Appendix 18

Social and Economic Impact Analysis Methodology and State-Specific Impact Analysis

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Appendix 18. Social and Economic Impact Analysis Methodology and State-Specific Impact Analysis

18.1 Introduction

This appendix describes the methods and data that underlie the social and economic impact analysis, the economic impact modeling analysis, and the environmental justice impact discussions. The social and economic impact analysis uses two general approaches. These are quantitative analysis and qualitative analysis. Input-output models such as the Impact Analysis for Planning (IMPLAN) model, an input-output (IO) model, provide a quantitative representation of the final demand and production relationships between individual economic sectors. This quantitative analysis approach is used when adequate information on physical production quantities and the prices and costs for goods and services is available. The first portion of the following discussion describes general aspects of the quantitative, qualitative, and environmental justice impact analysis methodologies. The quantitative methodology discussion describes the inputs required to run the IMPLAN model and how IMPLAN is used to estimate quantitative economic impacts. The resulting estimates from the IMPLAN model, by alternative, are in the Social and Economic Conditions (Including Environmental Justice) section of **Chapter 4**. The remaining sections provide additional detailed data used in the analysis for oil and gas, renewable energy (including geothermal, wind, and solar), and livestock grazing.

18.2 General Aspects of the Methodologies

18.2.1 Quantitative Economic Impact Analysis Using IMPLAN

A quantitative economic impact analysis was conducted for three resource uses: oil and gas development and production, geothermal development and production, and livestock grazing. Due to limitations on availability of data on production and quantity of market activities, analyses for nonenergy leasable minerals, locatable minerals, mineral materials, wind and solar energy, and greater sage grouse conservation were conducted qualitatively (see **Section 18.2.2**, Qualitative Economic and Social Impact Analysis, for discussion on the qualitative methodology used in the social and economic impacts analysis).

The basic approach used in quantitative economic impact analysis is to identify the economic sectors to be directly impacted and estimate the amount of direct economic activity likely to be affected by management decisions. For instance, management actions affecting oil and gas development on federal minerals could affect the Drilling Oil and Gas Wells sector if expenditures made by oil and gas companies to drill and complete new wells changes in response to these management actions. Potential direct impacts could also stem from changes in the amount of oil and gas produced. When direct impacts to economic activity can be quantified, they can be run through an economic input-output model to estimate the secondary economic activity that is generated as the direct impact ripples through the economy, "upstream" to providers of goods and services necessary for production, and "downstream" as income generated from production is spent by the households that receive the income.

The upstream, downstream, and total effects on economic activity are estimated through use of the IMPLAN model, an off-the-shelf input-output model that provides a mathematical accounting of the flow of money, goods, and services through a specified region's economy and yields estimates of gross economic output, jobs, and labor income. The model provides estimates of how economic activity (i.e., economic output,

income, and employment) in one sector of the economy ripples through the broader economy, affecting seemingly unrelated sectors. These ripple effects include both indirect and induced impacts of proposed management actions. Indirect impacts result from changes in economic activity in industries that sell inputs to the industries that may be directly impacted (for example, varying levels of economic output stemming from changes in supply purchases made by firms contracted to drill oil and gas wells). Induced impacts result from changes in household spending as households adjust their spending in response to increases or decreases in labor income supported by industries directly and indirectly affected by management actions (for example, changes in purchases at local stores for personal groceries).

This analysis used IMPLAN Cloud and data from IMPLAN's 2021data release. This means that parameters such as productivity and trade data reflect annual average economic conditions in the analysis areas during 2021. IMPLAN 2021 is the most recent vintage of data currently available in the IMPLAN Cloud platform. Prior to running the model, cost and price data were converted to a consistent dollar year (2023) using sector-specific adjustment factors from the IMPLAN model. Unless stated otherwise, the values in this appendix are expressed in year 2023 dollars.

Two models for each of the 10 states in the planning area were run, separately. The first model analyzed only the impacts on the counties in each state's analysis area, combined for each state. This provides information on the local economic contributions from direct economic changes in the analysis area, but it does not provide data on the economic contributions that result in other neighboring regions in the state from the direct changes in the analysis area. The second model took a multi-regional approach and analyzed the impacts on each state from direct impacts in the analysis area. The trade data available in the current version of IMPLAN (IMPLAN Cloud) make it possible to do multi-regional input-output (MRIO) analysis to track how an impact on any of the IMPLAN sectors in the identified socioeconomic analysis areas affects outputs in any of the sectors in other regions outside of the analysis area. For this analysis, this feature allowed the estimation of how an impact in the counties in the analysis area disperses into the counties in the rest of the state, and how these effects in the rest of the state create additional local effects in the analysis area. As a result, it was possible to estimate not only the jobs and income generation in the analysis area, but to also estimate how the economic activity in the analysis area affected jobs and income in each state as a whole.

The current IMPLAN model has 546 economic sectors, of which 507 are represented in the analysis area counties across all 10 states and 539 are represented across all counties in all states in the planning area (IMPLAN 2021 data).

Economic impacts were estimated and provided as an annual average over a 20-year time period (2023-2042). All dollar figures throughout the economic analysis area in constant 2023 dollars.

18.2.2 Qualitative Economic and Social Impact Analysis

The second methodological approach relies on qualitative discussions to describe potential economic and social impacts when impacts cannot be quantified. In such cases, the analysis describes the type of impact in a base scenario (in this planning effort, Alternative 1) and then assesses the relative changes in terms of increases or decreases in costs, the value of production, or differences in social conditions and changes in way of life for the communities across the analysis areas. This approach is used to describe potential impacts on market values, nonmarket values, and social conditions, which are all interconnected and discussed together by alternative.

Some of the management decisions under this planning action would result in increased costs to operators – the firms or individuals who undertake the activities – or to project proponents. The economic impacts of decisions that increase costs for operators and/or project proponents are many and can be complex. Cost increases may cut into profitability and drive delays to, reductions in, or cessation of operations or projects. However, where operations or projects are not delayed, reduced, or terminated, increased costs also represent increased economic activity. For instance, if changes in ROW avoidance and exclusion areas under an alternative result in a change in solar plant siting and would require a new transmission line having to take a longer route, additional expenditures for materials, equipment, and labor would be made. These increased expenditures would support some amount of additional income and employment. However, increased costs may also represent opportunity costs; that is, the project proponent or society may have benefited more if the additional funds were used in another way. In the socioeconomic analysis in **Chapter 4**, where management actions would potentially increase costs to operators or project proponents, these increased costs are pointed out and discussed qualitatively. Readers should keep in mind that these increased costs reflect an opportunity cost which may negatively impact operators and be perceived as a benefit by others but may not be socially optimal overall.

Some effects associated with land management actions stem from changes in environmental goods and services that are not traded on traditional markets and whose value is not captured in standard measures of economic activity. Since these goods and services exist outside of observable markets, they lack prices that reveal people's willingness-to-pay for the benefits derived from them and are commonly referred to as nonmarket goods. The term "nonmarket values" refers to the benefits individuals derive from nonmarket goods, such as clean air and water, and healthy populations of wildlife. These values include the personal benefits derived from experiences in the natural environment or uses of natural and cultural resources. Nonmarket values also include passive use values (i.e., existence, option, and bequest) which are independent from the direct and indirect use of natural resources. Since these values are difficult to quantify because they cannot be estimated using observable market prices, qualitative discussions are essential to identifying and assessing impacts to nonmarket values in the planning process (see **Chapter 3** for more information on nonmarket values in the planning area).

Qualitative analysis is critical to understanding how management actions may affect social structures and values. While some social impacts stem from economic impacts, such as when changes in mineral payments and tax revenue impact the provisioning of public services and maintenance of infrastructure. Other potential impacts are social and cultural in nature and can affect quality of life, recreation and amenity values, and traditional land uses and associated cultural values. Social impacts stemming from BLM management decisions can vary considerably depending on the characteristics and diversity of the communities of interest that are involved. Additionally, the level of impacts is dependent on the degree to which new and revised management actions alter the course set in previous BLM decisions, and the degree to which local populations are dependent on BLM lands and resources. For a planning effort that covers 10 state analysis areas, analysis of social impacts must necessarily focus on broader discussion of impacts. As a result, in **Chapter 4**, a qualitative review is provided on potential social impacts resulting from changes in public service available for populations, based on anticipated changes to employment levels and tax revenues. These social impacts are discussed alongside the economic changes in employment, output, and tax revenues as well as the impacts on quality of life and non-market values associated with GRSG conservation as well as livestock grazing and wild horse and burros.

Additionally, the social impacts analysis addresses impacts based on the varying points of view of key types of communities of shared interest. **Chapter 3** and **Appendix 13**, Socioeconomics Baseline Report, identify

several broad categories of communities of shared interest that could be impacted by sage-grouse management decisions in the planning area. These categories reflect different linkages people have to public land and reflect distinct sets of attitudes, beliefs, values, opinions, and perceptions about natural resources and the effects of various management policies and actions. It should be noted that individuals and social groups may have multiple interests and often identify with more than one community of shared interest category. This categorization allows for differentiation of social impacts based on broad differences in points of view. The social impacts analysis in **Chapter 4** of the EIS assesses the alternatives against the different points of view in the broad communities of shared interest categories.

As mentioned above, impacts to market, nonmarket, and social conditions are interrelated, so in **Chapter 4**, they are discussed together for each resource use. The methodology and assumptions for each resource use are discussed below, in **Section 18.3**, Methodologies by Resource Use.

18.2.3 Environmental Justice Impact Analysis

Definitions and methods for analysis of potential environmental justice issues are described in **Appendix 13**, Socioeconomic Baseline Report. In short, the socioeconomic study area was screened to identify counties with minority, low-income, or American Indian and Alaska Native populations that qualify as potential environmental justice populations based on guidance for environmental justice analysis from the Council on Environmental Quality and the BLM (CEQ 1997, BLM 2022). These counties and their potential environmental justice populations are noted in **Chapter 3** of the EIS, as well as **Appendix 13**, Socioeconomic Baseline Report. The BLM reviewed public comments and issues of concern that were brought up in 2012 economic workshops and public scoping comments received in 2012, 2019, and for the current planning effort. These issues were considered for carrying forward for impact analysis based on the BLM-management decisions included under the alternatives for this planning effort. Assessment of the likelihood of disproportionate and adverse impacts to these populations was conducted as described in **Chapter 4** of the EIS.

18.3 Methodologies by Resource Use

18.3.1 Oil and Gas

The economic impact of oil and gas reflects drilling, completion, production and tax revenue activities, and changes in economic impacts of oil and gas stem from changes in these activities due to a change in the level of stipulations for the protection of Greater Sage-Grouse under each alternative. Under alternative 3, all areas managed for GRSG would be PHMA and fluid minerals in these areas would be closed to leasing (see **Section 4.9**, Mineral Resources, of this EIS for more details). Closing areas to fluid mineral leasing could result in impacts on level of oil and gas activities and associated jobs, income, and tax revenue supported by local operations. Under alternatives 1, 2, 4, 5, 6, and the Proposed RMP Amendment, all states include language to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas closed to leasing than under alternative 3 (the stipulations on oil and gas leasing and the areas closed to leasing for these alternatives vary by state and alternative and are described in detail in **Section 4.9**, Mineral Resources).

The estimated number of wells drilled and completed, and production from new wells were projected for a 20-year period (2023 to 2042) for each alternative and state as part of the Reasonably Foreseeable Development Scenario (see **Appendix 12**, Reasonably Foreseeable Development Scenario, which provides a complete description of the assumptions and methodology used in developing these estimates). These projections were used as inputs in IMPLAN to model the economic impacts of oil and gas development under each alternative.

Drilling and completion costs per well were developed from Spears & Associates, Inc.'s Drilling and Completion Services Cost Index.[1] These estimates were developed per state, and the weighted average costs were calculated based on the percentage of well type for each state.

Total regional expenditures from drilling costs are calculated by multiplying the drilling cost per well by the projected average annual number of new wells spud (see **Appendix 12**, Reasonably Foreseeable Development Scenario). The number of new wells spud per year is multiplied by the completion ratio (which is estimated by state based on historical completion rates) to calculate the average annual new wells completed. Total regional expenditures from completion costs are calculated by multiplying the average annual number of new wells completed each year by the completion cost per well. Total regional expenditures from drilling and completion costs were used as an input in IMPLAN to generate total regional output, employment, and earnings from oil and gas development.

Projected annual production for new wells developed from 2023 to 2043 is from the reasonably foreseeable development scenario (see **Appendix 12**, Reasonably Foreseeable Development Scenario). Projected oil and gas production under each alternative represents the forecast under varying levels of stipulations and restrictions on leasable mineral development. These stipulations and restrictions could deter operators from leasing, drilling, and producing oil and gas on BLM-administered lands. Instead, operators could choose to develop oil and gas on non-federal lands, or they could choose to reduce production altogether. For the purposes of this analysis, it is assumed that operators choose to reduce production rather than choose to develop on non-federal lands. This means the reported economic impacts associated with changes in federal mineral development may overstate the potential economic impacts within an analysis area due to the ability of some operators to shift operations to non-federal lands and minerals.

The market value of production per well from 2023 to 2043 was calculated using projected annual oil wellhead and natural gas supply prices, from the 2023 Annual Energy Outlook (AEO) reference case published by the US Energy Information Administration (EIA) (EIA 2023). The EIA forecasts oil and gas prices as an average across eight multi-state regions (EIA 2023). For the purposes of this analysis, the price used for each state was taken from the regional average where the state is located. **Table 18-1** shows the 20-year average price, from 2023 to 2042, for oil and gas for each state in the planning area.

Table 18-1. 20-Year Average Oil and Gas Prices, by State

State	Multi-State Region	Oil Wellhead Price ($/barrel)	Natural Gas Supply Price ($/thousand cubic feet)
California	West Coast	93.31	2.75
Colorado	Rocky Mountain	87.22	2.92
Idaho	Rocky Mountain	87.22	2.92
Montana	Northern Great Plains	87.22	3.79
Nevada	Rocky Mountain	87.22	2.92
North Dakota	Northern Great Plains	87.22	3.79
Oregon	West Coast	93.31	2.75
South Dakota	Northern Great Plains	87.22	3.79
Utah	Rocky Mountain	87.22	2.92
Wyoming	Rocky Mountain	87.22	2.92

Source: US EIA 2023

[1] These estimates for drilling and completion costs can be provided from the BLM upon request.

The pace and timing of mineral development activities is dependent on a variety of factors outside the management decisions of the BLM, some of which cannot be foreseen with reasonable certainty. These include national and international energy demand and prices, enactment of future laws and regulatory policies, global supply disruptions, technological advances, and business strategies of operators. The RFD projects future production based on expected rates of well drilling, estimated completion rates, and current production decline curves. Together these parameters allow for projection of future oil and gas production volumes for use in the economic impact analysis. Future real world economic impacts could vary if actual development or production varies from the projection schedule under the RFD, if prices change, or if there are significant structural changes within the oil and gas sector or the broader economies of these study areas.

The IMPLAN sector 35, drilling oil and gas wells, was used to model an exogenous change in demand for oil and gas well drilling. Sector 20, oil and gas extraction, was used to model a change in oil and gas production.

