PIPESLINES IN PENNSYLVANIA:
A CASE STUDY OF LYCOMING COUNTY

Prepared 2012 for: League of Women Voters of Pennsylvania

Funded by: U.S. Department of Transportation, PHMSA Technical Assistance Grant #DTPH56-11-G-PHPT20

“Pipelines in Pennsylvania: A Case Study of a Community and its County: Lycoming County”
Cover Photography: Terry Wild Stock Photography, Williamsport, PA 17701

The Project wishes to acknowledge and thank Terry Wild whose photographic images of Lycoming County were generously donated to the project.

Contents...Page:

Executive Summary...3
The Pennsylvania League of Women Voters...11
Acronyms...12
Lycoming County...13
Pipeline Overview...21
Siting Pipelines in Lycoming County...27
Regulating Pipeline Safety in Pennsylvania...32
Pipeline Safety Requirements during Construction...41
Pipeline Safety Requirements during Operation...45
Pipeline Hazards & Risk Analysis...50
Ensuring the Safety of Lycoming County’s Natural Gas Pipeline Infrastructure...55
Public Awareness Surveys: Methods, Findings, Recommendations...56
2012 Survey of General Public in Lycoming County...57
2012 Survey of Emergency Responders in Lycoming County...59
The Role of Transparency and Communication in Ensuring Pipeline Safety...62
Contributors to the Project and Resources for More Information:...65
Agency List...65
Executive Summary

Lycoming County was selected as a case study for the relative absence of current pipeline infrastructure and its rural location in an area of concentrated Marcellus Shale gas development. It is a region where traditional oil and gas production has been minimal, therefore construction of more pipeline infrastructure will be required. The topography, ecology, flooding history and rural nature of Lycoming County make it prototypical of an area where a pipeline failure could pose a significant risk to people and to unusually sensitive environmental areas. This case study was conducted to provide objective information for educating the public and elected officials and to raise concerns and provide recommendations to serve as a basis for ensuring the safety of Lycoming County’s natural gas pipeline infrastructure.

The relative absence of current pipeline infrastructure and resulting lack of pipeline awareness are illustrated in the Lycoming County 2010 Hazard Mitigation Plan. The risks associated with natural gas pipelines were not even mentioned in this plan - in spite of the two existing interstate pipelines and the construction of new pipeline infrastructure in this area of Marcellus Shale development. The primary concern was flooding. Relative to Marcellus Shale natural gas development, the major concern involved accidents at gas well sites and the transportation of hazardous materials on the roads and highways. Because a pipeline failure could pose a significant risk to the people and their sensitive environment, increased public awareness of pipeline safety and appropriate regulation is imperative.

Complicating the onset of a new pipeline network to meet increasing demands are problems of Pennsylvania’s existing pipeline infrastructure. It is old and perhaps deteriorating. Population shifts and economic development has transformed once rural and remote areas into areas where a pipeline incident could have profound environmental consequences and loss of life. New and expanding pipeline networks are placing additional demands on outmoded transmission systems that may lead to unanticipated consequences.

New pipelines have their own set of problems. Regulation is patchwork both in terms of siting and safety – particularly for gathering lines in rural areas. Elected officials, from local to national levels, lack adequate, objective knowledge on which to base decision-making
regarding pipeline siting and safety. Landowners and the public lack fundamental knowledge about their rights when pipeline operations move into their communities.

The preceding problems, coupled with the unique features of this region, prompted this case study in Lycoming County. LWVPA received a US Department of Transportation, Pipeline Hazardous Materials Safety Administration (US DOT PHMSA) Technical Assistance Grant (TAG) to produce:

1. An overview of the state of pipelines in a Pennsylvania community and county similar to that completed through a similar grant to the Fort Worth League of Neighborhoods;
2. Objective information about the safety of the growing number of natural gas pipelines in an area of prototypical region, Lycoming County;
3. A review of regulations and status of existing and evolving transmission system; and
4. Sound recommendations to serve as a basis for educating the public and elected officials to promote active, informed decision making.

This case study offers the following recommendations

**Recommendations**

**The Department of Transportation, Office of Pipeline Safety should:**

1. Continue its review of shale gas gathering pipelines across the United States, and seek to improve oversight and safety standards for all gas pipelines, regardless of their rural, suburban or urban location.
2. Implement rulemaking to clarify the point where onshore-regulated gas gathering lines begin (49 CFR Part 192.8). That point should be defined to ensure there are no unregulated gas pipelines.
3. Implement rulemaking to include all Class One gathering lines, in all states, under full requirements of the Gas Transmission Pipeline Integrity Management Program (49 CFR Part 192 Subpart 0).
4. Continue offering free and publicly accessible information regarding the standard location data for all transmission pipelines, including current and comprehensive maps, and expand this information to also include information about on-going inspections, One-Call coverage, odorization, and emergency or hazard response contingency plans. As soon as possible, this information and maps should also be made available for gathering pipelines in shale gas development areas.
5. Undertake case studies to determine the benefits and risks of odorizing gathering lines, in both densely populated areas and more rural areas that are undergoing rapid development as a result of shale gas extraction. North-central Pennsylvania should be considered as one location for such a case study.

**The Federal Energy Regulation Commission should:**

6. Institute a policy for review of pipeline siting applications that considers cumulative effects.

7. Make the public participation process conducive to stakeholders at all levels.

**The Pennsylvania State Legislature should:**

8. Utilize the experience and work product of other state governments and national and local pipeline safety organizations to protect both citizens and pipelines. For example, the Municipal Research and Services Center of Washington State has developed a website that covers “planning near pipelines” issues and there are sample ordinances provided by the Pipeline Safety Trust.

9. Expand the purview of PA PUC in Act 127 to oversight of all gas pipelines, regardless of Class.

10. Replace or modify legal impediments to the sharing of State and local roadway right-of-ways to allow for and encourage the use of existing right-of-ways and minimize new surface disturbances.

11. Amend the Public Utility Code to clarify that the sharing of pipeline capacity, for purposes of increased efficiency and smarter deployment of gathering lines, shall not constitute public utility status.

12. Amend the Underground Utility Line Protection Law, commonly referred to as “PA One Call,” to include mandatory participation beyond the requirements of 58 Pa. C.S. § 3218.5, including specific location registration of all gathering lines.

13. Provide for greater regulatory authority, as well as financial and personnel resources for the Pennsylvania Department of Environmental Protection to thoroughly review pipeline permit applications in environmentally sensitive areas and to adequately enforce permit requirements.

14. Ensure that the same local ordinance and zoning regulations provided for in the Commonwealth of Pennsylvania Constitution remain enacted for natural gas pipelines at the local level and contain guidelines regarding best management practices for siting according to state and federal guidelines.
15. Allocate funding that would allow for an increase in the number of certified gas safety inspectors across the Commonwealth, ensure that they are properly trained, and that there are an adequate number of investigations completed per year.

16. Standardize the use of State Best Practices in pipeline design and construction as is required by all other construction activities.

17. Establish and implement costly penalties that encourage compliance with safety and environmental regulations, and allow for levying of fines that are consistent with the nature of the violation.

18. Implement a state wide financial assurance program specifically related to significant natural gas pipeline incidents and related damages to property and lives.

19. Find and allocate adequate funding for natural gas and hazardous liquids pipeline maintenance plans.

The Pennsylvania Public Utility Commission should:

20. Have more direct involvement in siting of larger diameter, higher-pressure Marcellus shale gathering pipelines in Class One, rural areas of Pennsylvania like Lycoming County; especially near schools, hospitals, and other community centers.

21. Work with PA One Call for purposes of creating a state map of shale natural gas and liquids transmission, gathering, and distribution pipelines.

22. Work with PA One Call to establish regulations requiring One Call for all pipeline construction, regardless of Class.

23. Require all pipeline operators to collaborate in standardizing right-of-way markers, including the spacing of markers. All markers should include contact information for the pipeline operator, location of the pipeline, notation to contact PA One Call prior to any excavation, and other critical information, including notation regarding whether there are multiple pipelines in a common right-of-way.

24. Continue their efforts at coordination and public outreach with the Department of Environmental Protection to further citizens’ understanding of the respective roles each agency plays in the review of permitting, siting, and placement of natural gas gathering lines.

25. Develop a protocol for greater public involvement and comment by all local stakeholders and citizens in the siting of Marcellus and Utica shale gathering and intrastate transmission pipelines that is reflective of the PA Municipalities Planning Code, the Pipelines and Informed
Planning Alliance (PIPA) recommendations, and that is consistent with state and local regulations regarding public meetings.

26. Ensure that gas pipeline safety inspectors and other enforcement personnel actively partner and establish on-going communications with local agencies.

27. Increase posting of materials regarding pipeline construction plans, operations, maintenance, and inspections on-line.

The Pennsylvania Department of Environmental Protection should:

28. Prioritize the comprehensive and thorough review of permit applications from pipeline operators and their contractors applying for waterway crossings and construction through environmentally sensitive areas and over potentially hazardous topographic land features, such as steep inclines and declines.

29. Include requirements in permits for pipeline construction and operation that avoid and properly mitigate surface disturbances in steep inclines and declines, avoid and properly mitigate impacts to sensitive wildlife habitats, avoid forest fragmentation, prevent disruption of view-sheds, and avoid direct intersection with waterways.

30. Continue efforts at coordination and public outreach with the Public Utility Commission to further citizens’ understanding of the respective roles each agency plays in the review of permitting, siting, and placement of natural gas gathering lines.

31. Develop a protocol for greater public involvement and comment by all local stakeholders and citizens in the siting of Marcellus and Utica shale gathering and intrastate transmission pipelines.

32. Ensure that gas pipeline safety inspectors and other enforcement personnel actively partner and establish on-going communications with local agencies.

33. Require pipeline operators to install methane capture devices on all production pipelines and compressor stations and institute a program of regular emissions monitoring along gathering and transmission pipelines to reduce methane leakage.

34. Increase posting of materials regarding pipeline construction plans, operations, maintenance, and inspections on-line.

35. Institute a review policy of pipeline siting applications that considers cumulative environment effects.

36. Make the public participation process conducive to stakeholder participation at all levels.
The Pennsylvania Emergency Management Agency should:

37. Develop and provide a dedicated training program for all local emergency responders specific to pipeline hazards and incident response in Lycoming County. The program should include:
   i. understanding the differences between a fire emergency and a natural gas emergency
   ii. how to respond to natural gas specific emergencies
   iii. who to call when a natural gas specific emergency occurs
   iv. appropriate emergency communication protocols for handling a natural gas pipeline incident.

38. Develop and administer the training program in cooperation with the USDOT PHMSA, Transport Canada, Secretariat of Transport and Communications 2012 Emergency Response Guidebook.

39. Make the training program available through both on-site workshop and internet access.

40. Make the training program a mandatory requirement with checks and balances for competency.

The Pennsylvania Office of the Attorney General should:

41. Establish and enforce ethical standards in order to insulate regulatory agencies from political or financial influences provided by the natural gas companies and their agents.

Lycoming County Government and All Local Pennsylvania Governments should:

42. Have direct involvement in siting of larger diameter, higher-pressure Marcellus Shale gathering pipelines in Class One, rural areas of Pennsylvania like Lycoming County; especially near schools, hospitals, and other community centers.

43. Promote the development of a regional interstate compact for siting interstate pipelines as first proposed in 2009 as PA House Bill 1817.

44. Enact ordinances and zoning regulations, where and when possible, for natural gas pipelines at the local level that contain guidelines regarding best management practices in order to protect the public, prevent environmental degradation, and reflect community or county-wide land-use planning.
45. Ensure that local land use planning initiatives near already constructed pipelines have at least three major goals:
   
i. Utilize PHMSA’s PIPA recommendations for communication between stakeholders in land use planning. Stakeholders as defined in PIPA include government officials, property owners, developers, pipeline operators and real estate commissions.

ii. Put in place practices, such as clear and accurate marking and signage of underground pipeline locations, which protect pipelines from construction damage.

iii. Create local planning and building ordinances that protect citizens who come to live near pipelines long after their construction and may therefore be unaware of the existence or location of pipelines.

46. Establish a protocol for ensuring greater public involvement and comment by all local stakeholders and citizens in the siting of Marcellus Shale gathering and intrastate transmission pipelines. The local protocol should be reflective of the PA Municipalities Planning Code, the Pipelines and Informed Planning Alliance (PIPA) recommendations, and consistent with state and local regulations regarding public meetings.

47. Increase internet posting of materials regarding pipeline construction plans, operations, maintenance, and inspections

Pipeline Operators and their Contractors should:

48. Consult with County and municipal governments to better understand the implications of a proposed project on a county or municipal comprehensive plan.

