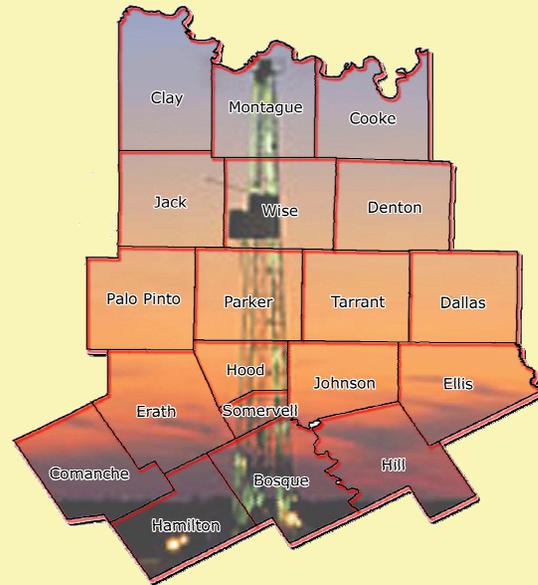


# **An Enduring Resource:**

## **A Perspective on the Past, Present, and Future Contribution of the Barnett Shale to the Economy of Fort Worth and the Surrounding Area**



**Barnett Shale Expo**

**March 2009**

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# EXECUTIVE SUMMARY



# Activity in Barnett Shale has Transformed Economy of Fort Worth and the Surrounding Area

- **Over the past several years, activity in the Barnett Shale has generated** thousands of jobs and tens of billions of dollars in investment. **Royalty and bonus payments** to area residents, cities, school districts, and others as well as property tax receipts to local taxing authorities have enabled improvements in infrastructure, quality-of-life, and financial stability.
- Although the pace of activity has slowed in recent months as a consequence of the global economic situation and falling energy demand and prices, the **scope of the Barnett Shale is expanding**, with exploration and development pushing boundaries and reserve estimates outward and upward. The Barnett Shale generates a multi-billion-dollar direct impact on the economy, with multiplier effects rippling through **virtually all regional industries**.

*“Cycles and volatility in the energy sector are inevitable. Even though the pace of growth is slower than in the recent past, the fact remains that development of the Barnett Shale has diversified and strengthened the Fort Worth-area economy in fundamental ways. The region is much better off in terms of jobs and other business activity than it would have been otherwise, both now and in the future.”*

-- M. Ray Perryman



# Despite Recent Slowdown, Fort Worth Area Continues to Dodge Worst of National Economic Downturn

*The past year has seen rapid deterioration in the health of the US economy. In the face of millions of jobs lost around the country, the ability of the Fort Worth area to maintain relative stability is impressive.*



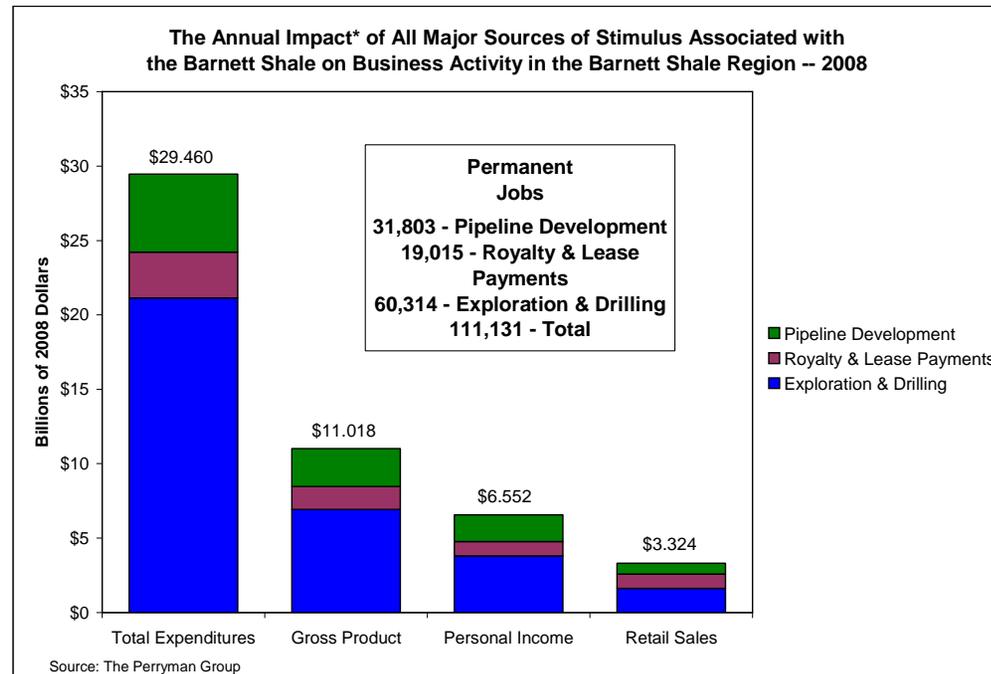
- Last year, The Perryman Group's assessment of the impact of the Barnett Shale noted that sluggishness had begun to emerge in the national economy, but that the Fort Worth area economy was projected to maintain a healthy pace of growth. Since that time, the US has seen the loss of millions of jobs, and even the relatively strong Texas economy has slowed markedly and is currently experiencing significant challenges.
- During 2008, the Fort Worth-Arlington Metropolitan Division (Johnson, Parker, Tarrant, and Wise counties) exhibited job gains most of the year before declines occurred in the final months. A similar pattern was observed in the surrounding counties.
- The Fort Worth economy has many sources of stability and future growth, but even in this large and dynamic economy, Barnett Shale exploration and production plays an important role.



# Barnett Shale Important Source of Stimulus

- During 2008, the Barnett Shale's overall benefits to the area economy expanded over 2007 levels, even though the pace of activity slowed significantly during the last half of the year. The first half of the year saw rapidly rising prices and expanded operations, while a substantial retrenchment occurred in the final months. The Barnett Shale represents an important source of economic potential for the area, and the number of permanent jobs associated with Barnett Shale activity expanded from 83,823 in 2007 to an average of 111,131 in 2008. (These levels are expected to decline during 2009.)

*Over the past few years, the impact of the Barnett Shale on regional business activity consistently exceeded projections. Even though the current environment has contributed to some slowing, it will remain a substantial source of economic contribution.*

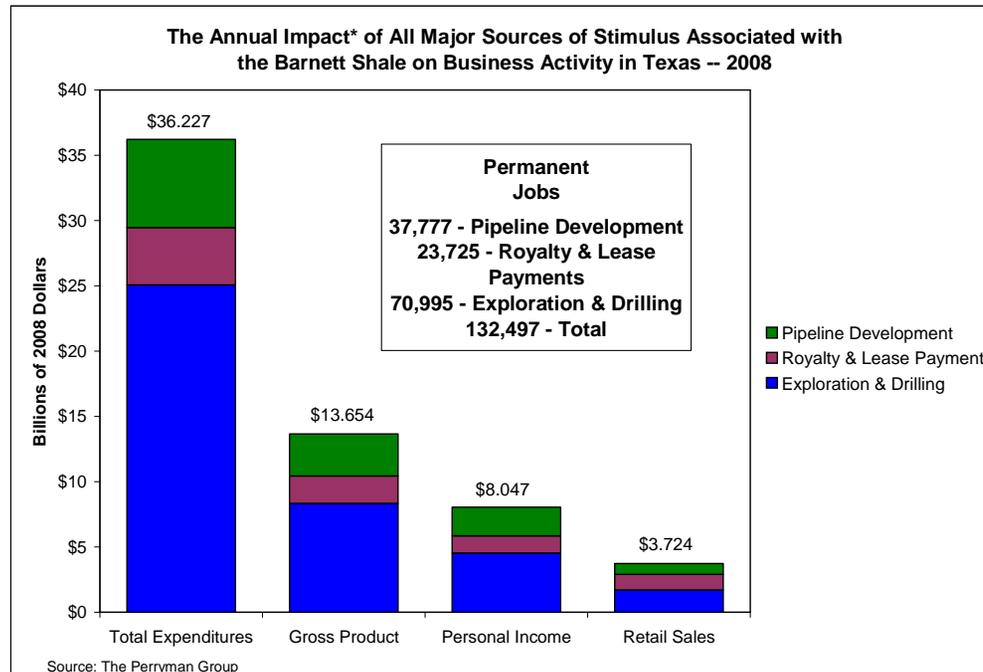


\*Impact based on average levels of activity during 2008.



# Texas Economy Also Benefits

- Barnett Shale activity generates a notable addition to state business activity and tax receipts, a particularly important contribution in today's down economy. Benefits to Texas in 2008 include an estimated **\$13.7 billion in annual output and 132,497 jobs** (based on average levels of activity during the year), well above the 2007 levels.



\*Impact based on average levels of activity during 2008.

*The State of Texas received more than \$275 million in severance taxes from activity in the Barnett Shale in 2008. Other types of State tax revenues and fees were also positively affected, with the total fiscal stimulus approaching \$1 billion.*



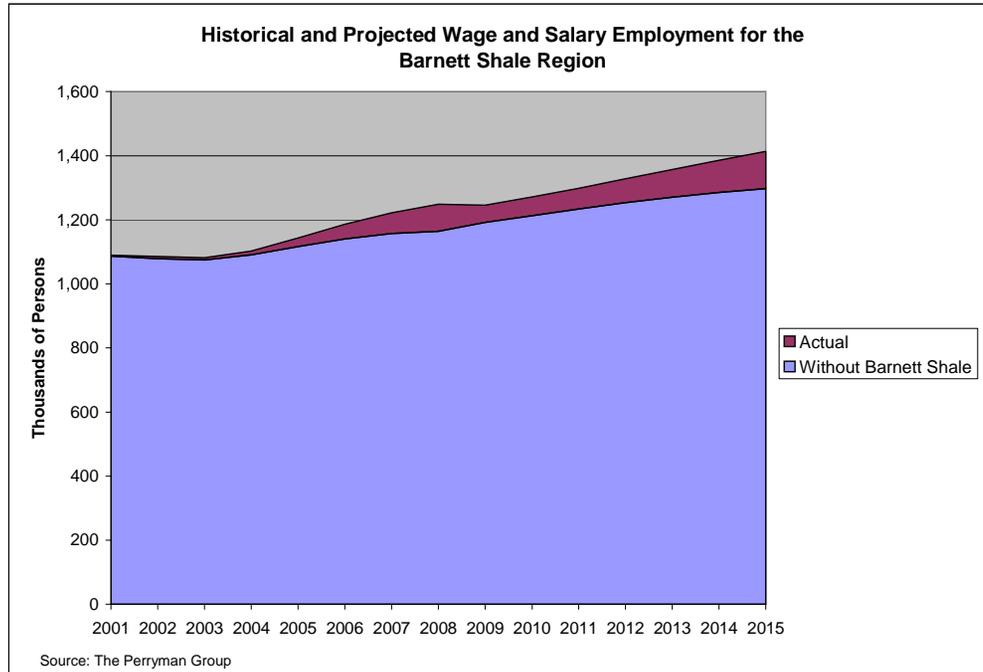
# Current Slowing Temporary

- The current relatively low price environment in the natural gas market is clearly dampening exploration and drilling activity.
- Despite this temporary slowing, however, the past benefits from the Barnett Shale continue to positively influence the Fort Worth area, and significant activity is ongoing.
  - Individuals and organizations (as well as local governments) received millions in bonus payments and royalty interests over the past several years. This money has been invested in a variety of substantial infrastructure improvements, quality-of-life enhancements, and various goods and services. Royalties continue to be paid on production.
  - Property taxes paid on oil and gas properties as well as tax receipts stemming from enhanced retail sales and real estate development due to the economic impact of the Barnett Shale increase fiscal resources of local and State governments.
- Even at the cyclical trough, the activity associated with the Barnett Shale brings tens of thousands of jobs and billions of dollars of activity that would not be occurring otherwise.
- With economic recovery, the demand for natural gas (and, hence, price levels) will rise. While cycles and market volatility are inevitable, natural gas is a desirable fuel and the Barnett Shale is an important resource.



# Fort Worth and Surrounding Area Economy With the Barnett Shale Healthier than Without

- Activity in the Barnett Shale has slowed from the rapid pace of development which characterized recent years. Even so, it continues to generate tens of thousands of jobs and billions of dollars in infusions to the Fort Worth area.



*Even in 2009, which is likely to be the trough of the current downturn in energy markets, the benefits are expected to include \$6.5 billion in output and about 70,000 jobs. These levels are above those observed in 2006. Moreover, there is every reason to believe that the need for natural gas will lead to a resurgence in the next few years.*



# Barnett Shale is an Enduring Resource

- Since 2001, the Barnett Shale activity has cumulatively led to incremental benefits totaling \$32.56 billion in Gross Area Product (in constant 2008 dollars) and over 327,000 person-years of employment.
- Assuming a modest recovery occurs as anticipated over the next few years, the **aggregate benefits over the 2001-2015 period will exceed \$100 billion in output and 1 million person-years of employment.**

*The Barnett Shale is a positive factor in the Fort Worth economy now and in the years to come. It remains a very valuable resource and substantial generator of opportunity for the people of the region.*





# INTRODUCTION



# Introduction

- Over the past several years, the Barnett Shale has played a major role in the growth of the Fort Worth-area economy. Although the pace has slowed in recent months, the field remains **one of the most important deposits of natural gas in the US and a source of tens of thousands of jobs in the region.**
  
- **Exploration, drilling, and production in the Barnett Shale continue to serve as a key economic generator for Fort Worth and the surrounding area.** Activity in the Shale generates
  - thousands of jobs and millions of dollars in personal income;
  - significant gains in output across a broad spectrum of industries;
  - a substantial stimulus to pipeline construction and operations;
  - sizable lease bonus and royalty payments to local individuals, organizations, and government entities; and
  - notable enhancement of the receipts to local taxing authorities.
  
- **Industry observers note that the current weaker demand for natural gas stems from the national economic downturn. With economic recovery expected to begin as early as this summer, there is every reason to believe that the pace of activity in the Barnett Shale will also gain momentum. Moreover, long-term energy needs will assure ongoing development of this important resource.**



# Purpose of This Study and Key Findings

- For the past several years, The Perryman Group (TPG) has been measuring the impact of activity within the Barnett Shale. The results of this year's update are provided in the current report.
- TPG's research indicates that Barnett Shale activity is and will remain an important component of the Fort Worth-area economy despite the recent slowdown. Past development has led to the creation of thousands of jobs and millions of dollars in lease and royalty payments to local businesses, individuals, and government entities. These payments have been used for myriad purposes, many of which continue to enhance the economy today. **The Fort Worth area economy is substantially better positioned with the Barnett Shale than it would be without it.**
- While the pace of activity slowed during the latter part of the past year and continues to do so, the Barnett Shale remains a key deposit of natural gas and a source of current and future stimulus for the Fort Worth-area economy.
- Business cycles are inevitable, and the energy sector is particularly volatile. With economic recovery, the Barnett Shale will again gain momentum as a source of business activity for the region and a critical fuel resource for the nation.



# The Perryman Perspective

- The Perryman Group is a Texas-based economic research and analysis firm with more than 20 years of experience in assessing the economic impact of corporate expansions, regulatory changes, real estate developments, and myriad other phenomena affecting business activity.
- TPG has conducted hundreds of impact analyses for the US and Texas economies as well as all Texas metro areas and counties. The firm has maintained an extensive set of economic models for more than two decades, including econometric, impact assessment, demographic, occupational, and real estate absorption models developed to specifically reflect the underlying structures of the economies of Fort Worth and the surrounding area. Impact studies have been performed for hundreds of clients including many of the largest corporations in the world, governmental entities at all levels, educational institutions, major health care systems, utilities, and economic development organizations.
- TPG has extensive experience in analyzing the Fort Worth area and its economy. The firm has been performing regular forecasts for the area and conducting economic outlook conferences for more than 20 years.
  - For the past two years, TPG has performed comprehensive assessments of the impact of the Barnett Shale on the local area.
  - Studies have also been completed for a number of local projects and initiatives, such as the development of the Fort Worth Alliance Airport, the Joint Strike Fighter Program at Lockheed Martin, major corporate relocations and expansions, large tourism venues, and infrastructure investments. The firm has conducted numerous investigations related to the oil and gas industry. These analyses include an assessment of the effects of offshore drilling for the US Department of the Interior, several studies of specific production areas, and projections of natural gas prices and output.





# CURRENT BARNETT SHALE ACTIVITY



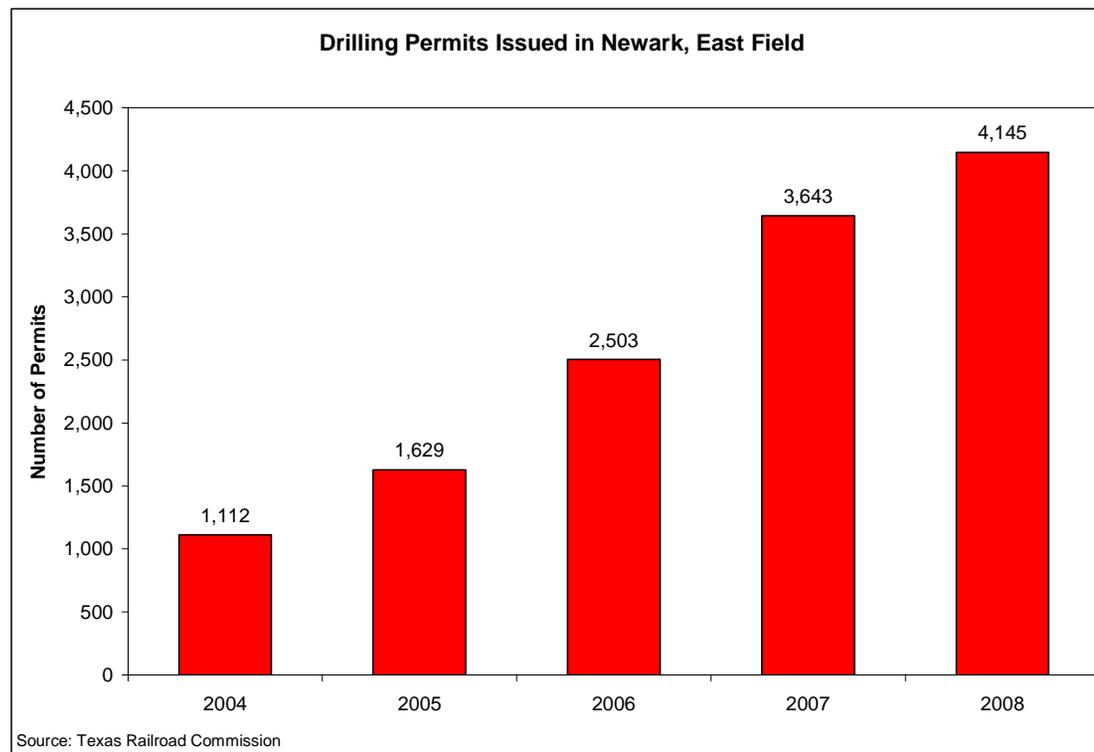
# Current Activity in the Barnett Shale

- During the past year, production in the Barnett Shale expanded by **32.0%** over 2007, with output of almost 1.4 trillion cubic feet of gas last year.
- While the pace of growth and new leasing activity slowed during the second half of 2008, the Barnett Shale nonetheless serves as an important source of economic stimulus for the Fort Worth area.
- The core area of the Barnett Shale is located in Wise, Denton, Parker, and Tarrant counties, with additional wells in Clay, Montague, Cooke, Jack, Palo Pinto, Dallas, Eastland, Erath, Hood, Somervell, Ellis, Comanche, Hamilton, Bosque, Johnson, and Hill counties.



