

## 4.0 Environmental Consequences

This chapter describes the environmental consequences, also referred to as “impacts” or “effects”, of implementing the alternatives. Considering the existing conditions and trends of the affected environment (Chapter 3.0) and imposing the descriptions of the alternatives (Chapter 2.0), the types of impacts were identified and quantified to the extent practicable for the purposes of this EIS. The types of impacts disclosed include the following:

- **Direct Impacts** – The effects that are caused by the action and occur at the same time and place. Examples include the elimination of original land use due to the erection of a structure.
- **Indirect Impacts** – The effects that are indirectly caused by the action. They occur later or are farther removed in distance, but are still reasonably foreseeable and related to the action by a chain of cause and effect. Indirect impacts may reach beyond the natural and physical environment (e.g., environmental impact) to include growth-inducing effects and other effects related to induced changes to resource users (e.g., non-environmental impact).
- **Cumulative Impacts** – The effects that result from incremental impacts when added to other past, present, and reasonably foreseeable future actions regardless of what person or agency (federal or non-federal) undertakes those actions.

Direct and indirect impacts are discussed in Chapter 4.0 and the cumulative impact analysis is discussed in Chapter 5.0. The duration of impacts are considered as either short-term and temporary (up to 5 years) or long-term (beyond 5 years to the project life of 30 years or longer). General impacts of wind energy facilities to resources and resource uses are described in the *Final Programmatic Environmental Impact Statement on Wind Energy Development on Bureau of Land Management (BLM)-Administered Lands in the Western United States* (BLM 2005).

The impact analysis is designed to show relative differences in alternatives as they pertain to specific resources, resource uses, or social and economic features. It is not intended to predict the exact amount, timing, or location of effects that could occur should the alternative be selected for implementation. The numbers generated and used for comparison of impacts are approximated and intended for analysis purposes only. The exact location of project features cannot be determined until a final design is completed. Therefore, the exact areas of impact on specific resources, resource uses, or social and economic features are estimates based on the best available information at the time of this writing.

Each resource section includes a discussion of the resource-specific analysis area, relevant management considerations, significance criteria, and assumptions used in the analysis, followed by the direct and indirect impacts of each alternative. Following the impact analysis, each resource includes discussions on mitigation and mitigation effectiveness, residual impacts, irreversible and irretrievable commitment of resources, and relationship between local short-term uses and long-term productivity.

Impacts for each alternative are described for the “alternative boundary”, which refers to a smaller boundary within the Application Area that was created specifically for each alternative based on constraints identified during the alternatives development process (these boundaries are discussed in Section 2.2 by alternative). The “conceptual area of development” is the area within each alternative boundary where development would most likely occur based on wind potential considerations and environmental constraints (discussed in Section 2.2.1).

## 4.1 Impacts to Air Quality

Impacts to air quality include increases in criteria pollutants including fugitive dust emissions, emissions of hazardous air pollutants and GHG emissions. Local effects are analyzed within 5 km of the alternative boundary; indirect effects are analyzed within 300 km of the alternative boundary. Generally, minor surface-based emissions do not have noticeable effects in areas beyond 5 km. Visibility impacts to Class I areas are analyzed at much greater distances. **Table 4.1-1** lists the relevant management considerations for air quality; impacts would be considered significant if federal or state standards are exceeded.

**Table 4.1-1 Relevant Management Considerations for Air Quality**

Resource Topic	Management Considerations
NAAQS	Compliance with NAAQS and state standards
Prevention of Significant Deterioration (PSD)	PSD and PSD increments
Visibility	Federal guidelines for visibility impairment
Atmospheric Deposition	Federal guidelines for atmospheric deposition
GHG	Climate Change

Ambient air monitoring data show low concentrations for criteria pollutants (except ozone) in the area. Taking into account the emission information estimated for this analysis and project-specific air quality analyses conducted in the area, such as Desolation Flats and Atlantic Rim, the BLM concludes that increases in concentrations of CO, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> associated with the proposed CCSM project would be unlikely to cause any exceedence of federal or state ambient air quality standards (BLM 2008b).

Assumptions used in this analysis include:

- Since other visibility studies have been completed in the region, the results of those studies and the comparative emissions of criteria pollutants are used to qualitatively evaluate visibility impacts at these Class I areas. No visibility modeling was conducted.
- The comparative impacts of emissions from other analyses in the region are used to qualitatively estimate ozone impacts for the project. No ozone modeling for project development was conducted.
- The analysis discusses compliance with state and NAAQS. Since the project does not constitute a PSD source, the analysis does not address PSD increment consumption.
- The analysis of impacts to air quality is based on the assumption that AMCs and standard BMPs will be successfully implemented (see **Appendix C**). These include measures for dust control, vehicle emissions, and general maintenance and compliance as well as disturbance management described in **Table C-3** of the appendix.

### 4.1.1 Impacts to Air Quality from the No Action Alternative

There would be no project specific air quality impacts from the No Action Alternative since there would be no project sources of emissions. Although the proposed CCSM project would emit low levels of pollutants principally from mobile sources during construction and operation, the net impact of the project would be to improve atmospheric conditions since the generation of electricity from wind turbines would reduce the need for electricity generated in fossil fuel-fired power plants. No action would mean that a

valuable renewable resource would not be tapped for power generation to augment fossil fuel-fired generation facilities.

#### 4.1.2 Impacts to Air Quality from Alternative 1R, Applicant Proposed Alternative

##### Air Emissions

Construction emissions would occur during construction of access roads, preparation of WTG sites, erecting those WTGs, and construction of the transmission line. Construction would involve the use of earth-moving equipment, including loaders, scrapers, bulldozers, shovels, and backhoes. WTG components and transmission line equipment, as well as electrical cable and other equipment and supplies would be delivered from the RDF to the project site by large trucks and semi-tractor trailers. Large cranes are used to install WTGs. Emissions from these activities include fugitive dust and tailpipe emissions (CO, NO<sub>x</sub>, VOCs, particulates, SO<sub>2</sub>, and air toxics).

Maximum air pollutant emissions from the construction of each WTG would be temporary (i.e., occurring only during the construction period), would occur in isolation, and would not significantly interact with adjacent WTG locations. Since construction emissions would be temporary, and construction emissions would not be from major stationary sources, PSD regulations including increments are not applicable.

Approximately 1,350 acres would be disturbed during Year 1 for construction of the facility. Construction and reclamation activities would be expected to continue for a total of five years. **Table 4.1-2** shows the net total number of acres disturbed during each year. Fugitive dust from construction activities and travel on project roads would be controlled by water trucks. An approximate conservative emission factor for construction activity operations is 1.2 tons/acre/month of activity. This value is most useful for developing estimates of overall emissions from construction scattered throughout a geographical area (USEPA 1995).

**Table 4.1-2 Fugitive Dust Emissions from Construction**

Project Year	Net Disturbed Acres <sup>1</sup>	Annual Fugitive Emissions <sup>2</sup>	
		PM <sub>10</sub> (tons)	PM <sub>2.5</sub> (tons)
1	1,350	1,620	632
2	1,383	1,659	647
3	2,191	2,629	1,025
4	2,219	2,663	1,038
5	590	708	276

<sup>1</sup> Source: PCW 2012.

<sup>2</sup> Calculations shown in **Appendix H, Table H-1**.

Fugitive dust emissions from disturbed areas assume six months of construction each year and 50 percent dust controls with water applied twice a day as needed. Construction would contribute to fugitive dust emissions due to personnel vehicle access, occasional road maintenance activities, ongoing reclamation/re-vegetation activities, and turbine maintenance and repair. Vehicle miles traveled (VMT) on project roads during construction are shown for each project year in **Table 4.1-3**.

Annual emissions of fugitive dust from each basic construction effort including road construction, WTG construction and electrical system construction are listed in **Table 4.1-4** for each project year.

**Table 4.1-3 Vehicle Miles Traveled on Project Roads During Construction<sup>1</sup>**

Construction Effort	Year 1 VMT (miles)	Year 2 VMT (miles)	Year 3 VMT (miles)	Year 4 VMT (miles)	Year 5 VMT (miles)
Road Construction	2,542,111	1,450,546	2,910,803	2,853,539	1,518,700
WTG Construction	0	1,298,865	3,541,253	3,271,679	1,714,107
Electrical System Construction	0	2,228,522	4,735,567	6,705,940	4,445,697
Total Construction	2,542,111	4,977,933	11,187,622	12,831,158	7,678,505

<sup>1</sup> Calculations shown in **Appendix H, Table H-2**.

Source: PCW 2012.

**Table 4.1-4 Fugitive Dust Emissions from Roads During Construction<sup>1</sup>**

Construction Effort	Year 1		Year 2		Year 3		Year 4		Year 5	
	PM <sub>10</sub> (tons)	PM <sub>2.5</sub> (tons)								
Road Construction	976.0	55.2	556.9	31.5	1,118	63	1,095.5	62.0	583.1	33.0
WTG Construction			498.7	24.2	1,360	66	1,256.1	60.9	658.1	31.9
Electrical System Construction			855.6	41.5	1,818	88	2,574.6	124.8	1,706.8	82.7
Total Construction Road Dust	976.0	55.2	1,911.1	97.1	4,295	217	4,926.2	247.7	2,948.0	147.6

<sup>1</sup> Calculations provided in **Appendix H, Table H-2**.

Five concrete batch plants are proposed to provide about 600 yd<sup>3</sup> of concrete for the foundation for each wind turbine. Annual emissions from the concrete batch plants are shown in **Table 4.1-5** for each project year during the construction phase.

**Table 4.1-5 Annual Point Source Emissions from Concrete Batch Plants<sup>1</sup>**

Pollutant	Emissions (tons/year)				
	Year 1	Year 2	Year 3	Year 4	Year 5
VOCs <sup>2</sup>	0.00	0.68	1.27	1.19	0.32
NO <sub>x</sub> <sup>2</sup>	0.03	8.57	15.91	14.91	3.98
SO <sub>2</sub> <sup>2</sup>	0.00	0.57	1.05	0.99	0.26
PM <sub>10</sub>	0.05	13.04	24.23	22.70	6.06
PM <sub>2.5</sub>	0.03	6.83	12.68	11.88	3.21

<sup>1</sup> Calculations provided in **Appendix H, Table H-3**.

<sup>2</sup> Engine Emissions.

It is assumed that:

- Five batch plants would produce 630,000 yd<sup>3</sup> of concrete over the construction period, with 23.85 percent (505 yd<sup>3</sup>) production during Year 1; 19.74 percent (124,349 yd<sup>3</sup>) during Year 2; 36.66 percent (230,984 yd<sup>3</sup>) during Year 3; 34.35 percent (216,300 yd<sup>3</sup>) during Year 4; and 9.17 percent (57,774 yd<sup>3</sup>) during Year 5. Emission factors are from USEPA air pollutant (AP)-42, Volume 1, 5<sup>th</sup> Edition Chapter 11.12, Table 11.12-2 for Concrete Batching. Batch plant emissions PM<sub>10</sub> and PM<sub>2.5</sub> data include total engine and watch emissions. There are no other criteria emission factors for cement batch production in AP-42. Emissions from concrete batch engines also are included in **Tables 4.1-6, 4.1-7, and 4.1-8**.
- The concrete batch plants would require air permits from WDEQ. The air permit would provide enforceable limits and potential air pollution mitigation measures to reduce air emissions impacts from operation of the batch plants.
- Tailpipe emissions would occur from mobile sources including earth-moving equipment such as scrapers, loaders, bulldozers, and backhoes during construction of access roads and preparation of WTG sites as well as from pickup trucks and semi-tractor trailers. WTG components and transmission line equipment, as well as electrical cable and other equipment and supplies would be delivered by large trucks and semi-tractors. Large cranes would be used to install WTGs. Emissions from these activities would include fugitive dust and tailpipe emission (CO, NO<sub>x</sub>, VOCs, particulates, SO<sub>2</sub>, and air toxics). Estimated project emissions are shown in **Table 4.1-6**.

Given these assumptions, construction engine emissions, the relatively small emission levels from the batch plants, and fugitive dust emissions would be widely dispersed. A screen analysis shows that these emissions would not cause a violation of ambient air quality standards or degradation of regional air quality. Implementation of environmental protection measures during construction, including the utilization of dust control measures, posting and enforcing speed limits, and watering storage piles, would minimize impacts on air quality due to fugitive dust.

#### Hazardous Air Pollutants

The highest near-field impacts for Alternative 1R would occur during construction activities resulting from combustion of fuel in project construction equipment. The regulated hazardous air pollutants (HAPs) listed in Section 112 of the CAA that would be emitted from construction of Alternative 1R include benzene, toluene, xylenes, acetaldehyde, formaldehyde, and propylene. Emissions of the remaining HAPs would be orders of magnitude smaller. **Table 4.1-7** provides an estimate of project emissions of HAPs for each of the 5 years.

**Table 4.1-6 Emissions of Criteria Pollutants from Construction Engine Sources<sup>1</sup>**

Project Year	Pollutant (tons)					
	CO	NO <sub>x</sub>	SO <sub>2</sub>	VOC	PM <sub>10</sub>	PM <sub>2.5</sub>
1	255.9	1,187.6	78.5	94.6	84.3	84.3
2	294.2	1,365.3	90.3	108.8	96.9	96.9
3	662.0	3,072.2	203.2	244.8	218.0	218.0
4	718.6	3,334.7	220.5	265.7	236.7	236.7
5	415.0	1,925.8	127.4	153.4	136.7	136.7

<sup>1</sup> Calculations provided in **Appendix H, Tables H-4 through H-7**.

Source: PCW 2012.

**Table 4.1-7 Tailpipe Emissions of HAPs from Mobile Construction Sources<sup>1</sup>**

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Year 4 (tons)	Year 5 (tons)
Benzene	0.26	0.30	0.65	0.72	0.52
Toluene	0.11	0.13	0.29	0.31	0.23
Xylenes	0.08	0.09	0.20	0.22	0.16
Acetaldehyde	0.22	0.25	0.54	0.59	0.43
Formaldehyde	0.33	0.39	0.82	0.91	0.66
Propylene	0.72	0.84	1.80	1.98	1.44

<sup>1</sup> Calculations provided in **Appendix H, Tables H-9**.

Source: PCW 2012.

**Table 4.1-8 Tailpipe Emissions of CO<sub>2</sub> from Mobile Construction Sources<sup>1</sup>**

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Year 4 (tons)	Year 5 (tons)
CO <sub>2</sub> e	44,056	50,650	113,968	123,705	71,440

<sup>1</sup> Calculations provided in **Appendix H, Tables H-4 through H-7**.

#### Impacts at Class I and II Areas – Acid Deposition

Although the proposed project would emit low levels of NO<sub>x</sub> and SO<sub>2</sub>, which are the primary potential acid producing pollutants principally from mobile sources during construction and operation, the net impact of the project would be to improve atmospheric conditions. Anticipated improvements would occur since the generation of electricity from wind turbines would reduce the need for electricity generated in fossil fuel-fired power plants.

#### Impacts at Class I and II Areas – Visibility

Background visibility data are not available for the CCSM area, but visibility is considered to be very good. A standard annual visual range of approximately 250 km (155 miles) has been calculated for the Flat Tops Wilderness areas using data from the FLAG Phase I report (FLAG 2000). Although the proposed project would emit low levels of pollutants, principally PM<sub>10</sub> and PM<sub>2.5</sub>, as well as tailpipe emissions from mobile sources, the net impact of the project would likely improve atmospheric conditions since the generation of electricity from wind turbines would reduce the need for electricity generated in fossil fuel-fired power plants. VISCREEN default screening criteria show that the change in visibility (change in extinction and contrast) are well within the values that would indicate impacts to visibility within the Flat Tops Wilderness and Rocky Mountain National Park would be very minor.

#### Impacts on Ambient Ozone Levels

Alternative 1R would be unlikely to cause or contribute to the formation of regional ozone at detectable levels due to the low level of emissions of potential ozone forming compounds, including NO<sub>x</sub> and VOCs that are shown in **Table 4.1-6**.

#### Greenhouse Gases

Annual construction engine emissions of GHGs (CO<sub>2</sub> equivalents, or CO<sub>2</sub>e, which include CO<sub>2</sub>, methane, and nitrous oxide [N<sub>2</sub>O]) from construction engine sources are shown in **Table 4.1-8**. The total GHG

emissions from construction of Alternative 1R would be a negligible contribution to net global emissions. In the final regulation on greenhouse gas permitting, the USEPA considers a source that emits more than 100,000 tpy of CO<sub>2</sub>e to be a major source and requires a stationary source that emits more than 25,000 tpy to report their emissions. An equivalency calculation indicates that the total CO<sub>2</sub>e emissions from construction of Alternative 1R in the Year 1 would release about the same amount of CO<sub>2</sub>e as the energy use for 746 average households in the U.S.<sup>1</sup>

#### **4.1.3 Impacts to Air Quality from Alternative 2, Checkerboard Only**

Impacts from Alternative 2 would be about 11 percent higher than Alternative 1R.

#### **4.1.4 Impacts to Air Quality from Alternative 3, No Miller Hill or South Sierra Madre**

Impacts from Alternative 3 would be about 5 percent higher than Alternative 1R.

#### **4.1.5 Impacts to Air Quality from Alternative 4, Private Lands Only**

Impacts from Alternative 4 would be about 6 percent higher than Alternative 1R.

#### **4.1.6 Mitigation and Mitigation Effectiveness**

No mitigation would be required for any of the alternatives. The air quality analysis concludes that neither the WAAQS nor NAAQS would be exceeded by actions taken under any of the proposed alternatives.

#### **4.1.7 Residual Impacts**

Fugitive dust emissions resulting from travel to service the WTGs on unpaved roads would occur during the lifetime of the project, but these impacts would be temporary and limited in extent.

#### **4.1.8 Irreversible and Irretrievable Commitment of Resources**

Air quality impacts from the CCSM project would not be irreversible. Once activities to service the WTGs are ended, the air quality would return to its natural state.

As the impacts of emissions are widely dispersed due to the spatial extent of the project, those impacts would be well below the ambient standards and would not produce a detectable effect on vegetation or grazing. The deposition of dust on vegetation may be noticeable at times, but would be short-lived during construction. In a naturally windy environment plants and air quality conditions are commonly exposed to dusty periods, but deposition is alleviated by the windy periods, and by the natural conditioning of the vegetation to windy and dusty conditions.

#### **4.1.9 Relationship between Local Short-term Uses and Long-term Productivity**

The various construction activities authorized for the proposed CCSM project would produce emissions of particulate matter. Soil disturbance and travel on unpaved roads would be the main causes of the emissions. Tailpipe emissions from vehicular travel and emissions from equipment use would result from construction activities. Short-term impacts from fugitive dust may affect the recreational enjoyment of wildlife viewing, vistas, and other recreational aspects of visiting the vicinity of the proposed CCSM project.

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<sup>1</sup> Based on 59 tpy per U.S. household. The Hinkle Charitable Foundation, [www.thehcf.org/emaila.5.html](http://www.thehcf.org/emaila.5.html).

## 4.2 Impacts to Cultural Resources

### Impacts Study Area

The impacts study area for cultural resources is the area of potential effect (APE). Under Section 106 of the NHPA, the APE is defined as “those areas in which impacts are planned or are likely to occur. Specifically, the APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. Additionally, the APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR 800.16[d]).”

The APE should include:

- All alternative locations for all elements of the proposed project;
- All locations where the proposed project may result in disturbance of the ground;
- All locations from which elements of the proposed project (e.g., wind turbines, substations, transmission lines, or land disturbance) may be visible or audible;
- All locations where the proposed project may result in changes in traffic patterns, land use, public access, etc.; and
- All areas where there may be indirect as well as direct effects.

For the proposed CCSM project, the APE for direct and indirect impacts encompasses the Application Area; the APE for visual impacts includes the Application Area plus a 5-mile buffer.

### Methods for Analysis

The analysis of potential impacts to cultural resources is based on review of existing literature and information provided by the Wyoming SHPO and BLM. Potential effects are quantified where possible. In cases where quantitative data are not available, best professional judgment or qualitative assessments are used to describe impacts.

BLM management and protection of cultural resources is viewed as an integrated system of identifying and evaluating cultural resources, deciding on their appropriate uses, and administering them accordingly, both on public lands and on other lands where BLM decisions could affect cultural resources. The objectives of this integrated system are:

- Protect and preserve in place representative examples of the full array of cultural resources on public lands for the benefit of scientific and public use by present and future generations.
- Ensure that cultural resources are given full consideration in all land-use planning and management decisions.
- Manage cultural resources so that scientific and socio-cultural values are not diminished, but rather are maintained and enhanced.
- Ensure that the BLM’s undertakings avoid inadvertent damage to cultural resources both federal and nonfederal.

These objectives are the basis for BLM’s approach in analyzing the effects of the proposed project on important cultural resources, including resources of concern to tribal groups, and ultimately for protecting these resources. The BLM’s relevant management considerations are provided in **Table 4.2-1**.

**Table 4.2-1 Relevant Management Considerations for Cultural Resources**

<b>2008 Rawlins RMP and ROD (2008)</b>
<p><u>Management Goals</u></p> <ul style="list-style-type: none"> <li>• Preserve and protect cultural resources to ensure that they are available for appropriate uses by present and future generations.</li> <li>• Reduce imminent threats from natural or human-caused deterioration or potential conflict with other resource uses.</li> <li>• Promote and maintain a working relationship with Native American tribes.</li> </ul>
<p><u>Management Actions</u></p> <ul style="list-style-type: none"> <li>• Where the integrity of setting contributes to NRHP eligibility, management actions resulting in visual elements that diminish the integrity of the property's setting will be managed in accordance with the Wyoming State Protocol and BMPs (Appendix 5 of the 2008 Rawlins RMP).</li> <li>• Implement protection measures for sacred or sensitive sites as determined through consultation with Native American tribes.</li> <li>• Surface disturbing activities will not be allowed within 0.25 mile of a cultural property or the visual horizon, whichever is closer, if the setting contributes to NRHP eligibility.</li> </ul>

Significance Criteria

Impacts are considered significant if management actions result in effects to properties listed or determined eligible for inclusion in the NRHP or considered important to Native American groups as measured by:

- Physical destruction or alteration of a property or relocation from its historic location;
- Isolation or restriction of access;
- Change in the character of the property's use or of physical features within the property's setting, or the introduction of visible, audible, or atmospheric elements that are out of character with the significant historic features of the property;
- Neglect that leads to deterioration or vandalism; and
- Transfer, sale, or lease from federal to non-federal control, without adequate and legally enforceable restrictions or conditions to ensure the preservation of the historic significance of the property.

Significance, under NEPA, is detailed in 40 CFR 1508.27 and is distinct from archaeological significance. Archaeological significance is measured by four categories defined by 36 CFR 60.4:

"The quality of significance in American history, architecture, archaeology, and culture present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

- A. Are associated with events that have made a significant contribution to the broad patterns of our history;
- B. Are associated with the lives of persons significant in our past;

- C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. Have yielded, or may be likely to yield information important in prehistory or history” (36 CFR 60.4).

### Assumptions

The impact analysis of cultural resources is based on the following assumptions.

- Class III field inventories would be conducted for all proposed disturbance areas prior to project construction.
- The number of sites that would be impacted by the proposed project is directly correlated with the degree, nature, and quantity of surface disturbance within the APE.
- Protection of cultural resources would occur in accordance with SHPO coordination requirements and other federal regulations.
- Places of cultural and religious importance to Native Americans, including traditional cultural properties (TCPs), would be protected in accordance with tribal consultation coordination requirements and other federal regulations.
- The values that render a cultural resource eligible for the NRHP would dictate what type and kind of impacts are of concern.
- Formal consultation with Native American tribes to identify places of cultural and religious importance to the tribes, including TCPs, would take place throughout the NEPA process and up to project completion.
- If a cultural resource has been determined by the BLM and SHPO as not eligible for inclusion in the NRHP, it is not a historic property for purposes of the NHPA.
- Based on previous inventories in the files search study area, site density is projected to be one site every 436 acres.

#### **4.2.1 Impacts to Cultural Resources from the No Action Alternative**

Under the No Action Alternative, the proposed CCSM project would not be implemented. As a result, none of the potential impacts to cultural resources as identified for the proposed CCSM project would occur. However, additional knowledge of local or regional prehistory of the area that would have been obtained through data recovery would not be collected.

#### **4.2.2 Impacts to Cultural Resources from Alternative 1R, Applicant Proposed Alternative**

##### **4.2.2.1 Potential Effects**

A total of 467 previously recorded prehistoric and historic sites were identified in the Application Area minus the sage grouse core areas where no disturbance is proposed. The 467 sites include 286 prehistoric sites, 83 historic sites, 93 multicomponent sites consisting of both prehistoric and historic components, and 5 sites of unknown cultural affiliation. The majority of prehistoric sites consist of open camps/occupation sites, lithic scatters, and stone features. Historic sites predominately are debris scatters followed by rock cairns, roads, bridges, mines, and stock herding camps.

The types and numbers of NRHP-eligible sites that could be impacted by Alternative 1R are unknown at this time. Class III cultural resources field inventories have not been conducted as of this date, but would be completed prior to project construction. Therefore, the following paragraphs provide only a qualitative assessment of impacts that could occur as a result of activities associated with project construction and operation.

Ground-disturbing activities, such as installation of WTGs; construction of internal resource/haul roads, underground electrical collection and communication lines, electrical substations, and overhead transmission lines; use of laydown areas for storage equipment and supplies; and, future maintenance activities would have the potential to directly impact NRHP-eligible sites. These physical impacts could occur to both known sites and subsurface sites and could result in the vertical and horizontal displacement of soil containing cultural materials, damage to or destruction of artifacts and features, and loss of archaeological data. Indirect effects are caused by an undertaking and are later in time or farther removed in distance, but are still reasonably foreseeable. Potential indirect effects to cultural resources could include changes in erosion patterns due to construction, soil compaction, or vegetation removal; off-road vehicle traffic associated with construction or maintenance activities; and, vandalism, inadvertent damage, and illegal artifact collection due to increased access and number of people in Alternative 1R.

Visual impacts to historic properties where setting is an aspect of integrity, such as the Overland Trail, could occur as a result of introducing visual elements out of character with a property located within or adjacent to the Alternative 1R area. Introduction of structures such as the proposed WTGs and transmission line into an otherwise rural or natural setting could diminish the integrity of a property's historic features that contribute to its significance. Significant impacts and adverse effects would occur to those properties where setting is an aspect of integrity, including but not limited to, historic districts, historic trails and roads, and properties of traditional religious and cultural importance to Native Americans. The adverse effects to these properties would be mitigated as defined in the PA.

The potential for the discovery of unanticipated cultural resources during construction activities exists within areas of conceptual development and could result in an adverse effect. Unanticipated discoveries could result in displacement or loss (either complete or partial) of the discovered cultural resource. Displacement of cultural resources affects the potential to understand the context of the site and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. Potential impacts to unanticipated discoveries would be greater than impacts to resources previously identified and therefore avoided or subjected to data recovery because damage to discovered sites occurs prior to their recordation and evaluation thereby complicating mitigation procedures. The potential for significant impacts to unanticipated discoveries would be directly proportional to the amount of surface disturbance, estimated to be 7,733 acres of initial disturbance for Alternative 1R.

#### **4.2.2.2 Resolution of Effects**

In consultation with the Wyoming SHPO and interested tribes, the BLM would determine whether construction and operation of Alternative 1R would have an adverse effect on any historic properties listed or eligible for inclusion in the NRHP. If BLM determines that a property would be adversely affected, mitigation would be proposed in accordance with the PA. Mitigation may include, but would not be limited to, one or more of the following measures: 1) avoidance through changes in the construction or operational design; 2) data recovery, which might include the systematic professional excavation of a NRHP-eligible site; 3) the use of landscaping or other techniques that would minimize or eliminate visual effects on a site's setting; 4) development of interpretive materials; 5) Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) or other agreed upon historic recordation process; or, 6) other mitigation determined by the BLM through consultation with the SHPO and interested tribes. Mitigation measures would be based on the types of impacts relevant to the site type.

A setting assessment has been completed for the Overland Trail and other historic properties located within or near the alternative boundary in which setting is an aspect of integrity. Additionally, a Key Observation Point (KOP) was set up on State Highway 130 at the Overland Trail Historical Marker to determine the number of WTGs that would be visible from this location (see Section 4.12, Visual Resources for an expanded discussion of findings associated with this KOP). Due to the large-scale nature of the proposed CCSM project, it is anticipated that adverse affects to the integrity of the Overland Trail's setting would occur. The applicant has committed to a 1 mile setback from the center

of the Overland Trail as presently mapped (BLM 2008a) in all areas except sections listed in **Appendix C, Table C-2** – Summary of Applicant Committed Measures, Cultural-Historic Trails, where the 2008 Rawlins RMP requirement of 0.25 mile was used. Although no surface disturbance would occur within a quarter mile of the trail, the WTGs would be visually obtrusive beyond this buffer. Under Alternative 1R, the proposed transmission line and haul road would cross non-contributing segments of the Overland Trail.

Adverse effects to the integrity of the Overland Trail would be mitigated through implementation of BMPs, applicant-committed protection measures, and in accordance with the PA. Proposed mitigation measures to reduce visual impacts associated with the proposed project are listed under “Visual” in **Appendix C, Table C-4**, Proposed Mitigation Measures. If adopted, these measures also would reduce adverse effects to the Overland Trail and other historic properties where setting contributes to the property’s NRHP eligibility. Compensatory mitigation, or compensating for an impact by replacement or providing substitute resources or environments, would be considered after application of other forms of on-site mitigation has been exhausted.

To minimize impacts associated with off-road vehicles, construction and maintenance traffic would be restricted to roads developed for the proposed project in compliance with ACMs. Use of other unimproved roads would be restricted to emergency situations. Vandalism, inadvertent damage, and illegal artifact collection are expected to occur due to increased access to and number of people in Alternative 1R.

As provided in the PA and ACMs, if any previously unknown archaeological sites, including human remains, are discovered during construction on public land, all construction activities would cease in the area of the discovery, and the BLM Authorized Officer would be notified of the find. Steps would be taken to protect the site from vandalism or further damage until the BLM Authorized Officer could evaluate the nature of the discovery, as outlined in the PA. Construction would not resume in the area of the discovery until the BLM Authorized Officer has issued a notice to proceed.

#### **4.2.3 Impacts to Cultural Resources from Alternative 2, Checkerboard Only**

Under Alternative 2, there would be an increase in the distances between WTGs and WTG groups compared to Alternative 1R. Consequently, there would be a need for more miles of linear ancillary facilities such as internal resource/haul roads and overhead/underground collection lines resulting in an increase in surface disturbance. Initial surface disturbance for Alternative 2 is estimated to be 8,569 acres, 836 more acres than Alternative 1R. More surface disturbance would increase the potential for direct impacts to NRHP-eligible sites compared to Alternative 1R. The types of direct impacts that could occur would be the same as described for Alternative 1R.

Under this alternative, the proposed transmission line and haul road would parallel WY 71 where it crosses the Overland Trail, which would reduce effects to the trail’s setting relative to the transmission line. However, the development footprint for Alternative 2 would be expanded to the east in the Chokecherry area resulting in a greater visual contrast thereby increasing the potential for adverse effects to the setting of the Overland Trail compared to Alternative 1R; effects to the setting of the Overland Trail relative to the Sierra Madre unit would be similar to Alternative 1R. Under this alternative, the proposed transmission line and haul road would cross non-contributing segments of the Overland Trail.

The potential for indirect effects, such as illegal collecting of artifacts, vandalism, and inadvertent damage, would be the same as Alternative 1R.

Adverse effects to NRHP-eligible sites would be mitigated through implementation of BMPs, ACMs, and the PA.

#### **4.2.4 Impacts to Cultural Resources from Alternative 3, No Miller Hill or South Sierra Madre**

Under Alternative 3, the western and southern portions of the Sierra Madre unit would be excluded from development; however, WTGs would be distributed over a larger development footprint within the Chokecherry area and remaining portions of the Sierra Madre area compared to Alternative 1R. As a result, a greater amount of surface disturbance would occur due to increases in the length of linear facilities such as internal resource/haul roads and overhead/underground collection lines. Initial surface disturbance for Alternative 3 is estimated to be 8,115 acres, 382 more acres than Alternative 1R. Increased surface disturbance would increase the potential for direct impacts to NRHP-eligible sites to occur compared to Alternative 1R. The types of direct impacts that could occur would be the same as described for Alternative 1R.

Under this alternative, visual effects to the Overland Trail would be slightly reduced compared to Alternatives 1R and 2 due to the exclusion of the western and southern portions of the Sierra Madre area. Visual effects relative to the proposed transmission line would be the same as Alternative 2. The proposed haul road would cross a contributing segment of the Overland Trail; placement of the transmission line relative to the Overland Trail would be the same as Alternative 2.

The potential for indirect effects, such as illegal collecting of artifacts, vandalism, and inadvertent damage, would be the same as Alternative 1R.

Adverse effects to NRHP-eligible sites would be mitigated through implementation of BMPs, ACMs, and the PA.

#### **4.2.5 Impacts to Cultural Resources from Alternative 4, Private Lands Only**

Under Alternative 4, WTGs would be installed only on private land, which would increase the development footprint compared to Alternatives 1R, 2, and 3. Expansion of the development footprint would require an increase in the total length of linear ancillary facilities such as internal resource/haul roads and overhead/underground collection lines resulting in increased surface disturbance. Initial surface disturbance for Alternative 4 is estimated to be 8,195 acres, 462 more acres than Alternative 1R. More surface disturbance would increase the potential for direct impacts to NRHP-eligible sites compared to the other alternatives. The types of direct impacts that could occur would be the same as described for Alternative 1R.

Under this alternative, the location of WTGs and aboveground collector lines would be distributed over a larger development footprint. As a result of the expanded footprint, there would be an increase in the degree of contrast and areal extent of structures visible from the Overland Trail, which would increase adverse effects to the trail's setting compared to Alternatives 1R, 2, and 3. Visual effects relative to the proposed transmission line would be the same as Alternative 2. Crossing of contributing versus non-contributing segments of the Overland Trail by the proposed transmission line and haul road would be the same as Alternative 3.

The potential for indirect effects, such as illegal collecting of artifacts, vandalism, and inadvertent damage, would be the same as Alternative 1R.

Adverse effects to NRHP-eligible sites would be mitigated through implementation of BMPs, ACM's, and the PA.

#### **4.2.6 Additional Mitigation**

**CR-1:** To minimize unauthorized collecting of archaeological material or vandalism to known archaeological sites, PCW and its contractors, and all construction personnel, shall attend mandatory

training and be educated on the significance of cultural resources and the relevant federal regulations intended to protect them.

**Effectiveness:** This measure would be highly effective with respect to project-related personnel. However, the measure would not apply to the public; therefore, the increase in road access would increase the potential for vandalism, looting, and destruction of sites.

**CR-2:** Additional mitigation measures will be included in the PA, which currently is being developed in coordination among the BLM, SHPO, ACHP, PCW, Indian tribes, and other interested parties.

**Effectiveness:** This measure would be highly effective in avoiding, reducing, and mitigating adverse effects to historic properties. The PA outlines the manner in which adverse effects would be mitigated and the roles and responsibilities of each signatory. The agreement stays in effect until all measures have been completed to the satisfaction of all parties who have participated in its development.

Note: Additional mitigation measures to reduce visual impacts associated with the proposed project are listed under “Visual” in **Appendix C, Table C-4**, Proposed Mitigation Measures. If adopted, these measures would reduce adverse effects to historic properties where setting is an important aspect of integrity.

#### **4.2.7 Residual Impacts**

Alternative 1R and action alternatives would result in the loss of cultural resources that are not eligible for the NRHP and located in proposed disturbance areas. Although these sites would be recorded to BLM standards and the information integrated into local and statewide archaeological databases, the sites ultimately would be destroyed by project construction. It is currently unknown how many NRHP-eligible sites would be affected by Alternative 1R or the other action alternatives. ACMs and BMPs for cultural resource protection would be followed. Adverse effects to NRHP-eligible sites would be avoided or, if avoidance is not feasible, mitigated in compliance with the project PA. NRHP-eligible sites would be mitigated through implementation of data recovery, the use of landscaping to minimize visual effects, development of interpretive materials, or other mitigation determined by the BLM in consultation with the SHPO and interested Tribes. Since some of the cultural value associated with these sites cannot be fully mitigated, it is anticipated that residual impacts to these resources would occur.

Accidental disturbance, vandalism, and illegal collecting would be expected to increase as a result of increased access.

#### **4.2.11 Irreversible and Irrecoverable Commitment of Resources**

NRHP-eligible sites could be irreversibly and irretrievably lost if inventory, avoidance, and/or mitigation efforts are not sufficient to identify and protect these sites.

#### **4.2.12 Relationship between Local Short-term Uses and Long-term Productivity**

The proposed project would result in the loss of short-term use and long-term productivity of cultural resources not eligible for the NRHP and located in proposed disturbance areas. For NRHP-eligible sites located in proposed disturbance areas that cannot be avoided, data recovery or other forms of mitigation would be conducted prior to project construction. The scientific information obtained through data recovery would be preserved for the long term. However, the site itself ultimately would be lost. There would be a long-term loss of cultural resources due to illegal collecting and vandalism associated with increased human activity in, and access to, the CCSM project area.

