3.15 Cumulative Impacts

This section describes the cumulative impacts that could result from the addition of impacts from the proposed rail line to impacts of other past, present, and reasonably foreseeable future projects and actions. The subsections that follow describe the cumulative impacts study area; the methods used to analyze cumulative impacts; past, present, and reasonably foreseeable future actions that could contribute to cumulative effects; and cumulative impacts by resource topic.

3.15.1 Analysis Methods

OEA followed the guidelines outlined in the CEQ handbook titled *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997) to evaluate whether cumulative impacts could result from adding impacts of constructing and operating the proposed rail line to impacts of past, present, and reasonably foreseeable future projects. Based on the CEQ guidance, OEA undertook the following steps to evaluate the cumulative impacts from construction and operation of the proposed rail line.

- OEA defined the geographic and temporal scope of the analysis.
- OEA relied on information from other agencies and organizations about reasonably foreseeable projects and actions that are beyond the scope of the Board's authority.
- OEA considered impacts of other past, present, and reasonably foreseeable future actions that relate to the geographic and temporal scope of the proposed rail line.
- OEA reached conclusions based on the best available data at the time of the analysis.

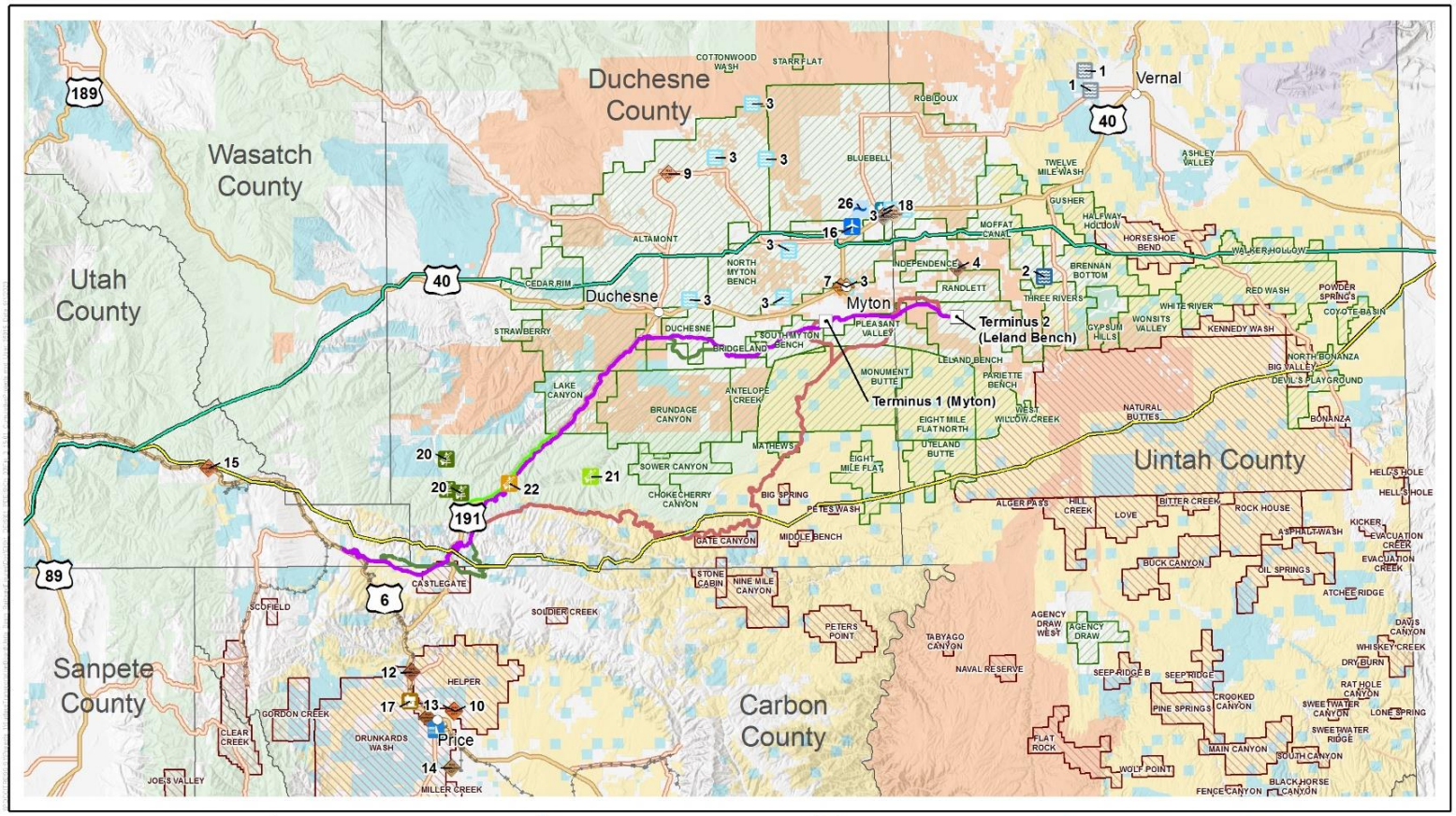
3.15.2 Cumulative Impacts Study Area

The cumulative impacts study area includes the areas identified for oil and gas development as shown on Figure 3.15-1. Consistent with past OEA practice, OEA used a 20-year time period for the analysis, extending from 2020 to 2040. OEA defined the cumulative impacts study area for each resource that would be affected by construction and operation of the proposed rail line, as described in Section 3.15.5, *Cumulative Impacts by Resource*. Some cumulative impacts study areas are identical to the resource study areas described for the analysis of direct and indirect effects in Section 3.1, *Vehicle Safety Delay*, through Section 3.13, *Socioeconomics,* of this Draft EIS. Other resources have a larger cumulative impacts study area.

3.15.3 Affected Environment

The exact location of the proposed rail line would depend on which Action Alternative, if any, the Board authorizes. Any of the Action Alternatives would have the same two terminus points in the Basin near Myton and Leland Bench, Utah, and the same connection with the existing UP rail line near Kyune, Utah. Figure 3.15-1 shows the Action Alternatives along with the other relevant projects included in this cumulative impacts analysis. The overall geographic region is primarily rural and sparsely populated. Predominant land uses include oil and gas production, ranching and farming, and rural residential development on subdivided ranch land.

Figure 3.15-1. Past, Present, and Reasonably Foreseeable Future Actions



The proposed rail line is located primarily within the Colorado Plateau ecoregion, composed of Semiarid Benchlands and Canyonlands, Escarpments, and the Uinta Basin Floor subregions. The region provides habitat for special-status species and big game wildlife species such as elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra Americana*), Western moose (*Alces alces andersoni*), and bighorn sheep (*Ovis canadensis*). Cultural resources include homestead cabins and nationally significant Fremont, Ute, and Archaic rock art and structures. The study area includes land managed by the Forest Service, BLM, state of Utah, and Ute Indian Tribe. Several BLM special designations are also located in this region, including Areas of Critical Environmental Concern (ACECs), Lands with Wilderness Characteristics, and Special Recreation Management Areas. Forest Service lands include Inventoried Roadless Areas (IRAs). Public lands in the study area support a variety of recreational activities including hunting, fishing, hiking, picnicking, bicycling, camping, horseback riding, nature viewing, OHV riding, scenic driving, and winter sports.

3.15.4 Other Past, Present, and Reasonably Foreseeable Future Actions

3.15.4.1 Oil and Gas Development

Oil and Gas Production

Oil and gas refer generally to fluid petroleum products that are derived from organic material deposited millions of years ago and now lie underground. Over time, heat and pressure transformed those raw materials into energy-rich hydrocarbon liquids and gases. Oil and gas are produced by drilling wells into the formations that contain oil and gas resources. After well sites are selected, they are prepared for drilling by construction of a well pad and supporting infrastructure. Drilling involves a drill rig, associated equipment such as pumps, and truck trips. After the wells are drilled, they are completed using a variety of techniques depending on the characteristics of the formation, such as hydraulic fracturing to create fractures in the rock. Hydraulic fracturing allows fluids to more freely flow from the formation into the well, where the fluids flow up the well to the surface. Oil, gas, and/or water produced by a well are separated at the well site or are transported to nearby facilities for separation. OEA anticipates that, if the Coalition were to construct and operate the proposed rail line, some of the crude oil produced in the Basin would be trucked from wells to rail terminals near Myton and Leland Bench for loading into trains.

The Coalition estimates that rail traffic on the proposed rail line would range from 3.68 trains per day (low rail traffic scenario) and 10.52 trains per day (high rail traffic scenario), on average, depending on future market conditions. The trains would primarily transport crude oil and would have the capacity to ship between approximately 130,000 and 350,000 barrels of oil each day, on average, out of the Basin. The actual volume of oil transported on the proposed rail line and the number of trains would depend on various independent variables and factors including general domestic and global economic conditions, commodity pricing, and the strategic and capital investment decisions of oil producers and their customers (Coalition Response to IR#2).

For the analysis of potential cumulative impacts, OEA developed two potential scenarios for future oil and gas development in the Basin that correspond to the Coalition's estimated range of rail traffic. Under the low oil production scenario, total oil production in the Basin would increase by an

average of 130,000 barrels per day compared to historical production levels. Under the high oil production scenario, total oil production in the Basin would increase by an average of 350,000 barrels per day. Historical production has varied substantially from year to year. Where the analysis required quantification of historical production, OEA used 90,000 barrels per day as a conservative baseline level of production, which is slightly lower than the maximum historical production from the Basin of 94,000 barrels per day. Although OEA expects that the proposed rail line would divert some oil that in the past has been trucked to terminals outside the Basin to rail transportation, OEA assumed, for the purposes of the cumulative impacts analysis, that all oil transported on the proposed rail line would come from new production. This is a conservative assumption because it may overstate total future oil production in the Basin and, therefore, potential cumulative impacts.

OEA assumed that future oil and gas development, including well drilling and operation along with construction and operation of related facilities, such as pipelines, would occur throughout the Basin in the fields shown in Figure 3.15-1. The exact locations of new oil and gas development would depend on many factors, including domestic and global demand, as well as future decisions by private, state, tribal, and federal owners of mineral rights in the Basin. The Monument Butte Oil and Gas Development Project, which proposes to develop up to 5,750 oil and gas wells in an area located about 6 miles south of Myton, Utah, is an example of a proposed oil and gas development project in the region (BLM 2016). Crude oil produced by the Monument Butte project wells potentially could be transported on the proposed rail line.

Well Development

To assess the impacts of increased oil and gas development as part of the cumulative analysis, OEA estimated the number of oil wells that would need to be constructed and operated to satisfy the expected increased oil production volume scenarios of 130,000 or 350,000 barrels per day, respectively. Based on consultation with UGS regarding current drilling technologies and methods in the Basin, OEA estimated that new horizontal wells would produce an average 366 barrels of crude oil per day during the first year of production (Vanden Berg pers. comm.). OEA reviewed data about vertical wells drilled between 2014 and 2018 from the Utah Division of Oil, Gas, and Mineral (UDOGM) to estimate an average initial production rate of 66 barrels of crude oil per day for new vertical wells. OEA used historical well data from UDOGM's completion and production databases to create a 15-year oil production decline curve for horizontal and vertical wells.[1] Based on consultation with UGS, OEA assumed that 20 percent of the new wells drilled each year would be vertical wells and 80 percent would be horizontal wells (Vanden Berg pers. comm.; UGS 2019).

OEA used the initial production rates, decline curves, and estimated ratio of horizontal wells to vertical wells to calculate the annual production rate of an average well in each year of its lifetime and the number of wells that would need to be constructed each year to meet the oil production volume expected in the respective scenarios. For simplicity, OEA assumed it would take one year to

[1] A duration of 15 years was selected to balance the two competing analysis interests: (1) a robust decline curve and (2) an accurate estimate of well production volumes. A longer duration captures a more complete decline curve, including the later period when a well's annual production begins to plateau from year to year. On the other hand, a shorter duration captures the production volumes of wells that were more recently drilled in the Basin. Compared to wells drilled in earlier years, these wells are more likely to use the same technologies and drilling processes of future wells analyzed under the cumulative analysis and are therefore more representative. Balancing the tradeoffs of optimizing interests (1) and (2), OEA selected a 15-year period of well volume data (i.e., 2004 to 2019).

construct all the wells before they would start producing oil at their expected annual rate. In the second year of the project (i.e., the first year of production), the wells constructed in the first year would be operating at the production volume needed to satisfy each of the two oil production scenarios (i.e., 130,000 or 350,000 barrels per day).

By the third year of the project (i.e., the second year of production) the wells constructed in the first year would not produce enough to satisfy the production scenarios because the average well production volume decreases over a well's lifetime. Therefore, additional wells would need to be constructed in the second year of the project to supplement the reduced production from the wells constructed in the first year. In the third year, the old (first year) and new (second year) wells combined would produce the volume needed to satisfy the production scenarios, and so forth. As the decline curve starts to plateau in later years, fewer and fewer wells would need to be constructed each year. OEA chose year 15 of the analysis to represent steady state development, as this was the analysis year when the number of wells constructed per year was closest to the number of new producing wells in that year (i.e., wells that were constructed in the 14th year). Production from an oil well will steadily decline. By year 15, OEA estimated that an average horizontal well could produce approximately 40 barrels per day and an average vertical well could produce approximately 7 barrels per day.

Based on this approach, steady state annual development under the low oil production scenario requires construction of approximately 80 wells, plus production from 83 wells for each year of production (i.e., under the steady state assumption there are 83 wells of each "vintage" steady state year). Therefore, the steady state total number of wells in the field in any year is 83 wells times 15 years, or 1,245 wells. Under the high oil production scenario, there would be 217 wells constructed and 222 wells operating for each steady state year of production. Therefore, the steady state total number of wells in the field in any year is 222 wells times 15 years, or 3,330 wells. As an example, Table 3.15-1 and Table 3.15-2 display the estimated annual well development for the low oil production scenario and high oil production scenario, respectively.

Table 3.15-1. Estimated Well Development for the Low Oil Production Scenario

Year	New Wells in Production	Wells in Construction	Total Wells in Production	Oil Produced (barrels/day)[a]
1	0	425	0	>=130,000
2	425	184	425	>=130,000
3	184	148	609	>=130,000
4	148	130	757	>=130,000
15 (steady state)	83	80	1,245[b]	>=130,000

Notes:

[a] The number of wells in production and construction in any given year is based on satisfying the condition that at least 130,000 barrels of oil be produced per day.

[b] Steady state development represents the average year of production. For the steady state year, total wells in production are equal to new wells in production (83) multiplied by the number of years from initial development (15).

Sources: UDOGM Mining 2020; UGS 2019; Vanden Berg pers. comm.

Table 3.15-2. Estimated Well Development for the High Oil Production Scenario

Year	New Wells in Production	Wells in Construction	Total Wells in Production	Oil Produced (barrels/day)[a]
1	0	1,144	0	>=350,000
2	1,144	496	1,144	>=350,000
3	496	398	1,640	>=350,000
4	398	349	2,038	>=350,000
15 (steady state)	222	217	3,330[b]	>=350,000

Notes:

[a] The number of wells in production and construction in any given year is based on satisfying the condition that at least 350,000 barrels of oil be produced per day.

[b] Steady state development represents the average year of production. For the steady state year, total wells in production are equal to new wells in production (222) multiplied by the number of years from initial development (15).

Sources: Utah Division of Oil, Gas, and Mining 2020; UGS 2019; Vanden Berg pers. comm.

OEA's estimate of oil well development exceeds the estimates provided by the Coalition. In response to an Information Request from OEA, the Coalition estimated that, on average, under the low oil production scenario there would be 130 wells operating and 29 under construction and under the high oil production scenario there would be 350 wells operating and 70 under construction. OEA's independent analysis as described in this section determined that the number of producing wells would likely need to be much greater than the Coalition's estimates to produce the low and high oil production scenario volumes.

OEA's estimates of future oil production represent a reasonably foreseeable development scenario based on historical data about the Basin and consultation with UGS. Oil and gas development technology is continually evolving. Changes in technology could affect the number of wells, the typical well mix (i.e., vertical/directional versus horizontal), and the volume of oil produced per well that would be carried on the proposed rail line in the future.

Support Facilities and Truck Trips

Ancillary facilities that support oil field development are expected to include access roads, electric power distribution lines, well pads, surface or subsurface pipelines, and storage tanks. Construction activities would involve vegetation clearing and surface disturbance for the construction of new wells and ancillary facilities. The extent of surface disturbance for construction of new wells and ancillary facilities would depend, in part, on whether the new wells represent infill development within an existing field, including additional well drilling from an existing well pad, or new development within a previously undeveloped area of the field.

OEA assumed that increased production for oil transported on the proposed rail line would originate from oil fields in the Basin, as shown in Figure 3.15-1. OEA estimated that 622 truck trips per day would transport oil from oil fields to the terminals under the low oil production scenario and 1,675 truck trips per day would transport oil from oil fields to the terminals under the high oil production scenario (Appendix M, *Air Quality Emissions and Modeling Data*).