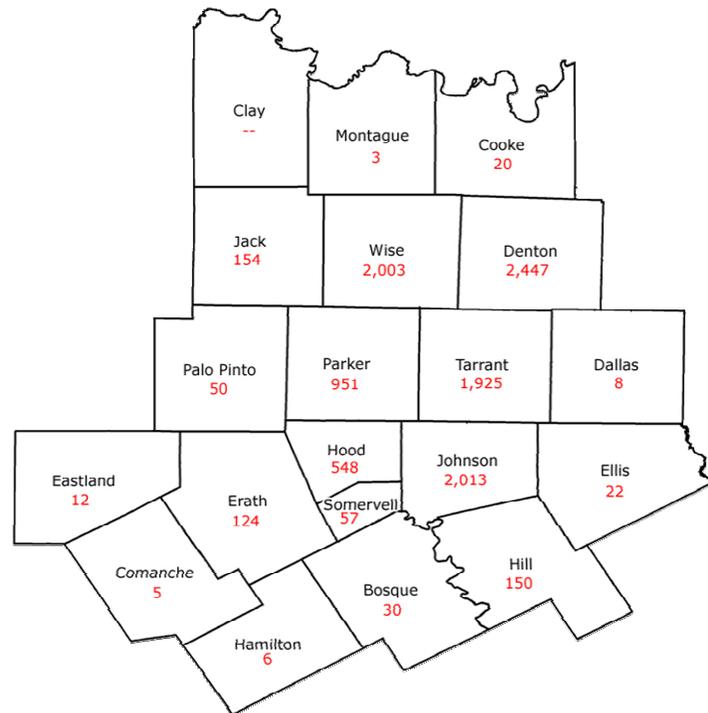
# Drilling Activity in the Barnett Shale

- In 2008, drilling permits continued to rise, totaling 4,145. When pending wells (where paperwork has not yet been completed) are included, the **March 3, 2009, total number of gas wells reaches 10,539, with 5,037 permitted locations** in the Newark, East (Barnett Shale) Field.



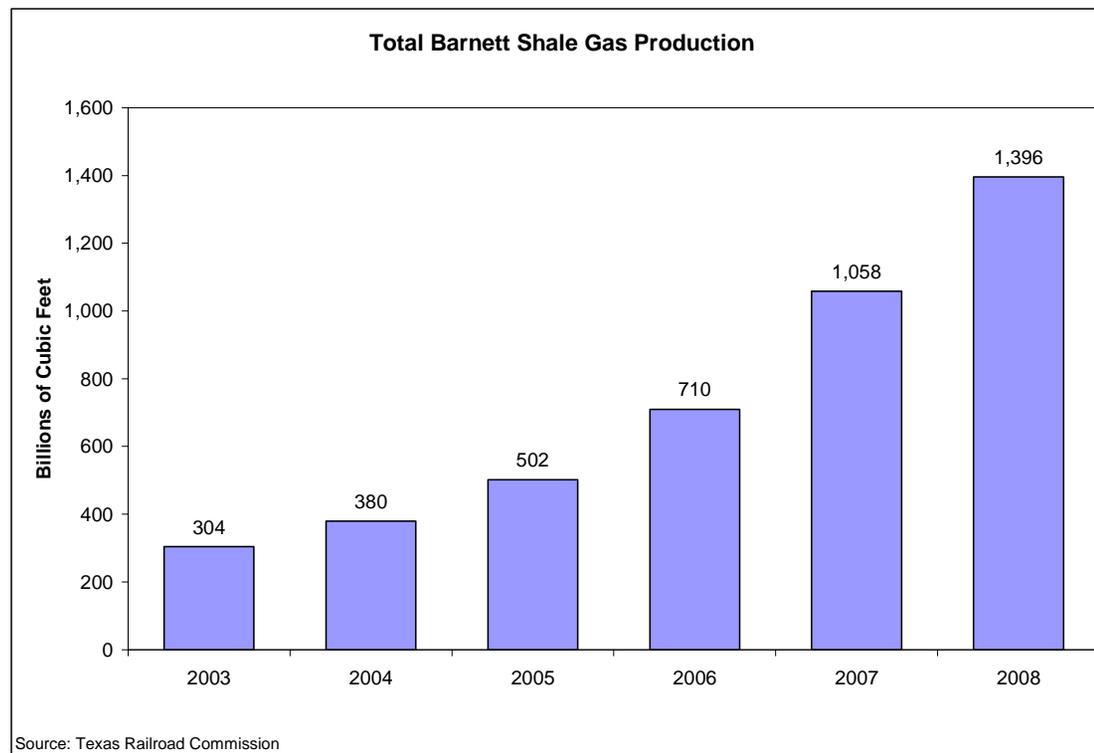
# Leases by County in the Barnett Shale

- There are roughly 10,500 leases in the Barnett Shale, with Denton, Johnson, and Wise counties holding the highest number of leases followed closely by Tarrant County.



# Production in the Barnett Shale

- Over the past two years, total gas production in the Barnett Shale has almost doubled, reaching 1.396 trillion cubic feet in 2008. The Barnett Shale accounted for an estimated 19% of Texas production last year, up from 15% in 2007 and 12% in 2006.

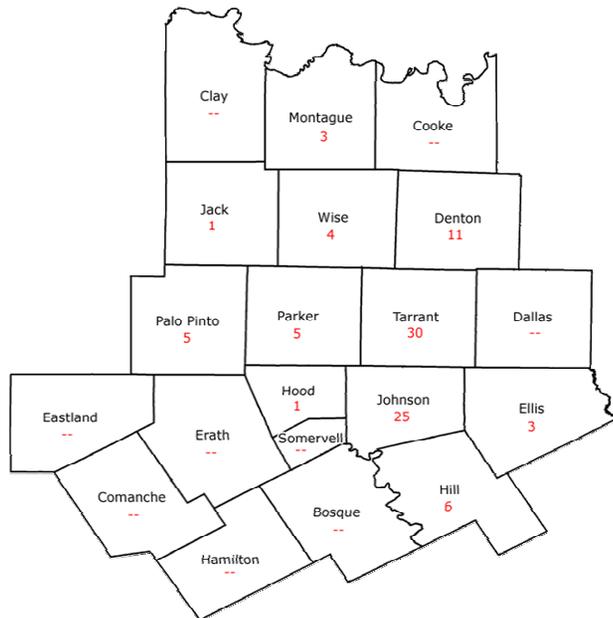


# Rig Count and Production by County in the Barnett Shale

- Rig activity continues to be concentrated in Tarrant and Johnson counties, which also had the highest total production last year.

## Rig Count

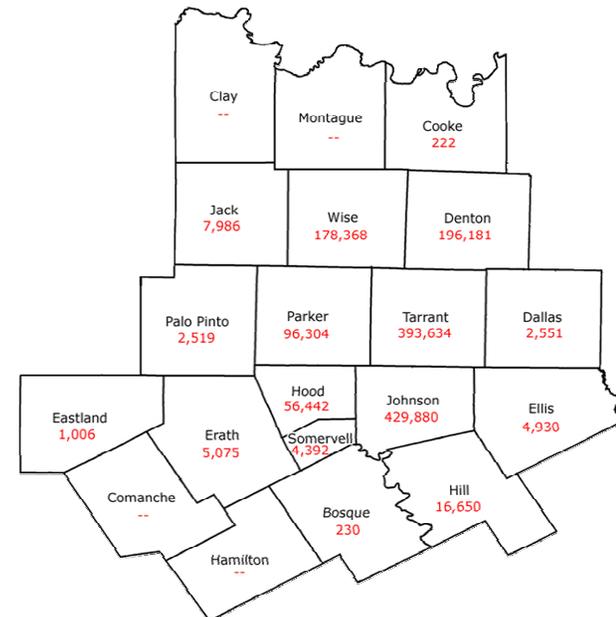
(as of February 27, 2009)



Source: Baker Hughes and The Perryman Group

## 2008 Production

(in millions of cubic feet)



Source: Texas Railroad Commission and The Perryman Group



# Firms Operating in the Barnett Shale

- As of January 2009, **222 companies were operating in the Barnett Shale**. The largest of these and their production totals for 2008 are noted in the table below.

<b>Major Operators in the Barnett Shale (2008)</b>				
<b>Operator Name</b>	<b>Oil (BBL)</b>	<b>Casinghead (MCF)</b>	<b>GW Gas (MCF)</b>	<b>Condensate (BBL)</b>
Devon Energy Production Co., L.P.	5,607	435,319	414,413,952	476,134
XTO Energy Inc.	11,301	616,595	216,929,729	117,502
Chesapeake Operating Inc.	0	0	195,270,756	45,454
EOG Resources Inc.	116,473	830,602	160,454,047	96,456
EnCana Oil & Gas (USA) Inc.	107,881	1,751,773	67,409,362	108,612
Quicksilver Resources Inc.	0	0	65,273,513	353,741
Range Production Company	0	0	41,080,459	45,962
Burlington Resources O&G Co., L.P.	0	0	35,170,531	325,289
Denbury Onshore LLC	0	0	28,132,964	19,791
Williams Prod. Gulf Coast, L.P.	0	0	22,408,094	139,171

Source: Texas Railroad Commission



# Projected Future Barnett Shale Activity

- Production in the Barnett Shale has not yet peaked. A recent estimate of the amount of natural gas still to be extracted in the Barnett Shale totaled 55 trillion cubic feet, up from 39 trillion cubic feet in a study last year. Ongoing exploration and advances in recovery methods are likely to further increase this estimate.
- As noted, **production reached an estimated level of 1.396 trillion cubic feet in 2008** (5.3% of the US total), **up from 1.058 trillion cubic feet in 2007**. Projections are that production in the field will continue to rise, reaching between 8 and 9 billion cubic feet per day by 2018.
- Cycles and volatility in the energy sector are inevitable, and periods of both rapid and slow development will occur in the future. However, the Barnett Shale will continue to be a key source of natural gas to meet US needs. As the economy (and, therefore, natural gas demand and prices) recovers, the pace of activity in the area will again gain momentum.
- While future production patterns will be determined by many factors (including technological development, natural gas prices, geology, and demand from major sectors), there is little doubt that the field will be a notable source of economic activity for years to come.





# THE POSITIVE EFFECTS OF THE BARNETT SHALE ON THE REGION



# Economic Impact of Barnett Shale Activity

- For the “current” component of this analysis, The Perryman Group analyzed the gains in business activity stemming from the Barnett Shale in 2008.
  - The past year has seen notable changes in the market for natural gas, from historic peaks in mid-summer 2008 to today’s much lower price level (and, hence, slower rate of exploration).
  - On balance, 2008 saw a significant rise in total activity compared to prior years.
- The Perryman Group also quantified the role of the Barnett Shale in the Fort Worth-area economy since the early stages of its development in 2001. This analysis clearly indicates the large and growing impact of the Barnett Shale over time.
- An outlook for this year (2009) is also included, which demonstrates that while the pace has certainly slowed, the Barnett Shale continues to generate tens of thousands of jobs and billions of dollars in business activity in the region.
- Simulations through 2015 of the Fort Worth area economy both “with” and “without” the Barnett Shale are also provided as an illustration of the importance of the resource in the years to come.





# The Current (2008) Economic Impact of Activity in the Barnett Shale



# Positive Effects of the Barnett Shale on the Region

- The last half of 2008 brought definite slowing in the pace of exploration of the Barnett Shale as natural gas prices fell from their summer peaks. Even so, the Fort Worth area continued to see substantial benefits from the presence of the Barnett Shale.
- **In fact, for 2008 as a whole, the positive effects of Barnett Shale activity are even higher than in years past, with incremental output of \$11.0 billion and 111,131 jobs.** These totals are up significantly from those The Perryman Group measured in 2006 (\$6.1 billion in annual output and 60,820 jobs) and 2007 (\$8.4 billion in output and 83,823 positions).
- Not only does this activity lead to a substantial direct business stimulus, it also serves as a catalyst for the creation of jobs and economic opportunities for thousands of area residents and companies.
- Property taxes and royalty payments generated by the expansion associated with the natural gas reserves continue to reshape the budgets of local school districts, cities, and others. Retail sales taxes, occupancy taxes, and other sources of fiscal revenue have also risen as the increase in activity works its way through the local and regional economies. Companies operating in the Barnett Shale continue to be important corporate citizens of the area, donating millions of dollars and substantial time to local **charities**.



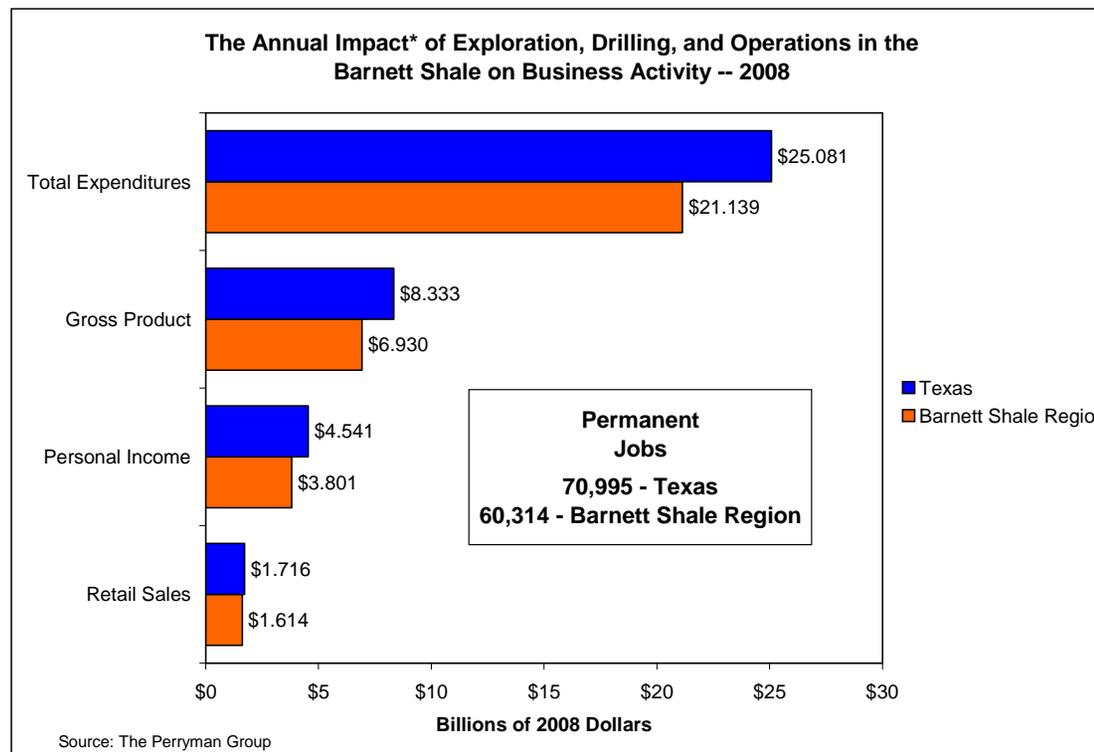
# Measuring the Economic Impact of Barnett Shale Activity

- Like all investments or corporate activity, the outlays related to the Barnett Shale are generating multiplier effects throughout the economy. Exploration, drilling, production, servicing, pipeline development and operations, royalty payments, and other direct expenditures bring substantial gains. In addition, these effects initiate a chain of spillover business stimulus throughout the area.
- Spillover effects include, among other things:
  - oil field service companies raising incomes, payrolls, and purchasing due to expanded business;
  - restaurants and retailers seeing increased patronage from drilling crews, royalty recipients, and others;
  - professionals such as attorneys, accountants, and engineers enlarging their client base with Barnett Shale-related transactions;
  - hotels and motels selling room-nights associated with business travel related to the Barnett Shale;
  - myriad other businesses enjoying higher volumes both directly and indirectly as a consequence of the Barnett Shale; and
  - residential development and other real estate activity as a result of increasing incomes and employment in the production area.
- The Perryman Group quantified these overall benefits utilizing the firm's impact assessment system which measures multiplier effects across industrial categories and geographic areas. (An explanation of this system, as well as terms used herein, may be found in Appendix A of this report; detailed findings by industry are presented in Appendix B.)



# Current Impact of Exploration, Drilling, and Operations

- For years, exploration, drilling, and operations activity have been a sizable stimulus for the region. The Perryman Group estimates these effects for 2008 to **include \$6.9 billion in output and 60,314 jobs**, up from almost \$5.6 billion in annual output and 48,811 jobs in 2007.

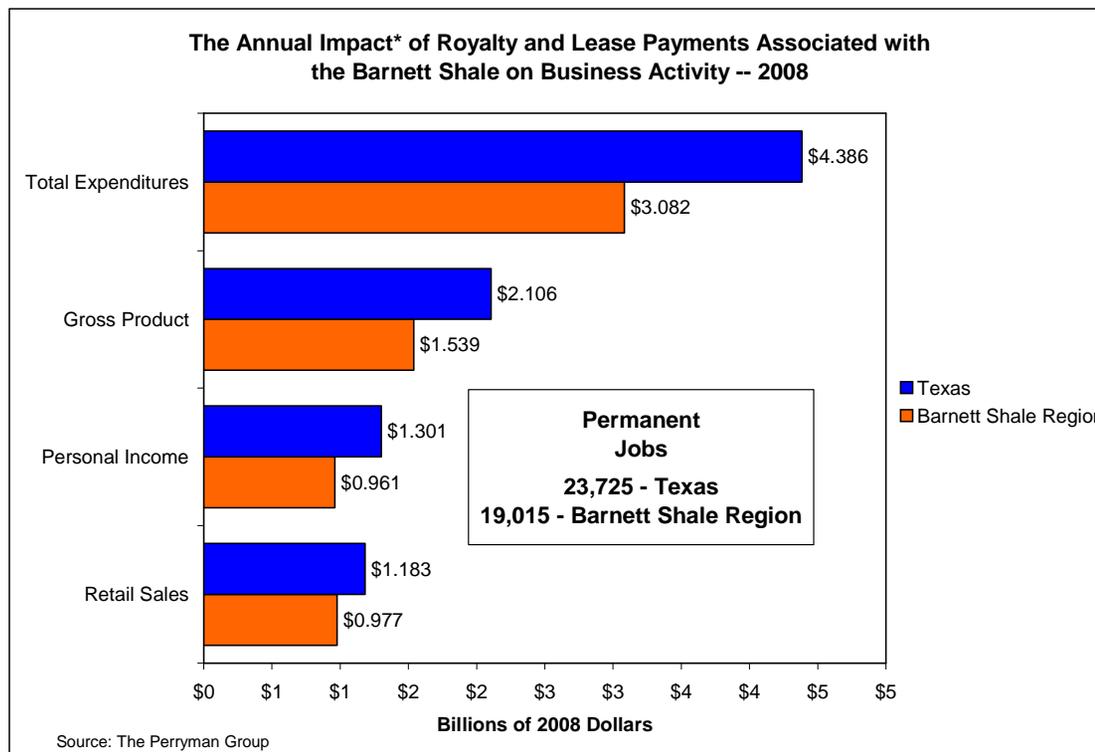


\*Impact based on average levels of activity during 2008.



# Current Impact of Royalty and Lease Payments

- While the pace of activity slowed in 2008, lease bonus payments and royalties nonetheless benefit individuals, organizations, and government entities in the area. For 2008, the addition to business activity is estimated to include some **\$1.5 billion in annual output and 19,015 jobs**, up from 2007's \$921 million in annual output and 11,383 jobs.

