4.9 Impacts to Soil Resources

The following section summarizes the impacts on soil resources that may result from construction and operation of the proposed project. This section includes an overview of scoping issues identified for soil resources, impact assessment methodologies, significance criteria, and proposed additional mitigation measures, as applicable, that would minimize or mitigate potential significant impacts. The analysis area used to determine impacts to soil resources consists of the appropriate alternative boundary.

Potential impacts to soil resources were investigated by examining soil types, their extent, and their physical and chemical characteristics in relation to the proposed project. This was done using the project description, the BLM soil survey data, Supplemental Order 3 NRCS soil survey data (where available), and field verification as described in Section 3.9. The analysis of the impacts to soil resources is based on the assumption that ACMs and standard BMPs will be successfully implemented (**Appendix C**). In addition, a Master Reclamation Plan, Watershed Monitoring Plan, and Erosion Control Plan are presented in appendices to the POD as proposed programs (PCW 2012a). Acres of impacts described below were taken from tables in Section 2.4. Photos discussed in the following text are located in **Appendix F**.

Issues related to soil resources as identified during the scoping process include the following:

- Soil disturbance during construction activities resulting in accelerated soil erosion, exposed soils, the potential for mass failure, and reduced soil productivity;
- Potential for successful reclamation of droughty soils or soils with other reclamation constraints; and
- Soil contamination associated with potential spills of petroleum products, solvents, lubricants, or other chemical substances.

This project would have surface disturbing activities that fall into two categories, short-term and long-term. Short-term impacts are those impacts to soil resources that are related to initial grading, construction, and installation such as road cuts and fills, lay down areas, and other remedial grading activities. These types of impacts would be reclaimed (revegetated) following disturbance and returned to a condition that currently exists within 5 to 10 years following installation of the project. Long-term impacts are those impacts associated with features used for operations and maintenance of the project that would not be reclaimed until after the project is decommissioned at the end of the project's life. Long-term impacts include roads, turbine pads, substations, connector poles, etc. The BLM's management goals, objectives, and actions for managing soil and watershed resources are listed in **Table 4.9-1** (BLM 2008a).

Table 4.9-1 Relevant Management Considerations for Soil Resources

2008 Rawlins RMP and ROD – Soils
Management Objectives • Maintain or improve water quality by managing surface land use and groundwater resources, where practical and within the scope of the BLM's authority, according to the State of Wyoming Water Quality Rules and Regulations. • Maintain the hydrologic and water quality conditions needed to support riparian/wetland areas; minimize flood and sediment damage to water resources from human and natural causes; analyze and, where possible, minimize levels of salt loading in watersheds; and protect water resources used by the public (including impoundments, reservoirs, pipelines, and irrigation ditches) and by federal, state, and local agencies for fisheries, wildlife, livestock, agricultural, recreational, municipal, and industrial uses.

Table 4.9-1 Relevant Management Considerations for Soil Resources

2008 Rawlins RMP and ROD – Soils
• Address all accidental spills of environmental pollutants on federal lands according to the 2008 Rawlins RMP (Appendix 32). • Implement intensive management of surface disturbing activities (2008 Rawlins RMP [Appendix 13]) in watersheds contributing to waterbodies listed on the Wyoming 303d list of waterbodies with water quality impairments or threats, within the BLM's authority. • Maintain or improve wetland/riparian areas as required by the Wyoming Standards for Healthy Rangelands (BLM 1997a). • Activities that would cause water depletion within the Colorado River system or North Platte River system will comply with existing agreements, decrees, rules, and regulations.
<u>Management Goals</u> • Maintain or improve surface and groundwater quantity and quality consistent with applicable state and federal standards and regulations. • Control or remediate sources and causes of pollution on federal lands in cooperation with other federal, local, and state agencies and private entities. • Maintain or reestablish proper watershed, wetland, aquifer, riparian, and stream functions to support natural or desired surface flow regimes that meet state water quality standards. • Minimize or control contributions of nonpoint source pollution from federal lands to all receiving waters (2008 Rawlins RMP [Appendices 11 and 13]). • Minimize or control elevated levels of salt contribution from federal lands to the Colorado River system, consistent with WDEQ water quality regulations. • Provide for availability of water to support uses authorized on federal lands where appropriate.
<u>Management Actions</u> • Intensive management of surface disturbing activities will be implemented in watersheds contributing to waterbodies listed on the State's 303d list of impaired waterbodies in consultation and cooperation with affected interests. • Rehabilitate or reclaim reservoirs and other water sources within the BLM's authority that are functionally compromised and provide new water sources designed in support of resource management goals. Coordinate with local entities during planning and implementation of water source improvements when appropriate. • Manage water and soil resources to meet the Wyoming Standards for Healthy Rangelands. • Surface disturbing activities will be avoided on unstable areas, such as landslides, slopes of greater than 25 percent, slumps, and areas exhibiting soil creep. Reclamation practices and BMPs will be applied as appropriate for surface disturbing activities (2008 Rawlins RMP [Appendix 13]). • Surface disturbing activities will be avoided in the following areas: (1) identified 100-year floodplains, (2) areas within 500 feet of perennial waters, springs, and wetland and riparian areas, and (3) areas within 100 feet of the inner gorge of ephemeral channels. Exceptions to this will be granted by the BLM based on an environmental analysis and site-specific engineering and mitigation plans. Only those actions within areas that cannot be avoided and that provide protection for the resource identified will be approved.

Source: Proposed 2008 Rawlins RMP, Final EIS for the RFO, Chapter 2, pp 2-49 through 2-50 (BLM 2008a).

For impacts to soil resources to be deemed significant the following would have to occur:

- Soil loss is greater than 2 tons per acre per year in areas attributed to surface disturbance after reclamation;
- Reclamation is unsuccessful within 3 to 5 years of implementation (as described in the 2008 Rawlins RMP) ;
- Soil productivity is reduced to a level that prevents the disturbed area from recovering to pre-disturbance soil/vegetation productivity levels;
- Unmitigated loss of wetlands or wetland function (EO 11990 and EO 11988) or activities that would degrade wetland/riparian areas such that, as a minimum physical state, PFC Standards for Healthy Rangelands (BLM 1997a) are not being maintained; or
- The alteration of stream channel geometry or gradient by accelerated runoff and erosion (e.g., undesirable aggradation, degradation, or side cutting) beyond what would be expected by natural processes.

4.9.1 Impacts to Soil Resources 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. Associated impacts to soils from construction and operation would not occur. Natural and anthropogenic actions such as agriculture, fire, recreation, and grazing would continue to impact soil resources at present levels in the project area.

4.9.2 Impacts to Soil Resources from Alternative 1R, Applicant Proposed Alternative

As described in Section 3.9, soil resources have been mapped by the BLM and updates are being completed by the NRCS. Data was supplemented by field visits to the Application Area.

Alternative 1R would result in 7,733 acres of surface disturbance which would result in direct impacts to soil resources. Implementation of Alternative 1R, based on conceptual layouts, would occur on soils that have severe existing limitations according to the BLM and NRCS soil mapping. Although the alternative layout is conceptual, it is anticipated that because sensitive soils are widely distributed throughout the Alternative 1R area, total avoidance of these areas is not feasible (**Figures 4.9-1** through **4.9-5**, located in **Appendix F**). **Table 4.9-2** provides the acres of disturbance related to project area soil limitations for Alternative 1R. Acres were summarized in GIS using the conceptual layout and BLM and NRCS Order 3 soil survey data.

Surface disturbance associated with construction of project roads, towers, laydown areas, transmission lines, and facilities would impact soil resources to varying degrees. The most notable long-term disturbance to soils would occur in association with construction of wind turbines, substations, and additional facilities. Approximately 1,620 acres associated with turbines, 307 acres associated with electrical collection system, and an additional 4,601 acres of soils initially would be disturbed during construction of the WTG road network, and during the construction of substations and other facilities.

Excavation, grading and leveling would be required to construct these facilities with the greatest level of effort required on more steeply sloping areas. During construction, the soil profiles would be mixed with a corresponding loss of soil structure. Soils would be compacted by hauling and construction equipment as a result of the construction of turbine and associated facilities with compaction maintained, at least in part, by continued vehicle and foot traffic as well as operational activities. Wind turbine construction is proposed on the rim of Miller Hill. Considerable areas of mass instability were noted in this area (**Photos 189** and **204**, **Appendix F**). Although landslide deposits were avoided, as shown on the No Surface Use Constraints (**Figure 2-1**), additional areas along the rim of Miller Hill, Chokecherry Knob, Sheep Mountain, and the hogback were noted in the field as potential areas of mass instability. These areas could be a siting hazard for WTG's.

Table 4.9-2 Disturbance Acres Associated with Soil Limitations

Limitation	Alternative 1R		Alternative 2		Alternative 3		Alternative 4	
	Initial	Long-term	Initial	Long-term	Initial	Long-term	Initial	Long-term
Water Erosion								
Slight	381	97	860	156	966	319	1,063	336
Slight/moderate	287	48	381	71	360	80	412	89
Slight/severe	3,519	738	4,068	830	3,573	609	3,695	646
Moderate	466	104	513	104	518	80	428	68
Moderate/severe	877	149	651	100	636	94	739	111
Severe	2,086	392	1,936	346	1,900	304	1,697	272
No Data	80	14	98	14	81	9	80	10
Wind Erosion								
Slight	67	10	15	3	1	0	52	9
Slight/Moderate	1,425	238	993	135	780	97	1,026	137
Moderate	5,979	1,262	7,219	1,433	6,990	1,356	6,853	1,357
Moderate/Severe	44	7	136	28	107	18	50	9
Severe	100	12	45	8	74	13	53	9
No Data	80	14	98	14	81	9	80	10
Runoff Potential								
Very Low	5	1	18	3	18	3	19	3
Low	45	9	54	9	53	9	49	8
Low to Moderate	18	3	56	12	38	7	4	1
Low to High	27	6	79	13	68	9	60	8
Moderate	1,074	231	1,516	316	1,406	258	1,467	273
Moderate to High	1,386	243	1,555	264	1,255	208	1,581	269
High	5,047	1,034	5,094	989	5,078	989	4,827	959
Very High	19	3	47	3	47	3	39	2
No Data	75	13	88	13	70	8	70	8
Topsoil Rating								
Poor	3,001	597	3,702	670	3,840	818	3,790	820
Fair	1,829	350	1,699	310	1,400	226	1,792	299
Good	2,541	537	2,645	574	2,348	380	2,138	354
No Data	322	59	461	68	445	70	394	59

Table 4.9-2 Disturbance Acres Associated with Soil Limitations

Limitation	Alternative 1R		Alternative 2		Alternative 3		Alternative 4	
	Initial	Long-term	Initial	Long-term	Initial	Long-term	Initial	Long-term
Road Rating								
Slight	254	41	181	31	0	0	142	25
Slight/ Moderate	51	32	29	28	0	0	0	0
Moderate	4,514	903	5,083	976	4,734	779	4,808	809
Severe	2,553	508	2,752	518	2,854	644	2,771	638
No Data	322	59	461	68	445	70	394	59

Note: GIS estimates use assumed component locations to generate disturbance associated with soil limitations. While these estimates may vary somewhat from disturbance estimates that were generated by assuming an average amount of disturbance associated with each project component proposed by alternative (as presented in Chapter 2.0), the difference is estimated to be less than 5 percent.

