**Executive Summary** 

# Northwest Colorado Socioeconomic Analysis and Forecasts

- Socioeconomic Forecasts
- Fiscal Projections
- Model Documentation



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April 4, 2008

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## Prepared for

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# Northwest Colorado Socioeconomic Analysis EXECUTIVE SUMMARY

Northwest Colorado is in the first decade of an extraordinary period of challenges, risks and opportunities. As the focal point of one of the largest "gas plays" in North America—as well as the center of potential U.S. oil shale production further in the future—economic activity in this mostly rural region is rapidly expanding. But the region is severely challenged by the pace, locations and nature of these growth pressures. County and municipal governments and the private sector are also confronted with many risks—ranging from the uncertainties of national energy markets, and the possibility of changes in state revenue allocations, to the potential implications of failure to keep up with planning and the infrastructure upgrades needed to serve fast growing demands. With proactive regional efforts, local commitment to solving difficult challenges and ongoing technical and financial support from state and federal sources, the region has the potential to capitalize on this extraordinary period, maintain economic diversity and develop high quality, sustainable communities.

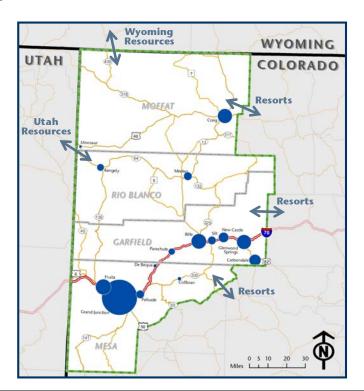
# Background

In June 2007, the Associated Governments of Northwest Colorado (AGNC) with support from the Colorado Department of Local Affairs (DOLA) retained BBC Research & Consulting (BBC) to analyze existing socioeconomic conditions in northwest Colorado and forecast how those conditions may change with future natural resource (e.g. natural gas and oil shale) development. The study area focused on Mesa, Garfield, Rio Blanco and Moffat counties while recognizing the influences of major resorts in some adjoining counties and the interrelationship with similar natural resource development occurring in nearby areas of Wyoming and Utah. Exhibit ES-1 depicts the study area and surrounding edges of the region.

### Exhibit ES-1. Northwest Colorado Study Region

Note: Circles for cities and towns are sized in proportion to current population.

Source: BBC Research & Consulting, 2008.



This project was funded by the State of Colorado and overseen by a committee of local government officials from the study area as well as representatives of affected state agencies. Day-to-day project management was provided by Ms. Judy Jordan, Energy Liaison for Garfield County and Mr. Aron Diaz, Director of the AGNC. Advisory board meetings were held approximately once per month during the eight-month analysis period. Extensive data, assistance and review was also provided by the Colorado State Demography Office (SDO).

The following is an overview of the key findings from this study. Implications and potential next steps are discussed at the end of this section.

# **Current Conditions and Recent Trends**

**Pre-2000 socioeconomic conditions**: The economy of northwest Colorado was hit hard by the collapse of the oil shale industry in 1982. By the late 1990's, however, the region had experienced an economic resurgence based on multiple factors:

- Reasonable cost of living. Low housing costs and generally low costs of living, coupled with access to I-70, environmental quality and proximity of recreation, attracted businesses, small entrepreneurs and retirees.
- Flourishing regional tourism. Tourism, a longstanding component of the economy in the region and in the nearby resort areas, benefitted from strong national and international economic conditions.
- > Local tourism complemented agriculture and hunting. Agriculture, ranching and hunting improved as beef prices rose, fruit orchards and wineries expanded, and wildlife management supported a strong local hunting and outdoor recreation industry.
- Housing availability and cost meshed with demand from resort areas. Housing for resort workers developed in response to the high cost of housing in nearby resort area (Pitkin, Routt and Eagle counties) economies.

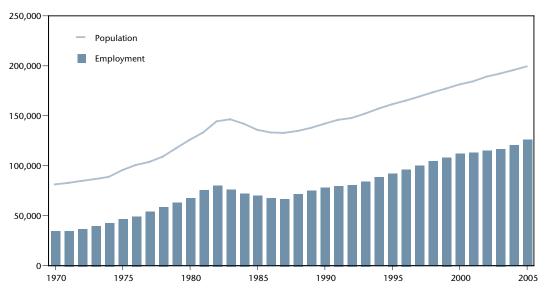
This economic growth was not uniformly spread within the region, although virtually all areas witnessed some expanded economic activity.

