is especially important on the south/east/west-facing edges, to provide shade where sun impact is more intense. This planting needs to occur wherever spatially feasible, during the construction phase of the facilities. This will help "seal the edge" and help reduce the advance of invasive species into the forests.
- Significant visual screening is recommended at facilities that impact populated areas, as well as recreational and tourism areas. Planting should be included as a component of the design of the visual screening, where appropriate.

Protection of Existing Vegetation

- Facilities and operations, including but not limited to parking, access roads and temporary facilities, should be designed to fit the available landscape and minimize native tree removal (as well as limiting impact on mature non-invasive non-native trees). Roots of existing remaining trees should be protected using fencing or similar barriers, placed outside of the tree drip lines to protect from compaction because the compaction kills trees, typically in the few years following the construction activity. Tree protection plans should be required for review.
- Non-native invasive species that exist on the site should be identified by species and mapped by percent of cover of the site (mapping per species) to establish baseline conditions regarding the presence of invasives. A goal of percent removal of each invasive species should be set in the planning stages, carried out through monitoring and invasive removal practices during construction, and met as a requirement of site restoration post construction. An invasive species monitoring and removal plan should be required for at last 3 years following the construction phase due to the robust nature of latent seed banks and rhizomes.

Soils Management

- Native topsoil should be protected in place through best management practices when possible. Fencing off areas that are not necessary for clearing to prevent compaction and disturbance of soil and the soil mantle will provide optimum conditions for the re-establishment of native vegetation and ecosystem functions post-construction. Native soil and the associated soil mantle takes many years to develop, and is usually a determinant of the existing vegetation type.
- Existing topsoil should not be removed from sites and sold/dumped elsewhere, but it needs to remain on site wherever feasible for re-use on site, for use during initial construction-phase planting stabilization, and to enable proper vegetation re-establishment (including forest and grassland restoration) after facilities are decommissioned. This "no-export" requirement is to prevent a site from having deficient topsoil needed for the proper initial planting and eventual restoration of a site and to protect native ecosystems and functions as much as possible. This also helps avoid importation of improper topsoil, or topsoil containing non-native invasive plant species, since the need for importation is reduced. Restoration activities attempting to re-establish appropriate pre-construction vegetation communities would benefit greatly from re-using existing topsoil rather than imported topsoil.
- Top soil brought to the site for construction and reclamation activities should be obtained from a source known to be free of invasive species as determined by an invasive species expert, and tested to be free of invasive species. Any organic matter brought to the site needs to be certified to be free of viable seeds. Invasive species are sometimes present as dormant seed and not obviously present; testing using current scientific protocols for seed identification and/or sprout testing is needed to determine if a soil is free of invasive weed seeds.
    - Testing should be required during the pre-construction submittal process, as well as for batch testing of delivered top soil since it can easily vary from the original submittals.
    - An expert in invasive plant identification is needed to properly certify the topsoil source site is free of invasive species.

- Imported organic matter including compost and mulch should be regulated because it can be a source of weed seeds. Protocols for determining weed free organic matter should be based on industry standards.

- Depth and contours of re-placed topsoil of constructed sites and restored sites should match the existing depths, at a minimum, and re-establish natural grading as much as possible to enable appropriate planting and the sustainable establishment of a vegetative community. The type of topsoil used needs to match pre-construction soil type to enable proper restoration. Pre-construction soil testing and soil profile identification is required to inform this soil management. Re-grading should be designed in conjunction with re-establishment of the pre-existing drainage patterns as an integral part of the restoration. Professionals knowledgeable in grading, stormwater management and ecological restoration should be involved in determining, designing and overseeing this restoration. Wherever feasible, excess existing topsoil (excavated from paving and pads) should remain and be installed on-site, at increased depths.
- A typical problem of construction sites is that subsoil (soil under the topsoil) becomes extremely compacted from vehicular use, which is detrimental to natural infiltration, soil oxygen levels, and plant health. Likewise, subsoil under building pads and pavement is compacted and is detrimental to plant growth. Therefore compacted subsoil should be de-compacted prior to topsoil placement. Overly-compacted topsoil also needs de-compaction. The contractors should be required to obtain a certified inspection for determining completion of de-compaction, prior to continuing soil and landscape operations. Recommended maximum compaction of each soil layer at planting areas is 85% proctor density, ASTM D-698; testing of subsoil is to be completed and certified prior to topsoil placement.
- Any gravel or crushed stone installed for the buildings, pads or pavements needs full removal, when the sites are restored.

Post Construction Phase Landscape Installation and Comprehensive Site Restoration

- Site restoration should be based on plant communities and reference ecosystems, as informed by pre-construction botanical surveys identifying the full range of species, accurate pre-construction topographic surveys, and plant community identification. To mitigate the negative impacts and re-establish ecosystem services, the restoration needs to include re-establishment of various landscape types including riparian areas, wetlands, grasslands and forests that were disturbed. Restoration requires careful planning of the landscape regeneration, including proper re-grading; it includes proper soils management for each landscape type.
- There will be many interstitial areas that should be fully planted, not just planted with grass seed, immediately after facility construction. For instance disturbed areas such as temporary construction stockpile areas, temporary siltation pond areas, temporary contractor mobilization areas, and temporary access roads could be fully restored immediately.
- Only locally native species should be used in restoration plantings; and invasive species should be removed. Monitoring for invasive plant species and the removal of emerging invasive species should be done on a six month schedule for at least three years following the close of construction.
- Mixed vegetation should be planted post construction to restore the vegetative system that was in place prior to construction, excluding non-native species. For grasslands, a native seed mix should be

used. For woodland edge and forest areas, the full array of vegetative species should be used: scrub/shrub, understory trees and large trees.