Rail Terminals

If the Coalition were to construct and operate the proposed rail line, OEA anticipates that new rail terminals would be constructed at the terminus points near Myton and Leland Bench to transfer commodities between trucks and rail cars. The Coalition is not seeking Board authority to construct new rail terminals as part of the proposed rail line. The Coalition anticipates that third parties, such as firms that specialize in oil field or freight logistics, would construct and operate the new rail terminals if the proposed rail line is authorized. This has been a common practice for development of truck-to-rail crude oil terminal facilities, for example in North Dakota, as the movement of crude oil in the United States by rail has increased with increasing oil production (Opendatasoft 2019).

Because new rail terminals are not part of the Coalition's proposal or the Board's decision-making in this proceeding, OEA has only general information regarding the potential design of those facilities based on similar projects elsewhere in the country.

Truck-to-rail terminal facilities providing for tank car loading and storage can have several layouts, including the following.

- Multiple relatively short (i.e., 20- to 40-car) tracks
- One or more long (i.e., 10,000-foot) tracks
- One or more loop tracks

If adequate and suitable land is available, loop tracks are often used for handling bulk commodity trains, such as crude oil, coal, or grain because loop tracks minimize the train movements required, which creates efficiencies. OEA reviewed publicly available information about terminals in North Dakota and Colorado and found that terminals with the capacity to load between a few trains per week up to multiple trains simultaneously range in size from a few hundred to more than 500 acres, and that size is not correlated with train-loading capacity. The review of topography and current land development indicate that the Myton and Leland Bench areas could be suitable for loop track facilities plus sidings to accommodate rail-car storage and handling of other commodities. Based on OEA's review of information on existing terminals in other areas of the country, OEA assumed that terminals at Myton and Leland Bench would be 400 acres each and would have two double-tracked loops with 10,000 feet of additional car storage track for both the low oil production scenario and high oil production scenario.

The rail terminal developers would determine the design and features of any terminals, where storage and transfer of crude oil between trucks, tanks, and rail cars would be subject to the Spill Prevention, Control, and Countermeasure regulations per 40 C.F.R. Part 112. Based on existing terminals developed elsewhere, the basic features for such terminals, in addition to the required rail track, would include facilities for offloading crude oil from tanker trucks, heated crude oil storage tanks and associated piping and pumping, multiple rail tank car loading, facilities for handling non-oil commodities, administration and utility buildings, and access roads. A mobile crane would be used for loading/offloading non-oil commodities, and open (lay down) areas would be provided for temporary storage of such commodities. These features are illustrated in Figure 3.15-2.

Figure 3.15-2. Example Crude Oil Rail Loading Terminal

As shown, multiple tanks would be anticipated as part of each terminal facility. Air emissions from tanks and unloading/loading would be controlled by flaring and/or vapor combustion units based on each terminal's permit issued by the Utah Department of Environmental Quality. To account for congestion, weather, or other considerations and potential sources of schedule delay, OEA anticipates that terminals would have approximately 5 days of oil-storage capacity.

For the low oil production scenario, OEA assumed that each terminal would have four heated tanks with an approximate 350,000-barrel total storage capacity. Each terminal would have the capacity to load, on average, one train (approximately 70,000 barrels) per day. OEA assumed that the facility would be able to unload at least six trucks simultaneously, load crude oil into at least 12 rail cars simultaneously, and load a unit train in approximately 12 hours. OEA further assumed, again based on readily available information on North Dakota and Colorado terminals, that each facility would employ approximately 50 personnel, and peak construction employment would be 300 personnel for each facility.

For the high oil production scenario, OEA assumed each terminal would have eight heated tanks with an approximate 900,000-barrel total storage capacity and would have the capacity to load three trains per day. OEA assumed the facility would be able to unload at least 12 trucks simultaneously, load crude oil into at least 24 rail cars and two trains simultaneously, and load a unit train in approximately 12 hours. OEA further assumed that each facility would employ approximately 125 personnel, and that peak construction employment would be 300 personnel.

3.15.4.2 Other Projects and Actions

OEA identified other projects and actions in the cumulative impacts study area with the potential to contribute to cumulative effects (Figure 3.15-1). The other projects and actions considered include infrastructure improvements (i.e., airport expansion, facility improvements, stormwater infrastructure), watershed improvement projects, road improvements projects, Forest Service actions, interstate electric power transmission lines, and cultural resources preservation. These projects are briefly described below; details of specific projects are included in Appendix R, *Other Projects and Actions Considered in the Cumulative Impacts Analysis*.

- **Facility and other infrastructure improvements.** These projects include improvements to the Roosevelt Airport runway and taxiway, new construction or improvements to Peerless Port of Entry facilities, construction of a new library, and stormwater infrastructure improvements.
- **Watershed improvement projects.** Watershed improvement projects address flood protection, sedimentation, water quality, watershed protection, water supply and irrigation infrastructure, agricultural water management, and public recreation development.
- **Road improvement projects**. Road improvement projects include road reconstruction, road widening, rehabilitation of roadway surfaces, drainage improvements, addition of guardrails and shoulder widening, and landscaping.
- **Forest Service actions.** Forest Service actions include forestry management and restoration projects, OHV trail construction, removing a historical guard station, and managing grazing allotments on Forest Service-managed land.
- **BLM actions.** BLM actions include fluid mineral leasing, surface leasing for grazing, issuance and maintenance of right-of-way grants, and management actions to implement the BLM's Resource Management Plans including managing BLM-administered land for recreation, hunting, fishing, wildlife habitat, and special designations.
- **Interstate electric power transmission.** Two planned interstate electric power transmission projects cross the cumulative impacts study area: the Gateway South Transmission Line and the TransWest Express Transmission Line.
- **Cultural resources preservation.** The U.S. Department of the Interior Bureau of Reclamation (Bureau of Reclamation) entered into a Programmatic Agreement with the Utah State Historic Preservation Officer that will govern the mitigation for adverse effects on irrigation infrastructure for projects for which the Bureau of Reclamation is consulting under Section 106 of the National Historic Preservation Act. The Programmatic Agreement applies to projects where the Bureau of Reclamation is the lead federal agency (regardless of land status) and applies to projects that have a determination of adverse effect on historic properties, which include irrigation infrastructure. The duration of the Programmatic Agreement is 10 years from the date it was fully executed (February 6, 2020).

3.15.5 Cumulative Impacts by Resource

3.15.5.1 Vehicle Safety and Delay

Cumulative Impacts Study Area

The vehicle safety and delay cumulative impacts study area includes the public roadways in the Basin that could have increased vehicle traffic as a result of construction and operation of the proposed rail line. The cumulative impacts study area for vehicle safety and delay is the same as the project study area for the analysis of direct and indirect effects.

Cumulative Impacts

Oil and Gas Development

Construction and operation of any of the Action Alternatives would, along with oil and gas development activities in the Basin, contribute to increased vehicle trips in the cumulative impacts study area that could increase the potential for vehicle safety and delay impacts. OEA anticipates that construction of the proposed rail line would occur during the same time period as terminal construction and that both activities would contribute additional vehicle trips on study area roads. To be conservative, OEA based the cumulative impacts analysis for the construction period on the Whitmore Park Alternative because the Whitmore Park Alternative would have the greatest number of vehicle trips, and therefore the most vehicle safety and delay impacts, in any single year (Section 3.1, *Vehicle Safety and Delay*, Table 3.1-7). Table 3.15-2 displays the estimated annual vehicle traffic, average annual daily vehicle trips, and one-way design hour volume (i.e., a measure of traffic at the daily one-hour peak volume) that would be associated with construction of the terminals and the proposed rail line, which is the year that OEA expects that construction-related traffic would be the highest.

Table 3.15-3. Estimated Traffic for Terminal Construction and Proposed Rail Line Construction

Activity	Annual Trips	Average Annual Daily Traffic	Design Hour Volume
Terminal construction	438,000	1,200	90
Rail line construction "(Whitmore Park Alternative)	1,519,498	4,163	312
Total	1,957,498	5,363	402

Vehicle trips during construction of the proposed rail line, combined with terminal construction, would generate an estimated 402 vehicle trips per hour during peak hour traffic flow. These trips would be distributed over multiple roadways within the Basin. As described in Section 3.1, *Vehicle Safety and Delay*, the major roadways in the study area all have substantial additional capacity. For purposes of comparison, OEA assumed vehicle traffic would be distributed evenly among the major roadways in the study area. Table 3.15-3 displays the used roadway capacity for the five major roadways in the study area under baseline conditions during the construction period, which is assumed to be the first year of construction in 2022, and the increase in capacity used during construction of the proposed rail line and terminals. Used roadway capacity would increase by a maximum of 5 percent on the major roadways, leaving substantial remaining capacity.

Table 3.15-4. Percentage of Used Roadway Capacity during Terminal Construction and Proposed Rail Line Construction

Route	Baseline (%)	Increase (%)	Total (%)
US 6	49	5	55
US 191	13	5	18
US 40	35	5	40
9 Mile Canyon Road	16	5	21
8000S/8250S	2	5	7

Notes:
Percentages may not sum to total due to rounding.
US 6 = U.S. Highway 6; US 191 = U.S. Highway 191; US 40 = U.S. Highway 40

In addition to the major roadways, vehicles used for terminal construction would also use a network of local roads, anticipated to include Leland Bench Road, 7500 E, AR-88, and Sandwash Road/6000 W/5888 W. Traffic on these roads would increase during construction of the terminals and could result in delays and localized road damage from construction vehicles and heavy equipment. Traffic data are not available for these and other local roads, but in general traffic would be lower than the major roads as they are rural and primarily carry local traffic. The anticipated increase in vehicle use on these local roads could result in vehicle delays, although the impacts would be temporary during the construction period. Damage to local roads as a result of construction equipment could be addressed through road use or easement agreements between the rail terminal developers and local government agencies and landowners. Because of the ample roadway capacity in the study area and temporary nature of the impact, traffic from construction of the proposed rail line, when combined with traffic from terminal construction would not result in significant cumulative impacts on vehicle delay.

Once the proposed rail line and the terminals are constructed, oil and gas construction and operations and terminal operations would increase until the steady state production volumes described above are achieved. These activities would generate vehicle trips as production wells are explored and placed into production and as the rail terminals and proposed rail line operate. OEA has based the cumulative impacts analysis for the steady state operational period on the Wells Draw Alternative because the Wells Draw Alternative would have the greatest number of vehicle trips during rail operations (Section 3.1, *Vehicle Safety and Delay*, Table 3.1-10). Table 3.15-4 displays the estimated annual vehicle traffic, annual average daily vehicle trips, and design hour volumes that would be associated with steady state oil well construction and operation, terminal operations, and operations of the proposed rail line.

Table 3.15-5. Estimated Annual Traffic for Steady State Oil and Gas Development and Operation of Proposed Rail Line

	Annual Trips	Average Annual Daily Traffic	Design Hour Volume
Low Oil Production Scenario			
Well construction	29,033	80	6
Well operations	301,130	825	62
Terminal operations	527,060	1,444	108
Oil and gas development subtotal	*857,223*	*2,349*	*176*
Rail line operations (Wells Draw Alternative)	12,522	34	3
Total	**869,745**	**2,383**	**179**
High Oil Production Scenario			
Well construction	78,752	216	16
Well operations	809,984	2,219	166
Terminal operations	1,405,250	3,850	289
Oil and gas development subtotal	*2,293,986*	*6,285*	*471*
Rail line operations (Wells Draw Alternative)	52,672	144	11
Total	2,346,658	6,429	482

Under the high oil production scenario, 471 trips during one-hour peak traffic volume would be produced from oil and gas development activity. Operation of the proposed rail line would also generate additional vehicle trips, primarily associated with employee commuting, but the number of vehicle trips would be relatively low at about 11 vehicle trips per hour. Similar to what would occur during rail construction, these vehicular trips would be distributed over multiple roadways within the Basin. Table 3.15-5 displays the used roadway capacity for the five major roadways in the study area under baseline conditions (i.e., assumed to be the first year of railway operations in 2026) and the increase in used capacity used during steady state oil and gas development and operation of the proposed rail line. As the distribution of traffic on area roadways is unknown, OEA assumed that these five major roadways would carry an approximately even volume of traffic. Traffic would also be disbursed along other local public and private roadways throughout the cumulative impacts study area. Near the rail terminals, these roads include Leland Bench Road, 7500 E, AR-88, and Sandwash Road/6000 W/5888 W. Based on consultation with the Ute Indian Tribe, these and other local roads near the rail terminals are used to access communities with tribal populations, such as Randlett and Fort Duchesne. OEA understands that tribal members are concerned about the potential for traffic and road damage on these roads associated with the increased vehicle trips from terminal construction and operations. Increases in traffic to support terminal operations on these roads could be substantial, and without road improvements such as additional turning lanes, would result in vehicle delays.

Table 3.15-6. Used Roadway Capacity during Steady-State Oil and Gas Development and Operation of Proposed Rail Line

	Low Oil Production Scenario (%)			High Oil Production Scenario (%)		
Route	**Baseline**	**Increase**	**Total**	**Baseline**	**Increase**	**Total**
US 6	60	2	62	60	6	66
US 191	14	2	17	14	6	21
US 40	37	2	39	37	6	43
9 Mile Canyon Road	19	2	21	19	6	25
8000S/8250S	2	2	5	2	6	9

Notes:
Percentages may not sum to total due to rounding.
US 6 = U.S. Highway 6; US 191 = U.S. Highway 191; US 40 = U.S. Highway 40

Under the high oil production scenario, used roadway capacity would increase by a maximum of 6 percent on the major roadways, leaving substantial remaining capacity. The increased vehicle traffic from oil and gas development would, therefore, have limited impacts on vehicle delay on major roadways. OEA concludes that because of ample roadway capacity and the dispersion of the increased traffic from oil and gas development, impacts on major roadways from the proposed rail line, when combined with traffic from oil and gas development would result in negligible cumulative impacts on vehicle delay. Local roads, however, have smaller roadway capacity, and OEA concludes that the increase in traffic on local roads used to serve the terminals could result in significant cumulative impacts on vehicle delay in the absence of road improvements or other mitigation.

For the analysis of vehicle safety, OEA evaluated the increase in annual VMT because a higher VMT would correspond to a higher potential for vehicle accidents. Table 3.15-6 displays the annual VMT that would be associated with construction of the terminals and the proposed rail line. For comparison, the table also shows the county-wide VMT for Duchesne and Uintah Counties, the two counties in which the major portion of the proposed rail line would be constructed, and the two counties in which the terminals would be constructed. Total VMT per year would be approximately 15 percent of the VMT per year in Duchesne and Uintah Counties. The increase in VMT from construction of the terminals and proposed rail line would be primarily from commercial vehicles operated by professional, licensed and trained operators, who would be required to adhere to federal and state safety standards. Again, OEA based the cumulative impacts analysis for the construction period on the Whitmore Park Alternative because the Whitmore Park Alternative would have the greatest number of vehicle trips in a single year (Section 3.1, *Vehicle Safety and Delay*, Table 3.1-7). Vehicle miles traveled from any of the Action Alternatives, when combined with VMT from terminal construction would not result in significant cumulative impacts on vehicle safety because of the commercial vehicle operator safety standards that would apply and the available roadway capacity on major roadways in the Basin.

Table 3.15-7. Annual Vehicle Miles Traveled for Terminal Construction and Proposed Rail Line Construction in 2022

Activity	VMT/year	County-wide VMT[a]	Percent of County-wide VMT
Terminal construction	24,191,536	822,422,977	2.9
Rail line construction (Whitmore Park Alternative)	100,670,533		12.2
Total	**124,862,069**	**822,422,977**	**15.2**

Notes:
[a] Duchesne and Uintah Counties.
VMT = vehicle miles traveled

Table 3.15-7 shows the annual VMT associated with steady state oil well construction and operation, terminal operations, and operations of the proposed rail line. Under the high oil production scenario, total VMT per year would be approximately 6 percent of the VMT per year in Duchesne and Uintah Counties. OEA again based the cumulative impacts analysis for the steady state operational period on the Wells Draw Alternative because the Wells Draw Alternative would have the greatest number of vehicle trips during operations (Section 3.1, *Vehicle Safety and Delay*, Table 3.1-10).

Table 3.15-8. Annual Vehicle Miles Traveled for Steady-State Oil and Gas Development and Operation of Proposed Rail Line

	VMT/year	County-wide VMT[a]	Percent of County-wide VMT
Low Oil Production Scenario			
Well Construction	362,912	822,422,977	<0.1
Well Operation	3,764,125		0.5
Terminals Operation	12,225,497		1.5
Oil and Gas Development Subtotal	16,352,534		2.0
Rail line operations (Wells Draw Alternative)	-15,409		0.0
Total	**16,337,125**	**822,422,977**	**2.0**
High Oil Production Scenario			
Well Construction	984,398	822,422,977	0.1
Well Operation	10,124,801		1.2
Terminals Operation	32,595,682		4.0
Oil and Gas Development Subtotal	43,704,881		5.3
Rail line operations (Wells Draw Alternative)	2,346,551		0.3
Total	**46,051,432**	**822,422,977**	**5.6**

Notes:
[a] Duchesne and Uintah Counties.
VMT = vehicle miles traveled

Vehicle safety in the study area is generally good; crash rates in Uintah and Duchesne Counties, where most oil and gas activity is occurring, is below the national average. Because of the commercial vehicle operator safety standards, the available roadway capacity in the Basin, and low existing crash rates, VMT from any of the Action Alternatives, when combined with VMT from oil and gas development would not result in significant cumulative impacts on vehicle safety.

