2.0 TECHNICAL APPROACH

Socioeconomic analysis responds to the public's interest in knowing that decision-makers have considered how people and their communities, lifestyles, and activities will be affected by the management of public lands and their resources. The technical approach used in this study was designed to support these considerations and to disclose their results.

As an impact topic, socioeconomic effects are difficult to fully disclose, not because information is lacking but because information is abundant and there are many ways to view and interpret it. This study has adopted an approach to the socioeconomic analysis that addresses the complexity of the subject by viewing the task from a long-term planning perspective. A long-term planning perspective focuses on the principal social and economic indicators that are typically tracked by local governments and other providers of community development, social, and educational services. By focusing on selected key indicators, a planning analysis focuses its resources toward developing additional mid-scale temporal, geographic, and demographic detail that can be helpful at the community level. The additional dimensions of detail directly relate to the planner's goal of determining of where, when, and how additional community development could be needed in the future under the Wyoming PRB RFD scenarios.

2.1 Projected Levels of Activity

The projection of future socioeconomic conditions directly depends on economic assumptions associated with the two RFD scenarios that were developed for the PRB Coal Review. Assumptions regarding future coal production are the primary factors differentiating the two scenarios, although substantial increases in future annual coal production are anticipated under both scenarios: increasing from 363 million tons per year (mmtpy) in 2003 to 508 mmtpy in 2020 under the lower production scenario and 591 mmtpy under the upper production scenario. In addition to increased coal production, both scenarios include expansion of coal rail shipment capacity, and the upper production scenario also includes expansion of electrical generation capacity in the PRB.

The key assumptions underlying the RFD scenarios are summarized in **Tables 2-1** and **2-2**, with the assumptions related to coal production depicted graphically in **Figure 2-1**, and the assumptions regarding conventional oil and natural gas and CBNG development depicted graphically in **Figure 2-2**. In keeping with the protocol established in Task 2, the development assumptions are reported for specific milestone years, though they represent activity that would occur during the intervening period since the previous milestone. For example, the +18,809 CBNG wells reported in 2015 indicates the number of new wells since 2010.

Imbedded within the coal production scenarios are a resumption of production or startup of two coal mines (Coal Creek Mine and P&M Ash Creek Mine) under the lower scenario and upper scenario both prior to 2010. The 12 currently active coal mines would continue production throughout the forecast under either scenario.

Table 2-1
Summary of Wyoming PRB RFD Assumptions

Industry	2003 Existing	2003-2010	2011-2015	2016-2020	Total Increase
Active Coal Mines					
Lower Scenario	12[1]	+2[2]	0	0	+2[2]
Upper Scenario	12[1]	+2[2]	0	0	+2[2]
Conventional Oil and Gas Wells[3]	18,302[4]	+5,194	+2,379	+1,946	+9,519
CBNG Wells[5]	17,515[4]	+23,999	+18,809	+20,060	+62,868
Coal-fired Power Plants	6[6]	+3	0	+1 (upper scenario only)	+3 (lower scenario) +4 (upper scenario
Operating Railroads	2	0	+1	0	+1

[1]Reflects active coal mines only.
[2]Includes one temporarily inactive mine (as of 2003), which is projected to reinitiate operations, and one projected new mine near Sheridan.
[3]Due to the concurrent refinement of the database for the Task 2 report and the REMI modeling conducted for this report, the projected levels new conventional oil and gas well development used in the socioeconomic analysis (as shown in this table) reflect an initial set of development assumptions that differ from those in the final Task 2 report (ENSR 2005b). The differences do not materially alter the anticipated impacts or conclusions of the overall socioeconomics assessment, but rather, they primarily affect the projected timing of anticipated tax revenues.
[4]Estimated total number of wells drilled including producing, inactive, and plugged and abandoned.
[5]The CBNG well projections for this study were being refined concurrently with the REMI modeling conducted for this report. As a result, the initial well numbers, as used in the REMI model and shown in this table, differ somewhat from the final well numbers in the database for the Task 2 report (ENSR 2005c). The final projections for new CBNG wells drilled in 2003-2010, 2011-2015, and 2016-2020 are 24,167, 19,206, and 16,361, respectively. The refined CBNG well projections, if incorporated into this analysis, would result in slightly higher cumulative employment and population changes and growth-related impacts in the near term, and slightly lower cumulative employment and population impacts in the long term (2016-2020) than what is presented in this report. However, the differences would be relatively minor in magnitude in any given time period and would tend to be somewhat offsetting when considered over the entire analysis horizon (2003 through 2020).
[6]Excludes the Dave Johnston Power Plant, which is located outside the study area near Glenrock.
Source: ENSR 2005b.