#### **4.2.13 Native American Concerns**

Specific statutes, regulations, and EOs guide consultation with Native Americans to identify cultural resources important to tribes and to address tribal concerns about potential impacts to these resources. These include the NEPA, NHPA, AIRFA of 1978, NAGPRA of 1990, EO 13007 (Indian Sacred Sites), and EO 13175 (Consultation and Coordination with Indian Tribal Governments). These statutes and regulations direct federal agencies to consult with Native American tribal leaders and others knowledgeable about cultural resources that are important to them and their way of life. Consultation is conducted for federal actions, such as decisions about the proposed project, that have the potential to affect locations of traditional concern, areas where religious ceremonies are conducted, areas of traditional cultural uses, archaeological sites, and other modern and ancestral tribal resources.

A Class II sample survey has been conducted in the Application Area. The Class II sample survey was geared towards identifying sites of traditional, cultural, and religious importance to the tribes and was not limited to locations of proposed disturbance. Only sites and associated artifacts and features with potential tribal significance were fully recorded. Information derived from the survey will assist the BLM in assessing potential impacts of the proposed CCSM project on these sites, and in developing appropriate measures in consultation with interested tribal groups to mitigate potential impacts. Direct, indirect, and visual impacts that could occur to sites of traditional, cultural, and religious importance to the tribes as a result of the proposed project would be the same as described above for cultural resources.

Places of traditional, cultural, and religious importance to the tribes would be identified through consultation and cooperation with affected Native American tribes, as well as through the Class II sample survey and site-specific Class III cultural resources inventories. No surface disturbance would occur within or immediately adjacent to the boundary of a potential TCP or other site of tribal importance prior to completion of all Native American consultation. If necessary, a mitigation plan to mitigate potential impacts to a property of tribal importance would be developed by the BLM and SHPO as outlined in the PA. Tribal representatives would be asked to participate in the development of any mitigation plan.

Any information provided by tribal members concerning sites of traditional, religious, and cultural importance would remain confidential. At this time, consultation with the contacted Native American groups is ongoing and would continue up to and including project construction.

### 4.3 Impacts to Geological and Mineral Resources

The study area for analysis of direct and indirect impacts related to mineral resources is the applicable alternative boundary and associated ROWs. The study area for direct and indirect impacts to geological hazards is the applicable alternative boundary and associated ROWs. **Table 4.3-1** lists the relevant management considerations for geological and mineral resources.

**Table 4.3-1 Relevant Management Considerations for Mineral and Geological Hazards**

<b>Minerals</b>
<p><u>Management Objectives</u></p> <ul style="list-style-type: none"> <li>• Manage mineral resources from available public lands and federal minerals while minimizing the impacts to the environment, public health and safety, and other resource values and uses.</li> </ul>
<p><u>Management Goals</u></p> <ul style="list-style-type: none"> <li>• Provide opportunities for exploration and development of conventional and unconventional oil and gas, coal, and other leasable minerals.</li> <li>• Provide opportunities for exploration and development of salable minerals.</li> </ul>
<p><u>Management Actions</u></p> <ul style="list-style-type: none"> <li>• Existing oil and gas or other mineral rights will be honored. When an oil and gas lease is issued, it constitutes a valid existing right, and the BLM cannot unilaterally change the terms and conditions of a lease.</li> <li>• The lessee is subject to stipulations attached to the lease; restrictions deriving from specific, nondiscretionary statutes; and such reasonable measures needed to minimize impacts to other resources and resource users. Oil and gas lease stipulations may be modified or eliminated using the exception, modification, or waiver criteria. The BLM may impose reasonable measures (conditions of approval) to operational aspects of oil and gas development, including modification of siting or design of facilities, timing of operations, and specifying interim or final reclamation measures to control the manner and pace of development.</li> <li>• All lands open to oil and gas leasing consideration also will be open to geophysical exploration, subject to appropriate resource surveys, surface protection measures, adequate bonding, and adherence to State of Wyoming standards for geophysical operations.</li> <li>• With the exception of WSAs and some other SMAs, the remainder of the RFO planning area is open to consideration for leasing of geothermal resources and non-energy leasable minerals.</li> <li>• Mineral material disposals are discretionary actions. Disposal will be considered on a case-by-case basis.</li> <li>• Surface disturbing activities will be intensively managed and will be subject to reclamation practices. Leases will be issued with stipulations to protect resource values.</li> <li>• There would be no management actions with regard to locatable minerals unless withdrawals are pursued.</li> </ul>

**Table 4.3-1 Relevant Management Considerations for Mineral and Geological Hazards**

<b>Geological Hazards</b>
<p><u>Management Objectives</u></p> <ul style="list-style-type: none"> <li>Apply Wyoming Mitigation Guidelines to mitigate impacts from surface disturbance and apply to activities such as road or pipeline construction, range improvements, and permitted recreation activities. The guidelines are not land use decisions; rather they are examples of mitigation measures that could be applied, as appropriate, based on site-specific NEPA analysis for individual proposals.</li> </ul>
<p><u>Management Goals</u></p> <ul style="list-style-type: none"> <li>Modify the operations of surface and other human presence disturbance activities as part of the statutory requirements for environmental protection.</li> <li>Inform a potential lessee, permittee, or operator of the requirements that must be met when using public lands.</li> </ul>
<p><u>Management Actions</u></p> <ul style="list-style-type: none"> <li>The Special Resource Mitigation Guideline is intended for use only in site-specific situations where general mitigation guidelines will not adequately address the concern. The resource value, location, and specific restrictions must be clearly identified. A detailed plan addressing specific mitigation and special restrictions will be required prior to disturbance or development and will become a condition for approval of the permit, plan of development, or other use authorization.</li> </ul>

Sources:

Minerals: ROD, 2008 Rawlins RMP, Final EIS for the RFO (BLM 2008a).

Geological Hazards: ROD, 2008 Rawlins, Final EIS for the RFO Appendix 1-Wyoming BLM Mitigation Guidelines for Surface Disturbing and Disruptive Activities (BLM 2008a).

For impacts to mineral resources to be deemed significant the following would have to occur (BLM 2008a):

- Access to minerals is in whole or part precluded by the proposed CCSM project, and
- Aggregate (sand and gravel) demand of the proposed CCSM project results in shortages of materials causing the new mineral materials disposals.

The following assumptions were used in the impact analysis for mineral resources:

- Potentially developable mineral resources underlie the Application Area;
- Oil, natural gas, and unconventional hydrocarbon (coalbed and shale gas) resources may underlie the entire Application Area and are the only minerals considered in analysis of access to minerals;
- Minable coal resources may underlie portions of the Application Area, but the Kindt Basin has been considered an unlikely area of commercial coal development (BLM 2003a); and
- Geothermal, locatable (e.g., uranium), and saleable minerals have low occurrence potential in the Application Area and are not considered in the impact analysis.

For impacts involving geologic hazards to be deemed significant, the following would have to occur (BLM 2008a):

- Slope failure or the action of swelling clay that causes damage to project infrastructure.

The following assumptions were used in the impact analysis for geological hazards:

- The potential geological hazards that have been identified in the Application Area are landslides and bedrock containing bentonite layers with shrink-swell potential that may contribute to tower foundation problems; and
- Seismic hazards are considered to be low in the Application Area and were not considered in the impact analysis. No other geologic hazards are considered.

#### **4.3.1 Impacts to Geological and Mineral Resources from the No Action Alternative**

Under the No Action Alternative, present management of mineral resources would continue and no effects on access to oil and natural gas resources would occur other than the restraints placed upon the oil and gas industry in the 2008 Rawlins RMP ROD (2008a), BLM Onshore Oil and Gas Orders, the BLM Goldbook (USDOI and USDA 2006), and BMPs as recommended or imposed by the BLM, and individual lease stipulations.

Under the No Action Alternative, natural processes (movement of landslides) would occur and any adverse effects would impact existing infrastructure as may be present, mainly roads. Swelling clay potentially present in the bedrock would not present a hazard if left undisturbed.

#### **4.3.2 Impacts to Geological and Mineral Resources from Alternative 1R, Applicant Proposed Alternative**

##### **4.3.2.1 Mineral Resources**

Potential impacts to mineral resources from the Alternative 1R include:

- Limitation of access to resources resulting in loss of recovery of the resource. The loss in recovery would result in loss of revenue to royalty owners and loss of revenue in the form of fees and taxes to governmental entities including Carbon County, State of Wyoming, and the federal government.
- The demand for sand and gravel by the proposed CCSM project could create shortages in local supplies requiring new mineral materials disposals.
- It is possible that in the future, the coal resources within the alternative boundary would be commercially mineable and that project infrastructure may pose access limitations to the resource.

Potential impacts due to conflicts with oil and gas development are expected to be minor given the low potential for development of those resources within the alternative boundary. If oil and gas development were to occur, it would not necessarily be precluded by the proposed CCSM project as described below.

Access limitations could occur as a result of placement of wind turbines, power lines, and access roads such that they would interfere with the location and spacing of oil and gas wells. Potential access limitations would affect various oil and gas resources in different ways. Marginal conventional oil and natural gas wells or relatively shallow coal bed natural gas wells generally have to be vertical in order to reduce development costs and maintain commercial viability. Limitations caused by project infrastructure could have adverse effects on these types of oil and gas resources. However, the Wyoming Oil and Gas Conservation Commission has oil and gas rules that would effectively deal with potential land use conflicts by allowing exception locations, providing the applicant can show cause and demonstrate that waste (non-recovery) of oil and gas would occur without an exception.

However, potential access limitations would be less for other kinds of unconventional oil and gas resources. For shale gas and oil extracted from low-permeability rocks (such as the Niobrara and Mowry Formations) horizontal drilling is the primary and most efficient method of extraction. Oil and gas operators would be able to drill horizontal laterals up to several thousand feet in length. Laterals of such lengths would allow for surface locations of such wells to be spotted such that the infrastructure of the proposed project would not impede access to the resource. In Alternative 1R, it is proposed to build or upgrade 438 miles of roads in order to accommodate construction activities. Based on **Table 2-2**, Alternative 1R would need 2,800,000 yd<sup>3</sup> of aggregate material. This translates to approximately 4.5 million tons of aggregate (1.6 tons per cubic yard; Glover 2003). PCW proposes to import the aggregate materials from distant sources by railroad and not rely on local sources (PCW 2012).

Given the present unlikely commercial feasibility of mining the coal seams in the alternative boundary, it is still possible that the seams may become economically mineable in the future at which time the project infrastructure may pose restrictions to access of the coal resource. If and when coal seam extraction becomes commercially viable, then access to the resource can be worked out between the applicant and the mineral owner. However, given the marginal nature of the resource (52 million tons of surface and underground resource), it is not likely that the proposed project would have a near-term or long-term impact on coal resource development. Powder River Basin coal production in 2008 was 444 million tons per year (tpy) and is projected to increase so that by 2030, production is expected to be 468 million tpy (lower production scenario). The high production scenario estimates 615 million tpy by 2030. Given the low cost and high volume production of coal from the Powder River Basin, it is not likely that the small volumes of underground resources in the alternative boundary could be developed commercially. There are no federal coal leases in the alternative boundary at present and no lease sales were anticipated during the 2008 Rawlins RMP planning period.

According to the guidance Commercial Wind Energy Development in Wyoming: A Guide for Landowners Second Edition June 2011 (Jakle et al. 2011), the Wyoming Wind Energy Rights Act of 2011 (WERA) “specifies that mineral rights are dominant to wind energy rights. This means a mineral interest owner has a right to be notified prior to state or county permitting. Since the wind rights are part of the surface estate, the wind developer and mineral owner are required to reasonably accommodate their respective activities, as is required with any surface activities.” Since use conflicts involving private mineral rights and surface rights are outside of the scope of this assessment, the BLM recommends that mineral owners should reach an agreement or agree to a process whereby the mineral owners and the wind energy facility operator would deal with potential conflicts that may arise in the future.

#### 4.3.2.2 Geological Hazards

Potential impacts from geological hazards include:

- During construction, disturbance of landslide material causing instability resulting in slope failure and causing damage to project infrastructure;
- During operation, wind turbine towers built too close to the edge of landslide-formed escarpments so that erosion of slopes would result in loss of support and subsequent damage to project infrastructure; and
- During operation, areas underlain by Cretaceous shale that contains swelling clay or bentonite. Could undermine foundational support of wind turbine towers. Areas with bentonite layers that are subject to fluctuating shallow-water table would be especially at risk to impacts due to swelling soil.

Potential landslide effects would most likely occur at the Miller Hill escarpment where landslides have been documented. Approximately 8 acres of landslide deposits would be affected during construction and 1 acre in the long-term. Landslides have the potential to undermine tower foundations and roads and the effects could be severe.

The shrinking and swelling of bentonite layers in the bedrock could undermine tower foundations resulting in damage to concrete footings and ultimately loss of support. The formations most likely to contain bentonites are the Lewis Shale, Mowry Shale, Steele Shale, and the Thermopolis Shale. In the alternative boundary for Alternative 1R, these formations underlie approximately 396 acres.

### **4.3.3 Impacts to Geological and Mineral Resources from Alternative 2, Checkerboard Only**

#### **4.3.3.1 Mineral Resources**

Development on the Alternative 2 Checkerboard Only would result in potential impacts to mineral resources that would be similar to Alternative 1R, except that gravel resources required would be 19 percent greater than Alternative 1R.

#### **4.3.3.2 Geological Hazards**

Potential impacts due to landslides from Alternative 2 would be similar to Alternative 1R because the proposed development on Miller Hill is much the same and would occur in or adjacent to landslide areas. Approximately 5 acres of landslide deposits would be affected in the short-term and 1 acre in the long-term. In the alternative boundary for Alternative 2, there are approximately 548 acres of bentonite-prone bedrock.

### **4.3.4 Impacts to Geological and Mineral Resources from Alternative 3, No Miller Hill or South Sierra Madre**

#### **4.3.4.1 Mineral Resources**

Alternative 3 would not substantially reduce potential impacts to minerals with the elimination of Miller Hill and Sierra Madre portions of the project because the development would be shifted to eastern portions of the Chokecherry segment as compared to Alternative 1R. The gravel resources required would be 9 percent greater than Alternative 1R.

#### **4.3.4.2 Geological Hazards**

Alternative 3 would eliminate potential impacts due to landslides, with less than 1 acre of disturbance to landslide deposits in the short-term and long-term within the alternative boundary (**Figure 3.3-4**). In the alternative boundary for Alternative 3, there are approximately 729 acres of bentonite-prone bedrock.

### **4.3.5 Impacts to Geological and Mineral from Alternative 4, Private Lands Only**

#### **4.3.5.1 Mineral Resources**

Development of the Alternative 4 would result in potential impacts to mineral resources that would be similar to Alternative 1R, except that gravel resources required would be 16 percent greater than Alternative 1R.

#### **4.3.5.2 Geological Hazards**

Potential impacts due to landslides from Alternative 4 would be similar to Alternative 1R. Approximately five acres of landslide deposits would be affected in the short-term and one acre in the long-term. In the alternative boundary for Alternative 4, there are approximately 793 acres of bentonite-prone bedrock.

### **4.3.6 Mitigation and Mitigation Effectiveness**

#### **4.3.6.1 Mineral Resources**

No mitigation is proposed for resource conflicts associated with oil and gas exploration and development.

If there is a demand for sand and gravel resources, more gravel pits would have to be permitted. However, no specific mitigation is recommended.

#### **4.3.6.2 Geological Hazards**

##### Landslides

Where landslide hazards are present for each of the alternatives, tower, road, and transmission line locations in landslide deposits or close enough to be affected by active landslide areas should be reviewed for slope instability. If potential hazards are present, moving proposed facilities would be the best option unless moving a wind turbine would reduce its potential efficiency. If avoidance is not possible, then implementation of appropriate site-specific geotechnical design and landslide mitigation measures is recommended.

##### Swelling Soil

All of the alternatives contain some portion of area that is underlain by bedrock that potentially contains bentonite layers. It is recommended that appropriate geotechnical testing be conducted at each tower site to determine the risk for swelling soil. If swelling soil is present, standard engineering practice in construction of tower foundations to mitigate the risk should be implemented.

Avoidance of landslide areas would be highly effective in reducing the risk of slope instability hazards. Implementation of appropriate site-specific geotechnical design would also be highly effective in reducing risks associated with landslides and swelling soil hazards.

#### **4.3.7 Residual Impacts**

A very small risk of facility damage would remain after implementation of landslide avoidance and geotechnical design measures for slope instability and swelling soils.

#### **4.3.8 Irreversible and Irretrievable Commitment of Resources**

There would be no irreversible and irretrievable commitments of resources concerning mineral or geological resources.

#### **4.3.9 Relationship between Local Short-term Uses and Long-term Productivity**

There would be no long-term effects in regard to mineral productivity or area geology.

#### 4.4 Impacts to Lands and Realty

This section describes potential impacts to land use and realty management that may result from the proposed project. The land use impact study area is limited to the applicable, which is dominated by a checkerboard ownership pattern with alternating sections of public (BLM) and private lands, and some state-owned lands. Landownership for each alternative is described in Section 3.4.

In general, land use impacts would be minor and not significant. Potential impacts to current land use activities of wildlife, grazing, visual, recreation, and limited mineral leasing are described in other appropriate sections of Chapter 4.0. There is considerable overlap between potential land use impacts and other resource impacts; therefore, any potential impacts to these resources are discussed in their respective section only and are not repeated here. For example, potential impacts to grazing are discussed in Section 4.6.

Multiple land use-related issues were identified during the public scoping process. Most of the scoping issues that were categorized as land use also are related to other resource areas, including range, recreation, socioeconomics, and transportation, among others. As such, some of the scoping issues listed below also may be referenced in other appropriate sections of Chapter 4.0. In general, the land use-related issues identified during the scoping process can be categorized in several broad statements, including (BLM 2009c):

- The EIS should evaluate the effects of reduced access to public lands for recreation and potential limitations on extracting minerals from existing mineral leases.
- Concern about project impacts to the WGFD easements along the North Platte River from road upgrades.
- Induced residential growth or change in land use due to proposed road network.

More specifically, public scoping participants expressed concern about the potential loss of hunting opportunities, loss of access to public and state lands, impacts of utility corridors on terrestrial resources and residential areas, and impacts to grazing and the livestock industry (primarily from increased traffic and decreased palatability of vegetation/forage from traffic-related dust). These specific land use-related scoping statements are addressed as follows:

- Potential impacts to grazing and the livestock industry are discussed in Section 4.6;
- Potential impacts to hunting opportunities, leases, and permits are discussed in Section 4.7;
- Potential impacts to access and roads are discussed in Section 4.10;
- Potential impacts to aesthetics and visual resources are discussed in Section 4.12; and
- Potential impacts to terrestrial resources are discussed in Section 4.14.

Federal regulations and planning documents, as well as Carbon County planning documents, provide legal and regulatory guidance related to land use and management within the CCSM project area. These include the 2008 Rawlins RMP, FLPMA, Minerals Leasing Act, and BLM CFRs 2800 and 2880. These plans and related management considerations are listed in **Table 4.4-1**.

The general method for identifying potential land use and realty included reviewing existing data sources, quantifying the extent to which the project would impact land use acreages, identifying conflicts with applicable land use plans and/or regulations, and identifying the lost opportunity for land tenure adjustments. Significance criteria were developed using these general methods as a guideline, as well as from issues identified through internal and public scoping. Potential land use impacts resulting from

**Table 4.4-1 Relevant Management Considerations for Land Use**

<b>2008 Rawlins RMP and ROD – Lands and Realty<sup>1</sup> (Vol. 1, Chapter 2, page 2-26)</b>	
<u>Management Goals</u>	<ul style="list-style-type: none"> <li>• Manage the acquisition, disposal, withdrawal, and use of public lands to meet the needs of internal and external customers (i.e., to respond to community needs for expansion and economic development and to preserve important resource values).</li> <li>• Improve management efficiency in areas of scattered or intermingled landownership patterns.</li> <li>• Review and evaluate the need and merits of current withdrawals.</li> </ul>
<u>Management Objectives</u>	<ul style="list-style-type: none"> <li>• Identify public lands available for acquisition, disposal, or withdrawal.</li> <li>• Develop and maintain a landownership pattern that will provide better access for management and protection of the public lands.</li> <li>• Respond to internal and external requests for land tenure adjustments (e.g., Recreation and Public Purpose Act actions, land sales, disposals, or exchanges).</li> <li>• Utilize appropriate actions (e.g., land tenure adjustments or easement acquisitions) to help solve problems related to intermixed landownership patterns.</li> <li>• Manage public lands to be consistent with goals and objectives of other resource programs.</li> <li>• Respond to internal and external requests (e.g., pipelines, access roads) for land authorizations.</li> </ul>
<b>Carbon County 2010 Comprehensive Land Use Plan (Chapter 8, page 89-90)</b>	
<u>Management Goals</u>	<ul style="list-style-type: none"> <li>• Achieve a sustainable balance between energy development, agriculture, and the environment.</li> </ul>
<u>Management Strategies</u>	<ul style="list-style-type: none"> <li>• Enhance the County government's capacity to monitor, comment on, and influence state and federal decisions on energy development projects.</li> <li>• Develop standards for wind energy, transmission lines, and other alternative energy development so they can occur with limited environmental impact on traditional land uses, humans, and wildlife.</li> <li>• Support mitigation of impacts created by energy industries where available science supports mitigation.</li> </ul>
<u>Management Actions</u>	<ul style="list-style-type: none"> <li>• Conduct regular meetings between the Board of County Commissioners, BLM, DEQ, USFS, and other governmental bodies to share information about pending energy projects.</li> <li>• Participate in comment periods for environmental impact statements.</li> <li>• Research best practices information for developing standards that encourage alternative energy development and transmission lines with the least environmental impact.</li> <li>• Prepare standards for adoption as part of the County Zoning Resolution.</li> <li>• Maintain dialog with energy industries by regular meetings to keep communication current.</li> <li>• Identify issues that need mitigation and develop solutions for resolution with industry leaders.</li> <li>• If available science indicates a proposed energy project cannot mitigate its impacts, Carbon County should either not approve the project or else recommend that it be located in a more suitable location.</li> </ul>

**Table 4.4-1 Relevant Management Considerations for Land Use**

<b>Carbon County Zoning Resolution (Chapter V, Section 5.2; page 47)</b>
<u>Regulations Applying To Certain Uses and Districts</u>
<u>Wind Turbines</u>
<ul style="list-style-type: none"> <li>• Placement of a private wind turbine requires application for a building permit.</li> <li>• Wind turbines must conform to the following minimum yard (or set back) requirements; the wind turbine must be located 1.5 times the total height of the tower, turbine, and blade (to the top of such blade when in vertical position) away from any adjacent buildings or overhead utility lines.</li> <li>• The bottom of the blade when in a vertical position must have at least 17 feet (17') of clearance from ground level.</li> </ul>
<b>FLPMA – Land Use Planning<sup>2</sup></b>
The BLM shall, “develop, maintain, and, when appropriate, revise land use plans which provide by tracts or areas for the use of the public lands. Land use plans shall be developed for the public lands regardless of whether such lands previously have been classified, withdrawn, set aside, or otherwise designated for one or more uses.”
<b>43 CFR Part 2800 – ROWs under FLPMA and PART 2880 – ROWs under the Mineral Leasing Act<sup>3</sup></b>
It is BLMs objective to grant ROWs under the regulations in this part to any qualified individual, business, or government entity and to direct and control the use of ROWs on public lands in a manner that: <ul style="list-style-type: none"> <li>(a) Protects the natural resources associated with public lands and adjacent lands, whether private or administered by a government entity;</li> <li>(b) Prevents unnecessary or undue degradation to public lands;</li> <li>(c) Promotes the use of ROWs in common considering engineering and technological compatibility, national security, and land use plans; and</li> <li>(d) Coordinates, to the fullest extent possible, all BLM actions under the regulations in this part with state and local governments, interested individuals, and appropriate quasi-public entities.</li> </ul>

<sup>1</sup> BLM 2008a.<sup>2</sup> BLM 2001.<sup>3</sup> National Archives and Records Administration 2009.

each of the alternatives were identified using this general methodology. Potential impacts were considered significant if they met one of the following significance criteria:

- Substantial conflict with existing land uses, including current land use authorizations;
- Substantial change in land use designations;
- Substantial reduction in opportunity for ROW authorizations and development activities; and
- Substantial reduction in the opportunity for land tenure adjustments.

Finally, the land use impact analysis was conducted using the following assumptions:

- The project would not limit existing access to public lands. Public access is already limited due to public-private checkerboard land ownership pattern.
- Grazing is the primary land use in the Alternative Areas (ranch lands), and recreation, visual resources, and wildlife habitat are important land use values. However, impacts to these resources are fully described in their respective section and referred to in this section.

#### 4.4.1 Impacts to Lands and Realty from the No Action Alternative

Under the No Action Alternative, there would be no anticipated impacts to lands and realty as the proposed project would not be developed. Under this alternative, the BLM would prohibit development on public lands, as well as access to private lands for the wind energy project through denial of permits. The combined result of these restrictions would be to prohibit the development of the project as proposed.

#### 4.4.2 Impacts to Land Use from Alternative 1R, Applicant Proposed Alternative

##### 4.4.2.1 Land Ownership and Use

###### Land Ownership

Under the Alternative 1R, up to 1,000 WTGs and associated facilities (e.g., transmission lines, roads, etc.) would be developed throughout Alternative 1R (**Figure 2-3**) on both public and private lands. The proposed project would be almost entirely located within the existing TOTCO ranch boundary. As shown in **Table 4.4-2**, 7 percent of the Alternative 1R disturbance would occur on non-TOTCO and non-BLM lands. Approximately 1 percent of the Alternative 1R disturbance would occur outside of TOTCO ranch boundary on state lands and public land within a small portion of the Upper Muddy Creek Watershed/Grizzly WHMA. **Table 2-1** summarizes how the project would use public, state, or private lands. In all cases, the proposed project would not be anticipated to affect the current ownership or land uses in these sections.

Over the long term operations and maintenance phase, the proposed project would occupy 545 acres, on less than 1 percent of the area within the Alternative 1R boundary. Operations and maintenance would not impact current land designations or ownership (including private residences and in-holdings), except in one location shown in **Table 4.4-2**. There would be no significant effect to land designations or ownership from potential development on public, state owned and private land. As such, significant changes in land ownership would not be anticipated.

##### 4.4.2.2 Land Use

Current land use authorizations for existing land uses consist of ROWs, easements, and leases for grazing, utilities, and oil and gas production. Construction activities would disturb 7,733 acres of land within the Alternative 1R boundary over the 8-year construction and reclamation period. Ground disturbance from construction activities is estimated to be a very small percentage (3.5 percent) of the total Alternative 1R boundary of 220,744 acres. Construction activities would take place concurrently in different locations within the Alternative 1R boundary. Road construction would occur across the entire Alternative 1R boundary in Year 1, and would be concentrated in specific development areas during Years 2-4.

The construction of the proposed CCSM project may displace grazing and recreation uses and other existing land uses in the Alternative 1R boundary, as evaluated in the appropriate resource sections of the document. These impacts would generally be short term and include ground disturbances, road and access closures, increased traffic, grazing area closures, and air quality, noise, recreation, and visual disturbances at private residences and in-holdings, but would not likely result in significant long-term changes in land use or any land use designations in the Alternative 1R area. Impacts to residential land uses from construction-related changes in air quality, noise, and visual disturbances are evaluated in the appropriate resource section. There would be no significant effect to the management of existing land uses through land use authorizations.

In the long term, the proposed CCSM project would be located on 0.7 percent of the Alternative 1R boundary, and its operation would not directly impact current land uses. There is currently very limited oil production and other mineral development within the alternative boundary. There would be no significant effect to oil production from the one producing well located in T19N R87W, Section 12, as the well would



**Table 4.4-2 Effects to Land Uses on Non-TOTCO and Non-BLM Lands<sup>1</sup>**

Area	Total Acres Impacted on Non-TOTCO/ Non-BLM Lands <sup>2</sup>	Percent of Non-TOTCO/ Non-BLM Lands Affected	Acres of Long-term Surface Disturbance on Non-TOTCO and Non-BLM Lands	Location	Facilities
					<p>Potential WTGs, access roads, and electrical collection lines on State lands as shown in the conceptual area of development for Alternative 1R (<b>Figure 2-3</b>). State lands include 9,600 acres used for grazing and recreation. Wind energy development on Wyoming state trust lands is under the jurisdiction of the State Board of Land Commissioners.</p>
Alternative 2		5	<p>Non-TOTCO – 42 State – 50</p>	<p>On or adjacent to small portions of privately owned lands in T20N R88W Section 13, T18N R88W Section 9, and T20N R87W Section 4.</p>	<p>While most project components would be sited on BLM-managed and TOTCO owned lands, several WTGs and/or project roads are proposed on or adjacent to private in-holdings within the TOTCO ranch boundary as shown in the conceptual area of development for Alternative 2 (<b>Figure 2-4</b>). Specifically, a project road would be sited within T20N R88W Section 13, and both WTGs and project roads would be sited within T18N R88W Section 9 and T20N R87W Section 4. Small portions of Section 9 are privately owned, and include residences. WTGs would not be constructed in buffers placed around residences in Section 9. A small in-holding in Section 4 includes a gravel quarry. WTGs would not affect the operation of the gravel pit.</p> <p>Haul road would cross State lands south of I-80. Other project components sited on state lands within development areas.</p>

**Table 4.4-2 Effects to Land Uses on Non-TOTCO and Non-BLM Lands<sup>1</sup>**

Area	Total Acres Impacted on Non-TOTCO/ Non-BLM Lands <sup>2</sup>	Percent of Non-TOTCO/ Non-BLM Lands Affected	Acres of Long-term Surface Disturbance on Non-TOTCO and Non-BLM Lands	Location	Facilities
Alternative 3	6,542	4	State – 33  Non-TOTCO – 15	State lands in T18N R86W Section 36. On or adjacent to small portions of privately owned lands in T20N R88W Section 13 and in T20N R87W Section 4.	WTGs would potentially be developed on state lands in T18N R86W Section 36. WTGs and/or project roads also are proposed in or adjacent to private in-holdings within TOTCO as shown in the conceptual area of development for Alternative 3 ( <b>Figure 2-5</b> ). Specifically, a project road would be sited within T20N R88W Section 13, and WTGs (3) would be sited within T20N R87W Section 4. Union Pacific owns Section 13. A small inholding in Section 4 includes a gravel quarry, which would not be affected by WTGs located nearby.
Alternative 4	1,575	7	WTGs on public lands or state lands would not be permitted under Alternative 4. Linear facilities such as roads and transmission lines would cross public and state lands.	T17N R88W Sections 24 and 2, T18N R86W Section 36, T18N R88W Section 9, T20N R88W Section 13, and T20N R87W Section 4.	A potential access road on T18N R86W Section 36. WTGs and/or project roads are proposed on or adjacent to several private in-holdings within the TOTCO boundary. Specifically, a project road would be sited within T20N R88W Section 13 and T20N R87W, and both WTGs and project roads would be sited within T18N R88W Section 9 and T17N R88W Sections 24 and 25. Small portions of Section 9 are privately owned and include residences. WTGs would not be constructed in buffers placed around the residences. All of Section 25 and most of Section 24 are exclusion areas because they are within a greater sage-grouse core breeding area.

<sup>1</sup> WTGs located on lands outside TOTCO boundary would be located on state lands.

<sup>2</sup> Includes all public lands not owned by the BLM and non-TOTCO private land not inside of alternative boundary.

be easily avoided during the siting of individual WTGs and associated infrastructure. Mineable coal resources may underlie portions of the alternative boundary, but the Kindt Basin has been considered an unlikely area of commercial coal development (BLM 2003a). There are no federal coal leases in the area at present and no lease sales are anticipated during the 2008 Rawlins RMP planning period. As evaluated in Section 4.3.2.1, it is possible that in the future, the coal resources in the area would be commercially mineable and that project infrastructure may pose access limitations to the resource. There is potential for small-scale impacts to the development of oil and gas resources at specific geographic areas, such as setback around wind turbine and ancillary facility sites, which may limit options for some surface locations of vertical oil and gas wells during the life of the project.

Proposed project components would be developed in only one section (T18N R88W, Section 9) of TOTCO that includes residences. WTGs would not be constructed in buffers placed around residences in Section 9, in accordance with HB0072; however, impacts to residential land uses from the operation of the project would consist of noise and visual intrusions, and are evaluated in the appropriate resource sections.

The internal haul road constructed in Year 1 of the construction phase would extend south from the RDF and construction trailer complex in the north through the center of Chokecherry and into the Sage Creek valley. There the road would split, with one segment going to Miller Hill and the other to Sage Creek Basin. The haul road would provide access to the major project components including the substations, operation and maintenance facilities, and the project laydown areas. The portion of the haul road in the Sage Creek valley is off-site because it is outside the Chokecherry and Sierra Madre development areas. The off-site haul road would be seven miles long, or 12 percent of the total 58-mile haul road, and would be located in the checkerboard. All private land crossed by the off-site haul road are owned by TOTCO. Impacts to land uses from the off-site haul road would include effects to grazing and recreation on the Overland Historic Trail, and are evaluated in the appropriate resource section. A site-specific POD would be developed for the internal haul road, including the off-site portion of the haul road, and would contain an engineering design with the necessary detail to evaluate and analyze site-specific impacts.

The proposed CCSM project would use the existing road network to access conceptual development areas. New access roads would be constructed from the internal haul road and other existing main roads to individual WTG sites in the conceptual areas. There would be no induced residential growth from new access roads, because these roads provide access primarily within the checkerboard land ownership area. Similarly, land uses would not change from the development of new access roads.

Localized land use impacts would not be anticipated from the placement of WTGs, utility corridors, and other project facilities.

The effects to land uses and access from the decommissioning of the project under Alternative 1R would be very similar to the impacts that would occur from construction activities. The Master Reclamation Plan (**Appendix D**) provides strategies to achieve the objective of final reclamation which would return the land to a condition approximating that which existed prior to disturbance with allowances for an improved and/or stable ecological condition, if possible. Upon decommissioning, land use impacts from construction and operation of the project would generally be reversible with successful reclamation, and thus, no permanent land use impacts would be anticipated from the project in Alternative 1R.

Construction, operation and decommissioning of the proposed CCSM project under Alternative 1R would not be expected to affect land uses, public land use designations, and current land use authorizations for these land uses. Wind power development is consistent with BLM Rawlins management direction for public lands (BLM 2008a), as well as Secretarial Order 3283 (DOI 2009).

#### **4.4.2.3 Land Ownership Adjustment**

Land tenure adjustments include land sales, disposals, or exchanges, in addition to ROW management, which is addressed in Section 4.4.2.4, and may be used to help solve problems related to intermixed

landownership patterns. Potential problems in the checkerboard include the management of resources and the mitigation of impacts to resources that affect intermingled public, private and state-owned lands. Minimizing or avoiding impacts as provided for in the BLM resource management objectives and BLM standard mitigation are not required for adjacent private lands in the checkerboard land ownership area. In addition, impacts to resources from proposed facilities and activities located on private and state lands also would affect resources and land uses on adjacent public lands. Implementing mitigation and monitoring strategies on public lands would be complicated by the inability of the BLM to provide similar management of resources on adjacent private lands. However, TOTCO currently owns 96 percent of private lands in the alternative boundary, and is an affiliate of PCW. All ACMs and BMPs proposed in the proponent's POD (summarized in Chapter 2.0 of this EIS) would be implemented on public and TOTCO-owned private land in Alternative 1R. ACMs and BMPs provided for resource impacts in the POD are compatible with BLM management objectives, and are summarized in **Appendix C**. Additional land owner adjustments would not be required in Alternative 1R to solve project-related impacts that occur in the checkerboard land ownership area. It would not be anticipated that the proposed project in the alternative boundary would affect any land tenure adjustments that may be required for other management actions.

No proposed facilities would be constructed or operated on identified BLM disposal lands, as all lands being considered for disposal within the alternative boundary are located outside of the Alternative 1R Chokecherry and Sierra Madre sites. There would be no impact to identified land ownership adjustments from the construction, operation, and decommissioning of Alternative 1R.

#### **4.4.2.4 Withdrawals/Classifications**

Current withdrawals in the alternative boundary include the Teton Reservoir Recreation Site. The reservoir is located outside of the Chokecherry and Sierra Madre sites. The Teton Reservoir Recreation site has been withdrawn from certain land and mineral laws to protect developed recreation and recreation opportunities such as fishing, and to provide for public safety. No facilities proposed for Alternative 1R would be located within the recreation site withdrawal area. There would be no impact to the resource values and public safety from the construction, operation, and decommissioning of Alternative 1R.

#### **4.4.2.5 ROWs and Leases**

As stated in the introduction to this section, the land use impact analysis was conducted using the assumption that the proposed CCSM project would not change the existing public access to public lands, which is limited due to public-private checkerboard land ownership pattern. Potential impacts to land tenure involve conflicts with ROWs or easements, which are located throughout the alternative boundary.

Access to public lands would temporarily be restricted in construction areas; once the construction phase is completed, access consistent with current restrictions would be restored to public lands. Public roads would remain open; however, traffic may experience temporary delays. These impacts are not expected to be significant and would only affect a small portion of the Alternative 1R boundary.

Over the long-term, the linear infrastructure associated with WTG development under Alternative 1R would be collocated within the disturbance of a new road network, and take advantage of existing road ROWs to the extent practicable. Construction and operation of the proposed CCSM project would be compatible with existing ROWs, as linear ROWs would generally provide opportunities to co-locate linear project facilities with existing roads and utilities, thereby reducing impacts to other resources. Areas designated as avoidance areas for ROWs would not be affected by proposed project construction and operation.