Other Projects and Actions

The proposed rail line would affect vehicle safety and delay, and would result in cumulative impacts on vehicle safety and delay when combined with impacts from other projects. Construction of reasonably foreseeable projects within the cumulative impacts study area, including the Duchesne County Myton Main Street Project, US 40 Improvement Project, removal of the Indian Canyon Guard Station, and additional road improvement projects (Figure 3.15-1, Items 4 to 15) could occur during the same time frame as construction of the proposed rail line, resulting in an increase in vehicle traffic. Construction on these roadways may also alter traffic patterns temporarily as drivers avoid construction. Because the study area is largely rural with limited detour routes, temporary impacts on vehicle delay could occur for the duration of the rail construction phase. Relative to existing road capacity in the cumulative impacts study area, increased traffic due to the other projects and the proposed rail line would be low. Implementation of the mitigation measures listed in Chapter 4, *Mitigation*, such as installation of detour signage during construction, would also reduce the impacts on safety and delay resulting from the proposed rail line. Therefore, OEA concludes that the contribution of impacts from the proposed rail line to cumulative impacts would not be significant.

3.15.5.2 Rail Operations Safety

Cumulative Impacts Study Area

OEA defined the rail operations safety cumulative impacts study area as the track for each of the Action Alternatives. The cumulative impacts study area for rail operations safety is the same as the project study area for the analysis of direct and indirect effects.

Cumulative Impacts

Oil and Gas Development

As noted previously, the two oil production scenarios would have different levels of associated equipment at the new rail terminals at Myton and Leland Bench. Table 3.15-8 summarizes the equipment OEA assumed for the purposes of the cumulative impacts analysis for rail operations safety.

Table 3.15-9. Assumed Terminal Facility Equipment

Equipment	Low Oil Production Scenario	High Oil Production Scenario
Heated storage tanks	4	8
Unloading racks	6+	12+
Loading racks	12+	24+
Train tracks for active loading	1	2

These terminal operations each have the potential to have accidents involving injuries to workers; damage to rail cars, trucks, and equipment onsite; or possibly oil spills resulting from equipment failures, human errors, or external events such as vandalism or extreme weather. The terminal operator's use of proper procedures, protective equipment, and training would limit the likelihood of injury or damage. Potential releases would most likely be small leaks from hoses, pipes, valves, or fittings. Larger releases would be much less likely and might be from major pipe breaks, storage tank leaks, or damage to rail cars. Since terminal operations would all take place in a fixed location and the terminals would be constructed in compliance with applicable local, state, and national standards and guidelines (such as 40 C.F.R. Part 112[2]), OEA expects that the terminal facilities would implement and acquire appropriate worker protection, train and truck movement controls, overfill control systems, excess flow valves, emergency response systems and procedures, spill-containment features, and fire protection equipment. This would minimize both the potential for accidents of any kind and the potential consequences of accidents. These anticipated terminal operations are the only identified projects that could contribute to cumulative impacts related to rail operations safety.

Other Projects and Actions

Aside from the potential rail terminals, other planned or proposed projects and actions would not have direct impacts on rail operations safety (or vice versa) since they do not have any rail operations proposed. Therefore, no additional cumulative impacts analysis is warranted.

3.15.5.3 Water Resources

Cumulative Impacts Study Area

OEA defined the water resources cumulative impacts study area for surface waters, floodplains, and wetlands as the hydraulic unit code (HUC) 10 watersheds that would be crossed by the proposed rail line (Figure 3.3-1). OEA did not assess cumulative groundwater impacts specifically because, as described in Section 3.3, *Water Resources*, OEA expects that the proposed rail line would not have adverse impacts on groundwater use (i.e., supply/drawdown), groundwater recharge, or groundwater quality. Therefore, the proposed rail line would not contribute to cumulative impacts on groundwater when combined with impacts from oil and gas development. In addition, OEA assumed that cumulative impacts related to water rights of groundwater wells and springs would be unlikely to occur as the cumulative projects take place at specific locations such that the projects would likely be able to avoid any existing groundwater wells or springs as part of the project planning and development process. The cumulative impacts study area for water resources is not the same as for the analysis of direct and indirect effects.

Cumulative Impacts

Oil and Gas Development

Oil and gas development could affect water resources. Past and ongoing oil and gas well construction and operation projects have resulted in ground clearing, soil erosion, placement of fill material, installation of culverts in access roads, use of equipment, and maintenance (e.g., vegetation management) that have affected water resources throughout the study area. Similar activities from foreseeable future oil and gas development would similarly affect water resources; the impacts that

[2] 40 C.F.R. Part 112 addresses oil pollution prevention including spill prevention, control, and countermeasures.

would affect water resources from oil and gas development are similar to those that would occur from the proposed rail line (Section 3.3.3.1, *Impacts Common to All Action Alternatives*).

The extent of the cumulative impacts would depend on the location of an oil or gas well relative to the Action Alternatives, with a greater potential for a cumulative impact if oil and gas development is near an Action Alternative (i.e., same subwatershed). The distance of each Action Alternative to oil and gas development areas is about the same; therefore, the potential for cumulative impacts would be generally the same: 36.2 miles of both the Indian Canyon Alternative and Whitmore Park Alternative are within oil and gas development areas, and 36.6 miles of the Wells Draw Alternative are within oil and gas development areas. Because future oil and gas projects would be subject to applicable federal, state, and local permitting, cumulative impacts on water resources would be avoided or minimized through compliance with state and federal laws and regulations that protect water resources, including, but not limited to, Clean Water Act (CWA) Sections 401, 402, 404, and National Flood Insurance Program and local floodplain management regulations.

Oil and gas well operations also produce a waste stream, including produced water, which is the largest waste stream component generated during oil and gas production. Produced water is natural groundwater that is extracted along with oil and gas; it is commonly saline and mixed with oil residues, so it must be either disposed of or treated and reused. Produced water disposal could result in cumulative surface water quality impacts depending on the disposal method. Current produced water disposal in the Basin consists of injection into deep wells, storage and evaporation in lined disposal ponds, and supplying water for flooding in enhanced oil recovering programs (UGS 2017). Of the current disposal methods, about 60 percent of the produced water is injected back into the ground via deep wells at sufficient depths, so as not to contaminate shallow aquifers, and where it can no longer be accessed or used; this is the most common method of produced water disposal in the United States (UGS 2018; USEPA 2020). USEPA regulates these injection wells through the Safe Drinking Water Act, which established the requirements and provisions for the Underground Injection Control Program.

Potential uses for future produced water from producing formations in the Basin include waterflooding for secondary recovery, drilling mud formulation, hydraulic fracturing fluid for well completion, and use for possible oil shale production (UGS 2017). None of the current disposal methods or potential future produced water use involve discharging produced water to surface waters. While discharge of produced water is an option for oil and gas producers west of the 98th meridian, which includes Utah, it is a disposal option rarely used due to the cost associated with treating produced waters to a level suitable to discharge to surface waters, as well as the availability of other wastewater management options that are lower cost (USEPA 2020). If in the future treatment of produced waters becomes more cost-effective, discharges to surface waters could occur in the Basin. USEPA regulates produced water discharge under 40 C.F.R. Part 435 and the CWA Section 402 NPDES permit program to ensure there are no exceedances of water quality standards. Therefore, should produced water be discharged to surface waters in the future, OEA believes it would be unlikely to have adverse effects on water quality.

As discussed in Section 3.3, *Water Resources*, OEA concludes that the proposed rail line would result in significant impacts on surface waters and wetlands, including, in particular, the loss of wetland habitat and permanent changes to surface water hydrology from crossing structures and stream realignments. Future oil and gas projects could worsen these impacts if the projects were to take place near the Action Alternatives and affect the same surface waters or wetlands as the proposed rail line. If the mitigation set forth in this Draft EIS were implemented, the Coalition would need to

take steps to avoid, minimize, or mitigate impacts on water resources in compliance with state and federal regulations that protect water resources, including CWA Sections 401, 402, and 404. Future oil and gas projects would also need to comply with these and other regulations, which would lessen cumulative impacts on water resources.

The Action Alternatives would connect with new rail terminals at Myton and Leland Bench. The terminal area at Myton contains several ponds and emergent wetlands, as well as the Upper Pleasant Valley Canal and associated intermittent streams and canals. The terminal area at Leland Bench contains one intermittent stream and no wetlands. No floodplains, flood-prone soils, groundwater wells, or springs exist in either terminal area; therefore, there would be no cumulative impacts on these resources. Construction and operation of the terminals would disturb ground, remove vegetation, and add new impervious surfaces, which can all affect surface waters and wetlands within or adjacent to construction activities, including water quality and hydrology. Section 3.3, *Water Resources,* describes in detail how construction activities related to the proposed rail line would affect surface waters and wetlands. Impacts from terminal construction on surface water and wetlands would be similar to those from construction of the proposed rail line but would be smaller in extent because the terminals would have smaller footprints than the proposed rail line. The extent of potential impacts would depend on the exact location and layout of the terminals and if surface waters and wetlands could be avoided. OEA expects that impacts on surface waters and wetlands would be avoided, minimized, or mitigated through compliance with state and federal laws and regulations that protect these resources, including, but not limited to, CWA Sections 401, 402, and 404. If impacts from the terminals on surface waters and wetlands cannot be avoided, construction of the proposed rail line and the new terminals would result in cumulative impacts on water resources in the area of the new terminals.

Other Projects and Actions

In addition to potential future oil and gas development, other past, present, and reasonably foreseeable future projects and actions could affect water resources. OEA identified 22 cumulative projects and actions in the study area, most of which are currently under construction or implementation or will be constructed or implemented in the foreseeable future (Figure 3.15-1 and Appendix R, *Other Projects and Actions Considered in the Cumulative Impacts Analysis*). Many of the cumulative projects and activities would disturb ground, remove vegetation, use construction equipment, and/or add new impervious surfaces, which can all affect water resources within or adjacent to project activities, including water quality and hydrology. The impact mechanisms that would affect water resources from these cumulative projects and activities would be similar to those that would occur from the proposed rail line (Section 3.3.3.1, *Impacts Common to All Action Alternatives*).

The extent of potential cumulative impacts would depend on the location of the cumulative project relative to the proposed rail line, with a greater potential for a cumulative impact if the activity is near the proposed rail line (i.e., same subwatershed). For example, two of the 22 cumulative projects overlap with the water resources study areas for the Action Alternatives (Section 3.3.1.1, *Study Areas*), including the Ashley National Forest grazing allotments and the Gateway South Transmission Line. Therefore, these two projects would have the greatest likelihood of resulting in cumulative impacts on water resources due to this geographic overlap.

The significant impacts on water resources from construction and operation of the proposed rail line would include, the loss of wetland habitat and permanent changes to surface water hydrology

from crossing structures and stream realignments. Future projects in the cumulative impacts study area, such as the Ashley National Forest grazing allotments and the Gateway South Transmission Line, could worsen these significant impacts if those projects were to affect the same surface waters or wetlands as the proposed rail line. If the mitigation set forth in this Draft EIS were implemented, the Coalition would need to take steps to avoid, minimize, or mitigate impacts on water resources in compliance with state and federal regulations that project water resources, including CWA Sections 401, 402, and 404. Future projects in the cumulative impacts study area would also need to comply with these and other regulations, which would lessen cumulative impacts on water resources.

3.15.5.4 Biological Resources

Cumulative Impacts Study Area

The biological resources cumulative impacts study area is the same as the study areas defined for biological resources in Section 3.4.1.1, *Study Areas*.

Cumulative Impacts

Oil and Gas Development

Wildlife

Potential future oil and gas development would affect wildlife species and their habitats. The types and severity of impacts from oil and gas development on wildlife would be similar to many of those that would occur from construction and operation of the proposed rail line (Section 3.4.3.1, *Impacts Common to All Action Alternatives*). Species displacement due to noise would occur during construction and drilling activities and from continuous mechanical well operations. Mortality rates may increase in conjunction with oil and gas development, especially for smaller species that have more difficulty escaping the vegetation-clearing activities. Impacts on habitat would result from vegetation removal for road construction, pad installation, and ditch digging. Specific disturbance areas would vary depending on type of development, type of well used, and the necessary infrastructure for development and production. The lifespan of a project would also vary and would depend on many factors (e.g., economic conditions, pumping life of well). OEA assumes that all oil and gas projects would be subject to proper reclamation procedures in compliance with Utah law when the wells are abandoned (per Utah Rule 649-3, Drilling and Operating Practices). Oil and gas wells on BLM-administered lands would be abandoned and reclaimed in compliance with BLM requirements.

Any of the Action Alternatives would be constructed and would operate in landscapes affected by oil and gas development and would contribute to cumulative impacts on wildlife by causing habitat loss, degradation, and alteration, as well as potentially causing injury or mortality of wildlife and changes to species distribution and composition. The extent of potential cumulative impacts would depend on the location of the oil and gas development relative to the proposed rail line, with a greater potential for a cumulative impact if the activity is closer to the proposed rail line. The proposed rail line impact area and oil and gas development impact area must overlap for there to be a cumulative impact. However, there is limited area in which this could occur because oil and gas development would need to occur within several hundred feet of the rail line, which is unlikely. There could be some small areas of wildlife habitat removal from oil and gas development in the

proposed rail line cumulative impacts study area related to oil and gas access roads or other ancillary features. However, any impact on habitat would likely be small compared to habitat surrounding the area of impact. In addition, reclamation is required for all oil and gas development once pumping stops, including on all federal lands, where most of the oil and gas development will likely occur. Noise and the presence of the rail line could affect wildlife movement and behavior, but again, this would need to occur where there is overlap with the impacts generated by both the proposed rail line and oil and gas development, and the distance at which noise generated by the proposed rail line would no longer rise to the level of a significant disturbance to wildlife is approximately 460 feet from the rail line (Section 3.4.1.3, *Analysis Methods*). Further, the direct and indirect impacts of the proposed rail line would be reduced by the implementation of the mitigation measures listed in Chapter 4, *Mitigation*. For these reasons, OEA anticipates that cumulative impacts on wildlife from the proposed rail line and oil and gas development would not be significant.

The Action Alternatives would connect with terminals at Myton and Leland Bench. The Myton terminal would be within mule deer habitat and both terminals would be within pronghorn antelope habitat. Both terminals would be outside of bighorn sheep, elk, and moose habitat, and the Leland Bench terminal would be outside of mule deer habitat; therefore, there would be no cumulative impacts on those species. Construction and operation of the terminals would cause habitat loss, increase potential for wildlife injury and mortality, and result in wildlife avoidance from increased human activity in and around the terminals. The proposed rail line would contribute to these impacts, the extent of which would depend on the exact location and layout of the terminals. However, similar to the discussion for oil and gas development, the proposed rail line's contributing impacts on wildlife are not anticipated to be extensive due to the limited overlap of the of the proposed rail line cumulative impacts study area; any impact that would occur in terms of both ground disturbance to habitat and noise that would be generated by trains would be limited to within several hundred feet of the proposed rail line, which would not extend far into the terminal footprints. Therefore, OEA anticipates that the impacts from the proposed rail line, when combined with construction and operation of the terminals, would not result in significant cumulative impacts on wildlife.

Fish

As discussed in detail in Section 3.4, *Biological Resources*, construction of the proposed rail line could affect fish by affecting water quality in nearby streams or altering fish habitat. Oil and gas development could also affect fish if construction or operations activities were to degrade water quality of nearby streams or alter fish habitat. The types and severity of impacts from oil and gas development on fish would be similar to many of those that would occur from the proposed rail line (Section 3.4.3.1, *Impacts Common to All Action Alternatives*). OEA assumes that oil and gas developers would minimize surface water impacts by implementing avoidance and minimization measures, such as sediment barriers, in compliance with appropriate federal, state, and local requirements.

Any Action Alternative would add to fish impacts from oil and gas development, including water quality degradation and habitat alteration. The extent of potential cumulative impacts would depend on the location of the oil and gas development relative to the proposed rail line, with a greater potential for a cumulative impact if the activity is closer to the proposed rail line. Fish habitat (i.e., surface waters) is protected through federal and state surface water and water quality regulations and permitting requirements. Because future oil and gas projects and the proposed rail line would be subject to the same applicable federal and state permitting requirements, cumulative impacts on

water resources that support fish would be avoided or minimized through compliance with state and federal laws and regulations that protect water resources, including CWA Sections 401, 402, and 404. Any cumulative impacts that could occur would be localized and minimized through implementation of mitigation measures (e.g., sediment barriers) required by applicable permits. Therefore, OEA anticipates that the impacts from the proposed rail line, when combined with impacts from oil and gas development, would not result in significant cumulative impacts on fish.