- Selection of the native species for planting should be based on the existing plant communities on the site prior to disturbance, adjacent areas and/or reference plant communities, as determined by a restoration specialist. Site-level plant surveying of existing plant species and identification of existing communities must be completed prior to initial construction.
- For the planted areas, the quantity and size of plants (for instance trees planted per acre, and average tree size) needs to be stipulated to ensure significant and effective landscape plantings. A substantially dense tree and shrub planting would help "heal" the landscape while the facilities are in operation, would suppress invasive species, and would help restore ecosystem services of the site including reducing stormwater runoff, improving air quality, and increasing carbon sequestration.
- Timing should require installation of landscape plantings for trees and shrubs prior to opening the permanent facility, or where not feasible due to season, in the first available season.
- There should be an escrow fee structure or similar financial security structure set up to ensure covering the decommissioning-phase ecological restoration costs. These costs include but are not limited to design, selective demolition, grading, soils management, planting, maintenance to ensure planting establishment, and invasive species management. Invasive plant species have direct economic implications to both landowners and society. Invasive species, for instance, have been estimated to cost the U.S. economy approximately $120 billion dollars per year (Pimintel et al. 2004), much of that absorbed by the taxpayer.

Appendix D

Frequently Asked Questions

Pennsylvania Supreme Court Decision on Act 13 and Zoning

Appendix D - Frequently Asked Questions: Pennsylvania Supreme Court Decision on Act 13 and Zoning

Introduction

The Pennsylvania Supreme Court's recent decision in Robinson Township, Delaware Riverkeeper Network, et al. v. Commonwealth, 83 A.3d 901 (2013), reinforced that municipalities can validly zone oil and gas operations like any other industrial use. If a municipality has a zoning ordinance in place that identifies specific districts where this industrial activity is allowed, the municipality cannot allow drilling to occur where it is not permitted, even if a gas drilling company has a lease and even if the company has a permit from the Pennsylvania Department of Environmental Protection ("DEP").

In addition, when carrying out governmental functions, municipalities must comply with Article I, Section 27 of the Pennsylvania Constitution. This means that municipalities are restrained from unduly infringing on the individual environmental rights of citizens, just as municipalities may not unduly infringe on private property rights. Thus, municipalities cannot allow unchecked shale gas development at the expense of citizens' rights to clean air, pure water and a health environment.

Citizens who have been trying to protect their communities from unreasonable expansion of industrial gas development have confronted opposition from those who place corporate profits above public health and welfare. Because citizens have frequently asked the following questions, we provide this memo to help counter the misinformation that drillers and their allies promote:

1. Is the Pennsylvania Supreme Court's decision in the Act 13 case final?
2. What does the Pennsylvania Constitution say about environmental rights?
3. Can a municipality refuse to allow industrial gas development even if the Pennsylvania Department of Environmental Protection grants a permit?
4. Can a municipality lawfully prevent a leaseholder from having a gas well on his property?
5. Is unconventional shale gas development an industrial activity?
6. Are government officials restricted from allowing industrial gas development activity in non-industrial zoning districts? and
7. Do government officials have an obligation — before acting — to determine whether the proposed action will cause an unreasonable degradation of our air and water?

Each of these questions will be addressed in turn.

1. Is the Pennsylvania Supreme Court's decision in the Act 13 case final?

Yes. Some people pushing for more drilling have apparently claimed that the Pennsylvania Supreme Court's recent decision in Robinson Township, Delaware Riverkeeper Network, et al. v. Commonwealth, 83 A.3d 901 (2013), might not be "final" and that it might still be overturned. There is no basis to any such suggestion.

The Act 13 decision declared Sections 3303 and 3304 of Act 13 of 2012 unconstitutional under Article I, Sections 1 and 27 of the Pennsylvania Constitution. Section 3303 attempted to have state and federal environmental laws supersede municipal regulations. Section 3304 established a one-size-fits-all zoning framework that mandated every municipality to require industrial gas development in every zoning district in the

Commonwealth. By finding these provisions unconstitutional, the Supreme Court reinforced that municipalities can validly zone oil and gas operations like any other industrial use. This was not the first case to reach this conclusion. Prior cases such as Huntley & Huntley, Inc. v. Borough Council of the Borough of Oakmont, 964 A.2d 855 (2009); Range Res. Appalachia, LLC v. Salem Twp., 964 A.2d 869 (2009); and Penneco Oil Company, Inc. v. County of Fayette, 4 A.3d 722, 726 (Pa. Commw. Ct. 2010), cert. denied (Pa. 2012), each affirmed that municipalities can zone oil and gas development just like other industrial development.

It is beyond dispute that the Court's decision is final. On December 19, 2013, the Court issued its decision finding Sections 3303 and 3304 unconstitutional, and enjoining them. Robinson Twp., 83 A.3d at 1000. On February 21, 2014, the Supreme Court reaffirmed its decision, denying the Commonwealth's request for reconsideration and their request to have the case reargued. February 21, 2014 Order of the Pennsylvania Supreme Court (Docket Nos. 63, 64, 72, and 73 MAP 2012). The Court remanded other issues to the Commonwealth Court that are separate from its final decision on Sections 3303 and 3304 of Act 13. Robinson Twp., Delaware Riverkeeper Network, et al., 83 A.3d at 1000; March 13, 2014 Memorandum and Order of P.J.Pellegrini (Docket No. 284 MD 2012). Sections 3303 and 3304 remain enjoined as unconstitutional.