49. Implement ROW agreements that allow for the continuation of local land uses, the replanting of local, native vegetation, and that require proper maintenance of vegetation according to local conservation best practices.

50. Consult with the appropriate experts to replant right-of-ways with vegetation that fosters habitat development for wildlife and in accordance with existing and future land uses.

51. Give consideration to utilization of existing or new pipeline pathways near existing or potential industrial development.

52. Consider co-location and simultaneous installation of their gas pipelines, water pipelines, power lines, and even wind and solar energy projects where appropriate and when possible.

53. Modify the pipeline operator’s Public Awareness Program to produce programs that lead to enlightened behavior changes in the target audiences that increase public safety and reduce environmental and private property damage.
54. Provide Lycoming County and any local Pennsylvania emergency personnel and planning staff with information on the location of all natural gas pipelines in order to enhance emergency response and ensure that community growth planning accounts for the location of gas pipelines.

55. Develop and implement a mandatory notification protocol with local municipalities early on in the planning and siting process in order to incorporate local knowledge of the environment, municipal planning and the public safety culture.

56. Share information with the public and local emergency responders on what the pipeline industry and specific operators are doing to keep citizens safe, as well as what the public can do to help keep their own communities safe, including sharing information with the public on the planned location of all types of pipelines.

**The Citizens of Lycoming County and Pennsylvania should:**

58. Contact the Pennsylvania League of Women Voters to learn how you can become better informed and how you can proactively participate in decisions made in Lycoming County.

59. Vote; and actively support officials with your time and volunteer efforts.

60. Work with local officials to learn where pipelines currently are located in your area, and where they may be expected to come in the future.

61. Participate in land use planning with your appropriate land use entity.

62. If a pipeline is proposed in your county, read this study to learn about procedure, process and what pipeline infrastructure means to you and your community. Know your property rights before a land agent approaches you to discuss a right of way agreement.

63. Make sure the One Call System is posted in your township building and fire halls. Ask for meetings to educate the community.

64. Use the One Call system before digging or excavating.

65. Stay actively involved in pipeline safety reviews through PEMA or local emergency planning efforts and make elected officials, regulatory agencies, and the pipeline industry aware of any concerns you have regarding access to pipeline safety information.

66. Participate in public meetings and hearings regarding the siting of compressor stations, pipeline routes and safety briefings by the industry, PA PUC, and PA DEP
The Pennsylvania League of Women Voters

The League of Women Voters (LWV) was formed as a nonpartisan political organization in Chicago in February 1920. This was six months before the ratification of the Nineteenth Amendment that gave women the right to vote. The goal of the League was to help women learn how to register and vote as well as become better informed about nomination and election procedures. In addition to educating women about how the government works, the LWV also hoped to work toward certain "needed legislation." Although members thought they might achieve their goals within five years and disband, history proved them to be wrong. Building from these core issues, the League has evolved from an organization concerned for women's needs and women voters to one concerned for the nation's needs and all voters.

In 2008, the Indiana County Chapter of the League of Women Voters of Pennsylvania (LWVPA) became acutely aware of the complexities of natural gas development and spearheaded a statewide Marcellus Shale Natural Gas Extraction Study. A resulting position statement was adopted by consensus in June 2009. Following this study, LWVPA recognized pipelines as meriting furthering study. Thus, in conjunction with the Indiana League, an inter-league organization, the League of Women Voters of Southeastern Pennsylvania Region (LWVSEPR) produced an additional study on pipelines. The resulting LWVPA Position on Pipelines was adopted on June 5, 2011. It recognizes pipelines as a relatively safe and efficient means of transporting natural gas while supporting “the maximum protection of public health and the environment in all aspects of Marcellus Shale natural gas transmission operations through improved siting, regulation, inspection, and enforcement that is transparent and responsive to stakeholder input.”
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Lycoming County

Lycoming County is situated in north central Pennsylvania at the convergence of two geomorphologic provinces; the Allegheny Plateau and the Valley and Ridge province. The largest of Pennsylvania’s 67 counties, Lycoming County’s 1,235 square miles make it comparable in size to the state of Rhode Island. The County is characterized by scenic landscapes, steep slopes, deep river valleys, and abundant forestland.

Located in one of four major drainage basins in Pennsylvania, the County Seat of Williamsport lies within the Susquehanna River Basin and is the county’s only city. There are 52 municipalities, 42 townships and nine boroughs within the County. Its most populated watershed is the West Branch of the Susquehanna River. Several tributaries of the West Branch have been designated exceptional and high quality watersheds by the Pennsylvania Environmental Quality Board therefore requiring permitting from PADEP in all stream disturbance projects. Thick sequences of carbonate rock formations have developed karstic landforms throughout Lycoming County. Such geology can result in significant land-subsidence problems that will be discussed further relative to pipeline siting and construction.
Pennsylvania and Lycoming County have a long history of energy production from timber, to coal, and conventional gas. In winter of 1879, the 6 inch Tidewater Pipeline was constructed 109 miles between McKean and Lycoming Counties. A project of Standard Oil Company and oil mongul John D. Rockefeller, the Tidewater Pipeline represents the world’s first successful oil pipeline. Although Lycoming County is outside previously developed conventional oil and gas operations, Lycoming County is in the midst of Marcellus Shale and its underlying Utica Shale.

Lycoming County
Relative to Marcellus Shale formations (top right)
http://alumni.libraries.psu.edu/marcellus.html
and Utica Shale formations (left)
Locations of Lycoming County Pipelines:

Since early 2008, a number of gas companies began to establish a presence in Lycoming County. In response, the Lycoming County Board of Commissioners and the Williamsport/Lycoming Chamber of Commerce formed a Community Gas Exploration Task Force (CGETF), recently renamed the Community Natural Gas Task Force (CNGTF). The purpose of the CNGTF is to “identify key issues, research facts and information, and review and propose public policy regarding the positive, economic impact of gas exploration of the Marcellus Shale in Lycoming County.”

The County of Lycoming Community Gas Exploration Task Force Public Safety Sub Committee of Planning & Community Development has been compiling information on the location of pipelines for use by planning agencies or to the public. As of April 2012 the County’s admittedly incomplete inventory map shows the location of drilled wells, transmission lines, and gathering lines. As shown in their 2012 report the system of gathering lines reported does not extend to Class 1 area\(^1\) wells, but does suggest the extent of new pipeline construction that can be anticipated. Distribution line data is held by the utility of record in Pennsylvania therefore no distribution lines maps are available. The mission of the Sub-Committee is to “Develop a practical, reliable, and competent community emergency response capacity. To have an industry wide perspective of needed training that is a common good for all. Together we will explore industry expectations for the responder community, look for gaps and how to fill them in a manner that is supported by the

\(^{1}\) see: gathering lines page 25
responders and the industry. Work together should there be an incident and mitigate the severity of it.”

Marcellus Shale gas development in adjacent Bradford County has been more intensive than in Lycoming County. Bradford County has developed a dedicated Natural Gas Information link to their website where maps such as this are provided. showing gas-related water resources as well as fracking water pipelines, gas gathering, and transmission pipelines. As previously reported, distribution line data is held by the utility of record in Pennsylvania, therefore no distribution lines are shown. Over time the pattern of gas wells in Lycoming County can be expected to resemble that in Bradford County.

Relative to experiences with previous energy sources, the speed of development of Marcellus and the corresponding need for infrastructure are staggering. Data provided by Powell Shale Digest for January 1 - June 30, 2011 indicate Lycoming County produced more than 20 million Mcf during the first half of 2011, ranking Lycoming County 6th among the 26 Pennsylvania counties producing unconventional natural gas. As more wells are drilled, Marcellus Shale gas development and supplementing pipeline networks will continue to expand.
According to a 2011 study conducted by The Nature Conservancy in Pennsylvania, approximately 25,000 pipeline miles of additional infrastructure will be required to transport Pennsylvania Marcellus Shale gas by 2030. Lycoming County and contiguous counties lay between Southeastern and Western gas production areas and major Northeastern markets. These new Marcellus resources, coupled with an existing infrastructure, make north central Pennsylvania an ideal hub of expanding infrastructure in gas transportation. The PHMSA National Pipeline Mapping System of Lycoming County, outlined below in yellow depicts roadways, pipelines, and population centers. North to south a red line indicates a hazardous liquid interstate transmission pipeline. East to west a blue line indicates a natural gas interstate transmission pipeline. Source: PHMSA

Augmenting concerns of Marcellus development is a growing awareness of the future with deeper, older, more extensive and lucrative Utica Shale deposits. Extraction of Utica Shale in Pennsylvania began September 2011 in northwestern Crawford County. In areas like Lycoming County, where Marcellus and Utica Shale extraction begin to occur concurrently but from different wellheads, the need for additional pipeline infrastructure will compound land use. No estimates of these additional pipeline requirements for Utica Shale operations were found.

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2 Marcellus Drilling News
The future of Lycoming County and its landscape is reflected in the FERC publication “On the Horizon” of nationally approved or pending pipeline projects. A Northeast and Southeast infrastructure build out consistent with Marcellus and Utica Shale formations is apparent.

The Williamsport based PVR Partners owns and manages coal reserves and other natural resources. In 2012 PVR expanded their interests to owning and operating natural gas midstream pipelines and processing plants. Their 2012 production outlook for Lycoming County illustrates the expansive unconventional gas development planned by this partnership.

Known interstate pipeline projects specific to Lycoming County include, but are not limited to:

The MARC-1 transmission pipeline intersect was built from The Transco Leidy Line in eastern Lycoming County, through Sullivan and Bradford Counties to the Tennessee pipeline intersect. Northeast from Marc 1, plans are underway to develop the Constitution Pipeline to transport Marcellus gas into New York State, New Jersey, New York City and overseas through processing in constructed LNG, facilities which liquify natural gas. LNG can be easily transport overseas to meet demands of higher market audiences.
Marc 1 terminus in southeast Lycoming County is proposed to connect to the Commonwealth Pipeline. A 2012 Partnership press release describes “The proposed Commonwealth Pipeline will extend from the southern terminus of Inergy Midstream's MARC I pipeline in Lycoming County, Pennsylvania, due south through central and eastern Pennsylvania and will continue south to access markets across southeastern Pennsylvania, Philadelphia and the Baltimore and Washington, D.C. metropolitan areas. The pipeline will connect these attractive markets directly to reliable supplies of Marcellus natural gas production from across Pennsylvania while providing a more cost effective transportation path compared to traditional routes. The pipeline is expected to cross and interconnect with a number of interstate pipelines along its route, providing even greater supply diversity while providing producers with direct access to markets that are currently served only through existing interstate pipelines.”

The Constitution Pipeline, and Commonwealth Pipeline alone provide infrastructure from Marc 1 to transport Lycoming County Marcellus Shale to New York, New Jersey, Ohio, Delaware, Virginia and ultimately overseas. With the advent of bidirectional interstate pipelines such as the Commonwealth Pipeline, Lycoming County Marcellus Shale pipelines will have the capacity to both import and export gas.
The Muncy Loop (below), is also proposed by Williams and will consist of an overall project of 2.22 miles of 42-inch pipeline parallel to the existing Leidy pipeline in Wolf and Penn townships; about 14 miles east of Williamsport. The 300-foot wide Muncy Loop corridor encompasses 142 acres of wetlands. A loop is the term used when multiple pipelines are laid parallel in a ROW.

Intrastate pipeline projects siting would be available through PADEP, however mapping is not available through PADEP at this time. Unregulated pipelines for gathering lines in Class 1 areas are not available through any government agency at this time.
As reported by the Philadelphia Inquirer’s interactive database for county by county drilled wells, Lycoming County Marcellus well counts are depicted, left to right from January 2005-December 2006 and from January 2006 - October 2012 reflecting the numbers of unconventional wells that required pipeline infrastructure. As will be illustrated by data collected in a public awareness survey for this case study, we know that the rapid growth in Marcellus Shale natural gas production is outpacing public awareness regarding the health, safety, and environmental hazards associated with natural gas pipeline infrastructure.

**Pipeline Overview**

Pipelines are categorized by what they carry and where they go as illustrated in the official PHMSA pipeline diagram. Each category of pipe may vary in size, operating pressure, construction materials, and designation of regulatory authority in terms of siting, construction, specifications, maintenance, inspections, and decommissioning.
Applicable to all pipelines is the fact that when buried underground, they tend to be forgotten by the general public until spectacular disasters occur.