The public's current ability to access public lands in the alternative boundary, such as WGFD easements along the North Platte River, would not be impacted under Alternative 1R except during construction and

decommissioning for safety and security reasons. Temporary fencing would be installed around laydown areas, storage yards, and excavations during construction. Permanent fencing would be installed and maintained around electrical substations. Turbine tower access doors would be locked to prohibit public access.

An oil and gas lease located in T19N R87W, Section 12 (Chokecherry site) contains one well that was productive in 2010. The well site would easily be avoided during the construction of the proposed facilities in that section. The proposed CCSM project would not adversely affect the ability of the operator to continue the current use of the lease. Existing oil and gas leases have a right of reasonable access, so that there would be no limitation or restriction to future access to mineral resources.

**Table 4.4-2** summarizes acres of disturbance on Wyoming state-owned lands. The project proponent must comply with the Rules and Regulations adopted by the Board of Land Commissioners in accordance with Wyoming Statute (W.S.) 36-2-107 and W.S. 36-9-118, in the event that development occurs on, or it is necessary to traverse, state lands. W.S. 36-2-107 provides for public use of state lands. W.S. 36-9-118 provides for ROW for public conveyances. The proponent has submitted an application for a Wind Energy lease encompassing 8,115 acres to the Office of State Lands and Investments. It would not be anticipated that the proposed CCSM project would conflict with W.S. 36-2-107 and W.S. 36-9-118.

In the event that the siting of individual WTGs or other project components would conflict with current land tenure activities, additional access would be secured through site and route analyses. There would be no adverse impact to existing utilities and roads, or conflicts with the terms of existing ROWs and leases for these facilities from the construction, operation, and decommissioning of the proposed CCSM project. It would not be anticipated that the use of existing ROWs for the location of proposed linear infrastructure would change public access and land tenure in the area.

#### **4.4.2.6 Transportation and Utility ROW Corridors**

A portion of the designated West-wide (Section 368) energy corridor crosses through the Alternative 1R boundary in T21N R87W; Sections 32, 34, and 26, and T21N R84W, Sections 22 and 26. None of the designated corridor ROW is within the Chokecherry area of conceptual development. No Alternative 1R facilities would be within the designated energy corridor or within the I-80 and Rock Springs to Dave Johnson corridors.

The existing I-80 Corridor, the Rock Springs to Dave Johnson Corridor, and the designated west-wide energy corridor provide an adequate area and a de facto corridor for the placement and development of future ROWs, and are expected to satisfy future needs for energy transmission (BLM 2008a). There would be no conflict with existing and potential uses of these existing designated corridors from the construction, operation, and decommissioning of Alternative 1R.

#### **4.4.2.7 Wind Energy Exclusion and Avoidance Areas**

In accordance with the Rawlins ROD, Wind Energy Avoidance Area may be available for location of ROWs with special stipulations or mitigation measures. WTGs and ancillary facilities would not be sited in the Wind Energy Exclusion and Avoidance Areas of the North Platte River SRMA, CDNST SRMA, Historic Trails Management Area, and existing and new recreation sites (avoidance area). WTGs and ancillary facilities would be sited in the Upper Muddy Creek Watershed/Grizzly WHMA. The sensitive resource values that are the basis for the avoidance area designation for the WHMA are the Colorado River fish species unique to the Muddy Creek watershed, and crucial winter habitat for elk and mule deer. These areas are addressed in Section 3.15, and potential adverse effects and mitigation for these resources is further addressed in Section 4.15. Compliance with the stated goals, objectives, and actions for the Upper Muddy Creek Watershed/Grizzly WHMA and the overlapping Red Rim Grizzly WHMA are addressed in Section 4.14.

#### 4.4.2.8 BLM Special Management Areas

As required to meet management goals stated in the Rawlins ROD for historic trails, no facilities are proposed within 0.25 miles of the Overland Trail and the North Platte River SRMA or within the 0.25 mile wide CDNST SRMA. The applicant has committed to a 1-mile setback except in specific locations as discussed in **Appendix C**.

Potential impacts to the Overland Trail from construction, operation, and decommissioning activities are addressed in Section 4.2.

Potential impacts to the CDNST purpose as described in the 2009 CDNST Comprehensive Plan from construction, operation, and decommissioning activities are addressed in Section 4.7 and Section 4.12.

The conceptual area of development for Alternative 1R in the Sierra Madre site overlaps 1,037 acres of the Red Rim-Grizzly WHMA and 3,407 acres of the Upper Muddy Creek Watershed/Grizzly WHMA. Both WHMAs are managed with specific goals and objectives for wildlife habitat and fisheries that are different than the remainder of the WHMAs. The WHMAs within the conceptual area of development do not contain a significant amount of the ecological elements that either of the WHMAs were established to protect. These elements generally occur outside of the conceptual area of development; although there are potential impacts to wildlife habitat within and downstream of the WHMA area of interest from Alternative 1R. As analyzed in Section 4.14, Alternative 1R would not jeopardize the stated management objectives of the either WHMA in regards to potentially affected species. Impacts from water that may be extracted from the Upper Colorado watershed to use in construction activities would potentially contribute to the decline of fish populations. This type of impact does not coincide with the management goals for the Upper Muddy Creek Watershed/Grizzly WHMA and Red Rim-Grizzly WHMA for fisheries. At this time, the exact locations for water extraction have not been identified, but this information would be provided in subsequent NEPA and additional analysis for potential impacts to fisheries would be conducted.

#### 4.4.2.9 Lands with Wilderness Characteristics

The BLM determined that there are six inventory units that intersect the Application Area, three of which are intersected by the conceptual area of development for Alternative 1R. The initial desktop inventory and subsequent field inventory found that none of the inventory units meet LWC criteria. Therefore, the construction, operation, and decommissioning of the proposed CCSM project would not affect wilderness characteristics for any lands within the alternative boundary.

#### 4.4.2.10 State and Local Planning and Zoning

The Carbon County Comprehensive Land Use Plan and Zoning Regulations govern land uses on private lands in the Alternative boundary (Carbon County 2010). Wind power development is consistent with the Land Use Plan objectives for future land uses in the Alternative boundary, which identifies the development of wind power through a future land use overlay. Alternative 1R is currently within a Ranching, Agriculture, Mining Zone, requiring a conditional use authorization from the county to develop the proposed CCSM project. There would be no significant effect to land use designations and no change in the zoning designation of private lands from the proposed CCSM project. Construction, operation and decommissioning of the proposed CCSM project under Alternative 1R would not conflict with future land use categories and the current zoning designation for private land.

#### 4.4.3 Impacts to Land Use from Alternative 2, Checkerboard Only

Under Alternative 2, up to 1,000 WTGs and associated facilities would be developed throughout the checkerboard portion of the Alternative 2 area (**Figure 2-4**) on both public and private lands. Unlike Alternative 1R, no WTGs or associated facilities would be sited south of T18N.

Construction activities would disturb 8,569 acres (4.6 percent) of the 187,465 acre Alternative 2 boundary over the five-year construction period. There would be no significant changes in landownership from construction activities in the Alternative 2 boundary.

Over the long-term operations and maintenance phase, the proposed CCSM project would occupy 1,629 acres on slightly less than 1 percent of the Alternative 2 boundary. Alternative 2 would disturb 84 acres (5 percent) more than Alternative 1R over the long-term. As shown in **Table 4.4-2**, 5 percent of Alternative 2 is located on non-TOTCO and non-BLM lands. The proposed CCSM project would not be anticipated to affect the current ownership or land uses in these sections.

Alternative 2 impacts to existing land use authorizations, BLM and Carbon County land use designations, the opportunity for ROW authorizations and development activities, and the opportunity for land tenure adjustments would be the same as described for Alternative 1R.

The haul road under Alternative 2 would extend west from the proposed RDF located south of I-80 to WY 71/CCR401, then parallel the east side of the WY 71/CCR401 corridor to Sierra Madre and Sage Creek Basin. This portion of the haul road would be off-site, or located outside of the Alternative 2 boundary, for a 15 mile distance, accounting for 24 percent of the 63-mile haul road. The route follows the highway corridor, to avoid the middle of Sage Creek Basin. The off-site Alternative 2 route would cross the checkerboard through public, private and state owned land, and is mostly outside of the area between the RDF and WY 71/CCR401. The Alternative 2 haul road was routed to avoid underground utilities to the extent possible and to avoid existing structures in T21 N, R87W Section 31.

The off-site haul road would cross state-owned lands in T21N R87W Sections 27 and 28 that contain the State penitentiary. The road would be approximately 1,445 feet south of the penitentiary to avoid design constraints that include the steep terrain to the south and existing underground utilities. The haul road would cross private non-TOTCO lands outside of the alternative boundary; including vacant lands owned by Union Pacific Resources (Anadarko), and along the section line between lands owned by Anadarko and the City of Rawlins (T21N R87W, Section 30). The City of Rawlins lands include a water treatment facility and associated reservoir. A private parcel in T21N R87W, Section 26 is zoned for agriculture, and includes a residential structure (Carbon County Assessor 2012). Other private lands crossed by the haul road are adjacent to the WY 71/CCR401 ROW outside of the alternative boundary, and are owned by Anadarko (Carbon County Assessor 2012).

The Alternative 2 haul road and transmission line would not be compatible with residential land uses in Section 26, or with the penitentiary. There would be potential conflicts with access to state and private lands from construction activities, as well as conflicts associated with heavy truck traffic in the vicinity of these land uses. The sights and sounds of construction activities and haul road traffic would be an adverse impact to the occupants of the structure in Section 26; as well as occupants of the penitentiary for the duration of the construction phase. In addition, there are potential security concerns related to construction activities in close proximity to the penitentiary. Noise impacts to residential land uses and the penitentiary are evaluated in Section 3.16. Visual impacts to these uses are evaluated in Section 3.12.

The Alternative 2 haul road as well as the internal transmission line would cross private, state, and municipal lands not under the control or ownership of TOTCO or PCW. Eminent domain statutes for Wyoming prohibit the condemnation of property for the erection, placement or expansion of collector systems associated with commercial facilities generating electricity from wind, as provide by W.S. Section 1-26-815(d) (Justia US Law 2011). Therefore, there would be no power of eminent domain to obtain the required ROWs necessary to construct the transmission line and the haul road, which also is associated with the generation of power. There would be a potential that PCW would not be able to obtain the necessary ROWs from affected private, state and municipal landowners to construct the haul road under this alternative.

A portion of the off-site haul road west of the RDF is located partially within the West-wide energy corridor and the Rock Springs – Dave Johnson designated ROW corridor. The haul road was sited to avoid steep slopes and existing utilities within designated corridors. Depending on required off-sets for the transmission line located along the haul road; there is potential that the designated corridors would not provide an adequate area for the placement and development of future ROWs, and would constrain the ability to satisfy future needs for energy transmission. There would be potential conflict with existing and potential uses of the corridor from the construction, operation, and decommissioning of Alternative 2.

The Alternative 2 haul road along WY 71/CCR401 is less than 0.25 mile from the Teton Reservoir Recreation Site. The Teton Reservoir Recreation site has been withdrawn from development to protect recreation opportunities, and to provide for public safety. The intrusion of the sights and sounds of haul road activities would adversely affect the quality of recreation opportunities at the reservoir. Impacts to public safety would include conflicts with haul road traffic from visitor vehicles entering and exiting the reservoir site at the junction of the reservoir access road and the haul road. The impacts to recreation and public safety at the Teton Reservoir Recreation Site would not be compatible with the protection of resources established by the withdrawal.

The Alternative 2 conceptual area of development in Sierra Madre would not be located within any part of the Red Rim-Grizzly WHMA; however, a small part of the development area would be within the Upper Muddy Creek Watershed/Grizzly WHMA. The impacts to the WHMA would be very similar to those described for both WHMAs under Alternative 1R. Alternative 3 would not jeopardize the stated management objectives of the Upper Muddy Creek Watershed/Grizzly WHMA in regards to potentially affected species. Impacts to the Colorado River watershed are the same as summarized for Alternative 1R, and described in greater detail in Section 4.14.

There would be no other significant impacts to existing land use and management activities from the construction, operation, and decommissioning of Alternative 2.

#### **4.4.4 Impacts to Land Use from Alternative 3, No Miller Hill or South Sierra Madre**

Under Alternative 3, up to 1,000 WTGs and associated facilities (e.g., transmission lines, roads) also would be developed in the alternative boundary (**Figure 2-5**), on both public and private land, though their placement would be restricted to a smaller area compared to Alternative 1R. The WTGs and associated facilities would be concentrated in the Chokecherry portion of the Alternative 3 area, as well as the eastern (east of T18N R88W) section of the Sierra Madre (Sage Creek Basin) portion. None of the proposed CCSM project would be sited within the western portion of the Sierra Madre and the Miller Hill areas (public lands in these areas are primarily classified as wind avoidance areas in the 2008 Rawlins RMP) to help avoid effects to visual resources and the Upper Muddy Creek Watershed/Grizzly WHMA.

Construction activities would disturb 8,115 acres (5.0 percent) of the 161,139-acre alternative boundary over the five-year construction period. There would be no significant changes in landownership from construction activities in the alternative boundary.

Over the long term operations and maintenance phase, the proposed CCSM project would occupy 1,506 acres on slightly less than 1 percent of the Alternative boundary. Alternative 3 would disturb 39 acres (2.5 percent) less than Alternative 1R.

As shown in **Table 4.4-2**, 4 percent of the alternative boundary is located on non-TOTCO and non-BLM owned lands. There is a potential that a small number of WTGs also would be located outside of TOTCO boundary as described for Alternative 1R, and shown in the conceptual area of development for Alternative 3 (**Figure 2-5**). The proposed CCSM project would not be anticipated to affect the current ownership or land uses in these sections.

The Alternative 3 haul road would be 40 miles long. Approximately 9 miles (23 percent) of the haul road would be located off-site in the Sage Creek Valley. All private land crossed by the interior and off-site haul road are owned by TOTCO. The off-site haul road route would be in a different location than the Alternative 1R route, but would cross through the checkerboard in the Sage Creek valley; and would have very similar impacts to land uses, land ownership, ROWs and leases, transportation and utility corridors. Impacts from the off-site haul road would include effects to grazing and recreation on the Overland Historic Trail, and are evaluated in the appropriate resource section.

The Alternative 3 conceptual area of development does not include any part of the Red Rim-Grizzly WHMA and the Upper Muddy Creek Watershed/Grizzly WHMA. Alternative 3 would not jeopardize the stated management objectives of the Upper Muddy Creek Watershed/Grizzly WHMA in regards to potentially affected species. Impacts to the Colorado River watershed would be the same as summarized for Alternative 1R, and are described in greater detail in Section 4.14.

Alternative 3 impacts to existing land use authorizations, BLM and Carbon County land use designations, the opportunity for ROW authorizations and development activities, and the opportunity for land tenure adjustments are the same as described for Alternative 1R.

There would be no other significant impacts to existing land use and management activities from the construction, operation, and decommissioning of Alternative 3.

#### **4.4.5 Impacts to Land Use from Alternative 4, Private Lands Only**

In general, the anticipated land use impacts (e.g., changes to land uses, designations, and/or ownership) under Alternative 4 would be similar to those previously described in both Alternative 1R. However, the impact (i.e., development of the project) to BLM-managed lands within the alternative boundary would be considerably less, since no more than 846 WTGs would be sited on private lands only. Access roads and transmission lines would still be located on public lands. The checkerboard land ownership would present challenges similar to those described for Alternative 1R, as access roads and collector lines would be located on public and private lands.

Construction activities would disturb 8,195 acres (3.7 percent) of the 220,919-acre alternative boundary over the five-year construction period. There would be no significant changes in landownership from construction activities in Alternative 4. The impacts of the haul road, including construction traffic on the haul road, would be similar to the impacts described for Alternative 1R.

Over the long-term operations and maintenance phase, the proposed CCSM project would occupy 1,541 acres on less than 1 percent of the Alternative 4 boundary. Alternative 4 would disturb 4 acres less than Alternative 1R.

As shown in **Table 4.4-2**, 7 percent of the Alternative 4 area is located on non-TOTCO and non-BLM owned lands. As displayed on the conceptual area of development for Alternative 4 (**Figure 2-6**), the WTGs and associated facilities would be concentrated on private lands only within the alternative boundary, including both the CCSM areas. The proposed CCSM project would not be anticipated to affect the current ownership or land uses in these sections.

The Alternative 4 haul road would be 38 miles long. Approximately 8 miles (21 percent) of the haul road would be located off-site in the Sage Creek Valley. All private land crossed by the interior and off-site haul road are owned by TOTCO. The off-site haul road route would be in a different location than the Alternative 1R route, but crosses through the checkerboard in the Sage Creek valley; and would have very similar impacts to land uses, land ownership, ROWs and leases, transportation and utility corridors. Impacts from the off-site haul road would include effects to grazing and recreation on the Overland Historic Trail, and are evaluated in the appropriate resource section.

The Alternative 4 conceptual area of development in Sierra Madre would not be located within any part of the Red Rim-Grizzly WHMA; however, a small part of the development area would be within the Upper Muddy Creek Watershed/Grizzly WHMA. The impacts to the WHMA would be very similar to those described for both WHMAs under Alternative 1R. Alternative 4 would not jeopardize the stated management objectives of the Upper Muddy Creek Watershed/Grizzly WHMA in regards to potentially affected species. Impacts to the Colorado River watershed are the same as summarized for Alternative 1R, and described in greater detail in Section 4.14.

Alternative 4 impacts to other existing land use authorizations, BLM and Carbon County land use designations, the opportunity for ROW authorizations and development activities, and the opportunity for land tenure adjustments would be the same as described for Alternative 1R.

No other significant impacts to existing land use and management activities from the construction, operation, and decommissioning impacts were identified.

#### **4.4.6 Mitigation and Mitigation Effectiveness**

Since land use impacts from all action alternatives are anticipated to be minor, no other mitigation measures are needed at this time for land use impacts.

#### **4.4.7 Residual Impacts**

No significant impacts were identified for land ownership and use, tenure adjustments, withdrawals/classifications, ROWs and leases, ROW corridors, and state and local planning and zoning; therefore, there are no residual impacts from the proposed CCSM project under any action alternative. Grazing and recreation uses may be displaced during the construction and reclamation period. Recreation, visual, and wildlife impacts occur in special management areas, as evaluated in the appropriate resource sections.

#### **4.4.8 Irreversible and Irretrievable Commitment of Resources**

While development of the proposed CCSM project would result in an irretrievable commitment of land use in specific locations, these areas would be reclaimed upon decommissioning of the project so the commitment of resources is reversible. Further, operation of the project is generally compatible with other existing productive land uses (e.g., grazing, mineral extraction). As such, irretrievable commitments associated with land use in the alternative boundaries are not significant. There would be no irreversible commitments of land use resources.

#### **4.4.9 Relationship between Local Short-term Uses and Long-term Productivity**

There are no land use-related short-term uses that would significantly affect the long-term productivity of land uses.

## 4.5 Impacts to Paleontological Resources

The methodology used in assessing potential impacts to paleontological resources involved the identification of the potential for paleontological resources in the applicable alternative boundary based on the PFYC system and assessed the need for project specific protective measures. The study area for paleontological resources are the areas within the alternative boundaries and an indeterminate area adjacent to construction activities where formations with medium to high potential are at risk to indirect impacts. Relevant management considerations are shown in **Table 4.5-1**.

**Table 4.5-1 Relevant Management Considerations for Paleontological Resources**

<b>2008 Rawlins RMP and ROD – Paleontological Resources</b>
<p><u>Management Objectives</u></p> <ul style="list-style-type: none"> <li>• Maintain the integrity of the scientific value of paleontological resources.</li> <li>• Reduce imminent threats from natural or human-caused deterioration, or potential conflict with other resource uses.</li> <li>• Promote stewardship, conservation, and appreciation of paleontological resources.</li> </ul>
<p><u>Management Goals</u></p> <ul style="list-style-type: none"> <li>• Identify paleontological resources by defining priority inventory areas based on probability of occurrence of high-value resources.</li> <li>• Assess the need for project or site-specific treatment plans or other protective measures in areas of high risk for development or at high risk for adverse effects.</li> <li>• Develop, maintain, and encourage opportunities for scientific research of paleontological resources.</li> <li>• Provide educational opportunities and public outreach programs.</li> <li>• Develop and maintain interpretation of paleontological resources in areas of high public interest and access.</li> </ul>
<p><u>Management Actions</u></p> <ul style="list-style-type: none"> <li>• Paleontological resources will be managed to protect their important scientific values. Area closures, restrictions, or other mitigation requirements for the protection of paleontological values will be determined on a case-by-case basis.</li> <li>• Collecting of scientifically significant vertebrate fossils by qualified paleontologists is allowed by permit only.</li> <li>• Manage paleontological resources to meet the Wyoming Standards for Healthy Rangelands.</li> <li>• Develop interpretive facilities (such as signs, kiosks, and developed areas) at specific localities with high paleontological values on a case-by-case basis.</li> <li>• Collection of fossils from public lands is allowed with some restrictions, depending on the significance of the fossils. Hobby collection of common invertebrate or plant fossils by the public is allowed in reasonable quantities using hand tools.</li> <li>• Utilize on-the-ground survey prior to approval of surface disturbing activities or land disposal actions for Class 4 and Class 5 formations to avoid resource-bearing strata on a case-by-case basis. Monitor during surface disturbing activities in potential resource bearing strata on a case-by-case basis. Survey and monitor on a case-by-case basis following discovery for Class 3 formations.</li> </ul>

Source: ROD, 2008 Rawlins RMP Final EIS for the RFO p. 2-24. BLM 2008a.

Impacts to paleontological resources would be considered significant if destruction or loss of scientifically important fossils occurred either through direct actions of the proposed project or indirect effects of increased access resulting in the theft or destruction of fossil resources.

Assumptions used in the analysis include the following:

- Bedrock formations are present in all the alternatives that have the potential to contain high value paleontological resources.
- The analysis considers high- to medium-potential formations.
- High-potential formations considered in this analysis include Cloverly-Morrison-Sundance combined unit and Niobrara Formation (PFYC rank 5) (**Table 3.5-2**).
- Medium potential formations considered in this analysis include the Lewis Shale, Mesaverde Group, Steele Shale, Frontier Formation, Mowry Shale, Thermopolis Shale, and Chugwater Formation (PFYC rank 3) (**Table 3.5-2**).
- Documented fossil sites are located within the conceptual areas of development.

**Table 2.14** summarizes and compares the potential impacts of the alternatives.

#### **4.5.1 Impacts to Paleontological Resources from the No Action Alternative**

Current management of the area would continue as directed by the 2008 Rawlins RMP EIS/ROD (BLM 2008). None of the proposed activities would occur under the No Action Alternative. Therefore, adverse impacts to paleontological resources may occur as the result of ongoing geological processes and disturbance through unauthorized collecting at currently accessible outcrops. The discovery and/or loss of potential fossil resources through the implementation of the proposed CCSM project would not occur.

#### **4.5.2 Impacts to Paleontological Resources from Alternative 1R, Applicant Proposed Alternative**

Potential impacts to fossil resources during construction of the proposed CCSM project would be both direct and indirect. Direct impacts include the destruction or loss of scientifically important fossil resources as a result of construction activities. In Alternative 1R, approximately 6,533 acres of formations with medium to high (PFYC Classes 3-5) potential for important fossil resources would be at risk for direct impacts. Indirect impacts during construction and operation would involve damage or loss of fossil resources due to the unauthorized collection of scientifically important fossils by construction workers or the public due to increased access to fossil localities near construction areas. Beyond the area of direct impacts is an indeterminate area adjacent to construction activities where formations with medium to high potential are at risk to indirect impacts. Adverse impacts to important fossil resources would be long-term and severe since fossils removed or destroyed are lost to science. It is possible that the proposed CCSM project would have the beneficial impact that ground disturbance activities might result in the discovery of important fossil resources. It would not be anticipated that operation of the facility would have impacts to paleontological resources unless maintenance activities were to occur outside of previously disturbed areas.

#### **4.5.3 Impacts to Paleontological Resources from Alternative 2, Checkerboard Only**

In Alternative 2, approximately 7,502 acres of formations with medium to high potential for important fossil resources would be at risk for direct impacts. An indeterminate area close to construction having formations with medium to high potential is at risk to indirect impacts.

#### 4.5.4 Impacts to Paleontological Resource from Alternative 3, No Miller Hill or South Sierra Madre

In Alternative 3, approximately 7,545 acres of formations with medium to high potential for important fossil resources would be at risk for direct impacts. An indeterminate area close to construction having formations with medium to high potential is at risk to indirect impacts.

#### 4.5.5 Impacts to Paleontological Resources from Alternative 4, Private Lands Only

In Alternative 4, approximately 7,258 acres of formations with medium to high potential for important fossil resources would be at risk for direct impacts. An indeterminate area close to construction having formations with medium to high potential is at risk to indirect impacts. Impacts for Alternative 4 would be similar to Alternative 1R; however, since the development would primarily take place on private lands, federal management of the resource would only take place where facility construction would have to cross public land. The at-risk potential resource for direct and indirect impacts would be similar to Alternative 1R.

#### 4.5.6 Mitigation and Mitigation Effectiveness

The 2008 Rawlins RMP specifies certain management actions be taken with regard to paleontological resources and those actions of relevance to this project include the following:

- “Paleontological resources will be managed to protect their important scientific values. Area closures, restrictions, or other mitigation requirements for the protection of paleontological values will be determined on a case-by-case basis.”
- “Collecting of scientifically significant vertebrate fossils by qualified paleontologists is allowed by permit only.”
- “Utilize on-the-ground survey prior to approval of surface disturbing activities or land disposal actions for Class 4 and Class 5 formations to avoid resource-bearing strata on a case-by-case basis. Monitor during surface disturbing activities in potential resource bearing strata on a case-by-case basis. Survey and monitor on a case-by-case basis following discovery for Class 3 formations.”

In addition to the aforementioned management actions that apply to ground disturbing activities in the RFO, the following specific mitigation measures would be applied to this project to reduce the impacts to paleontological resources:

**PALEO-1:** If any vertebrate fossils or scientifically important fossils are discovered during construction operations on federal lands, the permittee shall cease activities immediately and notify the BLM so the agency can determine the significance of the discovery. The BLM shall evaluate or have evaluated such discoveries and shall notify the permittee what action shall be taken with respect to such discoveries. Additionally, PCW also would contract with a qualified paleontologist approved by the BLM who shall be on call during all construction periods and available to travel to the site within 24 hours following notice of a discovery, and that the on-call paleontologist shall consult with the BLM to reach agreement on the significance of the discovery within 24 hours following arrival at the site by the on-call paleontologist. The BLM will then promptly notify PCW as to what actions shall be taken.

**PALEO-2:** Any fossils recovered on federal lands during the assessment of paleontological resources will be prepared in accordance with standard professional paleontological techniques. The fossils will be curated in a BLM-approved facility. A report on the findings and significance of the salvage program, including a list of the recovered fossils, will be prepared following completion of the program. A copy of this report will accompany the fossils, and a copy will be submitted to the Wyoming Museum, University of Wyoming.

**Effectiveness:** The mitigation measures described above, combined with the relevant management actions noted above from the 2008 Rawlins RMP, would be effective in reducing the potential impacts to paleontological resources. The mitigation measures are only applicable on federal lands.

#### **4.5.7 Residual Impacts**

Even if construction monitoring is implemented, some scientifically valuable fossils may be disturbed and lost during excavation and grading over the large number of miles of roads that are expected to be built. As a consequence, there would be a small incremental loss of fossil material that would be offset by the material that is recovered and preserved for scientific study purposes.

#### **4.5.8 Irreversible and Irretrievable Commitment of Resources**

The destruction or loss of scientifically important fossils would be an irreversible and irretrievable commitment of resources.

#### **4.5.9 Relationship between Local Short-term Uses and Long-term Productivity**

Issues concerning the relationship between local short-term uses and long-term productivity are not relevant to paleontological resources.

**4.6 Impacts to Range**

The impacts study area for range resources includes the portion of allotments within the applicable alternative boundary. The range resource within the Application Area is managed with the goal to maintain or enhance livestock grazing opportunities and rangeland health. This overall range goal conflicts with the proposed project objective of developing the affected rangelands as sites for installation of wind generation facilities. This conflict is generated from the endeavors that have been made by the BLM, WGFD, LSRCD, MCRMG, NRCS, and TOTCO to improve rangeland health to properly functioning conditions; specifically standards #2 – Riparian/Wetland Health and #4 – Wildlife/T&E of the Standards and Guidelines Assessments (also see Section 3.6.4).

Impacts to range resources from the proposed CCSM project could result from physical surface disturbance and human activities associated with each of the alternatives. These impacts may be linked to soil and vegetation loss during construction activities, effectiveness of reclamation activities, weed control, dust control from roads and other barren surfaces, vehicle collisions with livestock, damage to fences and other range improvements, and increased access for recreational use by the public. These types of impacts may result in reduced forage availability (loss of AUMs), direct mortality to livestock, or increased costs and difficulty for managing livestock on the affected allotments. The primary concerns among these various potential impacts were voiced during the public scoping process as the issues listed below:

- Loss of palatable forage and the effects on livestock in terms of available AUMs of forage;
- Loss of palatable forage as a result of fugitive dust emissions from road use during construction and operation;
- Increased grazing pressures within riparian areas and available water sources as a result of loss or reduction of palatable forage;
- Potential conflict between livestock on the subject allotments and the increased volume of project related traffic in the area during construction and operation; and
- Potential conflict between grazing permittees, agricultural producers, and landowners both within and near the CCSM project.

The BLM's management goal, objectives, and actions for managing rangelands for livestock grazing to address these issues are listed in **Table 4.6-1** (BLM 2008a).

**Table 4.6-1 Relevant Management Considerations for Range**

<b>2008 Rawlins RMP and ROD – Livestock Grazing</b>
<p><u>Management Goal</u></p> <ul style="list-style-type: none"> <li>• Maintain and/or enhance livestock grazing opportunities and rangeland health.</li> </ul>
<p><u>Management Objectives</u></p> <ul style="list-style-type: none"> <li>• Maintain, restore, and enhance livestock grazing to meet Wyoming Standards for Healthy Rangelands (BLM 2008a – Appendix 8) and achieve allotment objectives.</li> <li>• Encourage grazing permittees and the interested public to participate with the BLM to monitor and evaluate rangeland health to determine appropriate management actions.</li> <li>• Utilize livestock grazing management techniques (BLM 2008a – Appendix 19) to maintain vegetation communities and ecosystem functions, in consultation and coordination with the grazing permittees and with participation by the interested public. Utilize data collected from scientifically based inventory and monitoring techniques to support decisions that authorize livestock grazing levels and management.</li> </ul>

**Table 4.6-1 Relevant Management Considerations for Range**

<b>2008 Rawlins RMP and ROD – Livestock Grazing</b>
<ul style="list-style-type: none"> <li>• When feasible and, providing that Wyoming Standards for Healthy Rangelands are met, maintain and/or increase AUM levels for livestock grazing.</li> <li>• Identify opportunities and implement range and vegetation improvement projects to sustain and enhance livestock grazing and meet Wyoming Standards for Healthy Rangelands in cooperation, consultation, and coordination with the grazing permittees and the interested public (BLM 2008a – Appendix 19).</li> <li>• Mitigate direct, indirect, and cumulative livestock forage losses and impacts to livestock grazing (including impacts on livestock grazing operational capabilities and production performance) where opportunities exist.</li> </ul>
<p><u>Management Actions (those relevant to the Application Area)</u></p> <ul style="list-style-type: none"> <li>• The entire Application Area is available for livestock grazing. Areas such as developed recreation areas, wetland/riparian spring exclosures, and sensitive plant species exclosures will be excluded from grazing.</li> <li>• The current amounts, kinds, and seasons of livestock grazing use will be authorized until monitoring, field observations, ecological site inventory, or other data acceptable to the BLM indicates a grazing use adjustment is needed, as appropriate. Requests for changes in season-of-use or kind-of-livestock will be considered on a case-by-case basis. Any decision regarding changes in grazing use will include cooperation, consultation, and coordination with the grazing permittees and the interested public.</li> <li>• Manage livestock grazing to meet the Wyoming Standards for Healthy Rangelands.</li> <li>• The BLM will work closely with operators and others to determine the most appropriate methods for achieving the desired plant community, in addition to meeting the Standards for Healthy Rangelands (BLM 2008a – Appendices 8 and 19).</li> <li>• Grazing systems and range improvements will be designed to achieve the management goals for livestock grazing and to achieve and maintain healthy rangelands.</li> </ul>

Source: BLM 2008a – Chapter 2, Section 2.3.6, pp 2-18 through 2-19.

Impacts to rangeland health and livestock grazing would be considered potentially significant under the following situations:

- Project development and operational activities cause a reduction in forage availability (i.e., surface disturbance or access constraints) that results in greater than 10 percent permanent reduction in animal unit months available for livestock grazing within any given allotment.
- Project development or operational activities reduce or eliminate the opportunity to run the livestock of choice.

Assumptions for the analysis of range/livestock grazing impacts include the following:

- Potential project-related disturbance will be depicted on GIS files and quantified within the alternative boundaries for use in the analysis of impacts to various resources including range.

- Although a variety of vegetation communities, each with different forage characteristics, occur throughout the alternative boundaries, the range impact analysis will generally assume uniform forage characteristics across most allotments. Where individual allotments encompass broad elevational ranges, the allotments will be partitioned into upper and lower zones to reflect the major differences in vegetation composition and productivity. Therefore, potential loss of AUMs will be based directly on affected acreage and the average AUMs per acre within each allotment or elevational zone of the allotment.
- Livestock operations within the alternatives boundaries can be adjusted in a manner (through pasture rotation, etc.) to reduce conflicts with major construction activities in specific portions of the area if construction is staged in different segments of the area. Where necessary, it is assumed that the larger operators within the area will cooperate with smaller operations to provide flexibility of grazing resources during periods of construction activities. The possibility of using the Grizzly allotment as a grass bank to facilitate such flexibility has been raised and may represent a potential mitigation measure.
- Projections of existing and project-related vehicle traffic will be available through the transportation section of the NEPA document and traffic-related impacts to livestock grazing can be extrapolated in direct proportion to projected changes in traffic volume.
- Initial reclamation efforts (topsoil replacement and seeding) will occur on all temporary disturbance areas within 1 year after disturbance activities have ceased. It is assumed that for most of the area, effective reclamation will be achieved within a period of 5 years to vegetation conditions providing livestock forage comparable to the pre-disturbance conditions.
- All access roads will be closed and reclaimed during project decommissioning, subject to the determination by the BLM, State of Wyoming, and private landowners.
- Calculation of AUMs affected by disturbance areas within the Pine Grove/Bolten allotment are calculated on the basis of the federal acreage determined by GIS analysis and federal AUM data as provided through personal communication with the BLM (Newberry 2010b):
  - Chokecherry portion of Pine Grove/Bolten Allotment = 10 acres/AUM
  - Sierra Madre portion of Pine Grove/Bolten Allotment = 6 acres/AUM
- Calculation of AUMs affected by disturbance areas on other allotments are calculated on the basis of federal acreage and federal AUM data presented in Appendix 29 of the 2008 Rawlins RMP with resultant acres/AUM as shown in **Table 3.6-1**. It is assumed that these data are representative of each allotment as a whole.
- Calculation of AUMs affected by deposition of fugitive dust from traffic on unpaved roadways is based on an assumed effective width of deposition of 150 feet on both the downwind and upwind sides of the road, nominal wind speed of 10 mph, and vehicle speed of 25 mph for particles >130  $\mu\text{m}$ . This equates to an affected area of approximately 36.36 acres per mile of roadway. This method of calculation was adopted from the Atlantic Rim Natural Gas Project Final EIS (BLM 2006).
- Calculations of disturbance acreages are based on GIS data and may not add up to the total acreage within an alternative boundary due to the fact that only allotment impact acreage is being considered. Non-allotment impact acreage is not part of this discussion.

#### 4.6.1 Impacts to Range from the No Action Alternative

The No Action Alternative would involve the BLM's denial of the applicant's request to develop on public lands and their request for access to private lands for wind development. Therefore, the No Action Alternative would be a continuation of existing land uses in this area without any project-related development. To the extent that range impacts are occurring, albeit minor, from traffic on existing unpaved roads in the area and dust emissions related to such activity, such impacts would continue without change.

#### 4.6.2 Impacts to Range from Alternative 1R, Applicant Proposed Alternative

The primary impact to range from Alternative 1R during the construction phase includes surface disturbance of 7,680 acres of rangeland resulting in the temporary loss of approximately 969 AUMs of forage until effective reclamation is achieved on a portion of this area. PCW's phased construction sequence may benefit the vegetation reclamation process since top soils would not need to be stored for more than 1 year. This should improve the viability of the seed bed and enhance the re-establishment of new vegetation for livestock grazing. **Table 4.6-2** shows the expected distribution of this impact among the affected allotments. Grazing permit modifications would be addressed through separate NEPA actions and related decisions.