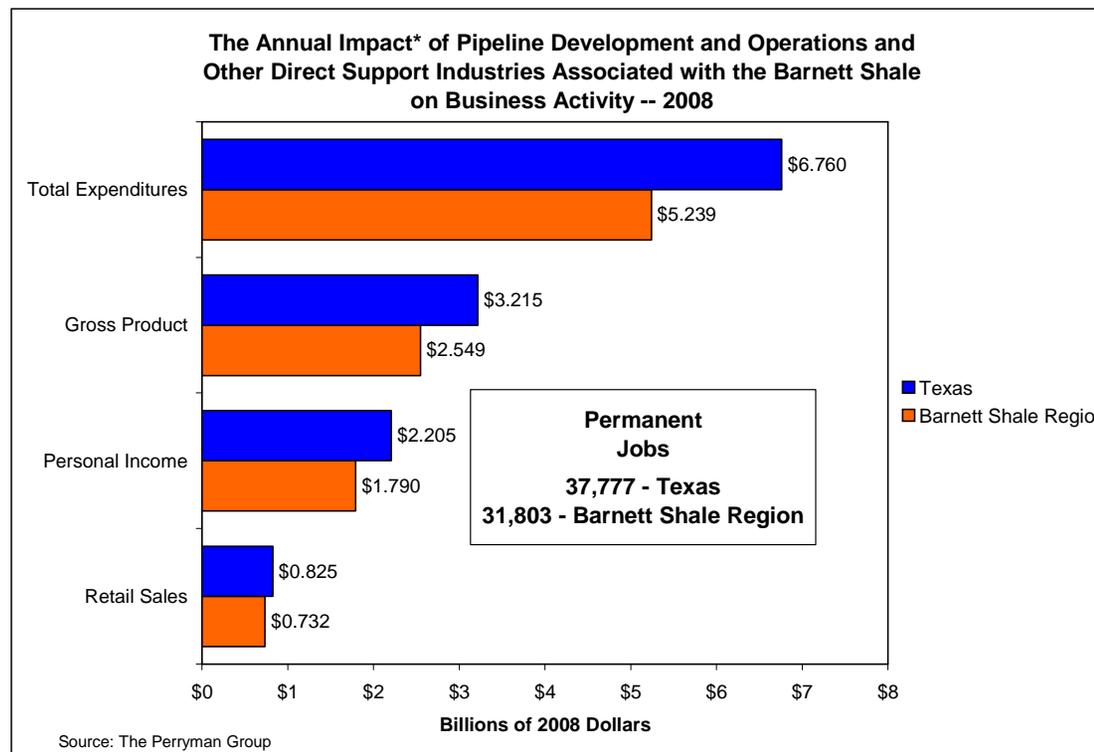


\*Impact based on average levels of activity during 2008.



# Current Impact of Pipeline Development and Operations and Other Direct Support Industries

- Last year brought a continued need for additional pipeline infrastructure and other direct support activity. The effect of such development and operations for 2008 includes **\$2.5 billion in annual output and 31,803 jobs**, compared to \$1.9 billion in annual output and 23,629 jobs in the region for 2007.

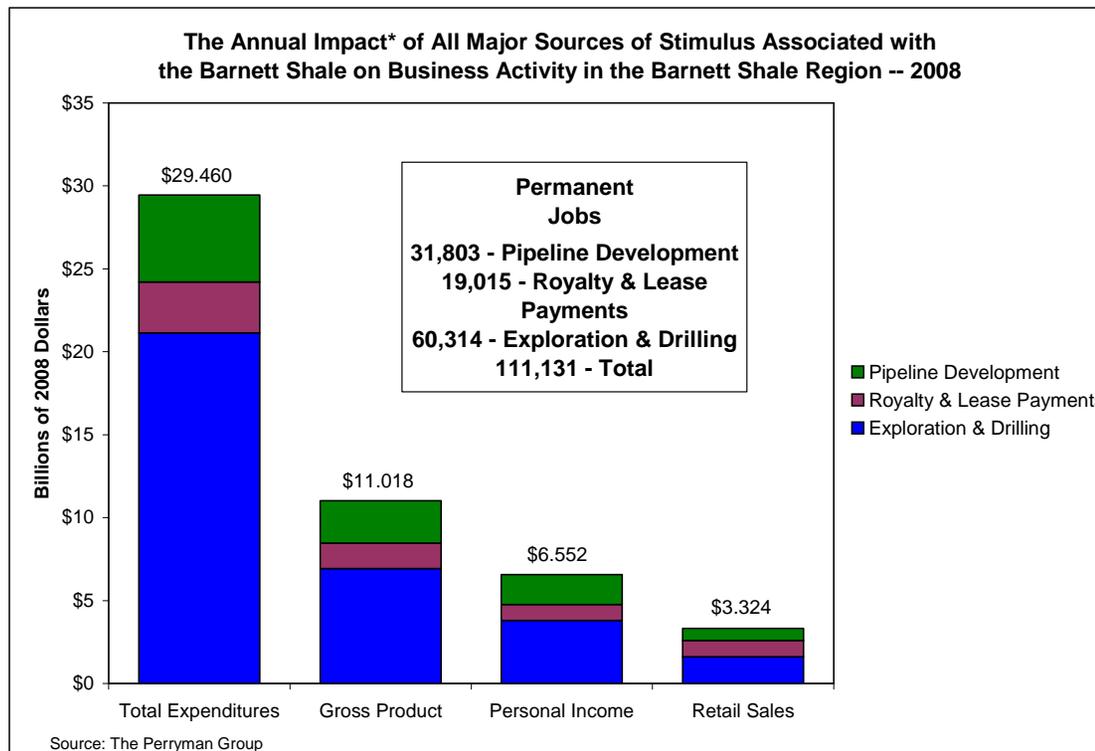


\*Impact based on average levels of activity during 2008.



# Current Impact of Activity in the Barnett Shale

- For 2008, the total effects of Barnett Shale activity were found to include \$11.0 billion in annual output and 111,131 jobs. Even with the recent slowing in new activity, the impact of the field and its development and production are substantial.



*The total impact of Barnett Shale activity is significantly higher than the levels for 2007 (\$8.4 billion in annual output and 83,823 permanent jobs) and 2006 (almost \$6.1 billion in annual output and 60,820 permanent jobs).*

\*Impact based on average levels of activity during 2008.



# Barnett Shale Activity as a Percentage of Total Economic Activity

- The Perryman Group calculated the percentage of total private-sector activity linked to the Barnett Shale and found that it is a major economic generator even in the large and dynamic Fort Worth-area economy.
- The total impact of Barnett Shale activity represents
  - ▣ 9.3% of private-sector gross product and
  - ▣ 10.4% of private-sector employment.
- These percentages are higher than those observed in 2007, when the Barnett Shale accounted for 8.1% of gross product and 8.9% of employment. These proportions will decline in 2009, as the energy sector is experiencing greater relative difficulty than the economy as a whole.
- Even in the current relatively slow period for new activity, exploration and production of natural gas from the Barnett Shale is a significant source of economic opportunity for the Fort Worth area.



# Royalties, Bonuses, and Charitable Contributions

- Over the past few years, landowners have received millions of dollars in signing bonuses and royalties. Local governments have used (or plan to use) this money for various long-term capital projects such as improvements to parks, additions to funding for foundations, road and bridge repairs, and many others.
- Institutions of higher education and the arts have also benefited through funding for scholarships and programs. Even now, activity in the Barnett Shale leads to sizable new lease bonuses and royalty payments for individuals and organizations. For example, the University of Texas at Arlington received its first monthly natural gas royalty of some \$500,000 this January.
- Although the large signing bonuses and high royalty rates have generally ceased with the decrease in the price of natural gas, already-signed deals with homeowners are being paid out and people are still seeing a flow of money. With recovery in natural gas prices, the bonuses and royalty payment rates can also be expected to rise in the years to come.
- Firms operating in the Barnett Shale have also given millions of dollars, thousands of hours of volunteer time, and generous in-kind donations to a variety of charities and community projects such as the United Way of Tarrant County, the Amon Carter Jr. Downtown YMCA, the North Texas Chapter of Big Brothers Big Sisters, and Camp Fire USA among many others.





# Growth in the Barnett Shale's Impact: 2001-2008



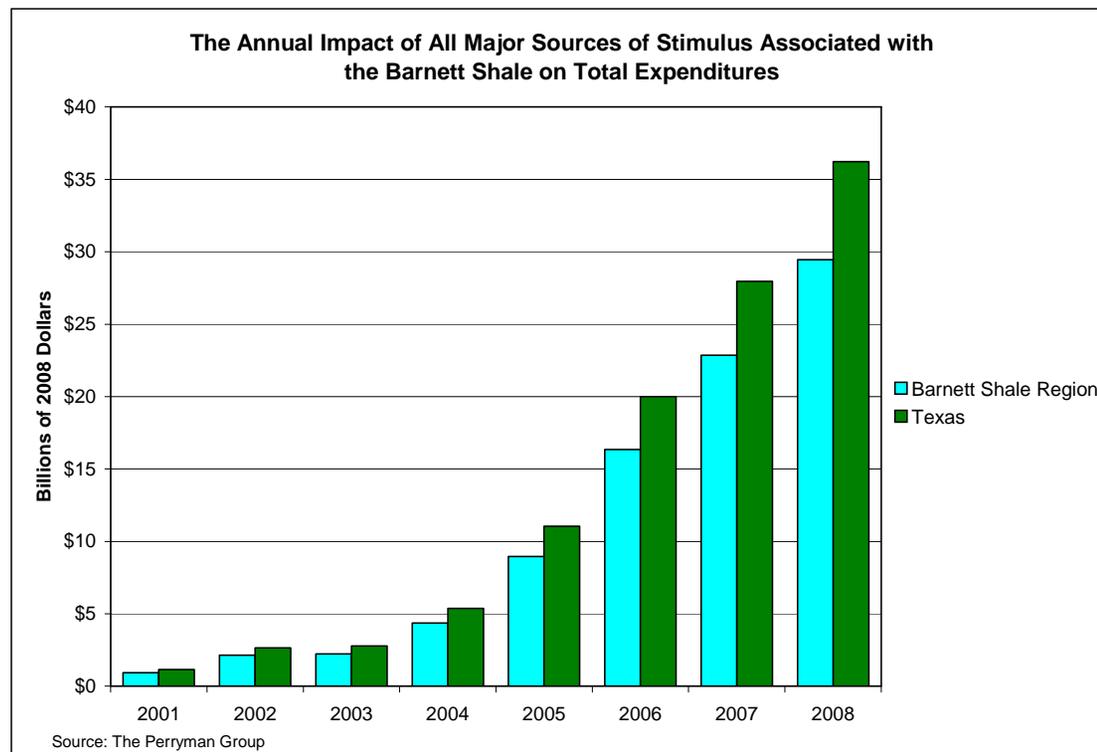
# Growth in the Barnett Shale's Impact Over Time

- The 2001-2008 time period saw rapid expansion in the impact of the Barnett Shale on business activity in the Fort Worth area.
- Through much of that time, the pace of growth in production exceeded earlier projections by a wide margin.
- People in many walks of life saw the inflow of thousands of dollars in lease bonus payments and royalties as did corporations, groups, institutions of higher education, and government entities.
- While the Fort Worth area has long been characterized by a diverse and vibrant economy, the Barnett Shale was “the icing on the cake” in terms of economic growth.
- The changes wrought by the investments, cash infusions, and other opportunities have permanently altered the regional economy for the better.



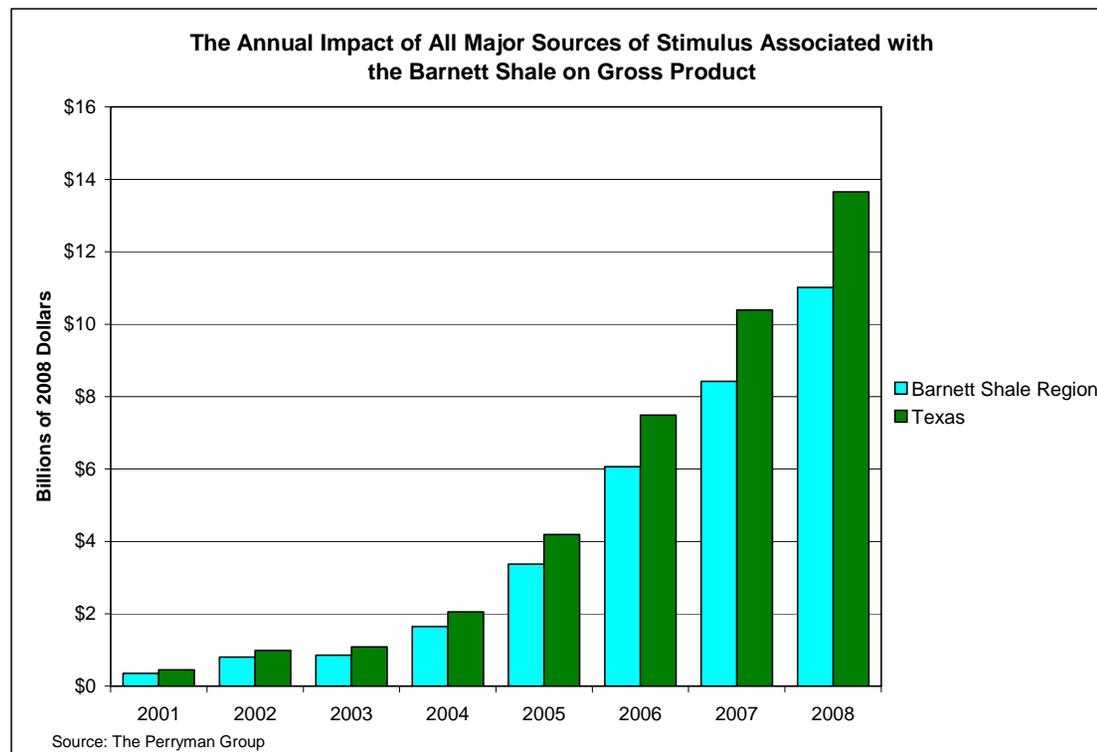
# Growth in the Barnett Shale's Impact Over Time: Total Expenditures

- Since 2001, total expenditures (a measure of the number of dollars changing hands in the economy through various rounds of multiplier or 'spin-off' activity) associated with the Barnett Shale have grown rapidly.



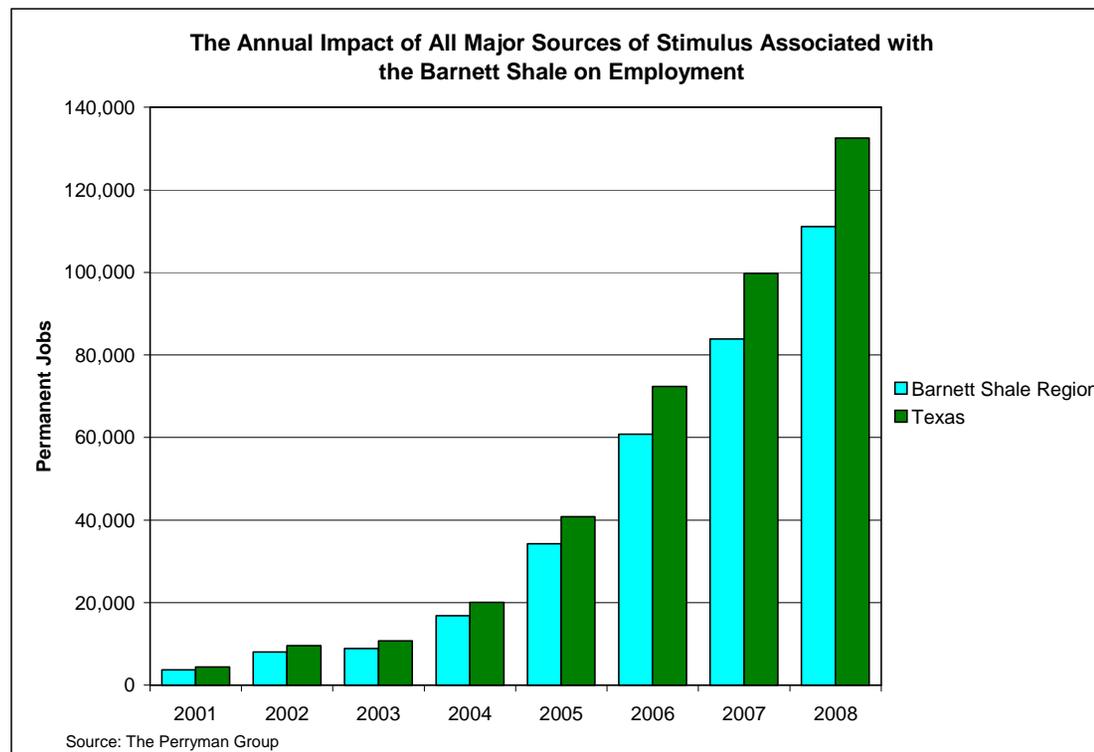
# Growth in the Barnett Shale's Impact Over Time: Output

- Output (real gross product) stemming from Barnett Shale activity has also grown rapidly.



# Growth in the Barnett Shale's Impact Over Time: Employment

- In terms of jobs, activity related to the Barnett Shale has led to tens of thousands of employment opportunities over time.



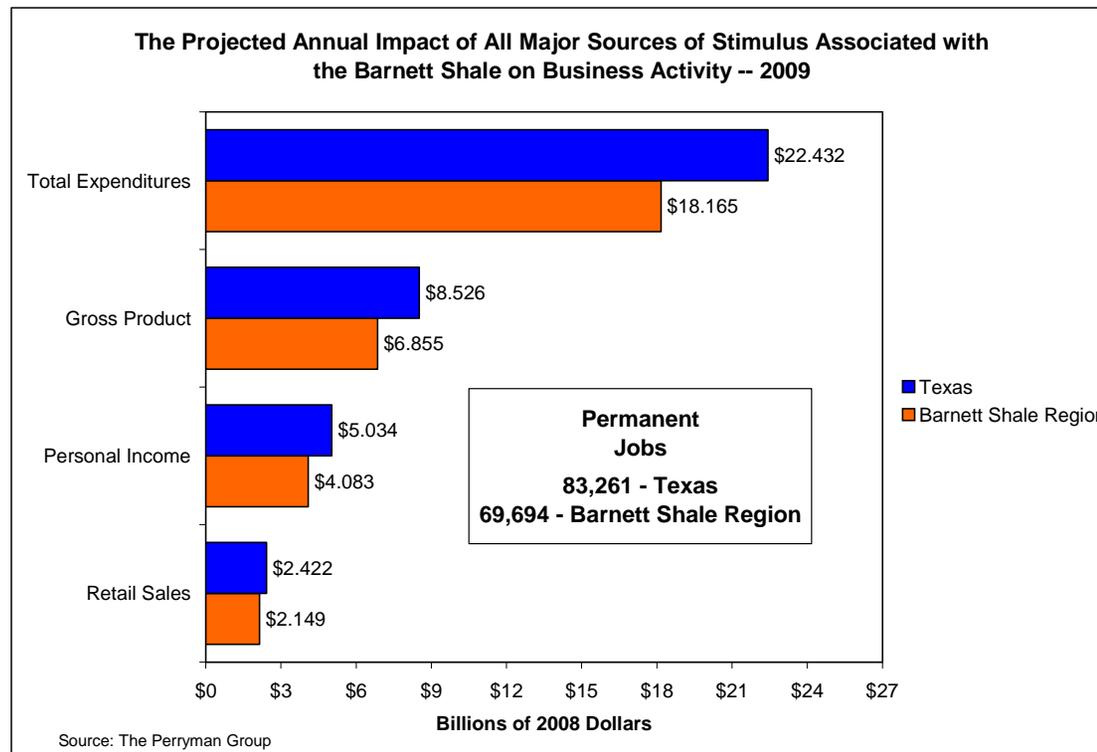


# The Coming Year: 2009



# The Coming Year: 2009

- As noted, the current price environment is not conducive to sustaining recent peak levels of drilling and exploration programs or the high lease and bonus payments of prior years. Even so, the Barnett Shale will continue to generate tens of thousands of jobs. Though likely to be down substantially from last year, the stimulus is still greater than just a few years ago and certainly higher than would be observed in the absence of this major natural gas formation.