Although not a pipeline, compressor stations merit inclusion in a pipeline overview. Natural gas needs constant pressurizing in order to travel from wellhead to consumer. As gas moves through pipelines, friction between the gas and pipeline walls reduces pressure and slows down its movement. Compressor stations, or pumping stations, are the "engine" that powers an interstate natural gas pipeline. The compressor station compresses the natural gas by pumping up its pressure, providing energy to move the gas through the next section of pipeline. Pipeline companies typically install compressor stations along a pipeline route every 40 to 100 miles, to serve the function of maintaining consistent pressure in the pipeline. The size of the station and the number of compressors in the station vary based on the diameter of the pipe and the volume of gas to be moved; however, the basic components of a station are similar. Compressor station siting depends on terrain, specifically with frequent elevations such as in the steep slopes of Lycoming County. The number of gas wells in a given area also increases the number of

**Barto Compressor Station, Lycoming County**  (©2010 Chief Oil & Gas All Rights Reserved)
compressor stations. Gas being transported through pipelines enters compressor stations, is pressurized by turbines, motors and engines and returns to the system at a maximum operating pressure (MAOP) appropriate to the gas and the pipeline.

The existing pipeline infrastructure of Lycoming County transports conventional gas and includes production, gathering, transmission and distribution lines. Marcellus Shale is considered an “unconventional” gas resource.

The distinction between conventional and unconventional gas resources is important to note. According to Canadian Association of Petroleum Producers, natural gas comes from both “conventional” (easier to produce) and “unconventional” (deeper, more difficult to produce) geological formations. The key difference between conventional and unconventional natural gas is the manner, ease and cost associated with extracting the resource. In 2005, unconventional gas represented 44% of U.S. lower-48 onshore production. Transporting Marcellus and Utica shale unconventional gases requires additional and expanded categories of pipelines. The following discussions of types of pipelines, siting and regulation are specific to Lycoming County and unconventional gas drilling areas.

**FreshWater Pipelines:** Unconventional gas extraction involves vertical and horizontal drilling using the technology of hydraulic fracturing or “fracking3”. Fracking uses a combination water and a proprietary blend of chemicals and sand to fracture shale and release gas deposits. Generally, one to eight million gallons of water are needed to frack a well and each well may be

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3 Fracking or Fracing: slang for hydraulic fracturing, or the propagation of fractures in a rock layer by pressurized fluid
fracked up to 18 times. In all, fracking a well may require up to 144 million gallons of fresh water. Until recently, trucks have transported these volumes of water to a well site. However, the costs of fueling trucks and roadway repair have spurred the creation of fresh water impoundment ponds and pipelines as illustrated above.

In many cases, water is now pumped from fresh water lakes, streams, subsurface wells, or water resource plants through fresh water pipelines and stored in ponds or impoundments until needed. **Flowback Water Pipelines:** Along with produced gas, each well returns millions of gallons of water and chemical slurry used in fracking as well as underground substances dissolved in the fracking process. This water is referred to as “produced water” or “flowback.” In the first two to three weeks of fracking, 125 to 250 gallons per minute of flowback typically continues for several hours and drops to 29 gpm (about 8 times the flow of a garden hose) within 24 hours. Over several days, flowback decreases to less than 3 gpm. This is followed by a gradual decrease to less than 0.1 gpm within a few weeks. Small quantities of flowback water may continue to return to the surface for years. Flowback must be contained due to its properties of contaminants such as drilling cuttings, radon, total dissolved solids, 70,000 to 250,000 mg/L brine salts, hydrocarbons, strontium, bromide, radioactive materials, and heavy metals. Both fresh and flowback pipelines may be made of simple agricultural irrigation water pipes, aluminum sections, polyethylene or steel. Most water pipelines are laid on the ground, raised over streams with cribbing and buried below road.

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4 SPE 152596 Hydraulic Fracturing 101: What Every Representative, Environmentalist, Regulator, Reporter, Investor, University Researcher, Neighbor and Engineer Should Know About Estimating Frac Risk and Improving Frac Performance in Unconventional Gas and Oil Wells. George E. King, Apache Corporation, This paper was prepared for presentation at the SPE Hydraulic Fracturing Technology Conference held in The Woodlands, Texas, USA, 6–8 February 2012.
crossings by trench cut. In some instances fresh water pipelines and flowback water pipelines are used interchangeably.

**Production Pipelines:** The pipes and equipment normally used near the wellhead to produce and prepare gas for transport are referred to as production pipes. Production pipes are threaded steel pipe which when screwed together, form underground strings of casings up to three miles long. Each shale gas well typically contains several strings of pipes with decreasing diameter inside each other. The outer casing typically is about 30 inches in diameter; the innermost (production) casing, about 5 to 6 inches.

**Gathering Lines:** Pipelines that transport natural gas from the wellhead or production facility to a transmission line or compressor station are called gathering lines. They begin at the first point of measurement where the piped gas leaves a well. Conventional gas wells in Pennsylvania are typically served by 6 - 8-inch diameter gathering lines that operate at low pressure (less than 200 psi). In contrast, Marcellus gas gathering lines are typically 24 inches in diameter or larger and operate at pressures of up to 1,440 pounds per square inch (psi). These gathering lines require compressor stations similar to those of interstate transmission pipelines. In Pennsylvania, gathering lines are classified numerically, 1-4, based on the population and risks in a given area. Most Lycoming County, and Pennsylvania, Marcellus Shale gathering lines are in rural areas and therefore categorized as Class I gathering lines. Some states classify gathering lines alphabetically.\(^5\)

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\(^5\) Forth Worth League of Neighborhoods *The State of Natural Gas Pipelines in Forth Worth*, page 7
**Transmission Lines:**
Relatively larger, higher-pressure pipelines that move gas to and from compressor stations, a storage facility, or distribution centers are transmission pipelines. These lines are designated as either **interstate pipelines** or **intrastate pipelines**.

**Interstate pipelines** transport gas across state lines between contiguous states and Canada. New interstate pipelines are being built and proposed that will transport gas and hydrocarbon liquids from the Marcellus and Utica Shale in Pennsylvania to Maryland, Virginia, New York, and New England. **Intrastate pipelines** do not cross state borders and transport gas only within state boundaries. Conventional gas transmission lines range in diameter from 6 to 48 inches and operate at between 200 to 1,500 psi. Unconventional gas transmission operates at higher psi and generally will require up to 60 inch diameter transmission pipelines.

**Distribution Lines:**
Relatively small in comparison to other pipelines, distribution pipelines are lower pressure lines used to supply natural gas to the consumer. These lines are part of a distribution system of mains and service lines located downstream of a transmission line or Citygate where pressure is stepped down prior to the dispatch of gas into industrial, commercial, and residential neighborhoods.
A Citygate is defined by the Energy Information Administration as: “A point or measuring station at which a distributing gas utility receives gas from a natural gas pipeline company or transmission system.” To ensure safety the chemical mercaptan is added at the City Gate to give gas its telltale “rotten egg” smell. In Lycoming County and the historic cities of Pennsylvania, such as Philadelphia, distribution lines may be made of plastic, or PVC, steel, cast iron and even wood.

**Siting Pipelines in Lycoming County**

While water, production, transmission, gathering, and distribution lines are all needed for the development of Marcellus Shale in Lycoming County, the process and authority for siting these lines varies by type. The rapid development of unconventional oil and gas across Pennsylvania and the United States is creating changes in the siting process. For example, the siting of gathering and intrastate pipelines in Pennsylvania was not clearly regulated until March 2012, when Act 127, (discussed in State Regulations, Oversight and Enforcement) was implemented. Even with Act 127 in place, many questions about the siting and regulation of gathering lines remain.
Siting of Fresh Water and Flowback Pipelines: Although technically not natural gas pipelines, the placement of water lines that transport fresh water or flowback to and from Marcellus Shale gas wells is an important consideration for public safety, emergency planning, and environmental protection related to the transport of hazardous materials. The decision of where to site above ground water lines in Lycoming County is currently made between the gas production companies and private or public landowners.

Siting of Production Lines: Production pipelines and related equipment are sited at the well pads. Before construction of a Marcellus Shale well pad can begin operators must obtain an erosion and sediment control permit from the Pennsylvania Department of Environmental Protection (PA DEP) approving the site plan.

Siting of Gathering Lines: Pipeline operators make siting decisions based on the location of well pads, compressor stations, topography, population densities, and the ability to obtain right-of-way agreements with landowners. Act 127 provides PA PUC siting oversight of the industry through a mandatory registry of miles and location of all classes of gathering lines.

Siting of Intrastate Transmission Lines: Pipeline operators in Pennsylvania must obtain necessary permits from the PA DEP for wetlands and stream or waterway crossings, and PennDOT for use of existing state road right-of-ways or roadway crossings. Act 127 provides PA PUC siting oversight through the authority to impose construction requirements for intrastate pipelines, as well as the ability to order work cessation or levy fines up to $1,000 per day for noncompliance. While falling short of full siting authority, mandates of Act 127 require that all intrastate pipeline operators provide PA PUC with an inventory of locations, sizes and pressures of all intrastate transmission and gathering lines they own and operate. As a Commonwealth, Pennsylvania municipalities have constitutionally had the ability to exercise local zoning authority in intrastate pipeline siting decisions. However, this is possible only if and when the municipality is aware of its authority and if and when an operator seeks a permit to use an existing roadway or other right-of-way owned by the municipality. Future ability of municipalities to exercise this siting authority is pending a final decision on the Constitutionality of Act 13, a 2012 revision of the state’s oil and gas statutes.

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**Siting of Interstate Transmission Lines:** In general and regardless of state, the federal government determines siting of interstate gas and hazardous liquids transmission lines under the jurisdiction of the Federal Energy Regulation Commission (FERC). Companies proposing construction of interstate lines are required to apply to the FERC for a certificate of public necessity and convenience for approval of siting plans. A FERC certificate grants the power of eminent domain, by which the company can acquire land for the pipeline right-of-way regardless of whether the landowner is willing to sell or not. To date, the majority of new gas pipelines associated with Marcellus Shale development proposed for Lycoming County are not interstate pipelines and no federal agency is involved in their siting.

**Siting of Distribution Lines:** The pipeline operator or utility has sole discretion over the siting of distribution pipelines.

**Siting and Rights-of-Way:** Implicit in any discussion of siting is the process of determining and negotiating a Right of Way. To protect the public, the pipeline itself, and other customers from loss of service and to ensure safety, a natural gas pipeline operator is responsible for maintaining a Right-of-Way (ROW). A **ROW agreement** between landowners and pipeline operators is important because it enables workers to gain access for inspection, maintenance, testing or emergencies; maintains an unobstructed view for frequent aerial or ground surveillance; and
identifies an area that restricts activities to protect the landowner, the community through which
the pipeline passes, and the pipeline itself.

**Concerns Regarding Pipeline Siting in Lycoming County:**
The siting of gathering and intrastate pipelines in Pennsylvania was not clearly regulated until
March 2012, when Act 127, was implemented. Even with Act 127 in place, many questions
about the siting and regulation of gathering lines remain. Specific areas of concern regarding the
siting of pipelines in Lycoming County include:

- Absence of federal, state, and local involvement in siting decisions of the new large diameter,
  higher-pressure gathering pipelines being used to convey Marcellus Shale gas to processing
  facilities and transmission pipelines.
- Siting of all pipeline types near rural schools, hospitals, and other community centers.
- Potential for a dramatic decline in land values from nearby gas production and transportation
  infrastructure is becoming a concern to landowners in Pennsylvania as insurers and mortgage lenders
  seek to avoid risks of damage.
- Absence of a consistent method in Lycoming County, or elsewhere in Pennsylvania, for finding
  out where and when natural gas infrastructure, be it a pipeline or compressor station, is going to
  be constructed in a specific location.
- Where gas gathering and water pipelines share a common ROW, no system of communication
  exists between pipeline construction, operations, maintenance, and emergency activities within
  that ROW. With each company building its own gas gathering and water pipeline systems risk is
  multiplied, with little apparent thought as to how to minimize safety risks and environmental
  impacts.
- Water pipelines that carry hazardous materials pose a threat to soil and water if ruptured.
- Pipelines that cut through contiguous forests are a threat to water quality as well as forest health
  and biodiversity, as their construction can cause soil erosion and fragmentation of the landscape
  and wildlife habitat.
- Invasive plant species in Pennsylvania, such as European buckthorn, multi-floral rose, privet,
  several Asian species of honeysuckle, burning bush, Japanese barberry, autumn olive,
  swallowwort, Oriental bittersweet, and garlic mustard are known threats to environmental stability
  when forests become fragmented.
In all cases, the construction of pipelines through wetlands, springs, and across waterways has the potential to cause serious threats to local fish, amphibian, and other wildlife populations, as well as to local hydrography.

**Recommendations for the Siting of Pipelines in Lycoming County:**

1. There should be more direct state and local government involvement in siting of larger diameter, higher-pressure Marcellus Shale gathering pipelines in Class One, rural areas of Pennsylvania like Lycoming County, especially near schools, hospitals, and other community centers. These gathering lines should be sited with the same precautions as are paid to federal interstate transmission pipelines.