Changes in oil and gas development could also affect state and county public finances through disbursements of federal mineral leasing revenue, state severance taxes, ad valorem taxes, sales and use taxes, and other local and state taxes and fees. The analysis of potential changes in federal mineral leasing payments is calculated from the projected production revenue and the federal royalty rate enacted in August 2022 (16.67 percent) for alternatives 1, 2, 4, 5, 6, and the Proposed RMP Amendment or the previous federal royalty rate (12.5 percent) for Alternative 3.[2] Revenue from rents and bonus bids depend on other site-specific factors, such as size of operation and proprietary information, so impacts on revenues from rents and bonus bids are discussed qualitatively. The impacts to the revenue from state severance taxes is calculated based on the severance tax rate for each state (see **Chapter 3**, Affected Environment, Social and Economic Conditions for the current severance tax assumptions by state). Revenue from ad valorem taxes and other oil and gas production taxes or fees are calculated based on the assumptions shown in **Table 18-2**. Sales and use taxes vary across states and often counties, so impacts on revenue from sales and use taxes are discussed qualitatively.

Tax and royalty revenues derived from activities on BLM-administered lands and minerals would continue to have fiscal implications for communities within the socioeconomic analysis area, the state, and the Federal Government.

[2] The new rate (16.67 percent) only applies to federal leases issued after the IRA was signed. Many new wells development, and the production associated from these new wells, occur on these leases that were issued prior to August 2022 and the royalties from this production would be assessed based on the old rate of 12.5 percent. Because Alternative 3 would close areas to new leasing, the production from oil and gas projected under Alternative 3 is assumed to occur under existing leases that were issued prior to August 2022..

Table 18-2. State and Local Taxes on Oil and Gas Production

State	Estimated Ad Valorem Property Tax Rate[1]	Other Oil and Gas Production Tax or Fee	Estimated Other Oil and Gas Production Tax or Fee Rate[2]
Colorado	5.00%	Oil and Gas Conservation Fee	0.11%
Idaho	—	Oil and Gas Production Tax	1.50%
Montana	—	Privilege and License Tax	0.27%
Nevada	—	Net Proceeds of Minerals Tax	3.66%
North Dakota	—	Oil Extraction Tax	5.00%
South Dakota	—	—	—
Utah	5.00%	Conservation Fee	0.02%
Wyoming	6.30%	Oil and Gas Conservation Tax	0.05%

Source: BLM 2018; Colorado Fiscal Institute 2018; Covenant Consulting Group 2017; Montana Department of Revenue 2020, 2022; Nevada Department of Taxation 2022; State of Utah 2014.
— = Not applicable to the state.
[1]Ad Valorem property tax revenue is calculated as the percent of annual production revenue for Utah and Wyoming, and for Colorado, it is calculated as the percent of assessed property value, which is calculated as 87.5 percent of annual production revenue.
[2]Other oil and gas production tax or fee revenues are calculated as the percent of annual production revenue.

18.3.2 Locatable Minerals

The qualitative analysis of impacts on social and economic conditions due to potential changes in locatable minerals focuses on the impacts of proposed conservation measures to protect Greater Sage-Grouse under the alternatives. Under alternative 3, all PHMA would be recommended withdrawal from mineral entry (see **Section 4.9**, Mineral Resources, of this EIS for more details). Recommending areas for closure to the mining laws for locatable exploration or development does not restrict any activities and therefore, such recommendation does not have any impacts. However, the BLM could ask the Secretary of the Interior to propose and make a withdrawal of the land from location and entry under the Mining Law of 1872 pursuant to Section 204(a) of FLMPA following subsequent NEPA analysis. Proposing and making a withdrawal cannot be done as part of the land use planning process. Should the Secretary propose a withdrawal, the proposal would require environmental and other analysis under NEPA and other applicable authorities before the minerals could be withdrawn. For purposes of this planning initiative, the alternatives analysis includes a description of the types of environmental effects that could occur should the Secretary propose and make a mineral withdrawal in the future (e.g., reduced potential for behavioral disturbance and habitat loss/alterations). If the Secretary ultimately decided to withdraw the land, under Alternative 3, such a withdrawal would likely result in impacts on the level of mineral extraction and associated jobs, income, and tax revenue supported by local mining operations. Under alternatives 1 (in all states) and 2 (in Montana only), actions would be taken to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas recommended for withdrawal than under alternative 3 (the areas recommended for withdrawal for these alternatives vary by state and alternative and are described in detail in **Section 4.9**, Mineral Resources). Under alternatives 2 (in all states except Montana), 4, 5, 6, and the Proposed RMP Amendment (in all states), no areas would be recommended for withdrawal.

18.3.3 Mineral Materials

The qualitative analysis of impacts on mineral materials are based on discussions of how changes in the acres available or unavailable for mineral material disposal, under each alternative, would impact mineral material extraction and costs associated with extraction, access to the resources, and transportation of minerals after they are extracted. Under alternative 3, all areas managed for GRSG would be PHMA and mineral materials would be closed to disposal in all PHMA (see **Section 4.9**, Mineral Resources, of this EIS for more details). Under alternatives 1, 2, 4, 5, 6, and the Proposed RMP Amendment , actions would be taken to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas closed to disposal than under alternative 3 (the areas closed to disposal for these alternatives vary by state and alternative and are described in detail in **Section 4.9**, Mineral Resources). Social impacts to communities due to availability of materials in free-use permits are also explored.

18.3.4 Renewable Energy (Geothermal, Wind, and Solar)

Geothermal

Economic impacts from changes geothermal exploration and development due to a change in the level of stipulations for the protection of Greater Sage-Grouse, under each alternative, are a function of construction and operation expenditures for geothermal electricity development, including drilling wells (exploratory, production, and injection), constructing power plants, and operating facilities. Under alternative 3, all areas managed for GRSG would be PHMA and these areas would be closed to all geothermal leasing (see **Section 4.9**, Mineral Resources, of this EIS for more details). Closing areas to geothermal leasing could result in impacts on level of future geothermal activities and associated jobs, income, and tax revenue supported by local operations. Under alternatives 1, 2, 4, 5, 6, and the Proposed RMP Amendment , all states include language to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas closed to leasing than under alternative 3 (the stipulations on geothermal leasing and the areas closed to leasing for these alternatives vary by state and alternative and are described in detail in **Section 4.9**, Mineral Resources). In the Reasonably Foreseeable Development Scenarios for geothermal development, the BLM analyzed future leasing and development of federal geothermal resources within the decision area over the next 20 years for each alternative. The outputs from the scenarios in the Reasonably Foreseeable Development Scenarios on projected capacity and number of geothermal plants was used to model economic impacts from economic activity (see **Appendix 12**, Reasonably Foreseeable Development Scenarios for more details on how these projections were calculated).

To estimate economic activity associated with geothermal development, BLM used the National Renewable Energy Laboratory's Jobs and Economic Development Impact (JEDI) model (National Renewable Energy Laboratory 2016) to calculate the gross regional economic output, employment, and labor income associated with a representative power plant. The assumptions used 20 MW nameplate capacity for the analyses in Colorado, Idaho, Oregon, and Wyoming, 30 MW nameplate capacity for the analysis in Utah, and 28.8 MW nameplate capacity for the analysis in Nevada (based on the average plant capacity of existing geothermal plants in the planning area). BLM used standard assumptions from the National Renewable Energy Laboratory for the inputs, where data was not available. The economic impacts from the JEDI model were multiplied by the number of geothermal power plants projected, as described in **Appendix 12**, Reasonably Foreseeable Development Scenarios.

The pace and timing of geothermal development activities is dependent on a variety of factors outside the management decisions of the BLM, some of which cannot be foreseen with reasonable certainty. These include demand for electricity, availability of transmission infrastructure capacity, geothermal energy prices relative to the prices for electricity from other sources, cost of energy generation technologies, technological

advances, and business strategies of operators. The RFD projects future production based on expected rates of well drilling, estimated completion rates, and current production decline curves. Together these parameters allow for projection of future oil and gas production volumes for use in the economic impact analysis. Future real world economic impacts could vary if actual development or production varies from the projection schedule under the RFD, if prices change, or if there are significant structural changes within the oil and gas sector or the broader economies of these study areas.

Wind and Solar Energy

The qualitative analysis of impacts on wind and solar energy from BLM-management decisions are based on how the number of acres designated as ROW exclusion or ROW avoidance areas, under each alternative, would impact wind and solar energy development and costs associated with development and transmission of wind and solar energy. Under alternative 3, all PHMA would be managed as ROW exclusion (outside of designated corridors; see **Section 4.8**, Lands and Realty (Including Wind and Solar), of this EIS for more details). Under alternatives 1, 2, 4, 5, 6, and the Proposed RMP Amendment , actions would be taken to maintain and enhance sagebrush habitats with the intent of conserving sage-grouse populations; however, there would be fewer areas managed as ROW exclusion than under alternative 3 (the areas managed as ROW avoidance and exclusion under these alternatives vary by state and alternative and are described in detail in **Section 4.8**, Lands and Realty (Including Wind and Solar)).

The pace and timing of wind and solar energy development activities are dependent on a variety of factors outside the management decisions of the BLM. These include demand for electricity, availability of transmission infrastructure capacity, renewable energy prices relative to prices for electricity from other energy sources, costs of energy generation technologies, technological advances, and business strategies of operators. Due to uncertainties in these factors as well as data limitations, potential economic and social impacts stemming from wind and solar energy affected by BLM-management decisions will be discussed qualitatively.

18.3.5 Livestock Grazing

Economic impacts from changes to livestock grazing are a function of the amount of forage utilization and the market value of livestock whose feed requirements are partially met through grazing on BLM managed allotments. Forage utilization is measured in animal unit months (AUMs), with one AUM defined as the amount of forage needed to feed a cow or five sheep for one month.

Two types of AUM measures are tracked: active AUMs, which measure the amount of forage from land available for grazing, and billed AUMs, which measure the amount of forage that the BLM bills for in a Grazing Fee Year. For the purposes of the analysis in **Chapter 4**, impacts were estimated based on the 5-year average (2018-2022) of billed AUMs, which is the closest available proxy for actual forage use. Because billed use may exceed actual grazing use, the economic analyses may overstate the actual economic impacts of grazing to some degree; however, the comparison across alternatives is still representative of the impacts from BLM-management decisions.

The number of billed AUMS on allotments with greater than 15 percent PHMA land was determined by overlaying GIS data layers. The 5-year average total billed AUMs as well as the billed AUMs on allotments with greater than 15 percent PHMA land by livestock type and state were reported in **Appendix 13**, Socioeconomic Baseline Report. **Table 18-3** shows the estimated projected number of billed AUMs by alternative for each state, broken out by livestock type and total. The total billed AUMs and billed AUMs by

Table 18-3. Number of Estimated AUMs by Livestock Type, State, and Alternative[1]

State	Alternative	Total Billed AUMs	Billed AUMs by Livestock Type	
			Cattle	Sheep
California	Alternatives 1, 2, 4, and 5	121,325	115,259	6,066
	Alternative 3	0	0	0
Colorado	Alternatives 1, 2, 4, and 5	126,183	104,227	21,956
	Alternative 3	0	0	0
Idaho	Alternatives 1, 2, 4, and 5	741,979	696,719	45,261
	Alternative 3	0	0	0
Montana	Alternatives 1, 2, 4, and 5	885,551	866,954	18,597
	Alternative 3	0	0	0
Nevada	Alternatives 1, 2, 4, and 5	1,092,825	1,019,606	73,219
	Alternative 3	0	0	0
North Dakota	Alternatives 1, 2, 4, and 5	3,871	3,863	8
	Alternative 3	0	0	0
Oregon	Alternatives 1, 2, 4, and 5	678,191	674,122	4,069
	Alternative 3	0	0	0
South Dakota	Alternatives 1, 2, 4, and 5	35,588	31,638	3,950
	Alternative 3	0	0	0
Utah	Alternatives 1, 2, 4, and 5	258,438	201,840	56,598
	Alternative 3	0	0	0
Wyoming	Alternatives 1, 2, 4, and 5	1,334,637	1,190,497	144,141
	Alternative 3	0	0	0

Source: BLM 2023

— = Data not available

[1]Data reported is for allotments where PHMA accounted for 15 percent or more of the acreage.

livestock type for Alternatives 1, 2, 4, and 5 was assumed to be consistent with the 5-year average billed AUMs. Under Alternative 3, all of the allotments where PHMA accounts for 15 percent or more of the acreage would be completely closed to grazing, so the billed AUMs would be reduced to zero.

The economic value of livestock whose annual feed requirements are partially met by grazing on BLM lands is estimated based on the market value of cattle and sheep. Values for cattle and sheep are estimated separately, and other grazing animals are considered of negligible commercial value. The direct value of production per AUM was estimated based on regional livestock production value data over 5 years and ratios in the livestock economics literature. **Table 18-4** shows the value of production per cow, AUMs per cow, and adjusted value of production per AUM. The value for cattle is $37.00 per AUM and the value for sheep is $59.56 per AUM.

The analysis focused on the economic impacts associated with cattle and sheep because those are the predominate types of livestock permitted to graze on BLM lands, however, BLM grazing permits may be issued for other classes of livestock. For the purposes of this analysis, one AUM for buffalo is assumed to be equivalent to one AUM for cattle and one AUM for goats is equivalent to one AUM for sheep. Forage utilization by horses was excluded from the analysis because it was assumed that most of this forage utilization for horses occurs as support for a ranching operation grazing other livestock and would thus be an input cost for producing cattle and sheep. The IMPLAN sectors, 11, beef cattle ranching and farming, including feedlots and dual-purpose ranching and farming, and 14, animal production, except cattle and poultry and eggs were used to model an exogenous change in demand for cattle and sheep grazing on BLM lands, respectively.

Table 18-4. Value of Livestock

Year	Value of Livestock Production (Nominal $)[1,2]		AUMs per Animal[3]		Adjusted Value of Livestock Production per AUM (2021$)[4]	
	Cow	Sheep/Ewe	Cow	Sheep/Ewe	Cow	Sheep/Ewe
2015	1015.79	214	16	3.2	49.76	54.50
2016	704.62	202	16	3.2	41.41	60.96
2017	710.20	203	16	3.2	40.66	59.44
2018	589.29	204	16	3.2	35.00	61.47
2019	558.00	203	16	3.2	33.15	61.43
2020	565.77	—	16	—	35.66	—
2021	606.07	—	16	—	37.88	—
2022	698.80	—	16	—	43.30	—
5 Year Average	**603.59**	**205.20**	**16**	**3.2**	**37.00**	**59.56**

Source: [1]USDA Economic Research Service 2023; [2]USDA National Agricultural Statistics Service 2021; [3]The AUMs per animal is the number of months of forage one animal needs to grow to market weight, and was estimated from the estimated number of months to get an animal to market weight minus the estimated number of months the animal spends in a feedlot (Pennsylvania Beef Council 2024; US Agency for International Development; US Department of Agriculture 2013)
[4] Nominal values were converted to 2021 dollar values using IMPLAN deflators (IMPLAN 2021 Data).
— = Data not available

The economic impacts were evaluated at both the analysis areas and state level for each state. The multi-regional input-output analysis feature of IMPLAN was used to evaluate the economic impacts at the state level from changes made in the analysis areas.

Forage utilization estimates in this analysis, and thus the economic impact estimates, only represent livestock grazing in allotments where PHMA accounts for at least 15 percent of total allotment acreage. They do not represent the total impact of livestock grazing in each state or county. Because of this, a percentage decrease between the action alternatives and Alternative 1 would be less on a total impact from livestock grazing basis than in the figures in **Chapter 4**, which are for livestock grazing in GRSG HMAs only.