Table 2-2
Summary of Wyoming PRB RFD Production Assumptions

Industry	2003 Existing	2010	2015	2020	Total Change
Annual Coal Production					
Lower Scenario (mmtpy)	363.4	416.0	476.0	508.0	+ 144.6
Upper Scenario (mmtpy)	363.4	484.0	553.0	591.0	+ 227.6
Conventional Oil[1] (barrels per year)	12,979,659	15,736,000	14,292,000	13,793,000	+ 813,341
Conventional Gas[1] (mmcfpy)	39,981	42,750	38,910	35,100	- 4,891
CBNG[2] (mmcfpy)	338,300	773,800	836,200	900,400	+ 562,100
Electrical Generation (MW of capacity)	702[3]	+1,000	0	+700 (upper scenario only)	+1,700
Railroad Coal-hauling Capacity (mmtpy)	350	400	440	500	+150

[1]Due to the concurrent refinement of the database for the Task 2 and the REMI modeling conducted for this report, the projected levels of annual conventional oil and gas production used in the socioeconomic analysis (as shown in this table) reflect an initial set of development assumptions that differ from those in the final Task 2 report (ENSR 2005b). The differences do not materially alter the anticipated impacts or conclusions of the overall socioeconomics assessment, but rather, they primarily affect the projected timing of anticipated tax revenues.

[2]The CBNG production projections for this study were being refined concurrently with the REMI modeling conducted for this report. As a result, the initial production numbers, as used in the REMI model and shown in this table, differ somewhat from the final annual production projections in the Task 2 report (ENSR 2005b) and associated database. The final projections for annual CBNG production in 2010, 2015, and 2020 generally are lower than those used in the modeling for this report. The differences in projected annual production would translate into corresponding effects on the projected public sector revenues presented in this report. In some cases, differences of as much as 40 percent may result. The cumulative differences, considering the value of coal and conventional oil and gas would be moderate; however, it would not be substantial in terms of the relative orders of magnitude of revenues that would be generated.

[3]Excludes the Dave Johnston Power Plant which is located outside the study area near Glenrock.

Source: ENSR 2005b.

Note: mmcfpy = million cubic feet per year
MW = megawatts

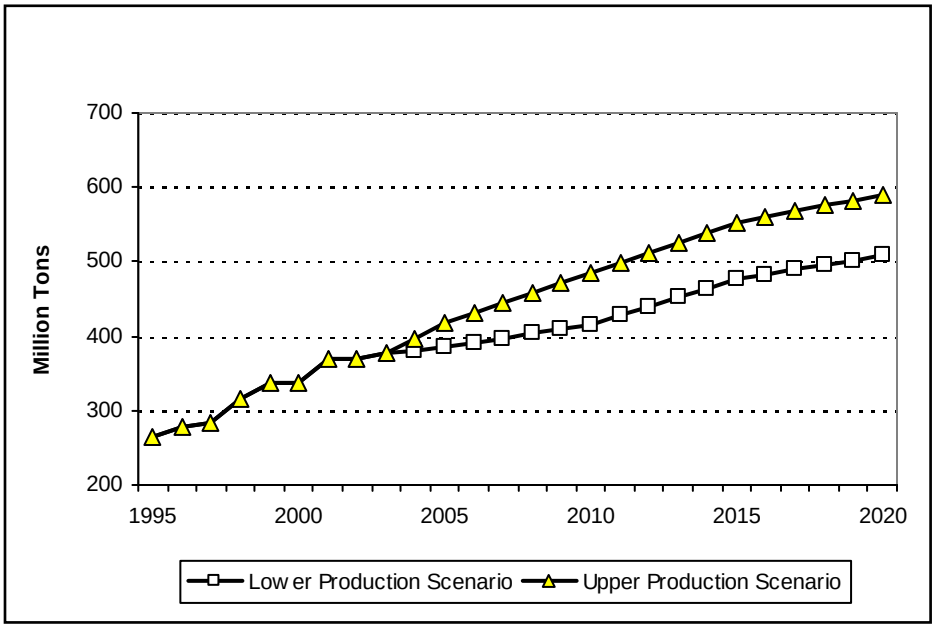

Figure 2-1. Projected Annual Coal Production in the Wyoming PRB

Source: Wyoming State Inspection of Mines 1995 to 2003.