**Changes since 2000:** Since 2000, rapidly increasing natural gas development has been the most visible change in the region.

- Energy emerges as a major economic driver. Natural gas development and other natural resource industries are playing an increasingly important role in the northwest Colorado economy. In 2006, these industries accounted for 15 percent of total direct and secondary employment in the overall region but a far more concentrated proportion in various subareas of the four county region.
- Skepticism remains concerning the long-term. After many years of frustration over the collapse of the last energy boom, there remains considerable local skepticism regarding long-term growth forecasts. Nevertheless, the steadfast pace of current gas exploration and related employment growth is leading to growing acceptance that recent increases in gas development activity are predicated on fundamentally different economics than the 1978-1982 situation.

Dramatic increases in local housing and labor costs. Housing costs in the study area, roughly 35 percent below comparable Denver metropolitan area costs just six years ago, now often match or exceed Denver area prices. Housing affordability issues, once considered a challenge of resort areas only, have become one of the study area's most pressing problems, particularly given the influx of young gas workers and the difficulties many businesses have in finding workers. Wages, particularly in occupations related to or competing with natural gas development, have also increased substantially.

Exhibit ES-2 depicts total employment and population in the region from 1970 through 2005.





Source: U.S. Bureau of Economic Analysis.

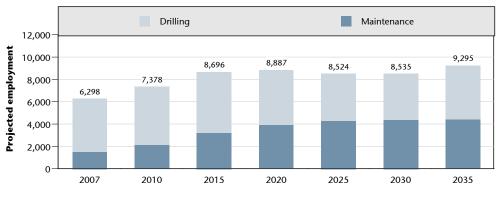
**Socioeconomic effects reach beyond the four county region**: Although this analysis focuses on a four-county area, the implications of the area's economic growth extend beyond these boundaries:

- ➤ Eagle, Pitkin and Routt counties. These resort and retiree dominated economies sit on the periphery of the study area. For many years, study area communities offered a reliefvalve for resort driven employee housing. This absorption capacity is largely gone and the resort area counties will have to act much more aggressively to find and house workers.
- Northeast Utah and Southern Wyoming. Northwest Colorado is part of an emerging regional economy. Vernal, Utah is becoming a major regional service community as the area's economy matures and may exert increasing influence in northwest Colorado. Traffic between Rock Springs, Wyoming and portions of the study region is increasing, particularly through Moffat and Rio Blanco counties.

## **Anticipated Future Natural Gas Activity**

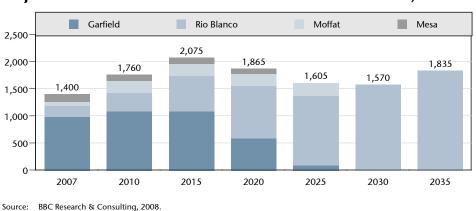
**Gas drilling activity will expand, and then stabilize:** Gas drilling is projected to continue to increase through 2015 then remain relatively stable through the end of the forecast period (2035).

Gas-related employment will continue to help drive the economy. New drilling technology requires fewer workers per well than just a few years ago. Over time, more and more of the gas-related jobs in the region will be tied to maintaining and reworking existing wells. There are currently about 7,500 operating wells in the region. Even with stable drilling activity, an estimated 50,000 additional wells may be drilled over the next 30 years. All wells will require support, gas processing, maintenance and distribution. Barring unforeseen changes in the national supply and demand for natural gas, the industry will provide a long-term supply of jobs. Exhibit ES-3 below depicts projected direct natural gas-related employment through 2035.





Geographic focus will shift to the north. Gas development and the myriad of support services and secondary growth that accompanies this development will be a primary force behind growth in the region, particularly in Rio Blanco, Garfield and Moffat counties. Over the next two decades, the focus of new well development will shift north, from Garfield County to Rio Blanco County. Exhibit ES-4 below depicts the projected number of new wells drilled and completed by year and by county.



## Exhibit ES-4. Projected Annual Natural Gas Wells Drilled in Northwest Colorado, 2007–2035

Source: BBC Research & Consulting, 2008.