The potential for erosion would increase through the loss of vegetation cover and soil structure as compared to an undisturbed state. This is of particular concern in areas of vegetated sand dunes (**Photo 067**, **Appendix F**). If the vegetation is disturbed or denuded on dunes, dunes would be highly wind erodible. Additionally, fine textured soils are highly susceptible to erosion by water. These soils were common on the valley floor as noted in **Photos 216** and **259**, **Appendix F**. Soil productivity would decrease, in like manner, primarily as a result of loss of surface soils and profile mixing along with the loss in vegetative cover. Tower foundation excavation would result in a substantial amount of excess subsoil. Foundation designs would vary based on the substrate found at the site; therefore the total volume of excess subsoil that would be generated from tower construction has not been determined by PCW. Turbine foundations could require up to 600 yd^3 of concrete. Some foundation designs may be up to 75 feet wide and 30 feet deep.

The majority of subsoils in the area are commonly characterized as having high pH, salts, and sodium, as described in Section 3.9. If excess subsoils are spread or redistributed on the soil surface it would dilute or reduce microbial communities and undesirable chemical or physical soil characteristics could create adverse impacts to soil quality for seedbeds and reclamation. PCW has committed to dispose of excess excavation materials in approved areas only or to stockpile suitable material for use in reclamation. Since PCW did not specify how material suitability would be determined, the BLM is recommending mitigation measure Soil 2 because it includes laboratory testing of excess soil to determine suitability.

A decrease in soil productivity and quality also would occur in association with planned soil salvage and stockpiling activities as microbial action is curtailed, at least to some degree, in constructed long-term stockpiles. These impacts would begin immediately as the soils are subjected to grading and construction activities and continue for the term of operations. PCW has committed to seeding with desired vegetation after one growing season and piles left for more than two years would be no deeper than 2 feet, including the native topsoil underneath. This commitment would help to maintain the soil productivity of topsoil**.** Long-term soil productivity and quality would be impacted on 1,047 acres associated with WTG road network, 180 acres associated with turbines, 4.9 acres associated with the electrical collection system, and 313 acres associated with substations and facilities. Where soil productivity is reduced to a level that prevents the disturbed area from recovering to pre-disturbance soil/vegetation productivity levels, there would be localized significant impacts.

Numerous existing two track roads cross the Alternative 1R area. In some cases, existing roads may not be feasible for use by the project or may need to be modified or relocated. If existing parallel roads are not reclaimed when new roads are constructed, road density would increase considerably in the Alternative 1R area. Construction of the WTG road network within the Alternative 1R area would result in 3,946 acres of surface disturbance to soil resources. During construction, project resource roads would be a minimum width of 80 feet to allow for two way traffic and movement of cranes, haul trucks, and other vehicles, as well as, for topsoil storage and drainage ditches. However, road widths could reach a width of 150 feet or more in areas where cut and fill slopes would be required due to the uneven terrain and steeply sloping areas that are common within the Alternative 1R area. During operations the roads would be reduced to an average width of approximately 17 feet. The Haul Road would be approximately 120 feet wide during construction and reduced to a width of 40 feet during operations. Roads result in a removal of land from the vegetative growing base, thereby interrupting nutrient cycling and altering soil productivity. Indirect effects may include landslides, gullies, generation of side cast materials, and disruption and interception of subsurface flow of water that could alter soil moisture regimes upslope and down slope from the road. Where the topography is relatively flat and grading occurs, disturbance would be limited to the upper subsurface soil horizons. As a result, subsurface soils would not be subject to profile mixing. Where cut and fill slopes occur, the soil profiles would be mixed with a corresponding loss of soil structure.

The proposed project haul road would cross numerous ephemeral and perennial streams including Sage Creek, Hugus Draw, Miller Creek, Little Sage Creek, Smith Draw, Rasmussen Creek, and Lone Tree Creek. The haul road also would cross approximately 69 unnamed ephemeral drainages. Section 3.6.4 provides a general assessment of these drainage systems based on proper functioning condition evaluations. Unpaved roads intercept surface runoff which provides a direct conduit for sediment to enter connected streams. **Photos 085** and **091** (**Appendix F**) depict the instability of the Little Sage Creek stream banks. The soils surrounding Little Sage Creek are highly saline and would be difficult to reclaim and prone to piping. Long-term increases in erosion and sedimentation to streams would be expected due to the long-term use of the roads. Please see Section 4.13.2 for further discussion on impacts associated with roads and sedimentation to streams.

Traffic on roads during construction and operations would result in soil compaction. Soil compaction would considerably impact the upper profile subsoils immediately beneath the road surface but also would impact subsurface soils at a greater depth if fine textured soils are present. Soil compaction would result in a corresponding loss of infiltration, permeability, and soil aeration. Runoff and soil erosion would increase as a result of compaction, as shown in **Photo 163** (**Appendix F**). Typically, soils that are compaction prone also are prone to rutting or displacement when saturated. Rutting occurs when the soil strength is not sufficient to support the applied load from vehicle traffic. The process of rutting physically severs roots and reduces the aeration and infiltration of the soil, thereby degrading the rooting environment. Rutting also disrupts surface water hydrology by damming surface water flows, creating increased soil saturation upgradient from ruts, or by diverting and concentrating water flows creating accelerated erosion.

If travel by vehicles or construction equipment occurs on moist or saturated soil, where topsoil has not been removed and stockpiled (e.g., overland travel during construction or maintenance of overhead electric collection, communication, and transmission lines), rutting may mix thin topsoil with the subsoil, thereby reducing soil productivity. Rutting is most likely to occur on moist or wet fine textured soils, but also may occur on dry sandy soils due to low soil strength. Where road surfacing is applied this impact would be reduced. Erosion also would be minimized through the use of erosion control devices (e.g., silt fences, jute netting, hay bales, water bars, check dams, berms, shallow swales, and mulches). These impacts from the WTG road network, along with a loss in soil productivity, would occur on approximately 1,047 acres for the duration of the project and until successful reclamation is achieved. PCW has committed to suspend construction activities when soils are wet. Additionally, the standard BLM ROW grant stipulations prevent rutting in excess of 4 inches on BLM lands. Where saturated and other sensitive soils are located mitigation measure Soil-1 is recommended to reduce the potential for rutting and to prevent the upward movement of subgrade soils into the gravel cover.

During construction, laydown areas would result in approximately 566 acres of surface disturbance. In general, laydown areas would result in a temporary disturbance that would be reclaimed once construction is complete. Topsoil would be salvaged from laydown areas and stored for future reclamation. Laydown areas would then be graded, leveled and assumedly graveled. Soil resources in these areas would be impacted similar to trafficked roads as discussed above. Proposed locations for laydown areas were visited during the field work performed in the summer of 2010. Laydown areas were observed to be located in drainages, on rock outcrop (**Photos 131** and **138**), salt flats (**Photo 159**), gullied areas (**Photo 250**), or vegetated dunes (**Photo 137**). However, because the proposed locations of project components including laydown areas are conceptual, they are subject to change. Additionally, mitigation measure Soil-3 and Soil-6 would mitigate or reduce impacts to limited reclamation potential soils and other sensitive soils that may be impacted during construction.

Construction of the electrical system would result in 307 acres of surface disturbance to soils. The electrical system would require both underground and overhead collection and transmission lines and support road. Buried lines would require trenching of the soil resulting in modification of existing soil structure, and generating adverse impacts relative to aeration and permeability. It is likely that some mixing of textural zones would occur, as well as mixing of saline and/or alkaline materials with relatively salt-free materials. This mixing may create adverse chemical impacts to soil quality for seedbeds. Long-term soil productivity would be impacted on 4.9 acres, associated with the power line pole and tower locations.

Impacts to soils would be reduced based on PCW's commitment to conduct interim and final reclamation to successfully restore productive land uses. However, revegetation of disturbed areas consisting of soils with severe limitations, such as poor topsoil and severe erosion potential, would be challenging. Several other factors would influence revegetation such as precipitation, slope, and soil depth.

In conclusion, impacts to soil resources are anticipated to be significant as follows:

- Because it is not feasible to completely avoid areas of severe and poor soil limitations, site-specific significant impacts to soil resources would be anticipated;
- Soil loss of less than 2 tons per acre per year is considered to be similar to background levels. Although the estimation of soil loss was not quantified for this analysis, surface disturbance to soil resources and loss of soil cover is anticipated to lead to soil erosion greater than 2 tons per acre per year (greater than background levels) and therefore, is considered to be significant;
- Because it is anticipated that some amount of topsoil would be lost (to erosive forces) or degraded (contaminated or diluted) soil productivity would be reduced in site specific areas to a level that prevents the disturbed area from recovering to pre-disturbance productivity levels and therefore is considered to be significant;
- Potential significant impacts to wetlands are further described in Section 4.11; and
- Potential significant impacts related to stream channel alteration by accelerated runoff and erosion are described in Section 4.13.

4.9.3 Impacts to Soil Resources from Alternative 2, Checkerboard Only

Alternative 2 would result in 8,569 acres of initial disturbance. Alternative 2 would have similar impacts to soil resources as described in Alternative 1R; however the acreage of total surface disturbance would be 836 acres greater than Alternative 1R. **Table 4.9-2** provides the acres of disturbance related to project area soil limitations for Alternative 2. Alternative 2 would result in fewer impacts to severely wind erodible soils than the other alternatives. The occurrence of soil limitations in relation to conceptual layouts for Alternative 2 is presented in **Figures 4.9-6** through **4.9-10**, located in **Appendix F**.

The haul road route for this alternative would differ from the Applicant Proposed Alternative (as shown in **Figure 2-4**). Under Alternative 2 the primary haul road would be longer than the haul road in

Alternative 1R, resulting in approximately 10 percent more surface disturbance to soil resources, but it would parallel an existing disturbance (SH 71). Although this route is longer, there would be less disturbance of water erodible soils than the haul road associated with Alternative 1R (7.4 miles versus 7.9 miles crossed by Alternative 1R). As noted during field surveys, the crossing location for Little Sage Creek, would be preferable from a soil stability and reclamation perspective, in relation to the crossing for Alternative 1R.

The proposed project haul road would cross numerous ephemeral and perennial streams including Deadman Creek, La Marsh Creek, Sage Creek, Miller Creek, Little Sage Creek, Smith Draw, Rasmussen Creek, and Lone Tree Creek. The haul road also would cross approximately 86 unnamed ephemeral drainages.

