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INDEPENDENT REGULATORY REVIEW COMMISSION

Reply to Regulatory Analysis Form

Proposed Regulations
Oil & Gas Surface Activities
Amendments to 25 PA Code Chapter 78, Subchapter C

McKean County
Community Impact Assessment

Overview:
Pennsylvania's Environmental Quality Board (EQB) was directed vis a vi 2012 Oil & Gas Act (Chapter 32, Act 13, 2012) to promulgate new regulation to protect the Commonwealth, its Citizenry and Natural Resources from hazards associated with newly introduced practices associated with the nascent shale gas industry.

While the charge to EQB was clearly and unequivocally directed toward shale (or unconventional) wells, the proposed amendments do not appear to differentiate between conventional and unconventional production. If the scope of the proposed regulation includes conventional wells, conventional producers and their associated drilling, service & support contractors and suppliers, and their host communities will be placed in jeopardy. Regulatory Review Act directs EQB to consider the "hidden cost upon the economy of Pennsylvania". EQB's cost analysis fails to recognize the economic and societal consequences that will result from this new regulation.

This report will:

- Consider the role conventional producers, their associated support contractors and suppliers currently play in McKean County Pennsylvania.
- Demonstrate how effect increased regulatory financial burden will affect McKean County conventional well operators' business behaviors
- Quantify the economic impact of the proposed regulation to McKean County and its communities.

McKean County was selected for this analysis, but the relative impacts will be similar in the other conventional producing counties of Northwestern Pennsylvania, including, but not limited to Elk, Forest, Warren, Venango, Clearfield, Jefferson Clarion, Crawford and Mercer Counties.

Economic Impact of Conventional Production in McKean County

McKean County's relationship with conventional oil & natural gas production has existed for approximately 140 years. The refinery in Bradford, PA began operations in 1881.

This section uses cumulative non-Marcellus production reports as furnished by PA DEP for quantities of oil & natural gas produced within McKean County. Commodity prices are taken from United States Energy Administration data:

McKean County Oil & Natural Gas Production:

	2010	2011	2012
Oil (barrels)	980,162	849,148	855,260
Oil - $/barrel	$74.71	$95.73	$94.52
Oil (revenue)	$73,227,957	$81,288,938	$80,839,175
Nat Gas (MMCF)	6,886,248	6,299,713	5,694,362
Nat Gas – $/MMCF	$4.48	$3.95	$2.66
Nat Gas ($)	$30,850,395	$24,883,866	$15,147,002
Total Wellhead	$104,078,352	$106,172,804	$95,986,178

For the purposes of quantifying the personal income value to McKean County residents, refer to:
Economic Profile System-Human Dimension Toolkit January 20, 2014 McKean County Report

Personal Income: 2012 Mining - Including Fossil Fuels: $217,249,000

This figure includes some limited personal income associated with gravel and stone quarrying, but the overwhelming majority comes directly from conventional production. The limited non-oil & gas mining is primarily quarrying to support conventional oil & gas construction activities. This figure includes many direct support contractors (such as drilling and well completions); it excludes excavation, site work contractors, equipment suppliers and all manner of ancillary business:

- Lawyers & Accountants
- Land surveyors
- Insurance agencies
- Truck dealers
- Metal fabricators
- Equipment dealers

As a stand-alone source of revenue, **Mining-Including Fossil Fuels** (excluding ancillary business) accounts for 20.9% of McKean County's economic output.
If we consider *all* of McKean County's conventional production, McKean County personal incomes derived from ***mining including fossil fuels*** is greater than any source other than manufacturing (keep in mind that the Bradford Refinery is scored in *Manufacturing*).

Segment	Aggregate Personal Income
Health Care & Social Assistance	$121,860,000
Government	$169,965,000
Manufacturing *(includes Refinery > $26,000,000)*	$219,926,000
Mining – Including Fossil Fuels ***(excludes Refinery)***	**$217,249,000**

Economic Profile System-Human Dimension Toolkit January 20, 2014 McKean County Report

Economic Impact of Legacy Wells

This section is based on PA DEP January-December 2010 McKean County Oil & Gas excluding Marcellus Production Reports.

