

MEMORANDUM



TO: Wyoming Water Development Commission
FROM: Edward Harvey and Doug Jeavons
RE: Task 4. Bear River Basin Water Demand Projections
Memo 2: Future Economic and Demographic Scenarios
DATE: October 6, 2000

Introduction

This memorandum describes economic and demographic projections for the Bear River Basin (Basin) under three alternative scenarios. The study team's economic and demographic projections for the Basin are addressed as follows:

- a description of the forecasting approach employed in this study, including a review of existing forecasts;
- alternative scenario projections for each of the key sectors – agriculture, energy, tourism and manufacturing/commercial; and
- aggregate economic and demographic projections under each scenario corresponding to the sector projections.

Information summarized in this memorandum was gathered from publicly available secondary sources and from personal and telephone interviews conducted by BBC Research & Consulting (BBC) from May through August 2000. References are listed at the end of this memorandum.

This memorandum is one of four that comprise the water demand projections for the Basin. An overview of economic and demographic conditions in the Basin, and more specific description of current conditions in key economic and water use sectors, was provided in Memo 1. The third memorandum describes the future water demand projections, based upon the economic and demographic projections detailed in this memorandum. Memo 4 offers projections of recreational water needs.

Approach

There are numerous approaches to developing economic and demographic projections for a regional economy, ranging from simple statistical extrapolation to sophisticated econometric modeling. The projection approaches vary in terms of complexity, the amount of information they convey, and the amount of data they require. The following paragraphs provide a description of existing economic and demographic projections for the Bear River Basin area and the study team's assessment of the appropriateness of those projections for the purposes of this study. This section concludes with an overview of the forecasting approach adopted by the study team, and reviewed by the Wyoming Water Development Commission, and an overview of the three planning scenarios that drive the subsequent projections.

Review of Existing Projections. The study team reviewed a number of existing economic and demographic projections for potential suitability for use in this study. These projections come from various sources, including:

- the Federal government – Bureau of the Census;
- Wyoming state government – Department of Administration and Information (DAI) projections;
- local governments within the study area – various county and municipal planning projections; and
- the private sector – Applied Geographic Solutions (AGS), Woods & Poole, Regional Economic Models Incorporated (REMI) and Data Resources International (DRI).

Necessary characteristics for purposes of projecting Bear River Basin water demands include: a time horizon similar to (or longer than) the 30- year planning horizon for this study, recognition of basin-specific economic and demographic characteristics and sufficiently detailed results to allow projection of specific types of water demand (such as agricultural use). The study team found that although each of the existing projections has merit for its intended uses, none was ideally suited in isolation to the purposes of this study. However, one of the planning scenarios adopted for this study (and for the Green River Basin study being simultaneously conducted by another consulting team) does borrow from a combination of the Bureau of Census and Wyoming DAI projections, as described later in this memo. It is intended that this single forecasting approach be utilized in other basin planning studies throughout the State.

Exhibit 1, below, provides a summary of the review of each existing economic and demographic projection.

**Exhibit 1. Alternative Economic and Demographic Techniques
Potentially Applicable to the Bear River Basin**

Source of Projection	Geographic Detail	Future Period	Variables Projected	Means of Application	Issues
Bureau of the Census	State of Wyoming	2025	Population	Trend applied to State, adjusted to reach national total	Not sufficiently Basin-specific
Wyoming State DAI	State of Wyoming; counties	2008	Population, Employment, Income	National model step down to state to counties	Forecast period not long enough
Local Uinta County/ Evanston/ Lincoln County/ Cokeville	Varied	Varied	Generally Population Only	Alternative, assumed growth rates	Population only
Private AGS	County and block level	2009	Many demographic/ economic variables	Combination of local and national data	Forecast period not long enough
Woods & Poole	State of Wyoming; counties	2020	Many demographic/ economic variables	National model step down to economic areas to counties	Not sufficiently Basin-specific
REMI	State of Wyoming; counties	2035	Population, Employment, Income	Interaction of County/ State economies with national economy	Not sufficiently Basin-specific
DRI	State of Wyoming; counties	2024	Population, Employment, Income	Manufacturing trends, county built up to state totals	No agriculture information

Economic Base Methodology. The economic and demographic projection approach adopted by the study team for this effort employs an established technique in regional economics known as “economic base analysis.” The economic base approach is a “bottom-up” method that has the advantages of focusing directly on specific activities that are likely to drive economic and demographic changes in the future and providing a substantial level of detail about those activities in the future, while at the same time being less data intensive than econometric modeling approaches. Essentially, this approach involves the following five steps:

1. Identify the existing and potential basic economic activities in the region through analysis of economic statistics and local interviews. Basic activities are defined as businesses or governmental organizations that bring money into the region from sales of goods or services to outside areas or through transfers of public funds.

2. Identify the current statistical relationships: a) between total employment in economic base activities and other employment in the economy (termed "local service employment"); and b) between total employment and population. The latter relationship reflects the proportion of the population that is of working age, the labor force participation rate amongst the working age population and the unemployment rate as well as in-commuting or out-commuting from the area.
3. Conduct industry studies for each of the basic economic sectors to identify trends in employment and production and factors affecting potential future growth of those sectors. These studies entail research and analysis of available industry data and local interviews. The likelihood of the emergence of new basic economic activities in the region is also assessed in this step.
4. Develop specific projections of future basic economic activity levels based upon the results of step 3 and clearly defined scenario assumptions.
5. Develop overall employment and population projections based upon the basic activity projections developed in step 4 and the statistical relationships developed in step 2. Potential changes in these statistical relationships in the future are also considered in this step.

Overview of Planning Scenarios. The study team developed three alternative planning scenarios for this study. Two of the scenarios employed the economic base forecasting approach just described, while the third used an alternative method based upon the Bureau of Census statewide population forecasts and the DAI short-term projections for Wyoming counties. An overview of each of these scenarios is provided below. More specific details about the assumptions for each key sector in the economic base projection scenarios are provided following this overview.

Economic Base High Case Scenario. In the simplest terms, the economic base high case scenario incorporates the study team's views of the most growth in each of the key sectors that is reasonably likely to occur over the forecast horizon. It is remotely possible that one or more of the key sectors could grow even more than we have assumed under this case or an unforeseen, new basic economic activity could become established and flourish in the region. However, because this scenario incorporates the aggressive assumption that each of the key sectors will achieve its highest reasonably likely growth at the same time, the study team believes this scenario represents a useful upper bound for subsequent water planning purposes.

Economic Base Low Case Scenario. The economic base low case scenario embodies the study team's views of the lowest growth (or largest contraction) reasonably likely to occur in each of the key sectors over the planning horizon. While even lower economic activity levels in one or more sectors are not impossible, the assumption of simultaneous low activity levels in each of the key sectors makes this scenario a supportable lower bound for planning purposes. While the low scenario obviously will not impose pressure on regional water resources, this scenario is sometimes used for purposes of determining the financial risk involved with potential water resource enhancements.

"Top-Down" Population Projection Scenario. The third scenario incorporated in this study involves a substantially different approach than the economic base scenarios. This scenario approach, also being incorporated into one of the scenarios developed in the Green River Basin Plan, focuses on total population projections for the region based upon the existing Bureau of Census projections for the State of Wyoming and the DAI projections of county population through 2008 (discussed earlier in Exhibit 1). While this approach does not directly provide information about employment levels or activity levels in specific sectors, future water demands can be related to the scenario either by interpolation based upon total population comparisons to the more specific economic base scenarios (the method employed in this study) or through independent projections of non-municipal water use in agriculture, industry and other activities (the method employed by the Green River Basin study team).

As discussed at the conclusion of this memo, the top-down approach ultimately resulted in a projected level of population growth that falls between the two economic base scenarios. While this result makes the top down approach, in effect, the middle scenario, it is important to recognize that none of the three scenarios should be viewed as the most likely future scenario.

Economic Base Scenario Assumptions for Key Sectors – Agriculture

Local interviews and research into both historic agricultural practices and competing environmental interests provide insight into potential factors that may influence the future of agriculture in the Bear River Basin. Potential factors that could significantly impact agriculture within the Basin include public land grazing policies and the potential development of a wildlife refuge near Cokeville, in Lincoln County. The following are summary observations about prospects for Bear River Basin agriculture in the future.