Risk of downturns in natural gas activity. The gas development scenario developed for this study portrays expected overall activity levels over the next three decades. However, well drilling activity will vary from year to year in an unpredictable fashion. Changing market conditions and price levels may also lead to periods of faster or slower gas development within the region and corresponding fluctuations in local retail sales, employment and fiscal conditions. Although all current indications suggest gas development will be ongoing for the next several decades, it remains possible that unforeseen changes in markets, other supply sources or other factors could curtail development sooner than expected. Eventually, development of new wells will inevitably decline as production capacity approaches the limits of the economically recoverable gas resources in the region.

## **Baseline Growth—Without Commercial Oil Shale**

**Regional population will double**: Approximately 210,000 persons lived in the four county region in 2006. Based upon projected growth in energy activity and growth in the other components of the region's economic base, the total population is forecast to nearly double to 417,000 residents by 2035—without development of a commercial oil shale industry. The most rapid growth will occur in the rural areas of western Garfield, Rio Blanco and Moffat counties, though Mesa County will gain the most total residents.

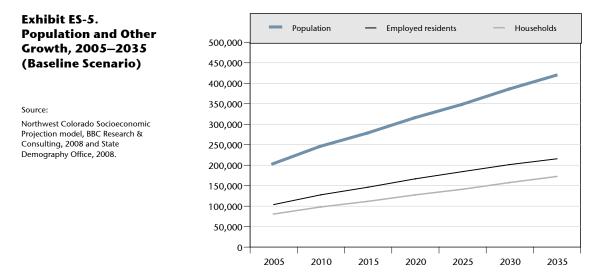


Exhibit ES-6 depicts projected population growth by county. Both Garfield County and Mesa County have their own long-term population forecasts (developed previously). In both cases, the county's forecast of future population growth is greater than the baseline forecast from this study. Consequently, both counties feel the baseline scenario may be conservative and could understate potential growth-related impacts.

County	2005	2010	2015	2020	2025	2030	2035
Garfield	50,673	67,253	78,393	95,860	109,894	119,979	136,697
Mesa	130,662	148,594	166,410	182,170	196,824	220,594	235,272
Moffat	13,426	17,705	19,798	22,014	24,257	25,483	26,356
Rio Blanco	6,073	9,753	11,360	13,055	14,724	16,822	18,624
Total	200,834	243,305	275,961	313,099	345,699	382,878	416,949

# Exhibit ES-6. Population by County, Baseline Scenario

Note: Excludes commercial oil shale activity.

Source: Northwest Colorado Socioeconomic Projection Model, BBC Research & Consulting, 2008 and Colorado State Demography Office, 2008.

- Communities will be challenged to absorb growth. Under the baseline scenario, the foreseeable capacity of existing local municipalities to absorb growth is largely consumed. Consequently, a large share of future growth is assigned to unincorporated areas. This level of development in places like unincorporated Rio Blanco and Moffat counties may be infeasible, given zoning and practical development limitations, and may well be undesirable. Local municipalities, with state, federal and private industry assistance, may find ways to overcome some of the barriers constricting development and expanding capacities to accommodate another level of growth. Those communities capable and willing to accommodate demand will grow at rates far greater than the regional average.
- ➤ New communities may be needed. Conversely, some local communities will be unable to solve capacity shortcomings or unwilling to accept the changes necessary to accommodate the demands foreseen in this analysis. In some instances, these constraints have to do with physical barriers or absence of private lands, which are difficult challenges to overcome. Under these circumstances, entirely new towns may be needed. Where, when and how these towns would be created and financed is unknown.
- ➤ How growth will be accommodated is uncertain. In all likelihood, much of the growth allocated to unincorporated areas (particularly in Rio Blanco County) will need to be accommodated by some combination of further expansion of the capacity of existing municipalities, planned higher density developments (or new towns) in currently unincorporated areas, employer provided housing and/or shifting population growth to other counties in the region. Some population growth may also shift to the Vernal, Utah area.