18.4 State-Specific Impacts on Social and Economic Conditions (Including Environmental Justice)

18.4.1 Introduction

Rangewide impacts from BLM decisions on economic and social conditions and nonmarket values are discussed in **Section 4.8**, Social and Economic Conditions (Including Environmental Justice), of the EIS; however, due to variations in BLM decision for certain states, some impacts vary by geographic region. In the subsections below are detailed discussions on the state-specific impacts on economic and social conditions for each state that differs from the rangewide impacts.

18.4.2 Alternative 1

Fluid Minerals (Oil and Gas) Management

Table 18-5 shows the direct, indirect, induced, and total impacts on economic contributions from projected oil and gas activity. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-5** are provided as well as a qualitative discussion on the market and nonmarket impacts from potential changes in oil and gas operations in each state with reasonably foreseeable future development of oil and gas.[3]

[3] California and Oregon did not have reasonably foreseeable future oil and gas development in the planning area, so they are not included in the discussion.

Table 18-5. Average Annual Economic Contributions from Oil and Gas, Under Alternative I

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,574	6,574	790,898,405	790,898,405	3,979,134,548	3,979,134,548
	Indirect	7,090	9,671	473,848,226	776,442,707	1,408,076,009	2,011,832,079
	Induced	4,411	6,020	222,619,299	321,309,153	726,211,232	1,032,129,727
	Total	18,075	22,265	1,487,365,930	1,888,650,265	6,113,421,790	7,023,096,354
Colorado (High Scenario)	Direct	12,791	12,791	1,539,179,946	1,539,179,946	7,738,174,737	7,738,174,737
	Indirect	13,786	18,801	921,044,007	1,508,906,703	2,737,727,285	3,911,507,852
	Induced	8,581	11,708	433,092,289	624,894,000	1,412,797,333	2,007,343,698
	Total	35,158	43,301	2,893,316,242	3,672,980,648	11,888,699,355	13,657,026,287
Idaho	Direct	6	6	360,003	360,003	1,873,754	1,873,754
	Indirect	4	5	245,779	285,872	843,411	989,487
	Induced	2	2	99,312	113,394	327,260	373,549
	Total	13	14	705,095	759,269	3,044,425	3,236,789
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	89	89	7,090,932	7,090,932	34,541,446	34,541,446
	Indirect	120	134	5,990,214	6,990,786	22,253,716	25,892,162
	Induced	29	41	1,000,002	1,653,841	4,411,230	6,438,783
	Total	238	264	14,081,147	15,735,559	61,206,393	66,872,391
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	11,727	11,727	1,149,445,274	1,149,445,274	11,250,865,363	11,250,865,363
	Indirect	8,889	8,907	638,335,304	639,668,064	2,054,425,775	2,058,559,520
	Induced	5,679	5,683	230,589,632	230,859,416	885,839,233	886,707,080
	Total	26,295	26,318	2,018,370,210	2,019,972,754	14,191,130,372	14,196,131,963
Total Planning Area (Low Colorado Scenario)	Direct	22,980	22,980	2,427,235,790	2,427,235,790	18,616,987,138	18,616,987,138
	Indirect	19,877	23,923	1,351,671,634	1,781,030,341	4,244,195,792	5,107,674,520
	Induced	12,606	14,930	567,890,538	705,462,574	2,004,649,641	2,437,727,636
	Total	55,464	61,833	4,346,797,961	4,913,728,705	24,865,832,571	26,162,389,294
Total Planning Area (High Colorado Scenario)	Direct	29,197	29,197	3,175,517,331	3,175,517,331	22,376,027,327	22,376,027,327
	Indirect	26,573	33,054	1,798,867,415	2,513,494,337	5,573,847,067	7,007,350,293
	Induced	16,777	20,618	778,363,527	1,009,047,421	2,691,235,741	3,412,941,607
	Total	72,547	82,870	5,752,748,273	6,698,059,088	30,641,110,135	32,796,319,226

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Colorado

On annual average, oil and gas production revenue and well development expenditures in the Colorado analysis area is expected to result in a range of about 22,000 to 43,000 total jobs (from 7,000 to 13,000 direct jobs in the drilling oil and gas wells sector and the oil and gas extraction sector), $1.9 billion to $3.7 billion in total labor income (from $791 million to $1.5 billion in direct labor income), and about $7.0 billion to $13.7 billion in economic output (from $4.0 billion to $7.7 billion in direct economic output) throughout the state. Most of the impacts on employment and economic output from oil and gas production revenue and well development expenditures would occur in the analysis area, accounting for about 87.0 percent of the total economic output.

Under Alternative 1, the total royalty revenue generated from oil and gas production in Colorado could range from about $453 million to $878 million. The Colorado severance tax revenue is expected to range from about $31.8 million to $61.7 million, under Alternative 1, and the oil and gas conservation fee could generate a range of $3.0 million to $5.8 million. Assuming an average tax rate of 5 percent across counties in the analysis area, oil and gas production could generate a range of about $119 million to $230 million in county revenues from ad valorem taxes. These revenues that are disbursed to counties would continue to support local public services.

Idaho

On annual average, oil and gas production revenue and well development expenditures in the Idaho analysis area is expected to result in about 14 total jobs (about 6 direct jobs in the drilling oil and gas wells sector and the oil and gas extraction sector), $759,000 in total labor income (about $360,000 in direct labor income), and about $3.2 million in economic output (about $1.9 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from oil and gas production revenue and well development expenditures would occur in the analysis area, accounting for about 94.1 percent of the total economic output.

Under Alternative 1, fluid mineral leasing would continue to be managed as NSO in Idaho IHMA and as CSU in GHMA. In IHMA, impacts on nonmarket and social conditions would be the same as described in *Rangewide Environmental Consequences* under the *Fluid Minerals (Oil and Gas) Management* subsection of **Section 4.8.2**, Alternative 1, of the EIS; however, within GHMA, if there is an increase in mineral development and activities, there would likely continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality, as described in **Section 4.8.1,** Nature and Type of Effects, of the EIS.

Montana

On annual average, oil and gas production revenue and well development expenditures in the Montana analysis area is expected to result in about 5,000 total jobs (about 2,000 direct jobs in the drilling oil and gas wells sector and the oil and gas extraction sector), $485 million in total labor income (about $285 million in direct labor income), and about $1.9 billion in economic output (about $1.3 billion in direct economic output) throughout the state. Most of the impacts on employment and economic output from oil and gas production revenue and well development expenditures would occur in the analysis area, accounting for about 97.6 percent of the total economic output.

Under Alternative 1, the total royalty revenue generated from oil and gas production in Montana would be about $112 million. The Montana severance tax revenue is expected to be about $62.6 million, under

Alternative 1, and the state is expected to generate about $1.8 million from the privilege and license tax. These revenues that are disbursed to counties would continue to support local public services.

Nevada

On annual average, oil and gas production revenue and well development expenditures in the Nevada analysis area is expected to result in about 42 total jobs (about 18 direct jobs in the drilling oil and gas wells sector and the oil and gas extraction sector), $2.2 million in total labor income (about $249,000 in direct labor income), and about $11.7 million in economic output (about $6.4 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from oil and gas production revenue and well development expenditures would occur in the analysis area, accounting for about 98.0 percent of the total economic output.

Under Alternative 1, the total royalty revenue generated from oil and gas production in Nevada would be about $520,000. The Nevada severance tax revenue is expected to be about $5,000, under Alternative 1. Additionally, oil and gas production could generate about $114,000 across the analysis area in revenue from the Net Proceeds of Minerals Tax. These revenues that are disbursed to counties would continue to support local public services.

Under Alternative 1, Nevada GHMA would continue to be managed as open to fluid mineral leasing, subject to CSU stipulations. If there are increased mineral development and activities in GHMA, there would likely continue to be impacts on nonmarket and social conditions due to changes in access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality, as described in **Section 4.8.1**, Nature and Type of Effects, of the EIS.

North Dakota

On annual average, oil and gas production revenue and well development expenditures in the North Dakota analysis area is expected to result in about 573 total jobs (about 275 direct jobs in the drilling oil and gas wells sector and the oil and gas extraction sector), $48 million in total labor income (about $32 million in direct labor income), and about $471 million in economic output (about $406 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from oil and gas production revenue and well development expenditures would occur in the analysis area, accounting for about 99.0 percent of the total economic output.

Under Alternative 1, the total royalty revenue generated from oil and gas production in North Dakota would be about $51.6 million. The North Dakota severance tax revenue is expected to be about $14.7 million, under Alternative 1. Additionally, oil and gas production could generate about $15.5 million across the analysis area in oil extraction tax revenues. These revenues that are disbursed to counties would continue to support local public services.

South Dakota

On annual average, oil and gas production revenue and well development expenditures in the South Dakota analysis area is expected to result in about 264 total jobs (about 89 direct jobs in the drilling oil and gas wells sector and the oil and gas extraction sector), $15.7 million in total labor income (about $7.1 million in direct labor income), and about $67 million in economic output (about $35 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from oil and gas production revenue and well development expenditures would occur in the analysis area, accounting for about 91.5 percent of the total economic output.

Under Alternative 1, the total royalty revenue generated from oil and gas production in South Dakota would be about $2.4 million. The South Dakota severance tax revenue is expected to be about $644,000, under Alternative 1. These revenues that are disbursed to counties would continue to support local public services.

Utah

On annual average, oil and gas production revenue and well development expenditures in the Utah analysis area is expected to result in about 7,000 total jobs (about 2,000 direct jobs in the drilling oil and gas wells sector and the oil and gas extraction sector), $454 million in total labor income (about $162 million in direct labor income), and about $2.5 billion in economic output (about $1.6 billion in direct economic output) throughout the state. Most of the impacts on employment and economic output from oil and gas production revenue and well development expenditures would occur in the analysis area, accounting for about 86.7 percent of the total economic output.

Under Alternative 1, the total royalty revenue generated from oil and gas production in Utah would be about $186 million. The Utah severance tax revenue is expected to be about $55.7 million, under Alternative 1, and the conservation fee is expected to generate about $223,000. Additionally, oil and gas production could generate about $55.6 million across the analysis area in county revenues from ad valorem taxes. These revenues that are disbursed to counties would continue to support local public services.

Under Alternative 1, Utah GHMA would continue to be managed as NSO near leks or CSU based on allocations in the plans that predate the 2015 amendment. In areas managed as NSO, impacts on nonmarket and social conditions would be the same as described in *Rangewide Environmental Consequences;* however, in areas managed as CSU, if there is an increase in mineral development and activities, there would likely continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality, as described in **Section 4.8.1**, Nature and Type of Effects, of the EIS.

Wyoming

On annual average, oil and gas production revenue and well development expenditures in the Wyoming analysis area is expected to result in about 26,000 total jobs (about 12,000 direct jobs in the drilling oil and gas wells sector and the oil and gas extraction sector), $2.0 billion in total labor income (about $1.1 billion in direct labor income), and about $14.2 billion in economic output (about $11.3 billion in direct economic output) throughout the state. Most of the impacts on employment and economic output from oil and gas production revenue and well development expenditures would occur in the analysis area, accounting for about 99.96 percent of the total economic output.

Under Alternative 1, the total royalty revenue generated from oil and gas production in Wyoming would be about $1.5 billion. The Wyoming severance tax revenue is expected to be about $557 million, and the oil and gas conservation tax could generate about $4.6 million, under Alternative 1. Additionally, oil and gas production could generate about $585 million across the analysis area in county revenues from ad valorem taxes. These revenues that are disbursed to counties would continue to support local public services.

Under Alternative 1, in Wyoming, GHMA would be managed as NSO within 0.25 miles of leks, and seasonal limitations within 2 miles of leks, while PHMA would continue to be managed as NSO within 0.6 miles of leks and as CSU or with timing limitations outside. In areas managed as NSO, impacts on nonmarket and social conditions would be the same as described in *Rangewide Environmental Consequences;* however, in areas managed as CSU, if there is an increase in mineral development or activities, there would likely continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and

reduced visitor and viewer enjoyment from changes in air quality, as described in **Section 4.8.1,** Nature and Type of Effects, of the EIS.

Renewable Energy (Geothermal, Wind, and Solar) Management

Table 18-6 shows the direct, indirect, induced, and total impacts on economic contributions from projected geothermal activity. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-6** are provided as well as a qualitative discussion on the market and nonmarket impacts from potential changes in geothermal in each state with reasonably foreseeable future development of geothermal.[4]

Table 18-6. Average Annual Economic Contributions from Geothermal, Under Alternative 1

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016

Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

[4] There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

California and Nevada

On annual average, geothermal development in the states of California and Nevada is expected to support about 540 total jobs (about 276 direct jobs), $36.0 million in total labor income (about $17.1 million in direct labor income), and about $106 million in economic output (about $24.4 million in direct economic output).

Colorado

On annual average, geothermal development in the state is expected to support about 16 total jobs (about 8 direct jobs), $1.1 million in total labor income (about $537,000 in direct labor income), and about $2.7 million in economic output (about $761,000 in direct economic output).

Idaho

On annual average, geothermal development in the state is expected to support about 36 total jobs (about 22 direct jobs), $1.8 million in total labor income (about $1.0 million in direct labor income), and about $4.9 million in economic output (about $1.4 million in direct economic output).

Under Alternative 1, in GHMA where lands would continue to be open for wind and solar development and in IHMA that would continue to be managed as avoidance for solar and wind development and only excluded for utility scale projects, there would continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality from changes in surface disturbance due to potential wind and solar development, as described in **Section 4.8.1**, Nature and Type of Effects, of the EIS.

Nevada

Under Alternative 1, in GHMA that would continue to be managed as avoidance for wind projects or in PHMA that would be open for non-utility-scale solar and wind projects, there would continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality from changes in surface disturbance due to potential wind and solar development, as described in **Section 4.8.1,** Nature and Type of Effects, of the EIS.

Oregon

On annual average, geothermal development in the state is expected to support about 11 total jobs (about 6 direct jobs), $577,000 in total labor income (about $297,000 in direct labor income), and about $1.5 million in economic output (about $402,000 in direct economic output).

Under Alternative 1, in PHMA that would continue to be managed as avoidance for solar and wind development and only excluded for utility scale projects, there would continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality from changes in surface disturbance due to potential wind and solar development, as described in **Section 4.8.1,** Nature and Type of Effects, of the EIS.

Utah

On annual average, geothermal development in the state is expected to support about 22 total jobs (about 12 direct jobs), $1.3 million in total labor income (about $743,000 in direct labor income), and about $3.6 million in economic output (about $1.1 million in direct economic output).

Under Alternative 1, in GHMA that would continue to be open to solar and wind projects and in PHMA that would continue to be open to wind projects within 5 miles of leks, there would continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor

and viewer enjoyment from changes in air quality from changes in surface disturbance due to potential wind and solar development, as described in **Section 4.8.1,** Nature and Type of Effects, of the EIS.

Wyoming

On annual average, geothermal development in the state is expected to support about 9 total jobs (about 6 direct jobs), $432,000 million in total labor income (about $288,000 in direct labor income), and about $1.3 million in economic output (about $388,000 in direct economic output).

Under Alternative 1, in PHMA where it would still be open to solar and wind development, there would continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality from changes in surface disturbance due to potential wind and solar development, as described in **Section 4.8.1**, Nature and Type of Effects, of the EIS.