# The Fort Worth Economy Through 2015: “With” and “Without” the Barnett Shale



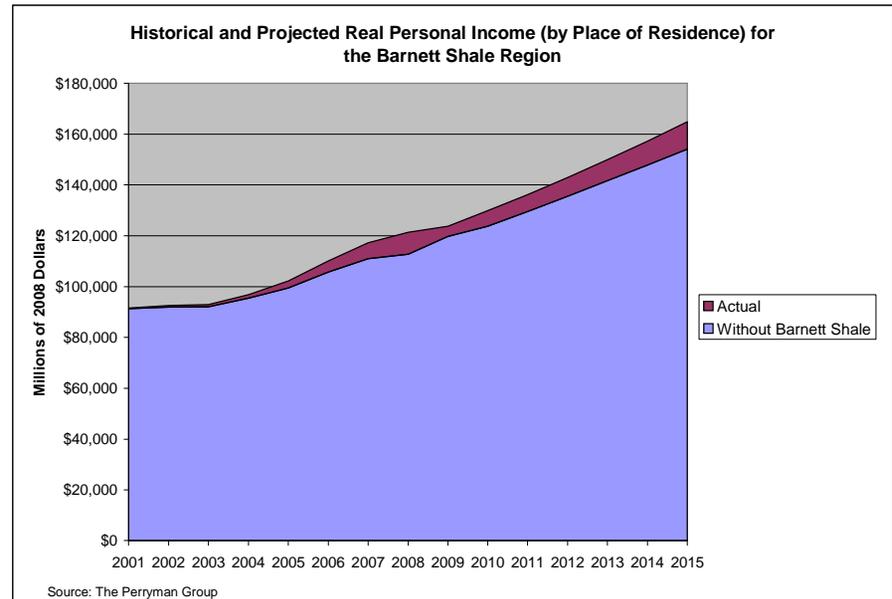
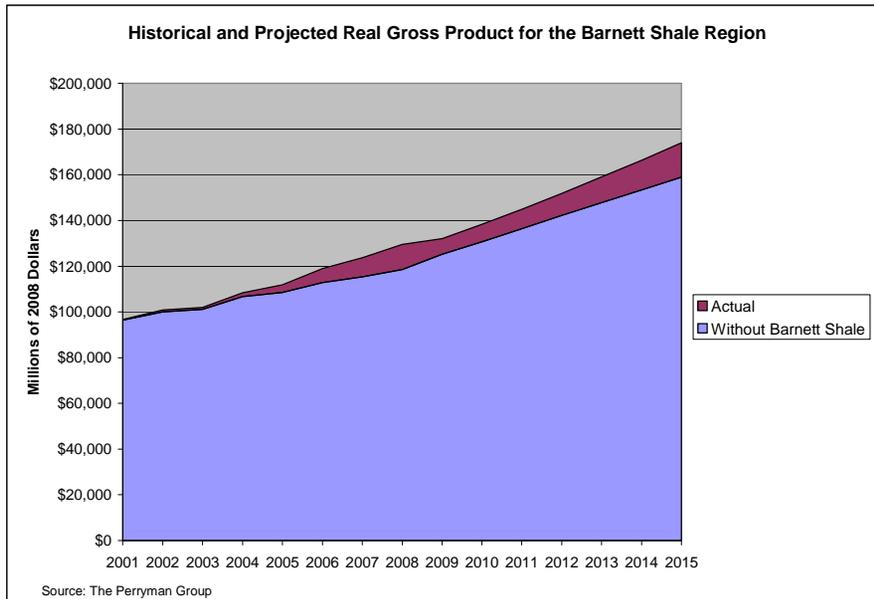
# The Fort Worth Area Economy “With” and “Without” the Barnett Shale

- Over the past several years, activity in the Barnett Shale has grown rapidly, generating substantial gains in economic output, incomes, jobs, and retail sales. Even with the recent slowing in exploration and leasing in the Barnett Shale, the Fort Worth economy is in a far better position thanks to the impetus of the Barnett Shale.
- In order to illustrate the magnitude of the positive impact of Barnett Shale activity on the regional economy, The Perryman Group analyzed its likely performance since 2001 if the field had never been developed.
- Using the firm’s Texas Econometric Model (described in Appendix A), TPG generated a simulation of the Fort Worth area economy as it likely would have progressed through 2015 if the Barnett Shale did not exist. This pattern was compared to the actual pace of expansion and baseline forecast. While growth would have occurred in either case, the pace of activity has been and will continue to be much more robust as a result of the presence of this valuable natural resource.



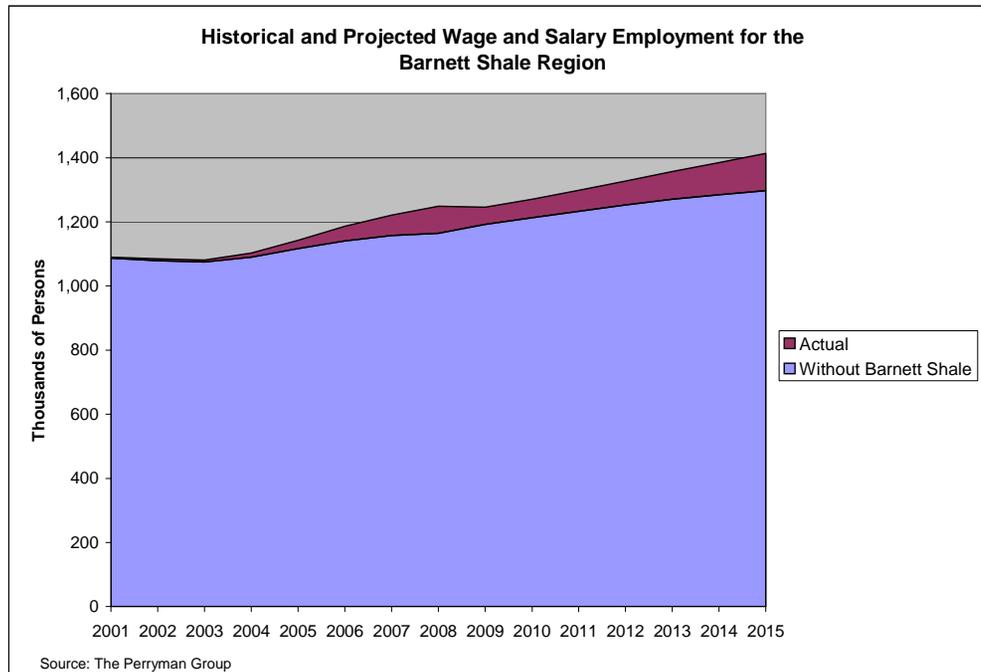
# Barnett Shale Benefits Fort Worth Economy

- As noted, the Fort Worth area business complex is large and diverse, with many sources of economic opportunity and growth. Even in the context of this vibrant economy, the Barnett Shale exerts a significant positive influence which is growing over time.



# Barnett Shale Generates Jobs

- In terms of jobs, the likely growth pattern for the region is significantly enhanced by the existence of the Barnett Shale.



*Since 2001, the Barnett Shale activity has cumulatively led to incremental benefits totaling \$32.56 billion in Gross Area Product (in constant 2008 dollars) and over 327,000 person-years of employment.*

*Assuming a modest recovery occurs as anticipated over the next few years, the aggregate benefits over the 2001-2015 period will exceed \$100 billion in output and 1 million person-years of employment.*





# CONCLUSION



# Conclusion

- The energy sector is characterized by cycles and volatility, and periods of greater and lesser activity are inevitable. The current environment of relatively low natural gas prices has contributed to slowing of new development of the Barnett Shale. However, the Barnett Shale continues to be an important component of the Fort Worth-area economy.
- Even with the dramatic retrenching in the national economy and weakness in the state outlook, Fort Worth and the surrounding area has continued to add jobs across a variety of industrial sectors for most of the past year. One reason for this performance is the past and current influence of the Barnett Shale.
- Predictions call for 20 to 30 more years of activity and decades more production, though the ultimate development will depend on factors such as the pace of technological advancement, gas prices, and geology.
- **In short, the Barnett Shale is, was, and will continue to be a vital segment of the local business activity, an important element of diversification, and a source of long-term expansion potential and economic opportunity for the region and the state.**





# APPENDICES





# **APPENDIX A:** Methods and Terms Used in This Analysis





# Methodology: Texas Econometric Model



# Texas Econometric Model

## Model Logic and Structure

- The projected values of overall baseline economic activity (which includes the effects of the Barnett Shale) were derived from a submodel of the Texas Econometric Model which reflects the specific economic characteristics and interactions within the Barnett Shale region. This system was also employed using information derived from the impact assessment process to simulate historical and projected values in the absence of this major natural gas formation. (Note that Dallas County was excluded from the region because its extensive economic complex and relatively minor level of drilling activity would skew the results.) Through this process, it was possible to derive findings regarding overall activity “with” and “without” the Barnett Shale using the simulation methods described below.
- The expanded version of the Texas Econometric Model, developed and maintained by The Perryman Group, revolves around a core system which projects output, income, and employment by industry in a simultaneous manner. For purposes of illustration, it is useful to initially consider the employment functions. Essentially, employment within the system is a derived demand relationship obtained from a neo-Classical production function. The expressions are augmented to include dynamic temporal adjustments to changes in relative factor input costs, output and (implicitly) productivity, and technological progress over time. Thus, the typical equation includes output, the relative real cost of labor and capital, dynamic lag structures, and a technological adjustment parameter. The functional form is logarithmic, thus preserving the theoretical consistency with the neo-Classical formulation.
- The income segment of the model is divided into wage and non-wage components. The wage equations, like their employment counterparts, are individually estimated at the North American Industry Classification System (NAICS) level of aggregation. Hence, income by place of work is measured for approximately 70 distinct production categories. The wage equations measure real compensation, with the form of the variable structure differing between “basic” and “non-basic.”



# Texas Econometric Model (continued)

- The basic industries, comprised primarily of the various components of Mining, Agriculture, and Manufacturing, are export-oriented, i.e., they bring external dollars into the area and form the core of the economy. The production of these sectors typically flows into national and international markets; hence, the labor markets are influenced by conditions in areas beyond the borders of the particular region. Thus, real (inflation-adjusted) wages in the basic industry are expressed as a function of the corresponding national rates, as well as measures of local labor market conditions (the reciprocal of the unemployment rate), dynamic adjustment parameters, and ongoing trends.
- The “non-basic” sectors are somewhat different in nature, as the strength of their labor markets is linked to the health of the local export sectors. Consequently, wages in these industries are related to those in the basic segment of the economy. The relationship also includes the local labor market measures contained in the basic wage equations.
- Note that compensation rates in the export or “basic” sectors provide a key element of the interaction of the regional economies with national and international market phenomena, while the “non-basic” or local industries are strongly impacted by area production levels. Given the wage and employment equations, multiplicative identities in each industry provide expressions for total compensation; these totals may then be aggregated to determine aggregate wage and salary income. Simple linkage equations are then estimated for the calculation of personal income by place of work.



# Texas Econometric Model (continued)

- The non-labor aspects of personal income are modeled at the regional level using straightforward empirical expressions relating to national performance, dynamic responses, and evolving temporal patterns. In some instances (such as dividends, rents, and others) national variables (for example, interest rates) directly enter the forecasting system. These factors have numerous other implicit linkages into the system resulting from their simultaneous interaction with other phenomena in national and international markets which are explicitly included in various expressions.
- The output or gross area product expressions are also developed at the NAICS level. Regional output for basic industries is linked to national performance in the relevant industries, local and national production in key related sectors, relative area and national labor costs in the industry, dynamic adjustment parameters, and ongoing changes in industrial interrelationships (driven by technological changes in production processes).
- Output in the non-basic sectors is modeled as a function of basic production levels, output in related local support industries (if applicable), dynamic temporal adjustments, and ongoing patterns. The interindustry linkages are obtained from the input-output (impact assessment) system which is part of the overall integrated modeling structure maintained by The Perryman Group. Note that the dominant component of the econometric system involves the simultaneous estimation and projection of output, income, and employment at a disaggregated industrial level.



# Texas Econometric Model (continued)

- Several other components of the model are critical to the multi-regional forecasting process. The demographic module includes (1) a linkage equation between wage and salary (establishment) employment and household employment, (2) a labor force participation rate function, and (3) a complete age-cohort-survival population system with endogenous migration. Given household employment, labor force participation (which is a function of economic conditions and evolving patterns of worker preferences), and the working age population (from the age-cohort-survival model), the unemployment rate and level become identities.
- The population system uses Census information, fertility rates, and life tables to determine the “natural” changes in population by age group. Migration, the most difficult segment of population dynamics to track, is estimated in relation to relative regional and extra-regional economic conditions over time. Because evolving economic conditions determine migration in the system, population changes are allowed to interact simultaneously with overall economic conditions.
- Retail sales is related to income, interest rates, dynamic adjustments, and patterns in consumer behavior on a store group basis. Inflation at the state level relates to national patterns, indicators of relative economic conditions, and ongoing trends.
- A final significant segment of the forecasting system relates to real estate absorption and activity. The short-term demand for various types of property is determined by underlying economic and demographic factors, with short-term adjustments to reflect the current status of the pertinent building cycle. In some instances, this portion of the forecast requires integration with the Multi-Regional Industry-Occupation System which is maintained by The Perryman Group.



# Texas Econometric Model (continued)

- The overall Texas Econometric Model contains numerous additional specifications, and individual expressions are modified to reflect alternative lag structures, empirical properties of the estimates, simulation requirements, and similar phenomena. Nonetheless, the above synopsis offers a basic understanding of the overall structure and underlying logic of the system.

## **Model Simulation and Multi-Regional Structure**

- The initial phase of the simulation process is the execution of a standard non-linear algorithm for the state system and that of each of the individual sub-areas. The external assumptions are derived from scenarios developed through national and international models and extensive analysis by The Perryman Group. In the present instance, simulations were also conducted based on a modified historical pattern for the area in the absence of the Barnett Shale. The incremental effects for the 2001-2008 period were derived from the annual simulations of the US Multi-Regional Impact Assessment System which are presented in the report (with detail in Appendix B).
- Once the initial simulations are completed, they are merged into a single system with additive constraints and interregional flows. Using information on minimum regional requirements, import needs, export potential, and locations, it becomes possible to balance the various forecasts into a mathematically consistent set of results. This process is, in effect, a disciplining exercise with regard to the individual regional (including metropolitan and rural) systems. By compelling equilibrium across all regions and sectors, the algorithm ensures that the patterns in state activity are reasonable in light of smaller area dynamics and, conversely, that the regional outlooks are within plausible performance levels for the state as a whole.



# Texas Econometric Model (continued)

- The iterative simulation process has the additional property of imposing a global convergence criterion across the entire multi-regional system, with balance being achieved simultaneously on both a sectoral and a geographic basis. This approach is particularly critical on non-linear dynamic systems, as independent simulations of individual systems often yield unstable, non-convergent outcomes.
- It should be noted that the underlying data for the modeling and simulation process are frequently updated and revised by the various public and private entities compiling them. Whenever those modifications to the database occur, they bring corresponding changes to the structural parameter estimates of the various systems and the solutions to the simulation and forecasting system. The multi-regional version of the Texas Econometric Model is automatically re-estimated and simulated with each such data release, thus providing a constantly evolving and current assessment of state and local business activity.



# Texas Econometric Model (continued)

## The Final Forecast

- The process described above is followed to produce the preliminary forecast. Through the comprehensive multi-regional modeling and simulation process, a systematic analysis is generated which accounts for both historical patterns in economic performance and inter-relationships and best available information on the future course of pertinent external factors. While the best available techniques and data are employed in this effort, they are not capable of directly capturing “street sense,” i.e., the contemporaneous and often non-quantifiable information that can materially affect economic outcomes. In order to provide a comprehensive approach to the prediction of business conditions, it is necessary to compile and assimilate extensive material regarding relevant events and patterns both across the state of Texas and elsewhere.
- The critical aspect of the forecasting methodology includes activities such as (1) daily review of hundreds of financial and business publications and electronic information sites; (2) review of all major newspapers in the state on a daily basis; (3) dozens of hours of direct telephone interviews with key business and political leaders in all parts of the state; (4) face-to-face discussions with representatives of major industry groups; and (5) frequent site visits to the various regions of the state. The insights arising from this “fact finding” are analyzed and evaluated for their effects on the likely course of the future activity.
- Another vital information resource stems from the firm’s ongoing interaction with key players in the international, domestic, and state economic scenes. Such activities include visiting with corporate groups on a regular basis and being regularly involved in the policy process at all levels. The firm is also an active participant in many major corporate relocations, economic development initiatives, and regulatory proceedings.



# Texas Econometric Model (continued)

- Once organized, this information is carefully assessed and, when appropriate, independently verified. The impact on specific communities and sectors that is distinct from what is captured by the econometric system is then factored into the forecast analysis. For example, the opening or closing of a major facility, particularly in a relatively small area, can cause a sudden change in business performance that will not be accounted for by either a modeling system based on historical relationships or expected (primarily national and international) factors.
- The final step in the forecasting process is the integration of this material into the results in a logical and mathematically consistent manner. In some instances, this task is accomplished through “constant adjustment factors” which augment relevant equations. In other cases, anticipated changes in industrial structure or regulatory parameters are initially simulated within the context of the US Multi-Regional Impact Assessment System to estimate their ultimate effects by sector. Those findings are then factored into the simulation as constant adjustments on a distributed temporal basis. Once this scenario is formulated, the extended system is again balanced across regions and sectors through an iterative simulation algorithm analogous to that described in the preceding section.





# Methodology: US Multi-Regional Impact Assessment System



# Impact Assessment System

- The basic modeling technique employed in this study is known as dynamic input-output analysis. This methodology essentially uses extensive survey data, industry information, and a variety of corroborative source materials to create a matrix describing the various goods and services (known as resources or inputs) required to produce one unit (a dollar's worth) of output for a given sector. Once the base information is compiled, it can be mathematically simulated to generate evaluations of the magnitude of successive rounds of activity involved in the overall production process.
- There are two essential steps in conducting an input-output analysis once the system is operational. The first major endeavor is to accurately define the levels of direct activity to be evaluated. The second step is the simulation of the input-output system to measure overall economic effects. In the case of a prospective evaluation, it is necessary to first calculate reasonable estimates of the direct activity.
- Once the direct input values were determined, the present study was conducted within the context of the US Multi-Regional Impact Assessment System (USMRIAS) which was developed and is maintained by The Perryman Group. This model has been used in hundreds of diverse applications across the country and has an excellent reputation for accuracy and credibility. In addition, the model has been in operation and continually updated for over two decades. The systems used in the current simulations reflect the unique industrial structures of the economies of the areas analyzed (the Barnett Shale region in the current analysis).



# Impact Assessment System (continued)

- In this instance, The Perryman Group utilized a variety of public and private sources of data regarding current and future production in the Barnett Shale and other information necessary to the analysis.
- The direct inputs for assessing the value of exploration, drilling, and production activity were obtained from (1) data from the Texas Railroad Commission and various industry sources and (2) employment information from the Texas Workforce Commission. This material was compiled by county on an annual basis and aggregated to the regional level. Information was compiled for the 2001-2008 period and projected for 2009 based on current patterns.
- The direct effects of royalties and related payments are based on current production levels and typical royalty rates. The amounts were fully adjusted to reflect those funds that are paid outside the region (and state) and are further reduced to account for out-of-area spending, savings, and taxes. The remaining financial resources are assumed to be spent in accordance with typical consumer patterns in the region as detailed by the US Department of Labor and ACCRA.