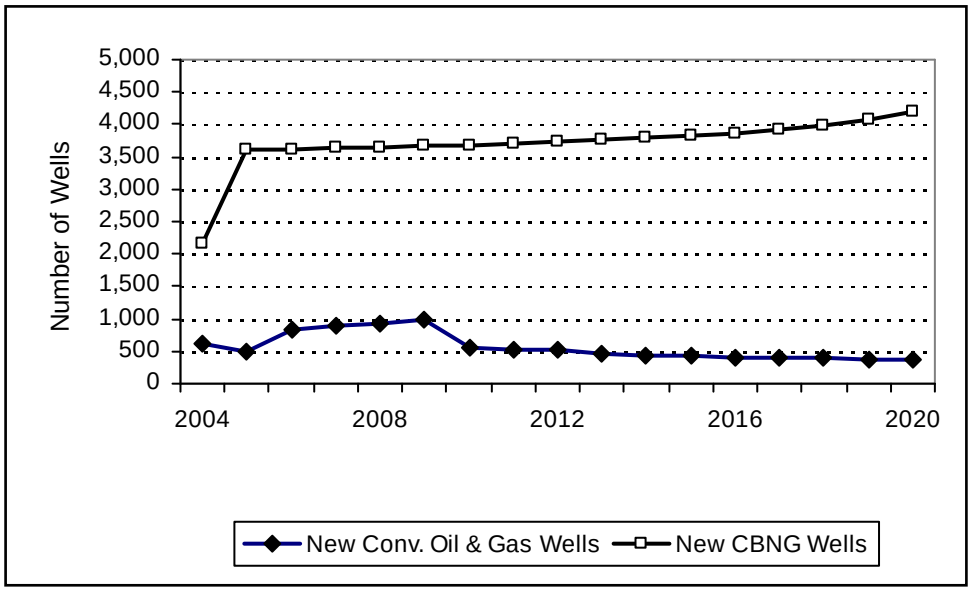

Figure 2-2. New Conventional Oil and Gas and CBNG Wells Drilled in the Wyoming PRB from 2004 to 2020

Under the lower coal production scenario, the Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) railroads would expand shipment capacity, and one new line would be built and operational by 2015. Three new power plants also would begin operations by 2010.

Expansion of electrical transmission line and generating capacity are projected as part of the upper production scenario. However, the timing and location of such a transmission line is so speculative as to be excluded from the current analysis. A fourth power plant is assumed to be built during the final 5-year period for this analysis (2016 to 2020). That power plant is assumed to locate in Campbell County to minimize coal transportation costs.

Cumulative development assumptions for oil and gas between 2004 and 2020 are 9,653 additional conventional oil and gas wells and 62,868 additional CBNG wells. That development outlook is intended to represent full development of the presently defined CBNG resource base in terms of the estimated number of well pads, with an allowance for multiple completions of some pads (see the Task 2 Report for the PRB Coal Review, Past and Present and Reasonably Foreseeable Development Activities [ENSR 2005b] for additional information regarding projected development), based on current pricing, geologic understanding of the PRB, regulatory environment, and technology. These assumptions contrast to those in the PRB Oil and Gas EIS (BLM 2003), which represented an interim, 10-year perspective on future oil and gas development. Consequently, the results and implications for socioeconomic conditions presented in this report are not directly comparable to those in the PRB Oil and Gas EIS.

For this study, future levels of new conventional oil and gas and CBNG development were combined with assumptions regarding annual drilling rates, success rates, average well life, and typical production per well to derive profiles of the oil and gas industry activity over time. Those profiles are shown in **Figures 2-2**, **2-3**, and **2-4**.

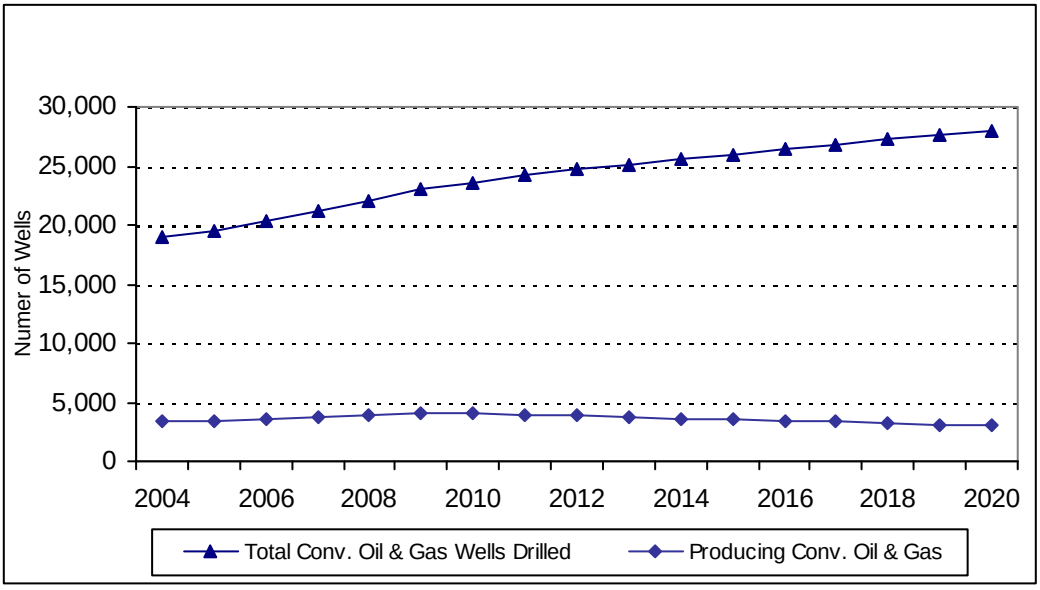

Figure 2-3. Cumulative and Producing Conventional Oil and Gas Wells in the Wyoming PRB from 2004 to 2020