- Agriculture and regional character will be impacted. Growth of both incorporated and unincorporated populations will accelerate the conversion of agricultural lands to other purposes. This conversion will further change the character of parts of northwest Colorado.
- Disproportionate impact will occur in some areas. Gas drilling is expanding north into Rio Blanco County, and will create pressure for commercial and residential development, if capacity can be created. Nevertheless, a substantial share of support and regional services are likely to remain based in Mesa County and Grand Junction, the largest city in the region.
- Dependency on gas-related employment will grow in certain areas. Under the baseline scenario, the proportion of the region's economy related to natural resources (primarily natural gas) is forecast to increase from about 15 percent at present to around 16 to 17 percent between 2010 and 2015, then decline slightly through 2035. However, the vast majority of growth in Rio Blanco County will be gas-related. As shown in Exhibit ES-7, by 2035 over 80 percent of jobs in Rio Blanco County will be energy-related.

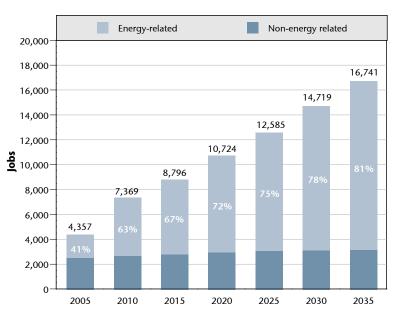
#### Exhibit ES-7. Total Jobs in Rio Blanco County, 2005–2035 (Baseline Scenario)

#### Note:

County energy job totals reflect work-site for natural gas jobs, not necessarily corporate office locations for the workers.

#### Source:

Northwest Colorado Socioeconomic Projection model, BBC Research & Consulting, 2008.

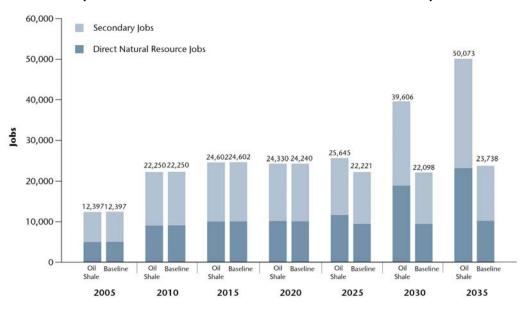


## **Potential Commercial Oil Shale Development**

**Commercial oil shale appears more likely than in the past**: The viability of commercialscale oil shale development remains uncertain, but the prospects appear better than in the past. Substantial private sector resources have been committed to solving the technical, environmental and economic issues associated with oil shale extraction and conventional oil supply, and price trends appear increasingly favorable to oil shale.

- Initial commercial production is likely more than ten years away. The study team expects the timing of future oil shale production to be consistent with estimates in the Draft Bureau of Land Management Preliminary Environmental Impact Statement (PEIS). The PEIS, however, does not estimate the magnitude of potential development. The study team has developed a scenario for rapid, yet reasonably foreseeable, oil shale development based on the experience with oil sands production in Alberta, Canada.
- ➤ More than twenty-five thousand direct and secondary workers by 2035. Within Colorado, commercial production is forecast to begin on a small scale in 2021. After 2025, about 50,000 barrels per day (bpd) of annual capacity is projected be added each year. All production will take place in Rio Blanco County. By 2035, oil shale development will require more than 9,300 direct workers. In addition, about 4,500 workers will be needed to produce additional natural gas as well as construct and maintain the electrical generation facilities necessary to meet oil shale's energy requirements. Over 12,000 secondary jobs would also be required to support the industry and its workforce. Exhibit ES-8 shows the additional direct and secondary energy-related jobs associated with commercial oil shale production compared to the baseline scenario.

#### Exhibit ES-8. Direct and Secondary Energy-Related Jobs, 2005–2035 (Commercial Oil Shale Scenario versus Baseline Scenario)



Source: Northwest Colorado Socioeconomic Projection model, BBC Research & Consulting, 2008.

- Oil shale challenges will grow beyond 2035. The year 2035 is the end of the modeling period for this study, but does not represent the end of the surge in oil shale production. The commercial oil shale scenario embodied in the model anticipates production levels of about 500,000 bpd by 2035. The U.S. Department of Energy has called for development of an industry capable of producing 2 million bpd, and Colorado has the best oil shale resources in the nation.
- Environmental and socioeconomic constraints. The potential introduction of commercial oil shale development will exacerbate the environmental and socioeconomic concerns already associated with the study area's rapid development. Major challenges include water conservation, greenhouse gas (GHG) emissions, land disturbance, waste management and existing environmental standards and limits. From a socioeconomic perspective, major issues of concern include an overwhelming demand on a limited population of skilled laborers and the affordability and availability of housing in the region.