- **History and Potential Future Constraints.** The agricultural sector historically has been the cornerstone of the economy in the Basin. Because the sector has grown little in recent years, its relative share of the local economy has declined. Increasing pressure on livestock grazing resources, both due to increasing land values on private lands (1997 Census of Agriculture) and increasing concern about stocking levels on public rangelands is likely to prevent the Basin agricultural sector from expanding significantly in the near future.
- **Local Insights.** Interviews with local agricultural representatives indicate that little has changed in the Basin agricultural sector over the past 30 years (Bear River Advisory Group) or (Burrough, Grandy, Grasmick). Some local sources commented on the conversion of traditional ranches in the Basin to ranchettes in the Evanston area (Burrough) and hobby farms near Cokeville. Such hobby farms have generally been leased back to local ranchers (Grandy).
- **Public Land Grazing Policies.** The BLM has been experimenting with more aggressive management plans on its bigger livestock grazing allotments. (Smiths Fork and Cumberland/Uinta). Agency representatives stress that these management plans are joint efforts with the operators, aimed at restoring forage levels. The primary policy change on the Cumberland/Uinta allotment is that no sheep AUM's will be converted to Cattle AUM's (Easley). In addition, the BLM is implementing more active rotational practices for cattle on both the Cumberland/Uinta allotments and the Smith's Fork allotments (Smiths Fork Allotment Interim Management Plan, Cumberland/Uinta Allotment Cooperative Management Plan). The BLM established AUM capacity within the basin has declined by about 9 percent over the last 15 years (Kemmerer Resource Management Plan, 1986, and Rawson). Most of this decline, however, occurred on the larger allotments where these alternative management practices were applied.
- **Cokeville Meadows Wildlife Refuge.** Another perceived factor in future agricultural levels in the Basin is the implementation of the Cokeville Meadows National Wildlife Refuge (CMWR). The proposed implementation plan for the refuge, recommended by the Fish and Wildlife Service (FWS), calls for a total of 26,657 acres of land to be included within the refuge boundaries. Of this total, 20,436 acres of private land are to be acquired from local landowners through fee

purchase, with another 3,696 acres of private wetland and upland acres acquired through conservation easements. The refuge area will also include 2,525 acres of State and Federal lands (Cokeville Meadows Wildlife Refuge Final Environmental Impact Statement, 1992).

A detailed assessment of the agricultural impacts of the proposed refuge is laid out in the FWS's Draft Environmental Impact Statement. Impacts on irrigated acreage include a stipulation that 25%, or approximately 3,024 acres of wet meadow hay acreage, be removed from production within the fee acquisition area (DEIS 1990, p. 14). In addition, although local ranchers will continue to crop 1,800 acres of meadow, 400 acres of this will be converted to small grain production as protection against waterfowl crop depredation (DEIS 1990, p. 14). Full refuge implementation will also result in the potential loss of an estimated 6,300 tons of forage on wet meadow haylands that is currently available to ranchers for aftermath grazing in the fall months (DEIS 1990, p. 121).

The CMWR has been open since 1993, but acreage acquisition for the refuge has been a slow process. Currently, the FWS has purchased or maintains easements on roughly 8,000 of the planned 26,657 acres in the refuge. The primary reasons for the slow rate of land acquisition are inconsistent agency funding sources and resistance on the part of local ranchers to sell their land (Damberg). Acquired acreage currently is being leased back to ranchers, with no real change in land or water use on the acreage. Any future water use impoundments for wildlife would require proof for the State of Wyoming that no current water users would be injured by such impoundments (Willis).

- Scenario Approach. BBC projected a low and high scenario for livestock and irrigated hay production in the Bear River Basin based on historic trends and assumptions about 1) future BLM grazing policies and 2) whether the CMWR will be fully implemented by the end of the projection time horizon.

Since livestock are the most important cash crop of the Basin agricultural sector, BBC's analysis of agricultural sector water use is based largely on livestock inventory data for Lincoln and Uinta Counties (Wyoming Agricultural Statistics Service). In order to standardize the analysis in terms of livestock forage levels, county level livestock inventories were converted to "Animal Units." This metric is equal to the sum of cattle

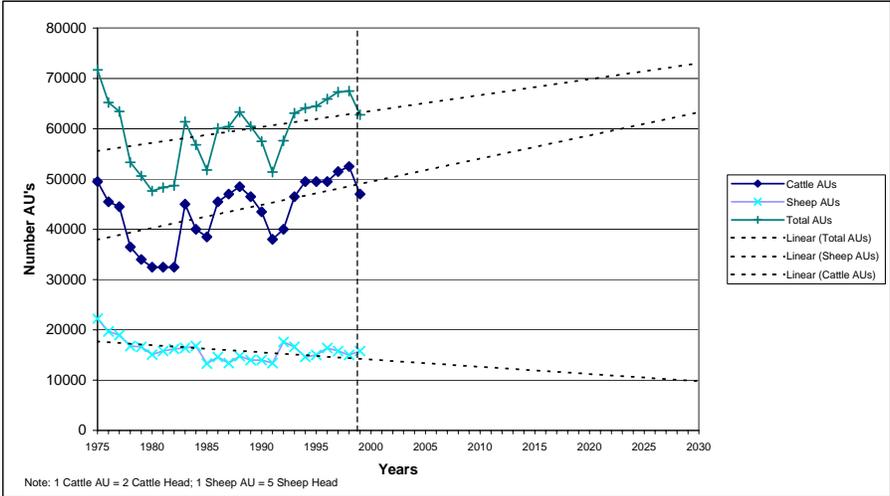
inventories divided by two and sheep inventories divided by five, and represents a measure of the average livestock inventory. Using trend analysis, total animal units were then projected from the last year of historical data (1999) to the end of the planning horizon (2030).

In order to scale the analysis from the county to the basin level, estimated trends are applied to Basin-specific allotment data, obtained from the BLM, on the stocking capacity of each allotment within the Basin as measured in animal unit months (AUM's). AUM's are then converted to Animal Units by dividing by the average length of time that livestock spend grazing on public rangeland (3.59 months). A key assumption is that the change in livestock inventory in the Basin follows the same time-trend as inventories in the rest of Lincoln and Uinta counties.

The irrigated hay acreage analysis assumes a long-term relationship between producer decisions about livestock stocking levels and irrigated hay production. Using trend analysis, this estimated relationship was applied to the projected livestock trends from the previous step. The resulting trends are then applied to GIS-estimated, 1998 irrigated acreage levels for the Basin (Leonard Rice Consulting Water Engineers) to project changes in irrigated acreage over the planning horizon.

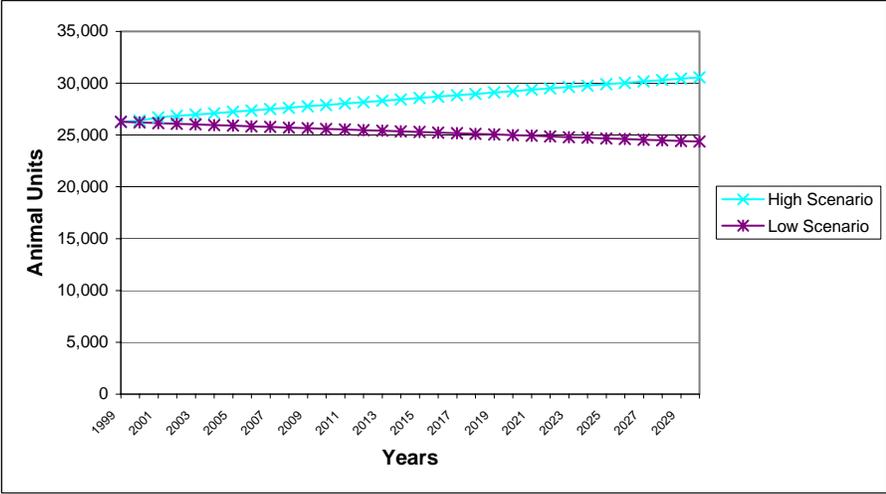
- **High Scenario.** The High Scenario for agricultural production reflects the assumptions that, throughout the projection period, the BLM will continue historical grazing policies and the CMWR will remain largely unimplemented. Under this scenario, cattle production continues to increase and sheep production continues to decline by about one percent annually. This scenario is depicted at the county level in Figure 1. By the end of the planning horizon, BBC projects roughly 63,000 cattle animal units and 10,000 sheep animal units within Lincoln and Uinta counties.