2. The same local ordinance and zoning regulations provided by the Pennsylvania Constitution should remain enacted for natural gas pipelines at the local level and contain guidelines regarding best management practices for siting according to state and federal guidelines in order to protect the public, prevent environmental degradation, and reflect community or county-wide land-use planning.

3. A protocol for greater public involvement in Lycoming County and across Pennsylvania should be created to include the opportunity for public involvement and comment by all local stakeholders and citizens prior to the siting of Marcellus Shale gathering and intrastate transmission pipelines. Ideally, residents living in a municipality where new gathering or intrastate transmission pipelines are being planned should be notified before the planning and start date of construction of those lines. Stakeholders should be offered an opportunity to request the exact location(s) of the pipelines and emergency response plans before construction begins. Protocol should be reflective of the PA Municipalities Planning Code, the Pipelines and Informed Planning Alliance (PIPA) recommendations, and consistent with state and local regulations regarding public meetings.

4. Pipeline siting meetings should be arranged at convenient venues for everyone and there should be a mediation process to resolve conflicts.

5. Utility companies should be required to co-locate and simultaneously install their gas pipelines, water pipelines, power lines, and even wind and solar energy projects where appropriate and when possible. In examining environmental concerns related to Marcellus Shale gas development and pipeline siting in the Delaware River Watershed, Aaron M. Lien and William J. Manner have made this recommendation in their 2010 report, *The Marcellus Shale: Resources for Stakeholders in the Upper Delaware Watershed Region.* In this way, land can be
minimally disrupted as water lines, gas pipelines, and/or other conduits are placed in the same ROW simultaneously and then covered.

7. ROW agreements should specify that a tree canopy remain intact to the maximum extent practicable and that proper maintenance of vegetation according to local conservation best practices be required. This requirement would reduce forest fragmentation, soil erosion, and also offer protection from invasive species.

**Regulating Pipeline Safety in Pennsylvania**

In order to make suggestions for ensuring and improving the safety of pipelines in Lycoming County, this section summarizes the basics of pipeline safety regulations on both the federal and the state level as well as industry-created safety standards. In addition, looking at regulations from other parts of the country may disclose regulations that could work in Pennsylvania if passed and implemented.

**Federal Regulations, Oversight & Enforcement:** Except for gathering pipelines in rural areas, the [Natural Gas Pipeline Safety Act of 1968](https://www.dot.gov/pipeline-safety) gave the Department of Transportation (DOT) the authority to [regulate safety of gas pipeline facilities and operators of gas pipelines](https://www.dot.gov/pipeline-safety). Through the Natural Gas Pipeline Safety Act, the U.S. Congress sets the framework for safety through mandates to the [US Department of Transportation Pipeline Hazardous Materials Administration (PHMSA) Office of Pipeline Safety](https://www.phmsa.dot.gov). The DOT, through its Office of Pipeline Safety (OPS) establishes the minimum safety standards for interstate, and in some cases, intrastate transportation of natural gas by pipelines, as well as for the “pipeline facilities” used in these activities. The term “pipeline facilities” includes pipelines, rights-of-way, facilities, buildings, and equipment used in transporting gas or treating gas during its transportation. OPS’s Office of Inspection and Enforcement has the responsibility for carrying out inspections of interstate transmission pipelines and enforcing federal pipeline safety regulations. While the number of inspectors throughout the country may vary, [Congress authorized additional staff in the 2009-2010 budget to bring the total number of inspectors across the country to 113.](https://www.dot.gov/pipeline-safety) OPS relies heavily on inspectors at the state level; in Pennsylvania, the PUC is that agency. As of March 2011, the PA PUC had only 8 certified gas safety engineer inspectors.

For purposes of safety relative to the number of people in close proximity to a pipeline, [PHMSA assigned four (4) class designations for both gas and hazardous liquid pipelines (Table 1).](https://www.phmsa.dot.gov)
Pipelines are classified prior to construction and periodically reclassified based on changes in population and land use. Pipeline classifications mandate design criteria for pipelines for sufficient wall thickness and composition to withstand anticipated pressure and loads. The higher the area class, the thicker the wall of the pipes and the stronger the pipeline material must be. PHMSA only consistently regulates onshore natural gas gathering pipelines designated at Class 2, 3, or 4. PHMSA does not regulate most pipelines in Class 1, or rural areas with low population densities. Most gathering lines in Lycoming County are Class 1 and are therefore not regulated by PHMSA. A recent study by Pennsylvania Governor Corbett which provided recommendations in regard to Act 13 included this list of the top ten counties for density of Class 1 gathering lines. Lycoming County is ranked fifth for unregulated gathering lines.

<table>
<thead>
<tr>
<th>Top 10 Counties: Class 1 Unconventional Gathering Lines by County</th>
<th>Class 1 Unconventional Gathering Line Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indiana</td>
<td>351.5</td>
</tr>
<tr>
<td>Bradford</td>
<td>244.5</td>
</tr>
<tr>
<td>Susquehanna</td>
<td>160.1</td>
</tr>
<tr>
<td>Tioga</td>
<td>150.5</td>
</tr>
<tr>
<td><strong>Lycoming</strong></td>
<td><strong>128.1</strong></td>
</tr>
<tr>
<td>Washington</td>
<td>119.1</td>
</tr>
<tr>
<td>Greene</td>
<td>111.4</td>
</tr>
<tr>
<td>Westmoreland</td>
<td>90.4</td>
</tr>
<tr>
<td>Clearfield</td>
<td>79.3</td>
</tr>
<tr>
<td>Jefferson</td>
<td>62.7</td>
</tr>
</tbody>
</table>
PHMSA does regulate hazardous liquid gathering pipelines if they are located within incorporated and unincorporated cities, towns, and villages, if they cross a waterway currently used for commercial navigation, and if the rural areas are also within one-quarter mile of environmentally sensitive areas.

Table 1. PHMSA Class Designations for Gas and Hazardous Liquid Pipelines.

<table>
<thead>
<tr>
<th>Class Designation</th>
<th>Location Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>An offshore area or any location with 10 or fewer buildings intended for human occupancy within 220 yards of the centerline of the pipeline.</td>
</tr>
<tr>
<td>Class 2</td>
<td>Any location with more than 10 but fewer than 46 buildings intended for human occupancy within 220 yards of the centerline of the pipeline.</td>
</tr>
<tr>
<td>Class 3</td>
<td>Any location with more than 46 buildings intended for human occupancy within 220 yards of a pipeline, or an area where the pipeline lies within 100 yards of either a building or a small, well-defined outside area (such as a playground) that is occupied by 20 or more persons at least 5 days a week for 10 weeks in any 12-month period.</td>
</tr>
</tbody>
</table>

While PHMSA has primary safety jurisdiction over federally regulated pipelines, pipeline construction activities and operations are also subject to regulations under the U.S. Environmental Protection Agency, the Occupation Safety and Health Administration, the U.S. Army Corps of Engineers, as well as state public service or public utility commissions. US DOT’s siting, operation, maintenance, and decommissioning of interstate pipelines are all subject to environmental review and public comment under the National Environmental Policy Act (NEPA, P.L. 91-190 of 1969, as amended).

Since September 11, 2001, pipeline infrastructure and natural gas facilities have been of increased national security interest. The Department of Homeland Security (DHS) and Transportation Safety Administration (TSA) play a significant role in ensuring the security of the nation’s pipeline system. TSA oversees industry identification and protection of critical pipeline assets through security reviews, risk assessment and inspections. The disclosure of the location of natural gas transmission pipelines to the public is limited to state and county-level maps available from PHMSA’s Public Map Viewer. The public does not have access to information regarding the exact location of gathering or distribution pipelines, however federal, state, and
local (including fire department staff) government personnel and pipeline operators have access to more specific location data (i.e., the latitudes and longitudes of pipelines, distribution and gathering line locations) after registering and being approved by PHMSA, and obtaining a password. via PHMSA’s Pipeline Integrity Management Mapping Application

**State Regulations, Oversight and Enforcement:** Two Pennsylvania regulatory changes were made in 2011 and 2012 that directly impact state natural gas pipeline siting, safety and oversight. They have each influenced all aspects of this case study and therefore preface this section. The Gas and Hazardous Liquids Pipelines Act (also known as “the Pipeline Act” or Act 127) and Amendments to Title 59 (Oil and Gas) of the Pennsylvania Consolidated Statutes (also known as Act 13) were both implemented at the same time the surveys and research for this case study were taking place.

**Act 127**
The Gas and Hazardous Liquids Pipelines Act (also known as “the Pipeline Act” or Act 127) was signed by Governor Corbett on December 22, 2011. With the March 16, 2012 implementation of Act 127, the Pennsylvania Public Utility Commission (PUC) gained the authority to enforce federal pipeline safety laws as they relate to non-public utility gas and hazardous materials pipelines and facilities. The Act, however, created grey areas of overlap and gaps in reporting siting and safety, and regulatory authority. Since Class 1 gathering lines remain exempt from PHMSA authority they are exempt from PUC safety authority. The Act does provide that PUC establish and maintain a registry of the locations, miles and size of pipelines, pressures, and named operators of all gas pipelines in Pennsylvania. Class 1 gathering lines are to be included in registry of miles of pipeline. The Commission will recover the costs of this program by assessments on pipeline operators based on the total intrastate regulated transmission, regulated distribution and regulated onshore gathering pipeline miles in operation for the transportation of gas and hazardous liquids in Pennsylvania during the prior calendar year. Non-compliance by pipeline operators is subject to a retroactive $10,000/day fine. The registry does not give PA PUC siting authority over non-interstate lines, however the registry does provide the PA PUC with the power to track and maintain records of the location of intrastate pipelines. As an example, Class 1 pipelines are not subject to Part 192 safety authority yet operators are required to report all Class 1 locations and miles for PA PUC informational purposes as part of the Act 127 registry. Operators who are planning pipelines, but do not yet have pipelines constructed must register the location, size and pressure prior to construction and register zero miles until construction is in progress. Entities which are completely exempt from PHMSA jurisdiction are not required to register as pipeline operators, however the PA PUC is still seeking comment on the issue of registration of production and Class 1 pipelines which have distribution service such as farm taps. The PA PUC’s present understanding is that PHMSA considers farm taps as regulated distribution service regardless of their Class location.
**ACT 13**

The Act Amending Title 59 (Oil and Gas) of the Pennsylvania Consolidated Statutes (also known as Act 13) was signed by Governor Tom Corbett on February 14, 2012 and went into effect on April 14, 2012. The Act requires municipalities to allow oil, gas, and water pipelines in all zoning districts. It also implements a drilling impact fee to be paid on each unconventional horizontal and vertical gas well by county, with collection and disbursement of the funds from the fee to be managed by the PA PUC.

The most controversial element of Act 13 stripped away local zoning laws, eliminated the legal concept of a Home Rule Charter, limited private property rights, and in the process, disempowered municipal governments. This has direct implications for local planning regarding the siting of natural gas pipeline infrastructure. Before Act 13 was passed, Lycoming County had just updated its county-wide zoning ordinances in 2011 to address many aspects of oil and gas development, including requiring pipeline operators to obtain zoning permit approval for gathering pipelines that cross public roads or floodplains. In July 2012, Pennsylvania Commonwealth Court declared the municipal preemption provisions of Act 13 unconstitutional, null, void, and unenforceable and allowed an injunction on its implementation to remain in place while the case proceeded to the Pennsylvania Supreme Court. On October 17, 2012, the Supreme Court heard oral arguments regarding the Act’s constitutionality.

The PUC remains Pennsylvania’s state agency of regulations, oversight and enforcement in safety and continues to be responsible for oversight of reporting and recordkeeping kept by pipeline operators. PUC investigators may examine property, buildings, plants, and offices as well as books, records, mail, e-mail, and other relevant documents as needed to enforce the PUC rules and regulations. If a violation is found, the Gas Safety Division issues a written report delineating the results of the on-site evaluation and the specific regulations in apparent violation. The operator has 30 days in which to respond. If the Gas Safety Division and the operator cannot agree on how to resolve the violation, the matter is referred to the PUC. The issue is then resolved more formally by filing a complaint, setting a penalty, or seeking enforcement through the courts.