2. What does the Pennsylvania Constitution say about environmental rights?

Article I, Section 27 of the Pennsylvania Constitution 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.

In interpreting the plain language of Section 27, the Pennsylvania Supreme Court has explained that Section 27 has two components that may overlap at times. The first component is that of individual environmental rights, while the second is the public trust. We summarize each below.

a. Individual Environmental Rights

> 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. – Art. 1, Sec. 27, cl.1

The first clause of Section 27 is a statement that the Pennsylvania Constitution protects individual environmental rights from governmental infringement. See, e.g., Pennsylvania Envtl. Def. Found. v. Com. ("PEDF"), 108 A.3d 140, 157 (Pa. Commw. Ct. 2015), reargument denied (Feb. 3, 2015) (citing and quoting Robinson Twp., 83 A.3d at 953). The term "the people" translates to a right "personal to each citizen," just as Article I, Section 8 has been interpreted to mean an individual right of privacy. Robinson Twp v. Commonwealth of Pennsylvania, 83 A.3d at 951 n.39. Thus, each citizen has an individual right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. The Pennsylvania Constitution protects these rights in the same way as all other inherent rights enshrined in Article I, including the right to free speech and property rights.

"The corollary of the people's Section 27 reservation of right to an environment of quality is ***an obligation*** on the government's behalf to refrain from ***unduly infringing*** upon or ***violating*** the right, including by legislative enactment or executive action." Robinson Twp., 83 A.3d at 952; see also PEDF, 108 A.3d at 156-57 (quoting 83 A.3d at 953). In other words, Section 27 protects individual environmental rights from undue governmental infringement, just like other rights such as free speech, due process, and property rights.

b. Public Trust

> 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. —Art. I, Sec. 27, cls. 2 & 3.

Section 27 recognized a public trust over Pennsylvania's public natural resources, and charged the Commonwealth ***and*** its political subdivisions, as trustees. As trustees, state and local governments are constrained to conserve and maintain public natural resources for the benefit of all Pennsylvania citizens, including generations yet to come. PEDF, 108 A.3d at 171-72 (citizens entitled to expect that governmental officials will respect the Pennsylvania Constitution); Robinson Twp., 83 A.3d at 951-52, 956-57, 977-78; Franklin Twp. v. Com., Dep't of Envtl. Res., 452 A.2d 718, 721-22 (Pa. 1982); Cmty. Coll. of Delaware Cnty. v. Fox, 342 A.2d 468, 481 (Pa. Commw. Ct. 1975). Public natural resources, which form the body or corpus of the trust, include both publicly-owned resources such as state forest lands and local parks, and "those resources not owned by the Commonwealth, which involve a public interest," which might include groundwater. 1970 Pa. Legislative Journal-House, at 2271-72; see also PEDF, 108 A.3d at 167-68 (quoting and discussing Robinson Twp., 83 A.3d at 955.

As a trustee, municipalities have fiduciary duties that they owe to both present and future Pennsylvanians. PEDF, 108 A.3d at 157; Robinson Twp., 83 A.3d 956-57, 958-59, 977-78, 980-81. "The plain meaning of the terms conserve and maintain implicates a duty to prevent and remedy the degradation, diminution, or depletion of our public natural resources. As a fiduciary, the Commonwealth has a duty to act toward the corpus of the trust—the public natural resources—with prudence, loyalty, and impartiality." PEDF, 108 A.3d at 168 (quoting Robinson Twp., 83 A.3d 957). Two primary duties are "implicit" in the fiduciary relationship set forth by Section 27. These duties are both "prohibitory" and affirmative. Most notably, Section 27 ***prohibits*** government:

> from performing its trustee duties respecting the environment unreasonably, including via legislative enactments or executive action. As trustee, the Commonwealth has a ***duty to refrain from permitting or encouraging*** the degradation, diminution, or depletion of public natural resources, whether such degradation, diminution, or depletion would occur through ***direct*** state action or ***indirectly***, e.g., because of the state's failure to restrain the actions of private parties. —PEDF., 108 A.3d at 157 (quoting Robinson Twp., 83 A.3d at 957–58)(emphasis added).

Section 27 also requires government "to act affirmatively to protect the environment, via legislative action." Id.

As to present and future Pennsylvanians, who are the beneficiaries of Section 27's public trust, state and local governments have fiduciary duties "to deal impartially with all beneficiaries and, second, . . . to balance the interests of present and future beneficiaries." Robinson Twp., 83 A.3d at 959, 980-81; PEDF, 108 A.3d at 157 (quoting id. at 958-59). The duty of impartiality "means that the trustee must treat all equitably in light of the purposes of the trust," which can touch on "questions of access to and distribution of public natural resources." Robinson Twp., 83 A.3d at 959; see also PEDF, 108 A.3d at 167. Further, to treat present and future beneficiaries equitably means to balance their interests; in other words, "the trustee cannot be shortsighted." Robinson Twp., 83 A.3d at 959; PEDF, 108 A.3d at 157 (quoting id.)

3. Can a municipality refuse to allow industrial gas development even if the Pennsylvania Department of Environmental Protection grants a permit?