# Impact Assessment System (continued)

- The direct effects of pipeline development and operations was derived from (1) published reports and secondary research related to pipeline investments and (2) standard employment data in this sector. The estimates are also incorporated in a multiple regression analysis of patterns of pipeline and field development in other areas. The relevant equations exhibited excellent empirical properties and conformed to observed patterns.
- As noted earlier, as the direct effects are determined, they are simulated within the context of the relevant geographic submodels of the USMRIAS. The USMRIAS is somewhat similar in format to the Input-Output Model of the United States and the Regional Input-Output Modeling System, both of which are maintained by the US Department of Commerce. The model developed by TPG, however, incorporates several important enhancements and refinements. Specifically, the expanded system includes (1) comprehensive 500-sector coverage for any county, multi-county, or urban region; (2) calculation of both total expenditures and value-added by industry and region; (3) direct estimation of expenditures for multiple basic input choices (expenditures, output, income, or employment); (4) extensive parameter localization; (5) price adjustments for real and nominal assessments by sectors and areas; (6) measurement of the induced impacts associated with payrolls and consumer spending; (7) embedded modules to estimate multi-sectoral direct spending effects; (8) estimation of retail spending activity by consumers; and (9) comprehensive linkage and integration capabilities with a wide variety of econometric, real estate, occupational, and fiscal impact models. The models used for the present investigation have been thoroughly tested for reasonableness and historical reliability.



# Impact Assessment System (continued)

- The impact assessment (input-output) process essentially estimates the amounts of all types of goods and services required to produce one unit (a dollar's worth) of a specific type of output. For purposes of illustrating the nature of the system, it is useful to think of inputs and outputs in dollar (rather than physical) terms. As an example, the construction of a new building will require specific dollar amounts of lumber, glass, concrete, hand tools, architectural services, interior design services, paint, plumbing, and numerous other elements. Each of these suppliers must, in turn, purchase additional dollar amounts of inputs. This process continues through multiple rounds of production, thus generating subsequent increments to business activity. The initial process of building the facility is known as the *direct effect*. The ensuing transactions in the output chain constitute the *indirect effect*.
- Another pattern that arises in response to any direct economic activity comes from the payroll dollars received by employees at each stage of the production cycle. As workers are compensated, they use some of their income for taxes, savings, and purchases from external markets. A substantial portion, however, is spent locally on food, clothing, healthcare services, utilities, housing, recreation, and other items. Typical purchasing patterns in the relevant areas are obtained from the ACCRA *Cost of Living Index*, a privately compiled inter-regional measure which has been widely used for several decades, and the *Consumer Expenditure Survey* of the US Department of Labor. These initial outlays by area residents generate further secondary activity as local providers acquire inputs to meet this consumer demand. These consumer spending impacts are known as the *induced effect*. The USMRIAS is designed to provide realistic, yet conservative, estimates of these phenomena.



# Impact Assessment System (continued)

- Sources for information used in this process include the Bureau of the Census, the Bureau of Labor Statistics, the Regional Economic Information System of the US Department of Commerce, and other public and private sources. The pricing data are compiled from the US Department of Labor and the US Department of Commerce. The verification and testing procedures make use of extensive public and private sources. Note that all monetary values, unless otherwise noted, are given in constant (2008) dollars to eliminate the effects of inflation.
- The fiscal impacts are determined based on a fiscal report system that links the industrial findings for the assessment described above to the specific tax structure of Texas and the relevant local areas.
- The USMRIAS generates estimates of the effect on several measures of business activity. The most comprehensive measure of economic activity used in this study is **Total Expenditures**. This measure incorporates every dollar that changes hands in any transaction. For example, suppose a farmer sells wheat to a miller for \$0.50; the miller then sells flour to a baker for \$0.75; the baker, in turn, sells bread to a customer for \$1.25. The Total Expenditures recorded in this instance would be \$2.50, that is,  $\$0.50 + \$0.75 + \$1.25$ . This measure is quite broad, but is useful in that (1) it reflects the overall interplay of all industries in the economy, and (2) some key fiscal variables such as sales taxes are linked to aggregate spending.



# Impact Assessment System (continued)

- A second measure of business activity frequently employed in this analysis is that of **Gross Product**. This indicator represents the regional equivalent of Gross Domestic Product, the most commonly reported statistic regarding national economic performance. In other words, the Gross Product of, say, Amarillo is the amount of US output that is produced in that area. It is defined as the value of all final goods produced in a given region for a specific period of time. Stated differently, it captures the amount of value-added (gross area product) over intermediate goods and services at each stage of the production process, that is, it eliminates the double counting in the Total Expenditures concept. Using the example above, the Gross Product is \$1.25 (the value of the bread) rather than \$2.50. Alternatively, it may be viewed as the sum of the value-added by the farmer, \$0.50; the miller, \$0.25 ( $\$0.75 - \$0.50$ ); and the baker, \$0.50 ( $\$1.25 - \$0.75$ ). The total value-added is, therefore, \$1.25, which is equivalent to the final value of the bread. In many industries, the primary component of value-added is the wage and salary payments to employees.
- The third gauge of economic activity used in this evaluation is **Personal Income**. As the name implies, Personal Income is simply the income received by individuals, whether in the form of wages, salaries, interest, dividends, proprietors' profits, or other sources. It may thus be viewed as the segment of overall impacts which flows directly to the citizenry.



# Impact Assessment System (continued)

- The fourth measure, **Retail Sales**, represents the component of Total Expenditures which occurs in retail outlets (general merchandise stores, automobile dealers and service stations, building materials stores, food stores, drugstores, restaurants, and so forth). Retail Sales is a commonly used measure of consumer activity.
- The final aggregates used are **Permanent Jobs and Person-Years of Employment**. The Person-Years of Employment measure reveals the full-time equivalent jobs generated by an activity. It should be noted that, unlike the dollar values described above, Permanent Jobs is a “stock” rather than a “flow.” In other words, if an area produces \$1 million in output in 2007 and \$1 million in 2008, it is appropriate to say that \$2 million was achieved in the 2007-2008 period. If the same area has 100 people working in 2007 and 100 in 2008, it only has 100 Permanent Jobs. When a flow of jobs is measured, such as in a construction project or a cumulative assessment over multiple years, it is appropriate to measure employment in Person-Years (a person working for a year). This concept is distinct from Permanent Jobs, which anticipates that the relevant positions will be maintained on a continuing basis.





**APPENDIX B:**  
Detailed Sectoral Results  
and  
Simulations “With” and “Without” the  
Barnett Shale



# Detailed Sectoral Results: 2001 Barnett Shale Impact

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in the Barnett Shale Region 2001  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$9,456,150	\$2,608,844	\$1,776,743	22
Forestry & Fishery Products	\$109,678	\$122,639	\$45,502	0
Coal Mining	\$411,209	\$119,125	\$125,488	0
Crude Petroleum & Natural Gas	\$378,303,748	\$82,906,595	\$38,236,361	206
Miscellaneous Mining	\$394,681	\$169,805	\$99,817	1
New Construction	\$57,308,234	\$26,051,005	\$21,467,665	333
Maintenance & Repair Construction	\$33,161,655	\$17,773,911	\$14,646,810	212
Food Products & Tobacco	\$10,340,067	\$2,665,456	\$1,361,592	19
Textile Mill Products	\$34,397	\$9,570	\$8,086	0
Apparel	\$3,164,124	\$1,748,259	\$885,738	18
Paper & Allied Products	\$1,777,420	\$800,931	\$362,093	3
Printing & Publishing	\$4,067,097	\$2,042,892	\$1,333,416	16
Chemicals & Petroleum Refining	\$10,951,061	\$1,827,039	\$857,836	5
Rubber and Leather Products	\$2,434,112	\$1,037,690	\$606,617	9
Lumber Products & Furniture	\$1,307,087	\$436,074	\$310,967	3
Stone, Clay, & Glass Products	\$3,185,428	\$1,632,167	\$853,549	11
Primary Metal	\$2,657,013	\$808,579	\$601,859	10
Fabricated Metal Products	\$12,607,907	\$4,812,647	\$3,107,103	54
Machinery, Except Electrical	\$3,929,000	\$1,651,501	\$1,179,848	12
Electric & Electronic Equipment	\$2,023,650	\$1,104,601	\$660,347	4
Motor Vehicles & Equipment	\$1,410,260	\$322,309	\$209,419	2
Transp Equip, Except Motor Vehicles	\$538,745	\$226,266	\$147,729	1
Instruments & Related Products	\$256,894	\$109,704	\$83,412	1
Miscellaneous Manufacturing	\$958,806	\$364,725	\$251,587	2
Transportation	\$19,408,690	\$12,860,876	\$8,505,768	102
Communication	\$9,984,793	\$6,180,347	\$2,638,621	18
Electric, Gas, Water, Sanitary Serv	\$29,730,573	\$6,666,933	\$2,909,264	7
Wholesale Trade	\$17,800,474	\$12,037,379	\$6,940,819	70
Retail Trade	\$79,547,684	\$65,941,492	\$39,430,993	1,119
Finance	\$9,996,376	\$5,482,921	\$3,192,744	23
Insurance	\$6,668,110	\$3,999,894	\$2,391,255	22
Real Estate	\$92,193,715	\$17,308,113	\$2,788,695	22
Hotels, Lodging Places, Amusements	\$6,662,755	\$3,496,688	\$2,293,913	53
Personal Services	\$16,844,058	\$10,421,217	\$8,107,911	135
Business Services	\$25,721,195	\$15,493,279	\$12,638,591	149
Eating & Drinking Places	\$38,132,104	\$22,352,192	\$11,892,637	581
Health Services	\$22,662,013	\$15,938,583	\$13,476,313	230
Miscellaneous Services	\$21,868,096	\$8,894,199	\$7,710,472	179
Households	\$788,853	\$788,853	\$772,140	45
<b>Total</b>	<b>\$938,797,907</b>	<b>\$359,215,298</b>	<b>\$214,909,720</b>	<b>3,698</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

All monetary values in constant (2008) dollars.

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in Texas 2001  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$12,670,194	\$3,490,947	\$2,377,373	30
Forestry & Fishery Products	\$284,717	\$314,509	\$116,421	1
Coal Mining	\$1,682,703	\$487,512	\$513,406	2
Crude Petroleum & Natural Gas	\$406,767,644	\$89,140,163	\$41,111,510	220
Miscellaneous Mining	\$578,161	\$248,713	\$146,210	1
New Construction	\$57,308,234	\$26,051,005	\$21,467,665	333
Maintenance & Repair Construction	\$36,534,662	\$19,546,474	\$16,107,573	232
Food Products & Tobacco	\$28,341,034	\$7,304,557	\$3,731,677	51
Textile Mill Products	\$357,620	\$99,569	\$84,394	1
Apparel	\$5,768,512	\$3,186,504	\$1,614,603	32
Paper & Allied Products	\$4,123,220	\$1,853,677	\$837,981	6
Printing & Publishing	\$6,181,925	\$3,106,661	\$2,027,617	23
Chemicals & Petroleum Refining	\$30,957,284	\$5,140,853	\$2,414,031	16
Rubber and Leather Products	\$3,795,688	\$1,619,633	\$946,575	14
Lumber Products & Furniture	\$1,696,884	\$567,967	\$405,109	4
Stone, Clay, & Glass Products	\$3,884,418	\$1,994,699	\$1,043,103	13
Primary Metal	\$6,645,510	\$2,018,021	\$1,502,038	24
Fabricated Metal Products	\$13,917,948	\$5,310,853	\$3,428,541	59
Machinery, Except Electrical	\$6,581,499	\$2,763,321	\$1,974,121	22
Electric & Electronic Equipment	\$3,526,204	\$1,919,386	\$1,147,015	6
Motor Vehicles & Equipment	\$2,003,057	\$454,111	\$294,862	2
Transp Equip, Except Motor Vehicles	\$1,006,838	\$421,846	\$275,604	1
Instruments & Related Products	\$839,909	\$358,791	\$272,840	2
Miscellaneous Manufacturing	\$1,653,386	\$630,125	\$434,679	3
Transportation	\$22,962,022	\$15,249,423	\$10,085,496	122
Communication	\$17,620,956	\$10,887,686	\$4,648,274	34
Electric, Gas, Water, Sanitary Serv	\$46,777,357	\$10,489,110	\$4,577,045	11
Wholesale Trade	\$28,856,470	\$19,515,431	\$11,252,827	116
Retail Trade	\$90,496,564	\$75,013,355	\$44,855,764	1,270
Finance	\$12,753,991	\$6,976,095	\$4,062,148	28
Insurance	\$14,396,831	\$8,633,291	\$5,161,083	47
Real Estate	\$128,254,869	\$25,857,319	\$4,166,152	35
Hotels, Lodging Places, Amusements	\$8,545,580	\$4,478,402	\$2,938,022	63
Personal Services	\$19,398,340	\$12,008,467	\$9,342,759	162
Business Services	\$41,899,642	\$25,580,266	\$20,866,966	242
Eating & Drinking Places	\$42,979,014	\$25,190,449	\$13,402,688	652
Health Services	\$28,605,393	\$20,102,804	\$16,997,220	288
Miscellaneous Services	\$24,176,128	\$9,800,694	\$8,496,408	198
Households	\$1,062,928	\$1,062,928	\$1,040,442	63
<b>Total</b>	<b>\$1,165,893,238</b>	<b>\$448,875,614</b>	<b>\$266,168,244</b>	<b>4,427</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

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# Detailed Sectoral Results: 2002 Barnett Shale Impact

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in the Barnett Shale Region 2002  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$20,218,905	\$5,591,486	\$3,808,058	51
Forestry & Fishery Products	\$233,871	\$264,271	\$98,045	1
Coal Mining	\$880,259	\$255,189	\$268,867	1
Crude Petroleum & Natural Gas	\$941,470,501	\$206,327,647	\$95,157,971	514
Miscellaneous Mining	\$936,878	\$403,183	\$236,952	2
New Construction	\$142,850,438	\$64,936,523	\$53,511,774	830
Maintenance & Repair Construction	\$77,471,266	\$41,644,946	\$34,318,066	511
Food Products & Tobacco	\$22,416,688	\$5,780,423	\$2,952,827	45
Textile Mill Products	\$74,680	\$21,458	\$18,152	0
Apparel	\$6,879,037	\$3,800,240	\$1,925,451	45
Paper & Allied Products	\$3,636,005	\$1,644,870	\$743,624	7
Printing & Publishing	\$8,725,676	\$4,377,176	\$2,857,041	39
Chemicals & Petroleum Refining	\$24,156,304	\$4,078,483	\$1,914,996	11
Rubber and Leather Products	\$5,329,579	\$2,269,251	\$1,326,580	23
Lumber Products & Furniture	\$2,901,896	\$962,158	\$686,112	8
Stone, Clay, & Glass Products	\$7,433,030	\$3,787,259	\$1,980,672	27
Primary Metal	\$6,470,356	\$1,973,297	\$1,468,845	24
Fabricated Metal Products	\$30,367,627	\$11,615,785	\$7,499,227	134
Machinery, Except Electrical	\$9,367,750	\$3,945,878	\$2,819,013	30
Electric & Electronic Equipment	\$4,586,832	\$2,512,490	\$1,501,971	10
Motor Vehicles & Equipment	\$3,049,368	\$698,562	\$453,907	4
Transp Equip, Except Motor Vehicles	\$1,185,720	\$496,705	\$324,425	2
Instruments & Related Products	\$559,676	\$240,376	\$182,735	1
Miscellaneous Manufacturing	\$2,095,787	\$793,124	\$547,043	5
Transportation	\$42,612,120	\$28,087,595	\$18,576,234	237
Communication	\$19,876,817	\$12,301,859	\$5,252,071	37
Electric, Gas, Water, Sanitary Serv	\$61,489,796	\$13,786,401	\$6,016,002	16
Wholesale Trade	\$39,415,262	\$26,651,830	\$15,367,645	166
Retail Trade	\$156,192,674	\$129,490,306	\$77,431,122	2,205
Finance	\$22,578,032	\$12,431,519	\$7,238,944	57
Insurance	\$14,519,165	\$8,712,192	\$5,208,432	54
Real Estate	\$195,243,590	\$40,329,275	\$6,497,864	56
Hotels, Lodging Places, Amusements	\$13,505,631	\$7,079,133	\$4,644,102	112
Personal Services	\$32,695,812	\$20,197,232	\$15,713,813	271
Business Services	\$57,962,659	\$35,138,182	\$28,663,818	356
Eating & Drinking Places	\$76,780,612	\$45,017,039	\$23,951,559	1,172
Health Services	\$45,507,645	\$31,938,771	\$27,004,670	467
Miscellaneous Services	\$46,250,216	\$18,941,958	\$16,421,031	395
Households	\$1,773,326	\$1,773,326	\$1,735,739	112
<b>Total</b>	<b>\$2,149,701,485</b>	<b>\$800,297,399</b>	<b>\$476,325,399</b>	<b>8,042</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

All monetary values in constant (2008) dollars.