4.9.4 Impacts to Soil Resources from Alternative 3, No Miller Hill or South Sierra Madre

Alternative 3 would result in 8,504 acres of initial disturbance. Alternative 3 would have similar impacts to soil resources as described in Alternative 1R, but the acreage of total surface disturbance would be 1,283 acres greater than Alternative 1R. **Table 4.9-2** provides the acres of disturbance related to project area soil limitations for Alternative 3. Alternative 3 would result in more impacts to severely wind and water erodible soils and soils with a poor topsoil rating than the other three alternatives. The occurrence of soil limitations in relation to conceptual layouts for Alternative 3 is presented in **Figures 4.9-11** through **4.9-15**, located in **Appendix F**.

The haul road route for this alternative would differ from the Applicant Proposed Alternative (as shown in **Figure 2-5**). Under Alternative 3 the primary haul road would be shorter than the haul road in Alternative 1R and would involve approximately 30 percent less disturbance of soil resources.

4.9.5 Impacts to Soil Resources from Alternative 4, Private Lands Only

Alternative 4 would result in 8,918 acres of initial disturbance. Under this alternative, PCW would have the option to move forward with construction on private lands. Alternative 4 would result in similar impacts to soil resources as described in Alternative 1R, but the acreage of total surface disturbance would be 1,697 acres greater than Alternative 1R. **Table 4.9-2** provides the acres of disturbance related to project area soil limitations for Alternative 4. This alternative would result in fewer impacts to severely erodible soils than the other alternatives. The occurrence of soil limitations in relation to conceptual layouts for Alternative 4 is presented in **Figures 4.9-16** through **4.9-20**, located in **Appendix F**.

The haul road route for this alternative would differ from the Applicant Proposed Alternative (as shown in **Figure 2-6**). Under Alternative 4 the primary haul road would be shorter than the haul road in Alternative 1R and would involve approximately 32 percent less disturbance of soil resources.

4.9.6 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). The following mitigation measures would be applied to further avoid, minimize, or mitigate Project-related impacts to soils. The following mitigation measures are common to all alternatives:

SOIL-1: Road fabric, or equivalent base stabilization as determined by the BLM, will be applied where roads cross sensitive soils (wet, severely erodible soils, and soils with low soil strength).

SOIL-2: Excess subsoil excavated from tower foundations will not be used as topsoil or spread on top of topsoil without further laboratory testing of the subsoil physical and chemical characteristics, and agency approval. PCW will identify the acceptable disposal method for excess subsoil in the final reclamation plan.

SOIL-3: Areas identified as having limited reclamation potential (as defined in the Rawlins IM No. WYD-03-2011-002) will be avoided during construction unless an acceptable site-specific reclamation plan is approved by the BLM.

SOIL-4: To reduce impacts related to road density in the Application Area, roads that are no longer needed will be effectively reclaimed.

SOIL-5: PCW will be required to submit a snow removal plan as part of the ROW grant application. The snow removal plan will include measures to ensure protection of soil, vegetation, and water resources.

SOIL-6: Drainages, vegetated sand dunes, salt flats, steep slopes, and gullied areas will be avoided for towers, laydown areas, facilities, and roads (to the extent possible). Towers, laydown areas, and other facilities will be re-located to areas of generally stable soils. These avoidances shall be taken into consideration during site specific analyses.

Effectiveness: The proposed mitigation measures would reduce most of the adverse effects to soil resources related to project construction, operation, and decommissioning. In addition, the proposed mitigation would increase the potential for successful reclamation. Measures 1, 2, 4, and 5, would facilitate reclamation efforts by maintaining soil quality, productivity, and biological characteristics. Measure 4 would reduce cumulative impacts within the CIA.

4.9.7 Residual Impacts

Mitigation measures are designed to reduce impacts to soil resources but do not fully mitigate the impacts. All of the alternatives would result in site specific losses to long-term soil productivity due to accelerated erosion and soil mixing. Because soil formation of topsoil is a slow process, it can take decades for topsoil to recover in the arid west and for soil productivity to improve.

4.9.8 Irreversible and Irretrievable Commitment of Resources

An irretrievable commitment of a resource is one in which the resource or its use is lost for a period of time. An irretrievable loss of soil productivity and quality would be lost on approximately 1,544 acres (Alternative 1R), 1,842 acres (Alternative 2), 1,780 acres (Alternative 3), or 1,871 acres (Alternative 4) associated with turbine locations, WTG road network, electrical network, and support facilities. Similarly, project roads would result in an irretrievable commitment of soil resources on approximately 866 acres (Alternative 1R); 1,153 acres (Alternative 2); 1,113 acres (Alternative 3); and 1,224 acres (Alternative 4). At the completion of the project, the towers, facilities, and roads would be removed and the disturbed areas associated with the project reclaimed, therefore no irreversible commitment of soil resources is anticipated.

4.9.9 Relationship between Local Short-term Uses and Long-term Productivity

Overall site productivity is primarily a matter of revegetation success. Productivity varies with vegetation community, but more importantly, with land management objectives as they relate to the establishment of desirable or productive vegetation types. In contrast, soil quality is an inherent soil resource characteristic involving aeration, permeability, texture, salinity and alkalinity, microbial populations, fertility, and other physical and chemical characteristics that are accepted as beneficial to overall plant growth and establishment. Based on this concept, there would be impacts to short-term uses and long-term productivity related to the quality of native soils after project-related disturbance, until successful revegetation is achieved.

4.10 Impacts to Transportation

This section assesses the potential effects of the No Action Alternative, the Applicant Proposed Alternative, and other alternatives on the highway and road transportation system providing access to the applicable alternative boundary (federal and state highways and Carbon County roads) and the public road network (WY 71 and CR 401/Sage Creek Road). Additional Carbon County roads within the alternative boundaries may be assessed in a subsequent Transportation Management Plan to be prepared by PCW and submitted to the BLM when final locations of WTGs are determined and access routes to the WTGs are identified. Transportation effects would be associated with the construction, operations and decommissioning/reclamation phases of the project.

Although the Union Pacific railroad system would likely realize an increase in the number of train movements and gains in freight volumes into the region, these effects would be generally beneficial and outside the scope of the EIS because the Union Pacific would be responsible for planning and scheduling the operations and any changes in its system capabilities. Local airports in the region may see limited and temporary increase in operations and use, but the increases would be expected to be minimal and within the operational capabilities of the existing facilities.

Transportation effects of the construction phase would be short-term and temporary, occurring over 7 months (May to November) in each of 5 construction years. Many of the transportation-related issues raised by the public and by federal and state agencies and interested organizations during scoping were associated with the potential environmental effects of the development of internal roads and the effects of construction and operations traffic on air and water quality, soils, vegetation, wildlife, viewsheds, soundscapes, and other resources. These effects are assessed in the corresponding sections in this EIS.

Effects of the Applicant Proposed Alternative and other alternatives on area transportation conditions were assessed by contrasting project-related transportation information (transportation modes, traffic volumes, vehicle type, and routing) provided by PCW in its January 12, 2012 POD (PCW 2012a) and February 1, 2012 Chokecherry and Sierra Madre Wind Energy Project PTMP (PCW 2012b) with existing level of service (LOS) and safety conditions on affected highways and roads.

Key transportation-related issues assessed in this section include the effects of high volumes of traffic, including overweight and oversized loads, on traffic conditions in communities and rural areas within the analysis area, on the condition of highways and roads, and on highway and road safety conditions.

Table 4.10-1 displays relevant transportation and access management considerations from the ROD and Approved Rawlins RMP and the Carbon County Comprehensive Land Use Plan (Carbon County 2010).

The following assumptions were used for the transportation assessment:

- The transportation modes, traffic volumes and routing associated with Alternative 1R and other action alternatives would be as described in the PTMP.
- A RDF would be constructed and operated as described in the PTMP and in Chapter 2.0 of this EIS. PCW's preferred location for the RDF is south of I-80, on private land near the UPRR mainline, between Rawlins and Sinclair in T21N, R86W and R87W.
- An alternate RDF location would be on private land east of Sinclair, within a 245-acre area in T21N, R86W, Sections 22 and 23. The alternate RDF site is essentially bounded by WY 76 on the west, the UPRR line on the north and I-80 on the south.
- Prior to the completion of the RDF in Year 1, all construction materials would be trucked to the area.

Table 4.10-1 Relevant Management Considerations for Transportation and Access Management

Management Considerations
BLM RMP and ROD – Transportation and Access Management (BLM 2008)
Management Objectives • Maintain or expand, as determined necessary, existing access, including the right of access by a non-federal-land in-holder. • Abandon or close redundant or unnecessary access roads; reclaim after consultation with local government and interested parties. • Conduct transportation planning to manage existing and new access in a manner that ensures compatibility with resource values and management objectives. • Incorporate existing state and county road systems into BLM's transportation system to accurately show existing access. Coordinate access issues with state and local governments.
Management Goal • Develop and maintain a transportation management system to accommodate public demand for legal access through and across public land and to meet resource management needs and objectives (e.g., wildlife objectives).
Management Actions • The public land transportation system will be maintained or modified to provide for public health and safety and adequate access to public lands. • Routing and construction standards will be adjusted based on route analysis and engineering design. • When roads constructed under other initiatives are no longer needed for their original purposes, and prior to termination and obliteration of the road, BLM will assess its utility for addition to the BLM transportation system. • In close coordination with state and county governments, inventory all roads on public land and determine which roads are owned by the state and the respective counties. Based on the inventory and road determinations, develop a transportation plan to identify roads or trails under the jurisdiction of the BLM for closure, modification, or maintenance within the life of the plan. The plan will include goals, objectives, and maintenance standards for roads or trails to be retained for public use, and will contain specific measures to accomplish road closure. Roads or trails that are eroding beyond a reasonable level will be fixed or closed. • Manage transportation and access to meet the Wyoming Standards for Healthy Rangelands. • Consistent with Wyoming BLM access policy, opportunities to acquire or maintain legal access to the areas listed in RMP Table 2-8 (in order of priority) will be pursued. Additional access needs will be identified on a case-by-case basis. • Consolidation of public lands will be pursued, when opportunities arise, to meet recreational demand. The criteria for which lands will be acquired include in-holdings within WSAs, some SD/MAs, and HMAs. • Road density will be considered during the analysis process and during authorization of surface disturbing and disruptive activities.
Carbon County Comprehensive Land Use Plan (Carbon County 2010)
Goal 6 • Ensure that future land development is fiscally responsible and has adequate roads and other infrastructure.

