

NATURAL GAS DEVELOPMENT OPPORTUNITIES, IMPACTS, AND NEEDS CONCEPTUAL ANALYSIS

This white paper is being developed as an educational tool to enable understanding of the positive economic development opportunities as well as the range of impacts and policy needs as well as sustainable revenue needs associated with the extraction and development of natural gas from the Marcellus Shale, Utica Shale, and other unconventional resource formations in Pennsylvania.

POSITIVE ECONOMIC DEVELOPMENT OPPORTUNITIES

- I. Large number of new jobs at various skill levels are being created
2. Private land owners and public land owners receive substantial gas lease income
3. State Oil and Gas Lease Fund has received hundreds of millions of dollars in lease revenue which has been transferred to help solve State Budget problems
4. Vacant commercial building leasing and land leasing by gas companies and their suppliers and support service companies equals new income for owners
5. Hotels and rental housing are in high demand and rental rates/revenues have been raised
6. New residential development to accommodate natural gas workers and their families adds to the tax base
7. Rail freight traffic has increased substantially and more local train crews are being hired with increased revenues
8. Rail freight traffic increase has spurred major expansion of local rail system plus restoration of unused rail sidings to serve warehouses and reused factory buildings Technical training providers (e.g. PCT and Career Consortiums) have strong market opportunity for their graduates and new sponsors for their training Restaurants and entertainment businesses have seen increased business Equipment repair and welding businesses have seen increased business Construction businesses and trucking companies have seen increased business Stone aggregate suppliers have seen increased business
12. Consultants providing land surveying, geology, engineering and permitting services
13. have seen rapid growth in business
14. Specialty businesses have new applications and markets for their products e.g. crane and rigging services; sand blasting and industrial coatings for pipe treatment; spray-on sealants and liquid containment applications for gas well pads; chiropractic services needed by gas industry workers add to client base of local medical practices Potential new revenue to counties and municipalities might be very large IF legislation were to be enacted by the P A General Assembly that provides for reasonable allocations to local governments
16. Newfound royalty and gas lease income poses volunteer donations opportunity for community foundations and non-profit organizations
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18. Certain local roads used by only one or two gas companies for access to their facilities have or will be reconstructed at gas company expense and may end up better than before (note this does not apply to many roads)

CATEGORIES OF KNOWN IMPACT

1. Road and bridge damage and accelerated deterioration
2. Storm water drainage channels erosion, and sediment deposition and capacity overload
3. Sewage collection and treatment system upgrades/expansions are needed to accommodate new residential and commercial development stimulated by the gas boom.
4. Wastewater treatment system development, modifications and upgrades needed to accommodate and treat hydro-fracturing flow back fluid wastewater
5. Mud on roads can create unsafe conditions during rain showers
6. Diesel fumes and dust from mud on roads can deteriorate private homes and create airborne health problems
7. Gas well brine has been used in some places for road dust suppression which creates airborne contaminated dust containing toxins plus chemicals that can pollute ditches and steams
8. Noise from compressor stations, drilling operations and heavy truck traffic
9. Groundwater / wells / springs and public water supply potential contamination
10. Stream and river frac-water withdrawal sites have closed traditional fishing, boating, canoeing and kayaking access locations due to gas company lease restrictions and/or dangers of heavy trucks mixing with recreational users and families
State-owned and private forested landscapes are being fragmented by thousands of well pads and access roads and pipelines
11. Workload for local agencies and for State agencies has skyrocketed
12. Demand for public information has skyrocketed
13. Demand on emergency responders for accidents, fires and spills has increased
14. Cost of emergency response for fires, gas well explosions and pipeline explosions or leaks is borne by the community to support their fire and ambulance companies
15. Demand for local police and P A State Police to deal with heavy truck traffic, oversize and overweight loads has increased
16. Gas company or subcontractor's trucks often fail P A Motor Vehicle Code inspection safety regulations as documented by P A State Police
17. Demand for human services from county governments (e.g. Children & Youth Services, Drug and Alcohol Rehabilitation, Detention and County Prison, Court System) has increased
18. County Legal Property Records have been damaged by people searching deeds and land records for mineral rights and some records are not replaceable
19. Property Records copier equipment wear has accelerated and replacement costs are significant
20. Demand for rental housing has priced students, young workers at starting wage levels, and other low and moderate income local residents out of the market
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22. Water well contamination or nearby stream contamination scares away buyers and drives down home values
23. Higher wages paid by gas companies have attracted local workers away from local businesses
24. Out of state gas workers who are on probation must be supervised by County Probation Officers which adds workload and costs to County governments Increase
25. in Domestic Relations Caseload has added cost to County governments Sex
26. offenders from other states come into P A as gas workers and are not registered in P A
27. Increased 9-1-1 call load for County Emergency Dispatch Centers
28. Cost of revisions to County Emergency Management Plan revisions
29. Preferential laws and regulations for the natural gas industry equal unfair treatment for other industries and developers
30. Rural mail delivery and other delivery vehicles wear and tear due to rural road conditions
31. Demand for stone aggregate for natural gas development access roads has escalated prices to municipalities and trucks are not available for other projects. Demand by
32. gas development has tied up contractors who are no longer available to municipalities, counties, County Conservation Districts for normal road and construction projects or who will bid higher prices due to gas work pricing.
33. Past and current tourism promotion investments e.g. P A WILDS, are being undermined by gas development activity.
34. Explosives storage facilities to support gas drilling/hydrofracing has sparked safety concern of residents.