The PUC was created by the Pennsylvania Legislative Act of March 31, 1937 (and the Public Utility Law of May 28, 1937), which simultaneously abolished the former Public Service Commission; the Pennsylvania Railroad Commission. The PUC is an independent agency funded through federal allocations and assessments on utility companies under their jurisdiction. PUC regulates approximately 6,000 electric, natural gas, telecommunications, water/wastewater and transportation utilities. Its roles include balancing the needs of consumers and utilities, ensuring
safe and reliable service at reasonable rates, protecting the public interest, consumer education in order to make independent and informed choices, further economic development, and fostering new technologies and competitive markets in an environmentally sound manner. As of March 2011, the PA Public Utility Commission had eight (8) certified gas safety engineer inspectors and was seeking to obtain authorization from the legislature for twelve additional staff positions.\(^6\) This short fall of inspectors in growing demands on PUC initiated the request for and approval from state legislature for twelve additional staff positions.

Through certification by OPS/PHMSA, Pennsylvania regulates and inspects intrastate gas pipeline operators in the Commonwealth. The federal government pays the PUC to assume inspection and enforcement responsibility for the intrastate pipelines it has jurisdiction over based on Pennsylvania law. As an agent of OPS/PHMSA, PUC enforces the federal safety standards and may prescribe additional, non-conflicting ones. The areas of standards include the design, installation, operation, inspection, testing, construction, extension, replacement, and maintenance of the pipeline facilities. According to the Tentative Implementation Order for Act 127, the PUC is authorized to promulgate regulations necessary to carry out the enforcement of the Federal pipeline safety laws, provided that the regulations are no more stringent than or not inconsistent with applicable federal law or regulations. Through this legislative authority, the Gas Safety Division of the Bureau of Transportation and Safety within the PUC conducts these inspections and enforcement actions.

Another function of the PUC is to serve as mediator between utility consumers and utility operators. Pennsylvania citizens can attend regular PUC meetings, and mediation between utility operators and citizens is available through the PUC Office of Administrative Law Judge (OALJ). The PUC also offers a complaint system. Citizens can file an informal complaint, which is handled by the Bureau of Consumer Affairs, or they can file a formal complaint which is handled by the OALJ. Citizens are also invited to comment on proposed rules and regulations published in the Pennsylvania Bulletin.

The Pennsylvania Department of Environmental Protection (PADEP) provides statewide oversight of soil erosion and sedimentation control. Depending on the construction location and FERC requirements, Erosion and Sediment Control and Stormwater Management for Oil and Gas Exploration, Production, Processing, Treatment Operations or Transmission Facilities General Permit (ESCGP-1) permits from PADEP are required prior to pipeline construction. Initial plans indicating land and water resources disturbance and use of Best Management Practices (BMPs) are a preliminary requirement and these plans are amended as directed by PADEP. An internet-accessible PA DEP fact sheet outlines the process for complying with 25 Pa. Code Chapter 102 is available to the public. PA DEP is also responsible for the administration and enforcement of the Clean Streams Law (35 P.S. § 691.9 et seq.), primarily for construction in waters and wetlands in accordance with 25 Pa. Code Chapter 105. In cases where construction involves a Special Protection Watershed, additional safeguards are to be established as set forth in PA DEP’s Water Quality Anti-degradation Implementation Guidance. When a Corps of Engineers permit is needed pursuant to the Federal Clean Water Act (CWA), it cannot be issued prior to PA DEP approval of anticipated impacts on water quality per CWA Section 401.

**Local Government Regulations and Oversight:** As a Commonwealth, Pennsylvania land use planning is generally a function of county and municipal governments empowered by the Municipalities Planning Code to enact ordinances regulating the zoning of land uses and implementing a process for seeking approval prior to constructing new land developments. Under Pennsylvania law, every county and municipal government must also have an emergency management plan.

Municipal powers to regulate zoning and land development specific to oil and gas activities were impacted by the enactment of Act 13 of 2012, however this aspect of the law was overturned by Commonwealth Court as unconstitutional and is under Pennsylvania Supreme Court appeal by the Governor’s office, PADEP and PAPUC. Zoning authority in oil and gas activities will remain with the municipality through the appeal process.

Local government regulatory authority over pipeline, storage reservoirs, and other gas-related construction activities in floodplains is also under review with Act 127 court decisions pending. Requests for floodplain encroachments are currently subject to County Conservation District review for erosion and sediment control. Conservation Districts were established with the
passage of the 1945 Conservation District Law by Pennsylvania state legislators to support grassroots conservation efforts. Today Conservation Districts work as agents of Counties and the PA DEP. Districts implement programs, and provide assistance for a range of issues which include: Abandoned Mines, Agricultural Land Preservation, Dirt & Gravel Roads Program, Environmental Education, Erosion & Sedimentation Pollution Control, Floodplain and Forest Management, Nutrient Management Program, Stormwater Management, Waterway Protection and Wildlife Management. These programs often interconnect with pipeline construction and safety and extend public access to participation in pipeline siting and safety.

**Concerns Regarding the Federal, State, and Local Regulation of Pipeline Safety in Lycoming County and Pennsylvania:**

The main concern regarding regulation of pipelines associated with shale gas developments in Lycoming County and across Pennsylvania involves the lack of federal and state regulatory authority with regards to rural and low-population density geographic areas, and in some cases confusion over what those regulations mean. This is of primary concern because shale gas is being conveyed from wellhead to compressor stations and transmission pipelines through increased diameter pipes and at increased operating pressures. This leads to an array of other concerns at the local level regarding the proper regulation of natural gas pipeline safety in shale gas development areas such as Lycoming County, including:

- Inadequate setback distance requirements from wells and other activities (per Act 13 of 2012).
- Over time, some rural areas where Class 1 pipelines are currently being built will develop into areas where high consequences would result in the event of pipeline failure (see Table 1).
- Lack of local planning and coordination regarding the siting and construction of transmission pipelines and high-pressure gathering pipelines leaving extensive strips of land in rural Pennsylvania unsuitable for residential, commercial, or public uses in the future. This may also pose a safety hazard when new local land uses infringe upon unrecognized gathering line ROWs.
- Jurisdictional, regulatory and safety issues as well as confusion among the public and operators due to a lack of standardization of regulatory definitions.
Re-assessment of existing best management practices by PHMSA, and proposed regulatory changes to natural gas pipeline operations in both rural and urban areas are being given direct input by PUC for more stringent oversight requirements. Currently, reauthorization of federal pipeline regulations to include all gathering lines is in process, but they are unlikely to be implemented before January 2014. The 2012 Annual PA PUC Gas Safety Seminar involved discussions with PA PUC, PHMSA and the gas pipeline industry regarding the necessity of rule making to remove the diversity of definitions and classifications of pipelines, both statewide and nationally.

Recommendations Regarding the Regulation of Pipeline Safety:

1. Pennsylvania should strengthen regulations under Act 127 and authorize the PA PUC to regulate all natural gas pipelines for safety.

2. Lycoming County and all municipalities in the Commonwealth impacted by Marcellus and Utica Shale gas developments should promote the development of a regional interstate compact for siting interstate pipelines as first proposed in 2009 as PA House Bill 1817.

3. Ordinances and zoning regulations, where and when possible, should be enacted for natural gas pipelines at the local level that contain guidelines regarding best management practices in order to protect the public, prevent environmental degradation, and reflect community or county-wide land-use planning. Such local regulations should focus on requiring disclosure of all gathering pipelines regardless of class, making permanent records of their location, and enacting setback ordinances providing minimum distances between new land improvements and all gas pipelines, based on the size and operating pressure of each pipeline.

4. Land use planning near already constructed pipelines should have at least three major goals:
   
   I. Utilize PHMSA’s PIPA recommendations for communication between stakeholders in land use planning. Stakeholders as defined in PIPA include government officials, property owners, developers, pipeline operators and real estate commissions.

   II. Put in place practices, such as clear and accurate marking and signage of underground pipeline locations that protect pipelines from construction damage.

   III. Create local planning and building ordinances that protect citizens who come to live near pipelines long after their construction and may therefore be unaware of the existence or location of pipelines.

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7 Industry = gas producers and pipeline operators, both private and publicly held and operated
5. The federal Office of Pipeline Safety (OPS) should implement rulemaking to clarify the point where onshore-regulated gas gathering lines begin (49 CFR Part 192.8). That point should be defined to ensure there are no unregulated gas pipelines. In doing so, all Class 1 gathering lines (49 CFR Part 192.9) would be under full requirements of the Integrity Management program (49 CFR Part 192 Subpart O).

6. Pennsylvania legislators should utilize experience and work product of other governments and safety organizations to protect both citizens and pipelines. The Municipal Research and Services Center of Washington State has developed a website that covers these “planning near pipelines” issues and sample ordinances are provided by the Pipeline Safety Trust.

**Pipeline Safety Requirements during Construction**

**Design & Construction:** The construction of a pipeline and its installation are critically important in ensuring long-term integrity and safety. Various safety precautions pertain mainly to gas transmission lines and the few regulated gathering pipelines in Lycoming County. Most Lycoming County production and gathering lines are not required to follow these standards.

**Choosing a Pipe:** Pipe sections are fabricated in steel rolling mills and inspected to ensure they meet government and industry safety standards. Generally between 40 and 80 feet in length, they are designed specifically for their intended location, type of fuel being transported and MAOP requirement of the pipeline. A variety of soil conditions and geographic or population characteristics of the route will dictate different requirements for pipe size, strength, wall thickness and coating material. Not all pipe is steel. Some low pressure gathering, transmission and distribution pipelines use other materials such as other metals, and nonmetallic material, such as plastic or composites.

**Pipe Burial:** Mechanical wheel trenchers and backhoes are used to dig open trenches for underground pipeline installation. Rock drilling and blasting may be required to break rock in a controlled manner. The material that is excavated during trenching operations is temporarily stockpiled on the non-working side of the trench.
This material is used again in backfilling the trench. In some locations, such as river crossings, horizontal directional drilling (HDD) and boring techniques are used to place pipe underground without trenching.

Federal regulations require that transmission pipelines and regulated Type A gathering lines\(^8\) be buried at least 30” below the surface in rural areas and deeper (36”) in more populated areas. In addition, the pipeline must be buried deeper in locations such as road and railroad crossings (36”) and crossings of navigable bodies of water (48”). The depth may be shallower in other locations, such as when the pipe is installed in consolidated rock (18” to 24”). The depth of burial must be according to these regulations at the time of burial, but there are no federal nor state requirements this depth be maintained over time. Erosion may expose pipelines not subject to frequent inspection and maintenance.

**Welding Steel Pipelines:** Pipe sections are temporarily supported along the edge of a trench, aligned and welded together into one continuous length using manual, semiautomatic, or automatic welding procedures. As part of the quality-assurance process, each welder must pass qualification tests to work on a particular pipeline job.

\(^8\) Type A Gathering Lines are defined in 49 CFR Part 192 (Final Rule March 2006) as “metallic lines with a maximum allowable operating pressure (MAOP) of 20\% or more of specified minimum yield strength (SMYS), as well as nonmetallic lines with an MAOP of more than 125 psig, in a Class 2, 3, or 4 location.”
Each weld procedure and welds are evaluated by placing the welded material in a machine and measuring the force required to pull the weld apart. A proper weld is stronger than the pipe itself. A second level of quality assurance is used for high stress pipelines over 6” in diameter. None of these procedures are required for gathering lines, unless the construction operator chooses to utilize them.

**Coatings:** Several types of coatings are used to coat pipes at the factory. The most common coatings today are fusion bond epoxy or polyethylene heat-shrink sleeves. After additional field coating and before the pipe is lowered into the trench, the entire coating of the pipe is inspected to ensure that it is free from defects. Typically there is no corrosion protection coating used on gathering lines.

**Lowering and Backfilling:** Once the pipeline is welded and coated, it is lowered into the trench. Lowering is done with multiple pieces of specialized construction equipment called side-booms. This equipment acts in tandem to lift and lower segments of the assembled pipeline into the trench in a smooth and uniform manner to prevent damaging the pipe. Once the pipeline has been lowered into the ground, the trench is backfilled with either a backhoe or padding machine depending on the soil. As the backfill operations begin, the excavated material can be returned to the trench in reverse order, with the subsoil put back first, followed by the topsoil. Thus the topsoil can be returned to its original position.

**Valves and Valve Replacements:** A valve is a mechanical device installed in a pipeline to control the flow of gas. Some valves are operated manually, others are operated remotely from a control room, and still others are designed to operate automatically. If a pipeline should fail, the speed in closing valves and the distance between the valves are major factors that determine how much gas is released. Many types of gas-related equipment have valves, and many valves are a source of gas leaks to the atmosphere. New and replacement residential service lines are being equipped with automatic shutoff valves.
that respond when excess flows are sensed, thereby preventing the buildup of gas in homes when service lines experience damage.