Additional rangeland impacts related to forage loss would occur as a result of dust deposition on vegetation along unpaved roads in the area of conceptual development. The effective width of affected area is assumed to be approximately 150 feet wide on either side of the road for deposition of particles larger than approximately <math>130\ \mu\text{m}</math> diameter. This width was selected on the basis of projected depositional characteristics for different sized particles as discussed in AP 42 (USEPA 1995) and professional judgment. This results in a potentially affected area of approximately 36.36 acres per mile of roadway. The degree to which dust deposition may reduce forage palatability would depend on several factors such as frequency and effectiveness of road watering or other dust control measures, frequency and timing of precipitation to wash dust from the vegetation, type and general condition of the affected plants, and availability of palatable forage elsewhere within the pasture. With construction of 438 miles of unpaved roads within affected allotments under Alternative 1R, the potentially affected area of vegetation amounts to approximately 15,853 acres or up to 2,000 AUMs if the entire area is rendered unpalatable. This loss would be distributed among the affected allotments as shown in **Table 4.6-2**. The haul road accounts for approximately 59 miles of the unpaved road mileage which equates to a loss of approximately 285 AUMs. This impact would occur exclusively within the Pine Grove/Bolten Allotment. The combination of losses incurred as a result of dust deposition, coupled with the direct disturbance (temporary) loss, represents approximately 9 percent of the currently available AUMs on the affected allotments within the alternative boundary. This does not qualify as a potentially significant impact to overall rangeland health and livestock grazing, but would be locally significant within individual pastures.

**Table 4.6-2 Alternative 1R Construction and Operation Impacts**

Allotments	Surface Disturbance	Percent Surface Acreage Disturbance	Dust Deposition/Unpaved Roads
<b>Construction</b>			
Cottonwood Draw	78 acres; 10 AUMs	4.8	4.4 miles; 21 AUMs
Grizzly	87 acres; 17 AUMs	1.2	5.1 miles; 37 AUMs
Middlewood Hill	29 acres; 6 AUMs	3.5	1.9 miles; 9 AUMs
Pine Grove/Bolten	7,323 acres; 915 AUMs	3.8	415 miles; 1,886 AUMs
Sage Creek	163 acres; 21 AUMs	0.6	9.8 miles; 47 AUMs
Sixteen Mile	No Loss	0.0	No Loss
Sulphur Springs	No Loss	0.0	No Loss
<b>Total</b>	<b>7,680 acres; 969 AUMs</b>	<b>3.4</b>	<b>438 miles; 2,000 AUMs</b>

**Table 4.6-2 Alternative 1R Construction and Operation Impacts**

Allotments	Surface Disturbance	Percent Surface Acreage Disturbance	Dust Deposition/Unpaved Roads
<b>Operation</b>			
Cottonwood Draw	12 acres; 2 AUMs	0.7	4.4 miles; 21 AUMs
Grizzly	14 acres; 3 AUMs	0.2	5.1 miles; 37 AUMs
Middlewood Hill	5 acres; 1 AUM	0.6	1.9 miles; 9 AUMs
Pine Grove/Bolten	1,478 acres; 185 AUMs	0.8	415 miles; 1,886 AUMs
Sage Creek	27 acres; 7 AUMs	<0.1	9.8 miles; 47 AUMs
Sixteen Mile	No Loss	0.0	No Loss
Sulphur Springs	No Loss	0.0	No Loss
<b>Total</b>	<b>1,536 acres; 198 AUMs</b>	<b>0.7</b>	<b>438 miles; 2,000 AUMs</b>

Along with the reduced palatability of forage, dust generated from roadways may contribute to respiratory problems for livestock and wildlife. Airborne dust is a common respiratory irritant for animals, particularly young animals. In cattle, it can contribute to viral and bacterial infections resulting in bovine respiratory disease (bronchial pneumonia, or “dust pneumonia”) which is frequently fatal in calves. Adult animals are typically less susceptible. Thus, the presence of dust from roadways and construction areas, particularly during the construction phase, may constrain the types and kinds of livestock (e.g., mature animals only) suitable for grazing these pastures.

The accumulation of dust on vegetation, particularly broad-leaved forbs with nearly horizontal leaf surfaces, also may reduce photosynthetic capability of the plants and thereby influence changes in the plant communities adjacent to the roadways over the long-term. As with the palatability effects, the degree of this influence would be affected by such factors as wind conditions, frequency of precipitation, and susceptibility of the various species involved. For example, some weedy species such as sunflower and cocklebur thrive in dusty roadside environments if adequate soil moisture is available for their growth. The area of impact to plant physiology and potential community composition is expected to be narrower than that considered above for palatability effects since a greater accumulation of dust on leaf surfaces is expected to be necessary for these impacts.

The above mentioned impacts related to dust deposition would occur in isolated construction areas due to PCW’s phased construction sequence. Isolating construction to smaller areas within a given period of time would potentially allow livestock operators to utilize larger portions of their pastures by rotating livestock away from areas that are near construction sites.

In addition to impacts to forage, losses from direct disturbance and from dust deposition, it is expected that the intensive construction activities would lead to changes in grazing patterns and possible avoidance of some water sources, thereby resulting in overutilization of areas remote from construction and underutilization of areas with heavy activity. These impacts are not expected to be uniformly distributed throughout an allotment, but instead would likely be more pronounced in some drainages than others.

Rangeland impacts during the project operations phase would be similar in nature to those discussed above but reduced in magnitude as portions of the disturbed surface from construction are revegetated.

The long-term (life-of-project) disturbance area to rangeland would be reduced to 1,536 acres, distributed among allotments as shown in **Table 4.6-2**. The length of unpaved roadways would remain at 438 miles, but traffic volumes would be expected to decrease substantially based on the limited level of routine monitoring and maintenance for the operating wind generation system. Thus, dust generation and loss of AUMs is expected to be substantially reduced on the long-term basis in comparison with the construction period, but the dispersion pattern would remain the same.

During the decommissioning phase of the project, areas remaining disturbed during the operations phase would be revegetated and returned to approximately pre-disturbance conditions. Reclamation procedures would include, but are not limited to, regrading, spreading of topsoil, and revegetation of all disturbed areas.

Risk of vehicle-livestock collisions would be closely related to the total number and diversity of personnel working on the project site. Likelihood of livestock collisions also would depend on the types and kinds of livestock in the area, since cow/calf pairs would be more at risk than yearlings. Thus the risk would be moderate during the construction phase, low during the operations phase, increasing during decommissioning, and return to pre-construction levels following decommissioning of the project. The risk of livestock-vehicle collisions during all phases of the project would be reduced by the posting and strict obedience of speed limit signs as shown in **Appendix C, Table C-3** under the Air – Dust Control section.

Risk of livestock losses due to straying as a result of fence or gate damage similarly would be greatest during the construction phase when numerous contractors are working on the site. This risk likely would return to near pre-construction levels during the operations phase when fewer personnel are conducting maintenance, monitoring, and occasional repairs. The risk would be similar to pre-construction conditions following decommissioning. Risk of livestock losses due to theft would be related to the accessibility of the area, particularly remote regions, during nighttime hours or periods of construction and operational inactivity. Thus, the risk likely would be highest during the operational phase of the project when maintenance activities are limited in frequency.

Road construction and other surface disturbances in those areas where noxious weeds and poisonous plants are present may contribute to further spread of these species. Although the POD includes BMPs regarding prevention of weed and poisonous plant introductions into the alternative boundary, additional precautions would be advisable for construction and maintenance activities in and around areas where known populations already exist. Introduction or expansion of weed populations in the alternative boundary also represents a threat for similar introduction into adjoining allotments. Known populations of poisonous plants include concentrations of halogeton (along pipeline ROWs and larkspur in the northern portion of the Chokecherry area and woody aster, which is a selenium accumulator, in the Sage Creek Basin. The threat of spreading and introducing noxious/invasive weeds would potentially be reduced as a result of PCW's phased construction sequence since construction would occur in isolated areas as opposed to a construction sequence plan where all of the proposed roads are constructed within a condensed time frame. The potential for spread of noxious/invasive weeds would still exist, but would include smaller areas within a given period of time.

Impacts to allotments adjoining the alternative boundary also would occur in relation to the enhanced road access provided by project development. This enhanced access into formerly remote areas could contribute to increased vandalism, fence damage; gates left open, and livestock straying or theft. The level of increased risk associated with such issues is impossible to estimate, but is not likely to be a serious problem for management of these adjoining allotments.

The portion of the Red Rim-Grizzly WHMA that overlaps with Alternative 1R contains five perennial tributaries that require a 500 foot avoidance buffer where no surface disturbing activities are permitted. This area is located within the Sierra Madre portion of the Alternative 1R boundary and consists of approximately 1,037 acres; however, these buffers reduce the potential construction area to 482 acres.

Within this potential construction area, approximately 68 acres would be impacted by temporary construction surface disturbances and 11 acres would be permanently displaced by project facilities.

The Upper Muddy Creek Watershed/Grizzly WHMA also would be impacted by temporary and permanent surface disturbance in the Sierra Madre portion of the Alternative 1R boundary. Temporary construction surface disturbances would be approximately 305 acres and permanent displacement would be approximately 50 acres.

#### 4.6.3 Impacts to Range from Alternative 2, Checkerboard Only

Rangeland surface disturbance under Alternative 2 would be 8,493 acres or an increase of approximately 10.6 percent over that associated with Alternative 1R (**Table 4.6-3**). This translates to a temporary loss of approximately 1,067 AUMs or an increased loss of 98 additional AUMs in comparison to Alternative 1R. This alternative would involve no surface disturbance within the Sage Creek allotment; all activity would be within the Pine Grove/Bolten allotment. PCW's phased construction sequence may benefit the vegetation reclamation process since topsoils would not need to be stored for more than 1 year. This should improve the viability of the seed bed and enhance the re-establishment of new vegetation for livestock grazing. Grazing permit modifications would be addressed through separate NEPA actions and related discussions.

Dust deposition on vegetation would be associated with 483 miles of unpaved roadway, an increase of approximately 10.5 percent above Alternative 1R. This translates to a loss of 2,201 AUMs or an increased loss of 201 additional AUMs in comparison with Alternative 1R. The off-site haul road accounts for approximately 63 miles of the unpaved road mileage which equates to a loss of approximately 303 AUMs. This impact would potentially affect 18 more AUMs than Alternative 1R and would occur exclusively within the Pine Grove/Bolten Allotment. The combination of losses incurred as a result of dust deposition, coupled with the direct disturbance (temporary) loss, represents approximately 10 percent of the currently available AUMs on the affected allotments within the alternative boundary. This assumes that the effects of fugitive dust deposition render the forage vegetation in the maximum area unpalatable. Although a portion is temporary, this level of impact does meet the criteria of a significant impact to livestock grazing operations. The permanent reduction of AUMs equates to 7.5 percent of the currently available AUMs on the affected allotments within the alternative boundary.

Along with the reduced palatability of forage, dust generated from roadways may contribute to respiratory problems for livestock and wildlife. Airborne dust is a common respiratory irritant for animals, particularly young animals. In cattle, it can contribute to viral and bacterial infections resulting in bovine respiratory disease (bronchial pneumonia, or "dust pneumonia"), which is frequently fatal in calves. Adult animals are typically less susceptible. Thus, the presence of dust from roadways and construction areas, particularly during the construction phase, may constrain the types and kinds of livestock (e.g., mature animals only) suitable for grazing these pastures.

**Table 4.6-3 Alternative 2 Construction and Operation Impacts**

Allotments	Surface Disturbance	Percent Surface Acreage Disturbance	Dust Deposition/ Unpaved Roads
<b>Construction</b>			
Cottonwood Draw	61 acres; 10 AUMs	3.8	3.8 miles; 23 AUMs
Grizzly	No Loss	0.0	No Loss
Middlewood Hill	37 acres; 7 AUMs	4.5	2.4 miles; 17 AUMs
Pine Grove/Bolten	8,364 acres; 1,046 AUMs	10	473.9 miles; 2,154 AUMs

**Table 4.6-3 Alternative 2 Construction and Operation Impacts**

<b>Allotments</b>	<b>Surface Disturbance</b>	<b>Percent Surface Acreage Disturbance</b>	<b>Dust Deposition/ Unpaved Roads</b>
Sage Creek	2 acres; 1 AUM	<0.1	0.1 miles; 1 AUM
Sixteen Mile	29 acres; 3 AUMs	27.1	1.7 miles; 6 AUMs
Sulphur Springs	No Loss	0.0	No Loss
<b>Total</b>	<b>8,493 acres; 1,067 AUMs</b>	<b>3.7</b>	<b>483 miles; 2,201 AUMs</b>
<b>Operation</b>			
Cottonwood Draw	10 acres; 2 AUMs	0.6	3.8 miles; 23 AUMs
Grizzly	No Loss	0.0	No Loss
Middlewood Hill	6 acres; 1 AUM	0.7	2.4 miles; 17 AUMs
Pine Grove/Bolten	1,591 acres; 265 AUMs	1.9	473.9 miles; 2,154 AUMs
Sage Creek	No Loss	0.0	0.1 miles; 1 AUM
Sixteen Mile	8 acres; 1 AUM	7.5	1.7 miles; 6 AUMs
Sulphur Springs	No Loss	0.0	No Loss
<b>Total</b>	<b>1,615 acres; 269 AUMs</b>	<b>0.7</b>	<b>483 miles; 2,201 AUMs</b>

The accumulation of dust on vegetation, particularly broad-leaved forbs with nearly horizontal leaf surfaces, also may reduce photosynthetic capability of the plants and thereby influence changes in the plant communities adjacent to the roadways over the long-term. As with the palatability effects, the degree of this influence would be affected by such factors as wind conditions, frequency of precipitation, and susceptibility of the various species involved. For example, some weedy species such as sunflower and cocklebur thrive in dusty roadside environments if adequate soil moisture is available for their growth. The area of impact to plant physiology and potential community composition is expected to be narrower than that considered above for palatability effects since a greater accumulation of dust on leaf surfaces is expected to be necessary for these impacts.

The above mentioned impacts related to dust deposition would occur in isolated construction areas due to PCW's phased construction sequence. Isolating construction to smaller areas within a given period of time would potentially allow livestock operators to utilize larger portions of their pastures by rotating livestock away from areas that are near construction sites.

Effects on grazing patterns and use of water sources would occur as with Alternative 1R, but would be distributed differently based on the different areas of construction activity in this alternative.

Risk of vehicle-livestock collisions would be similar to Alternative 1R since the total traffic volumes in each project phase would be similar to that alternative.

Risk of livestock losses due to straying or theft would be similar to Alternative 1R since the levels of construction and operational activities would be similar to that alternative.

The potential for the introduction and spread of noxious weeds would be the same as for Alternative 1R since the construction and operational activities would be similar.

The Upper Muddy Creek Watershed/Grizzly WHMA would be impacted by temporary and permanent surface disturbance in the Sierra Madre portion of the Alternative 2 boundary. Temporary construction surface disturbances would be approximately 166 acres and permanent displacement would be approximately 26 acres.

#### 4.6.4 Impacts to Range from Alternative 3, No Miller Hill or South Sierra Madre

Rangeland surface disturbance under Alternative 3 would be 7,779 acres or an increase of approximately 1.2 percent over that associated with Alternative 1R (**Table 4.6-4**). This translates to a loss of approximately 977 AUMs or an increased loss of 8 additional AUMs in comparison to Alternative 1R. This alternative would involve no surface disturbance within the Sage Creek allotment; all activity would be within the Pine Grove/Bolten Allotment. PCW's phased construction sequence may benefit the vegetation reclamation process since top soils would not need to be stored for more than 1 year. This should improve the viability of the seed bed and enhance the re-establishment of new vegetation for livestock grazing. Grazing permit modifications would be addressed through separate NEPA actions and related discussions.

**Table 4.6-4 Alternative 3 Construction and Operation Impacts**

Allotments	Surface Disturbance	Percent Surface Acreage Disturbance	Dust Deposition/ Unpaved Roads
<b>Construction</b>			
Cottonwood Draw	56 acres; 9 AUMs	3.5	3.6 miles; 21 AUMs
Grizzly	No Loss	0.0	No Loss
Middlewood Hill	37 acres; 7 AUMs	4.5	2.4 miles; 18 AUMs
Pine Grove/Bolten	7,669 acres; 959 AUMs	4.0	448.7 miles; 2,039 AUMs
Sage Creek	1 acre; 0 AUMs	<0.1	No Loss
Sixteen Mile	16 acres; 2 AUMs	14.9	1.4 miles; 5 AUMs
Sulphur Springs	No Loss	0.0	No Loss
<b>Total</b>	<b>7,779 acres; 977 AUMs</b>	<b>3.4</b>	<b>460 miles; 2,083 AUMs</b>
<b>Operation</b>			
Cottonwood Draw	9 acres; 2 AUMs	0.6	3.6 miles; 21 AUMs
Grizzly	No Loss	0.0	No Loss
Middlewood Hill	6 acres; 1 AUM	0.7	2.4 miles; 18 AUMs
Pine Grove/Bolten	1,228 acres; 154 AUMs	0.6	448.7 miles; 2,039 AUMs
Sage Creek	No Loss	0.0	No Loss
Sixteen Mile	3 acres; 0 AUMs	2.8	1.4 miles; 5 AUMs
Sulphur Springs	No Loss	0.0	No Loss
<b>Total</b>	<b>1,246 acres; 157 AUMs</b>	<b>0.5</b>	<b>460 miles; 2,083 AUMs</b>

Dust deposition on vegetation would be associated with 460 miles of unpaved roadway, an increase of approximately 4.6 percent above Alternative 1R. This translates to a loss of 2,083 AUMs or an increased loss of 83 additional AUMs in comparison with Alternative 1R. The off-site haul road accounts for approximately 40 miles of the unpaved road mileage which equates to a loss of approximately 193 AUMs. This impact would affect 92 fewer AUMs than Alternative 1R and would occur exclusively within the Pine Grove/Bolten Allotment. The combination of losses incurred as a result of dust deposition, coupled with the direct disturbance loss, represents approximately 9.3 percent of the currently available AUMs on the portion of the Pine Grove/Bolten Allotment within the alternative boundary. As stated for Alternative 1R, this level of disturbance would be significant within individual pastures.

Along with the reduced palatability of forage, dust generated from roadways may contribute to respiratory problems for livestock and wildlife. Airborne dust is a common respiratory irritant for animals, particularly young animals. In cattle, it can contribute to viral and bacterial infections resulting in bovine respiratory disease (bronchial pneumonia, or “dust pneumonia”) which is frequently fatal in calves. Adult animals are typically less susceptible. Thus, the presence of dust from roadways and construction areas, particularly during the construction phase, may constrain the types and kinds of livestock (e.g., mature animals only) suitable for grazing these pastures.

The accumulation of dust on vegetation, particularly broad-leaved forbs with nearly horizontal leaf surfaces, also may reduce photosynthetic capability of the plants and thereby influence changes in the plant communities adjacent to the roadways over the long term. As with the palatability effects, the degree of this influence would be affected by such factors as wind conditions, frequency of precipitation, and susceptibility of the various species involved. For example, some weedy species such as sunflower and cocklebur thrive in dusty roadside environments if adequate soil moisture is available for their growth. The area of impact to plant physiology and potential community composition is expected to be narrower than that considered above for palatability effects since a greater accumulation of dust on leaf surfaces is expected to be necessary for these impacts.

The above mentioned impacts related to dust deposition would occur in isolated construction areas due to PCW’s phased construction sequence. Isolating construction to smaller areas within a given period of time would potentially allow livestock operators to utilize larger portions of their pastures by rotating livestock away from areas that are near construction sites. Effects on grazing patterns and use of water sources would occur as with Alternative 1R, but would be distributed differently based on the different areas of construction activity in this alternative.

Risk of vehicle-livestock collisions would be similar to Alternative 1R since the total traffic volumes in each project phase would be similar to that alternative.

Risk of livestock losses due to straying or theft would be similar to Alternative 1R since the levels of construction and operational activities would be similar to that alternative.

The potential for the introduction and spread of noxious weeds would be the same as for Alternative 1R since the construction and operational activities would be similar.

#### **4.6.5 Impacts to Range from Alternative 4, Private Lands Only**

Rangeland surface disturbance under Alternative 4 would be 7,861 acres or an increase of approximately 2.4 percent over that associated with Alternative 1R, but all tower installations, and the majority of surface disturbance, would occur on private lands rather than the combination of public and private lands involved in the other alternatives (**Table 4.6-5**). This translates to a loss of 995 AUMs or an increased loss of 26 additional AUMs in comparison to Alternative 1R. PCW’s phased construction sequence may benefit the vegetation reclamation process since top soils would not need to be stored for more than 1 year. This should improve the viability of the seed bed and enhance the re-establishment of new vegetation for livestock grazing. Grazing permit modifications would be addressed through separate NEPA actions and related decisions.

**Table 4.6-5 Alternative 4 Construction and Operation Impacts**

<b>Allotments</b>	<b>Surface Disturbance</b>	<b>Percent Surface Acreage Disturbance</b>	<b>Dust Deposition/ Unpaved Roads</b>
<b>Construction</b>			
Cottonwood Draw	25 acres; 4 AUMs	1.4	2.0 miles; 12 AUMs
Grizzly	No Loss	0.0	No Loss
Middlewood Hill	No Loss	0.0	No Loss
Pine Grove/Bolten	7,727 acres; 966 AUMs	4.0	480.7 miles; 2,185 AUMs
Sage Creek	93 acres; 23 AUMs	0.4	3.7 miles; 34 AUMs
Sixteen Mile	16 acres; 2 AUMs	<0.1	1.4 miles; 5 AUMs
Sulphur Springs	No Loss	0.0	No Loss
<b>Total</b>	<b>7,861 acres; 995 AUMs</b>	<b>3.5</b>	<b>488 miles; 2,236 AUMs</b>
<b>Operation</b>			
Cottonwood Draw	5 acres; 1 AUM	0.3	2.0 miles; 12 AUMs
Grizzly	No Loss	0.0	No Loss
Middlewood Hill	No Loss	0.0	No Loss
Pine Grove/Bolten	1,268 acres; 159 AUMs	0.6	480.7 miles; 2,185 AUMs
Sage Creek	9 acres; 2 AUMs	<0.1	3.7 miles; 34 AUMs
Sixteen Mile	3 acres; 0 AUMs	<0.1	1.4 miles; 5 AUMs
Sulphur Springs	No Loss	0.0	No Loss
<b>Total</b>	<b>1,285 acres; 162 AUMs</b>	<b>0.6</b>	<b>488 miles; 2,236 AUMs</b>

Dust deposition on vegetation would be associated with 488 miles of unpaved roadway, an increase of approximately 11.7 percent above Alternative 1R. This translates to a loss of 2,236 AUMs or an increased loss of 236 additional AUMs in comparison with Alternative 1R. The off-site haul road accounts for approximately 38 miles of the unpaved road mileage which equates to a loss of approximately 188 AUMs. This impact would occur exclusively within the Pine Grove/Bolten Allotment. The combination of losses incurred as a result of dust deposition, coupled with the direct disturbance loss, represents approximately 10 percent of the currently available AUMs on the affected allotments in the alternative boundary. This assumes that the effects of fugitive dust deposition render the forage vegetation in the maximum area unpalatable. Although a portion is temporary, this level of impact does meet the criteria of a significant impact to livestock grazing operations. The permanent reduction of AUMs equates to 7.3 percent of the currently available AUMs on the affected allotments within the alternative boundary.

Along with the reduced palatability of forage, dust generated from roadways may contribute to respiratory problems for livestock and wildlife. Airborne dust is a common respiratory irritant for animals, particularly young animals. In cattle, it can contribute to viral and bacterial infections resulting in bovine respiratory disease (bronchial pneumonia, or “dust pneumonia”) which is frequently fatal in calves. Adult animals are typically less susceptible. Thus, the presence of dust from roadways and construction areas,

particularly during the construction phase, may constrain the types and kinds of livestock (e.g., mature animals only) suitable for grazing these pastures.

The accumulation of dust on vegetation, particularly broad-leaved forbs with nearly horizontal leaf surfaces, also may reduce photosynthetic capability of the plants and thereby influence changes in the plant communities adjacent to the roadways over the long-term. As with the palatability effects, the degree of this influence would be affected by such factors as wind conditions, frequency of precipitation, and susceptibility of the various species involved. For example, some weedy species such as sunflower and cocklebur thrive in dusty roadside environments if adequate soil moisture is available for their growth. The area of impact to plant physiology and potential community composition is expected to be narrower than that considered above for palatability effects since a greater accumulation of dust on leaf surfaces is expected to be necessary for these impacts.

The above mentioned impacts related to dust deposition would occur in isolated construction areas due to PCW's phased construction sequence. Isolating construction to smaller areas within a given period of time would potentially allow livestock operators to utilize larger portions of their pastures by rotating livestock away from areas that are near construction sites.

Effects on grazing patterns and use of water sources would occur as with Alternative 1R, but would be distributed differently based on the different areas of construction activities in this alternative.

Risk of vehicle-livestock collisions would be similar to Alternative 1R since the total traffic volumes in each project phase would be similar to that alternative.

The potential for the introduction and spread of noxious weeds would be the same as for Alternative 1R since the construction and operational activities would be similar.

The Upper Muddy Creek Watershed/Grizzly WHMA would be impacted by temporary and permanent surface disturbance in the Sierra Madre portion of the Alternative 4 boundary. Temporary construction surface disturbances would be approximately 56 acres and permanent displacement would be approximately 12 acres.

Risk of livestock losses due to straying or theft would be similar to Alternative 1R since the levels of construction and operational activities would be similar to that alternative.

#### **4.6.6 Mitigation and Mitigation Effectiveness**

All action alternatives would incorporate ACMs and BMPs described in Chapter 2.0 and found in **Appendix C**. Mitigation measure GEN-1, from the Draft EIS, is now part of the alternatives analysis in the Final EIS as it was included as an ACM by the applicant in the January 2012 revised POD (PCW 2012a).

**Range-1:** Coordinate construction schedules and ranching operations to allow sequencing of pasture use to the extent practicable within the Pine Grove/Bolten allotment and other affected allotments (Cottonwood Draw, Middlewood Hill, Grizzly, McCarty Canyon, and Sage Creek) in a manner to minimize conflicts between grazing and construction activities.

**Effectiveness:** Keeping livestock away from the primary construction sites would reduce the potential for vehicle/livestock collisions and loss of livestock from straying through gates left open or fences left down during construction activities. Shifts away from cow-calf operations may be considered necessary in pastures affected by heavy construction activity based on potential dust impacts to young animals.

The Pine Grove/Bolten allotment is the only allotment that comes close to the 10 percent disturbance significance criteria. Because both PCW and TOTCO are wholly owned affiliates of The Anschutz Corporation, the involved parties would be responsible for negotiating compensation.

#### **4.6.7 Residual Impacts**

The Air-Dust Control applicant-committed BMP's would reduce the impacts of dust generated by construction activities. The Phased Construction Mitigation Sequence may enable the operators of larger allotments to coordinate their pasture rotations to avoid cow-calf grazing near construction areas and mitigation measure Range-1 also would help to reduce potential conflicts between livestock operators and construction activities. Livestock operators may consider adjusting away from cow-calf operations in pastures affected by heavy construction activity based on potential dust impacts to young animals that are more susceptible to Bovine Respiratory Disease.

#### **4.6.8 Irreversible and Irretrievable Commitment of Resources**

The anticipated impacts to the range resource are not considered irreversible. The forage production lost during the construction and operation phases of the project would be irretrievable, but the reduced production levels would be reversible following decommissioning of the project.

#### **4.6.9 Relationship between Local Short-term Uses and Long-term Productivity**

Forage productivity would be reduced during the life of the project (30 years or greater, but most pronounced during the construction phase), but could be restored through effective reclamation of all disturbed areas following project decommissioning.

**4.7 Impacts to Recreation**

Recreation is one of the primary uses within the CCSM project area. In general, none of the alternatives would directly impact recreation use areas within the impacts study area; the primary impact would be a change in the quality of recreational experiences from potential degradation of visual resources. Access to some dispersed use opportunities may be limited during the construction phase and potentially increased during operations. Development of the project would substantially change the general landscape character of the area (in particular, when viewed from some recreation sites and use areas), and recreationists may choose to avoid the project area during construction and/or operations. This change is anticipated to result in significant short-and long-term effects to visual resources and would significantly degrade the recreational experiences of some visitors to the area, including to CDNST and North Platte River users (Section 4.12).

While the impact analysis considers all recreation resources within the applicable alternative boundary, as well as surrounding recreation sites and use areas that are generally within the larger visual resource area (Section 4.12), the focus is on those recreation sites, use areas, and activities that are located or occur within the alternative boundary or where the visitor experience may be affected as a result of the proposed CCSM project. That said, the visitor experience in adjacent areas (outside of the alternative boundary) would most likely be influenced by the scenic effect of the proposed project. The visual resource impacts study area extends 30 miles from proposed project facilities as shown in **Figure 4.12-1**. Since visual resources and associated project impacts are discussed in Section 4.12, including potential effects on the public and recreation visitors, they are generally not addressed or repeated here. However, other potential effects, such as access limitations on roads and waterways with public ROW, are addressed for adjacent recreation sites and use areas.

Multiple recreation-related issues were identified during the public scoping process. Specifically, scoping participants indicated reduced or limited public access, reduced wildlife viewing and hunting opportunities, scenic resource degradation, and site or use area or trail-specific concerns, among others (BLM 2009c). Some of these scoping issues also may be referenced in other appropriate sections of Chapter 4.0. In particular, potential effects on public access effects are discussed in Section 4.4, scenic resources effects on the related visitor experience are described in Section 4.12, and big game migration and hunting opportunities are described in Section 4.14.

Recreation on public lands in the CCSM project area is managed per the direction set forth in the 2008 Rawlins RMP/ROD (BLM 2008a). This includes specific management goals and objectives for the CDNST and the North Platte River SRMA. The 2008 Rawlins RMP/ROD and pertinent recreation resource management considerations, as well as the FLPMA are listed in **Table 4.7-1**.

**Table 4.7-1 Relevant Management Considerations for Recreation**

<b>2008 Rawlins RMP and ROD – Recreation and Visitor Services<sup>1</sup> (Volume 1, Chapter 2, pages 2-42)</b>	
<u>Management Goals</u>	<ul style="list-style-type: none"> <li>• Ensure the continued availability and accessibility of outdoor recreational opportunities.</li> <li>• Manage recreation resources to accommodate existing and future uses.</li> </ul>
<u>Management Objectives</u>	<ul style="list-style-type: none"> <li>• Provide for the health and safety of visitors.</li> <li>• Coordinate with other programs to minimize conflicts and adverse impacts on recreational opportunities.</li> </ul>

**Table 4.7-1 Relevant Management Considerations for Recreation**

<ul style="list-style-type: none"> <li>• In the Western Extensive Recreation Management Area (ERMA, located in the eastern portion of the Application Area), consider the above recreation objectives during development involving surface disturbing or disruptive activity.</li> <li>• In the Eastern ERMA (the western portion of the Application Area), retain the quality of dispersed recreation opportunities and settings (with the exception of isolated development areas, such as coal mines or wind generation facilities) while meeting the above recreation objectives.</li> <li>• Provide public education regarding appropriate use of BLM lands.</li> <li>• Provide opportunities for public use, interpretation, education, and appreciation of natural and cultural resources.</li> </ul>
<b>2008 Rawlins RMP and ROD – CDNST SRMA (Volume 1, Chapter 2, pages 2-43, 2-44)</b>
<p><u>Management Goals</u></p> <ul style="list-style-type: none"> <li>• Manage to emphasize interpretive and educational opportunities.</li> <li>• Ensure the continued availability of outdoor recreation opportunities associated with the CDNST.</li> </ul>
<p><u>Management Objectives</u></p> <ul style="list-style-type: none"> <li>• Comply with the CDNST Comprehensive Plan.</li> <li>• Locate the trail so users may experience available examples of the great diversity of topographic, geologic, vegetation, and scenic phenomenon in proximity to the Continental Divide.</li> <li>• Provide users with opportunities to view, experience, and appreciate examples of prehistoric and historic human use of the resources along the Continental Divide, and examples of the ways these resources on public lands are being managed in harmony with the environment, as an asset to the existing character of the Continental Divide, and which will not detract from the overall experience of the trail.</li> <li>• Provide a route that will have a minimum adverse effect on adjacent natural and cultural environments and harmonize with the management objectives of land and resource uses that are now or may be occurring on the lands through which the trail passes.</li> <li>• Maintain and enhance recreation opportunities for residents and visitors to the area to accommodate camping, wildlife viewing, and other compatible uses in prescribed settings so visitors are able to realize experiences and benefits.</li> <li>• Pursue opportunities for partnership and cooperative management with adjacent property owners.</li> </ul>
<p><u>Management Actions</u></p> <ul style="list-style-type: none"> <li>• The CDNST (600 acres; the federal portion of the trail is about 82 miles long and is located within a one-quarter-mile wide corridor) will be managed to provide opportunities for trail users to view the diverse topographic, geographic, vegetation, wildlife, and scenic phenomena that characterize the Continental Divide and to observe examples of human use of the natural resources. The prescribed setting for the CDNST is middle country (i.e., semi-primitive motorized).</li> <li>• Implementation of the CDNST Comprehensive Plan will potentially result in a significant rerouting of the trail and/or trail corridor.</li> </ul>

**Table 4.7-1 Relevant Management Considerations for Recreation**

<ul style="list-style-type: none"> <li>Pursue agreements with private landowners to facilitate routing of the trail and to improve the quality of recreational experiences.</li> </ul>
<b>2008 Rawlins RMP and ROD – North Platte River SRMA (Volume 1, Chapter 2, pages 2-45, 2-46)</b>
<u>Management Goal</u> <ul style="list-style-type: none"> <li>Manage to ensure the continued availability of outdoor recreation opportunities associated with the North Platte and Encampment Rivers.</li> </ul>
<u>Management Objectives</u> <ul style="list-style-type: none"> <li>Maintain or enhance recreation opportunities to accommodate existing niche activities, including hunting, fishing, camping, wildlife viewing, OHV touring, and other uses appropriate to the prescribed setting.</li> <li>Mitigate conflicts with other resource values and uses as appropriate, in coordination and cooperation with affected interests.</li> <li>Maintain or improve the quality of river-related recreational experience along the North Platte and Encampment rivers to continue to provide high-quality recreational experiences and benefits to local residents and visitors to the area (<b>Table 2-11</b>).</li> </ul>
<b>National Trails System Act<sup>2</sup></b>
<ul style="list-style-type: none"> <li>Section 7(a)(2): Development and management of each segment of the National Trails System shall be designed to harmonize with and complement any established multiple-use plans for the specific area in order to insure continued maximum benefits from the land.</li> <li>Section 7(c): Other uses along the trail, which will not substantially interfere with the nature and purposes of the trail, may be permitted by the Secretary charged with the administration of the trail.</li> </ul>
<b>FLPMA – Declaration of Policy<sup>3</sup></b>
“...the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use...”
<b>CDNST Comprehensive Management Plan, 2009<sup>4</sup></b>
<u>Management Goals</u> <ul style="list-style-type: none"> <li>The nature and purposes of the CDNST are to provide for high-quality scenic, primitive hiking and horseback riding opportunities and to conserve natural, historic, and cultural resources along the CDNST corridor (p. 4).</li> <li>Manage the CDNST to provide high-quality scenic, primitive hiking and pack and saddle stock opportunities. Backpacking, nature walking, day hiking, horseback riding, nature photography, mountain climbing, cross-country skiing, and snowshoeing are compatible with the nature and purposes of the CDNST (p. 16).</li> <li>Bureau of Land Management managers will develop Recreation Opportunity Spectrum (ROS) management prescriptions, which will provide the physical, biological, social, and managerial settings deemed appropriate for the CDNST segments within their jurisdiction.</li> </ul>

**Table 4.7-1 Relevant Management Considerations for Recreation**

<u>Management Objectives</u>
<ul style="list-style-type: none"> <li>• On public lands administered by the BLM, the visual resource inventory will follow the procedures outlined in BLM Manual Section 8400. The inventory shall be conducted on the basis that the CDNST is a high sensitivity level travel route (p. 13).</li> <li>• Use the ROS system in delineating and integrating recreation opportunities in managing the CDNST. Where possible, locate the CDNST in primitive or semi-primitive non-motorized ROS classes; provided that the CDNST may have to traverse intermittently through more developed ROS classes to provide for continuous travel” (p. 16).</li> <li>• Semi-primitive Motorized (i.e., Middle Country): Trail segments in the ROS class will be in a natural setting which may have moderately dominant alterations but will not draw attention, as would be judged by motorized observers on trails and primitive roads within the area... The user may experience more control and regulation but will still have a feeling of achievement, adventure, and a release from the dominance of human structures or noise” (p. 17).</li> <li>• Private Land ROWs or Easements: “Trail segments in this category provide the user with a safe continuous trail link between other trail segments. They have as their primary purpose the safety, protection, and convenience of the user. Evidence of civilization usually is predominant with the recreation opportunity pointed to allowing passage of recreationists in a safe, convenient manner. These segments will generally be as short as necessary to cross highways and railroads or passage through developed areas” (p. 19).</li> </ul>

<sup>1</sup> BLM 2008a.

<sup>2</sup> NPS 2009.

<sup>3</sup> BLM 2001.

<sup>4</sup> USFS 2009.

The general method for identifying potential recreation impacts and developing significance criteria for the impacts within the alternative boundaries analyzed, included reviewing existing data sources and interviews with BLM recreation specialists, recreation visitors, and recreation providers. Using these forms of information, potential effects were assessed by quantifying the extent to which the project would impact recreation, including recreational opportunities, experiences, and access. Potential recreational impacts resulting from each of the alternatives were identified using this methodology. Potential impacts (both short- and long-term) were considered significant if they met one of the following significance criteria:

- Project would compromise public health and safety at recreation sites and use areas.
- Project would limit or restrict public access to developed recreation sites and/or dispersed use areas, including those located along the North Platte River.
- Intensity of development is incompatible with the stated objectives of the CDNST and/or North Platte River SRMAs.