Livestock Grazing Management

Table 18-7 shows the direct, indirect, induced, and total impacts on economic contributions from livestock grazing in allotments where PHMA accounted for at least 15 percent of the acreage. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-7** are provided.

Table 18-7. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 1

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

California

BLM decisions on GRSG HMAs, under Alternative 1, are not expected to change economic contributions from livestock grazing from current conditions. On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the California analysis area is expected to support about 22 total jobs (about 7 direct jobs in the animal production and ranching sectors), $3.4 million in total labor income (about $2.1 million in direct labor income), and about $8.4 million in economic output (about $4.6 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing would occur in the analysis area, accounting for about 88.6 percent of the total economic output.

Colorado

On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Colorado analysis area is expected to support about 82 total jobs (about 50 direct jobs in the animal production and ranching sectors), $3.2 million in total labor income (about $1.8 million in direct labor income), and about $9.8 million in economic output (about $5.1 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing on these allotments would occur in the analysis area, accounting for about 91.9 percent of the total economic output.

Idaho

On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Idaho analysis area is expected to support about 221 total jobs (about 77 direct jobs in the animal production and ranching sectors), $22.8 million in total labor income (about $13.3 million in direct

labor income), and about $57.3 million in economic output (about $28.5 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing on these allotments would occur in the analysis area, accounting for about 97.4 percent of the total economic output.

Montana

On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Montana analysis area is expected to support about 381 total jobs (about 186 direct jobs in the animal production and ranching sectors), $21.0 million in total labor income (about $10.5 million in direct labor income), and about $67.3 million in economic output (about $33.2 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing on these allotments would occur in the analysis area, accounting for about 96.5 percent of the total economic output.

Nevada

On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Nevada analysis area is expected to support about 236 total jobs (about 82 direct jobs in the animal production and ranching sectors), $23.6 million in total labor income (about $13.7 million in direct labor income), and about $76.7 million in economic output (about $42.1 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing on these allotments would occur in the analysis area, accounting for about 97.6 percent of the total economic output.

North Dakota

On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the North Dakota analysis area is expected to support about 1 total jobs (about 1 direct jobs in the animal production and ranching sectors), $64,000 in total labor income (about $39,000 in direct labor income), and about $235,000 in economic output (about $143,000 in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing on these allotments would occur in the analysis area, accounting for about 97.2 percent of the total economic output.

Oregon

On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Oregon analysis area is expected to support about 206 total jobs (about 78 direct jobs in the animal production and ranching sectors), $14.1 million in total labor income (about $6.5 million in direct labor income), and about $50.0 million in economic output (about $25.2 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing on these allotments would occur in the analysis area, accounting for about 95.4 percent of the total economic output.

South Dakota

On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the South Dakota analysis area is expected to support about 10 total jobs (about 5 direct jobs in the animal production and ranching sectors), $402,000 in total labor income (about $186,000 in direct labor income), and about $2.5 million in economic output (about $1.4 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing on

these allotments would occur in the analysis area, accounting for about 95.0 percent of the total economic output.

Utah

On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Utah analysis area is expected to support about 90 total jobs (about 54 direct jobs in the animal production and ranching sectors), $6.2 million in total labor income (about $4.6 million in direct labor income), and about $16.9 million in economic output (about $10.8 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing on these allotments would occur in the analysis area, accounting for about 96.2 percent of the total economic output.

Wyoming

On annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Wyoming analysis area is expected to support about 552 total jobs (about 301 direct jobs in the animal production and ranching sectors), $25.1 million in total labor income (about $14.7 million in direct labor income), and about $91.3 million in economic output (about $52.6 million in direct economic output) throughout the state. Most of the impacts on employment and economic output from livestock grazing on these allotments would occur in the analysis area, accounting for about 98.9 percent of the total economic output.

Environmental Justice

Below is a detailed discussion of adverse and disproportionate impacts on environmental justice populations by state that contained identified environmental justice populations.[5]

California

BLM decisions, under Alternative 1, that impact low-income environmental justice populations would likely have disproportionate and adverse impacts on environmental justice populations in the California analysis area, since both counties in analysis area were identified as meeting the criteria for containing low-income populations. These impacts include impacts on access to subsistence resources.

Colorado

BLM decisions, under Alternative 1, that impact low-income and American Indian and Alaska Native environmental justice populations would likely have disproportionate and adverse impacts on environmental justice populations in the Colorado analysis area, since seven of counties in analysis area were identified as meeting the criteria for containing low-income populations and two of the counties were identified as meeting the threshold for American Indian and Alaska Native populations. These impacts include impacts on access to cultural and subsistence resources.

Idaho

The Idaho analysis area had 25 counties that met criteria for minority, low-income, and American Indian and Alaska Native environmental justice populations. All of the BLM decisions, under Alternative 1, that impact environmental justice populations would likely have disproportionate and adverse impacts on environmental justice populations in the Idaho analysis area.

[5] There were no counties in the North Dakota analysis area that met the threshold for environmental justice populations, so North Dakota is not included in the state-by-state discussion.

Under Alternative 1, in GHMA, fluid mineral leasing would continue to be managed as CSU and lands would continue to be open to wind and solar development and in IHMA, only utility-scale wind and solar projects would be excluded. If there would be an increase in mineral and ROW development and activities in GHMA and IHMA, there would likely continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality. These impacts could lead to disproportionate and adverse impacts on environmental justice populations, depending on where the environmental justice populations are located within each county in relation to the change in air quality.

Montana

The Montana analysis area had 18 counties that met criteria for minority, low-income, and American Indian and Alaska Native environmental justice populations. All of the BLM decisions, under Alternative 1, that impact environmental justice populations would likely have disproportionate and adverse impacts on environmental justice populations in the Montana analysis area.

Nevada

The entire Nevada analysis area (a total of 10 counties) met criteria for minority, low-income, and American Indian and Alaska Native environmental justice populations. All of the BLM decisions, under Alternative 1, that impact environmental justice populations would likely have disproportionate and adverse impacts on environmental justice populations in the Nevada analysis area.

Under Alternative 1, within GHMA, where fluid mineral leasing would continue to be managed as CSU and lands would continue to be managed as avoidance for wind projects and in PHMA, where only utility-scale wind and solar projects would be excluded. If there is an increase in mineral development and activities, there would likely continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality. These impacts could lead to disproportionate and adverse impacts on environmental justice populations, depending on where the environmental justice populations are located within each county in relation to the change in air quality.

Oregon

The Oregon analysis area had 7 counties that met criteria for minority, low-income, and American Indian and Alaska Native environmental justice populations. All of the BLM decisions, under Alternative 1, that impact environmental justice populations would likely have disproportionate and adverse impacts on environmental justice populations in the Oregon analysis area.

Under Alternative 1, in PHMA, where only utility-scale wind and solar projects would be excluded, there would likely continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality. These impacts could lead to disproportionate and adverse impacts on environmental justice populations, depending on where the environmental justice populations are located within each county in relation to the change in air quality.

South Dakota

BLM decisions, under Alternative 1, that impact low-income environmental justice populations would likely have disproportionate and adverse impacts on environmental justice populations in Butte County, South Dakota, since the county was identified as meeting the criteria for containing low-income populations. These impacts include impacts on access to subsistence resources.

Utah

BLM decisions, under Alternative 1, that impact low-income and American Indian and Alaska Native environmental justice populations would likely have disproportionate and adverse impacts on environmental justice populations in the Utah analysis area since 18 counties in analysis area were identified as meeting the criteria for containing low-income or American Indian and Alaska Native populations.

Under Alternative 1, in GHMA, where fluid mineral leasing would continue to be managed as NSO near leks or CSU based on allocations in the plans that predate the 2015 amendment and lands would continue to be open to solar and wind projects and in PHMA, where lands would continue to be open to wind projects within 5 miles of leks, if there is an increase in development, there would likely continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality. These impacts could lead to disproportionate and adverse impacts on environmental justice populations, depending on where the environmental justice populations are located within each county in relation to the change in air quality.

Wyoming

The Wyoming analysis area had 15 counties that met criteria for minority, low-income, and American Indian and Alaska Native environmental justice populations. All of the BLM decisions, under Alternative 1, that impact environmental justice populations would likely have disproportionate and adverse impacts on environmental justice populations in the Wyoming analysis area.

Under Alternative 1, within GHMA, where fluid mineral leasing would continue to be managed as NSO within 0.25 miles of leks with seasonal limitations within 2 miles of leks, and within PHMA, where fluid mineral leasing would continue to be managed as NSO within 0.6 miles of leks and as CSU or with timing limitations outside and where it would still be open to solar and wind development, if there is an increase in development and activities, there would likely continue to be impacts on access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality due to less restrictions than other areas. These impacts could lead to disproportionate and adverse impacts on environmental justice populations, depending on where the environmental justice populations are located within each county in relation to the change in air quality. In areas open to fluid mineral leasing with CSU stipulations or timing limitations, if there is an increase in mineral development and activities, potential for impacts on air quality would continue to exist.

18.4.3 Alternative 2

Fluid Minerals (Oil and Gas) Management

Table 18-8 shows the direct, indirect, induced, and total impacts on economic contributions from projected oil and gas activity. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-8** are provided as well as a qualitative discussion on the market and nonmarket impacts from potential changes in oil and gas operations in each state with reasonably foreseeable future development of oil and gas and with differing impacts from the rangewide impacts, as discussed in **Section 4.8** of the EIS.[6]

[6] California and Oregon did not have reasonably foreseeable future oil and gas development in the planning area, so they are not included in the discussion.

Table 18-8. Average Annual Economic Contributions from Oil and Gas, Under Alternative 2

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,669	6,669	802,283,755	802,283,755	4,036,412,178	4,036,412,178
	Indirect	7,192	9,810	480,668,731	787,619,135	1,428,344,184	2,040,792,766
	Induced	4,474	6,107	225,823,905	325,934,514	736,665,045	1,046,987,593
	Total	18,335	22,585	1,508,776,391	1,915,837,404	6,201,421,407	7,124,192,537
Colorado (High Scenario)	Direct	12,885	12,885	1,550,426,755	1,550,426,755	7,794,700,978	7,794,700,978
	Indirect	13,887	18,939	927,770,796	1,519,925,891	2,757,724,392	3,940,077,897
	Induced	8,644	11,794	436,256,457	629,458,854	1,423,119,210	2,022,007,419
	Total	35,415	43,617	2,914,454,009	3,699,811,501	11,975,544,580	13,756,786,294
Idaho	Direct	8	8	480,004	480,004	2,498,339	2,498,339
	Indirect	6	7	327,706	381,162	1,124,547	1,319,316
	Induced	3	3	132,416	151,192	436,347	498,065
	Total	17	18	940,127	1,012,359	4,059,233	4,315,719
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	89	89	7,090,932	7,090,932	34,541,446	34,541,446
	Indirect	120	134	5,990,214	6,990,786	22,253,716	25,892,162
	Induced	29	41	1,000,002	1,653,841	4,411,230	6,438,783
	Total	238	264	14,081,147	15,735,559	61,206,393	66,872,391
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	11,727	11,727	1,149,445,274	1,149,445,274	11,250,865,363	11,250,865,363
	Indirect	8,889	8,907	638,335,304	639,668,064	2,054,425,775	2,058,559,520
	Induced	5,679	5,683	230,589,632	230,859,416	885,839,233	886,707,080
	Total	26,295	26,318	2,018,370,210	2,019,972,754	14,191,130,372	14,196,131,963
Total Planning Area (Low Colorado Scenario)	Direct	23,077	23,077	2,438,741,141	2,438,741,141	18,674,889,353	18,674,889,353
	Indirect	19,981	24,064	1,358,574,065	1,792,302,059	4,264,745,103	5,136,965,036
	Induced	12,671	15,017	571,128,248	710,125,734	2,015,212,540	2,452,710,018
	Total	55,728	62,158	4,368,443,454	4,941,168,934	24,954,846,996	26,264,564,407
Total Planning Area (High Colorado Scenario)	Direct	29,293	29,293	3,186,884,142	3,186,884,142	22,433,178,152	22,433,178,152
	Indirect	26,676	33,193	1,805,676,130	2,524,608,816	5,594,125,311	7,036,250,167
	Induced	16,840	20,705	781,560,800	1,013,650,073	2,701,666,706	3,427,729,844
	Total	72,808	83,191	5,774,121,072	6,725,143,031	30,728,970,169	32,897,158,163

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Colorado

Under Alternative 2, on annual average, oil and gas production revenue and well development expenditures and well development in the Colorado analysis area is expected to support about 320 more total jobs (about 95 additional direct jobs), about $27million more in total labor (about $11 million in additional direct labor income), and about $100 million in economic output (about $57 million in additional direct economic output) on annual average across the state relative to Alternative 1.

The increase in projected oil and gas activity could result in a small increase in tax revenues compared with Alternative 1. Under Alternative 2, the total royalty revenue generated from oil and gas production in Colorado could range from $459 million to $884 million, which is about $6.4 million to $6.5 million more than under Alternative 1. The Colorado severance tax revenue could range from $32.3 million to $62.2 million, which is almost $500,000 more than under Alternative 1. The oil and gas conservation fee could generate a range of $3.0 million to $5.8 million, slightly more than under Alternative 1. Additionally, oil and gas production could generate a range of $121 million to $232 million in county revenues from ad valorem taxes, which is about $1.7 million more than under Alternative 1). The increase in oil and gas activity would likely lead to an increase in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. These revenues are disbursed to the counties and would continue to support local public services, such as education.

The potential increase in oil and gas activity is not likely to result in large impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest.

Under Alternative 2, PHMAs in Colorado would be designated as NSO for fluid mineral development. Compared with Alternative 1, changing GHMA from closed to fluid mineral leasing within 1 mile of leks and NSO within 2 miles of leks under Alternative 1 to NSO within 1 mile of leks under this alternative would likely result in an increase in air emissions because the amount of federal mineral estate available for leasing and development would be greater under this alternative. This could lead to less access to clean air, health and safety from changes in air quality and GHG emissions, and reduced visitor and viewer enjoyment from changes in air quality.

Idaho

Under Alternative 2, on annual average, oil and gas production revenue and well development expenditures in the Idaho analysis area is expected to support about 5 total additional jobs (about 2 additional direct jobs), $253,000 in additional total labor income (about $120,000 in additional direct labor income), and about $1.1 million in additional economic output (about $625,000 in additional direct economic output), across the state, compared to development under Alternative 1.

The small increase in projected oil and gas activity In Idaho could result in a small increase in tax revenues compared with Alternative 1, which would be disbursed to counties and would continue to support local public services, such as education.

The potential increase in oil and gas activity is not likely to result in large impacts from BLM-management decisions on lifestyles and culture for those in mineral development communities of interest.

Renewable Energy (Geothermal, Wind, and Solar) Management

Table 18-9 shows the direct, indirect, induced, and total impacts on economic contributions from projected geothermal activity. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-9** are provided as well as a qualitative discussion on the market and nonmarket impacts from potential changes in geothermal in each state with reasonably foreseeable future development of geothermal and with differing impacts from the rangewide impacts, as discussed in **Section 4.8** of the EIS.[7]

Table 18-9. Average Annual Economic Contributions from Geothermal, Under Alternative 2

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016

Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Nevada

Under Alternative 2, there would be an exception criterion avoidance for ROWs and to the closure to wind and solar development in Nevada PHMA and to wind development in Nevada GHMA. Compared with Alternative 1, this could increase the potential for impacts on nonmarket and social conditions due to

[7] There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

changes in air quality and GHG emissions because there would be a higher chance of development. However, the exception criteria would likely avoid impacts.