Yes. While some people have claimed that a municipality must allow industrial gas development if DEP has issued a permit, this is incorrect. DEP permits do not override local zoning. The fact that DEP has issued a permit does not in any way limit a municipality's authority or responsibility to ensure compliance with local ordinances, including zoning and subdivision and land development ordinances.

If a municipality has a zoning ordinance in place that identifies specific districts where this industrial activity is allowed, the municipality ***cannot*** allow drilling to occur where it is not permitted, even if a gas drilling company has a permit from the Pennsylvania Department of Environmental Protection ("DEP"). A municipality's zoning, subdivision, and land development processes are separate from DEP's process and from private contractual decisions. Just like every other land use, the issuance of a DEP permit does not allow a shale gas developer to move forward without complying with local zoning requirements. Indeed, if a developer does move forward in violation of local zoning, it faces a substantial risk of a lawsuit under Section 617 of the Municipalities Planning Code. 53 P.S. § 10617.

DEP permitting is a separate process from local zoning. In fact, rather than hamstringing local municipalities, *DEP* must consider and may rely on local zoning when it makes permitting decisions. Acts 67, 68, and 127 (see, e.g. 53 P.S. §§ 10619.2, 11006-A, 11105); see also Tri-County Landfill, Inc. v. DEP, et al., EHB Docket No. 2013-185-L (Opin. & Order on Motion for Summary Judgment, May 22, 2012) (finding that consideration of local zoning is relevant when measuring the Department's compliance with its Section 27 obligations). Indeed, the courts have repeatedly cited the fact that DEP's process is focused on different issues than local zoning as a reason for why DEP permitting *does not* preempt local zoning. In striking down Section 3304 of Act 13, the Pennsylvania Commonwealth Court discussed the different purposes of zoning versus state environmental laws, saying that "our Supreme Court explained that while governmental interests involved in oil and gas development and in land-use control at times may overlap, the core interests in these legitimate governmental functions are quite distinct. The state's interest in oil and gas development is centered primarily on the efficient production and utilization of the natural resources in the state. *Zoning, on the other hand, is to foster the orderly development and use of land in a manner consistent with local demographic and environmental concerns.*" Robinson Twp. , Delaware Riverkeeper Network, et al. v. Commonwealth, 52 A.3d 463, 483 (Pa. Commw. Ct. 2012) aff'd in part, rev'd in part by 83 A.3d 901 (Pa. 2013) (emphasis added).

The Pennsylvania Supreme Court in Huntley & Huntley stated:

> By way of comparison, the purposes of zoning controls are both broader and narrower in scope. They are narrower because they ordinarily do not relate to matters of statewide concern, but pertain only to the specific attributes and developmental objectives of the locality in question. However, they are broader in terms of subject matter, as they deal with all potential land uses and generally incorporate an overall statement of community development objectives that is not limited solely to energy development. *See* 53 P.S. § 10606; *see also id.,* § 10603(b) (reflecting that, under the MPC zoning ordinances are permitted to restrict or regulate such things as the structures built upon land and watercourses and the density of the population in different areas). *See generally* Tammy Hinshaw & Jaqualin Peterson, 7 Summ. Pa. Jur.2d PropertyY § 24:12 ("A zoning ordinance reflects a legislative judgment as to how land within a municipality should be utilized and where the lines of demarcation between the several use zones should be drawn."). More to the point, the intent

> underlying the Borough's ordinance in the present case includes serving police power objectives relating to the safety and welfare of its citizens, encouraging the most appropriate use of land throughout the borough, conserving the value of property, minimizing overcrowding and traffic congestion, and providing adequate open spaces. *See* Ordinance § 205–2(A). —Huntley & Huntley, Inc., 964 A.2d 855, 865 (Pa. 2009).

In the Act 13 decision, the Supreme Court affirmed that local conditions matter and must be considered when development is proposed for a property. In finding Sections 3303 and 3304 of Act 13 unconstitutional, the Court expressly found fault with the provisions' complete elimination of any local considerations, which traditionally has been accounted for at the local level via zoning. Robinson Twp., 83 A.3d at 977-982 (plurality); id. at 1004-08 (Baer, J., concurring). As the court recognized, local environmental considerations are a crucial part of environmental decisionmaking in Pennsylvania that cannot be ignored without raising a significant risk of breaching trustee obligations. As the court stated:

> In Pennsylvania, terrain and natural conditions frequently differ throughout a municipality, and from municipality to municipality. As a result, the impact on the quality, quantity, and well-being of our natural resources cannot reasonably be assessed on the basis of a statewide average. Protection of environmental values, in this respect, is a quintessential local issue that must be tailored to local conditions.

Thus, the fact that DEP has issued a permit is not an excuse for a local municipality to ignore its own zoning regulations or shirk its constitutional obligations. When carrying out governmental functions, municipalities *must* comply with Article I, Section 27 of the Pennsylvania Constitution. This means that municipalities are restrained from unduly infringing on the individual environmental rights of citizens, just as municipalities may not unduly infringe on private property rights. Thus, municipalities cannot allow unchecked industrial shale gas development at the expense of citizens' rights to clean air and pure water. See, e.g., Robinson Twp., 83 A.3d at 953-54, 960 (plurality); Main St. Dev. Grp., Inc. v. Tinicum Twp. Bd. of Supervisors, 19 A.3d 21 (Pa. Commw. Ct. 2011); rearg. denied (May 12, 2011), appeal denied 40 A.3d 123 (2012). Likewise, Section 27 restrains from municipalities from allowing the unreasonable degradation, diminution, or depletion of public natural resources, including groundwater, surface water, aquatic life, and air quality. The Pennsylvania Constitution protects current and future citizens' rights to rely upon and enjoy these resources. Id.