Exhibit 2. Projected Animal Units: Bear River Basin Counties (High Scenario)



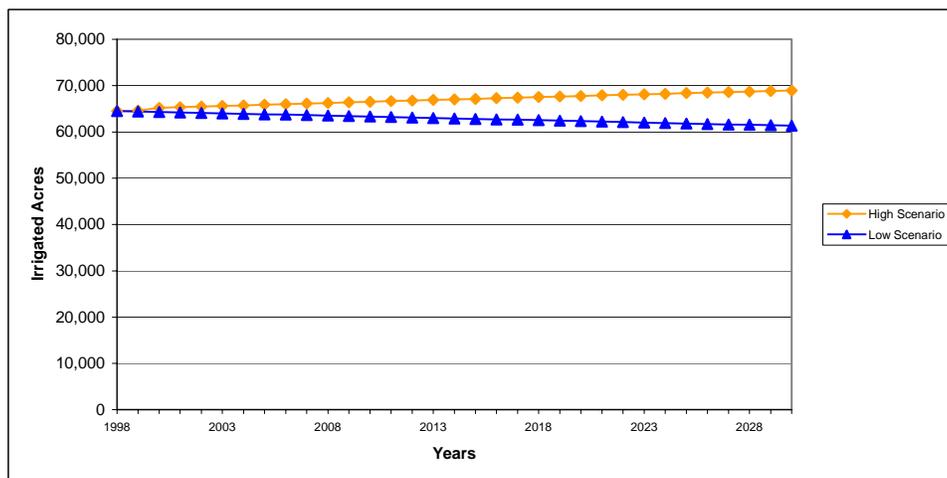
Under this scenario, BBC projects a total of about 31,000 animal units will be grazed in the Basin at the end of the planning horizon. Basin-level projections for the both the High Scenario and the Low Scenario (discussed later) are depicted in Exhibit 3.

Exhibit 3. Projected Animal Units: Bear River Basin (With Cokeville Meadows Refuge)



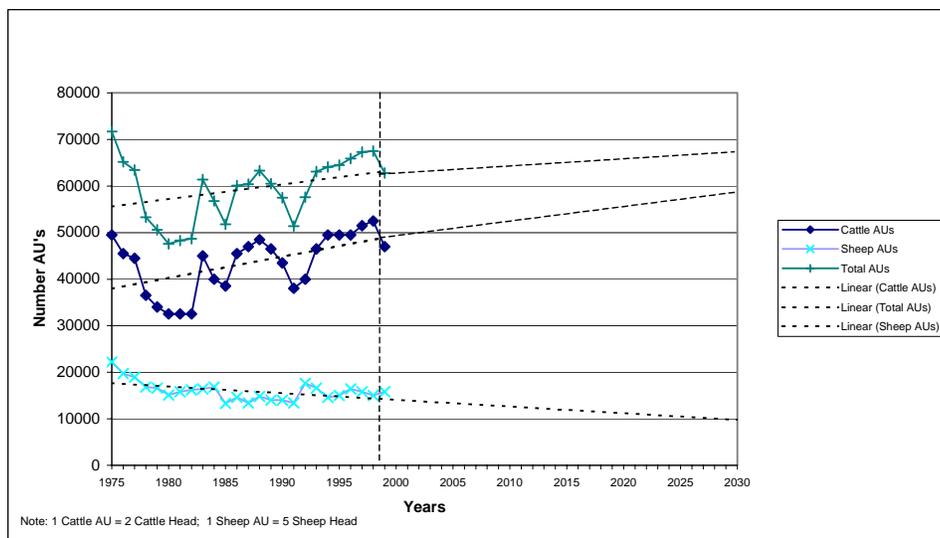
Under the high scenario irrigated hay acreage will slightly increase from current levels for the duration of the thirty-year projection period (See Exhibit 4). Specifically under the high scenario, BBC projects a total of about 69,000 acres of irrigated hay within the Basin in the year 2030. This more gradual rate of increase for irrigated acreage, relative to the projected livestock inventory growth rate, reflects continuation of the historic trend of a gradual increase in livestock levels per irrigated acre.

Exhibit 4. Projected Acres Irrigated Hay: Bear River Basin
(With Cokeville Meadows Refuge)



- Low Scenario.** The Low Scenario for agricultural production reflects changes in two important assumptions. The first is that BLM will expand its “no-conversion of sheep to cattle” grazing policy to other allotments within the Basin, producing a decline in grazing capacity on public lands. Exhibit 5 demonstrates that under this assumption, while sheep animal units continue to decrease according to their current trend, substitution to cattle animal units is restricted in the future so that cattle inventories in 2030 decline from current trend levels by roughly 4,000 animal units within Basin counties. Total animal units experience a corresponding decline.

Exhibit 5. Projected Animal Units: Bear River Basin Counties
(Low Scenario, Without Cokeville Meadows Refuge)



The second important assumption for the Low Scenario is that the CMWR will be fully implemented according to the plan detailed in the DEIS by the end of the planning horizon. Implementation of the CMWR results in a reduction of about 4,000 Basin animal units by 2030. Under this scenario, BBC projects a total of slightly more than 24,000 animal units will be grazed in the Basin at the end of the planning horizon.

Under both assumptions that constitute the Low Scenario, irrigated hay acreage within the Basin declines gradually over the 30 year planning horizon (see Exhibit 4 above). Specifically under the low scenario, BBC projects a total of just over 61,000 acres of irrigated hay within the Basin in the year 2030. This result stems from the livestock projections for this scenario and assumed continuation of historical increases in the number of animal units per irrigated hay acre within the Basin. In addition, full implementation of the CMWR implies that about 3,400 acres of irrigated hay within the Basin will be taken out of production.

- Future Employment. Under the High Scenario, the number of ranches and thus the number of farm proprietors and total farm jobs within the Basin would remain approximately at current levels, assuming increased labor efficiency. Under the Low Scenario, there would be a decline in total

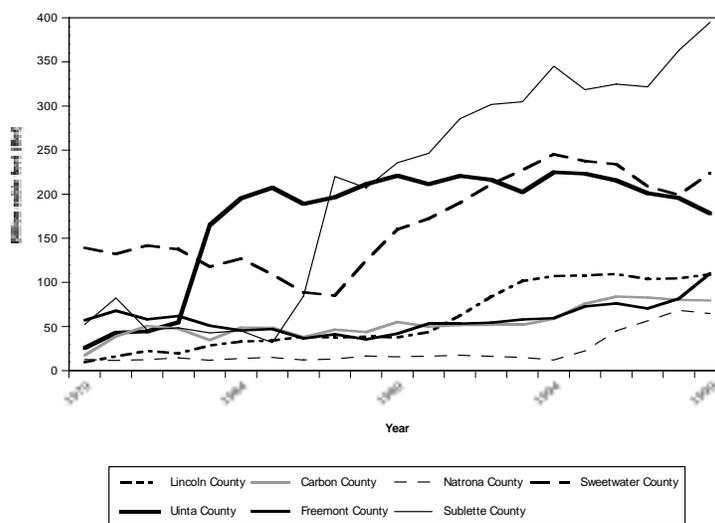
agricultural employment proportional to the projected 5 percent annual decline in irrigated acreage within the basin. Assuming the number of hired employees per ranch remains at its current level, the Basin could be expected to lose a total of 50 farm jobs by the year 2030.

Economic Base Scenario Assumptions for Key Sectors -- Energy

Historic trends and local interviews both provide indications of potential future changes in Bear River Basin oil and gas production. In light of the considerable attention focused on Coalbed Methane production in other parts of Wyoming in recent years, the study team also evaluated the potential for this type of activity in the Bear River Basin. The following are summary insights into the prospects for energy production and related activities in the future.