6,177 wells were in production in 2010. Of these, all but 16 wells would be defined as Marginal or "Stripper" wells (producing less than 10 barrels of oil per day OR less than 60MCF/day).

We assume a model of $3.25/MCF natural gas and $85/bbl oil. We then convert volumetric production numbers (furnished by the PA DEP McKean County Non-Marcellus report) to dollars per well. Net Revenue reflects revenue after paying 1/8th royalty to landowner.

	20th Percentile Well	Median Well	80th Percentile Well
Gross Revenue	$3,360	$4,406	$22,945
Landowner Royalty	$420	$551	$2,869
Net Revenue	$2,940	$3,855	$20,076

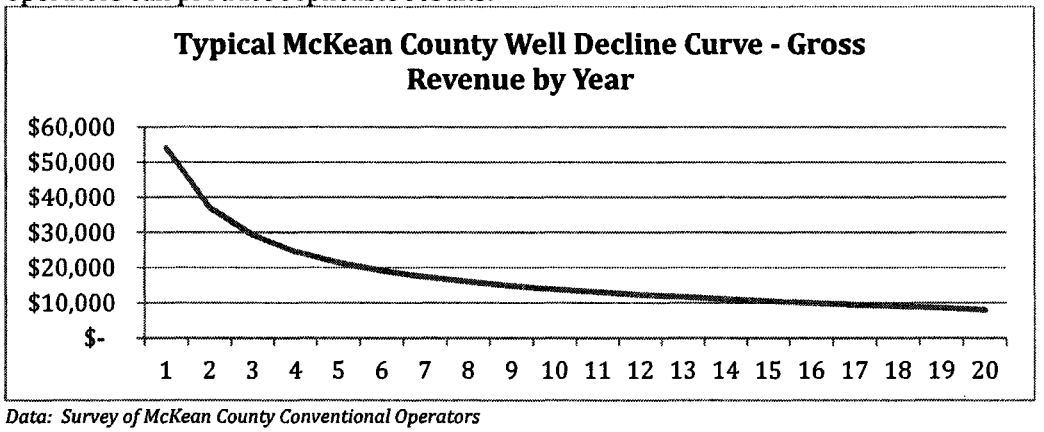
In 2010, McKean County was home to 4,120 wells that individually generated less than $10,000/yr in gross annual oil sales. These 4,120 wells (in aggregate) contribute roughly **$22,550,000** in annual royalty and working interest payments in McKean County.

Compare the 4120 poorest performing McKean County wells to other industries:

Segment	Aggregate Personal Income
Accommodation and Food Services	$18,667,000
Educational Services	$19,925,000
Administrative and Waste Services	$17,032,000
Professional and Technical Services	$19,125,000
Finance and Insurance	$15,669,000
Forestry	$10,882,000
McKean County's *lowest producing* 4120 wells (Wells that individually generate less than $10,000 per year in oil sales)	**$22,550,000**

Economic Profile System-Human Dimension Toolkit January 20, 2014 McKean County Report

While the revenue generated by these low-producing legacy wells is modest *individually*, the aggregate revenue generated is significant for McKean County's economy. Moreover, McKean County's conventional wells are predictable performers. Efficient conventional operators can produce replicable results:



Data: Survey of McKean County Conventional Operators

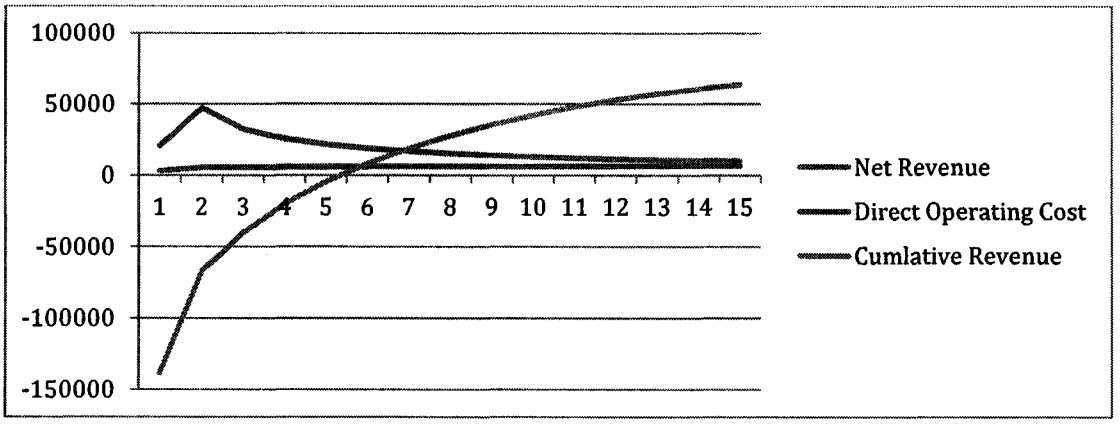
Wells have high levels of initial production (*flush*) then gradually decline. It is common for McKean County wells to produce economically for more than 25 years.

Economic Impact of New Well Drilling

While conventional Pennsylvania producers have enjoyed several years of strong oil pricing, natural gas sales are a critical part of the economics of Conventional Pennsylvania wells. McKean County conventional producers have faced strong price and capacity competition from Marcellus gas producers in recent years. The deterioration of gas prices, coupled with the shortage of takeaway capacity have significantly reduced the return on investment for conventional producers.

Consider a typical McKean County well, assuming:

- Well permitting, drilling and completion costs of $138,500
- Standard 1/8th royalty lease
- Monthly maintenance & operations cost of $444 with inflation factor of 3%
- Initial oil production of 541 barrels per year with typical decline curve
- Initial gas production of 2,494 MCF gas per year with typical decline curve
- $85/BBL oil & $3.25MCF Gas



Based on these parameters, we would expect the investment of $138,500 to be recouped at roughly 5½ years. At year 15, we would expect this well to have a cumulative return of $202,000 ($63,500 profit after recouping the $138,500 well cost). This is roughly equivalent to a 2.75% annual rate of return.

- *If new regulatory burden increases the initial well cost by $10,000, investment recovery is delayed from 5½ to 7 years. The effective rate of return would be reduced to 2.15% annually over a 15 year period. This represents greater than a 21% reduction in benefit of making the investment.*

- *If new regulatory burden increases the initial well cost by $20,000, recovery is delayed from 5½ to over 8 years. The effective rate of return would be reduced to 1.75% annually over a 15 year period. This represents greater than a 36% reduction in the benefit of making the investment.*

- *Penn Grade Crude Coalition's (PGCC) analysis calculated $52,000 in increased regulatory burden associated with proposed amendments to Chapter 78. This will delay recovery from 5½ years to over 12 years. The effective rate of return would be reduced to 0.4% over a 15 year period. This represents an 85% reduction in the benefit of making the investment.*

Oil & gas investors expect a reasonable rate of return. 5½ year payback is close to the minimum acceptable return to attract new investment. New regulatory costs may dramatically erode future investment.

"Of the two types of crude oil, paraffin or methane series oil is the most prized, but it comprises less than 2% of the total world supplies. The "Industry Standard" is "Pennsylvania Crude" derived from oil wells in the state of Pennsylvania. Crudes dominated by naphthenic components are called asphalt-based oils." ***Louisiana DNR – Educational Website***

McKean County wells produce Penn Grade Crude, the paraffin based crude that is unique and highly valued due to the non-fuel products that are manufactured from Penn Grade feed stock. These products are essential for the manufacture of lubricants, and pharmaceutical & cosmetic base stocks and waxes.

Of particular concern is continued viability of refining capacity for Penn Grade Crude. There are two refineries in North America that refine Penn Grade Crude:

- American Refining Group (ARG), Bradford, PA – 10,000barrels/day
- Ergon West Virginia, Inc. - Newell, WV – 18,000barrels/day

If the two refineries are unable to source sufficient volumes of Penn Grade (paraffin based) crude, one or both of the refineries would be forced to either shut down or retrofit their facilities to accept *naphthenic* or *asphalt-based* oils.