- Following completion of the RDF, most construction materials, WTG components, and equipment would be delivered via rail to the RDF. It may be impractical to move a small percentage of loads by rail; those loads would be delivered by truck and access the alternative areas via I-80 Exit 221 (PCW 2012b).
- For the alternate RDF facility, construction materials would be transported from the RDF to the CCSM Application Area over I-80 at Exit 221 via WY 76/CR 407 (CIG Road) and a connecting internal haul road.
- WYDOT would grant approval to use of the overpass of I-80 at Exit 221 to transport overweight loads to the Application Area.
- WTG components would not be transported over local public highways and roadways during peak traffic hours.
- All contractors hauling loads that exceed WYDOT's oversize and/or overweight standards will acquire the requisite permits and comply with WYDOT safety regulations.
- Access road alignment within the alternative boundaries will be determined during the preparation of detailed Transportation Management Plan, which will be submitted to the BLM RFO for review once the final project layout is developed. Portions of CR 505W (Miller Hill W. Road) and CR 505E (Miller Hill E. Road) may be utilized as part of that design. Any impacts to these roads based on the final design will be evaluated in the Transportation Management Plan.
- All use and modification of state highways will be conducted in accordance with WYDOT regulations.
- All use and modification of Carbon County Roads will be conducted in accordance with Carbon County regulations.
- All roads within the Application Area will be constructed to design specifications contained in the BLM Gold Book and BLM Manual 9113, where feasible.
- All public highway, roadway and intersection improvements needed to accommodate oversize and overweight vehicles will be completed prior to ongoing use by such vehicles. If changes are made to these intersections, they will be restored to their original condition at the completion of construction, at the discretion of WYDOT, Carbon County or the BLM.
- PCW will enter into Highway and Road use agreements with WYDOT, Carbon County and the BLM and contract for, or reimburse these parties for repairs to highways or roads damaged by project-related use during construction, operations and decommissioning according to the terms of such agreements.
- PCW will apply for a separate roadway easement for any route that traverses State Lands, even if using an existing two-track. Temporary roadways may, at the Director's discretion, be issued a Temporary Use permit, but permanent or semi-permanent roads require an easement.
- PCW will construct and operate the project in compliance with FAA standards and regulations (e.g., equipping towers with aviation warning lights, and other guidance with respect to locating wind energy projects in proximity to public airports and other aviation facilities).

The following criterion is used to determine whether transportation impacts would be significant:

- Increases in traffic levels on the local public transportation system that would cause the LOS on the system to fall below acceptable levels as defined by the responsible government agency.

4.10.1 Impacts to Transportation from the No Action Alternative

Implementation of the No Action Alternative would result in no impacts to transportation and access conditions in the analysis area. Under the No Action Alternative, the proposed project would not be

developed because the BLM would reject PCW's request to develop wind energy on public lands and deny any request to provide access to private lands for wind development.

4.10.2 Impacts to Transportation from Alternative 1R, Applicant Proposed Alternative

Construction, operation, and decommissioning/reclamation of the facilities associated with Alternative 1R including access roads, power collection and transmission lines, substations, interconnection lines, a RDF, preparation of the wind tower bases, and erection of the WTGs (described in Chapter 2.0 of this EIS) would require movement of workers and substantial quantities of materials, equipment, and supplies to and within the alternative boundary.

4.10.3 Construction

PCW's PTMP describes the proposed plans and means of transporting materials, equipment and supplies to and within the project boundary and discusses two options for workforce access to the area. Unless otherwise stated, the following descriptions of transportation modes, volumes and routing are drawn from the PTMP.

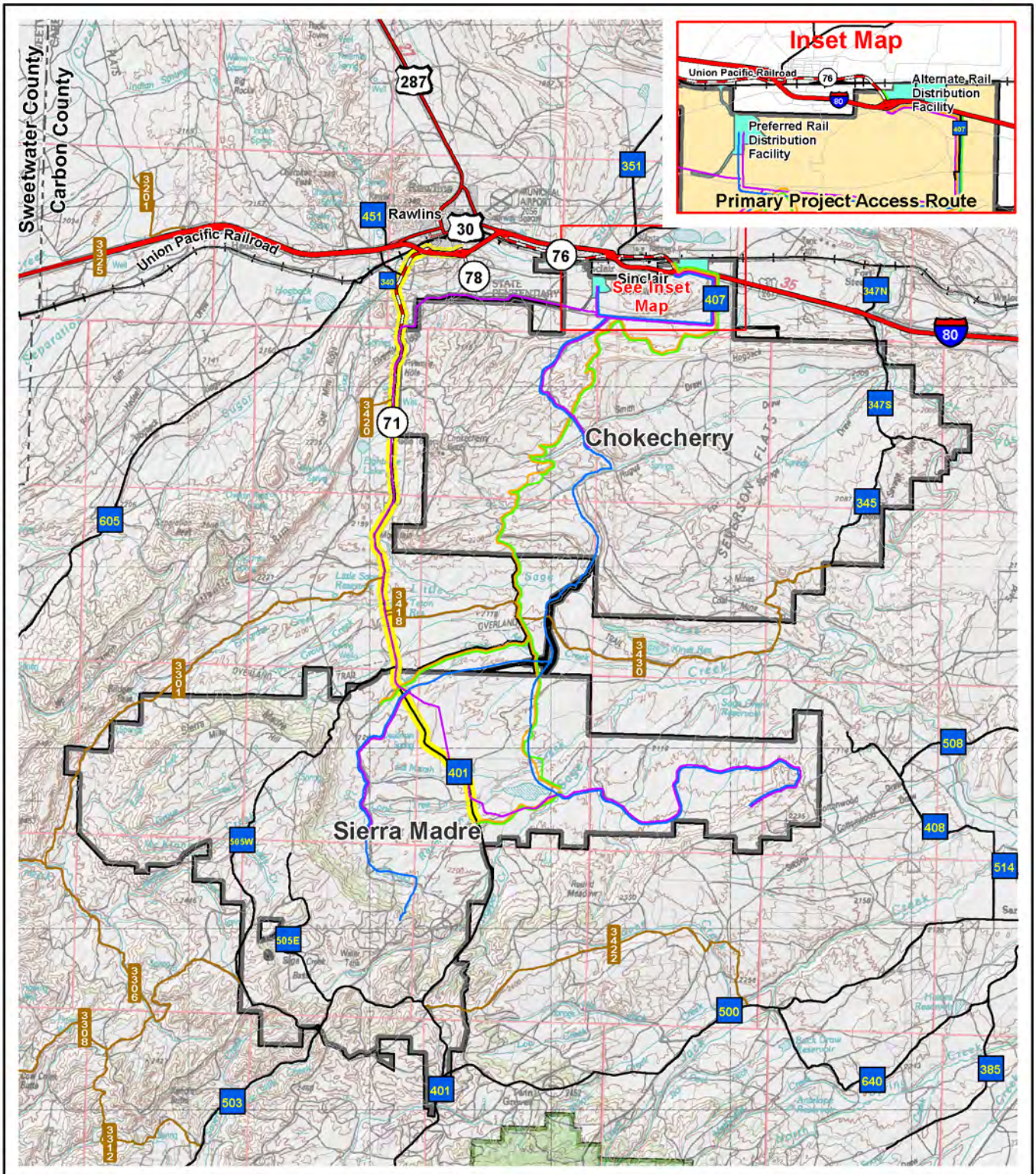
The PTMP assumes construction of a rail distribution facility, referred to as the RDF in this EIS. After the RDF is completed in construction Year 1, most construction materials including aggregate and WTG components would be shipped by rail to the RDF. Alternative 1R assumes the PCW preferred location for the RDF, which would be on private land located south of I-80, between Rawlins and Sinclair in T21N, R86W and R87W. Once completed, a RDF at this location would allow access to the UP mainline and allow transportation of almost all construction equipment and materials to occur entirely on private roads, avoiding use of public highways and roads.

Construction activities during Year 1 would primarily involve construction of the RDF and internal haul road. The large majority of truck trips to the site during Year 1 would be transporting aggregate. No WTG components would be transported during Year 1.

During Year 1, prior to completion of the RDF, all construction equipment, materials, supplies and workers would access the site via I-80 at Exit 221, east of Sinclair. All traffic would initially travel east on WY 76, then south on CR 407 (CIG Road), ultimately connecting to an internal haul road, which would be constructed by PCW. The internal haul road would travel south/southwest across the Chokecherry site, exit the Chokecherry south boundary, and travel south across BLM and private lands to a divide; the east fork would travel south and enter Sage Creek Basin within the Sierra Madre site and the west fork would travel west to enter the western portion of the Sierra Madre site. The haul road would cross CR 401 (Sage Creek Road) (**Figure 4.10-1**).

In subsequent years, trucks would be required to transport water and concrete for WTG foundations. These trucks would arrive on site at the beginning of the construction season and typically remain on-site for the duration of the season, hauling water and concrete from water sources and concrete batch plants within the Chokecherry and Sierra Madre sites. Similarly, trucks hauling cranes and heavy earthmoving equipment would transport that equipment to the site at the beginning of the construction season and from the site at the end of the season or whenever the equipment is no longer needed. Cranes and heavy equipment would stay within the site for the duration of the construction season. Movement of water trucks, concrete mixer trucks, and heavy equipment to and from the Alternative 1R boundary would occur during months when overall construction traffic levels would be low, and would generate minimal congestion on project access routes.

There are two options for workforce commuting during construction Years 2 through 5. The primary option would require all construction workers to access the area from I-80 at Exit 221. A second option is being considered by PCW, which would allow workers assigned to the Sierra Madre and Sage Creek Basin areas to use WY 71/CR 401.



The local construction workforce would travel to the project area from existing residences within commuting distance, which in some cases may be a one-way travel time of an hour or more from the site. Nonlocal workers would travel from temporary residences, preferring to locate in communities relatively close to the site, but willing to commute to more distant communities if suitable accommodations are not available locally. The PTMP assumes that the construction workforce (local and non-local) would be housed in the following areas:

- Rawlins Area: 65 percent;
- East of Rawlins (Laramie area): 10 percent;
- West of Rawlins (Wamsutter and Rock Springs areas): 15 percent; and
- South of Rawlins (Saratoga area): 10 percent.

For workers residing in Rawlins, the PTMP assumes the following residential distribution:

- Near 287/Cedar St: 56 percent;
- South of the UPRR, north of I-80: 24 percent; and
- Near Spruce St: 20 percent.

The PTMP assumes the above workforce residency distribution would remain constant during all 5 construction years. The actual workforce distribution would depend on: 1) PCW and its construction contractor's ability to recruit from the local labor pool; 2) housing availability in these communities during the construction period; and 3) any housing, housing incentive and transportation programs that PCW may implement. Some workers could be hired from the local labor pool in the Little Snake River Valley, and some non-local workers may choose to live in communities in that area. However, given the size of those communities, their distance from the project area, and their lack of substantial temporary housing resources, the numbers of such workers would likely be minimal and therefore result in negligible effects on transportation conditions.