The terminal areas at Myton and Leland Bench contain no perennial streams that support fish populations. Several ponds, the Upper Pleasant Valley Canal, and associated intermittent streams and canals are located within the terminal areas that could provide habitat for fish. Construction of the rail terminals would add impervious cover and increase surface water runoff that could affect fish habitat. The proposed rail line would contribute to these impacts, the extent of which would depend on the exact location and layout of the terminals and if surface waters containing fish habitat could be avoided. However, as described for oil and gas development, fish habitat (i.e., surface waters) is protected through federal and state surface water and water quality regulations and permitting requirements, which would apply to both the proposed rail line and terminals. As such, cumulative impacts on water resources that support fish would be avoided or minimized through compliance with state and federal laws and regulations that protect water resources, including CWA Sections 401, 402, and 404. Therefore, OEA anticipates that the impacts from the proposed rail line, when combined with construction and operation of the terminals, would not result in significant cumulative impacts on fish.

Vegetation

Oil and gas development would affect vegetation during construction of roads, pads, and other related infrastructure. The types and severity of impacts from oil and gas development on vegetation would be similar to many of those that would occur from the proposed rail line (Section 3.4.3.1, *Impacts Common to All Action Alternatives*). Specific disturbance areas would vary depending on type of development, type of well used, and the necessary infrastructure for development and production. OEA assumes that all oil and gas projects would be subject to proper reclamation procedures in compliance with Utah law when the wells are abandoned (per Utah Rule 649-3, Drilling and Operating Practices). Oil and gas wells on BLM lands would be abandoned and reclaimed in compliance with BLM requirements.

Any Action Alternative would add to vegetation impacts from oil and gas development, such as permanent vegetation loss, constraints to plant germination and growth, the spread of noxious weeds, effects on plant growth, increased risk of wildfires, altered riparian vegetation, and altered vegetation communities. The extent of potential cumulative impacts would depend on the location of the oil and gas development relative to the proposed rail line, with a greater potential for a cumulative impact if the activity is closer to the proposed rail line. The proposed rail line impact area and oil and gas development impact area must overlap for there to be a cumulative impact. However, there is limited area in which this could occur because oil and gas development would need to occur within several hundred feet of the rail line, which is unlikely. There could be some small areas of vegetation removal from oil and gas development in the proposed rail line cumulative impacts study area related to oil and gas access roads or other ancillary features. However, any impact on vegetation would likely be small compared to the area of vegetation surrounding the impact area. In addition, reclamation is required for all oil and gas development once pumping stops, including on all federal lands, where most of the oil and gas development will likely occur. Further, the direct and indirect impacts of the proposed rail line would be reduced by the

implementation of the mitigation measures listed in Chapter 4, *Mitigation*. For these reasons, OEA anticipates that cumulative impacts on vegetation from the proposed rail line and oil and gas development would be not be significant.

The Action Alternatives would connect with terminals at Myton and Leland Bench. Land cover at both terminals is primarily Inter-Mountain Basins Mat Saltbush Shrubland. Construction of the terminals would disturb ground, remove vegetation, and add new impervious surfaces, which can all affect vegetation within or adjacent to construction activities. The proposed rail line would contribute to these impacts, the extent of which would depend on the exact location and layout of the terminals. However, OEA expects that the proposed rail line's contributing impacts on vegetation would not be significant due to the limited overlap of the proposed rail line cumulative impacts study area; any ground disturbance and vegetation impact would be limited to within several hundred feet of the proposed rail line, which would not extend far into the terminal footprints.

Special Status Species

As discussed in Section 3.4, *Biological Resources,* OEA concludes that impacts from construction and operation of the proposed rail line on biological resources would be significant in part because of the number of special-status species that could be affected, including species listed as threatened or endangered under the ESA. The proposed rail line would affect special-status species by displacing, degrading, or altering habitat, introducing a new source of noise that could disturb wildlife, and potentially causing injury or mortality of the species status species and changes to species distribution and composition. New oil and gas development projects could worsen impacts on special-status species if the projects were to take place in the same area as the proposed rail line and affect the same special-status species habitat as the proposed rail line.

Oil and gas development could affect special-status species in the same way that it could affect common plant and animal species. The types and severity of impacts from oil and gas development on special-status species would be similar to many of those that would occur from the proposed rail line (Section 3.4.3.1, *Impacts Common to All Action Alternatives*). The extent of potential cumulative impacts would depend on the location of the oil and gas development relative to the proposed rail line, with a greater potential for a cumulative impact if the activity is closer to the proposed rail line. However, similar to the discussions for wildlife and vegetation, the proposed rail line's contributing impacts on wildlife and vegetation are not anticipated to be extensive; any impact that would occur in terms of both ground disturbance to habitat and wayside noise from trains would be limited to within several hundred feet of the proposed rail line.

Implementation of the mitigation measures described in this Draft EIS would avoid, minimize, or mitigate impacts on special-status species from construction and operation of the proposed rail line. OEA is consulting with USFWS under ESA Section 7 to develop measures to avoid, minimize, and mitigate impacts on ESA-listed species, including Pariette cactus (*Sclerocactus brevispinus*), Uinta Basin hookless cactus (*Sclerocactus wetlandicus*), Barneby ridge-cress (*Lepidium barnebyanum*), Ute ladies'-tresses (*Spiranthes diluvialis*), Colorado pikeminnow (*Ptychocheilus Lucius*), humpback chub (*Gila cypha*), bonytail (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*) (Appendix I, *Draft Biological Assessment*). New oil and gas development projects would follow either the ESA Section 7 process (for projects with a federal nexus) or ESA Section 10 process (for projects with no federal nexus), which would develop measures to avoid, minimize, or mitigate impacts on ESA-listed species. Under ESA Section 7, federal action agencies must ensure that their proposed action does not jeopardize the continued existence of ESA-listed species or adversely modify designated critical

habitat. As part of the ESA Section 10 process, USFWS must also ensure that their action of issuing an Incidental Take Permit to a non-federal entity does not jeopardize the continued existence of ESA-listed species or adversely modify designated critical habitat. These requirements would lessen the cumulative impacts of oil and gas development projects and the proposed rail line on ESA-listed species.

Any of the Action Alternatives would cross habitat for greater sage-grouse (*Centrocercus urophasianus*), a special-status species that is managed by BLM and the State of Utah, in the Emma Park area near the southern ends of the Action Alternatives. As shown in Figure 3.15-1, this area is far from mapped oil fields in the Basin. Therefore, OEA concludes that oil and gas development would not result in cumulative impacts on greater sage-grouse. If the Board were to approve an Action Alternative that crosses BLM land, the Coalition would need to ensure that construction and operation of the proposed rail line would be in compliance with applicable BLM RMPs, which could include working with BLM to minimize impacts on BLM special-status species. New oil and gas development projects, if on BLM land, would also need to comply with applicable BLM RMPs and other BLM requirements that would minimize impacts on BLM special-status species, including greater sage-grouse. If the Board were to approve an Action Alternative that crosses Forest Service land, the Coalition would need to abide by any Forest Service requirements for minimizing impacts on Forest Service special-status species. Because the Forest Service Biological Evaluation (Appendix H, *Biological Evaluation*) concludes that the proposed rail line would have little or no impact on Forest Service Sensitive Species, OEA expects that cumulative impacts on Forest Service special-status species would not be significant.

The primary special-status species of concern near Myton and Leland Bench, where new rail terminals could be constructed, would be the Ute Ladies'-tresses, a federally listed threatened plant. With the exception of Ute Ladies'-tresses, there would be no cumulative impacts on ESA-listed species because the rail terminals would be outside of suitable habitat for those species (Appendix I, *Draft Biological Assessment*). The area where the Myton terminal could be constructed contains some emergent wetland, which could support Ute Ladies'-tresses. Construction of the terminals would disturb ground, remove vegetation, and add new impervious surfaces, which could all affect Ute Ladies'-tresses within or adjacent to construction activities, if that species is present in the footprint of the terminal. OEA is consulting with USFWS under ESA Section 7 to develop measures to avoid, minimize, or mitigate impacts on Ute ladies'-tresses. Developers of the new terminals would also implement measures developed under ESA Section 7 or ESA Section 10 that would minimize impacts on Ute ladies'-tresses from construction and operation of the new terminals. Both terminals would be outside of greater sage-grouse habitat; therefore, there would be no cumulative impacts on that species.

Other Projects and Actions

In addition to oil and gas development, other projects and actions could contribute to cumulative impacts on biological resources, including wildlife, fish, vegetation, and special-status species. Of the projects that OEA identified, the Forest Service's management of grazing allotments and the Gateway South Transmission Line would intersect the biological resources study area for the proposed rail line. The Indian Canyon Alternative and Whitmore Alternative would intersect approximately 6 miles of the grazing allotments along US 191 in Ashley National Forest (Figure 3.15-1). The Indian Canyon Alternative and Whitmore Alternative would each intersect the proposed Gateway South Transmission Line at one location, while the Wells Draw Alternative would intersect the proposed transmission line at two locations (Figure 3.15-1).

Cattle grazing can adversely affect biological resources by controlling the vegetation species composition and structure and removing and/or trampling vegetation that would otherwise be used for wildlife food or cover. Defoliation from grazing can also benefit vegetation by promoting shoot growth; enhancing light levels, soil moisture, and nutrient availability; and aiding in seed dispersal and germination (USFWS 2009).

Electric transmission lines affect biological resources mainly by clearing vegetation (i.e., habitat loss), permanently changing forested habitat to shrubs and/or grasses (via vegetation maintenance in the right-of-way), and temporarily displacing wildlife during construction and operations.

Any of the Action Alternatives would add to the biological resource impacts from cattle grazing and construction and operation of the Gateway South Transmission Line. The impacts from cattle grazing and electrical transmission lines on biological resources would be similar to many of those that would occur from the proposed rail line, specifically vegetation removal and trampling impacts (Section 3.4.3.1, *Impacts Common to All Action Alternatives*). However, similar to the discussions for oil and gas development and rail terminals, the proposed rail line's contributing impacts on biological resources are not anticipated to be extensive; any impact that would occur in terms of both in ground disturbance to habitat and noise that would be generated by the train would be limited to within several hundred feet of the proposed rail line.

As discussed previously, the proposed rail line would affect special-status species, including ESA-listed species, by displacing, degrading, or altering habitat, introducing a new source of noise that could disturb wildlife, and potentially causing injury or mortality of special-status species and changes to species distribution and composition. Future projects worsen impacts on special-status species if the projects were to take place in the same area as the proposed rail line and affect the same special-status species habitat as the proposed rail line. Implementation of BLM or Forest Service requirements on BLM and Forest Service land, respectively, and of measures developed through ESA Section 7 or ESA Section 10, as applicable, would minimize these cumulative impacts.

3.15.5.5 Geology, Soils, Seismic Hazards, and Hazardous Waste Sites

Cumulative Impacts Study Area

OEA defined the cumulative impacts study area for geology and soils as a 0.5-mile buffer surrounding the construction footprint[3] of each Action Alternative and a 60-mile buffer surrounding the construction footprint of each Action Alternative for seismic hazards. The cumulative impacts study area for hazardous waste sites includes a 2,000-foot buffer surrounding the right-of-way for each Action Alternative. The cumulative impacts study area for geology and soils, seismic hazards, and hazardous waste sites are the same as for the analysis of direct and indirect effects.

[3] The *rail line footprint* includes the area of the railbed, as well as the full width of the area cleared and cut or filled. The rail line footprint would also include other physical structures installed as part of the proposed rail line, such as fence lines, communications towers, siding tracks, relocated roads, and power distribution lines. The rail line footprint is the area where rail line operations and maintenance would occur. The area would be permanently disturbed. The *temporary footprint* is the area that would be temporarily disturbed during construction, including areas for temporary material laydown, staging, and logistics. The temporary footprint would be reclaimed and revegetated following construction. The *project footprint* is the combined area of the rail line footprint and temporary footprint, both of which would be disturbed during construction, comprising where construction and operations of the proposed rail line would occur.

Cumulative Impacts

Typically, only projects occurring adjacent to or very close to the project footprint have the potential to interact with the Action Alternatives to result in cumulative impacts related to geology and soils. The proposed rail line would affect geology and soils and would combine with impacts from the other related projects to result in cumulative impacts on geology and soils in the cumulative impacts study area. Impacts would be related to increased potential for mass movement (e.g., landslide), increased erosion and sedimentation, and construction over unmapped abandoned mines, which could lead to collapse. The contribution of impacts from construction and operation of the proposed rail line to cumulative impacts in each affected project category is summarized as follows.

As it relates to the potential cumulative effect of hazardous waste sites, generally, only projects occurring adjacent or very close to the project footprint would have the potential to affect or be affected by the proposed rail line due to the limited potential impact radius associated with the release of hazardous waste into the environment. As discussed in Section 3.5, *Geology, Soils, Seismic Hazards, and Hazardous Waste Sites*, OEA did not identify any potential direct impacts related to hazardous waste sites in the study area.

Oil and Gas Development

Any of the Action Alternatives would intersect with oil and gas fields in the cumulative impacts study area. This overlap would include existing oil and gas wells, as well as both exploratory and production wells and supporting infrastructure that may be created in the future. Ground-disturbing activities associated with exploration and oil production, including drilling and road construction, would contribute to cumulative impacts, which would affect slope failure, soil erosion, and the potential for collapse. The Action Alternatives would also connect with the terminals at Myton and Leland Bench. The Myton terminal area contains soil resources that are vulnerable to both wind and water erosion. Both terminals could be constructed in the area of unmapped abandoned mines. Therefore, ground-disturbing activities associated with all three Action Alternatives would contribute to cumulative impacts affecting soil erosion near the Myton terminal and to cumulative impacts related to the potential for collapse associated with abandoned mines at both terminals. OEA assumes that future oil and gas development would comply with applicable federal and state permits and associated mitigation measures.

However, because future oil and gas development, the terminals, and the proposed rail line would be subject to many of the same applicable federal, state, and local permitting requirements, cumulative impacts related to geology, soils, and seismicity would be avoided or minimized through compliance with state and federal laws and regulations and local permitting requirements, including CWA Section 402, Occupational Safety and Health regulations, and Federal Railroad Administration requirements. Therefore, OEA concludes that the impacts related to geology, soils, and seismicity from the proposed rail line when combined with impacts from the terminals would not result in significant cumulative impacts.

Other Projects and Actions

In addition to potential future oil and gas development projects, the Action Alternatives would intersect with the footprint of the Removal of Indian Canyon Guard Station (Figure 3.15-1, Item 22) and the Gateway South Transmission line (Figure 3.15-1, Item 24). Ground-disturbing activities associated with all of these actions would contribute to cumulative impacts affecting slope failure, soil erosion, and the potential for collapse. Both the removal of the Indian Canyon Guard Station and

the Gateway South Transmission line would be constructed on geologic units subject to slope failure and on soils subject to soil erosion. Both projects could be constructed in the area of unmapped abandoned mines.

However, because the other projects and actions and the proposed rail line would be subject to many of the same applicable federal, state, and local permitting requirements, cumulative impacts related to geology, soils, and seismicity would be avoided or minimized through compliance with state and federal laws and regulations and local permitting requirements, including CWA Section 402, Occupational Safety and Health regulations, and FRA requirements. Therefore, OEA concludes that the impacts related to geology, soils, and seismicity from the proposed rail line, when combined with impacts from the other actions and projects, would not result in significant impacts.

3.15.5.6 Noise and Vibration

Cumulative Impacts Study Area

OEA defined the noise and vibration cumulative impacts study area as a 1-mile buffer from the track centerline of each Action Alternative. The cumulative impacts study area for noise and vibration is the same as the project study area for the analysis of direct and indirect effects.

Cumulative Impacts

Only projects occurring adjacent to or very close to the project footprint would have the potential to interact with the Action Alternatives to result in cumulative impacts related to noise and vibration. For example, the 65 DNL noise contours for rail operations would be less than 700 feet from the tracks. If another project were to generate noise at that level 700 feet from the tracks, the result would be a cumulative increase in noise level of 3 decibels. Noise sources further away would cause small cumulative increases in noise level, which typically would not be noticeable. Vibration is even more localized; therefore, cumulative vibration effects would be unlikely.

Oil and Gas Development

All of the Action Alternatives would intersect with oil and gas fields in the cumulative impacts study area. This overlap would include existing oil and gas wells, as well as both exploratory and production wells and supporting infrastructure that may be created in the future. As stated previously, cumulative noise and vibration effects are unlikely because of the lack of overlap of associated 65 DNL contours.

Truck-to-rail terminal facilities providing for tank car loading and storage could include multiple short tracks, one or more long tracks, or loop tracks. These activities would generate noise and vibration, as well as truck traffic to and from the terminals. Cumulative noise impacts associated with a terminal and rail line operations would be possible, but unlikely because there would be no through trains in the immediate vicinity of the new terminals. Therefore, OEA concludes that the impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable actions, would not result in significant cumulative impacts related to noise and vibration.

Other Projects and Actions

The additional planned or proposed projects and actions known to OEA would not have direct impacts on rail operations noise and vibration because of the lack of overlap of associated 65 DNL contours. Therefore, OEA concludes that impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable actions, would not result in significant cumulative impacts related to noise and vibration.