By 2020, nearly 28,000 conventional oil and gas wells are projected under the two RFD scenarios. The interim development assumptions include 5,328 new wells through 2010, an average of approximately 750 wells per year. Thereafter, the rate of drilling would decline steadily, such that

the number of new wells drilled would fall below 400 in 2018. More than 62,000 additional CBNG wells are projected to be drilled through 2020, an average of approximately 3,650 wells annually.

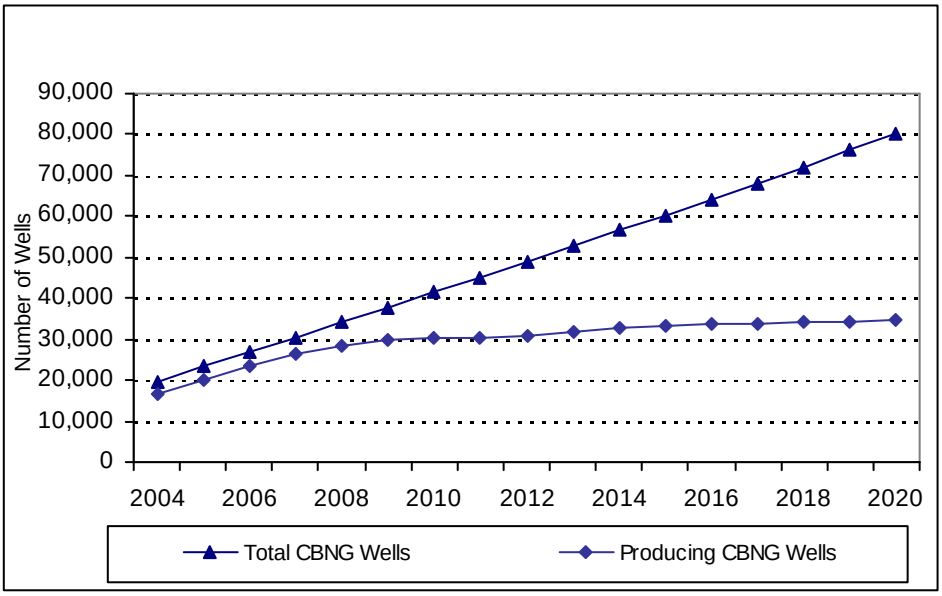

Figure 2-4. Cumulative and Producing CBNG Wells in the Wyoming PRB from 2004 to 2020

Based on the drilling rates outlined above, the number of active producing conventional oil and gas wells, excluding seasonally active wells, would increase to a peak of approximately 4,100 wells in 2009, after which it would decline to just over 3,000 in 2020 (**Figure 2-3)**.

The RFD scenarios assume development of nearly 24,000 new CBNG wells from 2004 through 2010, an additional 18,809 during the subsequent 5 years, and 20,060 in the final 5-year period of this study. By 2020, the cumulative number of CBNG wells to be developed would be approximately 80,383, with the number of active producing wells increasing steadily to more than 34,700 (**Figure 2-4**).

Annual output projections that correspond to the development parameters outlined above are shown in **Table 2-2**. These output projections were derived to support the fiscal impact analysis. Relative to the 2003 annual production, the increases in coal production represent 39.8 and 62.6 percent, respectively, for the lower and upper production scenarios.

Annual oil production would climb through the middle of the cumulative analysis period, peaking at 15.7 million barrels in 2015, after which it would steadily decline. By 2020, total annual oil production is projected to decline by nearly 2.0 million barrels compared to the peak; however, it would be more than 800,000 barrels higher than the annual oil production in 2003.

Conventional natural gas production also is anticipated to peak during the cumulative analysis period, with the peak coming 5 years sooner than that for oil. After climbing by 6.9 percent between 2003 and 2010, annual conventional gas production is projected to decline by 18 percent to 35,100 mmcfpy in 2020, approximately 12 percent below the 2003 production level.

CBNG production would increase sharply over the cumulative analysis period, climbing from 338,300 mmcf in 2003 to 900,400 mmcf in 2020, a 166 percent increase. That increase primarily would be a result of the continued high pace of new well development, combined with the high success rates for CBNG wells.

Electrical generating capacity located within the PRB would more than double under the low scenario, from 702 MWs to 1,702 MWs by 2010. An additional 700 MWs of capacity, over and above the incremental capacity added under the lower production scenario, is assumed to come online by 2020 under the upper production scenario.