Finally, the recreation impact analysis was conducted using the following assumptions:

- It is anticipated that most recreational resources in the alternative boundary are located primarily on BLM lands that are not within the checkerboard land ownership pattern, which has limited public access; however other public land, such as USFS lands, also may be affected.

- It is anticipated that a smaller number of state, county, municipal, and privately operated recreation facilities, such as parks and reservoirs, also may be affected.
- Management plans, ROWs, lease information, and any other supporting documentation provided by the requisite governing bodies are the most current and available for public use and review.

#### 4.7.1 Impacts to Recreation from the No Action Alternative

Under the No Action Alternative, there would be no anticipated impacts to recreation as the proposed project would not be developed. Under this alternative, the BLM would prohibit development on their lands, as well as access to private lands for the CCSM project. The combined result of these restrictions would be to prohibit the development of the project as proposed. Overall, recreational resource opportunities would generally remain unchanged under the No Action Alternative.

#### 4.7.2 Impacts to Recreation from Alternative 1R, Applicant Proposed Alternative

Under Alternative 1R, up to 1,000 WTGs and associated facilities (e.g., transmission lines, roads, etc.) would be developed as illustrated in **Figure 2-3** on both public and private land. The proposed project would be almost entirely located within the existing boundary of TOTCO. Overall, the construction and operation of the proposed CCSM project would not be anticipated to preclude recreation activities and/or limit public access to recreational opportunities. It would, however, significantly affect visual resources (as described in Section 4.12), which would substantially degrade the recreational experience for some visitors. Specific project effects on recreation are discussed in greater detail below by phase of the project (construction and operation).

##### Construction

During construction, there would be increased traffic, the presence of construction crews and equipment, noise, and dust. However, the proposed siting of project components under Alternative 1R would help minimize the effects of construction activities on recreation. In particular, construction activities would not limit access to developed recreation sites and use areas, such as the Rim Lake and Teton Reservoir recreation sites, though increased traffic along roads from construction vehicles may create temporary delays/congestion. To the extent practical, all heavy trucks would use internal haul roads, significantly reducing impact-related traffic on public roads. Construction activities would be visible from these developed recreation locations. Activities that may be visible to recreation visitors may include traffic (and fugitive dust), worker activity/movement, laydown areas, and construction of project facilities. A full description of visible construction activities and associated effects is provided in Section 4.12. Short-term construction-related effects would degrade the recreational experience for some visitors at developed sites (as well as dispersed use areas). ACMs (see **Appendix Table C-2**) site WTGs and other project facilities a minimum of one mile from the Teton Reservoir and the North Platte River (along the eastern boundary of the Overland Trail Ranch boundary) under Alternative 1R. Due to the management restrictions associated with the CDNST, no WTGs or other project facilities would be sited within 1 mile of the CDNST as discussed under the CDNST SRMA below. This would reduce any access restrictions, as well as help minimize visual and noise effects on the recreational experience in these areas. Construction impacts to recreational uses of the CDNST would be visual impacts within the trail viewshed, and are evaluated in Section 4.12.

The internal haul road constructed in Year 1 of the construction phase would extend south from the RDF and construction trailer complex in the north through the center of Chokecherry and into the Sage Creek basin.

Dispersed uses and activities (e.g., OHV use, camping, hunting, and fishing) on federal and state lands may be temporarily disrupted during construction of the proposed project under Alternative 1R. While dispersed uses tend to be limited on public lands south of T18N, any dispersed uses that may occur at or adjacent to project components (e.g., WTGs, transmission lines) would be restricted for safety and

security during construction. These types of safety and security restrictions would be limited in geographic scope since construction activities are only anticipated to disrupt about 3.5 percent of the Alternative 1R boundary. So, construction related activities may temporarily affect dispersed recreation use in specific locations, but would not result in widespread access limitations or degradation of the recreational experience south of T18N.

North of T17N, public access to dispersed recreation opportunities is already restricted due to the mixed public and private land ownership in the checkerboard area. Increased construction-related traffic would directly and indirectly affect public access to some dispersed areas in the Sierra Madre site south of T18N from the increase in heavy truck traffic on public roads. Potential impact to public access to recreation opportunities include an increased safety hazard from large vehicles on public roads, and the inconvenience of increased traffic levels on public roads. Construction-related traffic also would temporarily create noise and fugitive dust intrusions that would be perceived as an adverse impact to the quality of dispersed recreation activities, such as camping, that may occur in relatively close proximity to roads. The effects from construction traffic would occur over the 8-year construction and reclamation period, but localized to specific areas for relatively short durations of time according to the construction schedule. Recreationists may choose to avoid the area during construction.

Construction activities would affect the quality of dispersed recreation activities and may reduce the level of public use. Public lands which provide dispersed recreation opportunities in the Alternative 1R area occur only south of T18N in the Sierra Madre site, and account for a relatively small proportion of the area. Potential effects include the displacement of recreation opportunities such as camping and hunting, and the intrusion of the sight and sound of construction activities on recreation activities. These effects would degrade the experience of visitors to the CDNST and the North Platte River SRMA for the duration of construction activities at sites within viewsheds or within hearing distance of recreation activities. The visual impact of construction, noise effects, and the sight of fugitive dust from construction traffic and construction activities would attract the attention of the public within the Alternative 1R area south of T18N, and would likely degrade the recreational experience of scenic driving along WY 71 and dispersed uses during the 8-year construction and reclamation period. The visual effects from the construction of proposed facilities are evaluated in Section 4.12. Because dispersed recreation opportunities on public lands are affected in a relatively small area, there would generally be sufficient public land with similar recreation opportunities in nearby areas to absorb the relatively small number of recreationists displaced by construction activities.

Indirect effects from construction on recreation (both developed and dispersed), including changes in adjacent area use levels and/or displacement of visitors by transient workers (at campgrounds), may occur, but would not be anticipated to be long-term or significant. There would be no discernible indirect effect to the local economy from tourist-related revenues based on recreation opportunities in the Alternative 1R boundary. In general, public land outside of the checkerboard in the Alternative 1R area is used primarily by those members of the public who reside in the region. Hunting opportunities are widely available in the area. The loss of hunting opportunities would likely be absorbed by surrounding public lands; therefore local business would likely not experience any significant loss of revenues based on a reduction of hunting opportunities.

There are potential impacts to public health and safety at dispersed recreation and use areas from hazards related to construction equipment and activities; however, impacts would be reduced to less than significant because the public would be restricted from entering construction areas. Existing public access to designated recreation sites and use areas would not be affected. Construction activities would occur at sites generally located at least 1 mile from the CDNST, Teton Reservoir, and North Platte River SRMA. Outdoor recreation opportunities associated with these areas would continue to be available; therefore, the construction phase of the project would be compatible with the stated objectives of these areas. Any degradation of the recreation experience from visual and noise intrusions would be short-term. There would be no significant effects to recreation from construction and operation of the proposed CCSM project.

### Operation

During operation of the proposed CCSM project under Alternative 1R, the presence of project components (e.g., WTGs, transmission lines) would not be expected to limit or prohibit access to any of the recreation sites and use areas. Similar to the construction phase of the project, public access at and adjacent to project components may be restricted locally for safety and security, but would not affect general public access in the general area. New access roads may increase public access to dispersed recreational opportunities on contiguous public lands. In the checkerboard portion of the alternative boundary, public access currently is and would be restricted within the TOTCO boundary. This increase in public access is a long-term beneficial effect of the project under Alternative 1R.

Hunting access to federal lands in the alternative boundary would not be affected except temporarily for safety and security reasons during construction and decommissioning. Existing access on public roads to federal land for big game and other hunting would remain in place; however, access to construction areas and operating facilities would be restricted as provided in ACMs A-3-44 and A-3-45. As discussed in Section 3.7.2.1, the numbers of hunters in the Application Area hunting units is small relative to hunters on public lands outside of the Application Area. Temporary access restrictions that would affect hunter satisfaction and the local economy would also be relatively minor, as the majority of these uses occur outside of the alternative boundary.

There would be no impact to recreational opportunities provided by the City of Rawlins; however, the local economy is dependent in part on outdoor hunting and fishing opportunities provided by the RFO, including public land in the Application Area (City of Rawlins 2010).

The presence (sights and sounds) of the project under Alternative 1R would likely degrade the recreational experience of most but not all hunters, anglers, OHV users, and other visitors within and near the alternative boundary. Project components would be highly visible from Rim Lake Recreation Site, Teton Reservoir Recreation Site, scenic driving along WY 71, and dispersed use areas. The conceptual locations of project facilities under Alternative 1R would help minimize potential visual effects on the recreational experience, but would not completely mitigate potential effects. Operation of the project would not be expected to preclude existing recreational uses, but may displace them to other public lands. Project-related visual resource effects are described in more detail in Section 4.12.

The proposed project may potentially affect hunter success rates in the affected hunt units through changes in access to areas that are currently open to public access; and the numbers of big game animals may be reduced from the removal of wildlife habitat, changes to migration patterns, and other effects to species (see Section 4.13.3.1). Potential indirect effects on wildlife populations and migration are discussed in detail in Section 4.14.

While a satisfactory recreation experience for hunters is associated with hunting success; many hunters also value scenery and opportunities for solitude in a natural setting, and choose where to hunt based on the type of terrain and scenery they want to experience in Wyoming (WGFD 2011b). Unique hunting opportunities occur primarily in those portions of hunt units located in less roaded areas to the south of the Application Area (Trout Unlimited 2006). An increase in road density from construction would impact opportunities for solitude. Unique hunting opportunities were not identified in the alternative boundary. As summarized in **Table 3.7-1**, hunting unit counts of units mostly within the alternative boundary are low; the majority of hunting occurs in hunt units outside of the alternative boundary. PCW would coordinate with the Wyoming Fish and Game Department and the BLM to survey big game populations in the alternative boundary and identify appropriate management actions, including hunting, for big game populations that might be affected by the proposed CCSM project. Suspension of hunting would occur for sage-grouse. Sage-grouse hunting on TOTCO land within the Application Area was suspended in 2010 and would remain suspended throughout the life of the project. Hunting and other recreation is compatible with wind facilities with the implementation of special rules that ensure the safety of hunters and other public users.

### Effects to the CDNST SRMA

According to Section 7 (c) of the National Trail System Act, uses along the CDNST should not substantially interfere with the nature and purposes of the trail (NPS 2009). The 2009 CDNST Plan states that the nature and purposes of the CDNST are to provide for high-quality scenic, primitive hiking and horseback riding opportunities and to conserve natural, historic, and cultural resources along the CDNST corridor (USFS 2009, also see **Table 4.7-1**). Similarly, the 2008 Rawlins RMP/ROD states that the CDNST will be “managed to provide opportunities for trail users to view the diverse topographic, geographic, vegetation, wildlife, and scenic phenomena that characterize the Continental Divide and to observe examples of human use of the natural resources.”

Section 7(a)(2) of the National Trails Act also addresses the management of land adjacent to trails, including federal and private lands:

“Development and management of each segment of the National Trails System shall be designed to harmonize with and complement any established multiple-use plans for the specific area in order to insure continued maximum benefits from the land” (NPS 2009).

In accordance with Section 7(a)(2), the management of the CDNST considers the established goals and objectives of the 2008 Rawlins RMP for multiple uses of land within area. A management goal of the 2008 Rawlins RMP is to comply with 2009 CDNST Plan; however, the 2008 Rawlins RMP includes other resource goals and objectives for multiple land uses that occur within the checkerboard.

The CMP acknowledges private interests and the unique concentration of non-federal land “near the Continental Divide within the Great Divide basin in Wyoming” (USFS 2009). The CMP also anticipates that human modifications may dominate views from the trail, especially for portions of the CDNST crossing private land: “Trail segments in this category provide the user with a safe continuous trail link between other trail segments. They have as their primary purpose the safety, protection, and convenience of the user. Evidence of civilization usually is predominant with the recreation opportunity pointed to allowing passage of recreationists in a safe, convenient manner. Private property or safety considerations may dominate location alternatives” (USFS 2009).

The CDNST SRMA is an exclusion area; no construction or operation activities or facilities would occur within the 0.25-mile SRMA or cross any CDNST segment.

The prescribed setting for the CDNST SRMA in the RFO is middle country for 1 mile on either side of the trail (BLM 2012d, 2008a). The CDNST Comprehensive Plan states the objective for middle country settings as follows: “Trail segments in the ROS class will be in a natural setting which may have moderately dominant alterations but will not draw attention, as would be judged by motorized observers on trails and primitive roads within the area. The user may experience more control and regulation but will still have a feeling of achievement, adventure, and a release from the dominance of human structures or noise” (USFS 2009). No proposed facilities would occur within 1 mile of the CDNST under any alternative as shown in **Table 4.12-2**. Therefore, Alternative 1R would comply with a middle country setting for primitive hiking and horseback riding opportunities on the CDNST.

Operation of the WTGs would result in significant visual resource changes to views from the CDNST as described in 4.12 Visual Resources.

### Effects to the North Platte River SRMA

No construction or operation activities or facilities would occur within the SRMA or cross the North Platte River. The Water Extraction Site, on private land outside of the SRMA, would occur adjacent to the North Platte River. Approximately 8 acres of surface disturbance would be visible within 1,500 feet of the river, in addition to the extraction facility, roads, and electrical collection lines.

### Alternative 1R Impact Summary

In summary, effects to the recreation resources or uses in the Alternative 1R area from the proposed CCSM project would not be expected to be significant. While there would be localized delays or access restrictions for safety and security reasons, the proposed CCSM project would not result in widespread public access limitations or closures to developed recreation sites and dispersed use areas, including hunting, fishing, and OHV use areas. Authorized public access to this area would continue to be limited due to private land; however, construction of new roads may increase public access to contiguous public lands. The presence of the CCSM project would be expected to affect visual resources, which would substantially degrade the recreational experience for most but not all recreationists in the alternative boundary. These effects are described in Section 4.12. The proposed siting of project facilities under Alternative 1R generally avoids the more sensitive viewsheds along the CDNST and North Platte River corridors, and no disturbance would occur within the CDNST and North Platte River SRMAs consistent with the applicable management plans. Upon decommissioning, no long-term recreational resource effects would be anticipated, as impacts from construction and/or operation of the proposed project would likely be reversible.

#### **4.7.3 Impacts to Recreation from Alternative 2, Checkerboard Only**

Under Alternative 2, up to 1,000 WTGs and associated facilities (e.g., transmission lines, roads, etc.) would be developed throughout the checkerboard portion of the alternative boundary (**Figure 2-4**) on both public and private land. Unlike Alternative 1R, no WTGs or associated facilities would be sited south of T18N. Similar to Alternative 1R, the proposed CCSM project under Alternative 2 would be almost entirely located within the existing boundary of the Overland Trail Ranch. In general and similar to Alternative 1R, the construction and operation of the proposed CCSM project under Alternative 2 would not be anticipated to preclude recreational activities or limit public access to recreational opportunities beyond current conditions. Use would be temporarily restricted in some dispersed use areas for safety and security, but restrictions and closures would not be widespread since construction activities would only disrupt about 4.6 percent of the Alternative 2 boundary. Since the proposed CCSM project would be expected to significantly affect visual resources (see Section 4.12, the recreational experience of most recreation visitors would likely be degraded. Construction activities and related effects on recreation would be similar under Alternative 2 to those previously identified under Alternative 1R.

The off-site haul road under Alternative 2 would extend west from the proposed RDF to WY 71/CCR401, then parallel the east side of the WY 71/CCR401 corridor to Sierra Madre and Sage Creek Basin. The haul road would cross the Overland Trail adjacent to the WY 71/CCR401 crossing of the trail. Recreationists accessing this portion of the Overland Trail on public land from WY 71/CCR401 would be adversely affected by the sights and sounds of construction traffic on the haul road. These effects would be smaller than the impacts to the trail under Alternative 1R because the effects would be similar in quality, although considerably greater in scale, to the sights and sounds of traffic on WY 71/CCR401; whereas the effects under Alternative 1R occur in a natural landscape that does not include the sights and sounds of vehicle traffic.

The off-site haul road under Alternative 2 would be located in close proximity to the Teton Reservoir Recreation Area. The sights and sounds of heavy vehicles on the haul road, as well as dust from construction traffic, would be obvious and intrusive to outdoor recreational activities at the reservoir, and would degrade the opportunities for a natural setting and solitude to a greater degree than from the Alternative 1R haul road.

Similarly, project operations-related effects on recreation under Alternative 2 also are expected to be similar to those previously identified under Alternative 1R. Long-term access limitations or restrictions to developed recreation sites and dispersed use areas would not be anticipated, though project facility-specific locations may be closed to public access for safety and security. New project roads may increase unauthorized access to public lands in the checkerboard portion of the alternative boundary (though legal public access in this area would still be limited due to private land), thereby increasing

some types of unauthorized dispersed use (e.g., hunting, OHV use, fishing). The siting of project facilities also would minimize potential conflicts with the management goals and objectives along the CDNST and North Platte River corridors, because no facilities are within a 1 mile radius of these corridors. Additionally, while the project would significantly change the overall landscape character (as described in Section 4.12), its operation would generally not result in substantial, widespread, or long-term changes to recreational experiences in the area for most visitors.

Similar to Alternative 1R, there would be no significant effects to recreation resources from the construction and operation of the proposed project under Alternative 2.

#### **4.7.4 Impacts to Recreation from Alternative 3, No Miller Hill or South Sierra Madre**

Under Alternative 3, up to 1,000 WTGs and associated facilities (e.g., transmission lines, roads) also would be developed in the alternative boundary on both public and private land, though their placement would be restricted to a smaller area compared to Alternative 1R. As displayed in **Figure 2-5**, the 1,000 WTGs and associated facilities would be concentrated in the Chokecherry portion, as well as the eastern (east of T18N, R88W) portion of the Sierra Madre area. None of the proposed CCSM project components would be sited within the western portion of the Sierra Madre and the Miller Hill area to help avoid effects to visual characteristics and wildlife. This also would move project facilities farther away from the CDNST corridor, as well as dispersed hunting areas in the southern portion of the alternative boundary (near the CRs 503 and 401 intersection), thereby helping to preserve the recreation opportunities and experiences in these areas.

The impact to recreation opportunities and settings from the Alternative 3 haul road would be very similar to the effects that would occur from the Alternative 1R haul road. These effects would occur primarily during the construction phase, and would not be anticipated to be significant.

Public access to dispersed recreation occurs on public land blocks south of the Alternative 3 boundary. Similar to Alternative 2, Alternative 3 includes public lands within checkerboard land ownership. There would be no impact to dispersed opportunities or access to dispersed recreation from Alternative 3. While the proposed CCSM project would be developed in a smaller total area under Alternative 3 (compared to Alternative 1R), the likely recreation effects would be similar to those already described under Alternative 1R. There may be temporary construction related disturbances (e.g., visible activity, dust, noise) and location-specific public access restrictions, but in general, no significant impacts would be expected to recreation sites and use areas and/or recreational experiences in the area, though the recreational experience of some visitors would be degraded due to visual effects of the proposed CCSM project (see Section 4.12). As noted under the previous alternatives, there may be localized access limitations (for safety and security reasons) at and adjacent to project facilities, as well as degradation in recreational experiences for some visitors; however, none of these effects would be anticipated to be significant.

Similar to Alternative 1R, there would be no significant effects to recreation resources from the construction and operation of the proposed project under Alternative 3.

#### **4.7.5 Impacts to Recreation from Alternative 4, Private Lands Only**

Under Alternative 4, the WTGs would be sited only on private lands within the alternative boundary (**Figure 2-6**). Some access roads and electric collector lines would be installed on public lands. The effects to recreation resources on public land would be less than those that would occur under Alternative 1R, as no dispersed activities would be displaced by WTGs. However, the sights and sounds of construction and operation of Alternative 4 facilities on private land would negatively influence the recreation experience of the public on adjacent public lands.

During the construction phase of the project under Alternative 4, construction activities may be seen and heard (potentially influencing the recreational experience of some visitors) from some developed

recreation sites and dispersed use areas. No access restrictions would be anticipated at developed recreation sites in the alternative boundary, though access to some dispersed use areas may be limited (for safety and project security); and the recreational experience would be temporarily degraded from construction related traffic, as well as visual changes in the landscape. These effects would be anticipated to be temporary and not significantly affect recreation sites, use areas, or experiences in the Alternative 4 boundary.

The impact to recreation opportunities and settings from the Alternative 4 haul road would be very similar to the effects that would occur from the Alternative 1R haul road. These effects would occur primarily during the construction phase, and would not be anticipated to be significant.

During the operations phase of the project, there would be no public access to private lands where WTG and other facilities would be proposed; therefore, there would be no effects to public health and safety. Project components on public lands would not be located within the one-mile buffer along the North Platte River, although sights and sounds of the WTGs would be experienced from some segments of these areas. The effects to public access to recreation opportunities would be smaller than under Alternative 1R. There is the potential for an increase of unauthorized public access in the checkerboard landownership areas from the development of access roads; however, authorized public access in those areas would continue under the current limited public access. There would be no effect to public access of the public land blocks south of T18N, as no WTGs would be constructed in the block areas. Public access to dispersed recreation uses of these areas would be inconvenienced by road upgrades and installation of collector lines. These impacts would be temporary, and would not be significant. WTGs and other project components sited near the CDNST and North Platte River corridors under Alternative 4 would be generally closer than under Alternative 1R and would not limit or restrict access to these areas. Finally, the presence of the project would degrade the recreational experience for most visitors to the area (see Section 4.12).

Similar to Alternative 1R, there would be no significant effects to recreation resources from the construction and operation of the proposed project under Alternative 4.

#### 4.7.6 Mitigation and Mitigation Effectiveness

All action alternatives would incorporate ACMs and BMPs described in Chapter 2.0 and found in **Appendix C**. Mitigation measure GEN-1, from the Draft EIS, is now part of the alternatives analysis in the Final EIS as it was included as an ACM by the applicant in the January 2012 revised POD (PCW 2012a).

**GEN-2:** Off-site compensatory mitigation may be considered through future consultations between the BLM, Cooperating Agencies, and PCW if mitigation measures established through the project-wide EIS are later determined to not be adequate.

**Effectiveness:** Off-site compensatory mitigation can be an effective measure to compensate displaced recreationists from the Application Area as a result of project construction and/or operation by improving recreation facilities or opportunities in nearby areas. Such measures would enable recreationists to obtain comparable setting-dependent recreation outcomes affected by the CCSM project. The BLM would continue to monitor information from available sources to determine whether compensatory mitigation for recreation would be required under GEN-2 as site-specific PODs are approved.

#### 4.7.7 Residual Impacts

There would be no residual impacts from the proposed CCSM project on recreation use areas under any action alternative. Dispersed recreational uses would continue to be limited for the majority of the project area north of T17N due to private land. Where dispersed recreation occurs on public land south of T18N, an increase in heavy truck traffic on public roads would result in a perception of safety hazards or

inconvenience, temporarily create noise and fugitive dust, and displace recreation opportunities such as camping and hunting.

Degradation to hunting, fishing, scenic driving, and hiking experiences would occur within and adjacent to the alternative boundary. Potential residual impact to the recreation experience from unmitigable degradation of visual resources is evaluated in Section 4.12.

#### **4.7.8 Irreversible and Irrecoverable Commitment of Resources**

Project development sites (e.g., WTG locations, transmission line towers) would be reclaimed upon decommissioning of the project, as such, the commitment of resources is reversible. Additionally, operation of the project is generally compatible with most types of recreation use, especially those currently known to occur in the area (e.g., hunting, OHV-use, fishing). While the quality of most recreation experiences may decline due to degradation of the scenic quality of recreational settings resulting in an irretrievable commitment of resources for the life of the project, there are no irreversible or irretrievable commitments associated with recreation.

#### **4.7.9 Relationship between Local Short-term Uses and Long-term Productivity**

There are no project-related short-term uses that would significantly affect the long-term productivity (i.e., ability to provide recreation opportunities) of lands in the CCSM project area.

## 4.8 Impacts to Socioeconomics

This section describes and assesses the potential effects of the No Action Alternative, the Applicant Proposed Alternative (Alternative 1R), and other alternatives on socioeconomic conditions and trends in the CCSM analysis area. The expected workforce residency and commuting patterns and the area of expected visibility of the turbines are the two key determinants of the CCSM socioeconomic effects. The impact analysis area encompasses the central and western portion of Carbon County (Saratoga west and including the LSRV) and the eastern portion of Sweetwater County (Wamsutter east).

Key data and information sources used to identify and assess potential socioeconomic effects of Alternative 1R and other alternatives include:

- Carbon County Board of Commissioners and Carbon County Planning Commission (2010), Carbon County Comprehensive Land Use Plan;
- Carbon County, City of Rawlins, and CCSDs #1 and #2 annual budgets;
- City of Rawlins, comments to the Draft EIS;
- IMPLAN Economic Model Data Set for Carbon County – 2006;
- Rawlins Housing Assessment – 2007;
- Wyoming Housing Database Partnership Annual Report – July 2010;
- WDEQ Industrial Siting Division Section 109 Permit Applications for other wind energy projects in Carbon and Albany counties;
- Wyoming Departments of Revenue and Equalization reports;
- Current economic and demographic data from federal and state agencies (e.g., the U.S. Bureaus of Economic Analysis and Labor Statistics, U.S Census Bureau, Wyoming Departments of Employment and Revenue, and BLM/Headwater Economics' socioeconomic profile), illuminated with interviews by local officials and staff;
- Local housing availability and community infrastructure and service capacities, much of which was gained via interviews with local officials, community leaders and other informed citizens; and
- PCW POD (January 2012a).

**Table 4.8-1** displays relevant socioeconomic management considerations from the ROD and Approved Rawlins RMP and from the 2010 Carbon County Comprehensive Land Use Plan (Carbon County 2010).

### Issues

Key socioeconomic topics addressed in this section include the following issues raised during scoping for the EIS:

- The EIS should analyze the economic impact of the proposed project, identifying the number and types of jobs, whether local workers will be hired, and what the projected tax revenues for the state and county will be. Encourage utilization of local workforce to meet the project's labor needs.
- How many temporary and long-term jobs would the proposed project generate? What is the expected long-term employment for the wind farm following construction?
- The project will provide long-term jobs and long-term economic advantages for the local economy.
- What is the productive life of wind farms? It is probably longer than 20 years.

**Table 4.8-1 Relevant Management Considerations for Socioeconomics**

<b>Management Considerations</b>
<b>2008 Rawlins RMP and ROD</b>
<p><u>Management Objectives</u></p> <ul style="list-style-type: none"> <li>• Work cooperatively with private and community groups and local government to provide for customary uses consistent with other resource objectives and to sustain or improve local, regional, and national economies.</li> <li>• Maintain and promote the cultural, economic, ecological, and social health.</li> </ul>
<p><u>Management Goals</u></p> <ul style="list-style-type: none"> <li>• Provide opportunities to develop national energy resources on public lands.</li> <li>• Provide opportunities to develop resources other than those related to energy (e.g., grazing, recreation, wildlife, fisheries, and tourism) on public lands.</li> <li>• Provide opportunities to sustain the cultural, social, and economic viability of local and regional communities by using decision review processes that include considerations of various potential impacts of BLM decisions, including housing, employment, population, fiscal impacts, social services, cultural character, and municipal utilities.</li> </ul>
<b>Draft Carbon County Comprehensive Land Use Plan</b>
<p><u>Goals</u></p> <ul style="list-style-type: none"> <li>• Achieve a sustainable balance between energy development, agriculture, and the environment.</li> <li>• Protect water supplies of established users.</li> <li>• Sustain scenic areas, wildlife habitat, and other important open spaces.</li> <li>• Retain ranching and agriculture as the preferred land uses in rural areas.</li> <li>• Locate new residential developments and commercial sites in close proximity to municipalities and developed areas.</li> <li>• Ensure that future land development is fiscally responsible and has adequate roads and other infrastructure.</li> <li>• Retain diversity of use on public lands and provide for conversion of public lands to other land uses as would benefit the orderly development of the county.</li> </ul>
<p><u>Relevant Strategies and Actions</u></p> <ul style="list-style-type: none"> <li>• Enhance the county government’s capacity to monitor, comment on, and influence state and federal decisions on energy development projects. <ul style="list-style-type: none"> <li>– Conduct regular meetings between Board of County Commissioners, BLM, DEQ, USFS, and other governmental bodies to share information about pending energy projects.</li> <li>– Participate in comment periods for environmental impact statements.</li> </ul> </li> <li>• Develop standards for wind energy, transmission lines, and other alternative energy development so they can occur with limited environmental impact on traditional land uses, humans, and wildlife. <ul style="list-style-type: none"> <li>– Research best practices information for developing standards that encourage alternative energy development and transmission lines with the least environmental impact.</li> </ul> </li> </ul>

**Table 4.8-1 Relevant Management Considerations for Socioeconomics**

<ul style="list-style-type: none"> <li>– Prepare standards for adoption as part of the County Zoning Resolution.</li> <li>• Support mitigation of impacts created by energy industries where available science supports mitigation. <ul style="list-style-type: none"> <li>– Maintain dialog with energy industries by regular meetings to keep communication current.</li> <li>– Identify issues that need mitigation and develop solutions for resolution with industry leaders.</li> <li>– If available science indicates a proposed energy project cannot mitigate its impacts, Carbon County should either not approve the project or else recommend that it be located in a more suitable location.</li> </ul> </li> <li>• Identify open space priorities and recommendations for maintaining these resources. <ul style="list-style-type: none"> <li>– Develop land use standards that will maintain scenic vistas by the use of innovative subdivision design and clustering.</li> <li>– Support the acquisition of conservation easements on sensitive and unique scenic areas.</li> <li>– Adopt an overlay district for open space, scenic, and wildlife areas.</li> </ul> </li> <li>• Maintain recreational use on public lands. <ul style="list-style-type: none"> <li>– Support multiple use policies, including recreational uses.</li> <li>– Ensure there is adequate access to public lands and rivers by obtaining easements, getting approvals, and purchasing ground to reach public land.</li> </ul> </li> </ul>
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Sources: BLM 2008a; Carbon County 2010.

- Supports wind energy project because it will generate revenue for the state.
- Social and environmental affects should be assessed for this project similar to the analysis applied to oil and gas leasing and development.
- The proposed project provides little benefit to Carbon County as the power will benefit California, Nevada, and Arizona.
- Will the project have any impacts on local energy costs (e.g., will it help stabilize Carbon County's electrical costs)?
- EIS evaluation should consider the project's potential effects on tourism.
- The EIS should disclose and evaluate environmental justice issues consistent with EO 12898 for impacts to rural low-income communities or potential associated actions for the reasonably foreseeable development analysis.
- The proposed project will be detrimental to the economics of livestock management operations.
- Encourage BLM to work with grazing permittees and agricultural producers to understand the impacts associated with the proposed project. The project will have adverse impacts on grazing permittees, agricultural producers, and landowners both within and near the project area.
- The EIS should evaluate the potential conflicts between development and recreational activities.
- Potential loss of public access (for hunting and other recreation), especially on Miller Hill and elsewhere in the Sierra Madre, should be mitigated off-site. For example, recommends

additional access to the North Platte River across checkerboard between Pick Bridge and Seminoe Reservoir for sport fishing.

- A socioeconomic program should be developed for this project.
- Question about how the proponent can be a good corporate citizen in Rawlins.
- The Final EIS and ROD should include a thorough analysis of impacts and mitigate the increased costs and reduced revenues for grazing permittees in the project area.

In addition to the issues identified during scoping, the following socioeconomic issues were considered during the assessment:

- The assessment of socioeconomic impacts of Alternative 1R will be considered in the context of ongoing and proposed natural gas development, construction and operation of the coal-to-liquids project in eastern Carbon County, recent expansion of the Wyoming State Penitentiary and other area wind energy and electrical transmission projects.
- Effects of temporary workforces on local housing conditions, including temporary/short term housing resources, local labor market conditions (e.g., competition with other energy resource development), local population, effects on state and local government revenues, and public infrastructure and service demand.
- Potential effects on residents and other users of land and public access ways within and near the applicable alternative boundary (e.g., grazing permittees and recreationists).
- Effects of the temporary workforces on social conditions in the study area, particularly in and near Rawlins.
- Potential effects on local attitudes, opinions and lifestyles.

#### Methods for Analysis

Methods used in the assessment of potential socioeconomic effects of the Alternative 1R and other alternatives include:

- Review of the PCW POD (2012a) to determine the proposed timetable for project construction, construction and operations labor force and expenditure estimates for the WTGs, transmission lines, and electrical substations, to support the economic impact modeling.
- Quantitative descriptors for Alternative 1R were used to estimate the short- and long-term economic effects (jobs and income).
- Economic data from a version of the IMPLAN economic model are used to assess indirect and induced employment and income effects of the project, with emphasis on the construction period.
- The employment effects provide the basis for assessing the project's implications on community, population, housing, facilities and services, public education, and social conditions in the region.
- Major state and local revenues (e.g., ad valorem taxes during operations) associated with the capital investment and labor force income for each alternative were estimated using an Excel spreadsheet based model.
- A qualitative assessment of the effects of Alternative 1R and other alternatives on local fiscal conditions was conducted, based on the changes in demands on services, staffing requirements, and other key expenditure functions.
- Potential effects on local social conditions were assessed, focusing on other users of the study area. The assessment was based on scoping comments, articles and editorials in local news media, interviews with local officials and staff and other sources as cited.

- The CCSM EIS land use, recreation and visual analyses were reviewed to identify potential non-use and non-market value effects. Potential non-use and non-market value effects were assessed qualitatively.
- Information on low income and minority populations within the study area was reviewed to identify potential environmental justice populations. Environmental and health effects of Alternative 1R and other alternatives were reviewed to determine whether disproportionately high environmental and health impacts would accrue to identified minority or low income populations.

#### Significance Criteria

The following criteria were used to determine whether socioeconomic impacts of Alternative 1R and other alternatives would be significant:

- An increase in county or community temporary or resident population that would unduly strain the ability of affected communities to provide housing and services or otherwise adapt to growth-related social and economic changes;
- An aggregate change in public sector revenue and expenditure flows likely to result in an inability on the part of affected units of government to maintain public services and facilities at established service levels;
- Permanent displacement of residents or users of affected areas that would result from project-induced changes in or conflicts with existing uses or ways of life;
- Disproportionately high and adverse environmental or human health effects to an identified minority or low-income population, which appreciably exceed those to the general population around the project area.

#### Assumptions

The following assumptions were used for the socioeconomic assessment:

- Estimated direct employment, capital investment and schedule information provided by PCW are relied on to assess the economic, demographic, community service, fiscal and social consequences of Alternative 1R and other alternatives.
- Direct construction employment estimates are based on those presented in the POD.
- Project development costs, disaggregated into major subcategories, e.g., labor, materials, equipment, construction management, were provided by the project proponent.
- Workforce access and material and equipment deliveries into the applicable alternative boundary would use the routes identified in PCW's PTMP (PCW 2012b).
- Detailed estimates of the project development costs are not presently available. For the purposes of estimating selected future public sector revenues associated with the project, costs are assumed to be on the order of \$4.2 to \$6.2 billion.

#### **4.8.1 Impacts to Socioeconomics from the No Action Alternative**

Under the No Action Alternative, the CCSM project would not be built as proposed. Management of public lands in the area would continue to be guided by the 2008 Rawlins RMP. The private lands included in the proposed project would be available for continued agricultural use, as well as for other potential land uses that are consistent with the owner's preferences, resources, real estate market realities, and local land use regulations.

No Action, however, does not mean no change in future conditions. Long-term population forecasts prepared by the Wyoming Department of Administration and Information and reflecting general economic

and demographic trends across the state and in Carbon County anticipate modest growth through 2020, followed by extended slow decline in resident population through 2030. Superimposed on those general trends would be short-term and cyclical changes in economic and social conditions associated with previously approved, but not yet implemented, natural gas and other natural resource development on public lands, similar development on private lands, and a myriad of other ongoing events, influences, and actions that are unrelated to this project. The growth and decline would be accompanied by other changes in economic, demographic, and social conditions.

## **4.8.2 Impacts to Socioeconomics from Alternative 1R, Applicant Proposed Alternative**

### **4.8.2.1 Local Economic Effects**

#### Employment and Temporary Labor Force Immigration

Construction, operation, decommissioning and reclamation of the facilities associated with Alternative 1R, as described in Chapter 2.0 of this EIS, would represent a significant capital investment (on the order of \$4.2 to \$6.2 billion, depending on the model/capacity of WTG selected) resulting in the employment of a substantial workforce, deployment of a large fleet of construction equipment, and a commitment of materials, supplies and equipment. Critical parameters affecting the potential social and economic impacts associated with the applicants proposed alternative include the numbers of construction and operations workers, timing and duration of their employment, residency patterns of those nonlocal workers<sup>1</sup> who temporarily relocate to Rawlins and other communities in south-central Wyoming, and the availability of temporary housing (motels, RV parks, apartments, and single family rentals).