Utah

Under Alternative 2, areas outside PHMAs that are within 5 miles of leks in Utah would be avoidance for wind development. This could increase the potential for impacts on nonmarket and social conditions due to changes in air quality and GHG emissions compared with Alternative 1. This is because there would be a higher chance of development in an avoidance area as opposed to an exclusion area that includes an exception criterion to closure.

Livestock Grazing Management

Table 18-10 shows the direct, indirect, induced, and total impacts on economic contributions from livestock grazing in allotments where PHMA accounted for at least 15 percent of the acreage. A discussion on impacts is provided at the rangewide-level in **Section 4.8** of the EIS.

Table 18-10. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 2

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

Environmental Justice

Below is a detailed discussion of adverse and disproportionate impacts on environmental justice populations by state that contained identified environmental justice populations and with potential impacts that differ from the rangewide impacts, as discussed in **Section 4.8** of the EIS.[8]

Colorado

Impacts on environmental justice populations from potential impacts on cultural resources would be the same as described for Alternative 1, except in Colorado PHMAs, which would have no closed areas, and Colorado GHMAs, which would have NSO in place of closed areas. The exposure of areas in Colorado to fluid mineral leasing could increase the risk of potential impacts to cultural resources and decrease opportunities for American Indian and Alaska Native populations to maintain traditional cultural practices and values in areas where fluid mineral leasing occurs, although site specific NEPA analysis will be conducted to assess alternatives to avoid, minimize and/or compensate for identified impacts. This could have disproportionate and adverse impacts on environmental justice populations in the Colorado, especially on the American Indian and Alaska Native environmental justice populations located in Moffat County and Rio Blanco County (where American Indian and Alaska Native environmental justice populations were identified) as well as on American Indian and Alaska Native environmental justice populations that live outside of the analysis area that use the planning area for spiritual, cultural, and traditional uses. Future site-specific implementation analysis would be needed to determine the level and intensity of impacts.

Under Alternative 2, BLM-management decisions on fluid mineral development would increase potential impacts on nonmarket and social conditions due to changes in GHG emissions and air quality, compared with Alternative 1, which would disproportionately impact environmental justice populations throughout

[8] There were no counties in the North Dakota analysis area that met the threshold for environmental justice populations, so North Dakota is not included in the state-by-state discussion.

the Colorado analysis area. The extent to which environmental justice populations are impacted would depend on site-specific factors.

Idaho

In Idaho, removing SFAs and allowing consideration of new free use permits for salable minerals would reduce protections for GRSG and habitat, which could have negative impacts on cultural resources and decreased opportunities for American Indian and Alaska Native populations to maintain traditional cultural practices and values, such as observing lekking behavior. This could have disproportionate and adverse impacts on environmental justice populations in the Idaho, especially on the American Indian and Alaska Native environmental justice populations located in Adams, Bingham, Cassia, Clark, Custer, Elmore, Jefferson, Lemhi, Lincoln, Minidoka, Owyhee, Payette, Power, and Washington counties (where American Indian and Alaska Native environmental justice populations were identified) as well as on American Indian and Alaska Native environmental justice populations that live outside of the analysis area that use the planning area for spiritual, cultural, and traditional uses. Future site-specific implementation analysis would be needed to determine the level and intensity of impacts.

Under Alternative 2, allowing consideration of new free use permits for salable minerals in Idaho IHMA, would increase the potential for associated impacts on nonmarket and social conditions due to changes in air quality and GHG emissions compared with Alternative 1. This is because there would be a greater chance for more acres of salable mineral activities to occur in these areas. However, the impacts might be small due to the small amount of extraction.

Nevada

In Nevada, removing SFAs would reduce protections for GRSG and habitat, which could have negative impacts on cultural resources and decreased opportunities for American Indian and Alaska Native populations to maintain traditional cultural practices and values, such as observing lekking behavior. This could have disproportionate and adverse impacts on environmental justice populations in all counties in the Nevada analysis area as well as on American Indian and Alaska Native environmental justice populations that live outside of the analysis area that use the planning area for spiritual, cultural, and traditional uses. Future site-specific implementation analysis would be needed to determine the level and intensity of impacts.

Under Alternative 2, BLM-management decisions in Nevada would increase the potential for associated impacts on nonmarket and social conditions due to changes in air quality and GHG emissions from the potential for more nonenergy leasable mineral and salable mineral activities to occur.

Utah

In Utah, removing SFAs would reduce protections for GRSG and habitat, which could have negative impacts on cultural resources and decreased opportunities for American Indian and Alaska Native populations to maintain traditional cultural practices and values, such as observing lekking behavior. This could have disproportionate and adverse impacts on environmental justice populations in the Utah, especially on the American Indian and Alaska Native environmental justice populations located in Daggett, Duchesne, Emery, Garfield, Grand, Iron, Juab, Kane, Rich, and Uintah counties (where American Indian and Alaska Native environmental justice populations were identified) as well as on American Indian and Alaska Native environmental justice populations that live outside of the analysis area that use the planning area for spiritual, cultural, and traditional uses. Future site-specific implementation analysis would be needed to determine the level and intensity of impacts.

Under Alternative 2, areas outside PHMAs that are within 5 miles of leks in Utah would be avoidance for wind development. This could increase the potential for impacts on nonmarket and social conditions due to changes in air quality and GHG emissions compared with Alternative 1. This is because there would be a higher chance of development in an avoidance area as opposed to an exclusion area that includes an exception criterion to closure. This could have a disproportionate impact on environmental justice populations in analysis area counties in Utah.

Wyoming

In Wyoming, removing SFAs would reduce protections for GRSG and habitat, which could have negative impacts on cultural resources and decreased opportunities for American Indian and Alaska Native populations to maintain traditional cultural practices and values, such as observing lekking behavior. This could have disproportionate and adverse impacts on environmental justice populations in the Wyoming, especially on the American Indian and Alaska Native environmental justice populations located in Fremont County and Weston County, as well as on American Indian and Alaska Native environmental justice populations that live outside of the analysis area that use the planning area for spiritual, cultural, and traditional uses. There are protections in place for cultural resources within existing RMPs that would mitigate impacts on environmental justice populations. Future site-specific implementation analysis would be needed to determine the level and intensity of impacts.

18.4.4 Alternative 3

Fluid Minerals (Oil and Gas) Management

Table 18-11 shows the direct, indirect, induced, and total impacts on economic contributions from projected oil and gas activity. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-11** are provided as well as a qualitative discussion on the market and nonmarket impacts from potential changes in oil and gas operations in each state with reasonably foreseeable future development of oil and gas.[9]

[9] California and Oregon did not have reasonably foreseeable future oil and gas development in the planning area, so they are not included in the discussion.

Table 18-11. Average Annual Economic Contributions from Oil and Gas, Under Alternative 3

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,263	6,263	755,042,456	755,042,456	3,769,457,803	3,769,457,803
	Indirect	6,710	9,103	446,597,038	726,374,125	1,331,090,703	1,889,268,560
	Induced	4,195	5,685	211,750,319	303,124,126	690,742,964	973,984,029
	Total	17,169	21,052	1,413,389,813	1,784,540,707	5,791,291,470	6,632,710,393
Colorado (High Scenario)	Direct	9,122	9,122	1,099,726,614	1,099,726,614	5,488,012,722	5,488,012,722
	Indirect	9,768	13,251	650,031,765	1,057,138,792	1,937,740,979	2,750,295,798
	Induced	6,109	8,278	308,357,016	441,345,785	1,005,879,186	1,418,118,570
	Total	24,999	30,651	2,058,115,395	2,598,211,191	8,431,632,887	9,656,427,089
Idaho	Direct	5	5	312,003	312,003	1,623,920	1,623,920
	Indirect	4	4	213,009	247,755	730,956	857,555
	Induced	2	2	86,071	98,275	283,626	323,742
	Total	11	12	611,082	658,033	2,638,502	2,805,218
Montana	Direct	1,373	1,373	208,532,284	208,532,284	981,019,294	981,019,294
	Indirect	1,148	1,289	78,451,760	89,461,172	240,701,264	266,572,096
	Induced	1,140	1,215	56,520,836	60,271,768	181,144,175	192,975,835
	Total	3,661	3,877	343,504,881	358,265,225	1,402,864,733	1,440,567,225
Nevada	Direct	5	5	75,848	75,848	1,872,389	1,872,389
	Indirect	5	5	455,757	463,564	1,176,678	1,224,327
	Induced	2	2	96,998	103,864	315,246	337,269
	Total	12	12	628,603	643,276	3,364,313	3,433,985
North Dakota	Direct	233	233	27,075,375	27,075,375	343,845,594	343,845,594
	Indirect	145	152	8,675,140	9,223,747	37,657,396	39,726,925
	Induced	89	100	3,665,718	4,288,558	13,469,565	15,370,822
	Total	467	485	39,416,233	40,587,679	394,972,555	398,943,340
South Dakota	Direct	85	85	6,798,604	6,798,604	32,968,114	32,968,114
	Indirect	114	127	5,717,942	6,658,487	21,195,774	24,619,476
	Induced	28	40	955,881	1,577,407	4,216,565	6,143,908
	Total	227	252	13,472,426	15,034,497	58,380,452	63,731,498
Utah	Direct	2,122	2,122	145,452,892	145,452,892	1,453,148,321	1,453,148,321
	Indirect	1,813	2,948	103,766,870	203,833,762	343,164,682	538,804,986
	Induced	729	1,262	28,240,142	57,623,630	110,040,697	206,863,910
	Total	4,664	6,332	277,459,904	406,910,285	1,906,353,700	2,198,817,217

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	5,662	5,662	537,821,720	537,821,720	5,948,302,548	5,948,302,548
	Indirect	4,324	4,330	323,338,652	323,733,856	1,019,540,905	1,020,766,687
	Induced	2,716	2,717	110,271,847	110,351,847	423,630,524	423,887,867
	Total	12,702	12,708	971,432,220	971,907,423	7,391,473,976	7,392,957,101
Total Planning Area (Low Colorado Scenario)	Direct	15,748	15,748	1,681,111,182	1,681,111,182	12,532,237,982	12,532,237,982
	Indirect	14,263	17,958	967,216,167	1,359,996,470	2,995,258,358	3,781,840,612
	Induced	8,901	11,024	411,587,814	537,439,474	1,423,843,361	1,819,887,382
	Total	38,912	44,730	3,059,915,162	3,578,547,126	16,951,339,701	18,133,965,977
Total Planning Area (High Colorado Scenario)	Direct	18,607	18,607	2,025,795,340	2,025,795,340	14,250,792,901	14,250,792,901
	Indirect	17,322	22,106	1,170,650,894	1,690,761,137	3,601,908,634	4,642,867,850
	Induced	10,815	13,616	508,194,510	675,661,134	1,738,979,583	2,264,021,923
	Total	46,743	54,329	3,704,640,744	4,392,217,610	19,591,681,118	21,157,682,673

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Colorado

Under Alternative 3, on annual average, oil and gas production revenue and well development expenditures in the Colorado analysis area is expected to result in about 1,000 to 13,000 fewer total jobs (about 300 to 3,600 fewer direct jobs), about $104 million to $1.1 billion less in total labor income (about $36 million to $439 million less in direct labor income), and about $390 million to $4.0 billion less in economic output (about $210 million to $2.3 billion less in direct economic output) across the state compared to development under Alternative 1.

The decrease in projected oil and gas activity, under Alternative 3, would result in reductions in tax revenues, compared with Alternative 1. Under Alternative 3, the total royalty revenue generated from oil and gas production in Colorado could range from $312 million to $454 million, which is about $140 million to $424 million less than under Alternative 1. The Colorado severance tax revenue could range from $29.3 million to $42.6 million, which is about $2.5 million to $19.2 million less than under Alternative 1. The oil and gas conservation fee could generate a range of $2.7 million to $4.0 million, which is about $240,000 to $1.8 million less than under Alternative 1. Additionally, oil and gas production could generate a range of $109 million to $159 million in county revenues from ad valorem taxes, which is about $9.5 million to $71.5 million less than under Alternative 1). The reduction in oil and gas activity, in Colorado, would likely lead to a decrease in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities.

There could be impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment. These impacts would have a large effect on communities throughout the analysis area in Colorado due to the reliance on the mineral industry and oil and gas development on federal estate for the local economies.

Idaho

Under Alternative 3, on annual average, oil and gas production revenue and well development expenditures in the Idaho analysis area is expected to result in about 2 fewer total jobs (about 1 fewer direct jobs), $101,000 less in total labor income (about $48,000 less in direct labor income), and about $432,000 less in economic output (about $250,000 less in direct economic output) across the state compared to development under Alternative 1.

The small decrease in projected oil and gas activity in Idaho could result in reductions in tax revenues compared with Alternative 1, which could impact public services that are offered to the communities.

The potential decrease in oil and gas activity could result in impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest.

Montana

Under Alternative 3, on annual average, oil and gas production revenue and well development expenditures in the Montana analysis area is expected to result in about 1,400 fewer total jobs (about 550 fewer direct jobs), $127 million less in total labor income (about $76 million less in direct labor income), and about $499 million less in economic output (about $337 million less in direct economic output) across the state compared to development under Alternative 1.

The decrease in projected oil and gas activity, under Alternative 3, would result in reductions in tax revenues, compared with Alternative 1. Under Alternative 3, the total royalty revenue generated from oil and gas

production in Montana would be about $75.7 million, which is about $36.8 million less than under Alternative 1. The Montana severance tax revenue is expected to be about $56.0 million, which is about $6.6 million less than under Alternative 1. Additionally, oil and gas production could generate about $1.6 million in the privilege and license tax revenue, which is about $186,000 less than under Alternative 1. The reduction in oil and gas activity, in Montana, would likely lead to a decrease in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities.

Additionally, there could be impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment. These impacts would have a larger effect on communities in southeastern and northeastern Montana, where the local economies have relied on mineral industry and oil and gas development on federal estate.

Nevada

Under Alternative 3, on annual average, oil and gas production revenue and well development expenditures in the Nevada analysis area is expected to result in about 29 fewer total jobs (about 13 fewer direct jobs), $1.5 million less in total labor income (about $173,000 less in direct labor income), and about $8.2 million less in economic output (about $4.5 million less in direct economic output) across the state compared to development under Alternative 1.

The decrease in projected oil and gas activity, under Alternative 3, could result in reductions in tax revenues, compared with Alternative 1. Under Alternative 3, the total royalty revenue generated from oil and gas production in Nevada would be about $111,000, which is about $409,000 less than under Alternative 1. The Nevada severance tax revenue is expected to be about $2,000, which is about $4,000 less than under Alternative 1. Additionally, oil and gas production could generate about $33,000 across the analysis area in revenue from the Net Proceeds of Minerals Tax, which is about $82,000 less than under Alternative 1. The reduction in oil and gas activity, in Nevada, would likely lead to a decrease in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities.

There could be impacts from BLM-management decisions on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment. These impacts would have a larger effect on communities in southern Nevada, where the local economies have relied on extractive minerals and oil and gas development on federal estate.