## **Economic and Demographic Effects of Commercial Oil Shale Production**

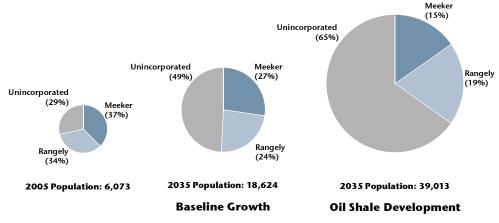
**Oil shale would add 50,000 residents by 2035**: With the development of commercial oil shale, the population is forecasted to reach nearly 466,500 by 2035 — nearly 50,000 more people than under the baseline scenario. Exhibit ES-9 compares projected county populations under the Commercial Oil Shale scenario with the Baseline scenario projections.

	2005	2035 Population		
	Population	Baseline	Oil Shale	Difference
Garfield County	50,673	136,697	154,301	17,604
Mesa County	130,662	235,272	241,746	6,474
Moffat County	13,426	26,356	31,487	5,131
Rio Blanco County	<u>6,073</u>	<u>18,624</u>	<u>39,013</u>	<u>20,389</u>
Total Region	200,834	416,949	466,547	49,598

## Exhibit ES-9. Projected County Populations, Commercial Oil Shale Scenario

Source: Northwest Colorado Socioeconomic Projection Model, BBC Research & Consulting, 2008 and Colorado State Demography Office, 2008.

Little room in existing towns for the added growth. The region, and particularly Rio Blanco and Garfield counties, would already face significant challenges just to accommodate projected growth under the baseline scenario. There appears likely to be little additional capacity in existing local municipalities—except perhaps in Mesa County—to accommodate the additional residents associated with oil shale production, construction of new oil shale facilities, and development and operation of power plants to supply required electricity. Rio Blanco County will face extraordinary growth pressures. Northwest Colorado's most rural county will face extraordinary growth pressure if commercial oil shale develops as envisioned in this study. The county is unlikely to accommodate all of the growth pressure it will face under the baseline scenario, in which the population is forecast to triple between 2005 and 2035. With the development of commercial oil shale, Rio Blanco's population is projected to exceed 39,000 residents — more than double the baseline forecast of about 18,600 people. Exhibit ES-10 depicts the relative size and forecast distribution of Rio Blanco County's population in 2005 and 2035 under the baseline and commercial oil shale scenarios. The projected population levels in Meeker and Rangely reflect estimated capacity limits for each town, it is not known how or where the remainder of the population growth (shown in unincorporated) would be housed. (*Meeker recently re-examined its capacity in a new study and believes it could accommodate up to 10,000 people—which would take some pressure off of the rest of the county*).



### Exhibit ES-10. Rio Blanco County Population Distribution, 2005 and 2035

Source: BBC Research & Consulting, 2008.

> Further rapid and unpredictable expansion is possible. If commercialization progresses, the oil shale industry has the potential to expand very rapidly—very likely overwhelming the capacity of local governments to deal with growth requirements.

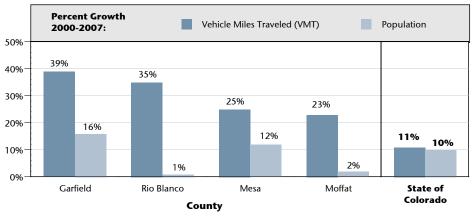
# **Public Sector Financial Implications**

## Municipal growth capacity and related financial support are pressing issues in

**Garfield, Rio Blanco and Moffat counties:** The levels of growth anticipated in three of the four counties in the study area exceed the reasonably long-term capacity of existing communities. Rifle and nearby communities are already stretching to accommodate additional development, and Rio Blanco and Moffat counties have minimal growth capacity.