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in Texas 2002  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$26,573,172	\$7,339,608	\$4,998,442	67
Forestry & Fishery Products	\$583,254	\$651,334	\$241,126	2
Coal Mining	\$3,517,249	\$1,019,299	\$1,073,702	4
Crude Petroleum & Natural Gas	\$1,010,312,580	\$221,405,437	\$102,112,220	549
Miscellaneous Mining	\$1,353,836	\$582,672	\$342,428	2
New Construction	\$142,850,438	\$64,936,523	\$53,511,774	830
Maintenance & Repair Construction	\$84,518,836	\$45,366,394	\$37,384,972	555
Food Products & Tobacco	\$60,401,847	\$15,573,152	\$7,955,898	120
Textile Mill Products	\$756,575	\$217,666	\$184,284	2
Apparel	\$12,511,602	\$6,910,236	\$3,501,578	81
Paper & Allied Products	\$8,662,368	\$3,905,757	\$1,765,679	16
Printing & Publishing	\$13,135,608	\$6,592,396	\$4,302,817	58
Chemicals & Petroleum Refining	\$68,669,544	\$11,527,915	\$5,413,141	40
Rubber and Leather Products	\$8,227,222	\$3,506,194	\$2,049,216	35
Lumber Products & Furniture	\$3,719,524	\$1,237,042	\$882,097	10
Stone, Clay, & Glass Products	\$9,019,886	\$4,604,462	\$2,408,068	32
Primary Metal	\$16,031,238	\$4,882,555	\$3,634,248	59
Fabricated Metal Products	\$33,343,127	\$12,753,455	\$8,233,327	147
Machinery, Except Electrical	\$15,571,157	\$6,553,901	\$4,682,034	55
Electric & Electronic Equipment	\$7,980,917	\$4,358,384	\$2,604,683	15
Motor Vehicles & Equipment	\$4,341,869	\$985,405	\$639,841	5
Transp Equip, Except Motor Vehicles	\$2,226,675	\$930,772	\$608,066	3
Instruments & Related Products	\$1,865,928	\$801,032	\$609,195	4
Miscellaneous Manufacturing	\$3,599,314	\$1,364,643	\$941,314	9
Transportation	\$49,573,669	\$32,744,025	\$21,655,897	281
Communication	\$35,931,913	\$22,201,553	\$9,478,491	78
Electric, Gas, Water, Sanitary Serv	\$97,137,341	\$21,776,916	\$9,502,643	27
Wholesale Trade	\$63,703,875	\$43,079,081	\$24,839,915	274
Retail Trade	\$174,623,397	\$144,760,916	\$86,562,804	2,462
Finance	\$28,325,345	\$15,558,605	\$9,059,696	69
Insurance	\$31,125,178	\$18,670,019	\$11,161,318	118
Real Estate	\$272,169,926	\$59,785,498	\$9,632,703	86
Hotels, Lodging Places, Amusements	\$17,257,497	\$9,033,417	\$5,926,379	135
Personal Services	\$37,080,719	\$22,921,464	\$17,833,264	315
Business Services	\$93,810,148	\$57,504,754	\$46,909,084	573
Eating & Drinking Places	\$85,024,308	\$49,844,050	\$26,519,769	1,293
Health Services	\$57,187,505	\$40,104,598	\$33,908,824	583
Miscellaneous Services	\$50,168,207	\$20,479,976	\$17,754,429	426
Households	\$2,327,942	\$2,327,942	\$2,278,751	149
<b>Total</b>	<b>\$2,635,220,734</b>	<b>\$988,799,047</b>	<b>\$583,104,116</b>	<b>9,570</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

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# Detailed Sectoral Results: 2003 Barnett Shale Impact

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in the Barnett Shale Region 2003  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$22,988,132	\$6,337,647	\$4,316,232	53
Forestry & Fishery Products	\$266,846	\$297,446	\$110,361	1
Coal Mining	\$999,313	\$289,434	\$304,876	1
Crude Petroleum & Natural Gas	\$874,717,100	\$191,696,960	\$88,410,245	476
Miscellaneous Mining	\$927,958	\$399,203	\$234,682	2
New Construction	\$132,430,759	\$60,199,977	\$49,608,562	770
Maintenance & Repair Construction	\$78,390,963	\$41,974,435	\$34,589,538	494
Food Products & Tobacco	\$25,032,607	\$6,452,258	\$3,295,994	45
Textile Mill Products	\$83,235	\$22,926	\$19,366	0
Apparel	\$7,653,557	\$4,228,990	\$2,142,543	42
Paper & Allied Products	\$4,376,693	\$1,970,019	\$890,627	7
Printing & Publishing	\$9,877,209	\$4,963,232	\$3,239,546	36
Chemicals & Petroleum Refining	\$26,371,091	\$4,383,285	\$2,058,031	10
Rubber and Leather Products	\$5,875,004	\$2,505,534	\$1,464,691	22
Lumber Products & Furniture	\$3,141,247	\$1,050,019	\$748,777	8
Stone, Clay, & Glass Products	\$7,532,985	\$3,867,020	\$2,022,238	25
Primary Metal	\$6,191,723	\$1,882,819	\$1,401,447	22
Fabricated Metal Products	\$29,494,232	\$11,250,315	\$7,263,360	124
Machinery, Except Electrical	\$9,223,727	\$3,874,261	\$2,767,797	28
Electric & Electronic Equipment	\$4,831,431	\$2,634,238	\$1,574,799	9
Motor Vehicles & Equipment	\$3,416,855	\$780,350	\$507,025	4
Transp Equip, Except Motor Vehicles	\$1,298,248	\$545,682	\$356,234	2
Instruments & Related Products	\$620,992	\$264,722	\$201,289	1
Miscellaneous Manufacturing	\$2,315,391	\$882,153	\$608,527	5
Transportation	\$46,805,714	\$31,065,506	\$20,545,720	241
Communication	\$24,772,433	\$15,334,018	\$6,546,684	43
Electric, Gas, Water, Sanitary Serv	\$72,980,669	\$16,366,357	\$7,141,824	15
Wholesale Trade	\$42,814,134	\$28,953,381	\$16,694,661	165
Retail Trade	\$198,092,552	\$164,205,330	\$98,189,797	2,785
Finance	\$23,893,267	\$13,089,077	\$7,621,868	53
Insurance	\$16,121,664	\$9,669,696	\$5,780,821	50
Real Estate	\$224,763,439	\$40,950,452	\$6,597,972	52
Hotels, Lodging Places, Amusements	\$16,448,356	\$8,635,253	\$5,664,931	128
Personal Services	\$42,073,718	\$26,041,109	\$20,260,502	334
Business Services	\$61,523,295	\$36,982,863	\$30,168,662	350
Eating & Drinking Places	\$94,311,194	\$55,279,753	\$29,411,994	1,437
Health Services	\$56,091,192	\$39,472,794	\$33,374,861	568
Miscellaneous Services	\$53,333,958	\$21,647,578	\$18,766,486	430
Households	\$1,888,356	\$1,888,356	\$1,848,355	105
<b>Total</b>	<b>\$2,233,971,236</b>	<b>\$862,334,446</b>	<b>\$516,751,926</b>	<b>8,943</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

All monetary values in constant (2008) dollars.

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in Texas 2003  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$30,977,130	\$8,528,834	\$5,808,198	71
Forestry & Fishery Products	\$700,805	\$771,746	\$285,668	2
Coal Mining	\$4,118,037	\$1,192,980	\$1,256,256	4
Crude Petroleum & Natural Gas	\$941,207,856	\$206,257,888	\$95,126,338	509
Miscellaneous Mining	\$1,365,647	\$587,380	\$345,336	2
New Construction	\$132,430,759	\$60,199,977	\$49,608,562	770
Maintenance & Repair Construction	\$86,646,281	\$46,306,835	\$38,159,830	543
Food Products & Tobacco	\$68,964,279	\$17,772,904	\$9,079,625	120
Textile Mill Products	\$872,123	\$240,436	\$203,864	2
Apparel	\$13,963,219	\$7,713,608	\$3,908,437	75
Paper & Allied Products	\$10,075,788	\$4,525,904	\$2,045,990	15
Printing & Publishing	\$15,056,357	\$7,569,384	\$4,940,233	53
Chemicals & Petroleum Refining	\$74,418,059	\$12,315,878	\$5,783,302	38
Rubber and Leather Products	\$9,189,655	\$3,922,744	\$2,292,580	33
Lumber Products & Furniture	\$4,094,219	\$1,373,070	\$979,440	9
Stone, Clay, & Glass Products	\$9,200,960	\$4,734,090	\$2,475,558	29
Primary Metal	\$15,537,744	\$4,713,416	\$3,508,220	55
Fabricated Metal Products	\$32,619,849	\$12,436,917	\$8,028,916	136
Machinery, Except Electrical	\$15,491,704	\$6,498,896	\$4,642,852	51
Electric & Electronic Equipment	\$8,422,695	\$4,579,832	\$2,736,839	13
Motor Vehicles & Equipment	\$4,849,486	\$1,099,061	\$713,639	5
Transp Equip, Except Motor Vehicles	\$2,422,604	\$1,015,758	\$663,634	3
Instruments & Related Products	\$2,018,092	\$860,748	\$654,530	4
Miscellaneous Manufacturing	\$3,997,698	\$1,525,975	\$1,052,682	8
Transportation	\$55,659,591	\$37,024,910	\$24,487,126	290
Communication	\$43,428,463	\$26,833,755	\$11,456,124	81
Electric, Gas, Water, Sanitary Serv	\$114,693,518	\$25,719,853	\$11,223,147	25
Wholesale Trade	\$69,471,534	\$46,984,274	\$27,091,682	272
Retail Trade	\$226,397,746	\$187,658,188	\$112,214,013	3,174
Finance	\$30,647,594	\$16,741,251	\$9,748,356	64
Insurance	\$34,883,034	\$20,916,371	\$12,504,001	109
Real Estate	\$312,489,582	\$61,334,938	\$9,882,329	80
Hotels, Lodging Places, Amusements	\$21,118,416	\$11,070,910	\$7,262,962	153
Personal Services	\$48,648,210	\$30,126,743	\$23,439,024	404
Business Services	\$100,428,006	\$61,233,773	\$49,951,162	568
Eating & Drinking Places	\$106,812,786	\$62,600,558	\$33,306,893	1,618
Health Services	\$70,888,232	\$49,846,304	\$42,145,863	712
Miscellaneous Services	\$59,289,603	\$23,986,966	\$20,794,775	479
Households	\$2,565,284	\$2,565,284	\$2,510,998	147
<b>Total</b>	<b>\$2,786,062,645</b>	<b>\$1,081,388,340</b>	<b>\$642,318,981</b>	<b>10,728</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

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# Detailed Sectoral Results: 2004 Barnett Shale Impact

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in the Barnett Shale Region 2004  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$42,828,496	\$11,825,762	\$8,053,889	103
Forestry & Fishery Products	\$496,275	\$556,971	\$206,645	1
Coal Mining	\$1,863,192	\$539,893	\$568,764	2
Crude Petroleum & Natural Gas	\$1,811,629,040	\$397,025,668	\$183,107,512	987
Miscellaneous Mining	\$1,856,460	\$798,791	\$469,516	3
New Construction	\$274,608,959	\$124,830,917	\$102,868,516	1,596
Maintenance & Repair Construction	\$155,058,911	\$83,198,566	\$68,560,829	1,002
Food Products & Tobacco	\$47,059,943	\$12,132,462	\$6,197,628	89
Textile Mill Products	\$156,629	\$44,081	\$37,264	1
Apparel	\$14,414,998	\$7,964,207	\$4,035,059	87
Paper & Allied Products	\$7,928,419	\$3,577,425	\$1,617,314	14
Printing & Publishing	\$18,442,430	\$9,259,356	\$6,043,684	76
Chemicals & Petroleum Refining	\$50,148,170	\$8,402,357	\$3,945,137	22
Rubber and Leather Products	\$11,117,123	\$4,737,276	\$2,769,344	45
Lumber Products & Furniture	\$5,999,371	\$1,997,096	\$1,424,134	16
Stone, Clay, & Glass Products	\$14,888,158	\$7,612,684	\$3,981,167	53
Primary Metal	\$12,618,721	\$3,843,261	\$2,860,726	46
Fabricated Metal Products	\$59,629,363	\$22,779,265	\$14,706,520	257
Machinery, Except Electrical	\$18,511,384	\$7,787,134	\$5,563,233	58
Electric & Electronic Equipment	\$9,358,004	\$5,114,537	\$3,057,523	18
Motor Vehicles & Equipment	\$6,412,482	\$1,466,761	\$953,038	8
Transp Equip, Except Motor Vehicles	\$2,465,099	\$1,034,360	\$675,428	4
Instruments & Related Products	\$1,171,214	\$501,171	\$381,035	2
Miscellaneous Manufacturing	\$4,376,444	\$1,661,737	\$1,146,225	9
Transportation	\$88,729,732	\$58,685,270	\$38,812,546	475
Communication	\$44,131,995	\$27,315,596	\$11,662,011	79
Electric, Gas, Water, Sanitary Serv	\$133,114,306	\$29,848,457	\$13,025,038	31
Wholesale Trade	\$81,624,977	\$55,196,294	\$31,826,527	330
Retail Trade	\$349,991,587	\$290,137,480	\$173,493,242	4,930
Finance	\$46,167,255	\$25,357,637	\$14,765,918	110
Insurance	\$30,394,780	\$18,234,519	\$10,901,153	104
Real Estate	\$416,166,092	\$80,852,034	\$13,026,925	108
Hotels, Lodging Places, Amusements	\$29,628,150	\$15,542,683	\$10,196,394	238
Personal Services	\$73,830,210	\$45,654,698	\$35,520,228	598
Business Services	\$118,693,113	\$71,661,365	\$58,457,495	703
Eating & Drinking Places	\$169,185,914	\$99,180,394	\$52,769,561	2,581
Health Services	\$100,456,317	\$70,602,619	\$59,695,552	1,024
Miscellaneous Services	\$98,668,242	\$40,227,471	\$34,873,643	819
Households	\$3,637,019	\$3,637,019	\$3,559,952	217
<b>Total</b>	<b>\$4,357,458,972</b>	<b>\$1,650,825,272</b>	<b>\$985,816,313</b>	<b>16,847</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

All monetary values in constant (2008) dollars.

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in Texas 2004  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$57,001,750	\$15,718,743	\$10,704,701	137
Forestry & Fishery Products	\$1,270,624	\$1,408,803	\$521,510	4
Coal Mining	\$7,561,485	\$2,190,920	\$2,307,485	7
Crude Petroleum & Natural Gas	\$1,946,459,617	\$426,554,507	\$196,727,160	1,055
Miscellaneous Mining	\$2,705,729	\$1,164,158	\$684,291	5
New Construction	\$274,608,959	\$124,830,917	\$102,868,516	1,596
Maintenance & Repair Construction	\$170,213,661	\$91,175,979	\$75,135,043	1,094
Food Products & Tobacco	\$128,215,932	\$33,050,032	\$16,884,296	239
Textile Mill Products	\$1,613,737	\$454,447	\$385,076	5
Apparel	\$26,258,072	\$14,504,024	\$7,349,314	155
Paper & Allied Products	\$18,560,819	\$8,352,848	\$3,776,042	31
Printing & Publishing	\$27,937,914	\$14,033,409	\$9,159,281	111
Chemicals & Petroleum Refining	\$142,046,132	\$23,680,780	\$11,119,886	78
Rubber and Leather Products	\$17,273,823	\$7,367,545	\$4,305,921	68
Lumber Products & Furniture	\$7,753,102	\$2,589,182	\$1,846,590	20
Stone, Clay, & Glass Products	\$18,122,376	\$9,285,802	\$4,856,059	61
Primary Metal	\$31,448,412	\$9,560,507	\$7,116,080	114
Fabricated Metal Products	\$65,691,962	\$25,089,375	\$16,197,045	282
Machinery, Except Electrical	\$30,919,049	\$12,993,707	\$9,282,664	106
Electric & Electronic Equipment	\$16,297,683	\$8,881,690	\$5,307,753	28
Motor Vehicles & Equipment	\$9,115,880	\$2,067,440	\$1,342,425	10
Transp Equip, Except Motor Vehicles	\$4,614,872	\$1,931,941	\$1,262,166	7
Instruments & Related Products	\$3,855,989	\$1,650,121	\$1,254,864	7
Miscellaneous Manufacturing	\$7,535,941	\$2,866,777	\$1,977,545	17
Transportation	\$104,352,130	\$69,169,507	\$45,746,580	569
Communication	\$78,515,693	\$48,513,380	\$20,711,788	158
Electric, Gas, Water, Sanitary Serv	\$209,728,312	\$47,024,933	\$20,519,901	52
Wholesale Trade	\$132,180,213	\$89,390,039	\$51,543,357	543
Retail Trade	\$395,891,637	\$328,168,341	\$196,234,992	5,565
Finance	\$58,546,613	\$32,071,888	\$18,675,307	132
Insurance	\$65,459,211	\$39,257,597	\$23,468,775	227
Real Estate	\$579,360,730	\$120,444,436	\$19,406,116	166
Hotels, Lodging Places, Amusements	\$37,952,833	\$19,881,765	\$13,043,336	285
Personal Services	\$84,601,408	\$52,347,568	\$40,727,183	710
Business Services	\$192,897,874	\$117,938,827	\$96,207,887	1,136
Eating & Drinking Places	\$189,567,936	\$111,115,462	\$59,119,485	2,877
Health Services	\$126,613,217	\$88,916,340	\$75,179,932	1,280
Miscellaneous Services	\$108,368,293	\$44,036,636	\$38,176,160	898
Households	\$4,855,084	\$4,855,084	\$4,752,418	295
<b>Total</b>	<b>\$5,385,974,703</b>	<b>\$2,054,535,503</b>	<b>\$1,215,884,929</b>	<b>20,130</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

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# Detailed Sectoral Results: 2005 Barnett Shale Impact

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in the Barnett Shale Region 2005  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$86,700,884	\$23,953,445	\$16,313,398	212
Forestry & Fishery Products	\$1,003,989	\$1,129,620	\$419,102	3
Coal Mining	\$3,772,846	\$1,093,435	\$1,151,957	5
Crude Petroleum & Natural Gas	\$3,803,614,885	\$833,578,292	\$384,444,842	2,074
Miscellaneous Mining	\$3,853,682	\$1,658,254	\$974,643	7
New Construction	\$576,779,649	\$262,190,763	\$216,061,657	3,352
Maintenance & Repair Construction	\$320,641,784	\$172,165,337	\$141,875,057	2,089
Food Products & Tobacco	\$95,583,109	\$24,644,061	\$12,588,949	184
Textile Mill Products	\$318,239	\$90,259	\$76,321	1
Apparel	\$29,298,023	\$16,186,380	\$8,200,915	183
Paper & Allied Products	\$15,881,177	\$7,172,542	\$3,242,622	30
Printing & Publishing	\$37,364,685	\$18,753,759	\$12,240,802	159
Chemicals & Petroleum Refining	\$102,279,832	\$17,186,147	\$8,069,424	45
Rubber and Leather Products	\$22,633,636	\$9,641,879	\$5,636,518	95
Lumber Products & Furniture	\$12,255,001	\$4,073,435	\$2,904,769	33
Stone, Clay, & Glass Products	\$30,778,158	\$15,716,415	\$8,219,242	111
Primary Metal	\$26,355,691	\$8,031,264	\$5,978,097	97
Fabricated Metal Products	\$124,214,660	\$47,475,335	\$30,650,486	540
Machinery, Except Electrical	\$38,467,144	\$16,190,040	\$11,566,420	123
Electric & Electronic Equipment	\$19,211,088	\$10,508,496	\$6,282,053	38
Motor Vehicles & Equipment	\$13,016,171	\$2,978,939	\$1,935,605	16
Transp Equip, Except Motor Vehicles	\$5,024,990	\$2,107,192	\$1,376,104	9
Instruments & Related Products	\$2,381,651	\$1,020,527	\$775,862	5
Miscellaneous Manufacturing	\$8,906,494	\$3,377,618	\$2,329,742	20
Transportation	\$180,765,382	\$119,405,739	\$78,971,113	982
Communication	\$87,827,147	\$54,359,320	\$23,207,896	160
Electric, Gas, Water, Sanitary Serv	\$267,337,122	\$59,943,005	\$26,157,462	65
Wholesale Trade	\$166,631,075	\$112,676,614	\$64,970,091	684
Retail Trade	\$694,241,311	\$575,529,350	\$344,148,634	9,786
Finance	\$94,696,588	\$52,060,685	\$30,315,261	232
Insurance	\$61,799,094	\$37,077,548	\$22,166,118	219
Real Estate	\$840,541,741	\$167,086,661	\$26,921,078	226
Hotels, Lodging Places, Amusements	\$59,217,783	\$31,055,983	\$20,373,530	481
Personal Services	\$146,049,826	\$90,280,250	\$70,239,729	1,193
Business Services	\$243,326,219	\$147,134,971	\$120,024,772	1,460
Eating & Drinking Places	\$337,613,634	\$197,926,753	\$105,308,123	5,152
Health Services	\$200,333,175	\$140,727,099	\$118,986,782	2,048
Miscellaneous Services	\$199,219,978	\$81,357,986	\$70,530,201	1,671
Households	\$7,451,664	\$7,451,664	\$7,293,750	455
<b>Total</b>	<b>\$8,967,389,208</b>	<b>\$3,374,997,059</b>	<b>\$2,012,929,125</b>	<b>34,245</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

All monetary values in constant (2008) dollars.