- Trends. Oil and gas production in the Bear River Basin has declined from historic maximum levels. Gas production peaked in 1994 at over 330 billion cubic feet and has declined about 10 percent since that year. Oil production peaked at about 13 million barrels in 1985 and has declined about 50 percent since that year. Exhibit 6, below, depicts annual gas production totals for each of the major producing counties in Wyoming, illustrating the relative age and declining share of state production accounted for by Uinta County, the primary producing area within the Bear River Basin.

Exhibit 6. Historical Natural Gas Production, BCF, 1979-1999 for Major Wyoming Counties

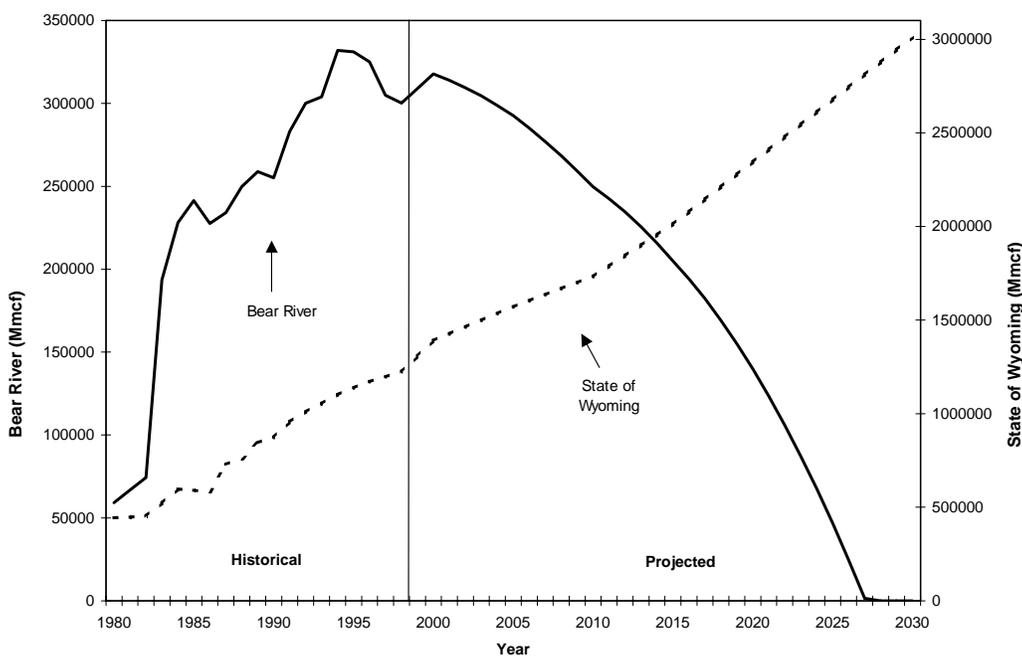


Source: Wyoming Oil and Gas Conservation Commission

- **Local Insights.** Local industry representatives expect that at least one of the three fields in the Bear River Basin may be economically exhausted within the next 15 years or so. Under mid-2000 prices and technological conditions, the other fields will likely also be at least somewhat diminished over the course of our 30-year projection period. With increasing prices and technological improvements, Basin production could remain relatively stable. Substantial increases in production appear quite unlikely though not absolutely impossible, according to local industry sources.
- **Coal Bed Methane.** Coal bed methane production is being explored, at a minimal level, in the Bear River Basin. However, despite the boom in coal bed methane production in other parts of Wyoming, only three wells have been completed to date in the basin, with two others under application. By comparison, more than 3,800 wells have been completed in Campbell County, with another 3,500 under application. Even with all of the recent activity in coal bed methane production elsewhere in the state, this type of gas production still represents only about six percent of all Wyoming natural gas production and is equivalent to only one-quarter of current Bear River Basin production of natural gas.
- **Scenario Approach.** BBC projected a low and high scenario for natural gas production and for oil production in the Bear River Basin. The projections were based upon local insights into the life cycle of the Bear River Basin oil and gas fields, USDOE70
- **Energy Information Administration long range projections of energy supply and statistical analyses to project first Wyoming production, then Basin production.** Essentially, the low and high scenarios reflect differing assumptions regarding: a) national and regional total gas and oil production, and b) the proportion of Wyoming gas production, and Rocky Mountain Region oil production, that will be supplied by operations within the Basin.
- **Low Scenario – Gas.** The Low Scenario Natural Gas production scenario reflects the EIA Reference Case projections for natural gas production in the Rocky Mountain Region. Based on historical trends, Wyoming is projected to continue to supply about 45 percent of Rocky Mountain Regional natural gas production. However, Basin wells are projected to supply a diminishing share of Wyoming's total gas production. Exhibit 7

depicts historical natural gas production from the largest producing counties in Wyoming. From this graphic, it is clear that older fields in Uinta County have begun to decline, while a growing proportion of Wyoming's natural gas production is being accounted for by younger fields in Sweetwater and Sublette counties. Under the low scenario, Wyoming natural gas production will increase from about 1.2 Tcf to about 3.0 Tcf by 2030, however Basin natural gas production will be exhausted in approximately 2027. Historic and low scenario production for the Basin and the State of Wyoming are depicted in Exhibit 7.

Exhibit 7. Natural Gas Production – Low Case

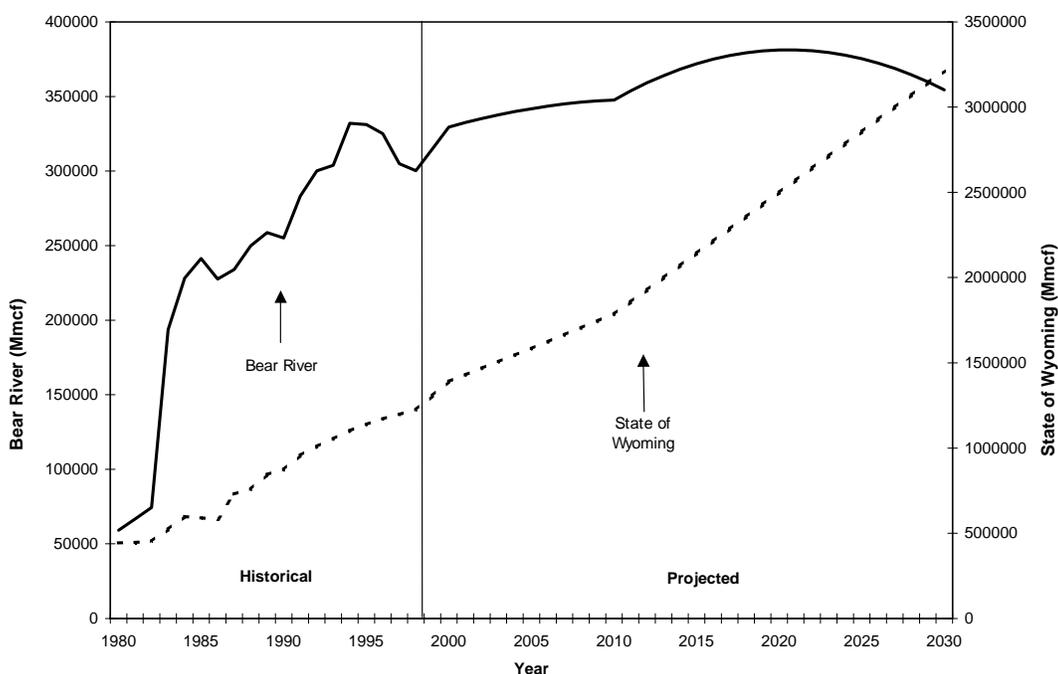


Source: Historical Wyoming and Bear River Basin volumes from Wyoming Oil and Gas Conservation Commission; Historical Rocky Mountain volumes from U.S. DOE, Energy Information Administration (EIA); Projected future Rocky Mountain volumes from EIA Annual Energy Outlook 2000, Reference Case; and Wyoming and BRB shares projected by BBC based on historical trends.