4. Can a municipality lawfully prevent a leaseholder from having a gas well on his property?

Yes. People with gas leases sometimes level that threat that it would be an unconstitutional "taking" to limit unconventional gas development to industrial districts and that municipalities can't prevent anyone with a lease from having his/her minerals developed. This is simply untrue. In reality, a municipality exposes itself to a constitutional challenge if it were to cede to the demands of the drillers and turn the whole community into an industrial zone.

Lawful zoning balances the rights of all in the community, not just those with gas interests. The courts have repeatedly held that it is constitutional to use zoning to protect the character of a community, including its residential areas, agricultural lands, schools, hospitals, and natural resources. Miller & Son Paving, Inc. v. Wrightstown Twp., 451 A.2d 1002, 1006 (Pa. 1982). Indeed, to be lawful, zoning "must be directed toward the community as a whole, concerned with the public interest generally, and justified by a balancing of community costs and benefits." In re Realen Valley Forge Greenes Associates, 838 A.2d at 729.

As a general rule, in order to prove that zoning would constitute an unconstitutional "taking", the proponents of this industrial activity would have to show either: 1) that the zoning eliminates *all* economically beneficial or

productive use of the property; or 2) that the zoning is not substantially related to a valid exercise of government authority such as promoting the public health, safety or welfare. In re Realen Valley Forge Greenes Associates, 838 A.2d 718, 728 (Pa. 2003); C & M Developers, Inc. v. Bedminster Township Zoning Hearing Board, 820 A.2d 143, 150 (Pa. 2002) ("Where there is a particular public health, safety, morality, or welfare interest in a community, the municipality may utilize zoning measures that are substantially related to the protection and preservation of such an interest."); Machipongo Land & Coal Co., Inc. v. Com., 799 A.2d 751 (Pa. 2002); Boundary Drive Associates v. Shrewsbury Twp. Bd. of Sup'rs, 491 A.2d 86, 90 (Pa. 1985); Gaebel v. Thornbury Tp., Delaware County, 303 A.2d 57, 60 (Pa. Commw. Ct. 1973). Enacting zoning to protect the public health, safety, and welfare; the character of residential and other non-industrial zones; and local water supplies and open space would not meet either of these tests and would not constitute an unconstitutional taking. See Robinson Township, Delaware Riverkeeper Network, et al. v. Commonwealth, 83 A.3d 901 (2013); Robinson Twp., Delaware Riverkeeper Network, et al. v. Commonwealth, 52 A.3d 463 (Pa. Commw. Ct. 2012); Penneco Oil Company, Inc. v. County of Fayette, 4 A.3d 722, 726 (Pa. Commw. Ct. 2010), cert. denied (Pa. 2012).

Having zoning limitations on surface unconventional gas development simply does not eliminate *all* economically beneficial or productive use of the properties in areas where surface development is prohibited. Many other lawful uses of the property will remain, including residential, agricultural, and commercial use, depending on the district. No one has a constitutionally-protected right to put their land to the most profitable one. See Rogin v. Bensalem Twp., 616 F.2d 680, 690, 692 (3d Cir. 1980); see also Machipongo Land & Coal Co., Inc., 799 A.2d 751, 764 (Pa. 2002); Miller & Son Paving, Inc. v. Wrightstown Twp., 451 A.2d 1002, 1006 (Pa. 1982).

Consequently, even if zoning were to prohibit gas drilling in all but industrial zoning districts, property owners could still use and enjoy their property in other ways. Indeed, the courts have long recognized that farm land has value and that the protection of agricultural land from development is a valid and appropriate basis for zoning. In re Petition of Dolington Land Grp., 839 A.2d 1021, 1035 (Pa. 2003), Boundary Drive Associates, 491 A.2d at 90.

No one — not even those property owners with gas leases — can seriously dispute that *some* economic use of these properties will exist under zoning that prohibits surface unconventional gas development in certain zoning districts. Indeed, a property owner who cannot engage in surface development of oil and gas owned could still receive royalties from her lease if the gas is accessed via a horizontal wellbore developed on a property outside of a protected zone. Compare Appeal of Mut. Supply Co., 77 A.2d 612, 614 (Pa. 1951). Further, just because a property owner signs a lease to allow a nuclear power plant to be built on her land, it does not mean the Township has to allow a nuclear power plant on that parcel. Likewise, just because someone has a contract to operate a quarry on their property does not mean the Township must allow that to occur in violation of existing zoning.

Municipalities must balance a gas leaseholder's property rights with constitutionally-protected rights to clean air and pure water, and with the rights of present and future generations to healthy public natural resources. Robinson Township, Delaware Riverkeeper Network, et al. v. Commonwealth, 83 A.3d 901 (Pa. 2013); see also PEDF, 108 A.3d at 170 ("If anything, when environmental concerns of development are juxtaposed with economic benefits of development, the Environmental Rights Amendment is a thumb on the scale, giving greater weight to the environmental concerns in the decision-making process."). Likewise, municipalities must balance the property rights of *all* those in a community, as *all* community members — not just those with gas leases — have a right to the use and enjoyment of their property. To comply with these constitutional mandates, a municipality simply cannot allow industrial gas development on every property where there is a lease.