North Dakota

Under Alternative 3, on annual average, oil and gas production revenue and well development expenditures in the North Dakota analysis area is expected to result in about 88 fewer total jobs (about 42 fewer direct jobs), $7.4 million less in total labor income (about $4.9 million less in direct labor income), and about $72 million less in economic output (about $62 million less in direct economic output) across the state compared to development under Alternative 1.

The decrease in projected oil and gas activity, under Alternative 3, would result in reductions in tax revenues, compared to Alternative 1. Under Alternative 3, the total royalty revenue generated from oil and gas production in North Dakota would be about $32.7 million, which is about $18.8 million less than under Alternative 1. The North Dakota severance tax revenue is expected to be about $12.4 million, which is about $2.3 million less than under Alternative 1. Oil and gas production could generate about $13.1 million

across the analysis area oil extraction tax revenues, which is about $2.4 million less than under Alternative 1. The reduction in oil and gas activity, in North Dakota, would likely lead to a decrease in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities.

There could be impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment. These impacts would have a larger effect on communities in southwestern North Dakota, where the local economies have relied on extractive minerals and oil and gas development on federal estate.

South Dakota

Under Alternative 3, on annual average, oil and gas production revenue and well development expenditures in the South Dakota analysis area is expected to result in about 12 fewer total jobs (about 4 fewer direct jobs), $701,000 less in total labor income (about $292,000 less in direct labor income), and about $3.1 million less in economic output (about $1.6 million less in direct economic output) across the state compared to development under Alternative 1.

The decrease in projected oil and gas activity in South Dakota could result in reductions in tax revenues compared with Alternative 1. Under Alternative 3, the total royalty revenue generated from oil and gas production in South Dakota would be about $1.8 million, which is about $616,000 less than under Alternative 1. The South Dakota severance tax revenue is expected to be about $637,000, which is about $7,000 less than under Alternative 1. The reduction in oil and gas activity, in South Dakota, would likely lead to a decrease in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. The reductions in tax revenues could impact public services that are offered to the communities.

The potential decrease in oil and gas activity could result in impacts from BLM-management decisions on lifestyles and culture for those in mineral development communities of interest.

Utah

Under Alternative 3, on annual average, oil and gas production revenue and well development expenditures in the Utah analysis area is expected to result in about 700 fewer total jobs (about 200 fewer direct jobs), $47 million less in total labor income (about $17 million less in direct labor income), and about $252 million less in economic output (about $167 million less in direct economic output) across the state compared to development under Alternative 1.

The decrease in projected oil and gas activity, under Alternative 3, would result in reductions in tax revenues, compared with Alternative 1. Under Alternative 3, the total royalty revenue generated from oil and gas production in Utah would be about $125 million, which is about $60.4 million less than under Alternative 1. The Utah severance tax revenue is expected to be about $50.0 million, which is about $5.6 million less than under Alternative 1. The conservation fee is expected to generate about $200,000, which is about $22,000 less than under Alternative 1. Additionally, oil and gas production could generate about $50.0 million across the analysis area in county revenues from ad valorem taxes, which is about $5.6 less than under Alternative 1. The reduction in oil and gas activity, in Utah, would likely lead to a decrease in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities.

Additionally, there could be impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment. These impacts would have a larger effect on communities in central and northeastern Utah, where the local economies have relied on mineral industry and oil and gas development on federal estate.

Wyoming

Under Alternative 3, on annual average, oil and gas production revenue and well development expenditures in the Wyoming analysis area is expected to result in about 14,000 fewer total jobs (about 6,000 fewer direct jobs), $1.0 billion less in total labor income (about $612 million less in direct labor income), and about $6.8 billion less in economic output (about $5.3 billion less in direct economic output) across the state compared to development under Alternative 1.

The decrease in projected oil and gas activity, under Alternative 3, would result in reductions in tax revenues, compared with Alternative 1. Under Alternative 3, the total royalty revenue generated from oil and gas production in Wyoming would be about $671 million, which is about $877 million less than under Alternative 1. The Wyoming severance tax revenue is expected to be about $322 million, which is about $235 million less than under Alternative 1. The oil and gas conservation tax is expected to generate about $2.7 million, which is about $2.0 million less than under Alternative 1. Additionally, oil and gas production could generate about $338 million across the analysis area in county revenues from ad valorem taxes, which is about $247 million less than under Alternative 1. The reduction in oil and gas activity, in Wyoming, would likely lead to a decrease in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities.

There could be impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment. These impacts would have a large effect on communities throughout the analysis area in Wyoming, due to the reliance on extractive minerals and oil and gas development on federal estate for the local economies.

Renewable Energy (Geothermal, Wind, and Solar) Management

Table 18-12 shows the direct, indirect, induced, and total impacts on economic contributions from projected geothermal activity. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-12** are provided as well as a qualitative discussion on the market and nonmarket impacts from potential changes in geothermal in each state with reasonably foreseeable future development of geothermal.[10]

[10] There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Table 18-12. Average Annual Economic Contributions from Geothermal, Under Alternative 3

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	0	0	0
	Indirect	0	0	0
	Induced	0	0	0
	Total	0	0	0
Idaho	Direct	11	514,407	711,614
	Indirect	5	281,427	1,421,504
	Induced	2	106,915	343,289
	Total	18	902,749	2,476,407
Oregon	Direct	0	0	0
	Indirect	0	0	0
	Induced	0	0	0
	Total	0	0	0
Utah	Direct	0	0	0
	Indirect	0	0	0
	Induced	0	0	0
	Total	0	0	0
Wyoming	Direct	0	0	0
	Indirect	0	0	0
	Induced	0	0	0
	Total	0	0	0
Total Planning Area	Direct	287	17,602,431	25,076,059
	Indirect	196	15,140,299	72,177,590
	Induced	75	4,142,777	11,494,826
	Total	558	36,885,507	108,748,475

Source: National Renewable Energy Laboratory 2016
Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

California and Nevada

The number of geothermal plants developed in California and Nevada would be the same as under Alternative 1 because the amount of acreage under existing leases within GRSG HMAs is sufficient to meet the projected growth in geothermal production capacity (see **Appendix 12**, Reasonably Foreseeable Development Scenario), so the impacts on jobs, labor, income, economic output from geothermal development would also be the same as described under Alternative 1.

Colorado

Under Alternative 3, on annual average, geothermal development in the state is expected to result in about 16 fewer total jobs (about 8 fewer direct jobs), $1.1 million less in total labor income (about $537,000 less in direct labor income), and about $2.7 million less in economic output (about $761,000 less in direct economic output), compared with Alternative 1.

Idaho

Under Alternative 3, on annual average, geothermal development in the state is expected to result in about 18 fewer total jobs (about 11 fewer direct jobs), $892,000 less in total labor income (about $506,000 less in direct labor income), and about $2.5 million less in economic output (about $702,000 less in direct economic output), compared with Alternative 1. The reduction in geothermal activities, under Alternative 3 would likely lead to a slight reduction in tax revenue collected by the state for geothermal production and disbursed to the counties. This reduction in tax revenue would reduce the quality and level of public services that are funded by the geothermal production tax.

If there is a reduction in wind and solar energy activities, under Alternative 3, due to BLM-management decision, such as a reduction in development and production, there would likely result in a decrease in tax revenue collected by the state and distributed to the counties, which could result in a decrease in quality and quantity of public services in the analysis area.

Oregon

Under Alternative 3, on annual average, geothermal development in the state is expected to result in about 11 fewer total jobs (about 6 fewer direct jobs), $577,000 less in total labor income (about $297,000 less in direct labor income), and about $1.5 million less in economic output (about $402,000 less in direct economic output), compared with Alternative 1. However, existing leases could still be used for geothermal development, so if any of these leases are developed, the impacts on economic contributions would change.

North Dakota

If there is a reduction in wind energy activities, under Alternative 3, due to BLM-management decision, such as a reduction in development and production, there would likely result in a decrease in tax revenue collected by the state and distributed to the counties, which could result in a decrease in quality and quantity of public services in the analysis area.

South Dakota

If there is a reduction in wind and solar energy activities, under Alternative 3, due to BLM decision, such as a reduction in development and production, there would likely result in a decrease in tax revenue collected by the state and distributed to the counties, which could result in a decrease in quality and quantity of public services in the analysis area.

Utah

Under Alternative 3, on annual average, geothermal development in the state is expected to result in about 22 fewer total jobs (about 12 fewer direct jobs), $1.3 million less in total labor income (about $743,000 less in direct labor income), and about $3.6 million less in economic output (about $1.1 million less in direct economic output), compared with Alternative 1. However, existing leases could still be used for geothermal development. If any of these leases are developed, the impacts on economic contributions would change, but development is less likely, under Alternative 3.

Wyoming

Under Alternative 3, on annual average, geothermal development in the state is expected to result in about 9 fewer total jobs (about 6 fewer direct jobs), $432,000 less in total labor income (about $288,000 less in direct labor income), and about $1.3 million less in economic output (about $388,000 less in direct economic output), compared with Alternative 1.

If there is a reduction in wind energy activities, under Alternative 3, due to BLM-management decision, such as a reduction in development and production, there would likely result in a decrease in tax revenue collected by the state and distributed to the counties, which could result in a decrease in quality and quantity of public services in the analysis area.

Livestock Grazing Management

Table 18-13 shows the direct, indirect, induced, and total impacts on economic contributions from livestock grazing in allotments where PHMA accounted for at least 15 percent of the acreage. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-13** are provided.

Table 18-13. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 3

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Colorado	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Idaho	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Montana	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Nevada	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
North Dakota	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Oregon	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
South Dakota	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Utah	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Wyoming	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Total Planning Area	Direct	0	0	0	0	0	0
	Indirect	0	0	0	0	0	0
	Induced	0	0	0	0	0	0
	Total	0	0	0	0	0	0

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

California

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the California analysis area is expected to result in about 22 fewer total jobs (about 7 fewer direct jobs), $3.4 million less in total labor income (about $2.1 million less in direct labor income), and about $8.4 million less in economic output (about $4.6 million less in direct economic output) across the state compared with Alternative 1. These impacts on economic conditions would likely disproportionately impact those communities in the analysis area with small family ranches that rely on federal lands for forage for their farming and ranching operations. Impacts on nonmarket and social conditions would likely be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3.

Colorado

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Colorado analysis area is expected to result in about 82 fewer total jobs (about 50 fewer direct jobs), $3.2 million less in total labor income (about $1.8 million less in direct labor income), and about $9.8 million less in economic output (about $5.2 million less in direct economic output) across the state compared with Alternative 1. These impacts on economic conditions would likely disproportionately impact those communities in the analysis area with small family ranches that rely on federal lands for forage for their farming and ranching operations. Impacts on nonmarket and social conditions would likely be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3.

Idaho

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Idaho analysis area is expected to result in about 221 fewer total jobs (about 77 fewer direct jobs), $22.8 million less in total labor income (about $13.3 million less in direct labor income), and about $57.3 million less in economic output (about $28.5 million less in direct economic output) across the state compared with Alternative 1. These impacts on economic conditions would likely be substantial, especially for those communities in the analysis area with small family ranches that rely on federal lands for forage for their farming and ranching operations. Impacts on nonmarket and social conditions would likely

be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3.

Montana

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Montana analysis area is expected to result in about 381 fewer total jobs (about 186 fewer direct jobs), $21.0 million less in total labor income (about $10.5 million less in direct labor income), and about $67.3 million less in economic output (about $33.2 million less in direct economic output) across the state compared with Alternative 1. These impacts on economic conditions would likely be substantial, especially for those communities in the analysis area with small family ranches that rely on federal lands for forage for their farming and ranching operations. Impacts on nonmarket and social conditions would likely be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3.

Nevada

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Nevada analysis area is expected to result in about 236 fewer total jobs (82 fewer direct jobs), $23.6 million less in total labor income (about $13.7 million less in direct labor income), and about $76.7 million less in economic output (about $42.1 million less in direct economic output) across the state compared with Alternative 1. These impacts on economic conditions would likely be substantial, especially for those communities in the analysis area with small family ranches that rely on federal lands for forage for their farming and ranching operations. Impacts on nonmarket and social conditions would likely be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3.

North Dakota

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the North Dakota analysis area is expected to result in about 1 fewer total jobs (1 fewer direct jobs), $64,000 less in total labor income (about $39,000 less in direct labor income), and about $235,000 less in economic output (about $143,000 less in direct economic output) throughout the state, compared with Alternative 1. Impacts on nonmarket and social conditions would likely be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3, although to a lesser degree.

Oregon

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Oregon analysis area is expected to result in about 206 fewer total jobs (78 fewer direct jobs), $14.1 million less in total labor income (about $6.5 million less in direct labor income), and about $50.0 million less in economic output (about $25.2 million less in direct economic output) across the state compared with Alternative 1. These impacts on economic conditions would likely be substantial, especially for those communities in the analysis area with small family ranches that rely on federal lands for forage for their farming and ranching operations. Impacts on nonmarket and social conditions would likely be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3.

South Dakota

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the South Dakota analysis area is expected to result in about 10 fewer total jobs (about 5 fewer direct jobs), $402,000 less in total labor income (about $186,000 less in direct labor income), and about $2.5 million less in economic output (about $1.4 million less in direct economic output) across the analysis area, compared with Alternative 1. These impacts on economic conditions would likely disproportionately impact those communities in the analysis area with small family ranches that rely on federal lands for forage for their farming and ranching operations. Impacts on nonmarket and social conditions would likely be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3.

Utah

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Utah analysis area is expected to result in about 90 fewer total jobs (54 fewer direct jobs), $6.2 million less in total labor income (about $4.6 million less in direct labor income), and about $16.9 million less in economic output (about $10.8 million less in direct economic output) across the analysis area, compared with Alternative 1. These impacts on economic conditions would likely disproportionately impact those communities in the analysis area with small family ranches that rely on federal lands for forage for their farming and ranching operations. Impacts on nonmarket and social conditions would likely be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3.

Wyoming

Under Alternative 3, on annual average, livestock grazing on allotments where PHMA accounted for at least 15 percent of the acreage in the Wyoming analysis area is expected to result in about 552 fewer total jobs (about 301 fewer direct jobs), $25.1 million less in total labor income (about $14.7 million less in direct labor income), and about $91.3 million less in economic output (about $52.6 million less in direct economic output) across the analysis area, compared with Alternative 1. These impacts on economic conditions would likely be substantial, especially for those communities in the analysis area with small family ranches that rely on federal lands for forage for their farming and ranching operations. Impacts on nonmarket and social conditions would likely be similar to those described in the *Rangewide Environmental Consequences* subsection under **Section 4.12.4**, Alternative 3.

18.4.5 Alternative 4

Fluid Minerals (Oil and Gas) Management

Table 18-14 shows the direct, indirect, induced, and total impacts on economic contributions from projected oil and gas activity. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-14** are provided as well as a qualitative discussion on the market and nonmarket impacts from potential changes in oil and gas operations in each state with reasonably foreseeable future development of oil and gas and with differing impacts from the rangewide impacts, as discussed in **Section 4.8** of the EIS.[11]

[11] California and Oregon did not have reasonably foreseeable future oil and gas development in the planning area, so they are not included in the discussion.