**Operating Pressures:** Maximum allowable operating pressure (MAOP) is the maximum internal pressure at which a natural gas pipeline or pipeline segment may be continuously operated. MAOP is set at levels meant to ensure safety by requiring that pressure does not cause undue stress on the pipeline. How this pressure is determined is defined in federal regulations and is based on a number of different factors such as the location of the pipeline, pipe wall thickness and previous pressure tests. Operating pressures in Pennsylvania shale gas gathering lines overlap with those in major transmission lines and tend to be far higher than in gathering lines serving conventional gas wells.

**Hydrostatic and In-Line Testing:** Newly constructed natural gas transmission pipelines generally must be hydrostatically tested before they can be placed into service. The purpose of a hydrostatic pressure test is to expose any defect that might threaten the pipeline's ability to sustain its MAOP with an additional safety margin. Hydrostatic pressure testing consists of filling the pipeline with water and raising the internal pressure to a specified level above the intended operating pressure. Critical defects that cannot withstand the pressure will fail. Upon detection of such failures, the defects are repaired or the affected section of the pipeline is replaced and the test resumed until the pipeline "passes." Although hydrostatic testing is not the only means for detecting pipe defects before a pipeline is filled with natural gas it is the most common.

**Concerns Regarding Construction of Pipelines in Lycoming County and Pennsylvania**

In 2009 the OPS held a workshop to discuss numerous problems found during 35 inspections of new, federally regulated transmission pipelines under construction. The pipeline inspectors recorded
significant problems with the pipe coating, pipe type, welding, excavation methods, pressure
testing, design, and other aspects related to construction. These OPS findings called into
question the current system of inspections for the construction of new interstate pipelines.
Because inspection is the first line of defense in the safety and critical for the ongoing safety of
pipelines for many years to come, it is of concern that:

- Gathering lines in Pennsylvania are not subject to any federal standards.
- Erosion and flood frequency and severity are increasing globally and in Pennsylvania.
- Damage to pipelines and other gas industry facilities in floodplains can be expected to
  increase.
- For high stress pipelines over 6” in diameter, a second level of quality assurance is used
to evaluate the ongoing welding operation. But, that none of these procedures are
required for gathering lines in Pennsylvania despite data supported by PUC that
Marcellus Shale gathering lines range from 12” - 42” with correlating MAOP up to 1480
psig. These larger diameter and higher MAOP gathering lines exist now in Lycoming
County

**Recommendations Regarding Pipeline Construction:**

1. Develop and enforce standardized regulations on the design and construction of all natural gas
   related pipelines regardless of location or contents.
2. Standardize the use of State Best Practices in pipeline design and construction as is required
   by all other construction activities.
3. Establish and implement costly penalties that encourage compliance with safety and
   environmental regulations, and levy fines that are consistent with the nature of the violation.

**Pipeline Safety Requirements during Operation**

Safe operation of natural gas production, gathering, transmission, and distribution pipelines is
ultimately the responsibility of pipeline operators. Operator safe-guards primarily involve
protection of pipelines from corrosion, electronic and visual surveillance of pipelines and ROWs,
integrity management planning, and placement of odorizers in distribution lines. However,
federal, state, and local governments do have an important role to play in enforcing regulations
and conducting periodic inspections.
Corrosion Protection: Unprotected steel pipelines are susceptible to corrosion, a weakening of the pipeline and an increased risk of harm to public safety. Three common methods are used to control corrosion on pipelines:

Cathodic protection (CP): Application of a direct electrical current to counteract the normal external corrosion of a metal pipeline. CP is used where all or part of a pipeline is buried underground or submerged in water.

Pipeline coatings and linings: Principal tools used for defending against corrosion by protecting the bare steel.

Corrosion inhibitors: Substances added to pipeline contents to slow the rate of internal corrosion.

Supervisory Control and Data Acquisition System (SCADA): SCADA is a computer system designed to gather pipeline information such as flow rate, operational status, pressure, and temperature readings. This information allows pipeline operators to monitor the pipeline and provide quicker reactions for normal operations and equipment malfunctions or gas releases. Some SCADA systems also incorporate the ability to operate compressor stations and valves remotely, allowing operators in a control center to adjust flow rates in the pipeline as well as to isolate certain sections of a pipeline. Many SCADA systems include leak detection systems based on pressure and mass balance in pipelines.

Right-of-Way Patrols: Federal regulations require patrols of pipeline ROWs to check for indications of leaks and ensure that no excavation activities are taking place on or near the ROW that may compromise pipeline safety. These patrols are often accomplished by aerial patrols and/or on ground by foot or vehicle.

Leak Surveys: Federal regulations require regular leak surveys for all regulated interstate gas pipelines. Leak detection device technology varies with operator. Inspection personnel walk, drive or fly over the ROW to determine if gas is leaking and if so to quantify the leak for monitoring and repair. Small leaks are considered a normal part of most gas pipeline systems. Following spectacular environmental damage by leaks from oil transmission pipelines in Utah and Michigan, Congress directed the OPS to report on ways to improve timely leak detection. That report is due in 2013.

Odorization: Natural gas is odorless. Therefore, all distribution pipelines, and some transmission and gathering lines in highly populated areas, are required by Pennsylvania and
federal law to be odorized with mercaptan; producing a rotten egg odor globally associated with a gas leak. Gathering lines in Class 1 areas of Pennsylvania are not required to be odorized.

**Integrity Management and “Smart Pig” Technology:** Integrity Management refers to federal rules that specify how pipeline operators must identify, prioritize, assess, evaluate, repair, and validate the integrity of their pipelines. Integrity Management applies to both gas transmission (since 2004) and distribution (since 2011) pipelines. Gathering lines remain exempt from these requirements. For gas transmission pipelines integrity management requires lines that could affect HCAs be re-inspected by their operators once every 7 years.

This inspection is primarily achieved with internal inspection devices called “smart pigs.” The smart pig device is inserted into apparatus in the pipeline ROW called Pig Launchers. Once inside the pipeline, the pig travels through the pipeline measuring the thickness of the pipe and identifying corrosion and other flaws which could produce leaks and ruptures. After inspection, the smart pig is removed from the pipeline and sent to the next pipeline for its inspection. Once a pipeline is “pigged”, or inspected, operators are responsible for responding to anomalies found on their pipelines in order to ensure pipeline integrity and safety. In the first 5 years of the Integrity Management Program nearly 3,000 repairs were required to be made to natural gas transmission pipelines that fall within HCAs.

**According to testimony provided to the House Republican Policy Committee Hearing on Pipeline Safety by Paul Metro, PUC Chief of Gas Safety,** his staff of 8 inspectors performs approximately 32 different types of inspections on regulated public utilities under PA PUC jurisdiction, inspecting 35 natural gas distribution facilities, 4 LNG facilities and 11 intrastate transmission lines across the Commonwealth. PUC inspects approximately 40,000 miles of pipeline serving approximately 3.5 million natural gas customers in the Commonwealth. The 2012 authorization of twelve additional inspectors and the reporting requirements of Act 127
have been proactive initiatives by PUC in preparation for the substantial increase anticipated in pipeline related activities as Marcellus and Utica Shales develop.

**Concerns Regarding the Safety of Pipeline Operations in Lycoming County and Pennsylvania:**
An immediate concern with regards to the safety of pipeline operations across Pennsylvania is the confluence of aging and new shale gas pipeline infrastructure in the Commonwealth with limited personnel and financial resources to adequately monitor the safety of their operation. For example, a PUC staff of 8 safety inspectors, increasing by 12 additional inspectors, is insufficient to cover the entire state. Another immediate public safety concern regarding the operations of pipelines in Lycoming County is the absence of odorant requirements in Class 1 gathering lines. The expansion of large diameter, high MAOP gathering pipelines around Williamsport and other more suburban areas of the county near homes, schools, and other places where people gather creates operational safety concerns that need to be addressed.

Of more long-term concern is the environmental safety of pipeline operations. This includes methane leakage from pipelines and other equipment used to process and store the natural gas from shale as well as operational failures that can result in local soil and water contamination. Although not as visible as soil and water contamination, the PUC reports that several tons of gas is either flared off or released to the atmosphere when pipelines are repaired and that PA DEP has developed a work plan for reduction of Lost and Unaccounted (L&U) natural gas as part of their greenhouse gas emission reduction efforts. The L&U natural gas is the difference between the total gas available from all sources and the total gas accounted for from sales, net interchange, and company use. One concern regarding operations of Marcellus shale pipelines in Lycoming County is methane leakage as L&U. These methane gas leaks from pipeline infrastructure reduce the amount of gas going to market and contributes to greenhouse gas emissions, which is of both local and global concern.

**Recommendations Regarding the Safety of Pipeline Operations in Lycoming County and Pennsylvania:**
1. Federal regulations on the safe operation of natural gas pipelines should encompass the entire transmission system, including all gathering lines. Standard location data with current and
comprehensive maps should be made publicly accessible and include information in on-going inspection, One-Call coverage, odorization, and emergency or hazard response contingencies.

2. Better enforcement of regulations for all natural gas pipelines that demonstrate standardization, best practices, costly penalties that encourage compliance, and fines consistent with the nature of the violation.

3. OPS should undertake a study to determine the benefits and risks of odorizing gathering lines, at least in densely populated areas. That study should at a minimum address the concern of proper injection of odorant at multiple well sites, how and at what concentrations heavier than air gas components may change the need for odorants, and the apparent disconnect between the requirements for odorant in Class One gathering lines in populated areas and the various exemptions to those requirements, particularly related to gathering lines transporting gas in rural areas.

4. To guarantee that regulations are being implemented, Pennsylvania pipeline inspections and enforcement activities need to be closely examined. This includes increasing the number of certified gas safety inspectors across the Commonwealth and the number of investigations. Ideally, there would be at least one inspector for each county where Marcellus Shale gas development is currently underway. This also means implementing standardized and comprehensive inspection standards for all natural gas pipelines throughout Lycoming County and Pennsylvania, including making sure that inspectors are continually updated in their training and employ best practices including on-site evaluations, objective information to verify self-reporting, and have the knowledge to gather accurate data from sophisticated technological devices.

5. Pennsylvania’s gas pipeline safety inspectors and other enforcement personnel should actively partner and establish on-going communications with local agencies, such as emergency response teams and county conservation districts, in Lycoming County and other counties where Marcellus and Utica Shale developments are occurring. 6. Pennsylvania should require operators to install methane capture devices on all production pipelines and institute a program of regular emissions monitoring along gathering and transmission pipelines to reduce L&U. Incentives via the EPA’s Natural Gas STAR Program should be used to require the installation of methane emission capture devices on production and gathering lines. On-going emissions monitoring
should be done as part of a joint Commonwealth-University program related to reducing Pennsylvania’s global carbon emissions.

**Pipeline Hazards & Risk Analysis:**

Risk is made up of two factors. The first is the probability that an event will occur (the chance a pipeline will rupture or leak). The second is the magnitude of possible consequences if it does. As previously discussed, various measures are required of operators to keep their pipelines safe and reduce the probability of a catastrophic event.

Historic data is used in efforts to prevent repeating trends. PHMSA produced data “Significant Incident Cause Breakdown” provides statistics on the causes of significant pipeline incidents by type of line for the years 1992-2011 data. (Source: PHMSA).

![Diagram of Serious Incident Cause Breakdown](image)

These statistics indicate which incidents were within the control of pipeline operators and which were caused by external forces, such as excavation damage. Excavation damage incidents continue to be the greatest cause of pipeline incidents nationally and for all pipeline systems.

The PHMSA table below summarizes Pennsylvania significant incidents 2002 - November 2012

<table>
<thead>
<tr>
<th>Type of Pipeline</th>
<th>Pipeline Miles</th>
<th>Significant Incidents</th>
<th>Fatalities</th>
<th>Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas distribution lines</td>
<td>47,290†</td>
<td>59</td>
<td>16</td>
<td>34</td>
<td>$15,361,504</td>
</tr>
<tr>
<td>Gas transmission lines</td>
<td>9,960</td>
<td>23</td>
<td>0</td>
<td>3</td>
<td>$9,137,713</td>
</tr>
<tr>
<td>Gas gathering lines</td>
<td>324</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hazardous liquids</td>
<td>2,763</td>
<td>27</td>
<td>0</td>
<td>1</td>
<td>$39,188,843</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>60,338†</td>
<td>109</td>
<td>16</td>
<td>38</td>
<td>$63,688,060</td>
</tr>
</tbody>
</table>

†Does not include small retail service lines.
In 2000 the Gas Research Institute contracted with C-FER Technologies to produce *A Model for Sizing High Consequence Areas Associated with Natural Gas Pipelines*. That model has become instrumental in helping define potential impact zones around natural gas pipelines. The model is complex, but the basic idea is that by considering the diameter of the pipeline and the operating pressure, it is possible to predict the impact area around the pipeline that could lead to human fatalities in the event of a catastrophic failure.