5. Is unconventional shale gas development an industrial activity?

Yes. Unconventional gas development is a heavy industrial use that brings round-the-clock noise and light, and dust, flaring, truck traffic, risks of explosion and industrial-scale emergencies, including evacuations.

Indeed, the nature and extent of unconventional shale gas development is markedly different than the vertical ("conventional") wells that have at times been found in parts of Pennsylvania. In contrast to the relatively small footprint and simple process involved in conventional well drilling, shale gas well development requires at least five (5) or more acres, multiple laterals, repeated high-volume hydraulic fracturing, staging areas, and all the equipment necessary to that development, including trucks, cranes, numerous compressors to supply the required horsepower for the fracking operations, chemicals, and explosives. There is significantly more waste and wastewater to handle because of the number of wellbores and the high-volume hydraulic fracturing process. Further, due to laterals, more opportunity exists for accidents such as a 2014 incident in Connoquenessing Township, in which XTO drilled into a mine shaft, releasing mine drainage into a nearby creek.

The hydraulic fracturing process on an unconventional shale gas well requires explosive charges to perforate the well casing, and a mixture of millions of gallons of water, fine sand (or another type of "proppant") to hold open the fractures, and large quantities of different chemicals, including many carcinogenic, toxic and hazardous substances. One unconventional well may uses several million gallons of water. The process also requires an extraordinarily large amount of hydraulic horsepower in order to pump the fracturing mixture into the approximately mile-deep wellbore and out through the perforated casing at a pressure high enough to fracture the shale and to allow gas to flow.

An unconventional well can be fractured multiple times, and this process is then multiplied by the number of wells on a particular wellpad. Further, an operator may decide to return several years later to drill a well deeper and engage in additional high-volume hydraulic fracturing to gather more gas from an already-drilled well, creating disruptions well into the future. As a result, a single unconventional gas site with multiple wellbores may require, over the entire development process, thousands of water trucks, hundreds of chemical storage trailers, numerous compressor engines, storage of explosives, sand-mixing trucks, monitoring equipment, and other vehicles and equipment in order to execute the fracturing process and fully develop all the wells on the wellpad. During that time, the site may also contain large impoundments of hazardous wastewater. A shale gas wellpad could take *at least* a year, if not two or more, to develop from start to finish. The well site remains indefinitely with various pipes, valves, and tanks that require servicing throughout the life of each well.

Unconventional gas development has a lasting impact on the landscape and the community including by its fragmentation and destruction of agricultural and other open space land; the removal of land from other types of development or preservation; the continued ability to return to the well to frack it years later given the sharp decline of natural gas from unconventional gas wells; and a negative impact on property values, especially for those who rely on local groundwater supplies.

The Supreme Court's decision in the Act 13 case explicitly recognized the industrial nature of unconventional gas development. As the court noted:

> The industry uses two techniques that enhance recovery of natural gas from these "unconventional" gas wells: hydraulic fracturing or "fracking" (usually slick-water fracking) and horizontal drilling. Both techniques inevitably do violence to the landscape. Slick-water fracking involves pumping at high pressure into the rock formation a mixture of sand and freshwater treated with a gel friction reducer, until the rock cracks, resulting in greater gas mobility. Horizontal drilling requires the drilling of a vertical hole to 5,500 to 6,500 feet—several hundred feet above the target

> natural gas pocket or reservoir—and then directing the drill bit through an arc until the drilling proceeds sideways or horizontally. One unconventional gas well in the Marcellus Shale uses several million gallons of water.
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> ***
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> The public natural resources implicated by the "optimal" accommodation of industry here are resources essential to life, health, and liberty: surface and ground water, ambient air, and aspects of the natural environment in which the public has an interest. As the citizens illustrate, development of the natural gas industry in the Commonwealth unquestionably has and will have a lasting, and undeniably detrimental, impact on the quality of these core aspects of Pennsylvania's environment, which are part of the public trust.
>
> ***
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> By any responsible account, the exploitation of the Marcellus Shale Formation will produce a detrimental effect on the environment, on the people, their children, and future generations, and potentially on the public purse, perhaps rivaling the environmental effects of coal extraction.
>
> ***
>
> Insofar as Section 3304 permits the fracking operations and exploitation of the Marcellus Shale at issue here, the provision compels exposure of otherwise protected areas to environmental and habitability costs associated with this particular industrial use: air, water, and soil pollution; persistent noise, lighting, and heavy vehicle traffic; and the building of facilities incongruous with the surrounding landscape. —Robinson Twp., 83 A.3d at 914-15, 975, 976, 979.

Municipalities must balance property rights with constitutionally-protected rights to clean air and pure water, and with the rights of present and future generations to healthy public natural resources. Robinson Township, Delaware Riverkeeper Network, et al. v. Commonwealth, 83 A.3d 901 (Pa. 2013); see also PEDF, 108 A.3d at 170 ("If anything, when environmental concerns of development are juxtaposed with economic benefits of development, the Environmental Rights Amendment is a thumb on the scale, giving greater weight to the environmental concerns in the decision-making process."). Likewise, municipalities must balance the property rights of *all* those in a community, as *all* community members — not just those with gas leases — have a right to the use and enjoyment of their property. To comply with these constitutional mandates, a municipality simply cannot allow industrial gas development in non-industrial areas.