Railroad shipment capacity to export coal is assumed to increase to 400 mmtpy under the lower and upper production scenarios, as both the BNSF and UP expand their existing systems to accommodate additional production. In addition, the Dakota, Minnesota, & Eastern (DM&E) railroad is assumed to be operational by 2015, initially with capacity to haul 40 mmpty. By 2020, its capacity is assumed to increase to its full initial design capacity of 100 mmtpy. The capacity assumptions are based on the Draft EIS for the DM&E Powder River Basin Expansion Project (Surface Transportation Board 2001).

The development and production parameters outlined above provided the basis for the economic modeling for this analysis.

2.2 Economic Modeling and Analytical Methods

From the assumptions presented in Section 2.1, which were developed primarily from a resource policy and engineering perspective, a set of economic inputs was derived as a starting point for the Wyoming PRB regional impact analysis that used specific data and models to project future conditions in socioeconomic terms.

The regional socioeconomic impact analysis for this study started with the mathematical modeling of the total effect of change to the regional economy. Economic change starts with the “injection” of outside money into a study area through spending on new developments, such as those represented in the RFD scenarios. Economic change occurs as new money is spent and re-spent within the local economy. The mathematical model simulates the economic transactions that would occur and calculates the resulting total effect. General concepts like jobs and income are used to measure the impacts, along with estimates of many additional specific economic outcomes.

2.2.1 REMI Model

The regional model used in this study is REMI Policy Insight (REMI). REMI is a fully developed forecasting model that projects how changes in a local economy cause economic effects on an annual basis. The REMI model for this study was customized to represent two economic regions, one encompassing only Campbell County, and the other comprising of the seven Wyoming counties bordering Campbell County and linked to its economy by established industry and consumer trading and work force commuting patterns. Results for the second region then were analyzed to focus on the five counties (Converse, Crook, Johnson, Sheridan, and Weston) that are

the most directly linked to development influences in the PRB. The five-county area is sometimes referred to as the surrounding counties in the remainder of this report.

An important feature of REMI is it capability to model how local population is involved in the economy and how it changes in response to new economic opportunities. This component of the model explicitly addresses the key issues identified in Section 2.1 regarding local labor markets and their response to change, the role of migration in future growth, the spillover of energy development effects from Campbell County to neighboring counties, the adequacy of community infrastructure and services to meet projected needs, and the fiscal effects of future development on affected units of local government and public schools.

2.2.2 Economic Inputs to REMI

REMI is sensitive to a wide range of economic activities, and its software interface facilitates “what if” analysis. An important step in the technical approach to this regional analysis is the translation of activities defined in the Task 2 Report of the PRB Coal Review, Past and Present and Reasonably Foreseeable Development Activities (ENSR 2005b) into economic terms for input into REMI as two different scenarios that can be compared and contrasted.

The “what if” framework for the analysis involved two steps. First, the lower production scenario for RFD activities was derived by translating assumptions regarding the number of new wells, tons of coal, and cubic feet of gas into a series of changes to future jobs and industry sales in each of the affected industries directly involved in the activity. Second, the upper production scenario translated a similar series meant to add in the changes to future jobs and industry sales that would occur if the economy were to experience activity levels under the upper production scenario instead of the lower production scenario. Changes in annual production and the value of power generated were the basis for estimating future operating employment for utilities.

In each step, industries that were modeled in REMI were selected to represent the activities assumed by the RFD scenarios. These industries were the mining industry for coal, conventional oil and gas, CBNG, and the contractors and professionals who support all types of mining; the construction industry for direct investment in new power plants and railroad lines; utilities for the operations of new power plants; and transportation for the operations of new railroad lines. Each series was a set of annual numbers from 2003 through the year 2020. The key inputs are presented in the appendix to this report.

Based on the specified inputs, REMI calculates the total effect on the economy and population, the distribution of effects between Campbell County and its neighbors, the timing of any highs and lows in overall development, flows of economic migration and commuting between the two model regions, and changes to the demographics of the population by age.

The forecasts and their implications are discussed fully in Chapter 3.0. These include details selected to provide planning insight and for use in estimating other variables not directly modeled in REMI. For example, REMI directly models population change by age. Change specific to the school aged population of 5 to 17 years of age is directly relevant to considering impacts to the public schools, while change to the population aged 65 years or older is relevant to a range of interests specific to retirees and the elderly. However, in two cases, detailed results that are goals of this study were not modeled directly by REMI. The first is the employment and population effects of the

upper and lower production scenarios in each of the five individual counties in the surrounding counties region. The second is the demand for housing in each county in the study area. The approach to deriving these effects from REMI results is described in the following sections.