- **High Scenario – Gas.** The High Scenario Natural Gas production scenario reflects the EIA High Technology Case projections for natural gas production in the Rocky Mountain Region, and a slower decline in the Basin proportion of total Wyoming gas production due to renewed exploration and enhanced recovery techniques in the Basin. Under this scenario, Wyoming natural gas production will increase from about 1.2 Tcf to about 3.2 Tcf by 2030. Basin production in 2030 will be about 350

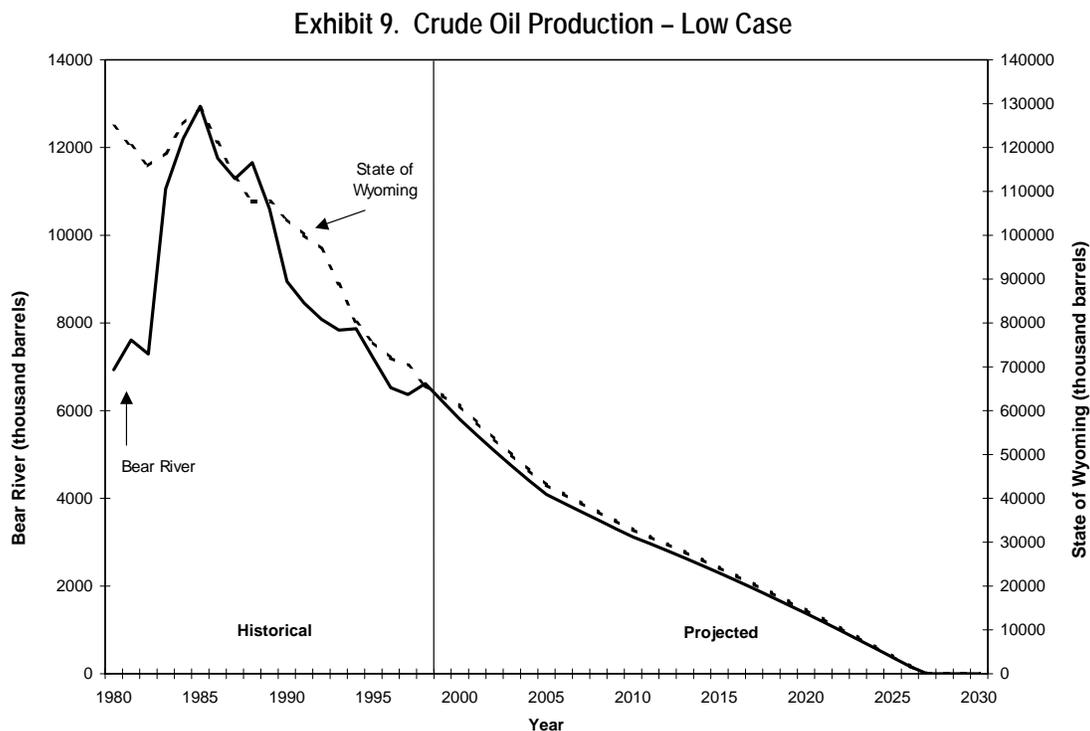
Bcf, or approximately 15 percent more than current production. However, Basin production in 2030 will represent less than 12 percent of total Wyoming production (compared to nearly 25 percent at present). Historic and high scenario production for the Basin and the State of Wyoming are depicted in Exhibit 8.

Exhibit 8. Natural Gas Production – High Case



Source: Historical Wyoming and Bear River Basin volumes from Wyoming Oil and Gas Conservation Commission; Historical Rocky Mountain volumes from U.S. DOE, Energy Information Administration (EIA); Projected future Rocky Mountain volumes from EIA Annual Energy Outlook 2000, Rapid Technological Progress Case; and Wyoming and BRB shares projected by BBC based on historical trends.

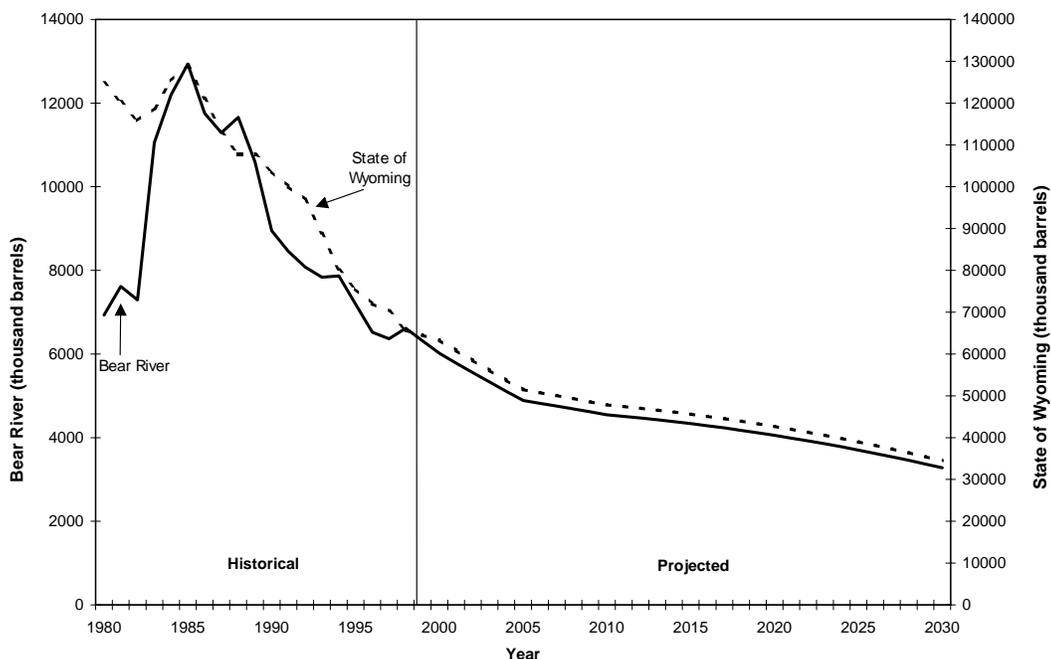
- **Low Scenario – Oil.** The Low Scenario Oil production scenario reflects the EIA Reference Case projections for oil production in the lower 48 states, a share of US oil production that diminishes at the same rate as experienced over the past 10 years for Wyoming and a Basin share of Wyoming production that remains constant at about 9.5 percent (as it has for the last decade). Under this scenario, Wyoming (and Basin) oil production will cease in about 2026. Historic and low scenario oil production for the Basin and State of Wyoming are illustrated in Exhibit 9.



Source: Historical Wyoming and Bear River Basin volumes from Wyoming Oil and Gas Conservation Commission; Historical U.S. volumes from U.S. DOE, Energy Information Administration (EIA); Projected future U.S. volumes from EIA Annual Energy Outlook 2000, Reference Case; and Wyoming and BRB shares projected by BBC based on historical trends.

- **High Scenario – Oil.** The High Scenario Oil production scenario reflects the EIA High Technology Case projections for oil gas production in the lower 48 states, a Wyoming share of total U.S. oil production that diminishes at one half the rate experienced over the past 10 years and a Basin share of Wyoming production that remains constant at about 9.5 percent. Under this scenario, Wyoming oil production will decline from about 66 million barrels today to about 35 million barrels by 2030. Basin production will decline from about 6.6 million barrels today to about 3.3 million barrels by 2030. Historic and high scenario oil production for the Basin and State of Wyoming are illustrated in Exhibit 10.

Exhibit 10. Crude Oil Production – High Case



Source: Historical Wyoming and Bear River Basin volumes from Wyoming Oil and Gas Conservation Commission; Historical U.S. volumes from U.S. DCE, Energy Information Administration (EIA); Projected future U.S. volumes from EIA Annual Energy Outlook 2000, Rapid Technological Progress Case; and Wyoming and BRB shares projected by BBC based on historical trends.

- **Future Employment.** Assuming no changes in productivity, estimated energy related Basin employment in 2030 under the High Scenario would be approximately the same as today, with losses in oil production employment offset by gains in gas production employment. Under the Low Scenario, there would be little or no energy related employment in the Basin by 2030.

Economic Base Scenario Assumptions for Key Sectors -- Tourism

Local interviews indicate that several factors are likely to impact the level of future tourism/visitor related activity in the Basin. Specifically, the continued population growth in the nearby Salt Lake City Metropolitan Area, the increases in traffic on Interstate 80 and the Evanston area's efforts to become a more frequent overnight or destination location for tourists should all serve to increase the size of the tourism/visitor sector of the Evanston economy. The following are summary insights into the prospects for tourism and visitor related activities in the future, as well as a description of the underlying assumptions for the high and low scenario projections.