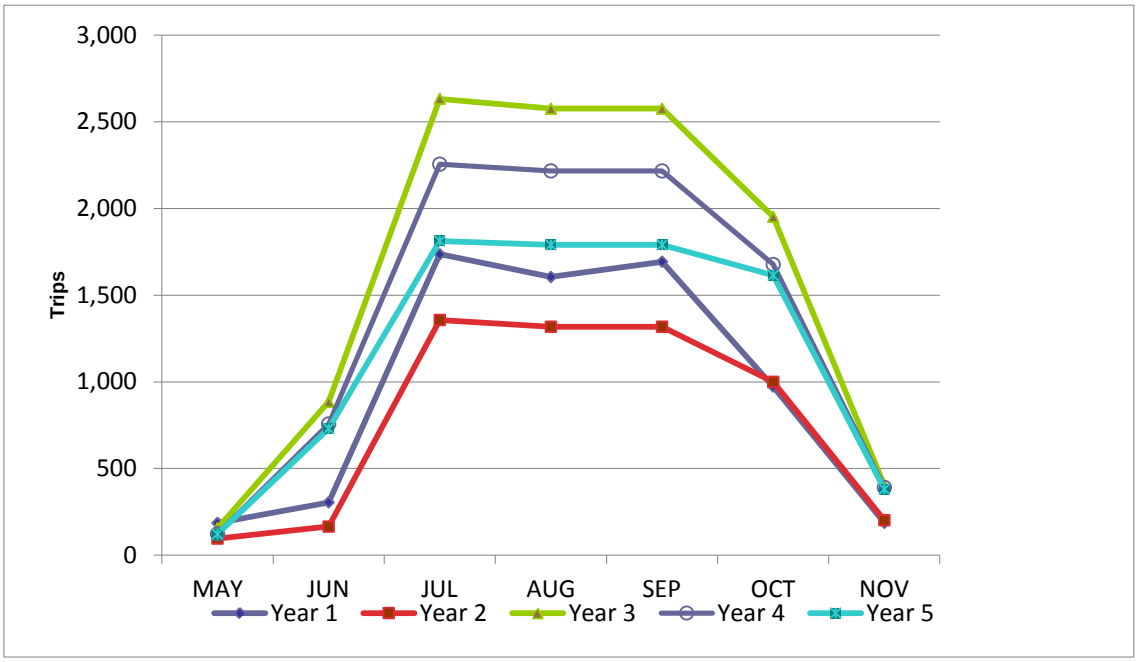
Some project workers also may choose to access the area over Carbon County roads from the Saratoga area (CR 500/Jack Creek Road) and from the Little Snake River Valley (CR 503/McCarty Canyon Road), because of the substantially shorter distance to certain parts of the project area. However, because workers living in these areas would be relatively few in number and access on county roads is quicker only for certain portions of the project area, it is anticipated that their effects on road conditions would be minimal. Workers would be unlikely to use these routes if PCW were to require all workers to enter the site via the internal haul road near Sinclair or via WY 71 and implement methods to enforce that requirement.

4.10.3.1 Average Daily Traffic

CCSM construction is anticipated to occur from May through November during each of the 5 construction years, with July, August, and September being the peak periods in each year. For each year, July is the peak month in terms of projected traffic volumes. **Figure 4.10-2** displays estimated average daily traffic that would access the Alternative 1R area via public highways and roads for each month of the 5 construction years. The traffic estimates do not include trips that would travel within the alternative boundary from the RDF, the Delivery Laydown Area, concrete batch plants, and water sources, because these trips would not use public highways and roads[1]. During Year 1, all deliveries including aggregate deliveries are assumed to originate outside of the alternative boundary. During Years 2 through 5, it is assumed that 90 percent of all truck trips would originate from the RDF and travel within the alternative boundary on internal roads; the remaining 10 percent of truck trips would originate outside the alternative

[1] Note that some trips would cross CR 401 (Sage Creek Road) on the haul road to access the Sierra Madre area.

boundary and travel on public highways and roads via I-80/Exit 221, WY 76 and CR 407 (CIG Road). For all years, it is assumed that all work force commuting trips would originate outside the project area and travel on public highways and roads.[2]



Note: Estimates are 1-way trips, reflecting both inbound and outbound trips. On average, 50 percent of the trips would be in each direction. Outbound truck trips would generally involve empty trucks.

Source: PCW 2012b.

Figure 4.10-2 CCSM External Construction Daily Traffic Estimates by Month: Alternative 1R Preferred RDF Location

As shown in **Figure 4.10-2**, average daily trips would be low to moderate at the beginning and end of each construction year, and rise to a peak during the summer and early fall. During Year 1, the majority of external trips would involve aggregate deliveries, comprising about two-thirds (1,154 trips/day) of the total 1,736 daily trips during the peak month of Year 1 (July). Work force commuting would account for virtually all of the remaining trips. Aggregate deliveries would originate at a yet to be identified location outside of the alternative boundary. Currently it is assumed that one third of all aggregate trips would originate north of Rawlins and access the project area via US 287, using the 287 bypass in Rawlins and I-80; one-third of the aggregate trips would originate west of Rawlins and one third would originate east of Sinclair. All aggregate trips during Year 1 would access the project area via I-80/Exit 22, WY 71 and CR 407 (CIG Road).

After the RDF becomes operational, PCW anticipates deliveries of equipment and material to begin approximately 2 months ahead of the onset of actual construction activity. External traffic would decrease during Year 2, peaking at 1,357 trips/day during the peak month (July), as aggregate and 90 percent of other deliveries arrive by rail and the construction workforce remains relatively moderate. No deliveries of WTGs are anticipated during Year 2.

[2] PCW has indicated that it would consider development of temporary worker housing facility should the need for such housing be identified during future permit hearings before the Wyoming ISC. PCW has not identified a site for such a facility, but has noted that locations both outside and within the Application Area would be considered. The transportation implications of such a facility are not addressed in the PTMP or this EIS.

External traffic in Year 3 would peak at about 2,600 trips/day during July, August, and September. Year 4 peak external traffic during those months would be between 2,200 and 2,250 trips. For comparison, average daily traffic on WY 76 at a point north of the I-80 Exit 221 westbound off-ramp was 1,830 trips during August of 2010, which was the peak month of the year. During that same period, average daily traffic on WY 71 south of the I-80 underpass was 450 trips and average daily traffic on CR 407 (CIG Road) south of I-80 was 120 trips.

During the peak month of Year 3, workforce commuting would total about 80 percent of all external trips. During the peak month of Year 4, workforce commuting would total about 94 percent of all trips. The percentage of workforce commuting to total external trips during other summer months of those years would be even higher.

During Year 5, external trips would diminish to about 1,800 trips/day during July, August, and September, with labor force commuting comprising over 95 percent of all trips.

4.10.3.2 Delay and LOS at Key Intersections

An accepted approach among traffic engineers for assessing the effects of increased traffic volumes on highways, streets and roads is to determine how changes in traffic volume would affect the LOS on highways, streets, roads and at intersections. LOS ratings (A through F) are assigned to highways, streets and roads based on measures (speed, travel time, freedom to maneuver, traffic interruptions, comfort and convenience) that characterize the operational conditions within traffic streams and the perceptions of those conditions by motorists. LOS A represents the best or free flowing travel conditions and LOS F represents the worst. LOS ratings for intersections are based primarily on the average delays experienced by drivers traveling through those intersections.

The CCSM PTMP assessment focuses on potential changes in LOS at affected intersections. **Table 4.10-2** displays LOS criteria for intersections controlled with traffic signals or two-way stop signs.

Table 4.10-2 LOS Criteria for Signalized and Two-way Stop Controlled Intersections

LOS	Control Delay per Vehicle (seconds per vehicle)	
	Signalized Intersections	**Two-way Stop Controlled Intersections**
A	<10	0 – 10
B	>10 – 20	>10 – 15
C	>20 – 35	> 15 – 25
D	>35 – 55	>25 – 35
E	>55 – 80	>35 – 50
F	>80	>50

Source: PCW 2010a.

For Year 1 of construction, the analysis conducted as part of the PTMP assumed all external trips would access the project area via I-80 Exit 221. **Table 4.10-3** contrasts existing (August 2010) delay and LOS ratings with anticipated construction Year 1 peak hour delay and LOS changes for key intersections within the CCSM transportation assessment area. Delay and LOS changes are assessed for the morning and afternoon peak hours, which coincide with the anticipated daily work schedule for workers.

Note that in some cases, Delay and/or LOS appear to improve with the addition of the project-related traffic. As noted in the footnote to **Table 4.10-3**, the PTMP assumes that signalized intersections will be

optimized for anticipated traffic volumes and stop sign controlled intersections will experience uniform traffic flows during the peak hours, which results in projected average delays that are shorter than existing delays when modeling project-related traffic effects, although the overall delay experienced by motorists would increase as a result of the higher traffic volumes.

According to the PTMP, Year 1 peak hour delays associated with Alternative 1R traffic during the peak month would be minimal at all affected intersections except the I-80/Exit 221 westbound off ramp at WY 76, which would increase from 8.8 seconds to 15.3 seconds, resulting in a drop in LOS from A to C for the afternoon peak hour. This impact would be temporary, short-term and below the significance criteria established for this assessment.

As noted above, for construction Years 2 through 5 under Alternative 1R, all aggregate and WTG components and 90 percent of other deliveries would arrive by rail, resulting in workforce commuting comprising over 95 percent of all traffic traveling to the project area over public highways and roads. **Table 4.10-4** contrasts existing (August 2010) delay and LOS ratings with anticipated construction Year 3 peak hour delay and LOS rating changes for key intersections within the CCSM transportation assessment area. Year 3 is the peak construction workforce and traffic year. Project related delay and LOS ratings are presented for the two workforce commuting options: the first option would require all construction workers to access the project area from I-80 at Exit 221; the second would allow workers assigned to the Sierra Madre and Sage Creek Basin areas to use WY 71/CR 401 (Sage Creek Road).

4.10.3.3 Haul Road Workforce Commuting Option

Implementation of Alternative 1R with the I-80/Exit 221/haul road workforce commuting option would result in minor incrementally longer average delays (less than 3 seconds) and reductions in LOS for all intersections during the peak hour of construction Year 1[3], with the exception of the intersection at the I-80/Exit 221 east and westbound off ramps and WY 76. It is estimated that average delays per vehicle at this intersection on the eastbound ramp would increase from 9.1 seconds to greater than 300 seconds in the peak morning hour. Delays on the westbound on ramp and WY 76 would similarly increase from 8.8 to over 300 seconds and the LOS would decrease from A to F in the peak afternoon hour. These impacts would be temporary and short-term, occurring during the peak morning and afternoon hours during the peak month of construction, with slightly lower impacts occurring in August and September and substantially lower impacts occurring during other construction months. Nevertheless, these effects would constitute significant impacts under the criteria adopted for this assessment.

Under the haul road workforce commuting option, peak hour transportation impacts would affect other users of I-80 Exit 221, including Sinclair residents, visitors, commerce associated with the Sinclair Refinery, the CIG compressor station and the truck stop located at Exit 221. These impacts would be short-term and temporary, occurring for two one-hour periods daily during the peak construction months.

The PTMP has identified the westbound I-80 off ramp at Exit 221 as a location where mitigation measures would be required to insure traffic safety. The PTMP identified the use of flaggers, restricting deliveries during peak workforce commuting periods and staggering workforce shift starting and ending times as potential mitigation measures that might improve conditions. The PTMP suggests that in particular the use of flaggers could prevent off-ramp traffic from backing up onto I-80.