2.2.3 Economic and Demographic Projections

A number of considerations led to the use of the two-region REMI model for the PRB Coal Review. Since a principal goal of the study was to estimate employment and population for individual counties throughout the PRB study area, it was necessary to undertake additional analysis and forecasting to disaggregate REMI's surrounding counties' forecasts. Separate spreadsheet models were used to divide REMI's aggregated forecasts (the control totals) into a separate forecast for each of the surrounding counties.

Similar procedures were used to disaggregate each control total into employment by industry for each county and county population by age (including school age population). All used a mathematical function fitted by regression analysis to project shares for the sub-areas contained within the study area. The sub-area shares then were used to allocate the regional control total. Data to support the analyses were obtained from the Wyoming Department of Administration and Information, Economic Analysis Division (WDAI) and U.S. Census Bureau.

County-level Employment by Industry

WDAI provided the principal data input for the disaggregation of REMI employment by industry (WDAI 2005a). Industry control totals for the 24 REMI industries were grouped to match the 15-industry Wyoming data. County shares of each industry were projected for each county, and the projected shares for 2010, 2015, and 2020 were used to allocate the REMI control totals. Initial results were compared to employment data assumptions from the PRB scenarios and to the disaggregated population projections (described below). Some ad hoc adjustments were made to the results for both PRB scenarios to smooth the transition from the last year of historical data in 2003 and to assure overall consistency with observed relationships between employment and population. Ad hoc adjustments were made to the results to adjust employment in the transportation industry for consistency with employment assumptions.

County-level Population by Age

WDAI Economic Analysis Division and the U.S. Census Bureau provided the principal data input for the disaggregation of county population by age (WDAI 2005b; U.S. Census Bureau 2005e). Wyoming historical data were grouped as five age groups within each county and matched by age group to REMI control totals for the upper and the lower production scenarios. County shares of each age group were projected for each county, and the projected shares for 2010, 2015, and 2020 were used to allocate the REMI control totals. Initial results were compared to employment data assumptions and to the disaggregated employment projections. Small ad hoc adjustments were made to the results in selected counties for both RFD scenarios to enhance consistency with employment assumptions.

Regional Population by County and Community

WDAI and the U.S. Census Bureau provided the principal data input for the disaggregation of total county population into total community population. Wyoming historical data on county and community population were assembled, and the community shares were projected for each county. Shares for 2010, 2015, and 2020 were used to allocate the estimated total county populations. Initial results were compared to employment data assumptions in the RFD scenarios, and small ad hoc adjustments were made in selected communities for consistency with those assumptions.

2.2.4 Housing Requirements

The procedure used to forecast total housing requirements in the future principally was driven by projected population levels and long-term national and local trends toward smaller household sizes. Projected housing requirements also factored in allowances for vacancy rates associated with the normal functioning real estate market.

The trends affecting household size are expected to continue. However, population growth and immigration may offset such declines under localized conditions. This may occur in Campbell, Sheridan, and Johnson counties. Thus, some ad hoc adjustments were made to the initial projections to reflect the demographic impact of younger economic migrants drawn by the job opportunities represented in the RFD scenarios. The adjustments marginally raised the number of persons per household and lowered housing requirements from trend-projected levels.

Data on household formation and housing vacancy rates for each county in the PRB study area were obtained from historical decennial censuses and local survey data. These were projected forward using exponential growth trends fitted to decennial data from 1940 to 2000. Housing requirements were derived from relationships among projected population, household size, the “normal” vacancy rate (3.5 percent) in the PRB study area, and the number of units typically held as “vacant” for seasonal, recreational, occasional, or other temporary uses.

2.2.5 Fiscal Analysis

Determining the fiscal impact of current and future energy production in the PRB involved several steps. The methodology is summarized below, and results are presented in Chapter 3.0. A full presentation of the underlying spreadsheets and input assumptions appears in the Appendix of this report. The methodology discussion described below is divided into two elements. The first is projected production, in terms of quantity (cubic feet, tons, or barrels, as appropriate) and monetary value. The second part discusses the approach to estimating the fiscal consequences associated with that production.

2.2.5.1 Production Quantity and Value

Due to differences in data sources, approach, and potential impacts, the production calculations were conducted differently for each of three energy commodities:

- Coal
- CBNG

- Conventional Oil and Gas

Furthermore, there are subcategories within each commodity.

Coal

Coal production was addressed as a range with figures given for a lower and an upper production level as described in the Task 2 Report for the PRB Coal Review, Past and Present and Reasonably Foreseeable Development Activities (ENSR 2005b) in 5-year intervals. In the fiscal analysis, the figures were interpolated into annual totals and were allocated to each affected county and school district based on the location of specific mines.

Production value was calculated by multiplying the production tonnage by a value per ton using the prices adopted by the State's Consensus Revenue Estimating Group (CREG) through 2010 and a 1.0 percent real annual increase thereafter, consistent with the CREG's projections up to that point.