3.15.5.7 Air Quality and Greenhouse Gases

Cumulative Impacts Study Area

The air quality and greenhouse gases (GHGs) cumulative impacts study area includes the same areas as described in Section 3.7, *Air Quality and Greenhouse Gases*. The cumulative impacts study area for regional air quality includes the area within 100 kilometers (i.e., 62 miles) of the proposed rail line as shown in Section 3.7, Figure 3.7-1. This area is in the Wasatch Front Air Quality Control Region (AQCR) and the Utah Intrastate AQCR in Utah, as designated by USEPA. The eastern edge of the cumulative impacts study area also extends about 18 miles into the Yampa Intrastate AQCR in Colorado. Within the cumulative impacts study area, OEA assessed air quality related values (AQRVs), which are resources that could be adversely affected by a change in air quality, such as visibility and acidic deposition. There are no Class I areas within the cumulative impacts study area. However, OEA assessed AQRVs at the nearest Class I areas and at sensitive Class II areas that are located in the cumulative impacts study area.

Cumulative Impacts

As discussed in detail in Section 3.7, *Air Quality and Greenhouse Gases*, construction and operation of the proposed rail line would result in emissions of criteria air pollutants and hazardous air pollutants, changes in ambient concentrations of such pollutants, and impacts on visibility and acidic deposition. Any of the Action Alternatives would contribute to cumulative impacts on air quality by adding to impacts from other projects. Any of the Action Alternatives would contribute incrementally to climate change by adding GHG emissions. The following subsections describe the impacts of the other projects and how impacts from the proposed rail line, when added to the impacts of these other projects, could result in cumulative impacts on air quality.

Oil and Gas Development

The cumulative air quality impact assessment for oil and gas development is based on the assumptions discussed in Section 3.15.4.1, *Oil and Gas Development.* Although this assessment focuses on oil development because crude oil is the primary product that would be transported on the proposed rail line, the wells in the cumulative impacts study area also may produce natural gas. The construction and operation of infrastructure to process and transport the gas also would contribute to cumulative impacts.

Wells and Infrastructure Emissions

To estimate emissions from construction equipment, drilling equipment, and vehicles used in well development, OEA used information from the BLM *Monument Butte Oil and Gas Development Project Final Environmental Impact Statement*, which evaluated a proposed oil and gas field development project in the Uinta Basin (BLM 2016). The Monument Butte project would consist of 5,750 new oil

and gas wells, including both vertical and horizontal oil wells, across 119,743 acres of southeastern Duchesne County and southwestern Uintah County.

As noted, OEA considers Monument Butte to be an example of the development that could occur as part of past, present, and reasonably foreseeable future oil and gas projects. Because of the volatility of energy markets, it would be speculative for OEA to predict the timing and amount of oil and gas development that could occur as part of the Monument Butte project. In the Monument Butte EIS, BLM conservatively calculated the air emissions that could occur if all 5,750 proposed oil and gas wells were operating in a given year (the maximum emissions year), which would be unlikely to occur. Because the number of producing wells in the maximum emissions year for the Monument Butte EIS (5,750 wells) is higher than the number of producing wells that would be needed to support the high oil production scenario in any year (3,330 wells), OEA believes that the air quality impacts described for the maximum emissions year in the Monument Butte EIS represent a conservative estimate of the air quality impacts that could result from producing the crude oil that could move on the proposed rail line.

To assess cumulative impacts on air quality and greenhouse gases, OEA added the estimated emissions from operation of the proposed rail line to estimated emissions from other reasonably foreseeable projects, including the oil and gas development that would be needed to meet the oil production scenarios, and compared those combined emissions to the emissions for the maximum emissions year from the Monument Butte EIS. OEA did not add the maximum emissions year emissions from the Monument Butte EIS to the cumulative emissions from the proposed rail line and reasonably foreseeable future projects because doing so would unreasonably overestimate potential future emissions from oil and gas development and cumulative air quality impacts in the study area. OEA assumed that total the oil and gas development in the Basin would not increase above baseline levels by more than would be required to meet the high oil production scenario.

The air quality analysis described in the Monument Butte Final EIS drew on the data and results of the Utah Air Resource Management Strategy (ARMS) Modeling Project (BLM 2014), a comprehensive regional modeling study. The ARMS Modeling Project is a cumulative assessment of potential future air quality impacts associated with predicted oil and gas activity in the Basin. The ARMS Modeling Project provides data, models, and estimates of future air quality impacts to facilitate BLM's future NEPA and land use planning efforts. The CMAQ photochemical modeling system was used, primarily because if its ability to replicate observed wintertime ozone formation and timing in the Basin. To analyze potential future year impacts, model simulations were conducted for a "typical year" based on annualized 2010 emissions, and for four 2021 scenarios reflecting differing levels of emissions controls. Cumulative air quality impacts within the Basin were assessed for criteria pollutants and AQRVs.

As discussed previously, the Monument Butte development project is an example of recent oil and gas development proposal in the Basin. If the Monument Butte project were developed, crude oil produced from the Monument Butte wells potentially could be transported on the proposed rail line. The Monument Butte EIS considers the environmental impact of developing and operating a total of 5,750 new wells, including both vertical and horizontal wells. OEA recognizes that the characteristics of other potential future oil and gas development projects in the cumulative impact study area could differ from those in the Monument Butte oil field, but there are no available data on the characteristics of other potential future oil and gas development projects. Because the Monument Butte EIS provides the best available data source on oil and gas development projects in the Basin, OEA adopted the assumptions and inputs from the Monument Butte EIS to assess

cumulative air impacts. OEA assumed that future oil and gas field development in the cumulative impacts study area would have characteristics similar to those described for the Monument Butte project, including the types and numbers of equipment, trucks, and commuter vehicles that would be required, and that construction emissions on a per-well or per-facility basis would also be similar to those estimated for Monument Butte.

Total air pollutant emissions each year would vary according to the number of wells constructed in that year. Construction emissions on a per-well basis would be the same for both the low oil production scenario and high oil production scenario, but the high oil production scenario would result in more wells under construction at any particular time and so would have greater annual emissions than the low oil production scenario. For purposes of estimating cumulative impacts of the proposed rail line, OEA assumed the low oil production scenario would coincide with the low rail traffic scenario, and the high oil production scenario would correspond to the high rail traffic scenario. Table 3.15-9 shows the emissions by source type for both oil production scenarios.

OEA assumed that future well operations in the cumulative impacts study area would have characteristics similar to those of the Monument Butte project as discussed previously, including the same facilities, equipment and vehicles, truck trips, and emissions controls.

Once a well is producing, emissions occur from operations and maintenance activities, which generate truck trips to the well site, and from trucks that transport the crude oil to the rail terminals. Emissions also occur from venting, flaring, equipment leaks, and engine exhaust from equipment located at operating wells (e.g., heaters, dehydrators, separators, tanks, pumpjack engines). Operations and maintenance activities for gas wells are similar to those for oil wells, and emissions are assumed to be similar.

Table 3.15-10. Estimated Emissions Associated with Oil and Gas Development by Source

	Low Oil Production Scenario[a]				High Oil Production Scenario[a]			
Pollutants	**Well Construction**	**Well Operation**	**Termini Operation**	**Total**	**Well Construction**	**Well Operation**	**Termini Operation**	**Total**
Criteria Pollutants and Volatile Organic Compounds (U.S. tons per year)								
CO	9	1,511	146	1,666	25	4,041	388	4,454
NO_X	32	1,092	51	1,175	86	2,922	138	3,146
PM10	159	356	30	546	432	952	79	1,463
PM2.5	17	128	7	152	47	342	17	406
SO_2	0	3	0	3	0	8	0	8
VOCs	4	2,023	51	2,078	10	5,412	136	5,558
Hazardous Air Pollutants (U.S. tons per year)								
Acetaldehyde	0	11	0	11	0	30	0	31
Acrolein	0	11	0	11	0	30	0	30
Benzene	0	9	0	9	0	23	0	23
1,3-Butadiene	0	1	0	1	0	4	0	4
Ethylbenzene	0	0	0	0	0	1	0	1
Formaldehyde	0	80	0	81	1	215	0	216

Pollutants	Low Oil Production Scenario[a]				High Oil Production Scenario[a]			
	Well Construction	Well Operation	Termini Operation	Total	Well Construction	Well Operation	Termini Operation	Total
DPM	1	73	0	75	4	196	1	201
Napthalene	0	0	0	0	0	0	0	1
POM	0	0	0	0	1	0	0	1
GHGs (metric tons per year)								
CO_2	6,744	603,746	7,790	618,279	18,292	1,614,838	20,700	1,653,830
CH_4	0	1,722	0	1,722	0	4,605	1	4,606
N_2O	0	1	0	1	0	3	0	4
CO_2e	6,785	640,198	84,585	731,568	18,404	1,712,337	227,449	1,958,190

Notes:

[a] Values less than 0.5 have been rounded to zero.

CO = carbon monoxide; NO_X = oxides of nitrogen; PM10 = particulate matter 10 microns or less in diameter; PM 2.5 = particulate matter 2.5 microns or less in diameter; SO_2 = sulfur dioxide; VOCs = volatile organic compounds; DPM = diesel particulate matter; POM = polycyclic organic matter; GHGs = greenhouse gases; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrogen dioxide; CO_2e = carbon dioxide equivalent

Rail Terminal Emissions

As discussed previously, the Coalition has not proposed to construct and operate new rail terminals in the Basin. OEA assumes that other entities, such as firms that specialize in oil field and/or freight logistics, would construct new rail terminals at the terminus points of the proposed rail line near Myton and Leland Bench. Because those new rail terminals are not part of the Coalition's proposed project, OEA does not know the specific size and design of the terminals and, therefore, cannot quantify the construction emissions. In general, rail terminal facilities consist mostly of rail track, storage tanks, and structures that can be built using standard construction techniques and that occupy a relatively small construction footprint compared to the size of the completed facility. Because new rail terminals would be located in generally flat areas, there would be minimal need for earthmoving, a construction activity that can result in high levels of air emissions. Activities related to the construction of terminal rail tracks would move over time, which would result in more dispersion of emissions than if the activity occurred at only one location. Given these circumstances, OEA anticipates that the emissions from terminal construction, including construction of the rail line leading from the terminal, would not lead to ambient concentrations that could exceed the NAAQS in the local areas of the terminals. Concentrations would be lower at greater distances from the terminals. Therefore, OEA anticipates that terminal construction would not contribute to cumulative air quality impacts.

OEA estimated emissions from terminal operations based on permitted emissions for the existing Price River Terminal in Price, Utah (UDEQ 2015) adjusted for the quantities of oil handled. Table 3.15-9 includes the estimated emissions from terminal operations. The terminals would require air quality permits. As part of the permit application process the terminal developer must demonstrate to the satisfaction of UDEQ that the facility would not cause ambient concentrations to exceed the NAAQS. In addition, OEA does not expect that the cumulative impact of terminal operations and rail operations on the line to the terminal would exceed the NAAQS because the

locomotives would be moving and would not be near the stationary emissions sources at the terminal for long periods of time, which would result in more dispersion of emissions than if all the sources were concentrated at only one location, and concentrations would be lower at greater distances from the terminals.

Downstream End Use Emissions

Refiners would refine the crude oil transported by the proposed rail line into various fuels and other products. OEA assumed conservatively that combustion would be the end use of all of the crude oil. OEA estimated the GHG emissions from this combustion, assuming conservatively that these fuels would not displace other fuels from the market, but would add to existing fuel consumption. Table 3.15-10 shows the estimated GHG emissions from combustion of the crude oil transported by the proposed rail line.

Table 3.15-11 Estimated GHG Emissions from Combustion of Fuels Refined from Crude Oil Transported on the Proposed Rail Line

	Estimated Greenhouse Gas Emissions (metric tons per year)			
Scenario	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Low oil production	19,716,083	807	167	19,785,953
High oil production	53,081,761	2,172	449	53,269,873

Notes:
CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrogen dioxides; CO_2e = carbon dioxide equivalent

Cumulative Air Quality Effects

Approach

Ambient pollutant concentrations and AQRVs in the cumulative impacts study area are influenced by numerous emissions sources spread throughout the study area and beyond, as well as by regional meteorology and topography. BLM and other agencies have modeled the cumulative impacts of oil and gas development and other reasonably foreseeable development in the region. To assess the cumulative impacts of the proposed rail line and the projected oil and gas development, OEA used information from a detailed photochemical air quality modeling study developed for the Monument Butte EIS (BLM 2016, Appendix K). The Monument Butte Final EIS includes details of the modeling. The maximum emissions year analyzed in the Monument Butte Final EIS assumes that a total of 5,750 wells would be producing in a single year, which is substantially higher than the 3,330 wells that would be needed to support the high oil production scenario, as described in Section 3.15.4.1, *Oil and Gas Development*, for the high oil production scenario.

The Monument Butte development would be located in the Basin in Duchesne County southeast of Duchesne County and south of Myton, and would extend eastward about 25 miles into Uintah County. This area is within the region from which producers would truck their crude oil production to the rail terminals. OEA considers the location of the Monument Butte development to be reasonably representative of the cumulative impacts study area in which oil and gas development would occur and, therefore, concluded that the estimated impacts of the Monument Butte development should be used to represent the impacts of the oil and gas development described in Section 3.15.4.1, *Oil and Gas Development*. Because the Monument Butte Final EIS analyzed a maximum emissions year that would involve more wells than would be needed to support the maximum projected rail traffic on the proposed rail line, OEA considers the results of the Monument

Butte modeling study to be a conservative representation of the air quality impacts of future oil and gas development. Table 3.15-11 shows that the estimated emissions of Monument Butte for the maximum emissions year are larger than the sum of the cumulative emissions from the operation of the proposed rail line and other reasonably foreseeable projects.

OEA estimated the air quality effects of the oil and gas development described in Section 3.15.4.1, *Oil and Gas Production*, by using the Monument Butte study. That study used the Community Multi-scale Air Quality (CMAQ) model, version 5.0. CMAQ is a photochemical grid model, which is a type of computer model that simulates the formation, transport, and fate of ozone and other pollutants in the atmosphere.[4] Further details of the emissions inventories, input parameters, and model assumptions are provided in the BLM study (BLM 2016: Appendix K).

Table 3.15-12. Relative Levels of Monument Butte and Uinta Basin Railway Cumulative Emissions

Project	Number of Producing Wells	Estimated Emissions (tons per year)					
		CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
Monument Butte EIS							
Monument Butte proposed action, maximum-emissions year	5,750	8,524	5,690	2,904	617	14	10,360
Proposed Rail Line (Uinta Basin Railway)							
High oil production scenario	3,330	4,454	3,146	1,463	406	8	5,558
Action Alternatives rail operations, high rail traffic scenario (Wells Draw Alternative)	–	1,401	1,238	379	77	2	121
Cumulative: sum of oil and gas and rail operations	3,330	5,855	4,384	1,842	483	10	5,679
Rail operations emissions as percent of cumulative impacts	–	24%	28%	21%	16%	20%	2%
Relative Emissions Levels of Cumulative Impacts and Monument Butte							
Sum of oil and gas and rail operations as percent of Monument Butte	58%	69%	77%	63%	78%	71%	55%

Notes:

Values have been rounded to the nearest ton.

Source: BLM 2016: Appendix K

CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter; SO_2 = sulfur dioxide; VOCs = volatile organic compounds

[4] The modeling domain encompassed Utah and western Colorado using a grid of cells 4 kilometers and 12 kilometers on a side.

Ambient Concentrations

An important capability of the CMAQ model is the ability to estimate ozone concentrations. Ozone is a component of photochemical smog and is formed from reactions of precursor chemicals (primarily oxides of nitrogen [NO_x] and volatile organic compounds [VOCs]) in the presence of sunlight. Ozone is of particular concern in the Basin because high levels of ozone have been measured there in winter, and USEPA has designated the Basin as nonattainment for ozone.

Appendix M, *Air Quality Emissions and Modeling Data,* Tables M-1 through M-7, shows the predicted impact of the Monument Butte project on criteria pollutant levels in the cumulative impacts study area, as well as the nearest Class I and sensitive Class II areas. The results reported in the Monument Butte project analysis indicate the following.

- The maximum nitrogen dioxide (NO_2) levels at all sites would be less than the NAAQS and Utah Ambient Air Quality Standards (AAQS). Because the high oil production scenario that OEA analyzed would involve a smaller number of wells than were considered in the Monument Butte project, OEA concludes that cumulative NO_2 concentrations from the proposed rail line and potential future oil and gas development would also be less than the NAAQS and Utah AAQS.
- The maximum carbon monoxide (CO) levels at all sites would be less than the NAAQS and Utah AAQS. Because the high oil production scenario that OEA analyzed would involve a smaller number of wells than were considered in the Monument Butte project, OEA concludes that cumulative CO concentrations from the proposed rail line and potential future oil and gas development would also be less than the NAAQS and Utah AAQS.
- The maximum sulfur dioxide (SO_2) levels at all sites would be less than the NAAQS and Utah AAQS. Because the high oil production scenario that OEA analyzed would involve a smaller number of wells than were considered in the Monument Butte project, OEA concludes that cumulative SO_2 concentrations from the proposed rail line and potential future oil and gas development would be less than the NAAQS and Utah AAQS.
- The maximum ozone impact of the Monument Butte project would not lead to exceedances of the ozone NAAQS at most sites. However, modeled total ozone levels exceed the NAAQS at some sites under existing conditions in the absence of Monument Butte. This is consistent with ozone exceedances measured by DEQ in winter in the Basin. Although the Monument Butte project would increase ozone concentrations, the Monument Butte modeling predicted no new exceedances due to Monument Butte. Because the high oil production scenario that OEA analyzed would involve a smaller number of wells than were considered in the Monument Butte project, OEA concludes that cumulative emissions of ozone precursors (VOC and NO_X) from the proposed rail line and potential future oil and gas development would be lower than predicted for the Monument Butte project. Existing exceedances of the ozone NAAQS would still occur.
- The maximum predicted levels of particulate matter 10 microns or less in diameter (PM_{10}) and annual particulate matter 2.5 microns or less in diameter ($PM_{2.5}$) with the Monument Butte project at all sites would be less than the NAAQS and Utah AAQS. Total 24-hour $PM_{2.5}$ levels would be less than the NAAQS and Utah AAQS at all sites except one. Because the high oil production scenario that OEA analyzed would involve a smaller number of wells than were considered in the Monument Butte project, OEA concludes that cumulative PM_{10} and $PM_{2.5}$ concentrations from the proposed rail line and potential future oil and gas development would be less than concentrations described for the Monument Butte EIS.