[3] Effects on intersections within Rawlins could be different than those contained in the PTMP forecasts if the residential distribution of workers to communities and within the City of Rawlins were substantially different than the distribution assumed for the PTMP. It is assumed that a revised Transportation Management Plan will be prepared before construction is initiated, which will provide additional detail about workforce residency and potential effects on key intersections.

Table 4.10-3 Alternative 1R, Construction Year 1 Average Delay and LOS at Key Intersections Contrasted with Existing Conditions

Intersection	Morning Peak				Afternoon Peak			
	Existing		Alternative 1R Year 1		Existing		Alternative 1R Year 1	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
US 287 Bypass/Higley Blvd & 3rd Street	10.0	A	10.0	A	9.7	A	11.0	B
US 287 Bypass/Higley Blvd & Cedar Street[1]	11.0	B	9.1	A	10.5	B	10.9	B
WY 71 & Jackson Street	9.0	A	8.9	A	9.0	A	8.9	A
WY 71 & Washington Street	9.1	A	9.2	A	9.3	A	9.3	A
WY 71/ Locust St & S. Higley Blvd	10.1	B	10.1	B	10.1	B	10.5	B
I-80 EB & Spruce Street	9.2	A	9.6	A	10.1	B	10.1	B
I-80 WB & Spruce Street	8.8	A	8.8	A	9.7	A	9.6	A
I-80 EB & S Higley Blvd	10.3	B	9.6	A	9.7	A	9.7	A
I-80 WB & S Higley Blvd	10.2	B	10.5	B	10.3	B	10.3	A
I-80 EB & WY 76	9.1	A	10.9	B	9.2	A	9.4	A
I-80 WB & WY 76	8.7	A	9.9	A	8.8	A	15.3	C

[1] This is a signalized intersection.

Delay = Average delay per vehicle at this intersection (seconds).

Delay estimates for signalized intersections assume optimized traffic signal operations.

Delay estimates assume uniform flow entering intersections during the peak hour.

Source: PCW 2012b.

Table 4.10-4 Alternative 1R, Construction Year 3 Delay and LOS at Key Intersections Contrasted with Existing Conditions under Two Workforce Commuting Options

	Morning Peak						Afternoon Peak					
	Existing		I-80 Exit 221 Option		WY 71/CR 401 Option		Existing		I-80 Exit 221 Option		WY 71/CR 401 Option	
Intersection	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
US 287 Bypass/ Higley Blvd & 3rd St	10.0	A	9.8	A	9.8	A	9.7	A	9.8	A	9.8	A
US 287 Bypass / Higley Blvd & Cedar St[1]	11.0	B	8.2	A	8.3	A	10.5	B	12.4	B	11.2	B
WY 71 & Jackson St	9.0	A	8.9	A	39.7	E	9.0	A	8.9	A	31.3	D
WY 71 & Washington St	9.1	A	9.1	A	15.9	C	9.3	A	9.3	A	15.5	C
WY 71/ Locust St & S. Higley Blvd	10.1	B	11.7	B	51.1	F	10.1	B	11.6	B	23.5	C
I-80 EB & Spruce St	9.2	A	12.1	B	10.4	B	10.1	B	10.1	B	10.1	B
I-80 WB & Spruce St	8.8	A	9.0	A	8.9	A	9.7	A	10.4	B	9.9	A
I-80 EB & S Higley Blvd	10.3	B	10.3	B	13.0	B	9.7	A	9.7	A	15.4	C
I-80 WB & S Higley Blvd	10.2	B	11.8	B	15.8	C	10.3	B	11.0	B	13.4	B
I-80 EB & WY 76	9.1	A	>300	F	9.8	A	9.2	A	15.1	C	9.5	A
I-80 WB & WY 76	8.7	A	10.2	B	9.2	A	8.8	A	>300	F	11.4	B

[1] This is a signalized intersection.

Delay = Average delay per vehicle at this intersection (seconds).

Delay estimates for signalized intersections assume optimized traffic signal operations.

Delay estimates assume uniform flow entering intersections during the peak hour.

Source: PCW 2012b.

4.10.3.4 WY 71/CR 401 (Sage Creek Road) Workforce Commuting Option

For the WY 71/CR 401 workforce commuting option, an estimated 81 percent of peak year workforce commuting trips would occur on WY 71 and CR 401. It is assumed that this route would not be used for deliveries. Consequently, if the WY 71/CR 401 workforce commuting option were to be implemented, the volume of workforce traffic accessing the project area via I-80/Exit 221 would be substantially reduced,

eliminating the long delays and substantial decreases in LOS at that area. Conversely, under this option increased delay and reductions in LOS would be anticipated at several intersections within Rawlins. While most intersections within Rawlins would only experience minor project-related delays during peak morning and afternoon hours, delays along the part of WY 71 within Rawlins would be more substantial. According to the PTMP, delays at the intersection of WY 71 and Jackson Street are forecast to increase from 9.0 to 39.7 seconds and LOS decrease from A to E during the peak morning hour; delays are similarly forecast to increase from 9.0 to 31.3 seconds and LOS decrease from A to D during the evening peak hour. Delays at WY 71/Locust Street and Higley Boulevard would increase from 10.1 seconds to 51.1 seconds and the LOS would decrease from B to F during the peak morning hour and delay would increase from 10.1 seconds to 23.5 seconds and LOS would decrease from B to C during the afternoon peak hour. Again, these effects would be temporary and short-term. Although the peak morning hour delay at WY 71/Locust Street and Higley Boulevard would be significant under the criteria used for this assessment, this level of delay would occur on the lowest approach volume at the intersection (less than 20 vehicles out of 785 traveling through the intersection) and all other approaches would operate at a LOS B or better, according to the PTMP.

Although the internal haul road would cross CR 401 near the northern boundary of the Sierra Madre site, only minimal delays are anticipated for non-project travelers on this road because PCW intends to use flaggers to stop haul road traffic to allow travelers on CR 401 to pass. In any case, existing traffic volumes on CR 401 are low.

The temporary workforce anticipated to live in Rawlins during construction months would add to the everyday traffic volumes within that community. Construction worker-related non-commuting traffic would occur primarily in commercial areas of the city and in areas where temporary housing is located. These effects would be temporary and short term, occurring primarily during evening hours.

4.10.3.5 Public Safety Effects during Construction

During construction, public safety effects on public highways and roads providing access to the project area could be associated with the high volumes of project-related traffic including heavy trucks on the affected roadways and at access points to the project site. Special measures such as the installation of traffic signals or flaggers on the bridge over I-80 at Exit 221 and at the point where the internal haul road would cross CR 401 could reduce traffic hazards in those areas. No at-grade railroad crossings are located on proposed access routes to the project area, although some of the estimated 15 percent of the total workforce commuting from points west of Rawlins could chose to access WY 71/CR 407 from I-80 via CR 340 (Hadsell Road/Ferris Crossing) under the WY 71/CR 407 workforce commuting option, which would involve an at-grade railroad crossing.

The addition of the volumes of and types of traffic associated with Alternative 1R would increase the risk of accidents on affected highways and roads. This risk could be reduced by the implementation of the mitigation measures described in Section 4.10.9.

4.10.4 Operations

O&M activities associated with Alternative 1R are anticipated to employ approximately 114 full-time, year round staff, substantially fewer workers than required during project construction. The majority of O&M trips would originate from the O&M facility on CR 407 (CIG Road), accessing various locations within the project site via the internal road network. The PTMP anticipates approximately 340 trips per day to and from the project area, with most these occurring in conjunction with the normal workday commuting. Although not estimated in the PTMP, intermittent maintenance trips would likely be associated with contract workers performing maintenance and repairs. The incremental traffic associated with project O&M would be substantially lower than construction related traffic and would be not anticipated to result in traffic delays or reduced LOS on the highway and road network providing access to the project area, with the exception of possible minimal and short-term delays on the segment of WY 76/CR 407 (CIG Road) leading to the project access road.

4.10.5 Decommissioning and Final Reclamation

At the end of the project's assumed 30-year life, or when it is determined that the project is no longer economical, the project would be decommissioned and the area reclaimed. During decommissioning the WTGs would be disassembled and removed from the site, as would the aboveground parts of the foundations, the meteorological towers and the aboveground electrical network. Access roads would be reclaimed, at the discretion of the BLM and private landowner, and disturbed areas re-vegetated. Project decommissioning and final reclamation work is anticipated to occur during the months of April through October over a 3-year period and require a peak of 300 to 400 employees during 3 to 4 months of each of the three decommissioning years. Similar equipment (cranes and earthmoving equipment) would be required for decommissioning and reclamation as would be required for project construction.

Traffic volumes would vary throughout the decommissioning/reclamation phase. The PTMP estimates that a daily peak of about 840 to 870 trips would be required during May, June July and August of each of the three decommissioning years. Estimated peak period (May through August of the third decommissioning year) traffic volumes are shown in **Table 4.10-5**. Estimated peak daily trips would total 868. Of those, 92 percent are projected to be passenger vehicle trips associated with workforce commuting.

Table 4.10-5 CCSM Peak Daily Decommissioning/Reclamation Trips

Daily Trips During Peak of Decommissioning/Final Reclamation	
Vehicle Type	**Peak Daily Trips**
Workforce Commuting	800
Removal Trucks	68
Total Daily Trips	868

Source: PCW 2012b.

The peak level of decommissioning traffic would be about 40 percent of that estimated for the peak construction month. Workforce commuting trips would occur on public highways and roads; equipment and materials removal trips could occur by rail or over public highways and roads. The PTMP assumes that background traffic volumes in Carbon County would grow at 2 percent annually, based on Wyoming Department of Administration and Information population forecasts. Based on these assumptions, the peak hour increase in delay attributable to Alternative 1R decommissioning activities would be a matter of a few seconds at most affected intersections. The greatest increase in delay – about 7 seconds – would occur at the I-80 westbound/WY 786 intersection at Exit 221 and the LOS at that intersection would decrease from A to C during the afternoon peak hour, according to the PTMP. These effects would be short term and temporary and below the level of significance identified for this assessment.

4.10.6 Impacts to Transportation 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 T18 N. Privately owned and state lands located in these areas also were considered available for 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 and transmission lines, substations and an interconnection line.

Alternative 2 assumes development of the RDF at PCW's preferred location, south of I-80. However, instead of the proposed internal haul road through the interior of the Chokecherry project PCW would construct a haul road which heads west from the RDF to Hwy 71, then turns 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). All traffic would access the alternate haul road using the same highways and roads as the proposed haul road in Alternative 1R, therefore the effects of external traffic to and from the project area would be similar to those associated with Alternative 1R, with the exceptions noted below.

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. Based on the construction activities and schedule outlined in the POD, it is likely that these increases would occur during Years 2 through 4. It is not known whether the increased number of trips would result in a higher peak hour/peak month traffic in one or more of the 5 construction years, or be distributed across each construction season. An increase in peak hour traffic would exacerbate some of the traffic impacts described above, whereas spreading the additional trips over each construction season would result in more traffic volume, and more frequent and/or extended duration of high volume effects on traffic, but within the basic parameters outlined for Alternative 1R.