CBNG

CBNG production was calculated separately for existing wells and those drilled in 2005 and beyond. Total production was disaggregated to account for federal, state, and private (fee) mineral interests, and also by county.

For future new wells, the calculation started with the number of wells to be drilled each year, as projected in the Task 2 Report for the PRB Coal Review, Past and Present and Reasonably Foreseeable Development Activities (ENSR 2005b). The fiscal analysis assigned annual production levels to each new well based on a lifetime production expectation of 234 mmcf and a production profile wherein annual production rises rapidly, peaks in the second year, and declines thereafter until the well is capped following 11 years of production. (See the appendix of this report for additional information on typical well productivity.)

For existing wells, the number of wells and their aggregate production were decreased over time in a similar manner but recognizing that, for the most part, the existing wells already had passed their most productive first 3 or 4 years.

Future prices were taken from the CREG[3] January 2005 report; however, unlike coal, there was no escalation in the unit price of CBNG beyond 2006 (and an actual decline from the 2005 figure). In calculating the total production value, an adjustment was made to the unit price to reflect a credit available to the producer to offset the cost of production (assumed to be $0.50 per mmcf).

[3] CREG is the official estimating body of revenues to be received by the Wyoming State Government. Formed by agreement between the executive and legislative branches, CREG consists of representatives from numerous state agencies, commissions, and the University of Wyoming. Semi-annually, CREG produces projections of major revenue streams for the upcoming 5 years, considering anticipated levels of mineral production, valuation, earnings on investments, and general fund sources of revenue (e.g., sales tax receipts). The projections help guide state budgeting. The projections generally are released in January and October and are available at http://eadiv.state.wy.us/CREG/CREG.asp. Information in CREG's January 2005 report was used in this analysis. The October 2005 report assumes higher energy resource prices. Incorporating the updated assumptions would result in a proportional increase the revenue projections presented later in this report.

Conventional Oil and Gas

Production of oil and gas from conventional (non-CBNG) wells was projected for the Wyoming PRB in the Task 2 Report for the PRB Coal Review, Past and Present and Reasonably Foreseeable Development Activities (ENSR 2005b). In the fiscal analysis, the production was allocated to the various counties and each leasehold type (federal, state, or fee) based on a constant factor that is, in turn, based on the known 2004 production and the expected location of future facilities.

The unit pricing for natural gas (per mmcf) and oil (per barrel) were taken from the CREG report with an adjustment for the production cost credit for natural gas.

2.2.5.2 Development-related Public Sector Revenue Effects

Most of the fiscal consequences of RFD activities stem directly from the value of production in the various sources described above. The fiscal consequences on public sector revenues addressed in this analysis include:

- Federal Mineral Royalties
- Severance Taxes
- State Mineral Royalties
- Ad Valorem Taxes
- Federal Coal Lease Bonus Bids

The fiscal analysis projects each of these on a year-by-year basis using the applicable geographic location of the production activity. Note that there also are royalties or lease payments to the fee holders where the production involves privately held mineral rights; however, those have not been calculated, nor are they a part of the public fiscal benefit. Severance tax and ad valorem taxes accrue from all three forms of ownership.

Federal Mineral Royalties

Lessees pay a royalty to the federal government based on the value of the production taken from federal lands. The current royalty rate is 12.5 percent for coal and natural gas and 6.0 percent for oil. The total receipts, less a processing and administration fee, are split equally between the state and federal governments. Funds disbursed to the State of Wyoming are distributed according to a legislatively approved formula. A summary of the distribution formula is shown in **Figure 2-5**.

Severance Taxes

Severance taxes are collected by the state on all mineral extraction based on the total production value. The current rate is 7.0 percent for coal and 6.0 percent for oil and natural gas. The state distributes the funds according to a formula to various entities, primarily the General Fund, the Budget Reserve, and the Permanent Wyoming Mineral Trust Fund. A certain amount of the total up to a cap goes to other entities including local jurisdictions. At least for now, that cap is being met by existing statewide production, although a substantial portion comes from production in the PRB.