- > Accommodating growth in this region is very challenging.
  - The area is among the most rural in the United States and local communities have very limited ability to absorb and service new development.
  - Public lands and topographic barriers can force inefficient development patterns.
  - Existing road systems were never intended to serve high levels of traffic and heavy trucks. Projected street maintenance and repair costs are staggering expenses for most communities.
  - Worker shortages, compounded by rising housing and cost of living expenses, make retention of service workers difficult and expensive. Similarly, the absence of contractors and the competition for their services along with shortages of materials drives up the costs of new projects and personnel.
  - Capital investment is needed far in advance of likely revenue. As a rule, residents arrive first and revenues follow, sometimes years later. Nevertheless, residents require public services, streets and utilities from the day of arrival.
  - The problems with TABOR expenditure limitations, which require population to be in place before increased spending can be allowed, compound service provision problems.

➤ Gas activity produces high volumes of traffic in an area with limited road system capacity. The gas industry is decentralized and highly mobile, and its employees and subcontractors commute each day to job sites in remote areas. High volumes of vehicle and truck traffic will continue even as activity turns from drilling to maintenance. Road expansion, a mixture of surface improvements, system expansions, safety enhancements, and on-going maintenance, are the most pressing needs. Funding for radical system alterations, such as new access routes into Rio Blanco County or additional bridges over the Colorado River are not included in these forecasts. Without the I-70 spine, which mitigated impacts in the recent gas development periods, growth in the next phase of resource development will be more difficult to accommodate.

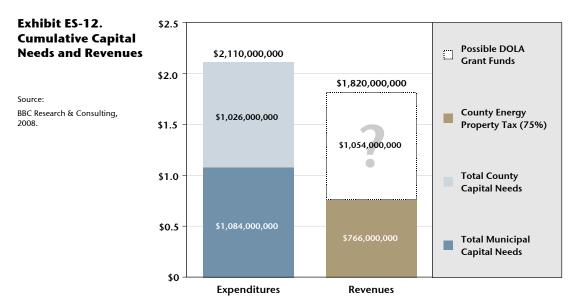


## Exhibit ES-11. Traffic Congestion and Population Growth, 2006

Source: Colorado Department of Transportation, 2007.

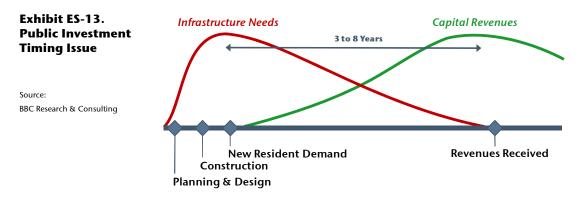
# > Housing and worker shortages will continue to restrict community development .

The gas industry has the ability to pay high wages and aggressively compete for workers. Although beneficial for local residents, this competition for workers and housing has strained many other local businesses and local governments, hospitals and schools. Housing costs have risen rapidly in the area and housing of any kind is scarce, making attraction of new residents difficult. Funding and timing of critical capital infrastructure, such as roads, water, sewer and community amenities are the study area's primary fiscal challenges. Under baseline conditions, BBC 's estimates suggest \$2.1 billion dollars of necessary infrastructure investments (road, bridges, administrative facilities, water, sewer, parks and recreation) over the next 28 years with projected energy related property tax funding of about \$1.0 billion. If past funding ratios hold true, there is the prospect of state discretionary grants for roughly an additional billion dollars. There is considerable uncertainty in capital cost estimates and the region-wide numbers obscure revenue/cost imbalances between jurisdictions.



There remain about \$300 million of capital investment needs that will require additional local, private, state or Federal participation

The lag -time between infrastructure need and tax revenue exacerbates funding problems. Simply stated, residents need functioning communities when they arrive, but most revenue sources (property taxes, sales taxes and severance taxes) occur only after new workers are in place, drilling and production is complete, and tax-revenue flowing. This tax lag problem is further compounded by the need to plan, design and construct infrastructure even before resident relocation.



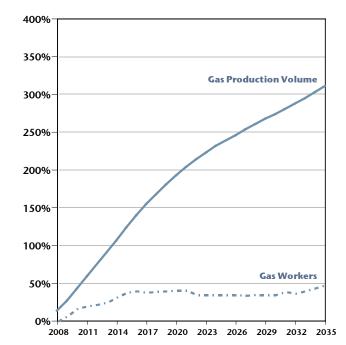
- > Uncertainty undermines investment strategies. Natural resource extraction has traditionally been a boom-and-bust business. Changes in gas development economics, rising or declining prices, and the uncertainty of tax revenue redistribution make infrastructure investment difficult. Gas prices are uncertain and the pace and value of extraction is subject to sudden swings. This makes both private and public investment decisions, which are often made in anticipation of future events, more difficult.
- Resource derived property taxes will rise substantially as new wells come online. Natural resource-based property taxes will rise rapidly as the region goes from nearly 8,000 to nearly 40,000 operating wells. In aggregate, the four counties will be in strong fiscal position to cover operating costs, but revenue timing and imbalances between service delivery responsibility and tax revenue collections will remain. Local communities will also benefit from expected increases in severance tax and federal royalty payments, which are distributed based on energy worker residence.