The PIR model does not take into account the length of time needed to close a pipeline’s valves and the remaining gas in the pipe is released. During that time a failed pipeline can continue to act as a giant blowtorch igniting nearby structures. The resulting fire can encompass an area much larger than described by the PIR. It is important to consider that the model may underestimate the size of impact areas for larger diameter pipelines at higher pressures. Pipelines, however, are not always operated at maximum allowable pressure. Thus such models must be applied carefully when adopted into local zoning ordinances. Setbacks based on pipeline diameter and MAOP are the most practical means of protecting the public from catastrophic pipeline failures, especially in rural areas. The [most significant pipeline incident investigations are conducted and reported by the National Transportation Safety Board](https://www.ntsb.gov). In May 2012, PHMSA increased operator reporting requirements for incidents. Additionally the PHMSA [PIPA](https://www.phmsa.dot.gov) recommendations seek to aide in creating safe setbacks through Industry and municipality cooperative land use planning.
Data available from significant damage incidents at federally regulated pipelines during the past decade in Pennsylvania, other states, and nationwide are summarized in the following chart.

### SIGNIFICANT INCIDENTS: ALL PIPELINES 2001 - 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Fatalities</th>
<th>Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>233</td>
<td>7</td>
<td>61</td>
</tr>
<tr>
<td>2002</td>
<td>258</td>
<td>12</td>
<td>49</td>
</tr>
<tr>
<td>2003</td>
<td>298</td>
<td>12</td>
<td>71</td>
</tr>
<tr>
<td>2004</td>
<td>312</td>
<td>23</td>
<td>56</td>
</tr>
<tr>
<td>2005</td>
<td>338</td>
<td>13</td>
<td>47</td>
</tr>
<tr>
<td>2006</td>
<td>256</td>
<td>19</td>
<td>34</td>
</tr>
<tr>
<td>2007</td>
<td>269</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>2008</td>
<td>279</td>
<td>9</td>
<td>58</td>
</tr>
<tr>
<td>2009</td>
<td>271</td>
<td>13</td>
<td>65</td>
</tr>
<tr>
<td>2010</td>
<td>256</td>
<td>22</td>
<td>107</td>
</tr>
</tbody>
</table>

Significant incidents are those where there is death, an injury requiring hospitalization, property damage of $50,000 or more, liquid releases where there is an unintentional fire or explosion, or a liquid release of >5 barrels of highly volatile liquid, or >50 barrels of other liquids.

**Damage Prevention Programs:**

**One Call:** As we have reported, the leading cause of pipeline incidents in the United States is damage to pipelines from excavation activities; whether as simple as putting in backyard fence posts or as complex as new construction of buildings. In fact, for the past 10 years excavation has been the main cause of deaths and injuries when all types of pipelines are considered together in the United States. For this reason programs designed to decrease excavation damage to pipelines are extremely important to the safety of people and the environment.

The Pipeline Safety Act of 2006 mandated that excavators and contractors who hit a pipeline, whether or not a gas leak or rupture occurs, immediately call 911. It further required that all owners or operators of pipeline facilities be subject to a civil action or assessment of a $1 million penalty should they fail to respond to a location request via a one-call center to accurately mark the location of a pipeline facility. The legislation further created the One-Call System.

**Pennsylvania One Call** “811 Call Before You Dig.”is the Commonwealth’s system. These federally mandated, non-profit centers serve as informational clearinghouses organized and
governed at the state level. They are funded by operators of underground facilities including power lines, water and sewer pipes, telephone services, and oil and gas pipelines. The One-Call System works as follows:

1. The “digger” calls 8-1-1 three business days prior to beginning the excavation project and provides the location of the activity.
2. The One Call center notifies facility operators in the area who mark the site with designated colored flags or spray paint designating lines and pipes.
3. The excavator uses the markings to avoid damaging systems and the project is safely completed.

Pennsylvania law requires the location of utilities be marked at least 48 working hours before excavation commences. Gathering pipelines and some intrastate pipelines unregulated by the PUC are presently not included in the PA One-Call System. Farming operations disturbing less than 18 inches of soil are not required to make a One Call.

**Damage Prevention Best Practices:** In 2000 a national organization, Common Ground Alliance (CGA) was launched in an effort to reduce damages to all underground facilities in North America through shared responsibility among all stakeholders. In promoting a spirit of shared responsibility, the CGA promotes participation by all stakeholders in the identification and promotion of best practices that lead to a reduction in damage. “Best practices,” endorsed by the CGA come with consensus support from experts representing the following stakeholder groups: excavators, locators, road builders, electric, telecommunications, oil, gas distribution, gas transmission, railroad, one-call centers, public works, equipment manufacturing, state regulators, insurers, emergency services, and engineering/design. CGA has taken the lead nationally in developing best practices to reduce damage to underground utilities, including pipelines. The latest edition is on line at: [Damage Prevention is Good Business](#)

In 2003, the American Petroleum Institute developed a series of recommended practices for pipeline operators to use to help ensure the effectiveness of these public awareness efforts. In 2005 these recommended practices were incorporated by reference into the federal pipeline safety regulations, as [API-RP 1162](#) and are now require public awareness programs to be

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9 These federal pipeline safety regulations are found in 49 CFR 192.616 and 49 CFR 195.440.
provided by the Industry to four stakeholder audiences: the affected public, emergency officials, local public officials, and excavators.

**Excavation Damage Reporting and Enforcement:** The statistics on pipeline damage and enforcement by the PA PUC have not been routinely published. As part of Act 127, revised requirements for annual reporting of pipeline damage and enforcement will extended beyond federal government requirements in HCAs.

**Concerns Regarding Prevention of Pipeline Damage:**
Ensuring all pipelines are appropriately and correctly marked above ground is a continuing concern with regards to excavation damage. As commented by Pipeline Safety Trust in response to incorporation of API PR 1162 into 49 CFR Section 192.616 and 49 CRF Section 195.440: ‘‘The basic goal of RP 1162 is to ‘enhance public environmental and safety property protection through increased public awareness and knowledge.’ Yet nowhere in the RP is any information provided that supports the premise that greater awareness and knowledge makes things safer. To the contrary, many recent studies in behavior change have shown that increased knowledge and awareness of information does little to actually change behaviors. If the actual goal is to really enhance public safety and reduce environmental and private property damage, then the goal should be to change behaviors that will actually lead to safer conditions. Since the basic premise of the RP is flawed, much of the emphasis on producing awareness materials and measuring the distribution of those materials and the associated change in knowledge is meaningless."

**Recommendations Regarding the Prevention of Pipeline Damage:**
1. Pennsylvania should strengthen Act 127 and the powers of the PA PUC to ensure that standard location data also includes information on on-going inspections, violations, One-Call coverage, odorization, and emergency or hazard response contingencies.
2. Lycoming County emergency personnel and planning staff should be provided with information on the location of all natural gas pipelines in order to enhance emergency response and ensure that community growth planning accounts for the location of gas pipelines.
3. As recommended by PST, the basic goal of the RP needs to be changed to: “The overall goal of the pipeline operator’s Public Awareness Program is to produce programs that lead to enlightened behavior changes in the target audiences that increase public safety and reduce environmental and private property damage.”
Ensuring the Safety of Lycoming County’s Natural Gas Pipeline Infrastructure:

Terry Wild Stock Photography, Williamsport, PA 17701
Assessing public knowledge and awareness of pipeline hazards and risks was implicit. Equally, if not more urgent in safety assessment was understanding the awareness of and preparedness and training of emergency responders in Lycoming County. This case study in Lycoming County asked three specific questions related to public knowledge and awareness around pipeline safety:

1. What does the public know about pipeline safety?

2. In what ways does the public elevate pipeline risks as a result of agricultural practices, hunting and fishing behaviors, and typical construction and excavation procedures?

3. Are emergency responders prepared to address pipeline risks in ways that alleviate potential danger or exacerbate negative consequences?

The relative absence of gas pipelines in the County has resulted in low to absent public awareness of the significant risks that pipeline siting and/or a pipeline failure could pose to the area’s residents and its unusually sensitive environment. In spite of the existence of two interstate pipelines in Lycoming County and the construction of new pipeline infrastructure to service the Marcellus Shale gas wells being drilled throughout the County, a 2010 Pennsylvania Emergency Management Agency contracted study, Lycoming County 2010 Hazard Mitigation Plan, made no mention of the risks associated with natural gas pipelines. The primary overall concern of the County’s planners and residents in this 2010 Plan was flooding, and the primary concern related to Marcellus Shale natural gas development involved accidents at gas well sites and the transportation of hazardous materials related to development activities on the roads and highways within Lycoming County. With the advent of the development of Marcellus Shale, increasing public education and awareness of pipeline safety is imperative.

Two surveys, one of the general public and one of emergency responders and planners, were conducted to answer these questions and gauge the overall level of knowledge and awareness regarding pipeline safety throughout the County. Prior to surveying the public and emergency responders, we were aware that there were deep divides among citizens when the topic relates to Marcellus shale gas developments, and in this case, pipelines relating to oil and gas extractions. This divide was echoed as we talked to and surveyed both audiences. While citizens and emergency responders would answer questions and share their thoughts, the majority of the
respondents preferred to be anonymous, keeping their responses private and off the record. For those who did not remain anonymous a post-evaluation interview was conducted via phone and e-mail to discuss the results of the survey and solicit feedback on specific types of public education and awareness activities that might be most valuable in the County.

**2012 Survey of General Public in Lycoming County**

In order to gauge the awareness levels and knowledge of the general public regarding natural gas pipelines in Lycoming County a survey of the general public’s awareness and knowledge of natural gas pipeline safety was conducted. The information collected was used to identify gaps in what citizens understand in relation to living safely with pipelines in the community. The purpose of the public survey was to focus future education and awareness efforts in the County concerning natural gas pipelines.

**Methods**

Several avenues were used to survey the general public of Lycoming County. First, a survey was created in an on-line format as well as a print format. The survey consisted of ten sets of questions, ranging from demographics to pipelines in the community, and from excavating protocols to pipeline incident protocols.

The survey was then distributed through a variety of avenues. We set up a booth at a local farmers’ market and asked vendors and shoppers to fill out our survey. We also canvassed Lycoming County over a two-day period, driving from the more populated centers of Williamsport, Muncy and Jersey Shore to the less populated areas of Glen Mawr, Kellysburg, Cogan House, and Ralston. During the two-day canvassing period, surveys were handed out at hospitals, grocery stores, libraries, and retail establishments in general.

Approximately seven hundred print surveys were handed out in-person as were one-thousand business cards, containing the on-line survey link. The survey was also shared via email to over 1,000 recipients. Besides filling out the survey on-line, recipients could also complete their survey and return it via mail, email, or fax. All avenues were used for returning surveys.
Findings of the General Public Survey

Of the 2,700 surveys distributed, 100 were completed and returned, resulting in an overall response rate of 3.7%. Overall, we achieved the best return rate for surveys that were delivered in-person (67% of completed surveys). That said, we also saw some success from virtual delivery, reaching audiences that we otherwise would not have (33% of completed surveys). We received surveys from the following areas of Lycoming County: Rose Valley, Trout Run, Montgomery, Williamsport, Cogan Station, Montoursville, Muncy, Pennsdale, Balls Mills, Bella Vista, Loyalsock, and Clarkstown. Respondents to the general public survey were from the following industries: food service, natural resource extraction (drilling mechanic), custom molding, finance and investment, banking, childcare, custom coating, higher education, education administration, web support, construction, and adoption services.

Half of the public respondents reported that they had not heard about pipeline safety in the past twelve months. And, almost a third of the public survey respondents gave the natural gas industry a “1” (very low) on how satisfied they are that local pipeline operators are doing a good job at informing people about pipeline safety. 51% of the general public survey respondents acknowledged that they were unaware of what waterways had pipelines crossing them. 38% of respondents did not know all the signs of pipeline problems to be aware of.

Concerns and Recommendations from the General Public Survey

From these survey findings, we can conclude that the general public would like to hear more often from the pipeline operators about their activities. Pipeline operators should share more information with the public on what the company is doing to keep citizens safe, as well as what the public can do to help keep their own communities safe. The planned location of pipelines is another area where pipeline operators need to share more information with the public. If citizens knew where the pipelines were and the “trouble” signs to be aware of, there would be more people to watch, hear, or smell for incidents relating to natural gas.