Prevention of Significant Deterioration

The Prevention of Significant Deterioration (PSD) program applies to projects subject to stationary source permitting in attainment areas. The PSD regulations set limits (i.e., increments) on the incremental pollutant concentrations that a project may contribute. The allowable increments are lower in Class I areas than in Class II areas. (There are no Class I areas in the cumulative impacts study area). PSD requirements did not apply to the Monument Butte project because the modeling was not part of a stationary source permitting process. Nevertheless, PSD increments can be used as a guide to compare results and to provide context for evaluating air quality impacts. PSD increments also do not apply to rail projects because railroads are not stationary sources, but the increments can be used to compare potential impacts for purposes of information. In the Monument Butte project analysis, no predicted impacts exceeded the applicable PSD increments. Because the oil production scenarios that OEA analyzed would involve smaller numbers of wells than were considered in the Monument Butte project, OEA concludes that cumulative impacts of the proposed rail line and potential oil and gas development would also be within the applicable PSD increments.

Visibility

- Under the Clean Air Act, visibility is an AQRV of concern for Class I areas (Section 3.7, *Air Quality and Greenhouse Gases*). In the Monument Butte project modeling, visibility impacts exceeded the applicable thresholds on multiple days. Because the oil production scenarios that OEA analyzed would involve smaller numbers of wells than were considered in the Monument Butte project, OEA concludes that cumulative impacts of the proposed rail line and potential oil and gas development would be lower than those described in the Monument Butte EIS. In general, the number of days on which visibility impacts would exceed the thresholds would be less than estimated for the Monument Butte project.

Acidic Deposition

- Under the Clean Air Act, acidic deposition is an AQRV of concern for Class I areas. The Monument Butte project modeling estimated that the nitrogen deposition analysis threshold (DAT) was exceeded in some areas but the sulfur DAT was not exceeded in any area. Because the oil production scenarios that OEA analyzed would involve smaller numbers of wells than were considered in the Monument Butte project, OEA concludes that cumulative impacts of the proposed rail line and potential oil and gas development relative to acidic deposition would be less than estimated for the Monument Butte project.

- For sensitive lakes, the change in acid neutralizing capacity (ANC) was calculated in the Monument Butte project study using the methodology suggested by the Forest Service (2000). The change in ANC was compared to the threshold of a 10 percent change in ANC for lakes with background ANC values greater than 25 micro-equivalents per liter (µeq/l) and no more than a 1 µeq/l change in ANC for lakes with background ANC values equal to or less than 25 µeq/l. The only sensitive lake in the cumulative impacts study area for which data are available is Dean Lake in the High Uintas Wilderness Area. At Dean Lake the estimated impact due to the Monument Butte project is a 0.18 percent change in ANC, which is less than the 10 percent threshold, and a change in ANC of 0.15 µeq/l, which is less than the 1 µeq/l threshold. Because the oil production scenarios that OEA analyzed would involve smaller numbers of wells than were considered for the Monument Butte project (Table 3.15-11), OEA concludes that cumulative impacts of the proposed rail line and potential oil and gas development would also be less than the applicable ANC thresholds.

Other Projects and Actions

The proposed rail line would affect air quality and would combine with impacts from other projects to result in cumulative impacts on air quality in the cumulative impacts study area. Other projects and actions would produce criteria air pollutant and hazardous air pollutant emissions. These emissions, when combined with emissions from other sources in and beyond the cumulative impacts study area, would lead to cumulative impacts on ambient air quality and AQRVs. Figure 3.15-1 shows the other projects and actions in the cumulative impacts study area with the potential to contribute to cumulative impacts, which include infrastructure improvements, watershed improvement projects, road improvement projects, Forest Service actions, interstate electric power transmission lines, and cultural resources preservation.

Most projects and actions would occur well outside of the study area for the proposed rail line. These projects would have to comply with Utah DEQ and other state permits and approvals related to air quality. Because of their expected emissions levels and their distance from the proposed rail line, OEA considers the air quality impacts of these projects to be captured in the background concentrations applied in the air quality modeling. The impacts described above based on the modeling would include the cumulative contributions from these projects.

Projects that occur near the proposed rail line, if constructed simultaneously with rail line construction in the same local area, could result in localized cumulative impacts. OEA anticipates that only roadway improvement projects could occur near the proposed rail line. Once constructed, roadway improvements would not contribute further to air quality impacts. Therefore, OEA concludes that the impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable actions, would not result in new exceedances of the NAAQS or AQRV thresholds. The cumulative impacts of the proposed rail line could increase the pollutant levels that are associated with existing exceedances of the 24-hour $PM_{2.5}$ NAAQS, the ozone NAAQS, and visibility impact thresholds.

3.15.5.8 Energy

Cumulative Impacts Study Area

OEA defined the energy cumulative impacts study area as the construction footprint for each Action Alternative, because this is the area where all construction and operation activities that would consume energy would take place. The cumulative impacts study area also includes the energy supply and distribution infrastructure, including electricity transmission, crude oil pipelines, natural gas pipelines, and petroleum product pipelines that could intersect the proposed rail line, and existing fuel (gasoline, diesel fuel) transport, storage, and distribution infrastructure that could supply fuel to the proposed construction and operation of the rail line.

OEA has included potential terminal locations and construction and operation of diesel fuel storage distribution equipment for fueling locomotives in the cumulative impacts study area. OEA also considered energy consumption related to the construction and operation of potential new rail terminal facilities and the disposition of crude oil that would be transported by the proposed rail line. For this reason, the cumulative impacts study area for energy is not the same as for the analysis of direct and indirect effects.

Cumulative Impacts

Oil and Gas Development

Construction of any of the Action Alternatives would provide the capacity to transport crude oil from the Basin to locations outside the Basin. Under the low oil production scenario, an estimated 130,000 barrels per day would be transported from the Basin by rail. Under the high oil production scenario, an estimated 350,000 barrels per day would be transported from the Basin by rail. There are five petroleum refineries located in Utah, all in the Salt Lake City area. These refineries have the capacity to process approximately 100,000 barrels per day of crude oil from the Basin received by truck. OEA does not anticipate that crude oil transported via the Action Alternatives would directly serve the existing oil refineries in Salt Lake City in the short-term because those refineries do not currently have the facilities to accept trains carrying crude oil. OEA anticipates that the crude oil would be transported by rail to other states. Therefore, the additional production of crude oil would contribute to the national supply of crude oil but would not directly affect petroleum refining in Utah or directly contribute to petroleum-product production in Utah. OEA expects that the direct impacts from the proposed rail line would not result in cumulative impacts on petroleum refining or petroleum production in Utah.

In the event that the Board authorizes the proposed rail line, rail terminals would be needed in the Basin to transfer commodities between truck and rail transportation modes. Operation of the rail terminals would consume energy directly in the form of fuel (diesel fuel and gasoline) for operation of rail terminal equipment and vehicles and operation of rail terminal personnel vehicles. Rail terminal equipment would include heated crude oil storage tanks and associated piping and pumping and mobile crane and other loading and unloading equipment. Operation of the rail terminals would also consume energy in the form of electricity for operation of terminal equipment, lighting, and administration and utility buildings. OEA anticipates that fuel consumption for rail operations and operation of the rail terminals would be small relative to the refining capacity of the Salt Lake City area refineries and would not, therefore, have a significant impact on regional fuel supply.

Other Projects and Actions

Electric Transmission Line Construction

The right-of-way of the proposed PacifiCorp Gateway South Transmission Line would cross the Indian Canyon Alternative at one location, the Whitmore Park Alternative at one location, and the Wells Draw Alternative at three locations. Construction of the Gateway South Transmission Line is anticipated to occur from June 2021 to October 2023 (Rocky Mountain Power 2020). The Action Alternatives also would cross the rights-of-way of two existing electric transmission lines. Figure 3.8-1 shows the existing electric transmission lines in the study area. Figure 3.15-1 shows the routes of the proposed electric transmission lines in the cumulative impacts study area.

The Gateway South Transmission Line is expected to be constructed from 2021 to 2023 and could be constructed at the same time as the proposed rail line. It is not known whether construction would commence at the specific points where the Gateway South Transmission Line would cross the Action Alternatives before or after the commencement of construction of the Action Alternatives. In either case, any crossing of utility rights-of-way would occur in accordance with applicable regulatory standards (Appendix B, *Applicable Regulations*). As discussed in Section 3.8, *Energy*, OEA does not anticipate that construction of the proposed rail line would require any modification or

relocation of the right-of-way of the proposed Gateway South Transmission Line. The proposed TransWest Express Transmission Line (Figure 3.15-1, Item 25) would not cross any of the Action Alternatives; therefore, no cumulative impacts would result.

Infrastructure Project Construction

Construction of infrastructure projects, including the Roosevelt Airport expansion and improvements and Peerless Port of Entry construction and improvements, would consume energy in the form of diesel fuel and gasoline for operation of on-road and off-road construction vehicles and equipment and for operation of construction personnel vehicles. Infrastructure projects constructed during the same timeframe as proposed construction of the Action Alternatives would contribute to demand for diesel fuel and gasoline (Appendix R, *Other Projects and Actions Considered in the Cumulative Impacts Analysis*).

The anticipated construction timeframe for the Indian Canyon Alternative and Whitmore Park Alternative is 2 years (24 months), and the anticipated construction timeframe for the Wells Draw Alternative is 2.6 years (32 months). Cumulative projects, including the Gateway South Transmission Line, the Pelican Lake Sediment Control Project, and several road improvement projects, could be under construction during the same timeframe as the Action Alternatives. Other cumulative projects, including the Roosevelt Airport expansion, the Ashley Valley Watershed Project, and other road improvement projects, are currently in the planning phases and do not have firm estimates of construction dates (Appendix R, *Other Projects and Actions Considered in the Cumulative Impacts Analysis*). Construction of these planned cumulative projects could also occur during the timeframe of construction of the Action Alternatives.

Section 3.8, *Energy*, Table 3.8-1, provides diesel fuel and gasoline consumption for each year of construction for each Action Alternative. OEA anticipates that total fuel consumption from construction of the Action Alternatives and from cumulative projects constructed in the same timeframe would be small relative to the refining capacity of the Salt Lake City area refineries and would, therefore, not affect regional fuel supply during the construction period.

Section 3.8, *Energy*, Table 3.8-4, provides fuel consumption for rail operations by scenario for the low rail traffic and high rail traffic scenarios for each Action Alternative. Cumulative projects, including road improvements, watershed improvements, and Forest Service actions, would not consume fuel after completion of construction except for equipment and vehicle operations associated with maintenance activities. The proposed Roosevelt Airport expansion and improvements and Peerless Port of Entry construction and improvements would increase fuel consumption for operation of those facilities. OEA concludes that fuel consumption for rail operations associated with the proposed rail line, when combined with fuel consumption from the operation of past, present, and reasonably foreseeable actions, would not result in significant cumulative impacts on regional fuel supply.

3.15.5.9 Cultural Resources

Cumulative Impacts Study Area

The cultural resources cumulative impacts study area is larger than the study area for direct and indirect cultural resources. It includes the area illustrated on Figure 3.15-1, which encompasses the region's oil and gas fields and other proposed projects. Its northern boundary latitude runs though

Vernal and its southern boundary through Price. On the west, the boundary longitude is approximately parallel to State Route 89. The eastern boundary is the Utah/Colorado state line.

Cumulative Impacts

Construction and operation of the proposed rail line would result in the following impacts on cultural resources: destruction, removal, or alteration of resources within the project footprint, obstructions to accessing cultural resources, and setting impacts (including visual impacts) on resources outside the project footprint. Any Action Alternative could contribute to cumulative impacts on cultural resources by adding to impacts from other projects.

Oil and Gas Development

Cumulative impacts on archaeological resources from oil and gas development would result from ground disturbance during the construction of new access roads, well pads, pipelines, rail terminals, and other associated infrastructure. To the extent that they are present, archaeological resources located on or below the ground surface would be damaged or destroyed by the digging needed to construct the infrastructure used to extract and transport oil and gas. To the extent that tribal resources, above-ground archaeological resources (e.g., rock imagery), and/or built environment resources are present within the footprint of the new infrastructure, these resources would also be damaged or destroyed by construction. Operation of new oil and gas extraction facilities could also impact the setting of above-ground cultural resources.

Impacts from construction and operation of the proposed rail line combined with impacts from oil and gas development could result in cumulative impacts on cultural resources if oil and gas development projects were to take place within the APE of the Action Alternatives. OEA concludes that adverse cumulative impacts on cultural resources would result because of the potential for permanent damage to or destruction of such resources from construction and degradation of their settings. Mitigation could reduce, but would not eliminate, these cumulative cultural resources impacts. As discussed in Section 3.9, *Cultural Resources*, adverse effects on cultural resources from construction and operation of the proposed rail line would be appropriately addressed by the implementation of the PA that OEA is developing under Section 106 of the NHPA (Appendix O, *Draft Programmatic Agreement*). Therefore, OEA concludes that the contribution of the proposed rail line to cumulative impacts on cultural resources would not be significant.

Other Projects and Actions

Although the nature and intensity of each planned project's impacts would vary, the addition of projects or actions in the study area would result in more impacts on cultural resources. Depending on the nature of the other project or action, cultural resources including tribal, archaeological, and built environment resources present within or adjacent to the footprint of the any new infrastructure would be damaged or destroyed by construction. Depending on the character-defining features of cultural resources within the study area of these projects or actions, operation of new projects or actions could also impact the setting of adjacent cultural resources.

Infrastructure Improvement, Watershed Improvement, and Road Improvement Projects

To the extent that cultural resources are present within or adjacent to the footprints of any proposed facility, infrastructure, watershed, and road improvement projects, impacts from such projects would result. Mitigation could reduce, but likely would not eliminate, impacts. If the

affected cultural resources are located within the APE of the Action Alternatives, then construction and operation of the proposed rail line could contribute to cumulative impacts on those cultural resources. Because adverse effects on cultural resources from the proposed rail line would be appropriately addressed by the implementation of the PA that OEA is developing in consultation with Section 106 consulting parties, OEA concludes that the contribution of the proposed rail line to cumulative impacts on cultural resources would not be significant.

Federal Agency Actions

Proposed Forest Service projects include removal of a historic guard station, which would be an impact on a cultural resource even with mitigation. Other Forest Service projects may involve ground disturbance or other activities that result in impacts on cultural resources. Some proposed BLM actions may involve ground disturbing activity or other forms of damage/destruction to cultural resources that result in an impact. Mitigation could reduce, but likely would not eliminate, impacts. If the affected cultural resources are located within the APE of the Action Alternatives, then construction and operation of the proposed rail line could contribute to cumulative impacts on those cultural resources. Because adverse effects on cultural resources from the proposed rail line would be appropriately addressed by the implementation of the PA that OEA is developing in consultation with Section 106 consulting parties, OEA concludes that the contribution of the proposed rail line to cumulative impacts on cultural resources would not be significant.

Interstate Electric Power Transmission

The proposed Gateway South and the TransWest Express transmission line projects both anticipate impacts on cultural resources. Both projects have a Section 106 PA in place to address avoiding, minimizing, and mitigating such impacts. Due to the nature of transmission lines, which have some flexibility in terms of siting, it is possible that impacts on cultural resources can be avoided but equally possible that impacts that cannot be mitigated would occur. Mitigation could reduce, but likely would not eliminate, impacts. If the affected cultural resources are located within the APE of the Action Alternatives, then construction and operation of the proposed rail line could contribute to cumulative impacts on those cultural resources. Because adverse effects on cultural resources from the proposed rail line would be appropriately addressed by the implementation of the PA that OEA is developing in consultation with Section 106 consulting parties, OEA concludes that the contribution of the proposed rail line to cumulative impacts on cultural resources would not be significant.

Cultural Resources Preservation

Although the PA between BLM and the Utah State Historic Preservation Office designed to mitigate adverse effects on historic properties, the need for mitigation implies that cultural resources are being impacted. If the affected cultural resources are located within the APE of the Action Alternatives, then construction and operation of the proposed rail line could contribute to cumulative impacts on those cultural resources. Because adverse effects on cultural resources from the proposed rail line would be appropriately addressed by the implementation of the PA that OEA is developing, OEA concludes that the contribution of the proposed rail line to cumulative impacts on cultural resources would not be significant.