- **Local Insights.** Local community leaders are interested in expanding the size of the Evanston tourist sector, and are looking to the upcoming Olympic games in Salt Lake City as a way to increase exposure for local recreational opportunities. Rooms in Evanston are already being booked as an alternative to staying in Salt Lake City or Park City of the Olympic events (Knopf, Joyce).
- **Scenario Approach.** BBC projected a high and a low scenario for tourist activity in the Bear River Basin. Under both scenarios, total visitor expenditures and corresponding sector job levels within the Evanston area are projected to grow substantially. The two projection scenarios were based upon 1) increases in traffic counts projected by the Wyoming Department of Transportation at the Evanston East traffic counter station, and 2) projected population growth for the Davis, Morgan, Salt Lake and Weber Counties in the Wasatch Front region of Utah.
- **High Scenario – WYDOT Projections.** The High Scenario reflects the assumption that Basin visitation will increase in proportion with projected increases in I-80 traffic in the Evanston area. It also assumes that the increased effort on the part of the city of Evanston to attract visitors will result in a 20 percent higher “capture rate” of both overnight and pass through visitors in the year 2030. Exhibit 11 shows that under this scenario, the number of overnight visitors to Evanston would increase to roughly 800,000 persons by 2030. Total annual visitor expenditures would increase to \$47.5 million, and the total number of Evanston jobs in the tourist sector would rise to 1,516 full-time equivalents over the same time horizon. Estimated tourist related employment in Evanston in 2030 under the High Scenario would be more than two times current employment levels, reflecting an average annual growth rate of 2.9 percent.

**Exhibit 11. Number of Visitors, Evanston, WY
Visitor Expenditures and Jobs Supported by Tourism – High Scenario**

	Number Visitors	Total Visitor Expenitures (\$Millions)	Number Jobs Supported
Total Overnight	801,164	\$38.5	1,219
Peak	363,748	\$17.4	552
Off-Peak	437,415	\$21.1	667
Total Pass Through		\$9.0	297
Peak		\$2.8	94
Off-Peak		\$6.2	203
Grand Total		\$47.5	1,516
Peak		\$20.3	645
Off Peak		\$27.3	871

* Peak months are June, July and August

Off-Peak months are the rest of the year

Source: Based on Wyoming Department of Transportation Traffic Projections

- **Low Scenario – Wasatch Front Projections.** The Low Scenario reflects the assumption that growth in Basin visitation will occur at the same rate as growth in the population of the Wasatch Front region in Utah, the primary source of non-highway visitors. Under this scenario, the number of annual overnight visitors to Evanston would increase to roughly 529,000 by 2030. Total annual visitor expenditures would increase to \$32.6 million, and the total number of Evanston jobs in the tourist/visitor sector would rise to 1,040 people over the same time horizon. Estimated tourist related employment in Evanston in 2030 under the Low Scenario would rise by slightly more than 60 percent, reflecting an average annual growth rate of 1.6 percent.

**Exhibit 12. Number of Visitors, Evanston, WY
Visitor Expenditures and Jobs Supported by Tourism – Low Scenario**

	Number Visitors	Total Visitor Expenitures (\$Millions)	Number Jobs Supported
Total Overnight	529,000	\$25.4	810
Peak	240,000	\$11.5	360
Off-Peak	289,000	\$13.9	440
Total Pass Through		\$7.2	240
Peak		\$2.3	70
Off-Peak		\$4.9	160
Grand Total		\$32.6	1,040
Peak		\$13.8	440
Off Peak		\$18.8	600

* Peak months are June, July and August

Off-Peak months are the rest of the year

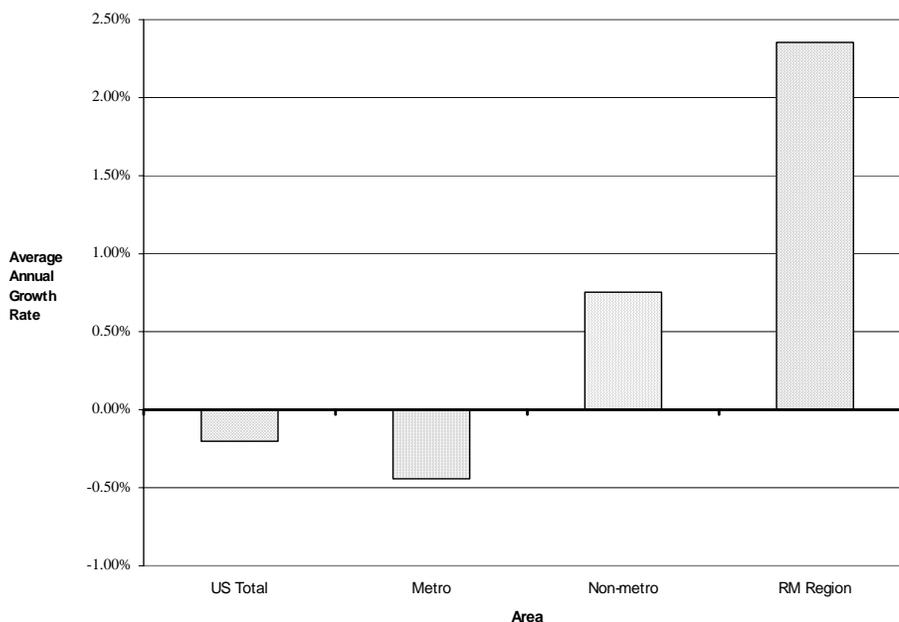
Source: Based on Wasatch Front Demographic Projections

**Economic Base Scenario Assumptions for Key Sectors –
Manufacturing/Other Basic Employment**

Apart from traditional economic base activities in agriculture, energy and tourism, the Bear River Basin, and the Evanston area in particular, have recently attracted a number of firms manufacturing goods or providing business services to customers outside the region. This component of the local economic base is still in the relatively early stages of development and is, consequently, more difficult to characterize and project than the more traditional components of the local economic base. Given continued growth of the Salt Lake City area's economy and Evanston's economic development strengths as a proximate, but non-metropolitan alternative to location on the Wasatch Front, these activities are likely to become increasingly important to the local economy in the future. The following insights were developed from local interviews and interviews with the Wyoming Business Council, as well as analysis of economic data for Uinta County published by the BEA-REIS.

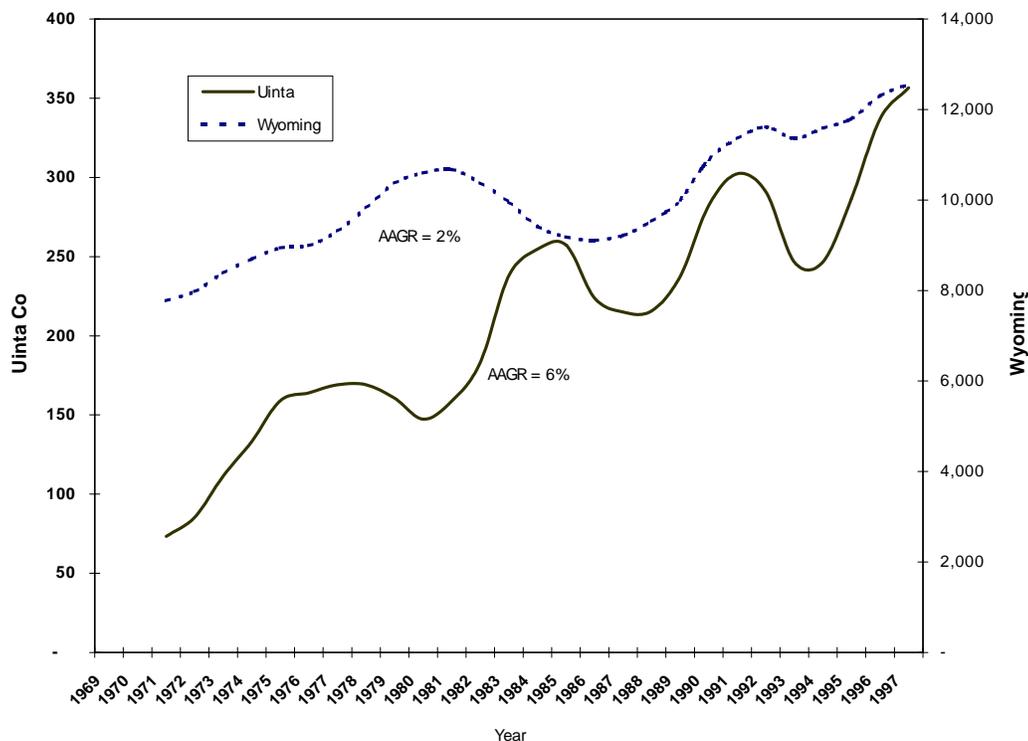
- National Trends.** Since 1970, there has been a gradual shift in manufacturing employment from the Eastern and Midwestern U.S. to the West and from metropolitan areas to non-metropolitan locations. While overall U.S. manufacturing employment has experienced little or no growth during the past three decades, manufacturing employment in the Rocky Mountain Region has continued to increase as shown in Exhibit 13.