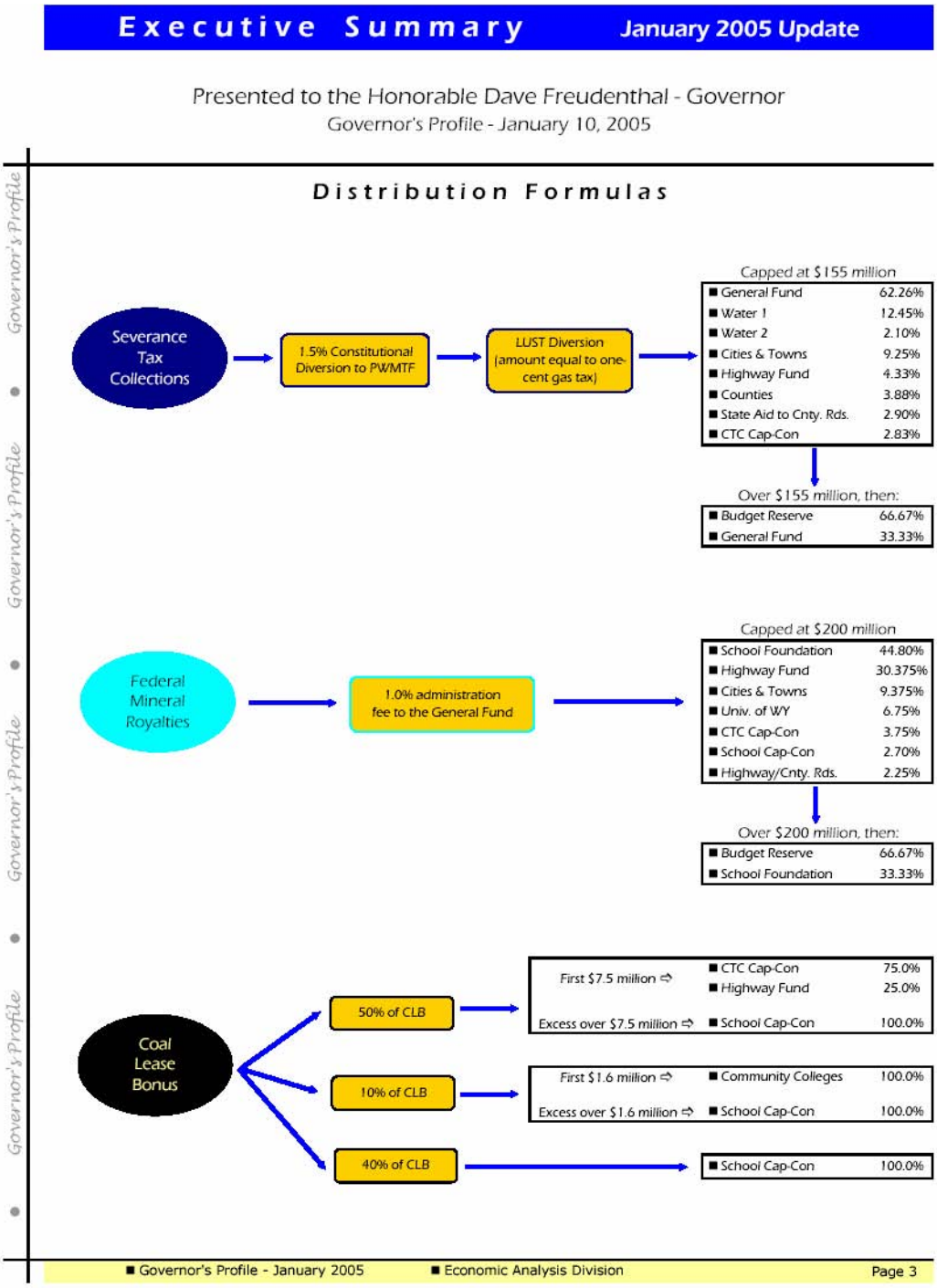

Figure 2-5. Distribution Formulas for State Revenues Derived From Energy Mineral Production

Source: CREG 2005.

State Mineral Royalties

Production from state-owned lands is assessed a royalty of 16.67 percent of the production value. All of these royalties accrue to the Wyoming Office of State Lands.

Ad Valorem Taxes

Ad valorem taxes are assessed by local jurisdictions bases on a combination of the assessed value of taxable property and the local mill levy. In Wyoming, the total production value of extracted minerals is considered taxable property in the year it is extracted (collected the following year, as with other ad valorem taxes). In the case of coal and natural gas, and additional taxable amount has been added to account for the buildings and equipment associated with the production activity.

The fiscal analysis has calculated the potential ad valorem tax revenue for each county in the PRB based on its current mill levy. It should be noted that assessments and mill levies change each year, and a large increase in production could result in a reduction in the mill levy, offsetting some or all of the potential increase in the total amount of taxes collected. In either case, it is a benefit to the taxpayers in that jurisdiction.

Federal Coal Lease Bonus Bids

Coal producers interested in securing rights to produce from federal coal resources must submit competitive bids to secure such reserves. To be accepted by the BLM, a winning bid must meet or exceed a minimum established by the agency that represents the estimated fair market value of the resource allowing for future mine development and production costs and a reasonable profit. One-half of the successful bonus bid amounts are returned to the state, with payments due within 5 years of the sale. Uncertainty exists with respect to the timing and size of future leases, although leasing of 2.5 to 3.0 billion tons by 2020 is reasonably foreseeable. Bonus bids have been rising over time, with recent bids in the $0.60 to $1.00 per ton range. Future bonus bids are assumed to remain in that range.