3.15.5.10 Paleontological Resources

Cumulative Impacts Study Area

OEA defined the cumulative impacts study area for paleontological resources as the project footprint, which includes all areas of temporary disturbance where construction activities and staging would occur and all areas of permanent disturbance, including the railbed, access roads, communication towers, and areas of cut and fill. The cumulative impacts study area for paleontological resources is the same as for the analysis of direct and indirect effects.

Cumulative Impacts

A cumulative impact on paleontological resources would occur when past, present, and reasonably foreseeable future projects, in combination with the proposed rail line, would cumulatively disturb, damage, or destroy scientifically important paleontological resources. Paleontological resources are nonrenewable resources because once they are lost, they cannot be recovered. Cumulative impacts on paleontological resources involve the loss of scientifically important fossils and associated data and the incremental loss to science and society of these resources over time.

Past construction projects, such as road construction and oil and gas well development, that have disturbed the ground and subsurface in areas of high potential to contain fossils have resulted in cumulative conditions affecting paleontological resources in the Basin. However, existing laws and regulations that provide protections for paleontological resources are known to reduce potential impacts with the implementation of mitigation measures during surface- and subsurface-disturbing actions. When properly designed and implemented, these mitigation measures can result in the recovery and permanent preservation of large numbers of scientifically significant paleontological resources that would otherwise have been damaged or destroyed and can greatly reduce the cumulative impacts of construction projects on paleontological resources. With appropriate mitigation, some construction projects can result in beneficial impacts on paleontological resources by making fossils available for scientific research and education that would otherwise never have been unearthed or discovered.

Oil and Gas Development

Impacts on paleontological resources as the result of oil and gas development in the cumulative impacts study area would occur primarily if fossil-rich geologic units, such as the Green River and Uinta formations, were disturbed during the construction of new access roads, well pads, and pipelines. These actions could damage or destroy surface and subsurface paleontological resources through physical breakage, resulting in direct adverse impacts. New road construction facilitates increased public access to the cumulative impacts study area, which can result in indirect adverse impacts, such as the loss of scientifically important paleontological resources due to unlawful collection and vandalism. With the implementation of appropriate mitigation measures, these impacts could be reduced and could result in beneficial cumulative impacts through the recovery of previously undiscovered paleontological resources of scientific importance. When combined with impacts from past, present, and reasonably foreseeable oil and gas development, OEA expects that impacts from the proposed rail line would not result in significant cumulative impacts on paleontological resources.

The Action Alternatives would connect with the new rail terminals at Myton and Leland Bench. Both terminals would be located in PFYC 2 geologic units, which have low potential to contain

paleontological resources (Section 3.10, *Paleontological Resources,* Figure 3.10-1). Therefore, OEA concludes that no cumulative impacts on scientifically important paleontological resources would occur.

Other Projects and Actions

Construction of various planned future projects in the cumulative impacts study area would include surface and subsurface disturbance to geologic units that have the potential to contain scientifically important fossils that could be damaged or destroyed. Additionally, development projects that result in increased public access due to new roads and trails increase the potential for the loss of scientifically important paleontological resources due to theft and vandalism. The Gateway South Transmission Line project could have direct and indirect impacts on paleontological resources. This project, in combination with the Action Alternatives, would have the potential to cumulatively disturb, damage, or destroy scientifically important paleontological resources. Once they are lost, paleontological resources cannot be recovered because they are nonrenewable. However, the implementation of appropriate mitigation measures during the approval process for the construction projects could result in a beneficial impact through the recovery and permanent preservation of scientifically important paleontological resources that would otherwise likely never have been discovered. Therefore, OEA concludes that the impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable actions, would not result in significant cumulative impacts on paleontological resources.

3.15.5.11 Land Use and Recreation

Cumulative Impacts Study Area

The cumulative impacts study area for land use and recreation encompasses Carbon, Duchesne, Uintah, and Utah Counties in Utah. The cumulative impacts study area differs from the footprint-specific study area defined Section 3.11, *Land Use and Recreation*, because construction of an Action Alternative would preclude any other land use impacts within that footprint. The broader four-county planning cumulative impacts study area supports a cumulative impact analysis of total acres of land use designation and ownership impacts.

Cumulative Impacts

Oil and Gas Development

The impacts from oil and gas development would be consistent with trends associated with the continued development of oil and gas resources in the cumulative impacts study area. These trends include increasingly greater density of surface disturbance and construction of facilities due to infill drilling in known oil and gas fields; increasing the potential for loss of livestock forage due to surface disturbance and livestock mortality from vehicle traffic; and increasing visual and noise impacts on recreational users. The proposed rail line would contribute to these changes in land use, including permanent changes in landownership and the loss of public and private lands used for grazing, agriculture, and mineral development. Construction and operation of any of the Action Alternatives would also contribute to visual and noise impacts on recreational users, particularly on areas of public lands where recreationists seek solitude and unobstructed recreational experiences. In the event the proposed rail line is authorized and constructed, OEA anticipates that rail terminals would be constructed near Myton and Leland Bench to transfer commodities between truck and rail

transportation modes. Operation of the rail terminals, as well as construction and operation of the proposed rail line, would require the permanent conversion of historical land uses. The rail terminals would be constructed on private land and would result in permanent changes in land ownership and the loss of lands used for grazing, agriculture, and mineral development if these uses are present and could not be avoided during construction and operation of the terminals. The proposed rail line would contribute to these impacts, as well as to visual and noise impacts on recreational activities, particularly if the immediate vicinity of the terminal areas is used for hunting.

As discussed in Section 3.11, *Land Use and Recreation*, construction and operation of the proposed rail line would result in locally significant impacts on land use and recreation, including the permanent loss of irrigated cropland and grazing land, the severance of properties, and visual and noise disruption of recreational activities on public and private lands. Construction and operation of new oil and gas development projects and new rail terminals could worsen those impacts if they were to occur in the same area as the proposed rail line because of the potential for permanent changes in landownership, the loss of public and private lands, and the increase in visual and noise impacts on recreational users.

Other Projects and Actions

The types of impacts that would affect land use and recreation from past, present, and future actions in the cumulative impacts study area, such as changes in land use and recreational experiences from interstate electric power transmission projects, are similar to those that would occur from the proposed rail line (Section 3.11.3.1, *Impacts Common to All Action Alternatives*). Conversely, Forest Service actions in the cumulative impacts study area such as the Badlands Lop and Scatter Project and the Badlands Trail Project would result in beneficial impacts on land use and recreation by improving hunting and recreational opportunities.

Short-term cumulative impacts on land use, including the potential loss of public and private lands used for grazing, agriculture, and mineral development would result from the combination of any of the Action Alternatives and the past, present, and future actions. The long-term cumulative impacts would include the permanent conversion of existing land use, permanent loss of livestock forage, and loss of existing cropland. The short-term cumulative impacts on recreation from any of the Action Alternatives in combination with the past, present, and future actions would include potential altered access and increased noise and visual impacts during construction. Long-term cumulative impacts on recreation include new infrastructure that would introduce permanent visual and noise impacts on recreationists in the cumulative impacts study area. The contribution of impacts on land use and recreation from the proposed rail line would generally be greatest under the Wells Draw Alternative because it would affect the most total land, followed by the Whitmore Park Alternative and then the Indian Canyon Alternative. The Indian Canyon Alternative and Whitmore Park Alternative would contribute short- and long-term cumulative impacts on IRAs by introducing new visual and noise impacts on National Forest System lands. If the Indian Canyon Alternative or Whitmore Park Alternative were licensed, the Coalition will consult with the Forest Service to ensure that construction and operation of the rail line complies with the *Ashley National Forest Land Management Plan* (Forest Service 2017a), including any existing or potential amendments to that plan, and with the Forest Service 2001 Roadless Rule. Because the Indian Canyon Alternative or the Whitmore Park Alternative alignment would adhere to mitigation conditions imposed by the Forest Service, OEA anticipates that cumulative impacts on IRAs would not be significant.

3.15.5.12 Visual Resources

Cumulative Impacts Study Area

The cumulative impacts study area for visual resources is the viewshed that encompasses both the proposed rail line and the other cumulative projects. The cumulative impacts study area encompasses up to 10 miles from the rail line footprint, which is within the middleground to background zones. This broad study area includes views of the cumulative projects that OEA identified, as well as the proposed rail line. The cumulative impacts study area for visual resources is not the same as for the analysis of direct and indirect effects.

Cumulative Impacts

Oil and Gas Development

Impacts on visual resources resulting from oil and gas development in the cumulative impacts study area would occur where exploration, construction, and operation of oil and gas infrastructure would be visible by a casual observer. Visual intrusions into the landscape could include any type of infrastructure related to the oil and gas development, including new access roads, well pads, and pipelines, as well as associated vegetation clearing. The proposed rail line would contribute to these visual impacts by introducing new humanmade infrastructure into the landscape. These cumulative impacts would occur where oil and gas wells are located in the vicinity of the proposed rail line and visible to viewers passing through the cumulative impacts study area. The area where these cumulative impacts would occur already contains extensive oil and gas infrastructure and the addition of new industrial elements would not change the overall visual character. Therefore, OEA concludes that impacts from the proposed rail line, when combined with impacts from past, present, and foreseeable future oil and gas development, would not result in significant cumulative impacts on visual resources.

The Action Alternatives would connect with the terminals at Myton and Leland Bench. Construction and operation of the terminals would introduce industrial elements on the landscape and generate fugitive dust and temporary nighttime lighting. The proposed rail line would contribute to these visual effects by adding additional rail and industrial infrastructure near Myton and Leland Bench. Because the terminals would be located on private land and in areas where oil and gas industry-related infrastructure already exists on the landscape, impacts on visual resources would be limited. OEA concludes that the proposed rail line, when combined with construction and operation of the terminals, would not result in significant cumulative impacts.

Other Projects and Actions

The proposed rail line would combine with impacts from other projects and actions in the cumulative impacts study area to result in cumulative impacts on visual resources. Construction of new rail terminals and other projects in the cumulative impacts study area, including the *Duchesne County Watershed Plan* (NRCS Utah 2020), the Duchesne County Myton Main Street project, the U.S. Highway 40 improvement project, the removal of the Indian Canyon Guard Station, Ashley National Forest grazing allotments, and the Gateway South Transmission Line would contribute to impacts on visual resources. Each of these projects and plans would be within 10 miles of the Action Alternatives and would be visible within the foreground to background views from the proposed rail line. Impacts on visual resources from other projects and actions would primarily include construction activities, with the exception of the Gateway South Transmission Line, which would

also contribute impacts post-construction. Impacts on visual resources associated with the Duchesne County Myton Main Street Project, U.S. Highway 40 improvement project, and removal of the Indian Canyon Guard Station would be temporary and would decrease to negligible impacts post-construction as the infrastructure for these projects is already present. Temporary impacts on visual resources from these projects could result from increased dust, the presence of construction equipment, and increased traffic. The overall landscape features would likely not be noticeable to the casual observer because the basic elements of form, line, color, and texture would likely remain post-construction.

As stated in Section 3.12, *Visual Resources*, direct impacts resulting from the proposed rail line under the Indian Canyon Alternative and the Whitmore Park Alternative would conflict with the existing Ashley National Forest visual quality objective designations. OEA is therefore recommending mitigation requiring the Coalition follow the reasonable requirements of any Forest Service decision permitting the proposed rail line within Ashley National Forest, should the Board approve either the Indian Canyon Alternative or the Whitmore Park Alternative, and to ensure that construction and operation on Forest Service lands comply with the *Ashley National Forest Land Management Plan* (Forest Service 2017a). The Forest Service may need to amend the *Ashley National Forest Land Management Plan* to update visual quality objective designations to permit the proposed rail line.

The *Duchesne County Watershed Plan* (NRCS Utah 2020) and the Gateway South Transmission Line would contribute to visual impacts in the cumulative impacts study area during construction and post-construction of those projects. Similar to the description of the temporary impacts from other projects above, impacts on visual resources from these projects could result from increased dust, the presence of construction equipment, and increased traffic. Long-term impacts that could result post-construction include vegetation clearing and the introduction of infrastructure and humanmade features (such as transmission lines and associated infrastructure, canals, flood-control elements, and irrigation elements). The introduction of these features could result in changes in the basic elements of form, line, color, and texture, and would remain post-construction.

The Ashley National Forest grazing allotments are within the cumulative impacts study area. The effects of grazing livestock are apparent in the area, such as fences, troughs and small water developments, but the water developments and fences are generally masked by vegetation and are not easily noticeable (Forest Service 2017b). Because these grazing allotments are currently present, and no additional improvements or changes are proposed for the allotments, no additional impacts are anticipated.

Cumulative projects including the Gateway South Transmission Line, *Duchesne County Watershed Plan* (NRCS Utah 2020), Myton Main Street Project, U.S. Highway 40 improvement project, and removal of the Indian Canyon Guard Station could be under construction during the same time as the proposed rail line. Rail terminals could also be constructed during the same time frame as the proposed rail line, which would result in cumulative impacts on visual resources. OEA concludes that the impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable actions, would not result in significant cumulative impacts on visual resources due to the additional visual disturbances these actions would introduce into the landscape.

3.15.5.13 Socioeconomics

Cumulative Impacts Study Area

OEA defined the cumulative impacts study area for socioeconomics as the four-county area that includes Carbon, Duchesne, Uintah, and Utah Counties. The cumulative impacts study area for socioeconomics is the same as for the analysis of direct and indirect effects.

Cumulative Impacts

Potential socioeconomic impacts of the proposed rail line could result from property acquisitions and displacements, displaced economic activity, adverse effects on nonmarket social values[5] and quality of life, benefits to the local economy, and increased tax revenue. Other past, present, and reasonably foreseeable future actions would contribute to or offset socioeconomic impacts of the proposed rail line as described below.

Oil and Gas Development

Construction of the proposed rail line would increase transportation capacity to ship an additional 130,000 to 350,000 barrels of oil on average each day from existing oil fields in the study area (Figure 3.15-1). To produce a steady state volume of oil to meet the planned transportation capacity of the proposed rail line, OEA estimates that oil and gas companies would need to drill between 49 and 131 new wells annually and would need to construct ancillary facilities for oil field development (i.e., access roads, electric power distribution lines, well pads, and storage tanks). This estimated increase in annual oil production would generate long-term employment, labor income, and increased direct, indirect, and induced spending on goods and services in the cumulative impacts study area and would generate increased state and local revenue through income taxes and sales and use taxes. New wells drilled on state land or accessing state minerals would also generate additional revenue for the state through royalties and lease payments.

Economic benefits related to direct, indirect, and induced spending would extend to members of the Ute Indian Tribe who reside in the cumulative impacts study area and to Indian-owned businesses that would benefit from indirect and induced spending. Other revenue streams associated with oil and gas development that would directly benefit the Ute Indian Tribe include royalties and lease payments associated with oil well development on Tribal trust lands, compensation for water use agreements to provide water for drilling, direct and indirect employment to support oil and gas development on Tribal trust lands, and payment of taxes and business fees to the tribe.

Employment for oil field development could result in short-term or long-term jobs depending on the pace of development over time, with more steady state employment leading to longer-term jobs and more uneven cycles of employment resulting in shorter-term employment. Forecast increases in employment for oil field development would increase demand for housing and public services in the cumulative impacts study area for as long as the rail line is in operation.

In the event the proposed rail line is authorized and constructed, rail terminals would be needed to transfer commodities between truck and rail transportation modes. Construction of the rail

[5] Nonmarket social values include appreciation for areas that are ecologically or culturally unique or sensitive, scenic, undisturbed, and free of pollution and areas that provide opportunities for quiet recreation, or that convey a sense of place.

terminals would generate employment and labor income and would increase direct, indirect, and induced spending on goods and services within the cumulative impacts study area. Construction of the rail terminals would also generate increased state and local revenue through income taxes and sales and use taxes. These economic benefits would extend to tribal members that reside in the cumulative impacts study area and to Indian-owned businesses that would benefit from indirect and induced spending.

OEA estimated that peak employment for construction of the rail terminals would be 300 workers for each facility, or up to 600 workers if the facilities are constructed concurrently. Construction employment for the rail terminals would be additive to construction employment for the proposed rail line and would further increase demand for temporary housing and public services in communities located within a commuting distance to each job site. However, if dedicated construction camps are used for construction of the rail terminals, the demand for temporary housing would be reduced.

During operations, OEA estimated that each of the two rail terminals would employ 50 to 125 personnel for operations. Long-term employment for operation of the rail terminals could be filled by local workers or nonlocal workers that migrate to the study area and increase demand for public services and long-term housing. OEA estimated that between 622 and 1,675 truck trips per day would be needed to transport oil from oil fields in the Basin to the rail terminals during operations, which would increase employment for short-haul trucking in the study area. OEA anticipates that long-haul trucking would continue to serve oil refineries in the Salt Lake City area during rail operations.

In 2017, over 2,000 temporary accommodations and over 2,500 vacant housing units were available in the communities of Helper, Price, Wellington, Myton, Roosevelt, Duchesne, Ballard, Vernal, and Naples in Utah (Section 3.13, *Socioeconomics*, Table 3.13-2), and OEA anticipates that cumulative demand for short-term and long-term workforce housing would not exceed available capacity during construction or operation of the proposed rail line.