**Exhibit 13. Average Annual Increase In Manufacturing Employment
1969-1997**



- Historic Trends in Bear Basin.** Since 1970, Wyoming manufacturing employment has increased at an average annual rate of about two percent per year, despite a decline in manufacturing jobs during the 1980s. Although the manufacturing sector in Uinta County is quite small and has experienced considerable ups and downs, manufacturing jobs in the county have averaged about a six percent annual growth rate over the past three decades. Historic trends in Uinta County and Wyoming manufacturing employment are illustrated in Exhibit 14. Unfortunately, due to the varied and dynamic nature of the broadly defined services sector, it is not readily feasible to identify corresponding historical trends for business service employment such as Cento Corporation.

Exhibit 14. Manufacturing Employment 1969-1997,
3 Year Moving Average

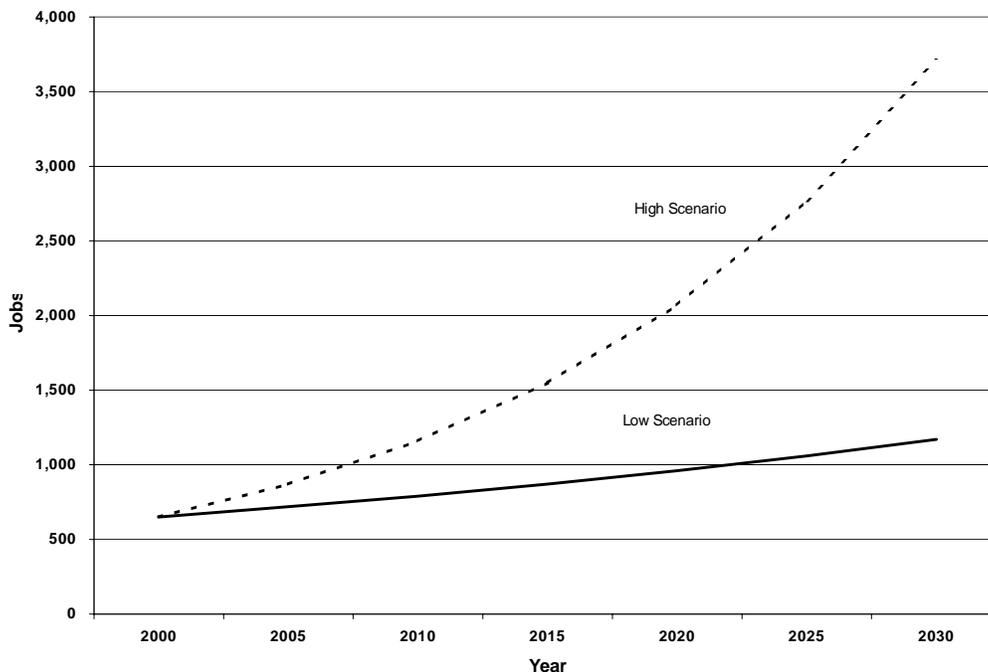


- Local Insights. Since the end of The Boom in the late 1980s, Evanston has made a real effort to diversify its economy away from dependence on oil and gas activity. Efforts to lure new firms to Evanston are fostered by several advantageous conditions from an economic development standpoint. There have, historically, been a number of available buildings that were vacated at the end of The Boom. The area has a low cost of doing business and low business tax rate by national standards. There is excellent basic infrastructure developed during and after The Boom, including water, sewer, human service and other basic requirements. Telecommunications has been a weakness, but appears to be improving with several fiber cables now installed through or near Evanston. There is excellent surface transportation through Evanston by both highway and rail. While the Evanston airport does not have scheduled, commercial service, Evanston is only about an hour and a half from the international airport at Salt Lake City resulting in better air

access than most Wyoming cities (Klinker). Some constraints from an economic development standpoint include the size and makeup of the workforce. While local workers are reasonably well educated, there has not historically been much technical training available, and there is some concern that local workers do not yet have the requisite skills or "manufacturing mentality." (Klinker). There may also be something of a housing shortage in Evanston. Local developers have, apparently, been reluctant to build new homes in town – perhaps due to difficulty in obtaining local financing – and the City is now soliciting interest from Salt Lake City developers (Knopf, Joyce, Davis). Overall, steady growth in light industrial and commercial activity is anticipated to continue into the future.

- **Scenario Approach.** BBC projected a low and high scenario for growth in manufacturing/light industrial and commercial activity. The low scenario reflects, in part, an anticipated slowdown in growth in manufacturing employment in the nearby Wasatch Front and reflects the close economic ties between Evanston and the Utah economic centers and the fact that Evanston is a potential alternative for firms looking to be near, but not in the midst of, the Salt Lake City Metropolitan Area. The high scenario is based on the historic trend in manufacturing job growth in the Evanston area.
- **Low Scenario Projections.** Under the low scenario, Basin employment in manufacturing, light industrial and business service activities is projected to increase at an average annual growth rate of two percent over the next 30 years. Total employment in these activities will rise from a current level of about 650 jobs to about nearly 1,200 jobs by year 2030. This scenario would reflect considerably slower job growth in these activities than has been experienced over most of the past 30 years in the Evanston area.
- **High Scenario Projections.** Under the high scenario, Basin employment in manufacturing, light industrial and business service activities is projected to increase at an average annual growth rate of six percent per year. Total employment in these activities will rise from a current level of about 650 jobs to over 3,000 jobs by year 2030. Projected employment under the high and low scenarios is depicted in Exhibit 15.

**Exhibit 15. Projected Basin Employment in Manufacturing & Non-Local Commercial Sectors
(Excluding Tourism/Agriculture and Energy Related Firms)**



Overall Economic and Demographic Projections

The preceding evaluations and assumptions were incorporated into a model of Bear River Basin employment and population in order to develop aggregated estimates of total residents and total jobs in 2030 under the Economic Base High Scenario and Economic Base Low Scenario. As indicated previously, a third scenario of total population growth was developed using an alternative, top-down, approach. The following text describes the development of overall economic and demographic projections for the Bear River Basin in 2030.

Projected Total Employment in 2030. Under the assumptions regarding changes in key economic activities described earlier in this memo, the study team projects that Bear River Basin basic employment under the high case scenario will increase from about 4,165 jobs at present to a little over 9,000 jobs by 2030. This increase would be largely driven by growth in tourism related employment and manufacturing and business services as well as relative stability in energy related employment in the Basin, as shown in Exhibit 16. Net out-commuting of

Basin residents to jobs in other locations is also projected to rise, reflecting both a continuation of substantial current commuting to mining jobs in Sweetwater County and an increase in commuting to jobs in resort areas and metropolitan Utah.

At present the ratio, or multiplier, between direct basic employment and total employment in the Uinta County portions of the basin is estimated to be approximately 2.5 – indicating that each basic job supports approximately 1.5 additional jobs in local services. This figure is within the range of multipliers the study team has examined in other, similarly situated and sized economies in other parts of the Rocky Mountain Region, although it is towards the higher end of the range. The relatively large multiplier likely reflects both the Evanston area's role as a center for trade and services in the region and, especially, the high wages paid in the local energy sector. Given the smaller proportion of the 2030 economic base accounted for by the energy sector, the study team believes it is likely the basic to total employment multiplier will decrease from 2.5 to approximately 2.3.