ARG's refinery is the cornerstone of Bradford, PA's manufacturing industry. In 2013, ARG:

Purchases of Penn Grade crude	$194,000,000
Purchases of other raw materials	$41,000,000
Direct wages and benefits to employees	$25,300,000
Payments to local utilities & sewer districts	$7,900,000
Local tax payments	$479,000
Annual Direct Economic Impacts	$268,600,000

A shutdown of the Bradford refinery would be devastating to McKean County and Northwestern PA. In addition to the loss of ARG's direct economic benefits, Pennsylvania's conventional producers would be reduced to a single buyer for their crude. Competitive pricing support would be diminished, further reducing incentive for conventional producers to invest in new production.

Alternatively, one or both of the refineries may elect to retrofit their facilities to accept naphthenic crudes. While conversion would preserve some of the economic benefits, it would represent a permanent destruction of the domestic market for Penn Grade crude. ARG currently spends $194,000,000 purchasing crude within the Commonwealth and neighboring NY, OH & WV. Conversion would mean those dollars would leave our region and instead go to Texas, Oklahoma, North Dakota or Alberta.

The refineries use legacy well production to plan for capacity. Transient downturns in drilling can be "averaged out" over several years, but sustained downturns in drilling eventually translate into reduced legacy production.

At first glance, it seems reasonable to think shutting down or retrofitting the refinery(s) is hyperbole. There have been periods in prior decades where drilling activity in PA was reduced, and two refineries were able to survive.

Today's environment is decidedly different. In prior decades, reductions in PA drilling coincided with national drilling trends. Oil & natural gas prices moved in tandem. When commodity prices increased, Texans and Pennsylvanians alike put rigs to work.

In the shale era, there has been a de-coupling of oil & natural gas pricing. North America has seen a dramatic reduction and stabilization of natural gas prices, while oil has maintained a persistent high price. Conventional PA producers rely on both natural gas and oil sales to make their well economics work. This is creating a historically unique period where drilling activity is strong throughout North America, but is weak among Penn Grade crude drillers.

In prior periods, refiners facing reduced volumes of Penn Grade would have also faced reduced volumes of naphthenic crude. Conversion would have made little sense, as existing naphthenic refiners would readily soak up demand for all available crude stocks.

In contrast to prior eras, Naphthenic crude is becoming increasingly abundant; we have sustained high levels of drilling in a low-priced natural gas price environment. If producers of Penn Grade have a sustained reduction in capacity, conversion would likely be the only option available for survival. If conversion is deemed uneconomic, the refinery(s) will close.

In either scenario, the Commonwealth will lose the most important economic driver in McKean County – conventional well production. Without refining capacity, Penn Grade Crude wells will no longer be drilled.

Based on *Human Dimension Toolkit January 20, 2014 McKean County Report,* McKean County's conventional producers and their associated drilling and completions contractors account for 2,017 *(2011)* of McKean County's 22,104 jobs. These jobs average $78,954/yr - *twice* the county average of $39,631 *(2012).*

It is beyond the scope of this report to extrapolate the broader impact of such loss. Every sector of McKean County's economy would be devastated.

The Commonwealth's conventional producers fueled America's rise to greatness. Penn Grade crude was the feedstock for innovation in manufacturing, petrochemicals and transportation. It powered our military, and helped us end two great wars.

Pennsylvania needs its conventional producers – McKean County depends on them.

Conventional oil & natural gas production is essential to the societal and economic wellbeing of McKean County.

Regulation impacting the conventional producers has the potential to curtail capacity at one or both of North America's two Penn Grade Crude Refineries.

Loss of Penn Grade Crude refining capacity (at either refinery) would trigger catastrophic and irreparable harm to McKean County and its citizens.

The Regulatory Review Act Compels EQB to consider "hidden cost upon the economy of Pennsylvania".

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