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in Texas 2005  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$114,860,825	\$31,692,570	\$21,583,210	281
Forestry & Fishery Products	\$2,546,002	\$2,830,227	\$1,047,717	8
Coal Mining	\$15,224,412	\$4,411,526	\$4,646,508	16
Crude Petroleum & Natural Gas	\$4,084,760,943	\$895,152,655	\$412,844,739	2,215
Miscellaneous Mining	\$5,598,237	\$2,408,955	\$1,415,878	10
New Construction	\$576,779,649	\$262,190,763	\$216,061,657	3,352
Maintenance & Repair Construction	\$351,151,893	\$188,244,133	\$155,125,723	2,276
Food Products & Tobacco	\$259,355,380	\$66,859,115	\$34,156,415	495
Textile Mill Products	\$3,258,506	\$924,972	\$783,476	10
Apparel	\$53,338,496	\$29,461,137	\$14,928,373	326
Paper & Allied Products	\$37,416,049	\$16,849,985	\$7,617,340	65
Printing & Publishing	\$56,472,105	\$28,357,310	\$18,508,337	233
Chemicals & Petroleum Refining	\$290,099,359	\$48,489,209	\$22,769,174	164
Rubber and Leather Products	\$35,083,081	\$14,958,975	\$8,742,755	143
Lumber Products & Furniture	\$15,788,951	\$5,264,717	\$3,754,523	41
Stone, Clay, & Glass Products	\$37,420,230	\$19,146,622	\$10,013,048	127
Primary Metal	\$65,534,917	\$19,937,167	\$14,839,740	240
Fabricated Metal Products	\$136,666,778	\$52,226,252	\$33,715,950	592
Machinery, Except Electrical	\$64,131,274	\$26,967,128	\$19,265,150	222
Electric & Electronic Equipment	\$33,445,891	\$18,241,188	\$10,901,183	59
Motor Vehicles & Equipment	\$18,514,536	\$4,200,099	\$2,727,200	22
Transp Equip, Except Motor Vehicles	\$9,418,115	\$3,940,545	\$2,574,384	14
Instruments & Related Products	\$7,877,925	\$3,375,256	\$2,566,832	16
Miscellaneous Manufacturing	\$15,321,391	\$5,821,225	\$4,015,508	35
Transportation	\$211,737,540	\$140,166,782	\$92,702,001	1,172
Communication	\$157,152,829	\$97,101,631	\$41,455,534	325
Electric, Gas, Water, Sanitary Serv	\$421,609,220	\$94,527,688	\$41,248,339	110
Wholesale Trade	\$269,640,394	\$182,347,319	\$105,143,637	1,127
Retail Trade	\$782,044,692	\$648,279,057	\$387,651,832	11,006
Finance	\$119,604,028	\$65,585,474	\$38,190,099	277
Insurance	\$132,865,457	\$79,688,312	\$47,639,019	476
Real Estate	\$1,170,725,090	\$248,445,035	\$40,029,703	349
Hotels, Lodging Places, Amusements	\$75,788,652	\$39,691,171	\$26,039,280	577
Personal Services	\$166,748,851	\$103,141,305	\$80,245,502	1,406
Business Services	\$394,833,695	\$241,638,424	\$197,114,973	2,358
Eating & Drinking Places	\$376,696,905	\$220,812,308	\$117,484,214	5,722
Health Services	\$252,228,398	\$177,042,815	\$149,691,801	2,558
Miscellaneous Services	\$217,811,833	\$88,658,038	\$76,859,209	1,822
Households	\$9,885,226	\$9,885,226	\$9,676,248	614
<b>Total</b>	<b>\$11,049,437,756</b>	<b>\$4,188,962,315</b>	<b>\$2,475,776,211</b>	<b>40,856</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

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# Detailed Sectoral Results: 2006 Barnett Shale Impact

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in the Barnett Shale Region 2006  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$152,663,583	\$42,228,422	\$28,759,487	387
Forestry & Fishery Products	\$1,765,382	\$1,996,881	\$740,845	6
Coal Mining	\$6,647,169	\$1,927,159	\$2,030,489	9
Crude Petroleum & Natural Gas	\$7,205,179,222	\$1,579,049,274	\$728,254,959	3,931
Miscellaneous Mining	\$7,141,657	\$3,073,464	\$1,806,251	14
New Construction	\$1,093,394,055	\$497,031,789	\$409,585,413	6,355
Maintenance & Repair Construction	\$589,731,817	\$317,093,747	\$261,305,301	3,903
Food Products & Tobacco	\$169,482,217	\$43,704,442	\$22,325,656	340
Textile Mill Products	\$564,698	\$162,742	\$137,687	2
Apparel	\$52,023,151	\$28,739,124	\$14,561,196	347
Paper & Allied Products	\$27,334,031	\$12,370,369	\$5,592,481	57
Printing & Publishing	\$65,905,032	\$33,056,662	\$21,576,534	301
Chemicals & Petroleum Refining	\$182,932,773	\$30,919,980	\$14,518,090	86
Rubber and Leather Products	\$40,332,236	\$17,170,834	\$10,037,893	180
Lumber Products & Furniture	\$21,988,893	\$7,286,484	\$5,195,966	62
Stone, Clay, & Glass Products	\$56,576,416	\$28,812,450	\$15,068,493	210
Primary Metal	\$49,429,466	\$15,077,470	\$11,223,098	184
Fabricated Metal Products	\$231,775,322	\$88,670,830	\$57,246,429	1,023
Machinery, Except Electrical	\$71,435,749	\$30,095,530	\$21,500,859	233
Electric & Electronic Equipment	\$34,822,350	\$19,080,377	\$11,406,262	73
Motor Vehicles & Equipment	\$23,049,118	\$5,281,374	\$3,431,711	31
Transp Equip, Except Motor Vehicles	\$8,977,433	\$3,759,791	\$2,455,810	17
Instruments & Related Products	\$4,233,427	\$1,819,204	\$1,382,939	10
Miscellaneous Manufacturing	\$15,857,597	\$5,998,186	\$4,137,097	38
Transportation	\$322,554,978	\$212,505,254	\$140,544,158	1,802
Communication	\$149,008,207	\$92,220,798	\$39,372,076	282
Electric, Gas, Water, Sanitary Serv	\$462,766,458	\$103,753,376	\$45,275,088	124
Wholesale Trade	\$298,593,093	\$201,901,186	\$116,417,776	1,267
Retail Trade	\$1,169,218,744	\$969,342,320	\$579,636,067	16,509
Finance	\$171,353,203	\$94,380,357	\$54,958,207	440
Insurance	\$109,818,008	\$65,898,058	\$39,396,017	415
Real Estate	\$1,472,822,608	\$306,926,860	\$49,452,132	428
Hotels, Lodging Places, Amusements	\$101,435,419	\$53,161,814	\$34,875,598	846
Personal Services	\$244,453,017	\$150,981,230	\$117,466,115	2,034
Business Services	\$439,809,626	\$266,776,714	\$217,621,909	2,713
Eating & Drinking Places	\$576,273,364	\$337,881,016	\$179,771,372	8,802
Health Services	\$341,460,196	\$239,595,685	\$202,581,410	3,510
Miscellaneous Services	\$348,844,239	\$142,967,035	\$123,940,026	2,992
Households	\$13,452,652	\$13,452,652	\$13,167,503	858
<b>Total</b>	<b>\$16,335,106,605</b>	<b>\$6,066,150,942</b>	<b>\$3,608,756,401</b>	<b>60,820</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

All monetary values in constant (2008) dollars.

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in Texas 2006  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$200,264,484	\$55,327,189	\$37,679,160	507
Forestry & Fishery Products	\$4,385,293	\$4,902,526	\$1,814,949	15
Coal Mining	\$26,498,366	\$7,679,442	\$8,089,509	30
Crude Petroleum & Natural Gas	\$7,730,786,985	\$1,694,168,796	\$781,350,815	4,199
Miscellaneous Mining	\$10,307,861	\$4,436,545	\$2,607,226	19
New Construction	\$1,093,394,055	\$497,031,789	\$409,585,413	6,355
Maintenance & Repair Construction	\$642,825,093	\$345,142,706	\$284,420,958	4,235
Food Products & Tobacco	\$455,923,426	\$117,552,684	\$60,054,486	916
Textile Mill Products	\$5,706,660	\$1,646,966	\$1,394,236	19
Apparel	\$94,598,598	\$52,246,593	\$26,474,683	619
Paper & Allied Products	\$65,293,506	\$29,448,515	\$13,312,836	122
Printing & Publishing	\$99,120,849	\$49,739,573	\$32,464,847	441
Chemicals & Petroleum Refining	\$520,296,341	\$87,432,240	\$41,055,312	310
Rubber and Leather Products	\$62,201,063	\$26,505,060	\$15,491,091	271
Lumber Products & Furniture	\$28,150,890	\$9,356,811	\$6,671,890	78
Stone, Clay, & Glass Products	\$68,625,253	\$35,013,395	\$18,311,658	241
Primary Metal	\$122,371,476	\$37,279,370	\$27,748,344	454
Fabricated Metal Products	\$254,368,971	\$97,313,598	\$62,823,369	1,122
Machinery, Except Electrical	\$118,662,202	\$49,955,571	\$35,687,644	420
Electric & Electronic Equipment	\$60,581,606	\$33,093,428	\$19,777,582	111
Motor Vehicles & Equipment	\$32,826,402	\$7,450,849	\$4,837,975	41
Transp Equip, Except Motor Vehicles	\$16,866,397	\$7,048,794	\$4,604,900	26
Instruments & Related Products	\$14,139,779	\$6,072,890	\$4,618,554	30
Miscellaneous Manufacturing	\$27,223,428	\$10,316,405	\$7,116,087	67
Transportation	\$374,655,111	\$247,335,539	\$163,580,166	2,140
Communication	\$270,034,425	\$166,848,316	\$71,232,412	590
Electric, Gas, Water, Sanitary Serv	\$731,340,810	\$163,953,511	\$71,543,289	208
Wholesale Trade	\$482,457,816	\$326,254,661	\$188,122,361	2,086
Retail Trade	\$1,304,753,518	\$1,081,638,018	\$646,788,027	18,407
Finance	\$214,640,013	\$117,943,776	\$68,678,050	526
Insurance	\$235,261,056	\$141,122,001	\$84,365,721	902
Real Estate	\$2,053,527,551	\$454,688,702	\$73,259,938	662
Hotels, Lodging Places, Amusements	\$129,564,492	\$67,812,243	\$44,488,323	1,017
Personal Services	\$276,777,290	\$171,062,954	\$133,089,730	2,356
Business Services	\$711,391,572	\$436,238,151	\$355,858,016	4,369
Eating & Drinking Places	\$636,973,717	\$373,423,173	\$198,681,631	9,693
Health Services	\$428,900,579	\$300,714,542	\$254,256,874	4,376
Miscellaneous Services	\$377,686,456	\$154,288,390	\$133,755,108	3,222
Households	\$17,617,431	\$17,617,431	\$17,245,201	1,138
<b>Total</b>	<b>\$20,001,000,821</b>	<b>\$7,487,103,145</b>	<b>\$4,412,938,372</b>	<b>72,337</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

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# Detailed Sectoral Results: 2007 Barnett Shale Impact

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in the Barnett Shale Region 2007  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$211,029,626	\$58,377,528	\$39,757,820	541
Forestry & Fishery Products	\$2,449,525	\$2,785,140	\$1,033,278	8
Coal Mining	\$9,330,138	\$2,705,516	\$2,850,516	13
Crude Petroleum & Natural Gas	\$10,306,440,007	\$2,258,716,990	\$1,041,716,631	5,625
Miscellaneous Mining	\$9,812,487	\$4,218,647	\$2,479,407	20
New Construction	\$1,356,758,493	\$616,751,205	\$508,241,731	7,886
Maintenance & Repair Construction	\$836,031,891	\$449,567,769	\$370,472,166	5,535
Food Products & Tobacco	\$235,346,713	\$60,674,071	\$30,994,331	474
Textile Mill Products	\$775,383	\$225,221	\$190,511	3
Apparel	\$71,719,360	\$39,604,523	\$20,066,314	477
Paper & Allied Products	\$38,341,502	\$17,362,610	\$7,849,420	82
Printing & Publishing	\$91,580,136	\$45,955,472	\$29,995,759	419
Chemicals & Petroleum Refining	\$255,477,631	\$43,262,667	\$20,313,427	122
Rubber and Leather Products	\$55,773,509	\$23,722,464	\$13,867,898	247
Lumber Products & Furniture	\$30,335,861	\$10,036,555	\$7,156,931	89
Stone, Clay, & Glass Products	\$76,731,133	\$39,107,585	\$20,452,564	287
Primary Metal	\$65,712,945	\$20,020,066	\$14,902,103	243
Fabricated Metal Products	\$306,205,699	\$116,939,904	\$75,497,189	1,345
Machinery, Except Electrical	\$100,334,326	\$42,285,518	\$30,209,495	327
Electric & Electronic Equipment	\$48,848,464	\$26,772,060	\$16,004,493	104
Motor Vehicles & Equipment	\$32,148,595	\$7,389,065	\$4,801,124	45
Transp Equip, Except Motor Vehicles	\$12,567,090	\$5,266,477	\$3,439,850	25
Instruments & Related Products	\$5,907,413	\$2,537,440	\$1,928,971	14
Miscellaneous Manufacturing	\$21,949,255	\$8,296,339	\$5,722,287	54
Transportation	\$444,881,440	\$293,166,996	\$193,891,147	2,497
Communication	\$208,695,398	\$129,158,309	\$55,142,005	400
Electric, Gas, Water, Sanitary Serv	\$648,128,066	\$145,294,360	\$63,402,437	178
Wholesale Trade	\$413,378,305	\$279,505,247	\$161,164,807	1,755
Retail Trade	\$1,630,121,920	\$1,351,479,362	\$808,142,147	23,030
Finance	\$238,353,296	\$131,333,580	\$76,476,271	615
Insurance	\$152,705,564	\$91,647,570	\$54,789,933	576
Real Estate	\$2,068,146,645	\$433,498,095	\$69,845,426	606
Hotels, Lodging Places, Amusements	\$141,280,572	\$74,054,448	\$48,581,742	1,177
Personal Services	\$341,467,175	\$210,956,167	\$164,127,717	2,836
Business Services	\$593,774,392	\$358,764,165	\$292,660,291	3,635
Eating & Drinking Places	\$805,455,939	\$472,260,357	\$251,268,677	12,318
Health Services	\$475,062,051	\$333,401,465	\$281,895,465	4,890
Miscellaneous Services	\$483,507,970	\$198,042,455	\$171,685,577	4,148
Households	\$18,492,511	\$18,492,511	\$18,100,617	1,178
<b>Total</b>	<b>\$22,845,058,426</b>	<b>\$8,423,635,917</b>	<b>\$4,981,118,475</b>	<b>83,823</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

All monetary values in constant (2008) dollars.

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in Texas 2007  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$277,761,994	\$76,740,744	\$52,262,325	713
Forestry & Fishery Products	\$6,089,314	\$6,838,675	\$2,532,047	21
Coal Mining	\$36,903,835	\$10,697,363	\$11,268,384	42
Crude Petroleum & Natural Gas	\$11,054,908,641	\$2,422,658,791	\$1,117,330,268	6,009
Miscellaneous Mining	\$14,146,887	\$6,082,810	\$3,574,947	27
New Construction	\$1,356,758,493	\$616,751,205	\$508,241,731	7,886
Maintenance & Repair Construction	\$910,700,274	\$489,020,991	\$402,985,927	6,003
Food Products & Tobacco	\$633,558,034	\$163,314,760	\$83,432,685	1,271
Textile Mill Products	\$7,893,065	\$2,292,830	\$1,941,265	27
Apparel	\$130,720,113	\$72,170,405	\$36,570,234	854
Paper & Allied Products	\$90,446,183	\$40,827,873	\$18,457,135	175
Printing & Publishing	\$137,556,063	\$69,056,749	\$45,072,909	615
Chemicals & Petroleum Refining	\$723,189,173	\$121,787,194	\$57,187,361	428
Rubber and Leather Products	\$85,976,750	\$36,603,193	\$21,393,295	371
Lumber Products & Furniture	\$38,850,760	\$12,894,278	\$9,194,616	111
Stone, Clay, & Glass Products	\$92,785,730	\$47,381,291	\$24,779,602	329
Primary Metal	\$162,710,179	\$49,503,878	\$36,847,364	600
Fabricated Metal Products	\$335,442,710	\$128,102,028	\$82,699,732	1,473
Machinery, Except Electrical	\$166,940,933	\$70,302,914	\$50,223,818	586
Electric & Electronic Equipment	\$83,989,714	\$45,896,542	\$27,429,714	159
Motor Vehicles & Equipment	\$45,368,946	\$10,334,790	\$6,710,863	58
Transp Equip, Except Motor Vehicles	\$23,290,964	\$9,741,457	\$6,364,152	37
Instruments & Related Products	\$19,499,351	\$8,371,507	\$6,366,319	42
Miscellaneous Manufacturing	\$37,683,848	\$14,270,569	\$9,843,643	96
Transportation	\$516,438,757	\$341,034,160	\$225,549,414	2,953
Communication	\$375,532,798	\$232,028,308	\$99,059,716	815
Electric, Gas, Water, Sanitary Serv	\$1,025,093,674	\$229,778,712	\$100,267,143	297
Wholesale Trade	\$665,249,084	\$449,846,115	\$259,386,541	2,867
Retail Trade	\$1,820,222,733	\$1,508,984,637	\$902,328,432	25,689
Finance	\$298,537,117	\$164,100,034	\$95,554,714	737
Insurance	\$325,714,469	\$195,412,393	\$116,821,662	1,243
Real Estate	\$2,884,727,950	\$642,432,562	\$103,509,439	931
Hotels, Lodging Places, Amusements	\$180,013,510	\$94,231,137	\$61,820,201	1,415
Personal Services	\$386,795,672	\$239,118,766	\$186,038,180	3,292
Business Services	\$959,566,854	\$586,399,679	\$478,351,406	5,853
Eating & Drinking Places	\$890,051,394	\$521,793,208	\$277,622,517	13,559
Health Services	\$596,593,250	\$418,360,321	\$353,727,867	6,098
Miscellaneous Services	\$523,923,590	\$213,903,447	\$185,436,458	4,475
Households	\$24,331,837	\$24,331,837	\$23,817,570	1,570
<b>Total</b>	<b>\$27,945,964,644</b>	<b>\$10,393,398,152</b>	<b>\$6,092,001,597</b>	<b>99,726</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

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# Detailed Sectoral Results: 2008 Barnett Shale Impact

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in the Barnett Shale Region 2008  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$281,073,463	\$77,679,963	\$52,903,651	697
Forestry & Fishery Products	\$3,258,420	\$3,678,508	\$1,364,753	10
Coal Mining	\$12,305,940	\$3,567,062	\$3,758,031	16
Crude Petroleum & Natural Gas	\$12,744,460,017	\$2,793,010,180	\$1,288,131,498	6,951
Miscellaneous Mining	\$12,627,176	\$5,431,516	\$3,192,376	24
New Construction	\$1,826,090,816	\$830,098,885	\$684,053,620	10,614
Maintenance & Repair Construction	\$1,061,856,096	\$570,386,873	\$470,034,632	6,947
Food Products & Tobacco	\$310,964,754	\$80,171,239	\$40,954,004	606
Textile Mill Products	\$1,031,014	\$294,506	\$249,044	4
Apparel	\$95,082,159	\$52,521,392	\$26,610,392	604
Paper & Allied Products	\$51,480,792	\$23,268,143	\$10,519,252	101
Printing & Publishing	\$121,430,625	\$60,947,896	\$39,781,442	526
Chemicals & Petroleum Refining	\$334,235,197	\$56,288,845	\$26,429,431	151
Rubber and Leather Products	\$73,608,018	\$31,340,467	\$18,321,247	312
Lumber Products & Furniture	\$39,888,130	\$13,239,885	\$9,441,304	110
Stone, Clay, & Glass Products	\$100,120,145	\$51,106,082	\$26,727,147	364
Primary Metal	\$85,491,999	\$26,045,618	\$19,387,159	315
Fabricated Metal Products	\$401,416,670	\$153,353,665	\$99,006,392	1,748
Machinery, Except Electrical	\$127,237,112	\$53,573,402	\$38,273,677	409
Electric & Electronic Equipment	\$63,108,019	\$34,538,805	\$20,647,556	129
Motor Vehicles & Equipment	\$42,405,198	\$9,719,668	\$6,315,456	55
Transp Equip, Except Motor Vehicles	\$16,431,426	\$6,889,829	\$4,499,588	31
Instruments & Related Products	\$7,768,030	\$3,330,431	\$2,531,944	17
Miscellaneous Manufacturing	\$28,969,653	\$10,975,888	\$7,570,671	67
Transportation	\$587,478,970	\$387,841,094	\$256,505,578	3,220
Communication	\$283,517,937	\$175,475,180	\$74,916,445	525
Electric, Gas, Water, Sanitary Serv	\$867,340,514	\$194,463,851	\$84,858,630	220
Wholesale Trade	\$542,920,897	\$367,115,719	\$211,681,442	2,249
Retail Trade	\$2,233,190,622	\$1,851,363,878	\$1,107,057,853	31,498
Finance	\$309,895,229	\$170,477,243	\$99,269,929	770
Insurance	\$201,273,559	\$120,770,183	\$72,200,245	725
Real Estate	\$2,738,218,827	\$552,316,610	\$88,989,526	754
Hotels, Lodging Places, Amusements	\$191,213,703	\$100,268,427	\$65,778,723	1,563
Personal Services	\$469,427,302	\$290,144,474	\$225,737,803	3,850
Business Services	\$786,775,383	\$475,396,181	\$387,802,511	4,740
Eating & Drinking Places	\$1,090,651,708	\$639,418,088	\$340,206,163	16,655
Health Services	\$645,808,477	\$453,563,667	\$383,494,501	6,613
Miscellaneous Services	\$645,614,439	\$263,833,659	\$228,720,588	5,446
Households	\$24,257,541	\$24,257,541	\$23,743,495	1,496
<b>Total</b>	<b>\$29,459,925,980</b>	<b>\$11,018,164,541</b>	<b>\$6,551,667,698</b>	<b>111,131</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

All monetary values in constant (2008) dollars.

The Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in Texas 2008  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$371,927,897	\$102,657,099	\$69,911,501	923
Forestry & Fishery Products	\$8,222,761	\$9,169,667	\$3,394,713	26
Coal Mining	\$49,354,368	\$14,302,965	\$15,065,193	52
Crude Petroleum & Natural Gas	\$13,681,338,639	\$2,998,205,947	\$1,382,773,371	7,425
Miscellaneous Mining	\$18,304,656	\$7,873,938	\$4,627,914	33
New Construction	\$1,826,090,816	\$830,098,885	\$684,053,620	10,614
Maintenance & Repair Construction	\$1,161,133,252	\$622,741,749	\$513,180,661	7,560
Food Products & Tobacco	\$842,165,586	\$217,091,312	\$110,905,631	1,627
Textile Mill Products	\$10,551,752	\$3,015,448	\$2,553,938	33
Apparel	\$173,207,915	\$95,654,765	\$48,469,711	1,078
Paper & Allied Products	\$121,123,558	\$54,585,494	\$24,676,414	216
Printing & Publishing	\$183,207,686	\$91,997,073	\$60,045,147	771
Chemicals & Petroleum Refining	\$946,904,270	\$158,623,855	\$74,485,168	540
Rubber and Leather Products	\$113,929,766	\$48,553,386	\$28,377,219	471
Lumber Products & Furniture	\$51,315,199	\$17,087,120	\$12,185,401	138
Stone, Clay, & Glass Products	\$121,506,663	\$62,147,228	\$32,501,128	418
Primary Metal	\$212,360,031	\$64,593,768	\$48,078,882	777
Fabricated Metal Products	\$441,065,377	\$168,479,103	\$108,765,967	1,915
Machinery, Except Electrical	\$212,062,369	\$89,211,268	\$63,731,979	735
Electric & Electronic Equipment	\$109,336,372	\$59,664,167	\$35,666,673	197
Motor Vehicles & Equipment	\$60,122,400	\$13,660,000	\$8,869,835	72
Transp Equip, Except Motor Vehicles	\$30,650,986	\$12,824,619	\$8,378,436	46
Instruments & Related Products	\$25,639,478	\$10,990,228	\$8,357,807	52
Miscellaneous Manufacturing	\$49,810,598	\$18,907,545	\$13,042,433	118
Transportation	\$686,521,890	\$454,203,289	\$300,396,033	3,831
Communication	\$507,543,799	\$313,598,360	\$133,884,357	1,061
Electric, Gas, Water, Sanitary Serv	\$1,368,996,043	\$306,914,845	\$133,926,270	367
Wholesale Trade	\$876,833,820	\$592,953,284	\$341,903,873	3,691
Retail Trade	\$2,510,433,063	\$2,081,072,617	\$1,244,420,196	35,355
Finance	\$390,557,434	\$214,306,936	\$124,789,919	922
Insurance	\$431,601,944	\$258,886,278	\$154,766,869	1,570
Real Estate	\$3,815,463,389	\$820,568,154	\$132,210,760	1,162
Hotels, Lodging Places, Amusements	\$244,371,529	\$127,967,507	\$83,952,714	1,877
Personal Services	\$534,956,783	\$330,860,102	\$257,414,224	4,520
Business Services	\$1,275,206,859	\$779,769,355	\$636,091,721	7,649
Eating & Drinking Places	\$1,213,954,136	\$711,617,855	\$378,619,571	18,456
Health Services	\$812,565,997	\$570,231,202	\$482,137,072	8,258
Miscellaneous Services	\$704,366,999	\$286,899,412	\$248,718,086	5,924
Households	\$32,133,638	\$32,133,638	\$31,454,328	2,014
<b>Total</b>	<b>\$36,226,839,317</b>	<b>\$13,654,119,460</b>	<b>\$8,046,774,735</b>	<b>132,497</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

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# Detailed Sectoral Results: Projected 2009 Barnett Shale Impact

The Projected Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in the Barnett Shale Region 2009  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$177,248,842	\$48,947,740	\$33,335,684	429
Forestry & Fishery Products	\$2,056,496	\$2,313,449	\$858,321	6
Coal Mining	\$7,755,127	\$2,247,410	\$2,367,591	9
Crude Petroleum & Natural Gas	\$7,650,565,909	\$1,676,655,823	\$773,270,630	4,171
Miscellaneous Mining	\$7,696,773	\$3,310,466	\$1,945,865	14
New Construction	\$1,095,654,490	\$498,059,331	\$410,432,172	6,368
Maintenance & Repair Construction	\$650,435,460	\$349,058,973	\$287,646,438	4,210
Food Products & Tobacco	\$195,197,810	\$50,319,750	\$25,704,865	370
Textile Mill Products	\$646,999	\$182,855	\$154,572	2
Apparel	\$59,636,968	\$32,944,138	\$16,691,142	362
Paper & Allied Products	\$32,927,945	\$14,863,384	\$6,719,573	60
Printing & Publishing	\$76,483,540	\$38,404,304	\$25,066,919	316
Chemicals & Petroleum Refining	\$208,604,050	\$34,994,454	\$16,430,870	91
Rubber and Leather Products	\$46,058,846	\$19,618,942	\$11,468,956	187
Lumber Products & Furniture	\$24,847,319	\$8,264,361	\$5,893,303	66
Stone, Clay, & Glass Products	\$61,374,006	\$31,385,456	\$16,413,483	219
Primary Metal	\$51,687,162	\$15,735,754	\$11,712,872	189
Fabricated Metal Products	\$243,570,214	\$92,989,048	\$60,034,663	1,049
Machinery, Except Electrical	\$77,435,643	\$32,582,386	\$23,277,266	245
Electric & Electronic Equipment	\$39,039,077	\$21,341,697	\$12,758,316	77
Motor Vehicles & Equipment	\$26,639,167	\$6,100,935	\$3,964,096	33
Transp Equip, Except Motor Vehicles	\$10,262,360	\$4,306,656	\$2,812,225	18
Instruments & Related Products	\$4,867,905	\$2,083,168	\$1,583,810	10
Miscellaneous Manufacturing	\$18,136,983	\$6,883,333	\$4,747,964	40
Transportation	\$367,291,755	\$242,896,217	\$160,643,701	1,975
Communication	\$182,976,197	\$113,252,128	\$48,351,421	331
Electric, Gas, Water, Sanitary Serv	\$552,795,736	\$123,948,033	\$54,087,485	132
Wholesale Trade	\$338,472,831	\$228,877,336	\$131,972,094	1,371
Retail Trade	\$1,447,965,657	\$1,200,353,313	\$717,774,187	20,401
Finance	\$191,942,814	\$105,458,027	\$61,408,894	462
Insurance	\$126,160,427	\$75,691,886	\$45,250,936	435
Real Estate	\$1,731,657,202	\$338,613,643	\$54,557,644	452
Hotels, Lodging Places, Amusements	\$122,691,936	\$64,363,017	\$42,223,778	987
Personal Services	\$305,505,461	\$188,922,108	\$146,985,006	2,478
Business Services	\$487,856,445	\$294,174,340	\$239,971,633	2,885
Eating & Drinking Places	\$701,289,326	\$411,116,053	\$218,736,914	10,703
Health Services	\$415,673,330	\$292,136,842	\$247,005,971	4,241
Miscellaneous Services	\$408,570,856	\$166,587,148	\$144,416,255	3,397
Households	\$15,050,003	\$15,050,003	\$14,731,122	900
<b>Total</b>	<b>\$18,164,729,068</b>	<b>\$6,855,033,906</b>	<b>\$4,083,408,636</b>	<b>69,694</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

All monetary values in constant (2008) dollars.

The Projected Annual Impact of All Major Sources of Stimulus Associated with the Barnett Shale on Business Activity in Texas 2009  
Detailed Industrial Category

Category	Total Expenditures (2008 Dollars)	Gross Product (2008 Dollars)	Personal Income (2008 Dollars)	Employment (Permanent Jobs)
Agricultural Products & Services	\$236,015,648	\$65,090,865	\$44,327,895	573
Forestry & Fishery Products	\$5,258,248	\$5,842,261	\$2,162,796	16
Coal Mining	\$31,350,881	\$9,084,659	\$9,568,033	31
Crude Petroleum & Natural Gas	\$8,218,106,719	\$1,800,955,175	\$830,601,344	4,455
Miscellaneous Mining	\$11,206,957	\$4,820,079	\$2,833,285	20
New Construction	\$1,095,654,490	\$498,059,331	\$410,432,172	6,368
Maintenance & Repair Construction	\$713,492,721	\$382,260,968	\$315,008,235	4,595
Food Products & Tobacco	\$531,592,459	\$137,017,884	\$69,998,326	993
Textile Mill Products	\$6,677,216	\$1,887,627	\$1,599,315	20
Apparel	\$108,718,231	\$60,043,644	\$30,424,577	647
Paper & Allied Products	\$76,820,915	\$34,586,265	\$15,635,304	130
Printing & Publishing	\$115,761,545	\$58,154,030	\$37,955,788	463
Chemicals & Petroleum Refining	\$589,953,140	\$98,476,759	\$46,242,145	324
Rubber and Leather Products	\$71,525,907	\$30,495,115	\$17,822,806	282
Lumber Products & Furniture	\$32,098,890	\$10,711,014	\$7,639,055	83
Stone, Clay, & Glass Products	\$74,605,063	\$38,232,105	\$19,993,638	251
Primary Metal	\$128,786,293	\$39,135,405	\$29,129,270	466
Fabricated Metal Products	\$268,103,844	\$102,331,768	\$66,062,751	1,149
Machinery, Except Electrical	\$129,379,126	\$54,384,485	\$38,852,166	441
Electric & Electronic Equipment	\$67,677,816	\$36,892,042	\$22,047,153	118
Motor Vehicles & Equipment	\$37,744,749	\$8,572,169	\$5,566,150	43
Transp Equip, Except Motor Vehicles	\$19,117,140	\$8,004,732	\$5,229,652	28
Instruments & Related Products	\$15,968,149	\$6,833,674	\$5,196,693	31
Miscellaneous Manufacturing	\$31,226,381	\$11,873,444	\$8,190,469	71
Transportation	\$431,583,742	\$286,043,951	\$189,180,609	2,358
Communication	\$325,039,485	\$200,834,181	\$85,742,034	656
Electric, Gas, Water, Sanitary Serv	\$871,358,347	\$195,363,785	\$85,249,423	220
Wholesale Trade	\$547,215,318	\$370,060,667	\$213,381,330	2,251
Retail Trade	\$1,637,057,344	\$1,357,026,447	\$811,461,697	23,020
Finance	\$243,231,823	\$133,282,919	\$77,610,037	553
Insurance	\$271,183,293	\$162,647,337	\$97,233,048	942
Real Estate	\$2,411,277,116	\$504,323,977	\$81,257,140	697
Hotels, Lodging Places, Amusements	\$157,003,132	\$82,247,469	\$53,957,999	1,183
Personal Services	\$349,911,018	\$216,514,617	\$168,451,571	2,939
Business Services	\$792,415,296	\$483,926,509	\$394,760,175	4,665
Eating & Drinking Places	\$785,122,833	\$460,205,950	\$244,854,634	11,923
Health Services	\$523,775,015	\$367,821,081	\$310,997,601	5,303
Miscellaneous Services	\$448,533,170	\$182,278,837	\$158,020,844	3,725
Households	\$20,105,670	\$20,105,670	\$19,680,479	1,227
<b>Total</b>	<b>\$22,431,655,130</b>	<b>\$8,526,428,897</b>	<b>\$5,034,357,640</b>	<b>83,261</b>

SOURCE: US Multi-Regional Impact Assessment System, The Perryman Group

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# The Barnett Shale Area Economy With the Barnett Shale

Actual Historical and Baseline Projected Values for Key Economic Indicators for the Barnett Shale Region\*

Date	Gross Area Product	Real Gross Area Product	Personal Income (by place of residence)	Real Personal Income (by place of residence)	Personal Income (by place of work)	Real Personal Income (by place of work)	Total Employment	Wage and Salary Employment
2001	\$76,315.256	\$96,754.916	\$79,583.180	\$91,581.650	\$51,737.985	\$59,538.335	1,378.7	1,089.8
2002	\$79,739.370	\$100,829.028	\$81,095.689	\$92,534.754	\$53,519.198	\$61,068.423	1,384.9	1,085.0
2003	\$83,454.517	\$102,025.656	\$83,447.555	\$92,888.030	\$55,296.425	\$61,552.145	1,401.4	1,081.4
2004	\$91,283.181	\$108,308.067	\$89,092.381	\$96,861.421	\$59,812.812	\$65,028.613	1,436.6	1,102.9
2005	\$98,315.152	\$111,874.288	\$97,207.499	\$102,139.270	\$63,717.123	\$66,949.777	1,491.1	1,142.8
2006	\$107,264.591	\$118,946.995	\$105,645.810	\$110,100.570	\$69,208.865	\$72,127.190	1,552.0	1,186.2
2007	\$117,462.269	\$123,757.397	\$113,681.507	\$117,272.764	\$74,383.791	\$76,733.614	1,599.0	1,220.9
2008	\$129,518.200	\$129,518.200	\$121,372.931	\$121,372.931	\$79,411.841	\$79,411.841	1,638.0	1,248.6
2009	\$131,965.502	\$132,061.338	\$127,145.982	\$123,811.005	\$83,182.900	\$81,001.054	1,634.2	1,245.3
2010	\$141,650.711	\$138,270.147	\$136,964.989	\$129,890.767	\$89,600.012	\$84,972.185	1,668.8	1,271.2
2011	\$152,111.778	\$144,866.826	\$147,350.233	\$136,210.223	\$96,386.567	\$89,099.525	1,705.3	1,298.6
2012	\$163,384.180	\$151,835.480	\$158,649.063	\$142,959.271	\$103,769.713	\$93,507.281	1,744.0	1,327.6
2013	\$175,371.105	\$159,058.480	\$170,776.079	\$150,025.155	\$111,693.484	\$98,121.659	1,783.0	1,356.9
2014	\$187,918.916	\$166,373.742	\$183,604.882	\$157,264.175	\$120,075.107	\$102,848.641	1,820.7	1,385.1
2015	\$201,226.236	\$173,938.525	\$197,354.795	\$164,834.487	\$129,057.920	\$107,791.635	1,858.6	1,413.4

\* GROSS AREA PRODUCT - Millions of Dollars; REAL GROSS AREA PRODUCT - Millions of 2008 Dollars; PERSONAL INCOME (By place of residence and work) - Millions of Dollars; REAL PERSONAL INCOME (By place of residence and work) - Millions of 2008 Dollars; EMPLOYMENT - Thousands of Persons



# The Barnett Shale Area Economy Without the Barnett Shale

Simulated Historical and Projected Values for Key Economic Indicators (in the Absence of Barnett Shale)  
for the Barnett Shale Region\*

Date	Gross Area Product	Real Gross Area Product	Personal Income (by place of residence)	Real Personal Income (by place of residence)	Personal Income (by place of work)	Real Personal Income (by place of work)	Total Employment	Wage and Salary Employment
2001	\$76,031.926	\$96,395.700	\$79,310.237	\$91,267.556	\$51,551.231	\$59,323.425	1,375.0	1,086.9
2002	\$79,106.465	\$100,028.730	\$80,573.603	\$91,939.025	\$53,101.756	\$60,592.097	1,376.8	1,078.7
2003	\$82,749.148	\$101,163.321	\$82,738.485	\$92,098.743	\$54,832.192	\$61,035.393	1,392.4	1,074.5
2004	\$89,891.848	\$106,657.242	\$87,835.590	\$95,495.035	\$58,906.066	\$64,042.797	1,419.7	1,089.9
2005	\$95,349.204	\$108,499.291	\$94,649.144	\$99,451.118	\$61,801.388	\$64,936.848	1,456.8	1,116.6
2006	\$101,794.228	\$112,880.844	\$101,382.748	\$105,657.748	\$65,746.122	\$68,518.434	1,491.2	1,139.7
2007	\$109,467.116	\$115,333.761	\$107,652.321	\$111,053.114	\$69,555.210	\$71,752.495	1,515.2	1,156.9
2008	\$118,500.035	\$118,500.035	\$112,752.318	\$112,752.318	\$72,860.173	\$72,860.173	1,526.9	1,163.9
2009	\$125,115.442	\$125,206.304	\$122,952.582	\$119,727.597	\$78,989.501	\$76,917.645	1,564.5	1,192.2
2010	\$133,925.815	\$130,729.610	\$130,540.527	\$123,798.128	\$84,863.629	\$80,480.435	1,592.1	1,212.8
2011	\$143,244.012	\$136,421.424	\$140,141.575	\$129,546.556	\$90,944.365	\$84,068.766	1,619.4	1,233.2
2012	\$153,024.128	\$142,207.722	\$150,436.212	\$135,558.640	\$97,405.224	\$87,772.216	1,646.1	1,253.1
2013	\$163,057.524	\$147,890.281	\$161,269.369	\$141,673.601	\$104,120.634	\$91,468.983	1,669.5	1,270.5
2014	\$173,286.135	\$153,418.631	\$172,572.118	\$147,814.215	\$111,065.439	\$95,131.537	1,689.0	1,284.9
2015	\$183,840.705	\$158,910.596	\$184,520.614	\$154,115.134	\$118,339.964	\$98,839.794	1,705.8	1,297.3

\* GROSS AREA PRODUCT - Millions of Dollars; REAL GROSS AREA PRODUCT - Millions of 2008 Dollars; PERSONAL INCOME (By place of residence and work) - Millions of Dollars; REAL PERSONAL INCOME (By place of residence and work) - Millions of 2008 Dollars; EMPLOYMENT - Thousands of Persons