6. Are municipalities restricted from allowing industrial gas development activity in non-industrial zoning districts?

Yes. Municipal officials who allow industrial gas development in non-industrial zoning districts risk constitutional claims for violating citizens' due process rights and for violating citizens' rights under the Pennsylvania Constitution's Environmental Rights Amendment. Each of these issues will be addressed in turn.

a. Allowing industrial gas development in non-industrial zoning districts exposes municipal officials to constitutional claims for violation of property owners' due process rights

Allowing industrial uses in a non-industrial zoning district exposes municipal officials to claims that they have violated constitutional due process guarantees.

The Pennsylvania and United States Constitutions require that for any zoning to be constitutional it must promote the public health, safety, morals, or welfare, and be substantially related to the protecting or furthering that interest. In re Realen Valley Forge Greenes Associates, 838 A.2d 718, 728 (Pa. 2003); C & M Developers, Inc. v. Bedminster Township Zoning Hearing Board, 820 A.2d 143, 150 (Pa. 2002); Boundary Drive Associates v. Shrewsbury Twp. Bd. of Sup'rs, 491 A.2d 86, 90 (Pa. 1985). "Lawful zoning must be directed toward the community as a whole, concerned with the public interest generally, and justified by a balancing of community costs and benefits." In re Realen Valley Forge Greenes Associates, 838 A.2d 718, 729 (Pa. 2003). A municipality violates its constitutional obligations if it fails to balance citizens' sometimes competing constitutional rights to the use and enjoyment of property – both of those who would develop their properties, and those who wish to protect theirs. Article I, Section 1 of the Pennsylvania Constitution. Robinson Twp., 83 A.3d at 1007-08 (Baer, J., concurring); Robinson Twp. v. Com., 52 A.3d 463, 484-85 (Pa. Commw. Ct. 2012) aff'd in part, rev'd in part sub nom. Robinson Twp., Delaware Riverkeeper Network, et al. v. Com., 83 A.3d 901 (Pa. 2013).

Allowing new industrial uses in a non-industrial zoning district can be the basis for a claim that municipal officials are violating these due process principles. Such municipal action injects uses that are incompatible with the purpose of the zoning district, thereby upsetting the established expectations of those who live there. See Robinson Twp., Delaware Riverkeeper Network, et al. v. Com., 83 A.3d 901, 979 (Pa. 2013)(plurality); id. at 1004-05, 1006-07 (Baer, J., concurring); Robinson Twp. v. Com., 52 A.3d 463, 484-85 (Pa. Commw. Ct. 2012) aff'd in part, rev'd in part, 83 A.3d 901 (Pa. 2013). Industrial uses, with detrimental impacts on health, safety, welfare, property values, and public natural resources, do not fit into zones set aside for other types of uses, including residential uses and conservation of natural resources for future generations. See Robinson Twp. v. Com., 52 A.3d 463, 484-85 (Pa. Commw. Ct. 2012) aff'd in part, rev'd in part, 83 A.3d 901 (Pa. 2013). By allowing industrial in areas set aside for non-industrial land uses, the municipality fails to further the very purposes underlying the non-industrial zoning district, and makes the district irrational.

To illustrate, allowing a new asphalt plant, a surface coal mine, or a quarry into an agricultural zone would destroy soils set aside for agriculture and would increase the risk of water contamination and depletion. In agricultural zones, water resources are important for irrigation, livestock, and drinking water. Such new industrial land uses would also bring truck traffic, dust, and the risk of industrial accidents that could threaten the lives and livelihoods of those who live and work nearby.

Similarly, placing a refinery in an open space zone would upset the expectation that the zone will be set aside for resource protection, recreation, and scenic values. Further, those who moved into the zone, and invested in their properties with the expectation that the surrounding land uses would be compatible would now face a situation in which their investments are diminished more so than their neighbors who happen not to live next to the property where the incompatible use is allowed. Robinson Twp., Delaware Riverkeeper Network, et al. v. Com., 52 A.3d at 484-85 (Pa. Commw. Ct. 2012) aff'd in part, rev'd in part, 83 A.3d 901 (Pa. 2013).

Likewise, allowing an unconventional gas well into a residential zone would bring non-stop lighting, flaring, truck traffic, dust, noise, chemical emissions, and other materials that disrupt the zone's purpose of being set aside for quiet, low-traffic areas where children can play, and people can rest after a hard day's work. See Robinson Twp., 83 A.3d at 1005 (Baer, J., concurring).

Allowing incompatible uses together makes the zoning classifications arbitrary, undermines the rationality of the ordinance, and is therefore vulnerable to constitutional challenge. It is irrational to allow an incompatible land use in a zone that was established to achieve a non-industrial character, development and conservation goals. Id.; Robinson Twp., 83 A.3d at 1005, 1007-08 (Baer, J., concurring).

b. Allowing industrial gas development in non-industrial zoning districts exposes municipal officials to legal challenge for violating the Pennsylvania Constitution's Environmental Rights Amendment

Allowing industrial uses in a non-industrial zoning district exposes municipal officials to claims that they have violated the Pennsylvania Constitution's Environmental Rights Amendment.

Municipalities have constitutional obligations to respect their citizens' constitutional right to "an environment of quality" and their constitutional "right to benefit from" their public natural resources. Pa. Const. Article I, Section 27; Robinson Twp., Delaware Riverkeeper Network, et al. v. Com., 83 A.3d 901, 976 (Pa. 2013). Municipal officials also have fiduciary duties as trustees of the public's public natural resources "to refrain from permitting or encouraging the degradation, diminution, or depletion of public natural resources, whether such degradation, diminution, or depletion would occur through direct state action or indirectly, *e.g.,* because of the state's failure to restrain the actions of private parties." Robinson Twp., 83 A.3d at 957 (plurality); see also PEDF, 108 A.3d at 157 (quoting same).