CATEGORIES OF POTENTIAL IMPACT

1. Streams and rivers potential contamination
2. Forest fires and explosions at compressor stations pose added public safety hazard
3. Release of air pollutants such as benzene, other carcinogens, and toxic neurotins from the gas wells, condensate tanks, compressor stations and pipelines unless vapor recovery and zero emissions dehydrators, pneumatic valves, and other best management technologies and practices are used.
4. Responsibility for and cost of plugging abandoned gas wells and on-going monitoring poses substantial future costs for P A DEP since the current bonding required is only \$2,500 per well or \$25,000 for a blanket statewide bond and costs often exceed 10 times that amount.
5. Drilling, and especially hydrofracturing, in flood plains poses potential for huge costs for public water supplies since most public water supply well fields are in floodplains that are coarse soils which allow easier migration of contaminants
6. Storage of gas drilling fluids in the floodplain pose an unacceptable public health risk to public water supply aquifers
7. Additional instructional and counseling costs for students from migratory gas worker families
8. Stone quarry expansions for road repair, gas well access roads and pads

9. Road conditions slow down ambulance response time and creating accelerated wear on ambulance vehicles
10. Cumulative stream contamination from Naturally Occurring Radioactive Materials (NORM) brought to the surface or seeps into waterways can lead to permanent degradation.
11. Conventional biological treatment systems in sewage treatment plants are not capable of treating NORM or high TDS gas well wastewater.
12. Degradation of the environment and natural resources enjoyed for outdoor recreation degrade the quality of life
13. Degradation of the outdoor recreational qualities makes it harder to recruit doctors, dentists, medical specialists and young professionals of other specialties.
14. Importation of invasive plant species on well service trucks may bring long-term negative changes to our forests and stream banks and may be very costly to address. Well service businesses which generate high volumes of 24/7 truck traffic are
15. not welcomed by residents of quiet towns and sparks divisive community dynamics. Economic change with both positive and negative consequences is
16. happening so rapidly there is a lack of overall planning to manage the impacts.

APPREHENSIONS FOR THE FUTURE

1. Recycling of gas well frac flowback fluid, while beneficial in many respects, can also concentrate the levels of contaminants that will require ultimate treatment, and potentially the level of radioactivity.
2. Potential concern is what concentration of volatile organics may be released into the air from frac flowback fluid treatment facilities, especially those located in cities and towns.
3. Potential concern is whether such intensive hydrofracing will lead to greater seismic activity and subterranean shifts of rock layers or tectonic plates thereby causing more fissures and pathways for migration of pollutants.
4. With more releases of toxins will the long-term endocrine disruption lead to severe public health disorders that may not emerge until decades later or even a future generation?
5. Since scientific health studies normally require years of case studies will the public health impacts be discovered soon enough to effectively treat and prevent those causes?
6. With the practice of some gas companies that provide replacement of contaminated private water supplies or other impact remediation in exchange for non-disclosure agreements will we learn the full extent of adverse impacts soon enough to prevent more extensive impacts?
7. Do we have in place now the baseline studies of water and air quality needed to make effective comparisons as changes are discovered?

IMPACTED RESOURCES / PARTIES

1. Private land owners-both those who lease their land to gas companies and those who are neighbors
2. Private land owners often incur damages to their property during fires, spills, accidents and explosions - and may suffer reduced property market value resulting from those risks
3. Town dwellers along the major trucking routes who experience 24/7 heavy truck noise, diesel fumes, dust and traffic congestion from constant convoys of gas drilling suppliers and service companies
4. State-owned forests and State forest roads and State Parks
5. Streams and rivers
6. Wetlands and groundwater aquifer recharge zones
7. Municipalities
8. Counties
9. State agencies
10. Penn State Cooperative Extension
11. Volunteer ambulance and fire companies
12. Medical care providers and health care insurance companies
13. School districts
14. State and local roads and bridges and railroads
15. Private local delivery companies and US Postal Service and UPS/FedEx
16. Hunters, fisherman and outdoors recreationists
17. Agricultural industry and culture, especially the Amish farmers
18. PA tourism industry, especially the PA WILDS region and the Endless Mountains Region and NE P A region which depend heavily on outdoor recreation
19. PA timber resource industry and value-added lumber products industry