Exhibit 16. Current and Projected Employment Breakdown
in Bear River Basin

	Current Employment Bear River Area Only		2030 -- High Scenario Bear River Area Only		2030 -- Low Scenario Bear River Area Only	
	Uinta Co	Lincoln Co	Uinta Co	Lincoln Co	Uinta Co	Lincoln Co
Basic Employment						
Agriculture	260	265	260	265	245	230
Tourism/ Visitor Related	640	50	1,500	130	1,040	100
Energy Related	900	0	900	0	0	0
Other Industry (Manuf./ Bus. Services)	650	0	3,700	100	1,170	0
Highway/ Railroad Construction and Service	100	0	100	0	100	0
State/ Federal Government	500	0	500	0	500	0
Net Outcommuting	<u>800</u>	<u>NA</u>	<u>1,500</u>	<u>NA</u>	<u>1,200</u>	<u>NA</u>
<i>Subtotal</i>	3,850	315	8,460	495	4,255	330
Indirect Basic/Local Service Employment						
<i>Subtotal</i>	<u>5,650</u>	<u>185</u>	<u>11,000</u>	<u>300</u>	<u>5,530</u>	<u>200</u>
Total Employment	9,500	500	19,460	795	9,785	530
Total Employment/Direct Basic Ratio*	2.5	1.6	2.3	1.6	2.3	1.6

Projected Total Population in 2030. For the high and low scenarios developed through the economic base projection approach, projections of total Bear River Basin population

were derived from the preceding employment projections. Deriving the population estimates from the projected employment totals for the Basin required four steps:

1. *Total jobs were converted into an estimate of the number of employed persons.* This step is necessary because the employment estimates used in this study follow the conventions used by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). BEA job counts include part-time jobs and self-employment, consequently there are numerous instances of multiple job holding by individuals.
2. *Based upon current and projected unemployment rates, the number of employed persons was converted into an estimate of the total labor force.* The unemployment rate will gradually move closer to the state coverage over time.
3. *Based upon current and projected labor force participation rates, the labor force was converted into an estimate of the total population over the age of 16.* In projecting future labor force participation rates, the study team made the assumption that participation rates in the Uinta County portion of the basin would decline somewhat towards the national average, currently 67 percent, by 2030.
4. *The population of ages 16 and older was converted into an estimate of the total future population of all ages.* Once again, the study team assumed that the current Bear River population proportion age 16 and older would more closely resemble the national average in 2030. The current national proportion is 77 percent, compared to 63 percent in the basin.

The results of these calculations are shown in Exhibit 17 below. Under the economic base high scenario, population of the basin is projected to nearly double by 2030, reaching more than 29,400 residents. Under the economic base low scenario, the basin would experience very little growth over the next 30 years, with a slight decline in population in the Lincoln County portions of the basin.

**Exhibit 17. Employment and Population Projections for Bear Rive Basin
(Numbers Reflect Only Portions of Counties Within Basin)**

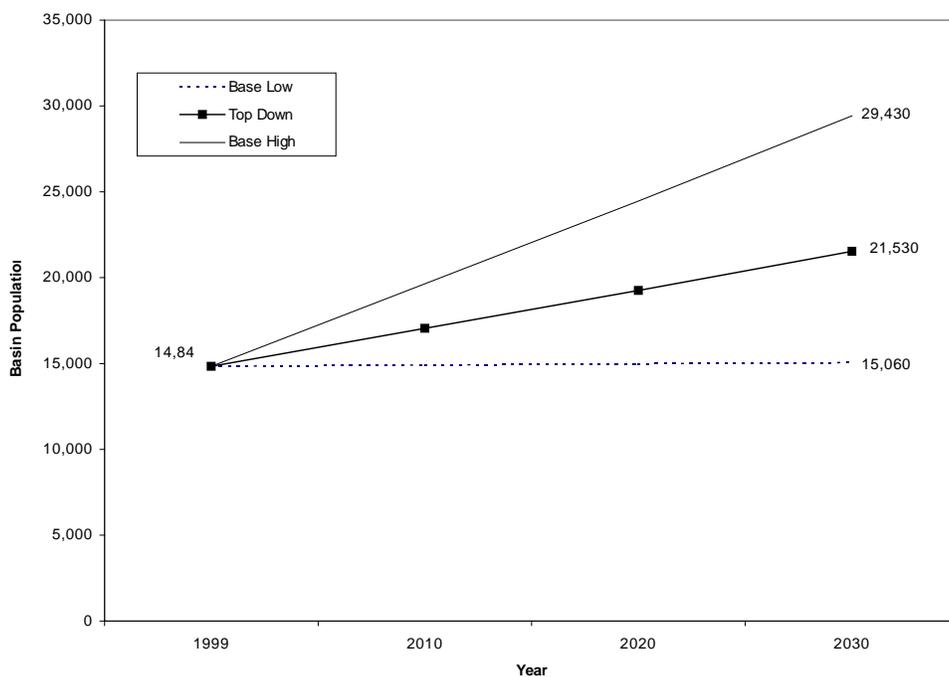
	1999		2030 High		2030 Low	
	Uinta Co.	Lincoln Co.	Uinta Co.	Lincoln Co.	Uinta Co.	Lincoln Co.
Estimated/ Projected Jobs	9,500	500	19,496	740	9,800	530
Estimated/ Projected Employed Persons*	6,770	390	13,890	580	6,980	410
Unemployment Rate	6.9%	6.2%	6%	6%	6%	6%
Labor Force	7,270	420	14,780	620	7,430	440
Labor Force Participation Rate	83%	70%	75%	70%	75%	70%
Population Age 16 or Older	8,760	600	19,710	890	9,910	630
Proportion of Population 16 or Older	63%	63%	70%	70%	70%	70%
Total Population	13,900	940	28,160	1,270	14,160	900

* Number of employed persons is less than number of jobs due to multiple jobholding by individuals.

Projected Population Under The "Top Down" Scenario. As discussed earlier in this memorandum, the study team developed a third set of population projections for the Bear River Basin by incorporating information from the Census Bureau's long-term projections for the State of Wyoming as well as the relative growth rates projected for Wyoming cities and counties through 2008 by the Department of Administration and Information. Under this scenario, the Bear River Basin is projected to have 21,530 residents in 2030.

Exhibit 18, below, provides a graphic depiction of the three alternative population projections for the Bear River Basin.

Exhibit 18. Alternative Population Projections for Bear River Basin



Summary

The study team projected three future scenarios for economic and demographic growth in the Bear River Basin, through the year 2030. Two of the scenarios employed an economic base modeling approach, in which prospects for key sectors that either bring money into the region and/or are the source of substantial water use were analyzed in detail. Based upon these analyses, a low and high case alternative forecast was developed for each key sector. Total employment, and corresponding population, was then estimated based upon the key sector projections. The third scenario employed an alternative, top down approach. This scenario, which became the middle case, involved developing a local population forecast based upon the U.S. Department of Commerce, Bureau of Census projections for the State of Wyoming as a whole and the Wyoming Department of Information and Administration, Division of Economic Analysis. Each of these three alternative scenarios is equally likely to occur.

The three scenarios portray markedly different potential futures for the region. Under the high case scenario, activity and employment in the energy producing sector would

remain relatively stable, agricultural production and irrigated acreage would increase modestly, and there would be substantial growth in tourism related employment and, especially, in new manufacturing and commercial activities targeted toward customers outside the region. Under the low case, there would be modest declines in agriculture due to public land grazing availability and implementation of the Cokeville Meadows Wildlife Refuge, energy activity would essentially cease by 2030, and growth in tourism and manufacturing/commercial activity would essentially be just sufficient to offset the loss of jobs in the energy sector.

Projected Bear River Basin population in 2030 under the high case would exceed 29,000 residents, compared with about 21,500 residents under the middle case and a little more than 15,000 residents under the low case, which is similar to year 2000 Basin population.

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