As summarized in Section 2.2, the proposed project would consist of two wind farm sites located south of Rawlins, on which up to 1,000 WTGs (2,000 to 3,000 MW combined capacity) would be erected, along with ancillary facilities and an internal road network to support development and maintenance. Construction of the project is scheduled over 5 years,<sup>2</sup> with the active period of construction concentrated during the months of May through November when weather conditions are most favorable. The specific locations and timing of construction activity would take into consideration seasonal wildlife avoidance areas, with the general schedule and location as follows:

- **Year 1:** Construction of the RDF and delivery laydown area, the primary internal haul road within both the Chokecherry and Sierra Madre sites, a portion of the construction trailer complex, and water extraction facility (if needed).
- **Year 2:** Completion of the construction trailer complex and the completion of project roads, approximately 200 wind turbine foundations, and collection systems on the Miller Hill portion of the Sierra Madre site. A concrete batch plant will be set up in the Miller Hill laydown area. Site preparation for the Miller Hill collection substations and the interconnection substation also would be scheduled.
- **Year 3:** Completion of approximately 150 additional wind turbine foundations and the delivery, installation and commissioning of approximately 350 wind turbines in the Miller Hill area. Miller Hill collection substations and the interconnection substations will also be completed. Wind turbine foundation preparation and project roads will be completed in the Sage Creek Basin and western Chokecherry area, and the Operations Center and Sierra Madre maintenance facilities built.

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<sup>1</sup> Note: For this assessment, a locally hired worker is one that commutes daily from his or her place of residence at time of hire, regardless of where that residence may be located. Residents of Carbon County, along with those from Wamsutter and Rock Springs in Sweetwater County, would account for most of the locally hired workers, although some workers from Albany, Natrona, and other nearby counties may seek employment on the project.

<sup>2</sup> PCW's POD calls for interim reclamation, employing a small number of workers, to continue for several years following the completion of construction.

- **Year 4:** Delivery, installation and commission of approximately 300 wind turbines and associated collection substations and internal transmission lines in the Sage Creek Basin and western Chokecherry areas. Turbine pads, project roads, collection systems and collection substation sites will be completed in the eastern portion of the Chokecherry site, and the Chokecherry maintenance facility will be built.
- **Year 5:** Installation and commission of remaining, approximately 350 wind turbines, in the eastern portion of the Chokecherry area. Collection substations and the internal transmission lines will be completed in the eastern Chokecherry area, and full project demobilization would occur.

Temporary construction employment, based on the preliminary engineering and conceptual layouts for the project would be anticipated to peak at 300 workers during Year 1 and 400 workers in Year 2. Those estimates exclude employment that would be associated with any off-site highway access improvements, for instance, I-80 ramp and interchange improvements, the need for which may be identified in the future. In Years 3 and 4 of construction, projected on-site direct construction employment would range between 900 and 1,200 workers during the summer, when wind turbine pad, road and internal transmission line construction would coincide with wind turbine installation and commissioning. In Year 5, anticipated construction employment would peak at 1,000 workers.

In developing its workforce estimates, PCW envisioned a 6-day workweek, with 10-hour work shifts, to achieve the desired construction schedule. The combination of the extended workweek and 10-hour work shifts has an important bearing on the socioeconomic assessment as it results in direct construction manpower estimates that are lower than those associated with the 40- to 50-hour workweeks that characterize many non-construction jobs. By extension, the reduction in workforce results in lower levels of immigration, population influx and perhaps most critically, lower demand for temporary housing. Considerations for weather and seasonal wildlife avoidance result in a seasonal employment profile characterized by a rapid ramp up in the spring, several months of high employment, and then a sharp drop-off in the fall (**Figure 4.8-1**).

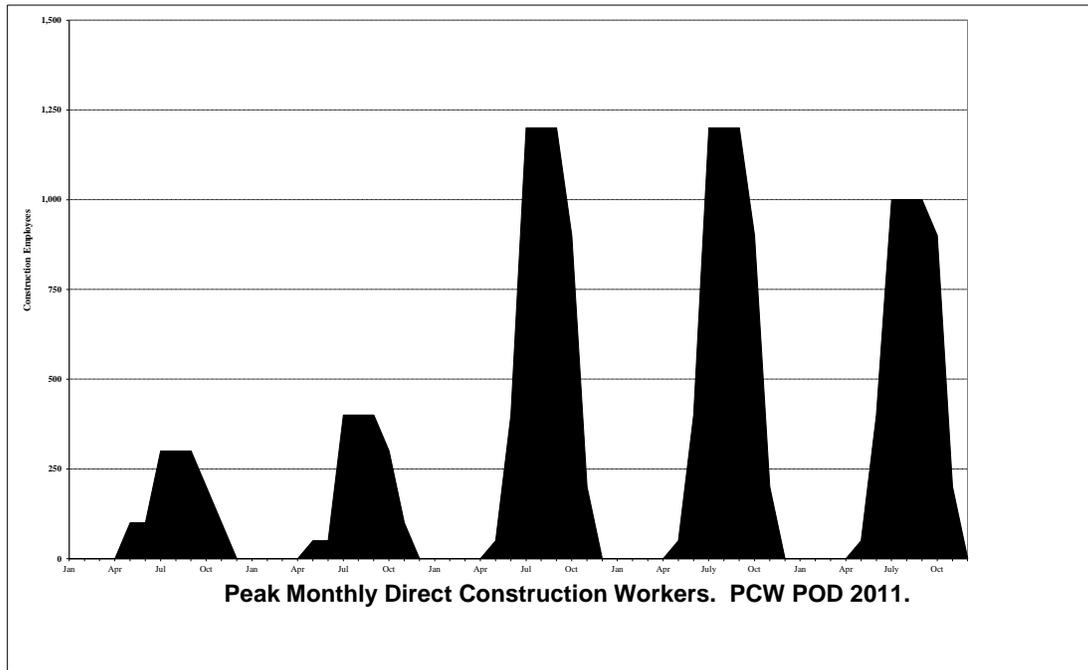
Along with the estimated workforce, PCW's proposed construction schedule is a crucial factor in the assessment of potential socioeconomic impacts. The eventual peak of approximately 1,200 construction workers in Year 3 is the basis for assessing many of the potential socioeconomic effects of the project within the region, particularly those related to housing and some services. At the same time, having several years of construction activity employing a smaller workforce would generate sales and use tax revenues for local governments, and provide the benefit of several years of experience and insight for PCW, its contractors, local public entities, local businesses and the community-at-large for planning and preparation to address the impacts in the peak years.

As WTGs are commissioned, staffing for ongoing O&M would commence. At full operations, up to 114 full-time employees would be required to operate and maintain the project throughout its operational life. On-site staff would be supported by employees of turbine and other equipment manufacturers, contractors, and vendors providing specialized support services.

In addition to the CCSM direct construction and O&M workers, the economic infusion associated with project construction and operations would support secondary jobs to service the CCSM construction and operation workforce. The secondary employment supported by the project would consist of the following:

- Indirect employment includes jobs supported by PCW and contractor purchases of goods and services from local and regional businesses. It is assumed that all major purchases of equipment, materials, and supplies would be made elsewhere and the commodities delivered to the area via truck or rail.
- Induced employment includes jobs created by employee spending of CCSM-related earnings and public sector revenues thereby generated, and by business, local government and school district spending in response to increased demand. Induced employment will occur across a

number of economic sectors including lodging, and food and beverage, fuel and convenience retail, and motor vehicle sales and service establishments.



**Figure 4.8-1 Projected Construction Employment for the CCSM Project, Years 1 through 5**

Existing business establishments in Rawlins and surrounding communities would realize much, if not most of the secondary benefits supported by the project. The increase in business revenues may allow some business to expand, as well as supporting new business development. Local government and other public entities also may experience increases in activity and staffing in conjunction with the project.

The relationship between direct and secondary jobs is commonly expressed in terms of a “multiplier”, where the multiplier represents either the total jobs supported per direct job, or the average number of additional jobs supported by each direct job. For example, a total jobs multiplier of 1.8 indicates a net change of 1.8 jobs for each direct job created; the direct job plus an average of 0.8 indirect and induced jobs. The same relationship can be expressed as a secondary multiplier of 0.8 jobs, which reflects only the indirect and induced response.<sup>3</sup> The secondary job multipliers for this assessment, based on economic data for Carbon County and the above factors, are 0.5 for direct construction jobs and 0.8 for long-term O&M jobs. The higher multiplier for the O&M jobs reflects a combination of year-round residency for most of these workers and local business spending in conjunction with the project. Applying the multipliers defined above to the multi-month average direct employment estimates yield total estimated temporary employment of 360 jobs in the study area in Year 1 of project construction (**Table 4.8-2**). Construction-related employment impacts climb to a peak of 1,740 jobs in Years 3 and 4,

<sup>3</sup> Multipliers are specific to a defined geographic or economic region and industries. For example, the multipliers for construction differ from those for transportation, and those for Carbon County likely differ from those for Teton County. Differences in the value of the multipliers for industries and regions reflect differences in the underlying economic structure of the region, intraregional supply and demand linkages between industries, and local public fiscal conditions. A project’s anticipated ability to recruit from the local labor pool, or attract non-local workers who permanently relocate to an area, also factor into the “multiplier” relationship because resident workers typically spend a larger portion of their income in the local community than do temporary non-local workers who forward substantial portions of the earnings back to their permanent place of residence.

and 1,389 jobs during the final year of construction. When fully operational, the project would support an estimated 205 to 284 year-round jobs in the regional economy; a long-term benefit in an economy that has been subject to substantial cyclical fluctuation in response to energy resource development.

**Table 4.8-2 Total Project-related Employment, CCSM Project, Alternative 1R**

	Year 1	Year 2	Year 3	Year 4	Year 5	Full Operations
Project Direct (Average) <sup>1</sup>	240	310	1,154	1,154	915	114 to 158 <sup>3</sup>
Indirect & Induced <sup>2</sup>	120	155	586	586	474	91 to 126
<b>Total</b>	<b>360</b>	<b>465</b>	<b>1,740</b>	<b>1,740</b>	<b>1,389</b>	<b>205 to 284</b>

<sup>1</sup> Includes average construction jobs for the 5-month period June through October and operations staff beginning in Year 3.

<sup>2</sup> Based on secondary jobs multipliers of 0.5 for construction and 0.8 for operations.

<sup>3</sup> Low end of the range is reported in the PCW POD (2012a) and appears to reflect 6-day, 10 hour/day workweeks. The high end of the range, reflecting 40 hour workweeks, was derived by AECOM.

Local sectors that would likely experience the largest boost from meeting the increased demand associated with CCSM construction include the hospitality industry (lodging, dining and drinking establishments), grocery and liquor stores, convenience food and gas, other automotive service establishments, and health care and personal services. Based on the proposed transportation access to the site, location of the RDF, and availability of temporary housing, the majority of the indirect and induced jobs in the region would likely be located in Rawlins. Other nearby communities, notably Wamsutter and Saratoga, would see lesser increases in local jobs, based on the residency of workers.

Although construction and operation of the project under Alternative 1R would be expected to have a net positive economic effect on the local economy, some individual business may see adverse effects in conjunction with the project. Such effects could be short-term or long-term, arising directly or indirectly from project-related impacts on customers effects, e.g. a store catering to outdoor recreation enthusiasts, or a store affected by new or expanded competition stimulated by expanded market opportunities. Such effects are uncertain and the potential for offsetting changes also exist, for example, an increase in OHV sales and services to workers associated with the project.

O&M staff would begin as WTGs are commissioned, increasing over time until reaching full employment estimated at between 114 and 158 employees. Hiring of the permanent staff, as well as related corporate purchase would support an estimated 91 to 126 additional indirect and induced employment in the region. The O&M and related secondary jobs would continue over the 25+ year expected life of the project, constituting a long-term social and economic benefit of the project to the community.

Construction and operations of the project would indirectly support additional jobs elsewhere in Wyoming as a result of economic and fiscal linkages between the study area and remainder of the state (i.e., the multiplier effect).<sup>4</sup> The number, industry and location of those jobs are uncertain, but they would likely be of a smaller magnitude than the effects within the region.

The commissioning of WTGs and transition to operations may trigger new residential construction, particularly in the Rawlins area, as project staff and others seek to buy or rent conventional housing. The timing and extent of such construction would reflect the level of hiring of staff from outside the area that

<sup>4</sup> Although described here in terms of employment, the "multiplier" concept also applies to economic output, personal income and many other economic parameters.

subsequently relocate to the area, the availability of suitable housing in the market, and building cost and financing conditions at the time. New residential construction could result in an additional, short-term, influx of non-local residential and commercial construction workers in the early years of operations. While the residential construction activity could be sensitive to weather-related fluctuation, some level of construction activity could occur year-round.

Large-scale construction projects such as the CCSM represent a substantial economic infusion into local economies, creating potential job opportunities for current residents of the region, including those willing to commute long-distances from other communities. In some instances, the infusion provides support to sustain existing jobs, in others it supports creation of new jobs. Local hiring to meet project needs also depends on underlying labor market conditions; stable and growing economies characterized by low under- and unemployment offers less opportunity for local hiring than do markets characterized by higher unemployment. At the same time, many of the direct jobs associated with construction of the CCSM project require specialized skills that are not readily available in sufficient numbers from within the resident labor force, thereby resulting in an influx of workers. Of necessity, wind energy projects typically employ specialized subcontractors who bring in most of their managerial and skilled laborers from their base of operations.

Unemployment at the beginning of 2010 had risen above 700 individuals in Carbon County and 2,000 prospective workers in Sweetwater County in the wake of reductions in the pace of oil and gas development and the effects of the national economic recession. Although unemployment in the two counties has since declined; a total of more than 1,500 people are still seeking work.

Based on local labor market conditions, seasonal augmentation of the labor force by high school and college students during the summer, job requirements of the project, and the potential for the project to increase labor force participation, this assessment estimates local labor, including daily commuters from other communities within the region, would fill approximately 130 jobs in Year 1, nearly 420 jobs in Years 3 and 4, and 80 to 90 of the long-term jobs. The remaining needs filled by workers from outside the local labor pool range from 230 (Year 1) to 1,322 (Years 3 and 4) (**Table 4.8-3**).

The potential level of immigration for the CCSM project reflects the total employment needs outlined in **Table 4.8-2**, less allowances for the hiring of workers from the local labor force and those from nearby communities willing to commute on a daily basis. In other words, the assessment identifies immigration assuming non-resident workers are able to secure temporary housing in the local area (housing is addressed in Section 4.8.3.3), rather than driving long-distances due to insufficient local availability. The willingness of some workers to endure lengthy commuting, either by choice or necessity, due to the distances between communities and/or limited availability of housing is commonly accepted in Wyoming and supported by analysis by the Wyoming Department of Employment. In many respects, however, such commuting represents a sub-optimal situation for workers, employers and communities.

At full operations, implementation of the CCSM project under Alternative 1R would result in as many as 194 additional workers in the local economy. The anticipated level of temporary workforce immigration is a principal determinant of housing needs and temporary population influx that creates additional demands on local facilities and services.

The availability of local labor to meet CCSM-related needs would be sensitive to competing demands from other projects, particularly those associated with oil and gas development. Such competition could constrain local labor availability, increase the level of immigration, but also limit the indirect and induced response should business and public sector employers are unable to fill positions due to insufficient availability of labor. Over time such conditions provide incentives for more residents to join the labor pool, however, the seasonal nature of these needs may limit such an effect, particularly in Years 3 and 4. In such instances, some employees and proprietors also “benefit” from additional hours of work, including overtime. Experience gained during Year 1 with respect to the demand for goods and services associated with the temporary workforce may benefit firms to better anticipate and respond to the seasonal needs in Years 2 through 4.

**Table 4.8-3 Projected Local Hiring and Migration to Fill Jobs Supported by Alternative 1R**

	Year 1	Year 2	Year 3	Year 4	Year 5	Full Operation
Total Incremental Jobs	360	465	1,740	1,740	1,389	205 to 284
Jobs Filled by Residents and Local Commuters <sup>1</sup>	130	172	418	418	365	80 to 90
Jobs Filled by Workers Relocating to the Area, Either Temporarily or Long-term	230	293	1,322	1,322	1,024	125 to 194

<sup>1</sup> Based on availability and seasonal expansion of the local labor force, local hires and those willing to commute daily from Rock Springs, Laramie, and other communities are expected to fill as much as 37 percent of the total project-related jobs.

Implementation of the Alternative 1R would promote a higher degree of seasonality in the local economy, during the short-term, than occurs in conjunction with tourism or hunting. From a community perspective, the seasonal nature of construction of the CCSM project would result in dramatic, twice a year changes in the level of activity, business sales, staffing needs, and hours of operation; in the spring when activity ramps up and again in the fall when activity declines sharply. The effects of a rapid influx and subsequent exodus of workers would be similar to what occurs in conjunction with University of Wyoming students, staff, and faculty in Laramie. There is, however, an important difference, that being the recurring certainty of the schedule for the University. Advanced communications to the Rawlins community regarding an anticipated startup of activity would help reduce the impacts. End of season changes, however, are subject to the influences of weather, and therefore uncertain.

The seasonal influence of the CCSM on the local economy would diminish during operations, although some additional activity could occur during the summer in conjunction with routine maintenance activities supported by contractors and vendors.

The bulk of the decommissioning and final reclamation would occur over a 3 year period, generating additional short-term direct, indirect and induced employment opportunities in the area. Decommissioning activities would occur from April through October due to seasonal wildlife avoidance and weather. Direct manpower requirements for decommissioning are estimated at 300 to 400 jobs, substantially less than required for project development. Future labor market conditions and the availability of qualified labor cannot be foreseen at this time, but local workers would be expected to fill some of the available jobs. The remaining jobs would be filled by temporary workforce immigration. Given the scale of the overall needs, the level of immigration would be much smaller than that associated with project construction.

#### Personal Income

Implementation of Alternative 1R would result in beneficial short-term and long-term increases in personal incomes in the region. Jobs in the construction industries are among the highest paying jobs in the local economy, thereby contributing to enhanced economic welfare for the directly affected households. The short-term direct increases, consisting of wages, salaries and the value of benefits paid to construction workers are estimated at approximately \$140 to \$170 million over the 5-year period; a portion of which would accrue to local residents. Although much of the income accruing to non-residents would leave the region, the local economy would benefit from local purchases of goods and services made by non-local workers during their time of local tenancy. Proprietor and employee earnings associated with the indirect and induced jobs supported by the construction phase of the project would contribute an estimated \$25 to \$30 million over the 5-year project, resulting in a net increase of \$165 to

\$200 million in earnings. The increases in wage and salary earnings would drive some short and long-term increases in non-earned income, resulting in additional income for residents.

Long-term gains in direct labor income associated with operations of Alternative 1R are estimated at \$8.7 to \$10.3 million per year, at full staffing levels. Annual income supported by the indirect and induced jobs would add approximately \$1.7 to \$2.1 million, yielding a net total of between \$10.2 and \$12.5 million annually; equivalent to nearly 2 percent of the total personal income of Carbon County residents in 2008.

The incremental income from operations would continue over the life of the project. Decommissioning and final reclamation would generate additional short-term income in the future.

#### Indirect Effects on Other Economic Sectors

Implementation of Alternative 1R might result in indirect effects on grazing, outdoor recreation, including hunting, general tourism, and other activities that contribute to the local economy. The effects on grazing would stem from short-term and long-term reductions in authorized grazing levels and from traffic and construction activities which could render some pastures temporarily unusable (Section 4.6). The losses would adversely affect three permittees, including TOTCO. Loss of grazing AUMs for the two non-TOTCO operators would be up to 3.5 percent of currently authorized levels during construction and less than 1 percent following reclamation. The incremental loss of total AUMs would be small within the context of the overall RFO and effects on TOTCO have likely been considered in the lease agreement between TOTCO and PCW. Other operators would not receive any offsetting economic benefits associated with the wind farm development. For these operators, the net effect would be adverse, the consequence depending on the availability of alternative grazing/feed. Loss of the use of pastures as a result of traffic and construction activities could represent a more substantial effect on individual operators, but these effects would be temporary and short term, likely occurring during one or two grazing seasons.

Access into the proposed project area for dispersed recreation is limited because the proposed project would be located almost entirely within the existing TOTCO boundary. Consequently, CCSM construction activities are not anticipated to preclude existing recreation activities and/or limit public access to recreational opportunities (Section 4.7). However, the substantial change in the recreation setting that would occur during construction could result in some relocation of recreation use to other parts of the RFO. At the same time, hunting and fishing could increase in the region due to the presence of more workers in the community.

Highway WY 71/CCR 401 provides access to the western portion of the Medicine Bow National Forest. The volume of traffic on WT 71/CCR is typically very low, consequently, trucks traveling on the internal haul road and crossing WY 71/CCR 401 during the first 3 years of construction, could occasionally result in very minor congestion and delays for motorists traveling on WY 71/CCR 401. Some minor delays and congestion for motorists could also occur throughout the northern portion of the route during shift changes if the WY 71/CCR 401 workforce commuting option was selected. The resulting delay may encourage travelers to that portion of the Medicine Bow National Forest to seek other routes or choose other recreation resources outside of Carbon County. These effects would likely be short term and temporary during the summer of the first 3 years of construction.

The net effect of CCSM construction on the Carbon County tourism and recreation economy is unclear. As noted above, recreationists displaced by construction activity may choose to recreate elsewhere in the county or RFO, although opportunities for recreating in undeveloped areas are becoming more limited given the increasing level of energy development in the County and RFO.

Potential long-term effects on tourism and outdoor recreation are unclear. As reported in Section 3.8, southern Wyoming, including the Rawlins area, has garnered favorable media coverage for its outdoor environment and recreation, attracting an unknown level of tourism visitation. Although outdoor recreationists and tourists occupy motel rooms and patronize eating establishments, gas stations and

convenience stores on a seasonal basis; I-80 travelers and energy industry workers are also major sources of clientele for these establishments.

In the short-term, outdoor recreation and tourism may be sensitive to construction activities, particularly in terms of competition for overnight lodging. According to the recreation assessment for this EIS (Section 4.7), some recreation use of the project area could be displaced during construction, but much of the use is thought to be by local residents who would take advantage of the numerous other recreation opportunities in the broader area. From an economic perspective, any temporary adverse effects of construction on the local outdoor recreation economy are likely to be limited as the economic benefits of construction would offset or exceed the adverse effects. It is likely that any adverse economic effects would accrue to those individual businesses or sectors of the economy that rely specifically on tourism and outdoor recreation, while the benefits would accrue more broadly, to sectors that provide goods and services to construction workers as well as visitors. At the same time, some of the individual businesses catering to outdoor enthusiasts could benefit from sales made to project-related construction workers.

The long-term effects of changes in character of the landscape on the tourism and outdoor recreation economy in the Rawlins area are unclear. Much of the Alternative 1R boundary is currently closed to general public access for outdoor recreation and would therefore be unaffected by the project. However, the landscape effects of the project would extend beyond the boundaries of the alternative boundary and the sensitivity of outdoor recreation and tourism visitation in the region to changes in landscape are unknown, though it is reasonable to expect that the net effect would be limited in scale and adverse.

#### **4.8.2.2 Local Population and Demographic Effects**

Immigration by workers to fill the temporary and long-term manpower requirements of the CCSM under Alternative 1R would translate into short and long-term population increase in the region. The majority of the nonlocal construction workers would be single-status, that is, unaccompanied by one or more other individuals. Most of those that are not single-status would likely be accompanied by another adult, most of whom would fill a job supported directly or indirectly by the project. Given the short-term and seasonal nature of construction, few non-local workers are likely to be accompanied by families. The transition to operations, which would begin as WTGs are commissioned in Year 3, would be accompanied by changes in demographic effects. Unlike the temporary construction workers, these residents would be year-round and their demographic characteristics, for instance, marital status, size of household and presence of children in the household, would generally mirror those of the local community.

The projected seasonal population impacts associated with the CCSM project, allowing for local hires, the combinations of construction and operations jobs in Years 3 and 4, and differences in demographic characteristics to fill direct and secondary jobs supported by the CCSM project, would be approximately 250 in Year 1, rising to 315 in Year 2, and peaking at 1,453 in Years 3 and 4 (**Table 4.8-4**). The temporary population influx in Year 5 would be approximately 20 percent below the peak in Years 3 and 4. Completion of CCSM project construction would result in long-term population growth of between 249 and 422 residents at full operations, depending on operational staffing levels. The long-term population growth due to the project would represent an increase of between 1.6 and 2.7 percent of Carbon County's current population. Most of the new residents would likely reside in Rawlins. The growth in resident population and the corresponding economic infusion it represents would generally be welcome in the community.

Recent construction experience indicates that few school age children would be among the temporary migrants as most workers would be single status. For example, the second quarter 2010 Wyoming Industrial Siting Division monitoring report for the Dunlap Wind Energy Project, located in eastern Carbon County, had a peak of 227 workers and only one new student enrolled in local schools (RES/Pacific Corp 2010). Moreover, the seasonal nature of the CCSM construction period from May through November, with workforce peaks during summer months would discourage workers with school age children from relocating them to the Rawlins area. Over time, CCSD #1 and other local school

districts could see enrollments of 30 to 70 additional students in conjunction with the CCSM project. The scale of the net changes is within the range of typical year-to-year fluctuation in enrollment, which could require additional staff but which is unlikely to trigger a need for new capital construction.

**Table 4.8-4 Project-related Population Impacts, CCSM Alternative 1R**

	Year 1	Year 2	Year 3	Year 4	Year 5	Full Operations
Workers Immigrating to the Area	230	293	1,322	1,322	1,024	125 to 194
Estimated population influx associated with the CCSM <sup>1</sup>	250	315	1,453	1,453	1,146	249 to 422

<sup>1</sup> Based on assumptions regarding percentages of average employment, single status vs. accompanied workers, persons per accompanied worker, and mix of construction and operations workers in Years 3 through 5 and includes population associated with the direct, indirect and induced workforce.

#### 4.8.2.3 Housing Needs

Housing availability is typically among the paramount socioeconomic issues associated with the project, and housing shortages tend to be correlated with other adverse effects. Construction-related housing demand associated with Alternative 1R would be created by the non-local construction workforce and by the non-local indirect and induced workforce who would provide goods and services to the project and to the construction workforce. Construction-related housing demand would occur primarily from May through November during each of five consecutive years, with the majority of such demand focused on temporary housing units (hotel/motel rooms and RV pads), although temporary workers would certainly use rental housing, apartments and mobile homes if available for short term occupancy.

Assessing housing effects of the construction phase of the CCSM project presents a number of challenges. Chief among these is the potential for other construction and natural resources development activities to compete with CCSM construction workers for housing resources in communities near the project site (Section 5.8). Workers associated with previously approved projects, such as the Atlantic Rim, Seminole Road, Desolation Flats and South Baggs Area natural gas development projects and authorized interim drilling associated with the Continental Divide - Creston Natural Gas Development Project typically seek temporary housing in the same communities as would workers on the CCSM project. An inventory of available temporary housing in the region was conducted during the summer of 2010 for this assessment. At that time, natural gas drilling activity was at a fraction of 2004 to 2008 levels and associated natural gas development housing demand was correspondingly low, so much so that several temporary worker housing facilities near Wamsutter and Dad were closed. Increases in natural gas sales prices could result in a resurgence of natural gas development activity with associated elevated employment levels for these previously approved projects, increasing competition for temporary housing resources in Rawlins and nearby communities.

Additionally, commercial, public infrastructure and highway construction projects within the CCSM project area typically occur in summer months and the workforce associated with these projects would similarly compete for housing resources. For instance, during the summers of 2009 and 2010, several I-80 highway and overpass reconstruction projects, a number of public infrastructure projects, and construction of a consolidated elementary school in Rawlins were underway. These projects absorbed an unknown but likely considerable amount of temporary housing during that period.

Consequently, the summer of 2010 was not atypical for temporary housing demand in communities near the CCSM project, but temporary housing availability at the time CCSM would begin construction could

be greater or less than that period, depending on natural gas development and infrastructure construction levels.

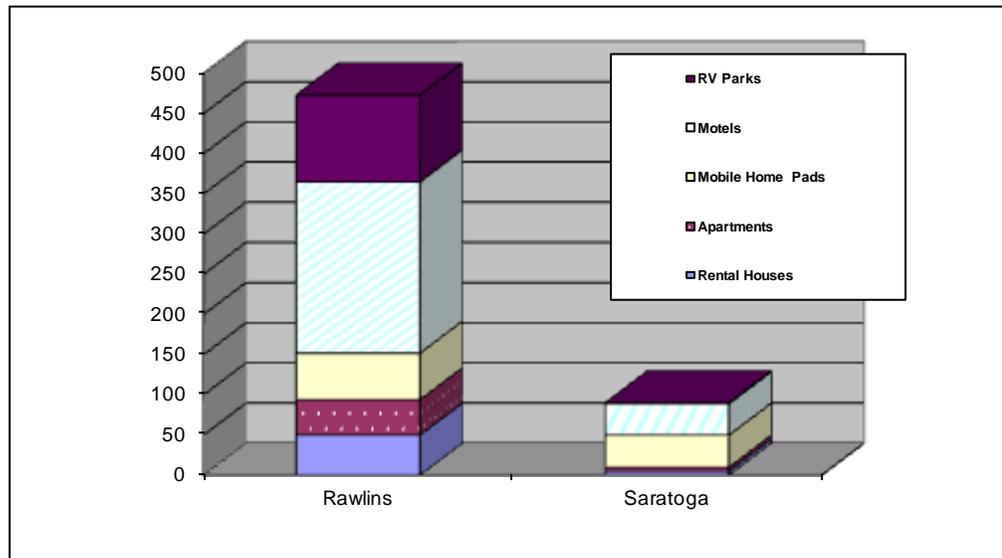
Housing availability estimates contained in this assessment are useful for assessing the general potential for communities to accommodate CCSM housing demand, but due to the factors listed above, are subject to relatively rapid change. The CCSM project would need to provide a detailed assessment of housing availability for the required Wyoming Industrial Siting Permit Application, and provide a plan for accommodating non-local construction workers. That assessment would occur closer in time to the beginning of construction and would presumably account for housing availability conditions at that time.

For this assessment, housing availability was assessed during August 2010, using currently published data augmented by telephone interviews with realtors, landlords and staff of the CCVC. For conventional rental housing (single and multifamily homes and apartments), the most current data on availability/vacancy is the Wyoming Housing Database Partnership's (WHDP) Semiannual Rental Vacancy Estimates for the second half of 2009. That survey represented rental housing managers who controlled 658 units, identifying a total of 105 vacancies, for a vacancy rate of 16 percent. The corresponding information for the first half of 2009 was a 22 percent vacancy rate; 124 vacant units out of a sample of 562 units. Interviews with realtors and apartment managers indicated fewer vacancies during the summer of 2010 due to seasonal increases in natural gas development and the infrastructure construction projects underway.

The CCVC conducted an informal motel and RV park occupancy survey in August of 2010. Based on that survey, the CCVC reported that newer motels in Rawlins affiliated with national chains averaged 95 to 98 percent occupancy, while older motels, which are more likely to accommodate construction and gas field workers on a weekly or monthly basis, averaged 75 to 80 percent occupancy. The RV parks in Rawlins reported average occupancy of 80 to 85 percent. Motels in Saratoga averaged 75 to 80 percent occupancy and the RV parks averaged 95 to 100 percent occupancy (CCVC 2010). The midpoints of each range of occupancy rates provide the basis for estimating availability to meet project-related needs.

Based on the above information, the assessment assumes that 50 rental homes within Carbon County would be available during CCSM construction and 10 percent of the apartments in Rawlins, or 44 units would be available. Based on the 2010 housing inventory, the assessment assumes that 58 mobile home pads in Rawlins and 40 mobile home pads in Saratoga would be available. The assessment includes no availability of motel or RV parking spaces in Baggs or Dixon, because temporary housing was reported to be fully occupied by ongoing natural gas drilling activity near those communities (Howell 2010). Natural gas development, although at recent low levels during summer of 2010, is likely to continue through the CCSM construction period. Similarly, no motel availability and only five RV spaces were assumed to be available in Wamsutter, again because of ongoing natural gas drilling in the area (Colson 2010). It is possible that some CCSM construction workers would secure housing in these communities, but the numbers of such construction workers would likely be small.

Finally, the assessment includes no temporary housing availability for Elk Mountain, Hanna or Medicine Bow, because of the limited housing resources available and likely competitive demand from ongoing and future wind energy facility maintenance and construction near those communities. No availability was assumed for Encampment or Riverside because of the limited temporary housing resources and the tourism and recreation nature of the temporary housing resource base in those communities. As with Baggs, Dixon and Wamsutter, some CCSM construction workers may secure housing in these communities, but the numbers of such workers would likely be small. Consequently, Rawlins and Saratoga were the only communities within the study area with a substantial temporary housing base and summertime availability during the summer of 2010 and, under current circumstances, the only communities likely to host substantial numbers of CCSM construction workers. **Figure 4.8-2** displays housing supply in Rawlins and Saratoga as of August 2010.



Source: Carbon County Visitors Council 2010.

**Figure 4.8-2 Rawlins and Saratoga Housing Availability: August 2010**

**Table 4.8-5** displays estimated construction-related housing demand for the 5 Year CCSM construction phase contrasted with estimated available housing supply during the summer of 2010. For the demand analysis, average employment for the 5 month period June to October for each construction season, and the average demand was increased by 15 percent to allow for temporary construction peaks and labor market friction<sup>5</sup>. The estimated housing need also reflect a ratio of 1.25 workers per housing unit across all types to reflect workers who would share accommodations and the portion of the indirect and induced jobs that would be filled by household members accompanying workers in direct, indirect and induced categories.

As shown in **Table 4.8-5**, estimated temporary housing availability in affected communities would be adequate to meet project-related demand during the first 2 years of construction, with surpluses on the order of 300 units. However, demand would exceed supply by substantial margins in Years 3 through 5 (e.g., 668 units in Year 3).

Project-related demand for temporary housing during the summer would compete with demand from other market segments, I-80 travelers for example. As a result, travelers may occasionally be unable to find rooms or RV campsites locally, requiring them to continue their travels to another community. Although some local residents or other stakeholders may view such potential displacement as an adverse impact, the underlying situation that it reflects, i.e., full occupancy, high average nightly rates, and expenditures in local eating and drinking establishments, represent substantial economic benefits of the construction. At the same time, the consequences of such shortages can include higher housing costs, increased reliance on unconventional housing, and an increase in the number of workers resorting to long-distance commuting to more distant communities to secure housing. Such responses could have adverse economic and social implications for workers and the affected communities.

<sup>5</sup> The term "labor market friction" refers to situations in which some job seekers arrive in a community but are unsuccessful in securing employment, newly hired workers arrive in advance of the actual beginning of their employment, or temporary delays in progress due to weather or other unforeseen events that result in additional temporary housing demand.

**Table 4.8-5 CCSM Housing Demand, Supply, and the Net Housing Balance during Construction**

<b>Total Housing Demand</b>	<b>Workers per Unit</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
Direct Hires	1.25	158	203	761	761	608
Indirect	1.25	36	44	309	309	255
Allowance for Peak and Friction	15%	29	37	161	161	129
<b>Total</b>		<b>223</b>	<b>284</b>	<b>1,231</b>	<b>1,231</b>	<b>992</b>
<b>Demand Preference by Type of Unit</b>						
Motel	65%	146	185	800	800	645
RV/Mobile Home Spaces	15%	33	43	185	185	149
Apartment	10%	22	28	123	123	99
Conv. Single Family	10%	22	28	123	23	99
<b>Total</b>		<b>223</b>	<b>284</b>	<b>1,231</b>	<b>1,231</b>	<b>992</b>
<b>Available Housing Supply</b>						
Motel		252	252	252	252	252
RV Spaces/Mobile Home Pads		207	207	207	207	207
Apartment		49	49	49	49	49
Conv. Single Family		55	55	55	55	55
<b>Total</b>		<b>563</b>	<b>563</b>	<b>563</b>	<b>563</b>	<b>563</b>
<b>Housing (Shortfall) or Surplus</b>						
<b>Net Housing Balance</b>		<b>340</b>	<b>279</b>	<b>(668)</b>	<b>(668)</b>	<b>(429)</b>

The projected housing shortfalls represent a potentially significant adverse impact associated with the CCSM project. At the time of this EIS, PCW has not developed a specific proposal to actively provide or expand housing supply within the local area. However, the company can anticipate being required to address projected housing needs in its Wyoming Industrial Siting Permit Application and associated public hearing. Examples of options that would be available to the company are discussed below.

One option would be to secure commitments from local motel and RV park proprietors to accommodate a larger share of the construction workforce than has been assumed for this assessment. While it is likely that some motel and RV proprietors would provide commitments for additional rooms, demand from other sources such as natural gas development, highway construction, and I-80 travelers could be unsatisfied. Under such conditions, some natural gas development and highway and infrastructure construction workers (and possibly CCSM construction workers) would likely seek unconventional accommodations, such as workers sharing rental accommodations or parking RVs in residential or commercial areas, as happened in Rawlins during another recent industrial construction project. Workers using these resources have caused disruption in residential neighborhoods and increased demand for

code and law enforcement services (Golnar 2010b; Massey 2010; Reed 2010). There also is concern among some BLM and USFS officials that natural gas and construction workers unable to find accommodations might camp on public lands reducing campground availability for public land visitors.

PCW also could seek to secure temporary housing commitments in more distant communities such as Laramie or Rock Springs. Securing housing commitments in these communities could allow a more moderate and constant level of construction worker housing demand within communities near the project area, which would provide income for lodging proprietors and other local businesses and reduce the level of local government service demand during peak construction months. However, there is considerable local skepticism that construction workers would choose to add a 3 hour daily round-trip commute to 10-hour workdays and 6-day workweeks, even if PCW were to provide busing to and from these more distant communities. If a substantial number of workers chose not to be housed in these more distant communities and make the 3-hour daily commute during peak construction months, they would likely seek housing in communities near the project area, resulting in conditions similar to those described in the previous paragraph.