NEEDS

1. To create a NEW revenue mechanism for the Environmental Stewardship Fund of P A and Growing Greener Fund and to replenish the Keystone Recreation Fund
2. To create a NEW revenue mechanism for Counties and Municipalities and their respective service agencies, water and sewer authorities and volunteer emergency response organizations, county planning commissions; especially those impacted by Natural Gas Development
3. To create a NEW revenue mechanism for our Commonwealth natural resource management agencies including, DCNR, P A Fish and Boat Commission, County Conservation Districts, County Planning Commissions, P A Game Commission, P A DEP and the Susquehanna River Basin Commission
4. To create a NEW revenue mechanism for county and municipal planning through grants from P A DCED
5. To create a NEW revenue mechanism that will encourage counties and municipalities to reinvest in public infrastructure upgrades and capacity expansions and in community asset enhancement

6. To create a NEW revenue mechanism for the General Fund Budget of PA

REVENUE ALLOCATION NEEDS

1. Municipalities
2. Counties
3. Environmental Stewardship Fund
4. Growing Greener Fund
5. County Conservation Districts
6. Sewage Treatment Fund
7. Public Water Supply Fund
8. Liquid Fuels Fund
9. PA General Fund
10. PA Department of Conservation and Natural Resources
11. PA Department of Environmental Protection
12. PA Department of Community and Economic Development
13. PA Department of Agriculture
14. PA Fish and Boat Commission
15. PA Game Commission
16. Volunteer Fire and Ambulance Companies in impacted communities

REVENUE MECHANISM OPTIONS

1. Restore legality of assessing natural gas production
2. Tax on private land gas lease and royalty income
3. Personal Income Tax
4. Close Loophole to require all corporations with business presence in P A to pay Corporate Net Income Tax, including those registered in Delaware Natural Gas
5. Drilling Tax or Natural Gas Development Impact Fee
6. Remove sales tax exemptions for down-hole materials such as sand, chemicals, cement, grouting, etc which are classified as exempt as natural gas "manufacturing"
Close 30 day exemption for hotel tax for gas companies that rent blocks of rooms for long periods and rotate workers in and out to restore funding to counties and tourism agencies
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CONCEPTUAL OPTIONS

1. The P A General Assembly could enact authorization to levy tax assessments on natural gas production
2. The P A General Assembly could enact a Natural Gas Development Impact Fee, or Gas Drilling Tax, which would be collected from the companies that develop and sell the natural gas on the basis of actual volume and/or value of gas produced.
The P A General Assembly could enact changes to close the Corporate Net Income
3. Tax loophole regarding registration in Delaware or other states by companies with their place of business in P A.

4. The P A General Assembly could enact changes to close the sales tax exemption for down-hole materials.
5. Some combination of the above mechanisms could be enacted.
6. The Governor and General Assembly could restore the original uses of the P A Oil and Gas Fund to be used for recreation, conservation and flood protection and NOT to fill the j> A General Fund Budget gap.

POTENTIAL ALLOCATIONS

1. Allocate 33% to Municipalities and Counties where natural gas has been severed, including, BUT NOT LIMITED TO, as eligible uses:
 - a. Sewage Treatment and Water Supply according to pending project needs with preference given to projects which enhance capacity to treat natural gas wastewater and related infrastructure or protect drinking water from degradation by natural gas waste
 - b. Planning, design and implementation of community infrastructure development
 - c. County Conservation Districts and County Planning Commissions to develop proactive plans for environmental restoration and to develop or update local ordinances to address natural gas facility impacts on local communities
2. Allocate 33% to Environmental Stewardship Fund and Keystone Recreation Fund
3. Allocate a portion, not greater than 33%, to P A General Fund

DISCLAIMER

This Analysis was prepared by Jerry S. Walls, AICP, certified Professional Planner, acting solely as a volunteer citizen, with no funding from any source. The purpose and intent was to focus on what impacts and opportunities have emerged or may emerge from natural gas development in P A as an educational tool. Although a number of municipal and county officials and agency personnel provided specific comments that were taken into account for this Analysis the content and recommendations contained herein represent the professional opinion of the author and no other person or organization or agency. This Analysis was prepared as a living educational tool, which will be updated when new information or constructive feedback emerges that is deemed pertinent by the author.

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