“Who to call” is also another area that should be addressed with future public awareness initiatives. The results of the survey showed a lack of overall knowledge for both the Pennsylvania One-Call System as well as who to contact if there is a natural gas incident.
Although it appears that most residents of Lycoming County are unaware of how they can play a more active role in State oversight of the natural gas pipelines in their county, there are avenues through which the public can participate in the regulation and oversight, as well as emergency planning, around natural gas pipelines. Through the Pennsylvania Emergency Management Agency (PEMA) and the Pennsylvania Emergency Management Council (PEMC), citizens may potentially participate in a Local Emergency Planning Committee (LEPC), dependent on how the LEPC is organized. LEPC members are appointed by the PEMC from a list of nominees submitted by the governing body of the county. PEMC membership includes the governor, the lieutenant governor, the secretaries of the various state departments with emergency response and recovery capabilities, the leadership of the General Assembly, and representatives of county and municipal government associations, labor, business and industry, and the private sector.

In addition, it is important for the general public to understand how federal laws are implemented. In order for a law (that is passed by Congress and signed by the President) to become enforceable it must have an implementing agency (DOT/PHMSA, DHS/TSA, EPA, etc.) propose and finalize regulations and publish them in the Code of Federal Regulations (CFR). During the time before regulations are created or revised for any given law, there is a period where the public can provide comments on the regulations before they are finalized. This is a critical time when private citizens have a chance to comment to the federal government on their concerns and knowledge regarding the proposed regulations. The exceptions to public comment periods are presidential mandates such as Executive Orders that go into effect immediately. When Executive Orders are made, no public comment period is held.

**2012 Survey of Emergency Responders in Lycoming County**

As part of developing a natural gas pipeline safety public awareness initiative in Lycoming County a survey was also conducted among emergency responders. The information collected from this survey was used to identify gaps in how emergency responders are engaged in pipeline safety. Likewise, the surveys’ results will help to focus future education and awareness efforts in the County concerning natural gas pipelines.

**Methods**

The Emergency Responder Survey was only available in print, and could be returned by mail, email, or fax. Initial distribution of the survey was attempted through the Lycoming County Department of Public Safety. However, calls and emails to the leadership of the Lycoming
County Department of Public Safety went unanswered. The next attempt at distributing the survey was to connect with fire department leadership in-person, and in early July, over a two day period, we were able to connect with fire department leadership in Jersey Shore, Montgomery, Picture Rocks, and Muncy. With most Lycoming County fire responders being volunteers, they also often have a job and respond to fire calls as necessary. Therefore, we only were able to connect with one of the more rural fire departments and that was Picture Rocks. When possible, we left information and surveys at the Fire Departments that did not have anyone present. All of the fire departments were receptive to answering questions about their pipeline experience, but at the same time, they were also reluctant to provide official responses on paper. We assured them that they could respond to the survey anonymously if they were more comfortable. Two of the contacts we spoke with were Fire Chiefs, and the other two were key department personnel. After more research on who coordinates emergency responses at the county level, we were able to connect with an administrator for Lycoming County. She connected with leadership and the PEMA Training Coordinator agreed to distribute the survey by email to all the emergency responders across the county. We also connected with an Emergency Preparedness Coordinator for a major health system in Lycoming County. This contact also distributed the survey by email to some key emergency responders.

Findings of the Emergency Responder Survey

Nine completed emergency responder surveys were received, with five of the responders wishing to remain anonymous. These surveys came from emergency responders serving the following areas in Lycoming County: Montoursville, Lairdsville, Trout Run, Muncy, and Pennsdale.

56% of the emergency responders who participated in the survey reported that they would like more communication with the pipeline operators. In addition, only 56% of the emergency responders reported that their organization disseminated One-Call System information to the public. And, in interviews and follow-up conversations with the leadership from County fire departments, who to call before you dig awareness campaigns were identified as immediate and urgent needs for current, and future emergency preparedness plans.
Only one of the emergency personnel who responded to the survey believed that their organization was ready to deal with a significant pipeline incident. One respondent that was familiar with a pipeline incident, and said that his organization had a Standard Operating Procedure or Response Plan, still did not believe his organization was ready for a significant natural gas pipeline emergency and recommended more localized training.

Likewise, only three respondents reported being aware of having a Standard Operating Procedure written down in regards to natural gas pipeline incidents. Finally, Emergency Responders also reported that they felt there were some deficiencies in responding to natural gas pipeline incidents. The biggest deficiency reported was with equipment and manpower, while the next areas that should be addressed are natural gas incident planning and training, as well as communicating more with the pipeline operators. Finally, some respondents would like to be more knowledgeable on petroleum and gas transmission and distribution systems and about the characteristics of natural gas and petroleum. All of the emergency responders surveyed would like to see more information on natural gas pipeline markers beyond the pipeline owner and contact number.

**Concerns and Recommendations from the Emergency Responder Survey**

All emergency responders surveyed expressed a concern that pipeline operators do not share more information with the public and emergency responders on what the company is doing to keep citizens safe. They all emphasized that working together with industry and the public makes a safer community for all.

According to the survey’s findings, fire departments and other emergency responders need to increase their distribution of One-Call System information. There was a concern among emergency responders that responded to the survey that call before you dig campaigns were not well known and needed more advertising. Related to this, emergency responders expressed concern that pipeline markers should include information about the type of substance being transported in the pipe, the operating pressure, diameter, and other important information.
The lack of knowledge regarding Standard Operating Procedures for responding to natural gas pipeline incidents among some of the emergency responders surveyed is of concern. This is an area that should be addressed immediately. And, as one follow-up interviewee mentioned, training should include understanding the differences between a fire emergency and a natural gas emergency, as well as how to respond, who to call and appropriate emergency communication protocols for handling a natural gas pipeline incident.

More training specific to pipeline hazards and incident response should be a priority for all emergency responders and planning personnel in Lycoming County.

**The Role of Transparency and Communication in Ensuring Pipeline Safety**

If you have made it this far in this report then you have taken an important step to help ensure that pipelines in Lycoming County will be as safe as possible by educating yourself about how they work, who’s in charge, and what needs to be done to ensure the public’s safety is being looked after. Pipeline safety is like a three-legged stool with the industry, regulators, and public each serving as one leg of the stool and each playing a crucial role. If any leg of the stool falters, pipeline safety is at risk.

The natural gas industry uses its vast resources and expertise to install, operate and maintain safe pipelines. The regulators verify through inspections and data collection that the minimum safety regulations are appropriate and are being met, and where authorized, they use enforcement authority to ensure compliance. The public, including elected officials, serve as the watchdogs to push for greater regulation and enforcement when necessary, and to make sure complacency doesn’t set in.

The public can only do their part of the job if there is adequate transparency in what the industry and the regulators are doing. Adequate performance, inspection, and enforcement data need to be made publicly available so compliance can be verified. The PHMSA/OPS has made great strides in the past few years increasing transparency by making better incident, enforcement and inspection data available.
One of the very basic measures of pipeline safety is the availability of incident, or accident, data. OPS has worked hard to upgrade their incident database in the past years, and now provides state-by-state breakouts of incident data including the specifics for each incident on the transmission lines they regulate. Only through verification can trust in pipeline safety grow, and only when government and industry is truly transparent is such verification possible.

**Concerns Regarding Public Awareness, Local Emergency Preparedness, and Transparency and Communication**

The lack of overall awareness, and knowledge, regarding natural gas pipelines in Lycoming County is alarming. There also is an immediate concern among the mostly volunteer emergency responders in rural areas of Lycoming County that they are not adequately trained or prepared to respond to a natural gas pipeline emergency. With regards to communication and transparency, there is a large amount of information that is publicly available, yet this information can be difficult to verify, and there is still important information missing or difficult to obtain. This information uncertainty seems to have led to widespread public distrust of how pipelines are sited, constructed, and operated. For example, adequate information about the specifications, contents, and routes of proposed pipelines need to be more readily available so people living in potentially impacted neighborhoods can provide meaningful comment and participation as to the need and adequateness of proposed safety precautions. The information that decision makers use to make pipeline safety decisions also needs to be available to the public so they can decide whether their officials are making decisions with full knowledge of the impacts and with the public’s safety and welfare in mind.

Even with the current electronic capabilities to post nearly unlimited materials online, the industry and government are failing to disclose information that they are already required to prepare in a timely manner to local citizens. Instead, the public must go through a formal public information request process to access this information. The gas industry in particular provides very little information about their plans for constructing pipelines and associated operations, maintenance, and inspections. However, it is also important that the industry and government be cognizant of the lack of computers and high speed internet in some rural areas, such as Lycoming County, and be ready to work with local libraries, book mobiles, and community centers, to
provide printed materials, and organize public meetings that will reach these more rural areas. Another major concern regarding communication and transparency is that national security issues since September 11, 2001 have been raised as a reason to prevent the public from access to important local pipeline information. These concerns often appear to be overblown, and instead of keeping such information “secret,” we argue that a well-informed public could both increase safety and security as well as provide local information regarding specific environmental and public safety risks related to new pipeline development.

**Recommendations Regarding Public Awareness, Local Emergency Preparedness, and Transparency and Communication**

1. Pipeline operators should share more information with the public and local emergency responders on what the pipeline industry and specific operators are doing to keep citizens safe, as well as what the public can do to help keep their own communities safe. This includes sharing information with the public on the planned location of all types of pipelines.
2. More training should be given to all local emergency responders specific to pipeline hazards and incident response in Lycoming County. This training should include understanding the differences between a fire emergency and a natural gas emergency, as well as how to respond, who to call, and the appropriate emergency communication protocols for handling a natural gas pipeline incident.
3. Pennsylvania and Lycoming County should increase posting of materials regarding pipeline construction plans, operations, maintenance, and inspections on-line. The Texas Railroad Commission has a robust website that includes pipeline maps, individual permits and annual reports, and information on excavation damage that is not available from most other state pipeline regulators. The Texas site is somewhat complex to use, but it provides a model for what could be done (and done better) in Pennsylvania as the Commonwealth’s pipeline infrastructure continues to increase during the next several decades.
4. State ethical measures need to be established and enforced in order to insulate regulatory agencies from political or financial influences provided by the natural gas companies and their agents. This would prevent conflicts of interest in decision making and information sharing, alleviate potential ethical concerns, and build public trust.
Contributors to the Project and Resources for More Information:

#The Citizens and First Responders of Lycoming County

#LWVPA Position Paper on Pipelines: [www.palwv.org/issues/Natural-Resources/Pipelines.asp](http://www.palwv.org/issues/Natural-Resources/Pipelines.asp)

#Schmid & Co. Inc., Consulting Ecologists, Media, PA 19063 * 610.356.1416 * [www.schmidco.com](http://www.schmidco.com)

#Nature Abounds, Clearfield, PA 16830 * 814.765.1453 * [melinda@natureabounds.org](mailto:melinda@natureabounds.org)

#c.a.s.e. Consulting Services, MD 20886 * 240.599.6655 * [communitypower.slp@gmail.com](mailto:communitypower.slp@gmail.com)

#Pipeline Safety Coalition, Chester County, PA *484.340.0648 * [www.pscoualtion.org](http://www.pscoualtion.org)

#Blue Heron Consulting, Agricultural and Environmental, Chester County, PA * lkfarrell@verizon.net

#Responsible Drilling Alliance (RDA), Lycoming County, PA * 814.765.1453 *

[http://responsibledrillingalliance.org](http://responsibledrillingalliance.org)

Agency List:


Pennsylvania Public Utility Commission: [http://www.puc.state.pa.us/](http://www.puc.state.pa.us/)

Pennsylvania Department of Environmental Protection [http://www.portal.state.pa.us/portal/server.pt/community/oil_and_gas/6003](http://www.portal.state.pa.us/portal/server.pt/community/oil_and_gas/6003)

US DOT Pipeline Hazardous Safety Materials Administration (PHMSA) [www.phmsa.dot.gov](http://www.phmsa.dot.gov/)

National Fire Protection Association (NFPA) – [www.nfpa.org](http://www.nfpa.org)

US Department of Transportation (DOT) - [www.dot.gov](http://www.dot.gov)

Pennsylvania Pipelines Mapped by County: [https://www.npms.phmsa.dot.gov](https://www.npms.phmsa.dot.gov)


National Transportation and Safety Board (NTSB) – [www.ntsb.gov](http://www.ntsb.gov)

Occupational Safety & Health Administration (OSHA) – [www.osha.gov](http://www.osha.gov)

Other Resources:

Pennsylvania League of Women Voters Marcellus Shale Study Guides (2009-2011)


Pennsylvania Marcellus News Digest compiled weekly by League of Women Voters: @ Julie Kollar: juliekwren@verizon.net

Common Ground Alliance (CGA): [www.commongroundalliance.com](http://www.commongroundalliance.com)

Pipeline Safety Coalition: Pennsylvania Non Profit Support for Citizens: [lynda@pscoalition.org](mailto:lynda@pscoalition.org)

Pipeline Safety Trust: National Leader in pipeline safety advocacy: [www.pstrust.org](http://www.pstrust.org)