Another construction worker housing option would be the installation of a Temporary Housing Facility (THF) within or near the project site. The THF could be sized to accommodate all or a portion of the non-local construction workforce, depending on PCW housing strategies. If the THF was sized to accommodate only a portion of the peak non local workforce, local businesses could still profit from construction worker spending for lodging, dining and entertainment. Depending on THF amenities and management policies, social issues associated with the large temporary and transient construction workforce and related local government service demand in nearby communities also could be reduced. PCW has committed to providing a THF within or near the project site should it be deemed appropriate during the ISC permit application process (PCW 2012).<sup>6</sup>

Another possible option for housing the temporary workforce could involve cooperative efforts with local governments, nonprofit housing organizations, other development projects or private developers to develop housing that could be used for the CCSM construction workforce and later serve other public or private housing purposes.

Housing demand during project operations would be associated with households supported by the 114 to 158 direct staff and up to 126 indirect and induced jobs in businesses and local government, schools, etc. who would provide goods and services to the project and project employees. Incremental housing needs at full operations are estimated at between 109 and 182 units in conjunction with new households in the area. Given the scale of the demand compared to total housing stock (Section 3.8.5), the Rawlins and Saratoga housing markets would be able to supply sufficient conventional housing units to accommodate CCSM operations-related demand, although all workers may not be able to secure the desired housing at the desired price immediately. Demand for conventional housing is likely to increase housing costs and stimulate some new residential construction in one or more existing or new subdivisions in Rawlins.

Because all operations employees are anticipated to report for work at the on-site O&M facility, they would likely seek conventional housing resources such as single and multifamily homes and mobile homes with a reasonable daily commuting distance of the project area, primarily Rawlins, Sinclair or Saratoga.

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<sup>6</sup> Due to uncertainties associated with the THF, i.e., location, size, duration of operations, and the possibility that it would be located on private lands, the potential environmental and indirect socioeconomic effects of the facility are not considered in this EIS. It is assumed that if a THF is developed, its placement and operation would be subject to additional NEPA (if on public lands), and/or permitting by Carbon County and/or the City of Rawlins. Local permitting would address issues such as solid waste disposal, potable water requirements, fire safety and connections to utility systems.

Decommissioning and final reclamation-related housing demand would be associated with the estimated 300 to 400 workers required for decommissioning/reclamation activities and the indirect and induced employees required to provide goods and services to the decommissioning/reclamation project and project employees. Most decommissioning/reclamation workers would require temporary housing. Because decommissioning/ reclamation activities would occur more than 30 years in the future, it is not possible to forecast how many workers might be drawn from the local workforce or the availability of temporary housing resources at that time, but it is anticipated that PCW will work with local communities to ensure adequate housing for decommission/reclamation employees prior to initiation of these activities.

#### **4.8.2.4 Community Infrastructure and Services**

Construction-related demand for local government infrastructure and services would occur within communities near the project area, and on the highways and roads that provide access to the project area.

Primarily affected Carbon County services would include emergency response, emergency and urgent health care, law enforcement/criminal justice and county road maintenance. As part of a broader health and safety plan, PCW would develop an emergency response plan for the proposed project (PCW 2012a). Such plans typically include notification and communications protocols with local law enforcement and emergency responders.

Other community and human resource/social service agencies and organizations also would experience increased need for services and other effects associated with project construction and operations, including seasonally higher demand at the conclusion of each construction season. Although some of these entities may realize increased funding from state and local sources, others rely on donations and volunteer efforts.

As shown in **Table 4.8-4**, the incremental population effects associated with Alternative 1R in Years 1 and 2 are relatively limited and reasonably comparable to typical seasonal variations associated with tourism, recreation, and some level of energy development. As such, they contribute to the demands on infrastructure and services, but generally are not of the scale that would result in the need for additional staffing or place stress on existing infrastructure capacities.

Project-related population effects in the final 3 years of project construction are considerably larger in scale, with a peak population growth of more than 1,450 during the summer. This growth would represent about nine percent of estimated Carbon County population in 2009 (15,720) and would be in addition to other seasonal demands including commercial traffic on I-80 and tourism. The challenge for Carbon County government – in fact the challenge for all communities and agencies that would provide services to the CCSM construction workforce – is that the service demand associated with the peak population would be temporary. Adding service capacity to accommodate such a substantial seasonal population can be inefficient and costly. In cases where certified personnel are required, such as law enforcement, emergency response and fire suppression, adding and equipping qualified staff for 4 to 7 months per year may not be possible. Although implementation of Alternative 1R would generate substantial sales and use tax revenues to local governments in Carbon County, these revenues would not flow in time to allow local governments to prepare in advance for accommodation of the first year construction peak, especially since major infrastructure components of the project (WTGs) would not arrive until the third year of construction. In such cases, where local government agencies are required to provide services to a substantially increased population without the resources or ability to increase service capacities, a reduction in levels of service for the existing population would be anticipated. Under current fiscal conditions, which have required local governments to cut services and staff, developing the capacity to accommodate the temporary spike in population would be particularly challenging (Section 3.8.6 and Section 3.8.7).

The Carbon County Sheriff's Office would provide law enforcement/criminal investigation, civil service, traffic enforcement, accident response, search and rescue and dispatch services to the project area and project access routes. In the past, high levels of industrial activity occurring in remote rural areas of the county have resulted in an increase in industrial accident calls, vehicle accidents, traffic infractions and crime (Colson 2009; Morris 2010). The Sheriff's office also provides criminal detention facilities in Carbon County.

The Carbon County Emergency Management coordinates emergency response services within the county and would likely coordinate the response to major emergencies such as large-scale industrial accidents and wild land fires within the alternative boundary and along project access routes.

The Carbon County Fire Department Rawlins and Saratoga divisions would likely experience an increase in vehicle accident responses and potentially wildfire responses associated with the CCSM construction project. The department also would respond to industrial accidents although to date, the department has responded to few calls related to wind energy project construction (Trapp 2010).

Emergency medical response and ambulance services within the alternative boundary, along I-80 and project access routes and within the communities of Rawlins and Sinclair would be provided by the Carbon County EMS (operated by MHCC) and the Wamsutter Health Care, Inc. Ambulance and emergency medical response services in Saratoga and along WY 130 would be provided by SCWEMS. Likely impacts on these agencies would include response to accidents along project access routes and at WTG and facility development sites, depending on PCW's on-site emergency response and medical capabilities. It is anticipated that PCW will have industrial security, emergency response and emergency medical staff and resources on site during construction. To date, the extent and location of these resources has not been provided. Industrial accidents involving serious injuries could use Flight-for-Life transport to regional trauma centers.

For non-local CCSM construction workers, emergency, urgent and in many cases, routine health care services are likely to be provided by MHCC. Workers with minor to moderate injuries from industrial and traffic accidents are likely to be transported to MHCC. Because non-local construction workers would not have primary care physicians in the area, they would likely seek care routine or urgent at the MHCC emergency room or Rawlins Urgent Care.

The Carbon County Road and Bridge Department would experience additional demand for road maintenance services on CR 407 and possibly on several other county roads due to the project. PCW has committed to enter into a road maintenance agreement with Carbon County, which would address the project's impacts on county roads.

CCSM construction-related demand for Rawlins municipal services would be associated with the relatively large numbers of non-local construction workers who live and recreate in the community. Because much of the non-local construction workforce would be anticipated to live in existing temporary and conventional housing, the effects on municipal infrastructure, including water and wastewater systems, would be limited to additional demand, which could be accommodated within the existing capacity of those systems. Construction of additional temporary housing to accommodate peak demands in Years 3 through 5, potentially including a THF, could contribute to a need for utility system improvements. The city has identified updated evaluation of and plans for its utility systems as a need, though timing for completing such plans is somewhat contingent upon improvements in the city's fiscal status.

Project-related travel to and from the CCSM worksite would create demand for traffic management services; including efforts to address anticipated congestion and delays in some locations (see Section 4.10). Rawlins' experience with large industrial construction projects has been that demand for law enforcement, code enforcement, criminal justice and emergency response services have all increased and for law enforcement and criminal justice demand, the types of service provided have changed to more alcohol and minor assault types of crimes (Massey 2010; Reed 2010). The Rawlins

Police Department staffing level during 2010 was 5.5 positions lower than 2008 levels and the Department would likely not add patrol staff on a seasonal basis, although the prospect of a multi-year construction period might support some hiring. If no additional staff is added, the level of service response for city residents as a whole would decline during peak project construction periods. Moreover, unless the general economy were to improve substantially before CCSM construction was initiated, the city would be unlikely to have sufficient revenue to restore staff positions lost during the recent recession.

Demand for code enforcement services would likely increase in the event that CCSM construction workers resort to using unconventional housing resources because apartments, motels and mobile home and RV parks become full. Construction workers charged with crimes, and code violations would increase the City Attorney's workload.

The Rawlins Fire Department would provide emergency response and fire suppression services within the City, along I-80 and portions of the WY71 access route to the project. Departmental staffing in 2010 was two fewer paid positions below levels in 2008, the cuts reflecting the effects of budgetary cutbacks in response to the recent recession. Response to fires and accidents on I-80 near the city and on project access roads and would temporarily affect coverage for other emergencies within the city.

PCW would build a RDF in Year 1. The preferred site for the RDF and laydown area is a location south of I-80 and the UPRR and approximately midway between Rawlins and Sinclair. Construction of the RDF would occur concurrently with construction of the internal haul road, and these projects would require substantial quantities of aggregate and other materials. PCW anticipates that these materials would be delivered to the site via truck during Year 1, primarily arriving from outside the area via I-80. However, PCW has assumed that one third of the aggregate required during Year 1 be sourced north of Rawlins, resulting in an increase in truck traffic on roads through portions of the city. That traffic, when combined with workforce construction traffic, could result in increased need for local street maintenance, as well as increased delay and deterioration in level of service at some intersections and increases risk of accidents (see Section 4.10 and PCW's PTMP [2012b]).

Completion of the RDF would facilitate the subsequent delivery of most of construction equipment, materials and WTG components in Years 2 through 5. Deliveries to the RDF would be offloaded and either travel or be transported via truck on the internal haul road to the appropriate location within the project area via truck. As a result, truck traffic in Rawlins in Years 2 through 5, and the demands for local street maintenance would likely be lower than during Year 1.

Although most of the construction workforce (local and non local) is anticipated to live in Rawlins, workforce commuting for 7 months out of each of 5 years is unlikely to substantially add to street maintenance demands.

Municipal solid waste generated by CCSM construction and the construction workforce would be transported from a transfer station in Rawlins to a regional disposal facility near Casper. Tipping fees are designed to cover the cost of waste disposal. The portion of the CCSM construction waste that is not recycled will be transported for disposal in an approved disposal site. Volumes of construction waste have not yet been provided so the effects on the landfill cannot be estimated.

Past consumption patterns, including meeting the temporary and seasonal demands related to travel, energy development, and construction at the Sinclair refinery, suggest that the city's water and wastewater systems have some surplus capacity to serve project-related demand. However, that demand could combine with changes in regulations and other factors to trigger infrastructure improvements, along with the attendant expenditures. The City of Rawlins, which would host the bulk of the construction workforce, has expressed interest in working cooperatively with PCW to address demands on utilities and other public facilities and services, the associated fiscal concerns, housing and other concerns (City of Rawlins 2012). The City has adopted a policy disallowing the extraterritorial extension of water and wastewater systems unless doing so is in conformance with an approved plan. However, at present no such plan has been approved.

Based on the City's experience with energy development and construction activities at the Sinclair Refinery, it anticipates increased use of its recreation facilities and programs, particularly the Rawlins Family Recreation Center. Although the increased use could lead to the need for extended operating hours and more programs, a change that has potential beneficial implications for residents, higher demand and use would increase operating costs, wear and tear on facilities, and competition among users for exercise equipment and available slots in programs during peak times.

Few construction workers are likely to live in Sinclair because there is no temporary housing and most conventional housing is occupied by refinery workers. Thus, CCSM-related demand for municipal service in Sinclair would likely be transportation related. Some CCSM workforce commuters may choose to access the project using WY 76 from Rawlins, rather than I-80, particularly during peak hours when delays and congestion are anticipated at Exit 221. The town's location along that route, its proximity to I-80 Exit 221, could result in an increase in traffic-related emergency service calls for the Sinclair police and fire departments. Concurrent project-related traffic from CCSM and traffic from the Sinclair refinery would result in more traffic enforcement demand for the Sinclair Police Department and increase the risk of accidents, as this route would have more traffic travelling through the residential and commercial part of town.

CCSM-construction-related service demand in Saratoga would be associated with the non-local construction workers residing in the town, currently anticipated to peak at about 115 workers based on 2010 housing availability, or six percent of 2009 total Saratoga population. Because non-local workers would be staying in existing accommodations that are currently served with utilities, the incremental impact on these systems would be minimal. Service demand in Saratoga would be limited primary to law enforcement, emergency response and emergency and urgent health care.

Few non-local CCSM construction workers are likely to secure housing in Baggs, Dixon, or other Carbon County communities, or the Sweetwater County community of Wamsutter because of the limited temporary housing base in those communities and likely competition from other energy development projects. The relatively few CCSM construction workers who do reside in these communities are unlikely to generate substantial demand for local government services or infrastructure.

During project operations the relatively small CCSM workforce (the operations workforce would be about 10 to 15 percent of the peak construction workforce), the incremental resident population, traffic and activity within the alternative boundary and on access routes would correspondingly generate substantially lower demand for local government services and infrastructure. The associated demand for utility service would be accommodated within existing system capacities in Rawlins, and Saratoga, where the bulk of CCSM operations workers are likely to reside.

During project decommissioning and final reclamation, the non-local portion of the transient workforce performing these activities would generate demand for a limited range of local government services including law enforcement, emergency response, health care and road maintenance from May through November each year. It is not possible to estimate the share of the decommissioning/reclamation workforce that will be nonlocal, where those workers would reside, or the capability of local government services to accommodate those demands some 30 or more years in the future, but it is assumed that PCW would cooperate with affected local governments on plans to accommodate the additional service demand prior to initiation of decommissioning and reclamation activities.

School districts serving the communities would see little increase in student enrollment related to either the construction or decommissioning activities. Consequently there would be no noticeable effects on staffing, facility or transportation needs. During long-term operations the districts could gain 35 to 60 students over time, with between 10 and 20 of those students being in grades 9 through 12. Most of the gain would affect Carbon County School District #1. The net change in enrollment associated with CCSM project operations is likely to fall within the range of year-to-year variation in district-wide enrollment in recent years. The magnitude of the incremental enrollment is unlikely to require additional facility capacity, but might result in limited need for additional staffing. Revenues associated with the

CCSM project that would accrue to CCSD #1 and the WSFC would be adequate to offset the additional costs.

#### 4.8.2.5 Fiscal Effects

The initial capital investment in facilities and equipment, the depreciated value of that investment over time, purchases of other goods and services by PCW, its contractors, and households supported by the project would generate a series of one-time and recurrent revenues for the federal, state, and local governments.

The major revenue sources associated with Alternative 1R would include federal rental fees on the ROWS grant, state and local sales and use taxes on the purchases of taxable equipment and supplies by PCW, its contractors and employees, and local ad valorem taxes on the value of the WTGs and ancillary facilities. Under a recently enacted state statute, wind energy producers will be assessed a \$1.00/MW hour of energy generated annually (W.S. 39-22) after the first 3 years of operation. Carbon County also would realize an increase in lodging taxes associated with the seasonal influx of temporary workers during the 5-year construction period.

- **Public land lease rental revenues:** Wind energy generating facilities granted ROWs on public lands must pay annual rental fees (43 CFR 2806). All rent receipts derived from the wind energy ROWs are retained by the federal government. The rents are presently set at \$2,365.00 per year per megawatt of installed capacity. Rents are phased in over a 3-year period once commercial production begins: 25 percent in Year 1, 50 percent in Year 2, and 100 percent in Year 3. Because neither the final locations nor specific turbine configurations have been determined for the CCSM, future rental rates are projected assuming 45 percent of the WTGs would be located on public lands, given either 2 MW or 3 MW capacity generator. Based on these assumptions, annual rents would accrue to the Federal Treasury based on completed capacity, such that annual receipts would begin in the third year of construction and increase over time to between \$2.1 million and \$3.2 million. These revenues would continue long-term over the life of the project.
- **Local ad valorem taxes:** projected capital development costs of Alternative 1R could range between \$4.2 and \$6.2 billion, depending on pending decisions regarding WTG capacity. Initially, the CCSM project would have an assessed value in the range of \$483 million and \$690 million (11.5 percent of improved value) declining over time as depreciation reduces the value of equipment. That assessment would qualify the CCSM as the single largest property taxpayer in the county, by a considerable margin. In recent years the County's tax base has been driven by increasing rates of natural gas production and prices, the latter resulting in a high risk of volatility. Such volatility is evident in the decrease in total assessed valuation for the county dropping by nearly 38 percent, from \$1.22 billion in 2009 to \$764 million for 2010. Relative to the latter value, the initial assessed value for CCSM would represent an increase of between 63 and 90 percent.

Based on current tax rates, projected ad valorem taxes across all local tax entities would total between \$29.7 million and \$42.4 million the first year following project completion.

Approximately 20 percent of that total would accrue to Carbon County, 7 percent to various special districts and the remainder to support public education, not just locally but across the state based on Wyoming's education funding mechanisms. The \$5.8 to \$8.3 million that would accrue to Carbon County would be a significant boost in revenues given the County's total current general fund revenues of \$22.1 million for 2010.

Ad valorem tax revenues to the county, public education and special districts would decline over time as depreciation reduces the project's capital value. However, despite the effects of depreciation, the high initial value of the project would insure that such payments remain substantial for many years. Estimated total annual payments across all local tax entities after

10 years would be between \$21.7 million and \$31 million and cumulative ad valorem tax payments over that period range from \$257 million to \$367 million.

Rawlins and other municipal entities would realize some additional property tax revenues in conjunction with Alternative 1R as a result of the project's effects in promoting additional residential and commercial development and higher property values.

Ad valorem taxes would continue over the life of the project, effectively ceasing following decommissioning and reclamation.

- **Sales and Use taxes:** Given the recent expiration of that exemption, sales and use taxes under Alternative 1R are projected assuming an overall construction budget of \$4.2 billion to \$6.2 billion, and a \$400 million allowance for non-taxable outlays, such as non-local engineering and legal services, motor vehicle fuels, any payments to the BLM and other landowners for rights-of-way and easements. Given the above, Alternative 1R could yield between \$216 million and \$336 million in sales and use tax receipts. Of those sums, between \$144 million and \$244 million would be derived from the state's 4 percent levy; 69 percent of which accrues to the general fund. The remaining \$44 million to \$69 million, less a 1 percent administrative fee, would be distributed to local governments with a substantial portion returned to Carbon County and local municipal governments. Based on the population distribution within Carbon County, these revenues would provide a substantial source of revenues to the City of Rawlins and towns of Saratoga and Sinclair.

The largest share of projected sales and use tax would be generated in conjunction with the purchase and delivery of the WTGs in Years 3 through 5. However, some sales and use taxes would be generated in conjunction with material and equipment purchases in Years 1 and 2, such as road and WTG foundation construction materials, and by local taxable consumer expenditures by PCW and contractor employees. Although substantially smaller in magnitude than those in the latter years, these revenues could be important to local governments preparing for the increased service demands in Year 3.

In addition to the local share of the state's sales and use taxes, Carbon County would realize sales and use taxes from its 1 percent general purpose option tax and potentially its 1 percent specific purpose option tax, the latter contingent upon approval of any specific projects by local voters. Implementation of Alternative 1R could generate receipts totaling between \$39 million and \$55 million from each of these levies.

Under the provisions of the Wyoming Industrial Development and Siting Act, local governments may be eligible for impact assistance payments. Such payments are transfers from the state's share of sales and use taxes receipts and are provide additional financial resources to local governments to address the service and infrastructure costs associated with large-scale industrial development, such as the CCSM project. The availability of such impact assistance is contingent upon growth in sales and use tax receipts during construction compared to a pre-construction base period, and discretionary decisions on the eligibility and distribution of such funds by the Industrial Siting Council.

Additional sales and use taxes would be generated over the operational life of the project however; they would be substantially lower in magnitude.

- **Wind Production Taxes:** In 2010, then Governor Freudenthal enacted a wind energy production tax that had been approved by the 2010 Wyoming Legislature. The tax is a \$1.00/MW hour produced annually by a commercial wind project. The statute (W.S. 39-22) provides a 3-year exemption from the date of initial production. Forty percent of the revenues generated by this tax will accrue to the state's general fund, with 60 percent distributed among counties where generating facilities are located. Although the distribution mechanism for the local share has not yet been finalized, it can be expected that a substantial share of the revenue will remain in the county where the power was generated. However, it is uncertain whether a share of the local revenue will flow through to municipalities.

Under the current POD (PCW 2012a), initial commercial production is anticipated late in Year 3 of construction. Given the 3-year exemption, full scale taxable production would be achieved in Year 7, yielding between \$6.1 million and \$9.2 million in annual tax receipts, depending on the final decision regarding the size/capacity of WTGs to be used.<sup>7</sup> Annual receipts accruing to the state general fund assuming full development and production would range between \$2.4 million and \$3.7 million. Revenues accruing to the local government distribution fund would range between \$3.7 million and \$5.5 million per year.

Wind production taxes would continue over the life of the project, fluctuating on a year-to-year basis in response to the amount of power produced.

The major public sector revenues projected in conjunction with Alternative 1R are summarized in **Table 4-8.6**.

**Table 4.8-6 Summary of Major Public Sector Revenues Generated by Alternative 1R**

Revenue Source	Projected Revenue	Revenues Distributed to
Federal ROW grant rentals	\$2.1 million to \$3.2 million per year at full development	U.S. Treasury
Local ad valorem tax (including mandatory state levies)	\$29.7 million to \$42.4 million (Year 1) \$21.7 million to \$31 million (Year 10)	County, local and statewide public education, special districts. Rawlins benefits indirectly.
Sales and use tax	\$216 million to \$336 million (over 5 years) Continue during operations, but much lower	State general fund and local governments, primarily Carbon County, Rawlins, Saratoga, and Sinclair.
Wyoming Impact Assistance Payments	Unknown	Affected units of local governments, as determined by the Industrial Siting Council.
Wind energy production tax	\$6.1 million to \$9.2 million per year (at full production after 3-year exemption period)	State general fund and local governments, primarily Carbon County, and possibly Rawlins, Saratoga, and Sinclair.

For local governments affected by the large-scale construction projects, such as CCSM, two important issues with respect to impact planning and mitigation are: 1) the potential time lags between the availability of revenues and the need for expenditures to provide services; and 2) jurisdictional mismatches between demands and revenues. The former occurs when growth or other factors creates demands for services, but associated revenues are not received until substantially later due to delays in reporting taxable expenditures and the tax collection, distribution and budgeting processes. The timing of receipts is always important for local governments, but particularly during periods of rapid growth following a period of economic decline and fiscal shortfalls, such as the period from 2008 to 2010 in Carbon County, that diminish local governments' capability to respond to growth-related demand. Although lag-time issues would not be unique to the CCSM project, they would take on added significance in this case due to the potential scale of the revenues and public sector expenditures associated with the project.

<sup>7</sup> Annual production based on a 35 percent capacity factor and 97 percent average productivity allowance.

Jurisdictional mismatches arise when a project such as CCSM generates substantial public revenues, but those revenues do not necessarily accrue to entities facing additional demands for services. Such situations are common in conjunction with natural resource development across Wyoming, when development occurs in unincorporated areas and the associated revenue accrues to counties but many public service demands affect nearby municipalities; as would be the case with respect to ad valorem taxes levied by Carbon County, while the City of Rawlins faces many service demands. Over time, local governments in Wyoming have responded to such situations by engaging in various formal and informal cooperative service arrangements, including the creation of joint-powers boards. Joint powers boards are a quasi-governmental entity, authorized by Wyoming statute, that are created by agreement between two or more public entities for the purpose of providing one or more services within a defined service area, drawing on various financial resources of the participating entities.

Local governments and other public entities would realize increases in other charges for services, fees, and intergovernmental revenue transfers, due to the increase in economic activity and business and consumer spending given the implementation of Alternative 1R. Such revenues would be substantially lower in magnitude than those identified above, but they would still be important to the specific entity involved.

Local lodging taxes to support tourism promotion would be expected to increase due to higher average occupancy rates in the summer, despite the potential for displacement of some other travel demand and the exemption of longer duration stays (30 days or longer) from lodging taxes.

Public service demands associated with the short-term and long-term population growth, jobs, housing, and other factors related to the Alternative 1R would result in incremental pressures on local government expenditures. Local governments and public service providers, including Carbon County, Rawlins and possibly Sinclair and Saratoga would be required to provide services to accommodate CCSM traffic and workforce before they receive substantial project-related revenues. Combined with recent cutbacks in some staffing levels, the increased demand could result in a deterioration of service levels in some local government services during the initial construction years.

Long-term public service demand and related local government expenditures associated with Alternative 1R would be limited due to the modest long-term population growth associated with the project. In general, the need for higher expenditures would be offset by the revenues described above, yielding long-term net fiscal benefits; particularly for Carbon County. Moreover, the expansion of the tax base afforded by the project, although expected to decline over time would provide some diversity and likely be less volatile than that associated with natural gas development. That stability, combined with the larger tax base, is another important benefit that would accrue from the project.

Complete decommissioning and final reclamation would initially result in temporary increases in local sales tax receipts generated by consumer expenditures made by contractors and workers on the project. However, it also would signal the impending cessation of federal rental income, local ad valorem taxes and wind production taxes, the latter affecting both the state and local governments.

#### **4.8.2.6 Social Effects**

Information for this section was drawn from scoping comments, local and regional newspaper articles and editorials, interviews with local officials and staff, and other sources as cited. A key source of information about attitudes and values among local residents was the Draft Carbon County Land Use Plan (Carbon County 2010) and the Planning Survey conducted as part of the land use planning process (Markert 2008).

Social effects of Alternative 1R construction would be associated with the presence of a large temporary and transient workforce in the project area, on project access routes, and in communities nearby. The effects would be moderate during Years 1 and 2 given the scale of construction activity and capacity for the community to accommodate most of the housing demand in existing resources, assuming continued

demand from other energy development at recent levels. Although current residents, local institutions and service providers, local businesses, and PCW and its contractors would garner experience and insights to project-related effects from Years 1 and 2, social effects in affected communities would become much more noticeable and widespread in Years 3 through 5, particularly in Year 3 when the construction workforce quickly ramps up to more than 1,000 workers. Social effects also would be associated with the changing character of the area and the surrounding view shed, which would affect various publics, organizations and individuals differently, depending on their interests in the area and other factors, such as the development of renewable energy.

Residents of Rawlins, Sinclair and Saratoga would experience project-related changes in the familiar landscape and seasonal changes in community social conditions during construction. Residents of, Baggs/Dixon and Wamsutter, though located more distant from the project area, could be affected by seasonal changes in community social conditions during the 5-year construction period, depending on PCW housing strategies and the availability of housing on these communities during construction.

Residents of Rawlins and Sinclair are familiar with the presence of energy development and construction workers in their communities. The activity in these communities associated with CCSM construction would be welcomed by many for the accompanying economic benefits and because of their support for renewable energy development. But for others, the recent experience with high levels of natural gas development and expansion of the Sinclair refinery has left wariness about the potential effects of future energy booms. During periods of CCSM construction, the increase in traffic and large numbers of construction workers in social settings such as stores, restaurants, bars, post offices and banks, may cause dissatisfaction for some long time residents, particularly during the summertime periods of peak employment in Years 3 through 5. The effects of CCSM construction on social conditions in these communities would depend in large part on the level of other energy development and construction projects occurring concurrently in the area, and on PCW construction worker housing arrangements and policies for managing the construction workforce and the effectiveness of those arrangements and policies.

Saratoga has some experience in housing energy and construction workers. Community residents also are accustomed to housing seasonal tourists and recreation visitors. The relatively moderate number of CCSM construction workers expected to live in Saratoga, based on 2010 temporary housing availability, would likely not result in substantial social disruption in that community.

Baggs, Dixon, and Wamsutter are similarly familiar with energy development workforces. Few CCSM construction workers are anticipated to live in these communities due to the distance from the project area, the lack of substantial temporary housing resources (except in Wamsutter) and competition for housing from natural gas development projects near those communities. Consequently, social issues related to the CCSM construction workforce are likely to be minimal in these communities.

Some residents of communities and rural areas are likely to be dissatisfied with the change in character of the project area and adjacent view shed. As noted in Section 3.8.9 and Section 3.8.10, Carbon County residents value clean air and water, wildlife, wildlife habitat, and access to and the health of public lands. For many residents, the presence of large tracts of relatively open and wild lands in close proximity to their homes is one of the reasons they were attracted to and remain in Carbon County. Although many residents take pride in the fact that Carbon County has become a center for renewable energy development, they lament the loss of open space and changes in treasured landscapes. While there are those who have adopted positions of support or opposition to further wind energy development and the CCSM project, there are those that are ambivalent for the above reasons. There also is a strong private land rights ethic among many Carbon County residents, who believe that landowners have a right to develop their lands as they wish as long as such development does not threaten the health, safety and welfare of others and this group may support development of Alternative 1R even though they are concerned about changes in scenic vistas and open space that would accompany development.

The recreation assessment conducted for this EIS concludes that construction activities associated with Alternative 1R are not anticipated to preclude recreation activities and/or limit public access to recreation opportunities (Section 4.7.2.). This is in large part because most of the proposed project is located within the boundaries of TOTCO, which in combination with the checkerboard pattern of land ownership effectively limits access to much of the public lands within ranch boundaries. Construction activities would however, alter the character of the recreation setting on areas adjacent to the project boundary and along access routes to some recreation use areas. Some recreation users of the area would likely be dissatisfied with the construction activity and change in recreation setting. Some local users with attachment to dispersed recreation areas open to the public south of T18N in the Sierra Madre site would likely be dissatisfied with construction activity, disturbance and changes in recreational setting.

Social effects of construction activities would be short-term and temporary, lasting approximately 7 months out of each construction year. Social effects of the change in character of the recreation setting would be long-term, extending through the operations and decommissioning phases of the project.

Livestock grazing would potentially be disrupted for much of the 5-year construction phase of the project, although the location of such disruption would be limited in scale and vary over time in response to changes in the location of construction activities. The majority of project-affected grazing lands would be located in the Pine Grove/Bolten allotment, which is held by TOTCO. Although grazing operations on the Pine Grove/Bolten allotment would be most affected by construction, these effects are likely accounted for in the lease arrangement between PCW and TOTCO. Two other grazing allotments would be affected by disturbance, by traffic along access roads that traverse allotments, by construction activities and by dust and reduced palatability of forage along access roads and near construction sites as described in Section 4.6 of this EIS. Livestock injury and mortality associated with vehicle/livestock collisions, damage to grazing improvements and wandering livestock resulting from gates left open during construction also are potential impacts. During intensive periods of construction, the affected operators may forego use of a particular pasture or reduce the scale of their grazing operations to reduce potential adverse effects. Other than TOTCO, affected grazing operators would not benefit economically from Alternative 1R. These potential impacts and changes in grazing operations could result in dissatisfaction for some grazing operators, as well as the economic impacts described in Section 4.8.2.1. To the extent that the project-affected grazing operators also are affected on other allotments by energy development, or by weather, cattle, feed and fuel prices or other external factors, the effects of CCSM project-related impacts could be compounded.

Construction activities would likely evoke a mixed reception among two other affected publics:

- 1) individuals and organizations that place high value or priority on resource protection, species and habitat protection, clean air and water, and preservation of scenic vistas and open space, and
- 2) individuals and organizations that place high values or priority on development of renewable energy resources, reducing greenhouse gas emissions, and other efforts to address global climate change. For many people that identify with both of these values, the scale and location of Alternative 1R has generated concern for effects on wildlife habitat and movement, surface water quality, invasion of noxious and invasive species and scenic vistas and open space.

During project operations, social effects would be associated with the change in setting and character of the project area and surrounding view shed that was initiated during construction. The substantial changes in daytime vistas and nighttime skies would result in dissatisfaction for some local residents and visitors. For some, these effects might be offset by the diversification of the local economy and additional tax base.

Social conditions and trends within the study area some 30 years or more in the future are impossible to predict, but the effects of decommissioning and final reclamation are likely to be associated with the accommodation of a relatively large, temporary and short term construction workforce and with returning the area to a more predevelopment state, depending on the number of roads that are eventually reclaimed.

#### **4.8.2.7 Environmental Justice**

Implementation of Alternative 1R would not be anticipated to result in significant adverse impacts to human health and environmental resources, much less disproportionately high effects on minority or low-income populations in the region. Consequently, environmental justice concerns would not arise in conjunction with Alternative 1R.

#### **4.8.3 Impacts to Socioeconomics from Alternative 2, Checkerboard Only**

Alternative 2 considers wind development on public lands located within the Chokecherry site and those public lands located within the Sierra Madre site north of T18N, R88W. Privately owned and state lands located in these areas also are regarded as available for the development. As with Alternative 1R, Alternative 2 would involve the construction, operation and decommissioning of up to 1,000 WTGs and associated access roads, power collection lines, substations and interconnection line. Alternative 2 assumes development of the RDF at PCW's preferred location. However, rather than proposed internal haul road alignment through the interior of the Chokecherry project, the haul road would be built along an alignment heading west from the RDF to Hwy 71, then turning south to parallel the Hwy 71 corridor to the Sierra Madre and Sage Creek Basin areas (see Section 2. 3.3 for a description of the WY 71 corridor haul road location). Project access would remain the same under Alternative 2 as in Alternative 1R, however; the distribution of WTGs would be different; more WTGs located in the Chokecherry and eastern portion of the Sierra Madre sites and offsetting decrease in the number of WTGs in the western portion of the Sierra Madre site compared to Alternative 1R.

Although the total number of WTGs would be unchanged as compared to Alternative 1R, implementation of Alternative 2 would require construction of additional internal resource roads, turnarounds, and a more extensive energy collection system, increasing the level of labor, number and length of trips required for materials and equipment deliveries. The critical implication of these differences would be higher projected traffic volumes during construction, compared to Alternative 1R, including more trucks hauling aggregate in Year 1 before the RDF is complete. Based on the construction activities and schedule outlined in the POD, somewhat higher employment would be required in Years 2 through 4 as well. Estimates of the additional employment are not available, but the incremental needs are not likely to be substantial relative to the peak workforce in Year 3.

##### **4.8.3.1 Local Economic Effects**

From a socioeconomic perspective, the critical implication of the construction of substantially more total miles of internal roads and more turnarounds is that it would translate to a need for additional direct construction labor and potentially, a higher project construction cost. Increases in the direct manpower needs for the project would in turn support additional indirect and induced jobs in the region, during the construction period.

Detailed construction phasing, scheduling and estimates of the additional direct construction labor effort are not available for Alternative 2. Consequently, the impacts on labor requirements associated with construction of the haul road in Year 1 and construction in the subsequent years are unclear. Also unclear is whether the additional construction requirements would result in a higher peak workforce, or by spreading the activity out over each year's construction season. An increase in the peak workforce would result in higher levels of immigration of nonlocal labor to fill the available jobs. Spreading the additional effort over the entire season would still result in the creation of more short-term jobs and higher personal income in the region; without affecting the peak employment.

Implementation of Alternative 2 would be accompanied by substantial seasonal increases in employment in the spring, followed by rapid declines in October/November, comparable to that for Alternative 1R.

Local lodging, retail and service establishments catering to construction workers would see an increase in business volume over the 5-year construction period as compared to Alternative 1R. The scale of the incremental effects on business revenues would be commensurate with the increase in construction

labor associated with Alternative 2, but would likely be modest given the large base associated with Alternative 1R. Effects of Alternative 2 on local personal income would be comparable to those with Alternative 1R.

The long-term O&M workforce assumed for Alternative 2 would be between 114 and 158 at full development, the same as under Alternative 1R.

Long-term employment effects related to operations, and the temporary effects associated with decommissioning and reclamation would be comparable to those for Alternative 1R. Local businesses would see an increase in business volume related to local expenditures by the company, contractors and vendors providing ongoing maintenance services, and employees whose jobs are supported by the project. Local residential construction activity could increase for several years during the transition from construction to operations in order to supply additional housing demand.

#### **4.8.3.2 Local Population and Demographic Effects**

Local population effects under Alternative 2 would mirror short-term employment patterns described for Alternative 1R. Seasonal influxes would accompany the startup of construction each season, followed by a corresponding outflow when weather and/or seasonal wildlife closures bring construction to an end. Generally, temporary population gains would be comparable to those under Alternative 1R, with the following caveat; slightly higher immigration would be expected if the additional labor effort associated with Alternative 2 results in a higher peak employment impact. Little additional growth would result if the additional labor effort is distributed over the course of the construction season. Long-term population gains of up to 422 residents could occur in conjunction with operations under Alternative 2.

Most workers relocating to the area to fill jobs supported by the construction of Alternative 2 would be single-status/unaccompanied.

Implementation of Alternative 2 would, like Alternative 1R, result in little increase in the number of school-age children moving to Carbon County during construction. Long-term gains in enrollment of between 35 and 60 students could occur in conjunction with operations. Local school districts have adequate facility capacity, but may require a limited increase in staffing levels to accommodate the enrollment gains. These increases would result in little net impact on public education budgets due to the guaranteed funding provisions of the WSFP.