The level of traffic associated with project operations and decommissioning would remain the same as those associated with Alternative 1R. However, the distribution of WTGs would be different, as Alternative 2 contemplates that 59 percent of total WTGs would be located in the Chokecherry site (compared to 53 percent under Alternative 1R) and 41 percent would be located in the Sierra Madre site (compared to 47 under Alternative 1R). Within the Sierra Madre site, the location of the WTGs under Alternative 2 also would change with 54 percent of the WTGs located west of WY 71/CC 401 (compared to 62 percent under Alternative 1R) and 46 percent located east of WY 71/CC 401 (compared to 38 percent under Alternative 1R).

Under the haul road workforce commuting option, the effects of Alternative 2 on the external access roads leading to the Application Area would be similar to those associated with Alternative 1R, with the exception that there would be a decrease in construction, operations and decommissioning traffic in the western portion of the Sierra Madre site compared to Alternative 1R, due to the reduction in WTGs that would be located in that area. This would result in a corresponding reduction in vehicles crossing CR 401 (Sage Creek Road) at its intersection with the internal haul road, which would mean fewer delays at that intersection during construction months of the 2 years when road and WTG construction would occur in the Sierra Madre site. Although construction traffic would yield to traffic on CR 401, if long trucks carrying blades are being moved across the highway, it could necessitate a slowdown or stop by oncoming traffic.

Under the WY 71/CR 401 workforce commuting option, the 13 percent reduction in the number of WTGs in the Sierra Madre site would correspondingly reduce the number of workforce commuting trips on that route. This could reduce peak hour traffic on the route compared to Alternative 1R.

If the WY 71/CR 401 workforce commuting option were to be selected, project-related traffic volumes on I-80 and within the City of Rawlins would be somewhat different than those forecasted in the PTMP for Alternative 1R. Fewer overall workforce commuting trips would be destined to the Sierra Madre site, which could result in reductions in peak hour traffic volumes on streets and intersections providing access to WY 71/CR 401 compared to Alternative 1R, depending on PCW's construction schedule. However, streets and intersections providing access to I-80 east for access to WY 76/CR 407 (CIG Road) would see increases in peak/hour volume compared to Alternative 1R to account for the higher numbers of workforce commuting trips destined to the Chokecherry site. These differences would likely not substantially alter conclusions about delay and reductions in LOS within Rawlins described under Alternative 1R.

As with Alternative 1R, the configuration of internal access roads and the related traffic and safety effects would be addressed in the Transportation Management Plan to be submitted by PCW prior to the initiation of construction.

Traffic volumes and patterns associated with Alternative 2 operation and maintenance activities would be comparable to those under Alternative 1R, with the majority of trips originating at the O&M facility on CIG Road and access the project site over the internal haul road. Based on these similarities and the conclusions in the PTMP, the traffic associated with project operations under Alternative 2 would be anticipated to result in similar effects on highways, roads and key intersections as would occur under Alternative 1R.

At the end of the project's assumed 30-year life, or when it is determined that the project is no longer economical, the project would be decommissioned and the area reclaimed. Traffic associated with decommissioning and reclamation under Alternative 2 would be comparable to that under Alternative 1R, with peaks occurring in May, June, July, and August.

Public safety effects of Alternative 2 would be similar to those discussed under Alternative 1R.

4.10.7 Impacts to Transportation from Alternative 3, No Miller Hill or South Sierra Madre

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

The distribution of WTGs to be located in each site under Alternative 3 would differ substantially from the distribution under Alternative 1R. Under Alternative 3, 66 percent of total WTGs would be located in the Chokecherry site (compared to 53 percent under Alternative 1R) and 34 percent would be located in the Sierra Madre site (compared to 47 under Alternative 1R). Within the Sierra Madre site, the location of the WTGs under Alternative 3 also would change with 40 percent of the WTGs in the Sierra Madre area located west of WY 71/CC 401 (compared to 62 percent under Alternative 1R) and 60 percent would be located east of WY 71/CC 401 (compared to 38 percent under Alternative 1R).

Although the total number of WTGs would be unchanged as compared to the Alternative 1R, implementation of Alternative 3 would require construction of additional internal resource roads, turnarounds, and a more extensive energy collection system, increasing the workforce and the total amount of materials, equipment and supplies deliveries for construction. The implication of these differences would be an increase in project-related traffic volume during construction. As with Alternative 2, these increased traffic effects would likely occur in Years 2 through 4.

4.10.7.1 Alternate RDF Location

Alternative 3 also assumes that the RDF would be constructed in the alternate location, north of I-80 and east of Sinclair. From the alternate RDF, construction equipment, materials and supplies delivered by rail would be transported to the project area by truck, initially traveling south on WY 76, then across the overpass of I-80 at Exit 221 east of Sinclair, east on WY 76 for about 1.25 miles, then south for about 1 mile on CR 407 (CIG Road), ultimately connecting to the internal haul road described under Alternative 1R (**Figure 4.10-1**).

Figure 4.10-3 displays projected daily traffic volumes for each month of each of the 5 construction years. These projections reflect trips originating at the alternate RDF site and elsewhere outside the Application Area that would access the area over public highways and roads. The projections were obtained from the PTMP and reflect the WTG siting configuration reflected in Alternative 1R, so PCW may have somewhat underestimated total trips given the additional internal resource roads, turnarounds, and a more extensive energy collection system associated with Alternative 3.

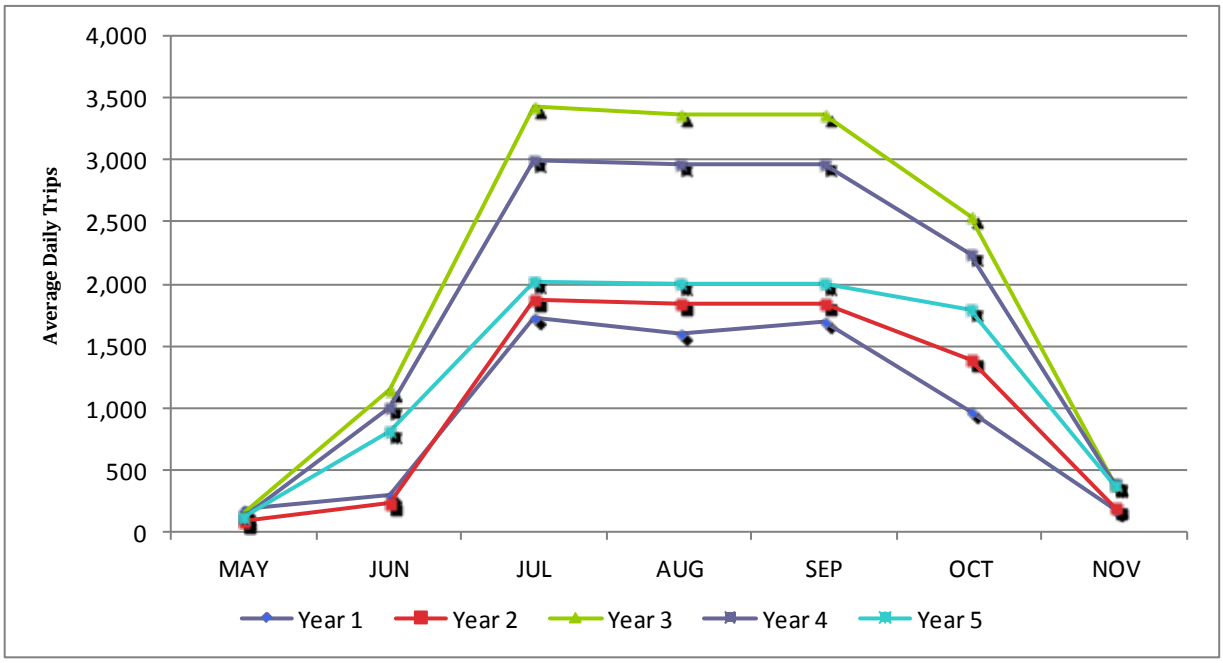


Figure 4.10-3 CCSM External Construction Daily Traffic Estimates by Month: Alternate RDF Location

The overall transportation profile for Alternative 3 is similar to that of Alternative 1R; construction-related traffic begins and ends at moderate levels during each construction year and peaks during July through September. The number of trips occuring on public roads associated with Alternative 3 is substantially higher than Alternative 1R however. **Figure 4.10-4** contrasts the projected number of Alternative 3 external trips with Alternative 1R external trips for the peak months of each construction year. External trips would be the same for both alternatives during the first year. Alternative 3 external trips would be 38 percent, 30 percent and 33 percent higher, respectively, during Years 2 through 4 of construction, and 11 percent higher during Year 5.

The increases in construction-related traffic shown in **Figure 4.10-4** would be limited to the WY 76/CR 407 (CIG Road) corridor providing access from the Alternate RDF to the haul road. The increases on this route reflect the truck traffic hauling equipment and materials including WTG components and aggregate from the RDF to the project area. These trips would be 90 percent internal under Alternative 1R, which assumes development of the RDF in the Preferred location.

Table 4.10.6 displays existing delay and LOS ratings for key intersections providing access to the project area contrasted with changes in those paramaters forecast for Alternative 3 and use of the Alternate RDF location. As might be anticipated, the only intersections which show substantially different values than those associated with Alternative 1R are the intersections of WY 76 and the I-80 on and off-ramps at Exit 221. Delays at these intersections are one or two seconds greater under Alternative 3 than those forecast for Alternative 1R.

As noted in Section 4.10.3, the PTMP identified the westbound I-80 off ramp at Exit 221 as a location where mitigation measures would be required to insure traffic safety. Such mitigation measures would be important under Alternative 3, given the additional volumes of traffic including heavy truck traffic that

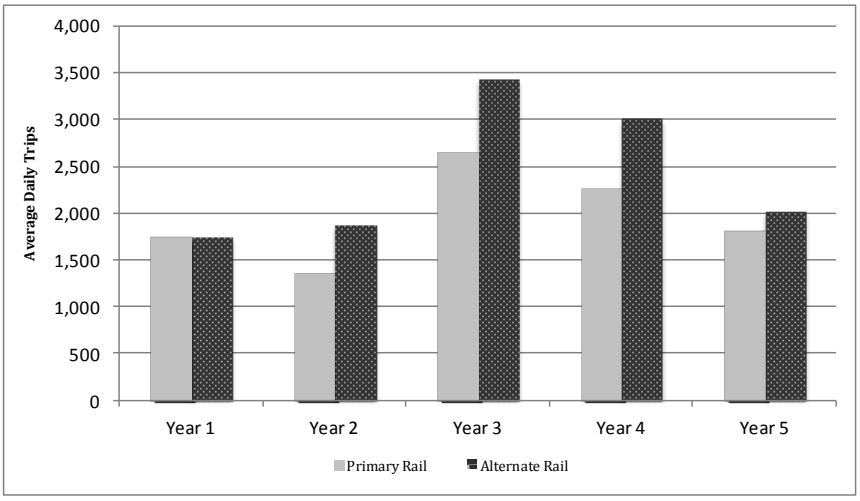


Figure 4.10-4 CCSM External Construction Daily Traffic Estimates by Month: Preferred RDF Location Contrasted with Alternate RDF Location

would be associated with this alternative. The PTMP identified the use of flaggers, restricting deliveries during peak workforce commuting periods and staggering workforce shift starting and ending times as potential mitigation measures that might improve conditions. The PTMP suggests that in particular the use of flaggers could prevent off-ramp traffic from backing up onto I-80.