Table 18-14. Average Annual Economic Contributions from Oil and Gas, Under Alternative 4

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,948	6,948	835,579,681	835,579,681	4,210,876,842	4,210,876,842
	Indirect	7,504	10,248	501,986,077	823,906,926	1,490,742,665	2,133,156,312
	Induced	4,664	6,375	235,380,145	340,348,186	767,841,591	1,093,220,978
	Total	19,116	23,572	1,572,945,903	1,999,834,792	6,469,461,097	7,437,254,132
Colorado (High Scenario)	Direct	13,366	13,366	1,607,628,515	1,607,628,515	8,094,956,453	8,094,956,453
	Indirect	14,424	19,695	964,497,723	1,582,653,768	2,865,161,143	4,099,691,974
	Induced	8,969	12,257	452,687,909	654,332,656	1,476,725,857	2,101,783,237
	Total	36,759	45,318	3,024,814,147	3,844,614,938	12,436,843,453	14,296,431,664
Idaho	Direct	10	10	600,005	600,005	3,122,924	3,122,924
	Indirect	7	8	409,632	476,453	1,405,684	1,649,144
	Induced	3	4	165,521	188,990	545,434	622,581
	Total	21	23	1,175,158	1,265,448	5,074,042	5,394,649
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	89	89	7,090,932	7,090,932	34,541,446	34,541,446
	Indirect	120	134	5,990,214	6,990,786	22,253,716	25,892,162
	Induced	29	41	1,000,002	1,653,841	4,411,230	6,438,783
	Total	238	264	14,081,147	15,735,559	61,206,393	66,872,391
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	8,563	8,563	830,351,311	830,351,311	8,484,142,024	8,484,142,024
	Indirect	6,508	6,519	473,985,967	474,829,686	1,514,484,786	1,517,101,700
	Induced	4,133	4,136	167,816,877	167,987,667	644,693,548	645,242,948
	Total	19,203	19,217	1,472,154,155	1,473,168,664	10,643,320,357	10,646,486,671
Total Planning Area (Low Colorado Scenario)	Direct	20,194	20,194	2,153,063,106	2,153,063,106	16,083,255,261	16,083,255,261
	Indirect	17,913	22,116	1,215,624,001	1,663,846,763	3,787,483,732	4,688,200,590
	Induced	11,315	13,739	517,944,837	661,705,453	1,805,352,487	2,257,603,788
	Total	49,421	56,049	3,886,631,943	4,478,615,322	21,676,091,480	23,029,059,639
Total Planning Area (High Colorado Scenario)	Direct	26,611	26,611	2,925,111,940	2,925,111,940	19,967,334,873	19,967,334,873
	Indirect	24,833	31,563	1,678,135,648	2,422,593,605	5,161,902,209	6,654,736,252
	Induced	15,620	19,621	735,252,601	975,689,923	2,514,236,754	3,266,166,046
	Total	67,064	77,795	5,338,500,188	6,323,395,467	27,643,473,836	29,888,237,171

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Colorado

On annual average, oil and gas production revenue and well development expenditures in the Colorado analysis area is expected to result in 1,300 to 2,000 additional total jobs (about 374 to 574 additional direct jobs), about $111 million to $172 million in additional total labor income (about $45 million to $68 million in additional direct labor income), and about $414 million to $639 million in additional economic output, compared with Alternative 1 (about $232 million to $357 million in additional direct economic output) throughout the state.

Under Alternative 4, the total royalty revenue generated from oil and gas production in Colorado could range from $482 million to $924 million, which is about $29.3 million to $45.8 million more than under Alternative 1. The Colorado severance tax revenue could range from $33.9 million to $64.9 million, which is about $2.1 million to $3.2 million more than under Alternative 1. The oil and gas conservation fee could generate a range of $3.2 million to $6.1 million, which is about 193,000 to 302,000 more than under Alternative 1. Additionally, oil and gas production could generate a range of $126 million to $242 million in county revenues from ad valorem taxes, which is about $7.7 million to $12.0 million more than under Alternative 1. The increase in oil and gas activity, in Colorado, would likely lead to an increase in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. This increase in revenues that are disbursed to counties could bolster public finances which may be used to support additional public services, compared with Alternative 1. Additionally, there could be more support and preservation of nonmarket values associated lifestyles and culture for those in mineral development communities of interest and those who value preservation of historical mining communities.

In Colorado more acreage would be available for fluid mineral leasing than under Alternative 1, since closures within one mile of leks in GHMA would no longer apply. This could allow for more development-related impacts on nonmarket and social conditions associated with changes in air quality and GHG emissions, compared with Alternative 1.

Idaho

On annual average, oil and gas production revenue and well development expenditures in the Idaho analysis area is expected to result in about 9 total additional jobs (about 4 additional direct jobs), $506,000 in additional total labor income (about $240,000 in additional direct labor income), and about $2.2 million in additional economic output (about $1.2 million in additional direct economic output) throughout the state, compared with Alternative 1.

The small increase in projected oil and gas activity In Idaho could result in a small increase in tax revenues compared with Alternative 1, which would be disbursed to counties and would continue to support local public services, such as education.

The potential increase in oil and gas activity is not likely to result in large impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest.

Wyoming

Under Alternative 4, NSO stipulations would be applied to all land in PHMA and within 0.25 miles of leks in GHMA. This would reduce the acreage available for fluid mineral leasing, compared to Alternative 1. On annual average, oil and gas production revenue and well development expenditures in the Wyoming analysis area are expected to result in about 7,000 fewer total jobs (about 3,000 fewer direct jobs), $547 million less in total labor income (about $319 million less in direct labor income), and about $3.5 billion less in economic

output (about $2.8 billion less in direct economic output) across the state compared to development under Alternative 1.

The decrease in projected oil and gas activity, under Alternative 4, would result in reductions in tax revenues, compared with Alternative 1. The total royalty revenue generated from oil and gas production in Wyoming would be about $1.2 billion, which is about $341 million less than under Alternative 1. The Wyoming severance tax revenue is expected to be about $434 million, which is about $123 million less than under Alternative 1. The oil and gas conservation tax is expected to generate about $3.6 million, which is about $1.0 million less than under Alternative 1. Oil and gas production could generate about $456 million across the analysis area in county revenues from ad valorem taxes, which is about $129 million less than under Alternative 1. The decrease in oil and gas activity, in Wyoming, would likely lead to a reduction in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities, including education.

There could be impacts on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment.

The reduction in the acreage available for fluid mineral leasing could reduce the development-related impacts on nonmarket and social conditions associate with changes in air quality and GHG emissions, compared with Alternative 1.

Renewable Energy (Geothermal, Wind, and Solar) Management

Table 18-15 shows the direct, indirect, induced, and total impacts on economic contributions from projected geothermal activity. A discussion on impacts are provided at the rangewide-level in **Section 4.8** of the EIS.

Table 18-15. Average Annual Economic Contributions from Geothermal, Under Alternative 4

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272

State	Type of Impact	Employment	Labor Income	Economic Output
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016
Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Livestock Grazing Management

Table 18-16 shows the direct, indirect, induced, and total impacts on economic contributions from livestock grazing in allotments where PHMA accounted for at least 15 percent of the acreage. A discussion on impacts is provided at the rangewide-level in **Section 4.8** of the EIS.

Table 18-16. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 4

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

18.4.6 Alternative 5

Fluid Minerals (Oil and Gas) Management

Table 18-17 shows the direct, indirect, induced, and total impacts on economic contributions from projected oil and gas activity. In the state-specific sub headers, a discussion on quantitative impacts shown in **Table 18-17** are provided as well as a qualitative discussion on the market and nonmarket impacts from potential changes in oil and gas operations in each state with reasonably foreseeable future development of oil and gas and with differing impacts from the rangewide impacts, as discussed in **Section 4.8** of the EIS.[12]

[12] California and Oregon did not have reasonably foreseeable future oil and gas development in the planning area, so they are not included in the discussion.

Table 18-17. Average Annual Economic Contributions from Oil and Gas, Under Alternative 5

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,948	6,948	835,579,681	835,579,681	4,210,876,842	4,210,876,842
	Indirect	7,504	10,248	501,986,077	823,906,926	1,490,742,665	2,133,156,312
	Induced	4,664	6,375	235,380,145	340,348,186	767,841,591	1,093,220,978
	Total	19,116	23,572	1,572,945,903	1,999,834,792	6,469,461,097	7,437,254,132
Colorado (High Scenario)	Direct	13,366	13,366	1,607,628,515	1,607,628,515	8,094,956,453	8,094,956,453
	Indirect	14,424	19,695	964,497,723	1,582,653,768	2,865,161,143	4,099,691,974
	Induced	8,969	12,257	452,687,909	654,332,656	1,476,725,857	2,101,783,237
	Total	36,759	45,318	3,024,814,147	3,844,614,938	12,436,843,453	14,296,431,664
Idaho	Direct	10	10	576,005	576,005	2,998,007	2,998,007
	Indirect	7	8	393,247	457,395	1,349,457	1,583,179
	Induced	3	4	158,900	181,431	523,616	597,678
	Total	20	22	1,128,152	1,214,830	4,871,080	5,178,863
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	89	89	7,090,932	7,090,932	34,541,446	34,541,446
	Indirect	120	134	5,990,214	6,990,786	22,253,716	25,892,162
	Induced	29	41	1,000,002	1,653,841	4,411,230	6,438,783
	Total	238	264	14,081,147	15,735,559	61,206,393	66,872,391
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	11,198	11,198	1,096,050,568	1,096,050,568	10,787,200,027	10,787,200,027
	Indirect	8,491	8,507	610,809,003	612,060,166	1,964,016,319	1,967,896,977
	Induced	5,420	5,424	220,083,280	220,336,547	845,478,379	846,293,093
	Total	25,108	25,129	1,926,942,851	1,928,447,281	13,596,694,725	13,601,390,097
Total Planning Area (Low Colorado Scenario)	Direct	22,828	22,828	2,418,738,362	2,418,738,362	18,386,188,347	18,386,188,347
	Indirect	19,896	24,104	1,352,430,652	1,801,058,185	4,236,959,037	5,138,929,902
	Induced	12,602	15,028	570,204,619	714,046,774	2,006,115,502	2,458,629,029
	Total	55,326	61,960	4,341,373,633	4,933,843,320	24,629,262,886	25,983,747,279
Total Planning Area (High Colorado Scenario)	Direct	29,246	29,246	3,190,787,196	3,190,787,196	22,270,267,959	22,270,267,959
	Indirect	26,816	33,551	1,814,942,298	2,559,805,027	5,611,377,515	7,105,465,564
	Induced	16,907	20,910	787,512,383	1,028,031,244	2,714,999,768	3,467,191,288
	Total	72,969	83,706	5,793,241,877	6,778,623,466	30,596,645,242	32,842,924,810

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Colorado

The economic and social impacts of changes in oil and gas development in the Colorado analysis area due to the BLM decisions would be the same as under Alternative 4.

Idaho

On annual average, oil and gas production revenue and well development expenditures in the Idaho analysis area is expected to result in about 8 total additional jobs (about 4 additional direct jobs), $456,000 in additional total labor income (about $216,000 in additional direct labor income), and about $1.9 million in additional economic output (about $1.1 million in additional direct economic output) throughout the state, compared with Alternative 1.

The small increase in projected oil and gas activity In Idaho could result in a small increase in tax revenues compared with Alternative 1, which would be disbursed to counties and would continue to support local public services, such as education.

The potential increase in oil and gas activity is not likely to result in large impacts from BLM-management decisions on lifestyles and culture for those in mineral development communities of interest.

Wyoming

On annual average, oil and gas production revenue and well development expenditures in the Wyoming analysis area is expected to result in about 1,000 fewer total jobs (about 530 fewer direct jobs), about $92 million less in total labor income (about $53 million less in direct labor income), and about $595 million less in economic output (about $464 million less in direct economic output), compared with Alternative 1 throughout the state.

The decrease in projected oil and gas activity, under Alternative 5, would result in reductions in tax revenues, compared with Alternative 1. Under Alternative 5, the total royalty revenue generated from oil and gas production in Wyoming would be about $1.5 billion, which is about $57 million less than under Alternative 1. The Wyoming severance tax revenue is expected to be about $537 million, which is about $21 million less than under Alternative 1. The oil and gas conservation tax could generate about $4.5 million, which would be about $172,000 less than under Alternative 1. Oil and gas production could generate about $563 million across the analysis area in county revenues from ad valorem taxes, which is about $22 million less than under Alternative 1. The decrease in oil and gas activity, in Wyoming, under Alternative 5, would likely lead to a reduction in revenue from rents, bonus bids, and sales and use tax, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities, including education.

There could be impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment.

The reduction in the acreage available for fluid mineral leasing could reduce the development-related impacts on nonmarket and social conditions associate with changes in air and GHG emissions, compared with Alternative 1.

Renewable Energy (Geothermal, Wind, and Solar) Management

Table 18-18 shows the direct, indirect, induced, and total impacts on economic contributions from projected geothermal activity. A discussion on impacts is provided at the rangewide-level in **Section 4.8** of the EIS.

Table 18-18. Average Annual Economic Contributions from Geothermal, Under Alternative 5

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016
Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Livestock Grazing Management

Table 18-19 shows the direct, indirect, induced, and total impacts on economic contributions from livestock grazing in allotments where PHMA accounted for at least 15 percent of the acreage. A discussion on impacts is provided at the rangewide-level in **Section 4.8** of the EIS.

Table 18-19. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 5

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

18.4.7 Alternative 6

Fluid Minerals (Oil and Gas) Management

Table 18-20 shows the direct, indirect, induced, and total impacts on economic contributions from projected oil and gas activity. In the state-specific sub headers for Wyoming, below, a discussion on quantitative impacts shown in **Table 18-20** are provided as well as a qualitative discussion on the market and nonmarket impacts from potential changes in oil and gas operations.

Table 18-20. Average Annual Economic Contributions from Oil and Gas, Under Alternative 6

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,948	6,948	835,579,681	835,579,681	4,210,876,842	4,210,876,842
	Indirect	7,504	10,248	501,986,077	823,906,926	1,490,742,665	2,133,156,312
	Induced	4,664	6,375	235,380,145	340,348,186	767,841,591	1,093,220,978
	Total	19,116	23,572	1,572,945,903	1,999,834,792	6,469,461,097	7,437,254,132
Colorado (High Scenario)	Direct	13,366	13,366	1,607,628,515	1,607,628,515	8,094,956,453	8,094,956,453
	Indirect	14,424	19,695	964,497,723	1,582,653,768	2,865,161,143	4,099,691,974
	Induced	8,969	12,257	452,687,909	654,332,656	1,476,725,857	2,101,783,237
	Total	36,759	45,318	3,024,814,147	3,844,614,938	12,436,843,453	14,296,431,664
Idaho	Direct	10	10	576,005	576,005	2,998,007	2,998,007
	Indirect	7	8	393,247	457,395	1,349,457	1,583,179
	Induced	3	4	158,900	181,431	523,616	597,678
	Total	20	22	1,128,152	1,214,830	4,871,080	5,178,863
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	89	89	7,090,932	7,090,932	34,541,446	34,541,446
	Indirect	120	134	5,990,214	6,990,786	22,253,716	25,892,162
	Induced	29	41	1,000,002	1,653,841	4,411,230	6,438,783
	Total	238	264	14,081,147	15,735,559	61,206,393	66,872,391
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	11,089	11,089	1,085,144,628	1,085,144,628	10,691,456,750	10,691,456,750
	Indirect	8,409	8,425	605,149,258	606,384,102	1,945,461,542	1,949,291,584
	Induced	5,367	5,371	217,933,729	218,183,692	837,220,724	838,024,811
	Total	24,865	24,886	1,908,227,615	1,909,712,421	13,474,139,017	13,478,773,144
Total Planning Area (Low Colorado Scenario)	Direct	22,720	22,720	2,407,832,421	2,407,832,421	18,290,445,070	18,290,445,070
	Indirect	19,814	24,022	1,346,770,907	1,795,382,120	4,218,404,261	5,120,324,509
	Induced	12,549	14,975	568,055,068	711,893,919	1,997,857,846	2,450,360,747
	Total	55,083	61,717	4,322,658,396	4,915,108,461	24,506,707,178	25,861,130,327
Total Planning Area (High Colorado Scenario)	Direct	29,137	29,137	3,179,881,256	3,179,881,256	22,174,524,682	22,174,524,682
	Indirect	26,734	33,469	1,809,282,553	2,554,128,962	5,592,822,739	7,086,860,170
	Induced	16,854	20,857	785,362,832	1,025,878,389	2,706,742,113	3,458,923,006
	Total	72,726	83,463	5,774,526,641	6,759,888,606	30,474,089,534	32,720,307,858

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Wyoming

Management of ACECs as open to leasing subject to NSO stipulations with an exception/modification to allow occupancy if there are drainage concerns from adjacent development and if it can be demonstrated that no direct or indirect impacts on GRSG will occur could lead to a reduction in the number of wells drilled and completed as well as oil and gas production from these wells in Wyoming, compared with Alternative 1.