#### Exhibit ES-14. Projected Increases in Regional Gas Production and Workforce

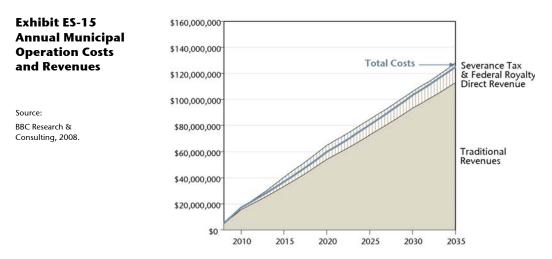
Note: Projected increased relative to 2006.

#### Source:

Northwest Colorado Socioeconomic Projection Model, BBC Research & Consulting, 2008.



Federal royalties and severance tax revenue production from northwest Colorado will grow rapidly, but distribution of revenues to this region is uncertain. Northwest Colorado federal royalty and severance tax payments are projected to rise very rapidly in line with gas production. The percentage of production on federal lands (subject to federal royalty taxes) will more than double, stimulating federal royalty payments. As tax production in this area grows, other Colorado gas and oil fields will likely decline dampening the overall growth in statewide collections. If severance tax and Federal Royalty payments to local municipalities rise in line with state collections, local municipalities will be well positioned to meet operating obligations.



These resource-based revenues will be substantial but local communities have no assurance that redistribution of production-based taxes will continue in the present manner or grow in proportion to local gas productivity.

- Local ability and willingness to expand self-funding capacity is uneven. Certain communities—larger cities with strong retail sales, towns that can attract higher value development and communities with aggressive impact fees—will be able to fund much of what is required to service rapid residential growth. As energy development migrates northward, affecting the smaller and more remote communities of Rio Blanco and Moffat counties, growth-financing capacities become more constrained and infrastructure solutions will require more regional or state support. Communities that retain TABOR limitations will be hard pressed to maintain services.
- ➤ A commercial oil shale industry will overwhelm the area's rural public infrastructure. Oil shale leasing costs are undetermined. Some form of major financial intervention and regional planning effort will be required to develop requisite infrastructure at the appropriate time in preparation for worker needs.

# **Potential Next Steps**

This study provides economic, demographic and fiscal forecasts for northwest Colorado based on the best information available at this time. This effort has also produced an economic and demographic model that can incorporate revised data concerning future natural resource development as conditions change.

Perhaps most importantly, the information described in this report points out a number of risks and challenges confronting local governments in northwest Colorado. These challenges are well described in the words of the local governments in the region. Section VII of this report provides comments from several local governments based on the initial draft of this report.

While this study provides a starting point, much more work needs to be done to address the challenges facing this region over the next three decades. A regional perspective and Adaptive management that responds to changing conditions is essential. The collaborative Task Force of local government and state agency representatives that supervised development of this report has indicated a willingness to continue collaborative efforts. Productive areas for further research, analysis and policy development include, but are not limited to:

- Monitoring of resource management, development and extraction trends;
- Revising and updating socioeconomic data and forecasts as conditions change;
- Expanding regional transportation planning, modeling and impact analysis efforts;
- Monitoring and updating revenue and cost projections;
- Coordinating regional efforts for infrastructure planning, development and financing;
- Expanding partnerships with state government and industry;
- Evaluating local financing and impact mitigation strategies that could address capital needs, cash flow issues and risk management;
- Evaluating land use planning and growth management tools and identifying locations where growth may best be accommodated;
- Coordinating attainable and affordable housing efforts;
- Evaluating strategies to address issues and opportunities created by a large, transient workforce; and
- Identifying strategies for community sustainability in the eventual, post-production era.