Under Alternative 3 and the haul road workforce commuting option, effects on project external access routes under Alternative 3 would differ from Alternative 1R in that in addition to workforce commuting trips, all traffic associated with delivery of materials, equipment and supplies, including WTG components and aggregate would access the site via WY 76/CR 407 (CIG Road).

If the WY 71/CR 401 workforce commuting option were selected under Alternative 3, there would be substantially fewer trips on that route compared to Alternative 1R because of the reduced numbers of WTGs in the Sierra Madre site. Conversely, there would be more workers accessing the project area at I-80/Exit 221/WY 76/CR 407, because more turbines would be located in the Chokecherry site. Peak traffic volumes on this route would still be lower than under the haul road only commuting option.

Within Rawlins, traffic effects would be similar to Alternative 1R under the haul road workforce commuting option. Under the WY 71/CR 401 workforce commuting option, fewer trips would be required on WY 71/CR 401, potentially reducing peak hour delay and reductions in LOS at intersections providing access to that route. Correspondingly more trips would be required to access the project area via the internal haul road so increases in delay and reductions in LOS at intersections providing access to I-80 east would be greater than Alternative 1R under this workforce commuting option, but still less than the haul road only commuting option.

As with Alternative 1R, the configuration of internal access roads and the related traffic and safety effects would be addressed in the Transportation Management Plan that would be submitted by PCW prior to the initiation of construction.

Also as with Alternative 1R, highway and road segments providing access to the project for WTGs and construction materials would require improvement before construction and decommissioning begins and repair after construction and decommissioning has been completed.

Table 4.10-6 Alternative 3: Alternate RDF Location Construction Year 3 Delay and LOS at Key Intersections Contrasted with Existing Conditions Under Two Workforce Commuting Options

	Morning Peak						Afternoon Peak					
	Existing		I-80 Exit 221 Option		WY 71/CR 401 Option		Existing		I-80 Exit 221 Option		WY 71/CR 401 Option	
Intersection	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
US 287 Bypass/ Higley Blvd & 3rd St	10.0	A	9.8	A	9.8	A	9.7	A	9.8	A	9.8	A
US 287 Bypass/ Higley Blvd & Cedar St[1]	11.0	B	8.2	A	8.3	A	10.5	B	12.4	B	11.2	B
WY 71 & Jackson St	9.0	A	8.9	A	39.7	E	9.0	A	8.9	A	31.3	D
WY 71 & Washington St	9.1	A	9.1	A	15.9	C	9.3	A	9.3	A	15.5	C
WY 71/ Locust St & S. Higley Blvd	10.1	B	11.7	B	51.1	F	10.1	B	11.6	B	23.5	C
I-80 EB & Spruce St	9.2	A	12.1	B	10.4	B	10.1	B	10.1	B	10.1	B
I-80 WB & Spruce St	8.8	A	9.0	A	8.9	A	9.7	A	10.4	B	9.9	A
I-80 EB & S Higley Blvd	10.3	B	10.3	B	13.0	B	9.7	A	9.7	A	15.4	C
I-80 WB & S Higley Blvd	10.2	B	11.8	B	15.8	C	10.3	B	11.0	B	13.4	B
I-80 EB & WY 76	9.1	A	>300	F	10.3	A	9.2	A	13.5	B	9.9	A
I-80 WB & WY 76	8.7	A	11.2	B	9.8	A	8.8	A	>300	F	12.3	B

[1] This is a signalized intersection.

Delay = Average delay per vehicle at this intersection (seconds).

Delay estimates for signalized intersections assume optimized traffic signal operations.

Delay estimates assume uniform flow entering intersections during the peak hour.

Sources: PCW 2012a.

Long-term transportation effects associated with O&M under Alternative 3 would essentially be the same as under Alternative 1R. Although the volume and types of decommissioning trips under Alternative 3 would be similar, Alternative 3 truck trips would occur on public highways and roads, assuming rail transport of decommissioned equipment under both alternatives. Decommissioned equipment and materials would be loaded on rail at the preferred RDF location under Alternative 1R, avoiding use of public highways and roads. Under Alternative 3, trucks carrying decommissioned equipment and materials would travel on CR 407/WY 76 to the alternate rail site, resulting in temporary and short-term increases in traffic, delay and deterioration of LOS at intersections on that route.

Public safety effects of Alternative 3 would be similar to those discussed under Alternative 1R.

4.10.8 Impacts to Transportation and Access from Alternative 4, Private Lands Only

Alternative 4 also assumes the alternate location for the RDF and considers placement of WTGs on private lands only within both the Chokecherry and Sierra Madre sites. Up to 846 WTGs would be developed, 156 fewer than under Alternative 1R and approximately 66 percent of the total would be developed in the Chokecherry site and 34 percent in the Sierra Madre site.

The number of WTGs located west of WY 71/CR 401 in the Sierra Madre area would be reduced by almost 48 percent under Alternative 4 compared to Alternative 1R, substantially reducing project traffic at the point where the internal haul road would cross CR 401 (Sage Creek Road) under Alternative 4 compared to Alternative 1R.

Although 15 percent fewer WTGs would be developed under Alternative 4 compared to Alternative 1R, implementation of Alternative 4 would require construction of additional internal resource roads, turnarounds, and a more extensive energy collection system, increasing the workforce and the total amount of materials, equipment and supplies deliveries for those aspects of construction. Conversely, the reduction in construction effort associated with WTG construction and commissioning would result in fewer equipment, materials and workforce commuting trips for those aspects of construction. Because these two factors have offsetting tendencies, the net effects on traffic volume, delays and LOS at the key access locations addressed in the PTMP, are unclear. However, estimates of the net effects on labor for Alternative 4 derived from projections for Alternative 1R suggests that the net effect on project-related trips on I-80 and at the intersections at I-80 Exit 221 providing access to WY 76/CR 407 (CIG Road) and the internal haul road would not differ substantially from those forecast in the PTMP for the Alternate RDF location. Overall traffic volumes within the City of Rawlins would likely be also similar. Consequently transportation effects of Alternative 4 would likely be similar to those described for Alternative 3.

As with other action alternatives, the configuration of internal access roads and the related traffic and safety effects would be addressed in the Transportation Management Plan that would be submitted by PCW prior to the initiation of construction. The highway and road segments providing access to the project for WTGs and construction materials would require improvement before construction and decommissioning begins and repair after construction and decommissioning has been completed.

Long-term transportation effects associated with O&M, as well as the eventual decommissioning and reclamation under Alternative 4 would be lower than those associated with Alternative 1R, because there would be 15 percent fewer WTGs and ancillary facilities requiring maintenance and decommissioning. However, like Alternative 3, decommissioning would result in more external trips to transport disassembled WTGs and other materials to the RDF, assuming rail transport under both alternatives.

Public safety effects of Alternative 4 would be similar to those discussed under Alternative 1R.

4.10.9 Mitigation

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).

The assumptions listed at the beginning of this section include a number of safety, highway and road enhancement and restoration measures that are included in the PCW PTMP. The following additional measures are proposed to mitigate the effects of Alternative 1R on area transportation and access.

TRANS-1: To the extent that all governmental entities are willing to participate, PCW shall participate in a coordinated transportation planning process with the BLM, WYDOT, Carbon County, the Town of Sinclair and the City of Rawlins, to identify and develop measures to avoid, manage or mitigate transportation impacts of construction. The BLM shall coordinate with affected local governments to solicit input from the Sinclair Refinery, the CIG compressor station, affected grazing operators, and other major property owners (including the operator of the truck stop just north of I-80 Exit 221) in the affected area. The group shall meet prior to and during the construction phase of the project and in the initial year of project operations, as needed.

TRANS-2: PCW shall develop measures to inform and update Carbon County residents and travelers on I-80 near Sinclair and WY 71 about potential delays during peak months and especially during peak hours. In coordination with WYDOT, electronic signage shall be used near I-80 Exit 221 to encourage I-80 travelers to use alternate access to Sinclair during peak hours.

TRANS-3: PCW shall coordinate with WYDOT to identify measures to control traffic and enhance traffic flows in the vicinity of I-80 Exit 221 during shift changes and at times when oversized vehicles will be crossing the bridge over I-80, and along WY 71 within the City of Rawlins if the WY 71/CR 407 (Sage Creek Road) workforce commuting option is selected.

TRANS-4: PCW shall implement incentives for carpooling and/or other workforce transportation measures to reduce traffic and congestion during shift changes.

Effectiveness: Given the large volumes of traffic anticipated under Alternative 1R during peak months and during peak traffic hours, congestion, delay, and deteriorations in LOS on certain highways and roadways and at certain key intersections and increased risk of accidents are inevitable. Additionally, the large numbers of trucks including overweight trucks would result in damage to the route from the alternate RDF location to the internal haul road and at the point where the internal haul road would cross CR 401 (Sage Creek Road). If diligently implemented, the mitigation measures listed above, along with performance of the safety, highway and road enhancement and restoration measures listed as assumptions at the beginning of this section could effectively avoid, manage, and mitigate potential adverse transportation effects of project construction.

4.10.10 Residual Impacts

Residual long-term transportation impacts associated with Alternative 1R and other action alternatives during project operations would include minor incremental contributions to local traffic volumes, contributing to congestion, delay and deterioration in LOS on certain highways and roadways and at certain key intersections providing access to the applicable project area. The key roads and highways used by operations traffic would be subject to somewhat accelerated wear, requiring additional maintenance effort and outlays, although these would be anticipated to be relatively moderate during project operations. Residual risks of traffic accidents and associated property damage, injuries and fatalities would be higher than under the No Action Alternative, due to the increased traffic volume, but substantial increases in such risk would not be anticipated. Transportation impacts of decommissioning and reclamation are discussed under each alternative. After the completion of decommissioning and reclamation activities, residual transportation effects would be limited to reclamation monitoring and are likely to be negligible.

4.10.11 Irreversible and Irretrievable Commitment of Resources

At the conclusion of decommissioning, project roads and access points would be reclaimed at the discretion of the BLM and the landowner. Consequently, some internal project roads could remain in place after decommissioning and reclamation. However, the continued existence of such roads would not represent irreversible and irretrievable commitments of resources because they could be abandoned and reclaimed at a later date.

4.10.12 Relationship between Local Short-term Uses and Long-term Productivity

Short-term increases in traffic with associated delays and reductions in LOS on roads and at key intersections providing access to the project area could temporarily impede and delay other commercial and industrial traffic on these roads and intersections. Such delays would likely be minimal for most users of these routes and result in minimal effects on short-term use and long term productivity.