On annual average, oil and gas production revenue and well development expenditures in the Wyoming analysis area is expected to result in about 1,000 fewer total jobs (about 640 fewer direct jobs), about $110 million less in total labor income (about $64 million less in direct labor income), and about $717 million less in economic output (about $559 million less in direct economic output), than under Alternative 1, throughout the state (see **Table 18-9** in **Appendix 18**).

The decrease in projected oil and gas activity, under Alternative 6, would result in reductions in tax revenues, compared with Alternative 1. The total royalty revenue generated from oil and gas production in Wyoming would be about $1.5 billion, which is about $69 million less than under Alternative 1. The Wyoming severance tax revenue is expected to be about $532 million, which is about $25 million less than under Alternative 1. The oil and gas conservation tax is expected to generate about $4.4 million, which is about $208,000 less than under Alternative 1. Oil and gas production could generate about $559 million across the analysis area in county revenues from ad valorem taxes, which is about $26 million less than under Alternative 1. Additionally, a reduction in oil and gas activity, in Wyoming, under Alternative 6, could lead to a decrease in revenue from rents, bonus bids, and sales and use taxes, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities, including education. There could be impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment.

The reduction in the acreage available for fluid mineral leasing could reduce the development-related impacts on nonmarket and social conditions associate with changes in air and GHG emissions, compared with Alternative 1.

Renewable Energy (Geothermal, Wind, and Solar) Management

Table 18-21 shows the direct, indirect, induced, and total impacts on economic contributions from projected geothermal activity. A discussion on impacts are provided at the rangewide-level in **Section 4.8** of the EIS.

Table 18-21. Average Annual Economic Contributions from Geothermal, Under Alternative 6

State	Type of Impact	Employment	Labor Income	Economic Output
California and Nevada Combined	Direct	276	17,088,024	24,364,445
	Indirect	191	14,858,872	70,756,086
	Induced	73	4,035,862	11,151,537
	Total	540	35,982,758	106,272,068
Colorado	Direct	8	536,971	761,363
	Indirect	4	333,762	1,356,788
	Induced	3	186,572	540,294
	Total	16	1,057,306	2,658,444

State	Type of Impact	Employment	Labor Income	Economic Output
Idaho	Direct	22	1,020,547	1,413,689
	Indirect	10	561,620	2,833,188
	Induced	5	212,864	683,476
	Total	36	1,795,032	4,930,353
Oregon	Direct	6	297,479	402,124
	Indirect	3	188,906	846,182
	Induced	2	90,611	260,967
	Total	11	576,996	1,509,272
Utah	Direct	12	742,958	1,059,324
	Indirect	6	397,232	1,868,982
	Induced	4	209,788	671,228
	Total	22	1,349,977	3,599,534
Wyoming	Direct	6	288,314	388,376
	Indirect	2	113,518	796,725
	Induced	1	30,436	101,568
	Total	9	432,268	1,286,669
Total Planning Area	Direct	330	19,974,293	28,389,321
	Indirect	216	16,453,910	78,457,951
	Induced	88	4,766,133	13,409,070
	Total	634	41,194,337	120,256,340

Source: National Renewable Energy Laboratory 2016
Note: There were no geothermal power plant developments projected for Montana, North Dakota, and South Dakota due to limited geothermal potential in the analysis areas under all alternatives.

Livestock Grazing Management

Table 18-22 shows the direct, indirect, induced, and total impacts on economic contributions from livestock grazing in allotments where PHMA accounted for at least 15 percent of the acreage. A discussion on impacts is provided at the rangewide-level in **Section 4.8** of the EIS.

Table 18-22. Average Annual Economic Contributions from Livestock Grazing in Allotments where PHMA Accounted for 15 Percent or More of the Acreage, Under Alternative 6

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
California	Direct	7	7	2,146,636	2,146,636	4,625,897	4,625,897
	Indirect	6	8	696,936	898,981	1,815,961	2,545,591
	Induced	6	7	261,689	340,831	995,028	1,219,542
	Total	19	22	3,105,261	3,386,449	7,436,887	8,391,031
Colorado	Direct	50	50	1,844,864	1,844,864	5,164,123	5,164,123
	Indirect	19	22	694,800	841,506	2,390,963	3,006,278
	Induced	9	10	455,946	514,078	1,491,065	1,671,211
	Total	78	82	2,995,610	3,200,447	9,046,152	9,841,613
Idaho	Direct	77	77	13,312,954	13,312,954	28,474,475	28,474,475
	Indirect	71	75	5,978,587	6,198,240	16,904,455	17,943,103
	Induced	66	68	3,158,689	3,294,103	10,417,492	10,862,683
	Total	214	221	22,450,229	22,805,297	55,796,422	57,280,261

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Montana	Direct	186	186	10,506,213	10,506,213	33,185,106	33,185,106
	Indirect	109	122	6,251,713	6,858,824	20,744,631	22,504,995
	Induced	69	73	3,419,901	3,613,023	10,966,233	11,575,632
	Total	364	381	20,177,827	20,978,060	64,895,970	67,265,732
Nevada	Direct	82	82	13,703,178	13,703,178	42,086,589	42,086,589
	Indirect	85	88	5,973,781	6,146,434	20,950,722	22,479,206
	Induced	63	65	3,616,403	3,717,918	11,765,675	12,091,385
	Total	230	236	23,293,363	23,567,530	74,802,986	76,657,180
North Dakota	Direct	1	1	39,141	39,141	143,402	143,402
	Indirect	0	0	16,853	18,114	61,594	66,765
	Induced	0	0	6,328	6,822	23,344	24,852
	Total	1	1	62,321	64,077	228,340	235,019
Oregon	Direct	78	78	6,451,505	6,451,505	25,184,996	25,184,996
	Indirect	73	79	4,601,991	5,095,613	15,223,657	16,982,271
	Induced	46	49	2,412,991	2,592,299	7,323,332	7,844,739
	Total	197	206	13,466,487	14,139,416	47,731,985	50,012,006
South Dakota	Direct	5	5	185,898	185,898	1,405,882	1,405,882
	Indirect	4	4	157,013	176,985	794,297	888,717
	Induced	1	1	30,346	39,578	134,827	163,478
	Total	10	10	373,256	402,461	2,335,006	2,458,076
Utah	Direct	54	54	4,634,026	4,634,026	10,839,099	10,839,099
	Indirect	16	18	803,047	892,704	2,901,262	3,399,715
	Induced	17	18	646,897	692,011	2,527,803	2,676,460
	Total	87	90	6,083,969	6,218,740	16,268,163	16,915,273
Wyoming	Direct	301	301	14,742,131	14,742,131	52,633,690	52,633,690
	Indirect	172	176	7,079,345	7,304,934	26,109,990	27,047,064
	Induced	74	74	2,998,096	3,012,816	11,552,266	11,599,690
	Total	547	552	24,819,572	25,059,882	90,295,946	91,280,444
Total Planning Area	Direct	841	841	67,566,546	67,566,546	203,743,259	203,743,259
	Indirect	555	592	32,254,066	34,432,335	107,897,532	116,863,705
	Induced	351	365	17,007,286	17,823,479	57,197,065	59,729,672
	Total	1,747	1,801	116,827,895	119,822,359	368,837,857	380,336,635

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.

18.4.8 Proposed RMP Amendment

Fluid Minerals (Oil and Gas) Management

Table 18-23 shows the direct, indirect, induced, and total impacts on economic contributions from projected oil and gas activity. In the state-specific sub headers for Wyoming, below, a discussion is provided on the market and nonmarket impacts from potential changes in oil and gas operations.

Table 18-23. Average Annual Economic Contributions from Oil and Gas, Under the Proposed RMP Amendment

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Colorado (Low Scenario)	Direct	6,948	6,948	835,579,681	835,579,681	4,210,876,842	4,210,876,842
	Indirect	7,504	10,248	501,986,077	823,906,926	1,490,742,665	2,133,156,312
	Induced	4,664	6,375	235,380,145	340,348,186	767,841,591	1,093,220,978
	Total	19,116	23,572	1,572,945,903	1,999,834,792	6,469,461,097	7,437,254,132
Colorado (High Scenario)	Direct	13,366	13,366	1,607,628,515	1,607,628,515	8,094,956,453	8,094,956,453
	Indirect	14,424	19,695	964,497,723	1,582,653,768	2,865,161,143	4,099,691,974
	Induced	8,969	12,257	452,687,909	654,332,656	1,476,725,857	2,101,783,237
	Total	36,759	45,318	3,024,814,147	3,844,614,938	12,436,843,453	14,296,431,664
Idaho	Direct	10	10	576,005	576,005	2,998,007	2,998,007
	Indirect	7	8	393,247	457,395	1,349,457	1,583,179
	Induced	3	4	158,900	181,431	523,616	597,678
	Total	20	22	1,128,152	1,214,830	4,871,080	5,178,863
Montana	Direct	1,922	1,922	284,762,972	284,762,972	1,318,085,631	1,318,085,631
	Indirect	1,563	1,725	105,741,719	118,169,771	327,422,634	359,077,656
	Induced	1,561	1,651	77,407,961	81,913,449	248,078,502	262,290,130
	Total	5,046	5,299	467,912,653	484,846,192	1,893,586,767	1,939,453,416
Nevada	Direct	18	18	249,165	249,165	6,374,761	6,374,761
	Indirect	17	18	1,554,685	1,580,942	4,001,386	4,162,182
	Induced	6	6	329,181	352,408	1,069,843	1,144,350
	Total	41	42	2,133,031	2,182,516	11,445,990	11,681,292
North Dakota	Direct	275	275	31,990,856	31,990,856	406,307,567	406,307,567
	Indirect	172	180	10,249,846	10,897,896	44,494,011	46,938,673
	Induced	105	119	4,331,162	5,067,030	15,914,717	18,161,000
	Total	551	573	46,571,864	47,955,782	466,716,295	471,407,239
South Dakota	Direct	89	89	7,090,932	7,090,932	34,541,446	34,541,446
	Indirect	120	134	5,990,214	6,990,786	22,253,716	25,892,162
	Induced	29	41	1,000,002	1,653,841	4,411,230	6,438,783
	Total	238	264	14,081,147	15,735,559	61,206,393	66,872,391
Utah	Direct	2,368	2,368	162,438,183	162,438,183	1,619,804,067	1,619,804,067
	Indirect	2,022	3,284	115,705,860	226,994,302	382,678,849	600,222,762
	Induced	814	1,407	31,513,987	64,193,883	122,797,623	230,483,019
	Total	5,204	7,059	309,658,031	453,626,368	2,125,280,538	2,450,509,848

State	Type of Impact	Employment		Labor Income		Economic Output	
		Analysis Area	State	Analysis Area	State	Analysis Area	State
Wyoming	Direct	11,089	11,089	1,085,144,628	1,085,144,628	10,691,456,750	10,691,456,750
	Indirect	8,409	8,425	605,149,258	606,384,102	1,945,461,542	1,949,291,584
	Induced	5,367	5,371	217,933,729	218,183,692	837,220,724	838,024,811
	Total	24,865	24,886	1,908,227,615	1,909,712,421	13,474,139,017	13,478,773,144
Total Planning Area (Low Colorado Scenario)	Direct	22,720	22,720	2,407,832,421	2,407,832,421	18,290,445,070	18,290,445,070
	Indirect	19,814	24,022	1,346,770,907	1,795,382,120	4,218,404,261	5,120,324,509
	Induced	12,549	14,975	568,055,068	711,893,919	1,997,857,846	2,450,360,747
	Total	55,083	61,717	4,322,658,396	4,915,108,461	24,506,707,178	25,861,130,327
Total Planning Area (High Colorado Scenario)	Direct	29,137	29,137	3,179,881,256	3,179,881,256	22,174,524,682	22,174,524,682
	Indirect	26,734	33,469	1,809,282,553	2,554,128,962	5,592,822,739	7,086,860,170
	Induced	16,854	20,857	785,362,832	1,025,878,389	2,706,742,113	3,458,923,006
	Total	72,726	83,463	5,774,526,641	6,759,888,606	30,474,089,534	32,720,307,858

Source: IMPLAN 2021 Data for model region including counties in the socioeconomic analysis area in California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, and Wyoming as well as for all counties in the state using the multi-regional input-output analysis.
Note: There were no oil and gas developments projected for California and Oregon under all alternatives.

Wyoming

Impacts under the Proposed RMP Amendment would be similar to those as those described under Alternative 5, except in some areas, management decisions on PHMA would lead to a reduction in oil and gas activity, compared with Alternative 5. These decisions would lead to the same impacts on economic and social conditions as under Alternative 6. On annual average, oil and gas production revenue and well development expenditures in the Wyoming analysis area is expected to result in about 1,000 fewer total jobs (about 640 fewer direct jobs), about $110 million less in total labor income (about $64 million less in direct labor income), and about $717 million less in economic output (about $559 million less in direct economic output), than under Alternative 1, throughout the state (see **Table 18-9** in **Appendix 18**).

The decrease in projected oil and gas activity, under Alternative 6, would result in reductions in tax revenues, compared with Alternative 1. The total royalty revenue generated from oil and gas production in Wyoming would be about $1.5 billion, which is about $69 million less than under Alternative 1. The Wyoming severance tax revenue is expected to be about $532 million, which is about $25 million less than under Alternative 1. The oil and gas conservation tax is expected to generate about $4.4 million, which is about $208,000 less than under Alternative 1. Oil and gas production could generate about $559 million across the analysis area in county revenues from ad valorem taxes, which is about $26 million less than under Alternative 1. Additionally, a reduction in oil and gas activity, in Wyoming, under Alternative 6, could lead to a decrease in revenue from rents, bonus bids, and sales and use taxes, compared with Alternative 1. The reductions in tax revenues could put strain on local governments' budgets and could impact public services that are offered to the communities, including education. There could be impacts from BLM decisions on lifestyles and culture for those in mineral development communities of interest, especially for those individuals who rely on oil and gas extraction for employment.

The reduction in the acreage available for fluid mineral leasing could reduce the development-related impacts on nonmarket and social conditions associate with changes in air and GHG emissions, compared with Alternative 1.

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