In Robinson Township, the Supreme Court struck down a state law that would have placed industrial activity in every zoning district in every municipality. The Court found that such legislation violates the Environmental Rights Amendment. In reaching this holding, the Court stated, "a new regulatory regime permitting industrial uses as a matter of right in every type of pre-existing zoning district [including residential and agricultural] is incapable of conserving or maintaining the constitutionally-protected aspects of the public environment and of a certain quality of life." Robinson Twp., 83 A.3d at 979.

Placing industrial uses in areas designated for non-industrial uses degrades the local environment in which people live, work, and recreate, including the public natural resources on which people rely. It does so by exposing "otherwise protected areas to environmental and habitability costs associated with this particular industrial use: air, water, and soil pollution; persistent noise, lighting, and heavy vehicle traffic; and the building of facilities incongruous with the surrounding landscape." Robinson Twp., 83 A.3d at 979. In addition, "some properties and communities will carry much heavier environmental and habitability burdens than others" by virtue of the haphazard placement of industrial operations. Id. at 980. "This disparate effect is irreconcilable with the express command that the trustee will manage the corpus of the trust for the benefit of 'all the people.' Pa. Const. Art. I, § 27." Id.

Municipalities cannot simply allow unfettered development. Municipalities must balance development against conserving the natural resources. The courts will strike down municipal zoning ordinances that do not strike an appropriate balance. Main St. Dev. Grp., Inc. v. Tinicum Twp. Bd. of Supervisors, 19 A.3d 21 (Pa. Commw. Ct. 2011); reargument denied (May 12, 2011), appeal denied 40 A.3d 123 (2012). Municipalities must balance competing interests and cannot favor some to the exclusion of others. See, e.g., Robinson Twp., 83 A.3d 901, 953-54, 960 (plurality). Allowing industrial development throughout a municipality simply fails to reflect that municipal officials have conducted the constitutionally-required balancing.

Such a failure exposes municipalities and their officials to a legal challenge for violation of citizens' constitutional environmental rights. Robinson Twp., 83 A.3d at 951-52, 956-57, 974-75, 977-78. As the Supreme Court held in Robinson, the rights guaranteed in the Environmental Rights Amendment are on a par with our other inherent political rights, including our private property and free speech rights. Id. at 953-54. Just as citizens may vindicate those political rights in the courts, so too may citizens vindicate their rights and hold government officials accountable under the Environmental Rights Amendment. Id. at 951-52, 956-57, 974-75, 977-78; PEDF, 108 A.3d at 156 (quoting id. at 950-51).

7. Do government officials have an obligation – before acting -- to determine whether the proposed action will cause an unreasonable degradation of our air and water?

Yes. The Pennsylvania Constitution limits government officials from acting when they have not determined in advance whether the proposed activity will cause an unreasonable degradation of our environment.

Under Article I, Section 27 of the Pennsylvania Constitution, state and local government officials have an obligation to assess whether any proposed project, law, regulation or ordinance would cause unreasonable "actual or likely degradation" of air or water quality, or other protected constitutional features, such as natural and scenic values of the environment. Robinson Twp. v. Com., 83 A.3d 901, 951-955 (Pa. 2013)(plurality); Pennsylvania Envtl. Def. Found. v. Com., 108 A.3d 140, 156 (Pa. Commw. Ct. 2015), reargument denied (Feb. 3, 2015). If a governmental entity fails to perform the analysis, or allows development to proceed that would cause unreasonable "actual or likely degradation," it raises a significant risk of a Section 27 challenge by citizens. Robinson Twp., 83 A.3d at 952 ("The failure to obtain information regarding environmental effects does not excuse the constitutional obligation because the obligation exists *a priori* to any statute purporting to create a cause of action."); see also id. at 951 (stating that clause 1 "implicates a holistic analytical approach to ensure both the protection from harm or damage and to ensure the maintenance and perpetuation of an environment of quality for the benefit of future generations."); see also PEDF, 108 A.3d at 156, 172.

Further, as a trustee, government officials must consider before acting whether the proposed action will lead to the "degradation, diminution, or depletion" of the people's public natural resources either now, or in the future. Id. at 952, 957, 959 & n.46; see also id. at 959 n.45, 20 Pa.C.S. § 7203(a) & (c)(5); PEDF, 108 A.3d at 157, 168; In re Scheidmantel, 868 A.2d 464, 492 (Pa. Super. Ct. 2005) ("trustee's action must represent an actual and honest exercise of judgment predicated on a genuine consideration of existing conditions"); 20 Pa.C.S. § 7773. Likewise, government officials must consider whether the proposed action places higher environmental burdens on some citizens than others, which would violate a trustee's duty of impartiality to treat the beneficiaries "equitably in light of the purposes of the trust." Robinson Twp., 83 A.3d at 957, 959, 980; PEDF, 108 A.3d at 157 (quoting id. at 958-59). Section 27 specifically establishes a preference for protecting the natural quality of the environment and its benefits over development and disturbance, requiring that the government officials take the same focus and care in their actions. Robinson Twp., 83 A.3d at 973 n.55.

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