Conversion of land in the Basin for additional oil production and construction of the rail terminals would add industrial facilities, construction noise, truck traffic, and air quality emissions, which would result in adverse effects for nonmarket social values and quality of life for populations, including tribal members, that reside in proximity to oil fields and the proposed locations for the rail terminals. These effects would be additive to adverse effects on nonmarket social values and quality of life from construction and operation of the proposed rail line.

The economic benefits of the cumulative actions would generally be regional while the adverse economic effects would be more localized. OEA concludes that, as a whole, the impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable oil and gas development, would not result in significant adverse cumulative impacts on socioeconomics.

Other Projects and Actions

Other reasonably foreseeable future actions including implementation of watershed improvement projects, road improvements, facility and other infrastructure improvements, and construction of interstate electric power transmission lines would generate construction employment, labor income, and increased direct, indirect, and induced spending on goods and services within the cumulative impacts study area. Construction employment and spending would also generate

increased state and local revenue through income taxes and sales and use taxes. Increases in employment and revenue generation would be additive to the Action Alternatives.

OEA expects that workers employed for construction of local infrastructure improvement projects would be sourced locally, while construction of the interstate transmission lines would employ a mix of local and nonlocal workers that would move along the transmission lines as they are constructed. Temporary construction workers that do not reside locally would increase demand for public housing and services in the study area. Road improvements and other facility and infrastructure improvements (i.e., Roosevelt airport and library expansions, Port of Entry improvements, stormwater infrastructure improvements) would increase the capacity or quality of public facilities in the study area, which would be beneficial for meeting the increased demand for those services by nonlocal construction workers.

Acquisition of land for other reasonably foreseeable future actions would be negotiated between the project proponent and landowner, and OEA does not expect there would be cumulative effects related to land acquisition and displacement, or displacement of economic activity. Construction of two interstate electric power transmission lines (Gateway South and TransWest) would add large-scale utility infrastructure to the landscape with further deterioration of the scenic, recreational, environmental, and wilderness aspects of lands in the study area. Other existing and reasonably foreseeable future actions offer offsetting benefits for maintaining these qualities in the landscape. For example, large areas within the cumulative impacts study area are managed as public lands administered by BLM and the Forest Service. As such, BLM and Forest Service land management plans and associated land use designations comprise the principal mechanism for maintaining land uses that support nonmarket values and quality of life in the study area. Continued federal management of public lands with special designations (i.e., ACECs, Special Recreation Management Areas, Lands with Wilderness Characteristics, and IRAs) in accordance with BLM and Forest Service land management plans would have offsetting benefits for the maintenance of scenic, recreational, environmental, and wilderness aspects of lands in the study area. In summary, OEA expects that the beneficial impacts from increased employment and spending would offset the adverse impacts from the deterioration of scenic, recreational, environmental and wilderness aspects of lands within the study area. Therefore, OEA concludes that the impacts from the proposed rail line, when combined with impacts from past, present, and reasonably foreseeable actions, would not result in significant adverse cumulative impacts on socioeconomics.

3.15.5.14 Environmental Justice

Cumulative Impacts Study Area

OEA defined the cumulative impacts study area for environmental justice as the four-county area that includes Carbon, Duchesne, Uintah, and Utah Counties. The cumulative impacts study area for environmental justice is the same as for the analysis of direct and indirect effects.

Cumulative Impacts

OEA reviewed the cumulative impact analyses for all resource areas analyzed in Section 3.14, *Environmental Justice*, to identify any high and adverse cumulative impacts related to construction and operation of the proposed rail line in combination with other past, present, and reasonably foreseeable future actions. For the cumulative environmental justice analysis, OEA identified high and adverse impacts where cumulative impacts would be significant under NEPA or above generally

accepted norms and have the potential to adversely affect minority populations, low-income populations, or American Indian tribes. These high and adverse impacts include increases in vehicle delay on local roads that would be used for rail terminal operations, and cumulative impacts of oil and gas development on land use, recreation, and air quality.

OEA also reviewed other adverse impacts that the Ute Indian Tribe identified as areas of concern, to determine if impacts would be otherwise high and adverse for tribal members specifically. Through consultation with the Ute Indian Tribe, OEA identified impacts related to air emissions, vehicle safety and delay, rail operations safety, big game habitat and migration corridors, impacts on habitat for Pariette cactus and Uinta Basin hookless cactus, and protection of cultural resources as areas of concern to the tribe.

Where OEA identified high and adverse cumulative impacts that would affect minority populations, low-income populations, or American Indian tribes, OEA evaluated whether those impacts would be disproportionately high and adverse. To make this determination, OEA considered whether the affected minority populations, low-income populations, or American Indian tribes would experience exposure to an adverse effect that would be appreciably more severe or greater in magnitude than the adverse effect that the general population in the affected area would experience. In making its determinations, OEA considered the totality of the circumstances, including the benefits that could result from the proposed rail line in combination with other past, present, or reasonably foreseeable future actions.

Oil and Gas Development

Vehicle Safety and Delay

Construction and operation of any of the Action Alternatives would—along with oil and gas development activities in the Basin and construction and operation of the rail terminals—contribute to increased vehicle trips in the cumulative impacts study area.

OEA anticipates that construction of the proposed rail line would occur during the same time period as terminal construction and that both activities would contribute additional vehicle trips on study area roads. The major roadways in the study area all have substantial additional capacity. Vehicles would also use a network of local roads near the terminal locations during construction of the terminals. Construction traffic would increase vehicle trips and could result in delays and localized road damage. This impact would be temporary during the construction period. OEA expects that damage to local roads caused by construction activities would be addressed through road use or easement agreements. Because of the ample roadway capacity in the study area and temporary nature of the impact, traffic from construction of the proposed rail line, when combined with traffic from terminal construction would not result in significant impacts on vehicle delay.

Once the proposed rail line and the terminals are constructed, additional vehicle trips would be generated for development and maintenance of oil wells, transporting oil from oil fields to the terminals, and for operation of the proposed rail line and rail terminals, including vehicle trips for employee commuting. Traffic generated for oil field development and maintenance, and for transporting oil out of the field, would be dispersed across the major roadways and other local public and private roadways used to access oil fields in the Basin (Figure 3.15-1).

OEA concludes that because of ample roadway capacity and the dispersion of the increased traffic from oil and gas development, impacts on major roadways from the proposed rail line, when

combined with traffic from oil and gas development would not result in significant cumulative impacts on vehicle delay. Local roads, however, have smaller roadway capacity, and an increase in traffic on local roads used to serve the terminals would result in locally significant cumulative impacts on vehicle delay. Local roads near the rail terminals include Leland Bench Road, 7500 E, AR-88, and Sandwash Road/6000 W/5888 W. Increases in traffic to support terminal operations on these roads could be substantial, and without road improvements such as additional turning lanes, could result in vehicle delays. The rail terminals are located in an area where minority and low-income populations and American Indian tribal members live. Because high and adverse effects related to vehicle delay on local roads near the terminals would affect communities where these populations are present, and would not occur elsewhere, OEA determined that impacts on local roads from terminal operation would result in a disproportionately high and adverse effect on minority and low-income populations, and the Ute Indian Tribe.

Rail Operations and Safety

Terminal operations involve heated storage tanks, loading and unloading racks, and train tracks for active loading that have the potential for accidents involving injuries to workers; damage to rail cars, trucks, and equipment on site; or possibly oil spills resulting from equipment failures, human errors, or external events (such as vandalism or extreme weather). The terminal operator's use of proper procedures, protective equipment, and training would limit the likelihood of injury or damage. Constructing and operating the rail terminals in compliance with applicable local, state, and national standards and guidelines would minimize both the potential for accidents of any kind and the potential consequences of accidents. OEA determined that the cumulative impact of operating the proposed rail line and rail terminals would not be high and adverse. Therefore, impacts related to rail operations and safety would not result in disproportionately high and adverse impacts on minority and low-income populations, or American Indian tribes.

Air Quality

Ambient pollutant concentrations in the cumulative impacts study area are influenced by numerous emissions sources spread throughout the study area and beyond, as well as by regional meteorology and topography. Oil and gas development would result in air emissions from construction equipment, drilling equipment, and vehicles used in well development. Once a well is producing, emissions occur from operations and maintenance activities, which generate truck trips to the well site, and from trucks that transport the crude oil to the rail terminals. Emissions also occur from venting, flaring, equipment leaks, and engine exhaust from equipment located at operating wells. USEPA has designated the Basin as nonattainment for ozone and OEA expects that existing exceedances of the ozone NAAQS would continue if the proposed rail line is constructed and operated in combination with ongoing oil and gas development in the cumulative impacts study area. Air emissions from oil and gas development would occur throughout the study area within oil fields shown on Figure 3.15-1 and impacts on air quality would not be disproportionately borne by minority or low-income populations, or the Ute Indian Tribe.

The rail terminals are located in an area where OEA has identified the presence of minority and low-income populations, and the Ute Indian Tribe. OEA anticipates that air emissions from terminal construction and operation would not lead to ambient concentrations that could exceed the NAAQS in the local areas of the terminals. In addition, OEA does not expect that the cumulative impact of terminal operations and rail operations on the track to the terminal would exceed the NAAQS. The terminals would require air quality permits. As part of the permit application process the terminal

developer must demonstrate to the satisfaction of Utah DEQ that the facility would not cause concentrations to exceed the NAAQS. Locomotives are mobile sources and would only intermittently contribute to ambient pollutant concentrations at the terminals, which are stationary sources.

OEA concludes that cumulative impacts on air quality resulting from construction and operation of the proposed rail line and rail terminals would not be high and adverse, and therefore would not result in disproportionately high and adverse effects on minority or low-income populations, or the Ute Indian Tribe.

Biological Resources

Sclerocactus

Construction of any of the Action Alternatives would temporarily disturb and permanently remove suitable habitat for Pariette cactus and Uinta Basin hookless cactus. The amount of temporary disturbance and permanent removal of suitable habitat would be greatest under the Wells Draw Alternative. The Indian Canyon Alternative and Whitmore Park Alternative could also temporarily disturb or permanently remove habitat in a Core 2 Conservation Area[6] on Tribal trust lands. Oil and gas fields in the cumulative impact study area overlay close to 350,000 acres of suitable habitat for *Sclerocactus* and more than 94,000 acres of Core Conservation Area, and future oil and gas development in the Basin would likely remove additional suitable habitat for Pariette cactus and Uinta Basin hookless cactus.

Pariette cactus and Uinta Basin hookless cactus are both listed as threatened under ESA. To address impacts of the Action Alternatives on the Pariette cactus and Uinta Basin hookless cactus, OEA is consulting with USFWS to develop appropriate mitigation for those species, pursuant to ESA Section 7. Future oil and gas development involving federal surface or federal minerals in the cumulative impact study area would also trigger consultation with USFWS under Section 7. This would reduce the impacts of future oil and gas development on Pariette cactus and Uinta Basin hookless cactus where there is a federal nexus. OEA also expects that oil and gas development on Tribal trust lands would be conducted in accordance with the tribe's *Sclerocactus* management planning, which may include undertaking soil assessments, complying with mitigation measures to be developed in consultation with the tribe, and contributing to a conservation mitigation fund.

These measures would reduce but not completely avoid adverse effects to these ESA-listed species, particularly in areas that do not involve federal surface, federal minerals, or Tribal trust lands. Of the nearly 350,000 acres of suitable habitat that overlay oil and gas fields in the study area, approximately 281,000 acres are located in areas with federal or tribal jurisdiction, while over 68,000 acres have no federal or tribal jurisdiction. Because Pariette cactus and Uinta Basin hookless cactus are culturally important to the Ute Indian Tribe and the cumulative oil and gas development scenario involves substantial potential for disturbance or removal of suitable habitat, OEA believes that cumulative adverse effects on Pariette cactus and Uinta Basin hookless cactus would be a disproportionately high and adverse effect for the Ute Indian Tribe.

Big Game Habitat and Migration

Big-game species (i.e., bighorn sheep, elk, moose, mule deer, and pronghorn antelope) all have year-long substantial and/or crucial habitat in the cumulative impact study area. Construction of any of

[6] A *Core 2 Conservation Area* for cactus is an area that contains the densest concentrations of cactus with a 1,000-meter buffer using a kernel density analysis.

the Action Alternatives would temporarily disturb or permanently remove big-game habitat in the project footprint and could potentially disrupt migration corridors.

Ongoing and future oil and gas development and construction of the rail terminals would contribute to cumulative impacts on wildlife, including big game species by causing habitat loss, degradation, and alteration, as well as potentially causing injury or mortality of wildlife, and wildlife avoidance from increased human activity. The extent of potential cumulative impacts would depend on the location of the oil and gas development relative to the proposed rail line, with a greater potential for a cumulative impact if the activity is closer to the proposed rail line.

The Ute Indian Tribe has strong hunting traditions that are still practiced today and that are important to tribal members' way of life. Impacts on big game from habitat disturbance and noise could diminish hunting opportunities and adversely affect tribal hunting traditions. Because this effect would be experienced only by tribal members, OEA concludes that it would represent a disproportionate effect for the Ute Indian Tribe. OEA has concluded, however that the effect would not be high and adverse. Therefore, OEA concludes that cumulative impacts on big game would not result in disproportionately high and adverse effects on minority or low-income populations, or the Ute Indian Tribe.

Cultural Resources

Oil and gas development would result in ground disturbance for the drilling of new wells and the construction of well pads, pipelines, electric power distribution lines, access roads and other associated infrastructure. To the extent that they are present, archaeological resources could be disturbed by construction activities that involve excavation, grading, and other earthwork. Because the cumulative impact study area has not been surveyed comprehensively, OEA concludes that additional cultural resources, such as previously unidentified archeological sites and rock imagery sites, are likely to be present in the study area. It is likely that many of these unidentified cultural resources are of cultural significance to the Ute Indian Tribe and that adverse effects to those resources would, in the absence of mitigation, be a disproportionately high and adverse impact on the tribe.

Where there is a federal nexus (i.e., use of federal surface or extraction of federal minerals), oil and gas development activities would be subject to NHPA Section 106 consultation and OEA expects that adverse effects would be avoided, minimized, or mitigated through the Section 106 process. Similarly, oil and gas development with a State nexus (i.e., use of State lands or extraction of State-owned minerals) would be subject to state regulations that govern the protection of cultural resources, and development of Tribal trust lands would be subject to consent of the Ute Indian Tribe.

OEA expects that the Ute Indian Tribe would be engaged to resolve adverse effects on cultural resources that are important to the tribe where there is a federal, state, or tribal nexus, such that adverse effects would be less than significant. Oil and gas development on private surface and accessing private minerals would not be subject to the same of level of protection, although a more limited review may be undertaken for a specific activity that requires a federal or state permit, approval, or license. Because there is a lower level of cultural resource protection on private surface accessing private minerals, OEA expects that adverse effects of future oil and gas development on private surface with private minerals could result in a disproportionately high and adverse effect to the Ute Indian Tribe.

Socioeconomics

As described in Section 3.15.5.13, *Socioeconomics*, construction and operation of the proposed rail line and rail terminals, and projected oil field development to meet the transportation capacity of the rail line, would all generate employment, labor income, and spending on goods and services in the cumulative impacts study area. Economic benefits related to direct, indirect, and induced spending would extend to members of the Ute Indian Tribe who reside in the cumulative impacts study area and to Indian-owned businesses that would benefit from indirect and induced spending. Other revenue streams associated with oil and gas development that would directly benefit the Ute Indian Tribe include royalties and lease payments associated with oil well development on Tribal trust lands, compensation for water use agreements to provide water for drilling, direct and indirect employment to support oil and gas development on Tribal trust lands, and payment of taxes and business fees to the tribe.

Conversion of land in the Basin for additional oil production and construction of the rail terminals would add industrial facilities, construction noise, truck traffic, and air quality emissions, which would result in adverse effects for nonmarket social values and quality of life for populations, including tribal members, that reside in proximity to oil fields and the proposed locations for the rail terminals. These effects would be additive to adverse effects on nonmarket social values and quality of life from construction and operation of the proposed rail line. These adverse effects would be offset by economic benefits that would be realized locally and regionally within the four-county study area.

OEA concludes that, as a whole, the impacts from the proposed rail line, when combined with impacts from construction and operation of the rail terminals, and reasonably foreseeable oil and gas development, would not result in high and adverse effects on socioeconomics. Therefore, OEA concludes that cumulative impacts on socioeconomics would not result in disproportionately high and adverse effects on minority or low-income populations, or American Indian tribes.

Other Projects and Actions

The other projects and actions considered in this cumulative impact analysis are not concentrated in areas where OEA determined minority or low-income populations, or the Ute Indian Tribe to be present. In addition, the cumulative impact analyses presented in Sections 3.15.5.1 through 3.15.5.13 do not identify any high and adverse cumulative impacts related to construction and operation of the proposed rail line in combination with other projects and actions. Therefore, OEA concludes that the other projects and actions would not contribute to disproportionately high and adverse effects on minority or low-income populations, or American Indian tribes.