#### **4.8.3.3 Housing Needs**

As with Alternative 1R, Alternative 2 would involve the construction, operation and decommissioning of up to 1,000 WTGs. Project access would remain the same as Alternative 1R under Alternative 2. The project's direct labor requirements would be slightly higher. A modest increase in labor resulting in a higher peak workforce in Years 1 and 2 could likely still be accommodated by existing housing resources in the region. An increase in the peak workforce requirements in Years 3 through 5 would exacerbate increase the shortfall in housing and bolster the need for action by PCW to address housing. Higher project-related demand also would increase the competition with other market segments and also push nightly room rates higher.

Housing needs during project operations would likely be met by a combination of existing units and new residential construction. Several existing and proposed subdivisions provide capacity to accommodate new construction. Local housing prices would likely rise in response to the increased demand for long-term housing.

#### **4.8.3.4 Facilities and Services**

Demands and the effects of those demands on public facilities and services, including public education, under Alternative 2 would generally be comparable to those described for Alternative 1R. As with employment and housing, temporary peak demands could be higher depending on the final sequencing

of construction activity. However, there are no facilities or services facing critical capacity or staffing shortfalls where a difference in the incremental peak would likely result in a dramatic reduction in service levels or response capability as compared to the effects of Alternative 1R.

#### 4.8.3.5 Fiscal Effects

The capital investment in facilities and equipment, purchases of non-capital goods and services by PCW, its contractors, and households support by the project would generate a series of one-time and recurrent revenues for the federal, state, and local governments. Like Alternative 1R, the major revenue sources associated with Alternative 2 would include federal rental fees, state and local sales and use taxes, local ad valorem taxes, and wind energy production tax. Carbon County also would realize an increase in lodging taxes associated with the seasonal influx of temporary workers during the 5-year construction period.

- Public land lease rental revenues: Wind energy generating facilities granted ROWs on public lands must pay annual rental fees (43 CFR 2806). All rental receipts derived from wind energy right of way grants are retained by the federal government. Total generation capacity, and hence, projected production would be the same under Alternative 2 as for Alternative 1R. Projected annual rents accruing to the Federal Treasury of between \$2.1 million and \$3.2 million per year also would be the same. These revenues would continue long-term over the life of the project.
- Local ad valorem taxes: projected project development costs of Alternative 2 may be slightly higher than the estimated \$4.2 billion to \$6.2 billion for Alternative 1R. The incremental difference in project development cost not known at this time, but it expected to be modest given that the bulk of the project cost lies in the cost of the WTGs, the road network, and electrical system included in Alternative 1R. The difference, in relative terms, would translate into a similar effect on the assessed valuation and ad valorem tax revenues over time, all other factors unchanged. As with Alternative 1R, Carbon County would realize benefits associated with the relative stability of the assessed value and tax revenues from the project.

Rawlins and other municipal entities would realize additional property tax revenues in conjunction with Alternative 2 as a result of the project's effects in promoting additional residential and commercial development and higher property values, but the magnitude of such receipts would not differ dramatically from those for Alternative 1R.

Ad valorem taxes would continue over the life of the project, effectively ceasing following decommissioning and reclamation.

- Sales and use taxes: Given the recent expiration of the sales and use tax exemption for capital equipment and related materials and supplies used in the construction of renewable energy projects, all of the WTGs and other capital equipment would likely be subject to sales and use tax. Total sales and use taxes paid in conjunction with the CCSM project under Alternative 2 would be slightly higher than \$216 million to \$336 million in the corresponding receipts projected for Alternative 1R. Of those sums, the amounts accruing to both the state and to local governments would be proportionately higher than for Alternative 1R. Carbon County and local municipalities also would realize a proportionate gain to the increase in the taxable costs associated with the project. Revenues generated by the local 1 percent general purpose option tax and potentially by a 1 percent specific purpose option tax also would increase.

Although the geographic distribution of WTGs under Alternative 2 would differ from that under Alternative 1R, the general scheduling and phasing of construction would be similar. Consequently, so too would be the timing of sales and use tax receipts – relatively low in Years 1 and 2, increasing substantially in Years 3 through 5 when the WTGs are delivered and installed. The receipt of sales and use taxes in Years 1 and 2 could be important to local governments preparing for the increased service demands in Year 3.

Affected units of local government would be eligible for impact assistance payments, subject to the approval of such payments by the Wyoming Industrial Siting Council, and increases in sales and use tax receipts during construction that are sufficiently higher than those during a pre-construction base period to trigger such payments.

Additional sales and use taxes would be generated over the life of the project; however, they would be substantially lower in magnitude than those during construction.

- **Wind production taxes:** In 2010, Wyoming enacted a \$1.00/MW hour wind energy production tax. Forty percent of the revenues generated by this tax will accrue to the state's general fund, the remaining 60 percent distributed among counties where generating facilities are located. Although the distribution mechanism for the local share has not yet been finalized, it might reasonably be expected that a substantial share of the revenue will remain in the county where the power was generated. Given the 3-year exemption from tax provided for in statute, full taxable production would be achieved in Year 7 and yield between \$6.0 million and \$9.0 million in annual taxes beginning in Year 8, the amount varying with the size/capacity of WTGs used. Annual receipts accruing to the state general fund, assuming full development and production, would range between \$2.4 million and \$3.6 million. Revenues accruing to the local government distribution fund would range between \$3.6 million and \$5.4 million per year.

Wind production taxes would continue over the life of the project, varying on a year-to-year basis in response to the quantity of power produced.

**Table 4.8-7** summarizes the projections of the four major sources of public revenues that would result in conjunction with Alternative 2.

For local governments affected by the CCSM project, concerns with respect to potential lags in revenue receipts and jurisdictional mismatches with Alternative 2 would be the same as under Alternative 1R.

Local governments and other public entities would realize increases in other charges for services, fees, and other taxes, for example lodging taxes, given the implementation of Alternative 2. Such revenues would be substantially lower in magnitude than those identified above, but they would still be important to the specific entity involved. Although it is unclear as to whether the revenues would offset the costs incurred by a specific entity in serving project related demand, these revenues would generally accrue over time when incremental demands associated with the project would be minor.

**Table 4.8-7 Summary of Major Public Sector Revenues Generated by Alternative 2**

Revenue Source	Projected Revenue	How Compares to Alternative 1R	Revenues Distributed to
Federal ROW grant rentals	\$2.1 million to \$3.2 million per year at full development	Same	U.S. Treasury
Local ad valorem tax (including mandatory state levies)	More than \$29.7 million to \$42.4 million (Year 1 of full development) More than \$21.7 million to \$31 million (Year 10)	Higher	County, local and statewide public education, special districts. Rawlins benefits indirectly.
Sales and use tax	More than \$216 million to \$336 million (over 5 years) Continue during operations, but much lower	Higher	State general fund and local governments, primarily Carbon County, Rawlins, Saratoga, and Sinclair.

**Table 4.8-7 Summary of Major Public Sector Revenues Generated by Alternative 2**

<b>Revenue Source</b>	<b>Projected Revenue</b>	<b>How Compares to Alternative 1R</b>	<b>Revenues Distributed to</b>
Wyoming Impact Assistance Payments	Unknown	Comparable	Affected units of local governments, as determined by the Industrial Siting Council.
Wind energy production tax	Approximately \$6.1 million to \$9.2 million per year (at full production after 3 year exemption period)	Comparable to, but slightly lower than Alternative 1R due to less efficient turbine layout and lower energy production. (PCW 2011).	State general fund and local governments, primarily Carbon County, and possibly Rawlins, Saratoga, and Sinclair.

Public service demands associated with the short-term and long-term population growth, jobs, housing, and other factors related to the Alternative 2 would result in incremental pressures on public sector expenditures. Although not quantified in this assessment, the incremental short and long-term expenditures by Carbon County associated with Alternative 2 would be limited when the incremental revenues are considered. Moreover, the expansion of the tax base afforded by the project, although expected to decline over time, would be less volatile than that associated with natural gas development. That stability, combined with the larger tax base is another important benefit that would accrue from the project. Consequently, from a fiscal perspective, implementation of Alternative 2 is likely to be beneficial, both in the short term and over the long term.

Complete decommissioning and final reclamation would generate temporary increases in local sales tax receipts generated by consumer expenditures made by contractors and workers on the project. However, it also would signal the impending cessation of federal rental income, local ad valorem taxes and wind production taxes, the latter affecting both the state and local governments.

#### **4.8.3.6 Social Effects**

Social effects of Alternative 2 would be similar to those described in Alternative 1R. The potential for construction-related social disruption in Rawlins and Sinclair could be slightly different than that described for Alternative 1R depending on project scheduling.

#### **4.8.3.7 Environmental Justice**

Implementation of Alternative 2 would not be anticipated to result in significant adverse impacts to human health and environmental resources, much less disproportionately high effects on minority or low-income populations in the region. Consequently, environmental justice concerns would not arise in conjunction with Alternative 2.

#### **4.8.4 Impacts to Socioeconomics from Alternative 3, No Miller Hill or South Sierra Madre**

Alternative 3 considers development of up to 1,000 WTG on public lands within the Chokecherry site and within the Sierra Madre site east of the eastern half of T18N, R88W. Privately owned and state lands located in these areas also were considered available for the development. All lands (federal, state, and private) below T18N or in the western half of T18N, R88W Section 21 are excluded from wind development under Alternative 3.

Alternative 3 assumes the RDF would be constructed in the alternate location, east of Sinclair and northeast of Exit 221 on I-80. The immediate access to the RDF would be from WY 76. From the alternate RDF, construction equipment, materials and supplies delivered by rail would be transloaded to trucks for transport to the project area. Trucks would initially exit the RDF and laydown area, turn left onto WY 76, then across the I-80 overpass at Exit 221, continuing on WY 76 and CR 407 (CIG Road), ultimately connecting to the internal haul road described under Alternative 1R.

Although the number of WTGs under Alternative 3 is the same as with Alternative 1R, the distribution of WTGs in each site under Alternative 3 would differ substantially from the distribution under Alternative 1R. Under Alternative 3, approximately 25 percent more WTGs would be located in the Chokecherry site with 15 percent more WTGs located in the eastern portion of the Sierra Madre site. These increases would be offset by a reduction in the number of WTGs located in the western portion of the Sierra Madre site compared to Alternative 1R. Differences in distribution of WTG between the sites would require construction of additional internal resource roads, turnarounds, and a more extensive collection system.

#### **4.8.4.1 Local Economic Effects**

As with Alternative 2, the critical implication associated with the construction of substantially more total miles of internal roads and more turnarounds is that it translates to a need for additional direct construction labor and potentially, higher project construction costs. Increases in direct construction manpower needs would in turn support additional indirect and induced jobs in the region, during the construction period.

Detailed construction phasing, scheduling and estimates of the additional direct construction labor effort are not available for Alternative 3. Consequently, the impacts on labor requirements associated with construction of the haul road in Year 1 and construction in the subsequent years are unclear. Also unclear is whether the additional construction requirements would result in a higher peak workforce, or by spreading the activity out over each year's construction season. An increase in the peak workforce would result in slightly higher levels of immigration of nonlocal labor to fill the available jobs. Spreading the additional effort over the entire season would still result in the creation of more short-term jobs and higher personal income in the region; without affecting the peak employment.

Implementation of Alternative 3 would be accompanied by seasonal increases in employment in May/June and a rapid sharp decline in October/November, comparable to that for Alternative 1R.

Local lodging, retail and service establishments catering to construction workers would see an increase in business volume over the 5-year period as compared to Alternative 1R. The scale of the incremental effects on business revenues would be commensurate with the increase in construction labor associated with Alternative 2, but would likely be modest given the large base associated with Alternative 1R. Due to the location of the RDF at the alternate site and optional highway access to Rawlins via WY 76, convenience retail establishments in Sinclair may realize a larger increase in revenues from sales to construction workers under Alternative 3 than under Alternatives 1R or 2. Effects of Alternative 3 on local personal income would be somewhat higher than those with Alternative 1R.

The long-term O&M workforce assumed for Alternative 3 would be between 114 and 158 at full development, the same as under Alternative 1R.

Long-term employment effects related to operations, and the temporary effects associated with decommissioning and final reclamation would be comparable to those for Alternative 1R. Local businesses would see an increase in business volume related to local expenditures by the company, contractors and vendors providing ongoing maintenance services, and employees whose jobs are supported by the project. Local residential construction activity could increase for several years during the transition from construction to operations in order to supply additional housing demand.

#### 4.8.4.2 Local Population and Demographic Effects

Local population effects under Alternative 3 would mirror short-term employment patterns. Seasonal influxes would accompany the startup of construction each season, followed by a corresponding outflow when weather and/or seasonal wildlife closures shut down construction for the year. Generally, temporary population gains would be comparable to those under Alternative 1R, with the following caveat; slightly higher temporary workforce immigration would be expected if the additional labor effort associated with Alternative 3 results in a higher peak employment impact. Little additional growth would result if the additional labor effort is distributed over the course of the construction season.

Long-term population gains of up to 422 residents could occur in conjunction with operations under Alternative 3.

Most workers relocating to the area to fill jobs supported by the construction of Alternative 3 would be single status/unaccompanied.

Local school districts would see few school-age children moving to the area during construction under implementation of Alternative 3. Long-term enrollment gains of between 35 and 60 students could occur in conjunction with project operations. Local school districts have adequate facility capacity, but may require a limited increase in staffing to accommodate the enrollment gains. These increases would result in little net impact on public education budgets due to the guaranteed funding provisions of the WSFP.

#### 4.8.4.3 Housing Needs

As with Alternative 1R, Alternative 3 would involve the construction, operation and decommissioning of up to 1,000 WTGs. Project access would remain the same as Alternative 1R under Alternative 3. The project's direct labor requirements would be slightly higher when compared to Alternative 1R. An increase in labor resulting in a higher peak workforce in Year 1 would increase the shortfall in housing availability and associated needs for action by PCW to address housing. Higher project-related demand also would increase the competition with other market segments and also push nightly room rates higher.

A modest increase in labor resulting in a higher peak workforce in Years 1 and 2 could be accommodated by existing housing resources in the region. An increase in the peak workforce requirements in Years 3 through 5 would exacerbate increase the shortfall in housing and bolster the need for action by PCW to address housing. Higher project-related demand also would increase the competition with other market segments and also push nightly room rates higher.

Housing needs during project operations would likely be met by a combination of existing units and new residential construction. Several existing and proposed subdivisions provide capacity to accommodate new construction. Local housing prices would likely rise in response to the increased demand for long-term housing.

#### 4.8.4.4 Facilities and Services

Demands and the effects of those demands on public facilities and services, including public education, under Alternative 3 would generally be comparable to those described for Alternative 1R. As with employment and housing, temporary peak demands could be higher depending on the final construction schedule. However, there are no facilities or services facing critical capacity or staffing shortfalls where a difference in the incremental peak would likely result in a dramatic reduction in service levels or response capability as compared to the effects of Alternative 1R.

Due to the location of the RDF at the alternate site and the highway access from Rawlins to the site via WY 76, law enforcement and other first responders in Sinclair could see more calls for service under Alternative 3 than under 1R.

#### 4.8.4.5 Fiscal Effects

The capital investment in facilities and equipment, purchases of non-capital goods and services by PCW, its contractors, and households support by the project would generate a series of one-time and recurrent revenues for the federal, state, and local governments. Like Alternatives 1R and 2, the major public sector revenue sources associated with Alternative 3 would include federal rental fees, state and local sales and use taxes, local ad valorem taxes, and wind energy production tax. Carbon County also would realize an increase in lodging taxes associated with the seasonal influx of temporary workers during the 5-year construction period.

- Public land lease rental revenues: projected annual rents accruing to the Federal Treasury under Alternative 3 would be between \$2.1 million and \$3.2 million per year, the same as under Alternative 1R and 2. These revenues would continue long-term over the life of the project.
- Local ad valorem taxes: projected project development costs of Alternative 3 would be higher than the estimated \$4.2 billion to \$6.2 billion for Alternative 1R. The incremental cost difference is not known at this time, but it is expected to be modest given that the bulk of the project cost lies in the cost of the WTGs, the road network, and electrical system included in Alternative 1R. The difference, in relative terms, would translate into a similar effect on the assessed valuation and ad valorem tax revenues over time, all other factors unchanged. As with Alternative 1R, Carbon County would realize benefits associated with the relative stability of the assessed value and tax revenues from the project.

Rawlins and other municipal entities would realize additional property tax revenues in conjunction with Alternative 3 as a result of the project's effects in promoting additional residential and commercial development and higher property values, but the quantity of such receipts would not differ dramatically from those for Alternative 1R.

Ad valorem taxes would continue over the life of the project, effectively ceasing following decommissioning and reclamation.

- Sales and use taxes: Most, if not all of the WTG would likely be subject to sales and use tax. Sales and use taxes assuming no WTG deliveries prior to the sunset date would be slightly higher than \$216 million to \$336 million in sales and use tax receipts projected for Alternative 1R. Of those sums, the amounts accruing to both the state and to local governments would be proportionately higher than for Alternative 1R. Carbon County and local municipalities also would realize a proportionate gain from the local share of the state's tax and from revenues generated by the local 1 percent general purpose option tax and potentially by a 1 percent specific purpose option tax also would increase.

Although the geographic distribution of WTGs under Alternative 2 would differ from that under Alternative 1R, the general phasing of construction would be similar. Consequently, so too would be the timing of sales and use tax receipts – relatively low in Years 1 and 2, increasing substantially in Years 3 through 5 when the WTGs are delivered and installed. The receipt of sales and use taxes in Years 1 and 2 could be important to local governments preparing for the increased service demands in Year 3.

Affected units of local government would be eligible for impact assistance payments under Alternative 3, subject to same conditions and contingencies as apply under Alternatives 1R and 2.

Additional sales and use taxes would be generated over the life of the project; however, they would be substantially lower in magnitude.

- Wind production taxes: According to PCW, receipts from this tax under Alternative 3 would be slightly lower than under Alternative 1R because of a less efficient turbine layout. At full production, this tax would yield approximately \$6.0 to \$9.0 million in annual taxes, depending on the size/capacity of WTGs used. Annual receipts accruing to the state general fund would range

between \$2.4 million and \$3.6 million and revenues accruing to the local government distribution fund would range between \$3.6 million and \$5.4 million per year.

Wind production taxes would continue over the life of the project, fluctuating from year-to-year in response to the quantity of power produced.

The major public sector revenues projected in conjunction with Alternative 3 are summarized in **Table 4.8-8**.

For local governments affected by the CCSM project, concerns with respect to potential lags in revenue receipts and jurisdictional mismatches with Alternative 3 would be the same as with Alternative 1R.

Local governments and other public entities would realize increases in other charges for services, fees, and other taxes, for example lodging taxes, given the implementation of Alternative 3. These revenues would be very comparable to the expected receipts under Alternative 1R.

Public service demands associated with the short-term and long-term population growth, jobs, housing, and other factors related to the Alternative 3 would result in incremental pressures on public sector

**Table 4.8-8 Summary of Major Public Sector Revenues Generated by Alternative 3**

Revenue Source	Projected Revenue	How Compares to Alternative 1R and 2	Revenues Distributed to
Federal ROW grant rentals	\$2.1 million to \$3.2 million per year at full development.	Effectively the same as Alternatives 1R and 2.	U.S. Treasury.
Local ad valorem tax (including mandatory state levies)	More than \$29.7 million to \$42.4 million (Year 1). More than \$21.7 million to \$31 million (Year 10).	Effectively the same as 1R and 2.	County, local and statewide public education, special districts. Rawlins benefits indirectly.
Sales and use tax	More than \$216 million to \$336 million (over 5 years). Continue during operations, but much lower	Marginally higher than Alternative 1R, and comparable to Alternative 2.	State general fund and local governments, primarily Carbon County, Rawlins, Saratoga, and Sinclair.
Wyoming Impact Assistance Payments	Unknown	Comparable	Affected units of local governments, as determined by the Industrial Siting Council.
Wind energy production tax	Approximately \$6.1 million to \$9.2 million per year (at full production after 3-year exemption period).	Comparable to, but slightly lower than Alternative 1R due to less efficient turbine layout and lower energy production. (PCW 2011).	State general fund and local governments, primarily Carbon County, and possibly Rawlins, Saratoga, and Sinclair.

expenditures. Although not quantified in this assessment, the scale of the incremental short and long-term demands on Carbon County associated with Alternative 3 would be limited when the incremental revenues are considered. The expansion and stability of the ad valorem tax base afforded by the project would be an important benefit that would accrue from the project. Consequently, from a fiscal perspective, implementation of Alternative 3 is likely to be beneficial, both in the short-term and over the long-term.

Complete decommissioning and final reclamation would initially be accompanied by temporary increases in local sales tax receipts generated by consumer expenditures made by contractors and workers on the project. However, it also would signal the impending cessation of federal rental income, local ad valorem taxes and wind production taxes, the latter affecting both the state and local governments.

#### **4.8.4.6 Social Effects**

Social effects of Alternative 3 would be similar to those described in Alternative 1R. The potential for social disruption in Rawlins and Sinclair during construction could be slightly different than that described for Alternative 1R depending on project sequencing.

#### **4.8.4.7 Environmental Justice**

Implementation of Alternative 3 would not be anticipated to result in significant adverse impacts to human health and environmental resources, much less disproportionately high effects on minority or low-income populations in the region. Consequently, environmental justice concerns would not arise in conjunction with Alternative 3.

### **4.8.5 Impacts to Socioeconomics from Alternative 4, Private Lands Only**

Alternative 4 considers placement of WTGs on private lands only within both the Chokecherry and Sierra Madre sites. Up to 846 WTGs would be developed compared to up to 1,000 WTGs under Alternative 1R. Approximately 55 percent of the total would be developed in the Chokecherry site and 45 percent in the Sierra Madre site. Placement of the WTGs on private lands would require construction of substantially more miles of internal resource roads, more turnarounds, and a more extensive collection system than under Alternative 1R. Other ancillary facility needs would be similar in scale, but more of the development would occur off-site.

As in Alternative 3, Alternative 4 assumes the RDF would be constructed in the alternate location, north of I-80 and east of Sinclair.

Projected direct construction manpower needs assuming implementation of Alternative 4 differ from that under Alternative 1R in that labor requirements to erect and commission WTGs would be reduced, while labor needs for road construction increase. Combining the two changes would most likely result in a net reduction in overall level of projected construction employment.

The reduction in the total number of WTGs is assumed to reduce the long-term direct O&M workforce to between 96 and 133 year-round employees at full development under Alternative 4. The difference would not result in appreciably different social and economic effects than would occur under the other alternatives.

#### **4.8.5.1 Local Economic Effects**

From a socioeconomic perspective, the critical implication of reducing the number of WTGs, while at the same time increasing the amount of road construction, is that it would translate to somewhat less total direct construction labor and a lower total project construction cost. The net effect on labor requirement would not be expected to be substantially different from the total under Alternative 1R.

A net decrease in the direct manpower needs for the project would in turn support fewer indirect and induced jobs in the region, during the construction period. Although the net total labor required may be lower, it does not necessarily follow that the reduction in direct labor requirement would result in a lower peak workforce. The increase in road construction could result in a higher peak workforce in Year 1, if the objective is to complete all major access roads in a single year, or the additional effort could be spread over several years. The reduction in construction effort associated with WTG construction and commissioning could be spread out over Years 3 through 5, or occur primarily in Year 5 with the project being completed several months sooner. An increase in the peak workforce would result in incrementally higher levels of labor immigration to fill available jobs, whereas spreading the incremental effort over several years would create more short-term jobs and higher personal income in the region and reduce the year-to-year variations in labor shown in **Figure 4.8-1**.

Implementation of Alternative 4 would be accompanied by seasonal increases in employment in May/June and declines in October/November similar to that with Alternative 1R.

Local lodging, retail and service establishments catering to construction workers would see increases in business volume over the 5 year period, but the increases would be of smaller scale than under Alternative 1R. Despite the smaller scale, these increases would represent benefits of the project.

Based on the location of the RDF at the alternate site and optional highway access to Rawlins via WY 76, convenience retail establishments in Sinclair may realize a larger increase in revenues from sales to construction workers under Alternative 4 than under Alternatives 1R or 2.

Effects of Alternative 4 on local personal income would be marginally lower during construction and operations. Differences in personal income during construction would reflect the net differences in construction labor associated with the increases in road construction and reduction in the number of WTGs completed. At full operations, the net stimulus to local personal income under Alternative 4 would be approximately 15 percent less than with Alternative 1R.

Long-term employment effects related to operations and the temporary effects associated with decommissioning and final reclamation would be comparable to, but smaller in scale, as those for Alternative 1R. Local businesses would see an increase in business volume related to local expenditures by the company, contractors and vendors providing ongoing maintenance services, and employees whose jobs would be supported by the project.

#### **4.8.5.2 Local Population and Demographic Effects**

Local population effects under Alternative 4 would mirror the timing and magnitude of short-term and long-term employment described in 4.8.6.1 above. Seasonal influxes and outmigration would accompany the startup and completion of construction each year. Temporary population gains during construction would be similar to those under Alternative 1R, with the following caveats; slightly higher temporary workforce immigration would be expected if the additional labor effort associated with Alternative 4 results in a higher peak employment impact. Little additional growth would result if the additional labor effort is distributed over the course of the construction season. Concentrating the reduction in construction employment associated with the erection and commissioning of 15 percent fewer WTGs in Year 5 would result in lower temporary population impact. Other minor differences could arise on a year-to-year basis depending on modifications in construction schedule associated with the placement of WTGs only on private lands. Over the 5-year construction period, the two changes would offset each other to some extent, such that the net effects on population would not be dramatically different than under Alternative 1R.

Most workers relocating to the area to fill jobs supported by the construction of Alternative 4 would be single status/unaccompanied.

Implementation of Alternative 4, like Alternative 1R, would result in little increase in the number of school-age children moving to Carbon County during construction. Long-term gains in enrollment of between 35 and 60 students could occur in conjunction with operations. Local school districts have adequate facility capacity, but may require a limited increase in staffing to accommodate the enrollment gains. These increases would result in little net impact on public education budgets due to the guaranteed funding provisions of the WSFP.

#### **4.8.5.3 Housing Needs**

Implementation of Alternative 4 could result in slightly different profile of temporary housing demand, with the differences paralleling the net effects on peak and average employment during Years 1 through 5. Existing temporary housing resources could likely accommodate higher employment in Years 1 and 2. Substantial shortfalls in availability would be expected in Years 3 and 4, comparable in magnitude to those under Alternative 1R. Shortfalls in availability also would be expected in Year 5, but whether the shortfall would be lower in magnitude or of the same magnitude but shorter in duration would depend on how the change in labor requirement is distributed across the construction season.

As with Alternative 1R, PCW will be required to assess housing availability and address housing needs as part of PCW's Wyoming Industrial Siting Permit Application. The construction worker housing mitigation options listed under Alternative 1R would be available under Alternative 4.

Housing demand associated with operations under Alternative 4 would be reduced as compared to Alternative 1R, and would be accommodated in Rawlins, Saratoga and other locations in the study area. Despite the lower demand, upward pressure on housing prices and demand-induced new residential construction would occur under Alternative 4.

Housing demand associated with decommissioning/reclamation would be reduced under Alternative 4 compared to Alternative 1R as a result of 15 percent fewer WTGs. As with Alternative 1R, effects of decommissioning and final reclamation on area housing conditions would occur more than 30 years in the future.

#### **4.8.5.4 Facilities and Services**

Demands and the effects of those demands on public facilities and services under Alternative 4 would be similar to those described for Alternative 1R. As with employment and housing, temporary peak demands could be higher depending on the final construction sequencing, but lower in the latter years depending on labor force needs in Years 3 and 4. However, there are no facilities or services facing critical capacity or staffing shortfalls where a difference in the incremental peak would likely result in a dramatic improvement in service levels or response capability as compared to the effects of Alternative 1R.

#### **4.8.5.5 Fiscal Effects**

The capital investment in facilities and equipment, purchases of non-capital goods and services by PCW, its contractors, and households supported by the project would generate a series of one-time and recurrent revenues for the federal, state, and local governments. Like the other action alternatives, Alternative 4 would generate substantial public sector revenues in the forms of state and local sales and use taxes, local ad valorem taxes, and wind energy production tax. However, unlike the other alternatives, the lack of generating capacity development on Public lands would result in dramatically lower rental income to the Federal Treasury under Alternative 4. Carbon County would realize an increase in lodging taxes associated with the seasonal influx of temporary workers during the 5-year construction period.

- Public land lease rental revenues: Alternative 4 would generate rental income to the Federal Treasury based on an annual per acre rent for any linear ROWs associated with roads or power lines. The current rate for lands in Wyoming is \$15.69 per acre, yielding projected total annual

rent of less than \$100,000 based on the conceptual development plan; considerably less than that under the other action alternatives. These revenues would continue long-term over the life of the project.

- Local ad valorem taxes: project development costs of Alternative 4 would be substantially lower than under Alternative 1R, \$600 million to \$900 million less assuming reduction proportional to the reduction in the number of turbines. The differences would translate into a similar effect on the assessed valuation and ad valorem tax revenues over time, all other factors unchanged. As with Alternative 1R, Carbon County would realize benefits associated with the relative stability of the assessed value and tax revenues from the project.

Rawlins and other municipal entities would realize additional property tax revenues in conjunction with Alternative 4 as a result of the project's effects in promoting additional residential and commercial development and higher property values, but the quantity of such receipts would not differ dramatically from those for Alternative 1R.

Ad valorem taxes would continue over the life of the project, effectively ceasing following decommissioning and reclamation.

- Sales and use taxes: Most, if not all of the WTG would likely be subject to sales and use tax. Sales and use taxes assuming no WTG deliveries prior to the sunset date would be \$194 million to \$284 million in sales and use tax receipts, substantially lower than those projected for Alternative 1R. Of those sums, the amounts accruing to both the state and to local governments would be proportionately lower than for Alternative 1R. Carbon County and local municipalities also would realize a proportionate gain from the local share of the state's tax and from revenues generated by the local 1 percent general purpose option tax and potentially by a 1 percent specific purpose option tax that may also increase.

Additional sales and use taxes would be generated over the life of the project; however; they would be substantially lower in magnitude.

- Wind production taxes: Receipts from this tax would be approximately 15 percent lower than under Alternative 1R. At full production, this tax would yield between \$5.2 million and \$7.8 million in annual taxes, depending on the size/capacity of WTGs used. Annual receipts accruing to the state general fund would range between \$2.1 million and \$3.1 million and revenues accruing to the local government distribution fund would range between \$3.1 million and \$4.7 million per year.

Wind production taxes would continue over the life of the project, varying on a year-to-year basis in response to the quantity of power produced.

The major public sector revenues projected in conjunction with Alternative 4 are summarized in **Table 4.8-9**.

For local governments affected by the CCSM project, the issues with respect to potential lags in revenue receipts and jurisdictional mismatches would be the same with Alternative 4 as under Alternative 1R.

Local governments and other public entities would realize increases in other charges for services, fees, and other taxes, for example lodging taxes, given the implementation of Alternative 4. These revenues would be lower than the expected receipts under Alternative 1R.

Public service demands associated with the short-term and long-term population growth, jobs, housing, and other factors related to the Alternative 4 would result in incremental pressures on public sector expenditures. Although not quantified in this assessment, the scale of the incremental short and long-term demands on Carbon County associated with Alternative 4 would be limited when the incremental revenues are considered. The expansion and stability of the ad valorem tax base afforded by the project would be an important benefit that would accrue from the project. Consequently, from a

fiscal perspective, implementation of Alternative 4 is likely to be beneficial, both in the short-term and over the long-term.

**Table 4.8-9 Summary of Major Public Sector Revenues Generated by Alternative 4**

<b>Revenue Source</b>	<b>Projected Revenue</b>	<b>How Compares to Alternatives 1R, 2, and 3</b>	<b>Revenues Distributed to</b>
Federal ROW grant rentals	Unknown, but likely less than \$100,000 per year at full development.	Much lower than other action alternatives.	U.S. Treasury.
Local ad valorem tax (including mandatory state levies)	More than \$25.5 million to \$36.1 million (Year 1). More than \$18.6 million to \$26.3 million (Year 10).	Lower than other action alternatives.	County, local and statewide public education, special districts. Rawlins benefits indirectly.
Sales and use tax	More than \$194 million to \$284 million (over 5 years). Continue during operations, but at much lower levels	Lower than for the other action alternatives.	State general fund and local governments, primarily Carbon County, Rawlins, Saratoga, and Sinclair.
Wyoming Impact Assistance Payments	Unknown	Comparable order of magnitude, but likely lower	Affected units of local governments, as determined by the Industrial Siting Council.
Wind energy production tax	\$5.2 million to \$7.8 million per year (at full production after 3-year exemption period).	Approximately 15 percent lower than for the other action alternatives.	State general fund and local governments, primarily Carbon County, and possibly Rawlins, Saratoga, and Sinclair.

Complete decommissioning and final reclamation would initially be accompanied by temporary increases in local sales tax receipts generated by consumer expenditures made by contractors and workers on the project. However, it also would signal the impending cessation of federal rental income, local ad valorem taxes and wind production taxes, the latter affecting both the state and local governments.

#### **4.8.5.6 Social Effects**

Social effects of Alternative 4 would be similar to those described in Alternative 1R. The potential for social disruption in Rawlins and Sinclair during construction would be similar to those described for Alternative 1R depending on project sequencing. Local support for the project could increase because all turbines would be located on private lands.

#### 4.8.5.7 Environmental Justice

Implementation of Alternative 4 would not be anticipated to result in significant adverse impacts to human health and environmental resources, much less disproportionately high effects on minority or low-income populations in the region. Consequently, environmental justice concerns would not arise in conjunction with Alternative 4.

#### 4.8.6 Mitigation and Mitigation Effectiveness

All action alternatives would incorporate ACMs and BMPs described in Chapter 2.0 and found in **Appendix C**. Mitigation measure GEN-1, from the Draft EIS, is now part of the alternatives analysis in the Final EIS as it was included as an ACM by the applicant in the January 2012 revised POD (PCW 2012a).

**GEN-2:** Off-site compensatory mitigation may be considered through future consultations between the BLM, Cooperating Agencies, and PCW if mitigation measures established through the project-wide EIS are later determined to not be adequate.

**Effectiveness:** By definition, compensatory mitigation would be considered effective, albeit not necessarily providing for in-kind mitigation within the same area of influence. The BLM would continue to monitor information from available sources to determine whether compensatory mitigation for socioeconomics would be required under GEN-2 as site-specific PODs are approved.

No additional specific mitigation measures to address socioeconomic effects are identified in this EIS. The lack of additional mitigation measures reflects the limited scope of enforcement for the BLM with respect to socioeconomics, and more importantly, recognition of the authority and responsibility vested in the ISC with respect to addressing the potential socioeconomic effects of large-scale industrial development on local communities. In fact, socioeconomic considerations are a major focus of the ISC process and PCW must obtain an ISC permit prior to constructing and operating the CCSM. Wyoming state statutes and regulations give the ISC broad discretionary authority to address mitigation. Furthermore, potentially affected local governments, including Carbon County and its municipalities, can petition to be parties to the siting process and ISC hearings on an application. As a party to the hearings, local governments can more directly engage in a more comprehensive and detailed assessment of potential housing needs and other impacts to the community facilities and services; propose strategies to avoid, manage and mitigate potential impacts; and advocate for Council approval and allocation of impact assistance payments.

#### 4.8.7 Residual Impacts

Residual short-term social and economic effects would occur seasonally through construction and interim reclamation and again during decommissioning and final reclamation. The majority of the residual effects would be localized in the Rawlins/Sinclair area, although some effects may occur to other communities.

Residual long-term socioeconomic impacts associated with Alternative 1R and other action alternatives would include effects on regional economic and fiscal conditions, including limited immigration and associated population effects, increased sales revenues for local retail and service establishments, incremental increases in sales and lodging taxes, long-term effects on property and wind energy taxes, and relatively moderate demands on public facilities and services. Given the relatively moderate level of population increase and the substantial tax revenues associated with project operations, these effects would likely be viewed as beneficial. Residual social effects would be associated with the change in character of the landscape in and near the project area, which could be viewed as adverse for some local residents and other users of these lands.

#### **4.8.8 Irreversible and Irretrievable Commitment of Resources**

Development and operation of the CCSM project would require the commitment of natural, human, engineered, and monetary resources. Most of the non-monetary resource investments would be irretrievable and their use may preclude or foreclose other opportunities. Meeting the demands for goods and services directly and indirectly associated with the project, for example, the commitment of natural and other resources to the construction of housing, or aggregate to build and maintain highways, also would be irreversible, although some reuse may occur.

#### **4.8.9 Relationship between Local Short-term Uses and Long-term Productivity**

Development and operation of the proposed project would provide economic support for households. Communities would benefit from additional investments, and public entities, including the federal, state, and local governments, would derive revenues from the economic activities. Development of the wind resources would provide a source of renewable energy to residential, commercial, industrial, and public sector consumers. Some of the infrastructure put in place to service this project also may support future production and distribution of energy resource elsewhere in the region. Siting the project in this location would result in reductions in agricultural production and displacement of some dispersed recreation use in and near the area. However, once completed the energy harnessed from the wind by the project and transmitted to consumers would contribute to long-term economic productivity over the useful life of the project, both locally and across a broader region.